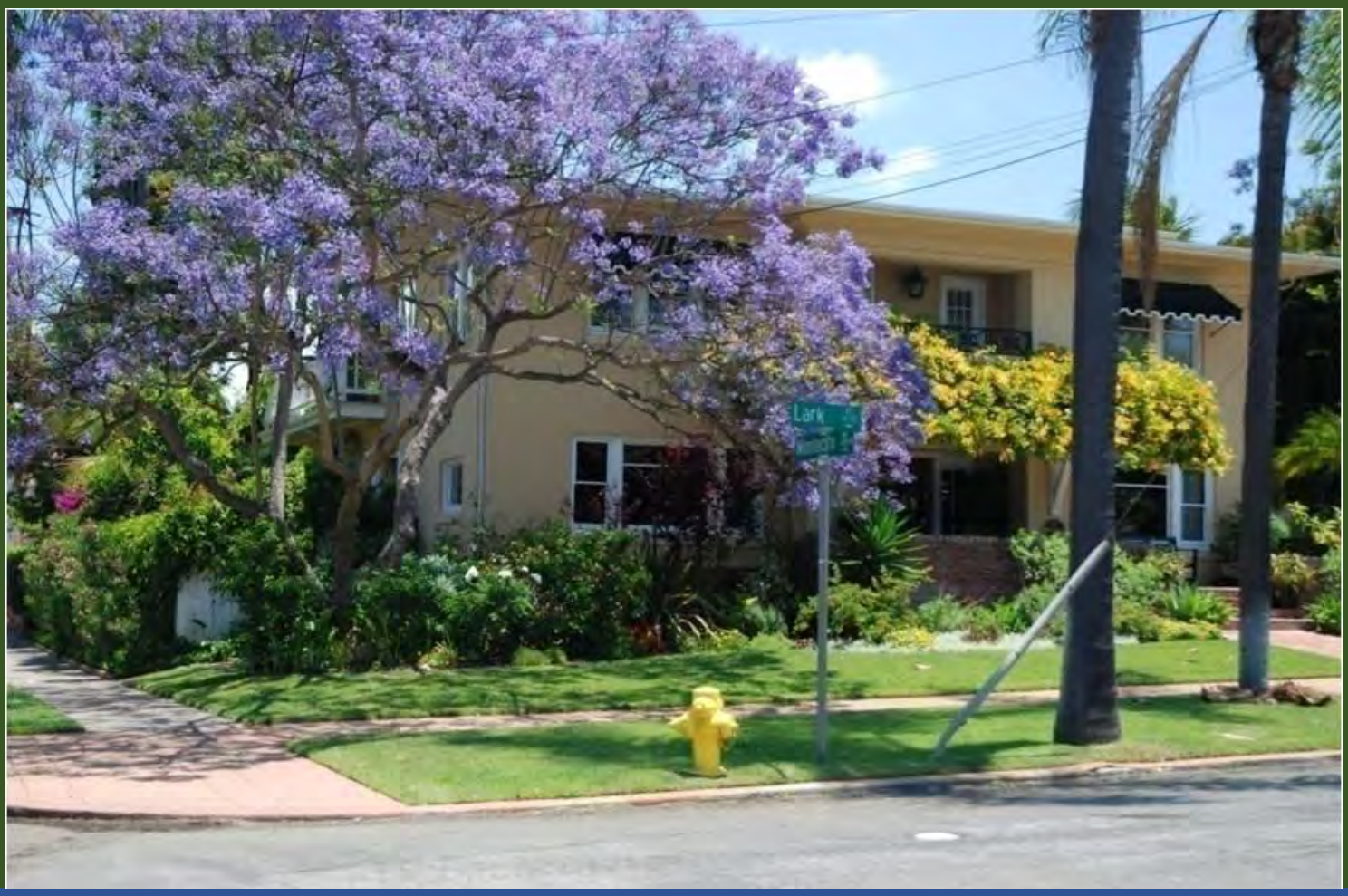

The City of San Diego

Draft
Urban Forest Management Plan

Prepared by:
Inland Urban Forest Group

Draft Date:
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Executive Summary

This Urban Forest Management Plan (Plan) outlines the objectives and actions needed to sustain, protect, and enhance community trees in the City of San Diego. The trees along streets, in parks, and in open space areas provide many benefits to the City, its residents and visitors—they provide shade, save energy, improve air quality and public health, mitigate climate change, reduce stormwater runoff, increase property values, create wildlife habitat, and enhance quality of life.

The goals for the urban forest are outlined in the 2008 General Plan. This implementation plan outlines the objectives and actions for achieving those goals, principally to:

- Establish and maintain optimal levels of tree cover, age and species diversity to maximize ecosystem benefits provided by urban trees
- Maintain trees in a healthy condition through good tree care.
- Incorporate street tree plans and urban forest management in community plan updates.
- Require planting and maintenance of trees in development permits.
- Foster public education and community support for urban forestry.

This Plan discusses issues and trends that affect San Diego's urban forest. The most recent tree inventory was completed in 2002, and there is a need for an updated inventory and a tree canopy assessment. Significant investments are needed to implement a management program to achieve a healthy urban forest, particularly for tree planting and replacement, watering, pruning and trimming.

The City of San Diego's policies, regulations, and planning documents establish a strong framework for maintaining and enhancing the city's urban forest. The economic downturn and recent fiscal challenges have resulted in cuts to tree planting, tree pruning and palm trimming, code compliance, and public education.

Recommendations for this plan were based on input from city staff, local urban forestry professionals and planners. Community members identified benefits of trees, desires for more trees in their neighborhoods, issues relating to tree care, and their willingness to invest in trees. Local tree care professionals and planners reviewed and revised the Street Tree Selection Guide to identify additional species and remove those less suitable for street tree planting.

This plan is meant to be a working document that will be continually implemented and monitored during the next 20 years. Budget decisions will either limit or enhance the quality and quantity of trees planted and managed, and their resultant contributions to air quality and public health, energy reduction, stormwater retention, climate change adaptation, and desirability of urban neighborhoods.

[Cover photo taken by Marilyn French]

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Provide comments on this draft Urban Forest Management Plan by Friday, March 6, 2015 to Melissa Garcia, Senior Planner,. magarcia@sandiego.gov.

Introduction

San Diego is the eighth-largest city in the United States and the second largest in California, with a population of 1.3 million.[1] San Diego is known for its mild Mediterranean climate, tourist destination, border with Mexico, deep harbor, educational institutions, and technology-based industries in the southwest corner of California.

San Diego's tree canopy provides significant contributions to the quality of life for residents and visitors, because trees make a vital and affordable contribution to the sense of community and create pedestrian-friendly neighborhoods. During the past decade, San Diego's tree cover has declined; budgets for tree planting and maintenance have been reduced; and landscape code violations were given lower priority for enforcement.

A diminished urban forestry program reduces public assets, costs taxpayers money, and eliminates grant-funding eligibility. A long-range plan, guided by urban forestry expertise, is needed to bring together existing policies and guidelines, best urban forestry management practices, and community planning. An effective urban forestry program is critical to meeting the city's commitment to sustainability, carbon sequestration, stormwater reduction, water conservation, and climate change, as set out in the 2008 General Plan.

This Plan provides an overall strategy that will help San Diego maximize its urban forest benefits for years to come. It covers the city's street trees, park trees, and trees required by development permits on private property. The scope is 20 years with the expectation that it be reviewed every five years.

The Process

The City completed the General Plan in 2008, with policies outlining a healthy urban forest and the development of an urban forestry master plan. In 2013, the City of San Diego received a grant from the California Department of Forestry and Fire Protection (CAL FIRE) to develop an urban forest management plan. The community outreach process began in 2014, to determine and assess community attitudes regarding trees, the benefits of an urban forest as well as concerns about neighborhood trees.

Concurrently, monthly working group meetings were conducted with city staff and community members from April 2014 to February 2015. Interviews were conducted with individual city staff members during this time. Two public forums or stakeholder meetings were held on September 22 and 29, 2014, to review the draft goals and objectives. Stakeholder meetings were held on January 26 and February 2, 2015, to review the draft plan.

[1] 2010 census.

The goals from the city's 2008 General Plan were used as the basis for this plan. Objectives were developed to support those goals, and then actions were written to implement each objective. Public comment on the draft Plan was obtained.

Overview

Environmental and Historical Context

Located along the coast of the Pacific Ocean, San Diego's subtropical climate is characterized by warm, dry summers and mild winters with most of the annual precipitation falling between December and March. The city has a mild climate year-round with an average of 201 days above 70 °F and low rainfall (9–13 inches annually). San Diego falls into Sunset's[2] zones 21 and 23 (inland foothills and valleys) and 24 (coastal with marine influence).

Like most of Southern California, the majority of the City of San Diego's vegetation was originally occupied by chaparral and sage-scrub, plant communities with mostly drought-resistant shrubs. The steep and varied topography and proximity to the ocean create a number of different habitats within the city limits. Sycamore, cottonwood, and willow trees grow in the riparian area along creeks and rivers, with native oaks growing on the slopes.

Trees native to many other places can thrive in San Diego's urban environment. The soil is alkaline and low in organic matter due to the plant types grown here and lack of water. Urban soil is often a mixture of disturbed soils and sometimes construction debris. Frequently, trees have restricted rooting space, often constrained by concrete or asphalt and overhead utility lines. Imported water and recent drought conditions favor selecting trees with low water requirements.

Trees have played a substantial role in San Diego's history. Olive trees were first cultivated in California at Mission San Diego de Alcalá in the late 1790s[3]. Eucalyptus trees were planted in the late 1800s with an unrealized promise to produce lumber for railroad ties.[4] The citrus trees planted in the early 1900s were gradually replaced by housing developments in the 1950s.

[2] Brenzel, Kathleen Norris. *The New Sunset Western Garden Book*. New York, NY. Time Home Entertainment Inc., 2012. Also described at http://www.sunset.com/garden/climate-zones/sunset-climate-zone-san-diego-area

[3] Carter, Nancy C. 2008. San Diego olives: Origins of a California industry. J. San Diego History 54(3):137-161. Available at http://www.sandiegohistory.org/journal/v54-3/pdf/v54-3carter.pdf

[4] Stanford, Leland. 1970. San Diego's eucalyptus bubble. J. San Diego History 16(4):. Available at http://www.sandiegohistory.org/journal/70fall/eucalyptus.htm

City Park was established in 1868 and is now known as Balboa Park. The park's first trees were planted by Kate Sessions, a renowned horticulturalist, who leased 36 acres for a nursery in 1902. In exchange she planted 100 trees a year in the park, and furnished 300 more trees annually for planting throughout the city. Today Balboa Park is a significant horticultural and cultural resource with more than 15,000 trees.

From the early 1900s, planners, architects, and landscape architects have been incorporating trees into their plans for residential developments, business areas, and boulevards. In the late 1990s, the Mayor, City Council and community leaders began working together to establish urban forestry initiatives. As a result, the Community Forest Advisory Board (CFAB) was established in 1999 (formerly known as the Tree Advisory Board); the City was certified as a Tree City USA in 1999; a Tree Protection Policy was adopted in 2005; and urban forestry guidelines were incorporated into the General Plan in 2008.

Why a Plan Is Needed

Urban forestry researchers and practitioners draw upon longstanding arboriculture practices and many scientific and social science disciplines in managing urban trees to provide environmental, economic, and social benefits.[5] To realize these benefits, a comprehensive vision is needed for the management of the city's trees, and an implementation schedule followed to secure the resources.

An urban forest management plan is a planning process, with a number of steps to gather, analyze, and act on information. The first step is to conduct a tree inventory that consists of information gathered about specific trees or estimated from aerial images. This information is then analyzed and evaluated to describe the current state of the urban forest. The City's tree inventory is incomplete and outdated, and is a high priority for accomplishment.

Based on the tree inventory, management goals are set for the urban forest resources and program, including goals for services provided to city residents, percent of urban tree canopy, mix of species by age and location, regulations governing tree cover and care, and technical oversight. The resources and actions to achieve these goals are outlined generally in this Plan, and need to be further detailed as tree inventory information is obtained.

Benefits Provided by Trees

San Diegans' quality of life depends on the urban forest, as trees make a vital and affordable contribution to the sense of community, pedestrian-friendly neighborhoods, energy savings, and air quality. The urban forestry program is critical to meeting the city's commitment to climate change, carbon sequestration, stormwater reduction, and

[5] Glossaries of terms used in urban forestry, tree management, and this Plan are available at http://www.treepeople.org/glossary and http://selectree.com/information.lasso .

water conservation. Trees are one of the few infrastructure investments that grow in value over time.

References in this section were taken from the review of benefits of trees and urban forests by Alliance for Community Trees, which cited 122 references.[6] Other references for the benefits of trees are the Urban Ecosystems and Social Dynamics research program at the USDA Forest Service Pacific Southwest Station;[7] Urban Forests, Environmental Quality and Human Health research program at the USDA Forest Service Northern Research Station;[8] and the Human Dimensions of Urban Forest and Urban Greening at the University of Washington.[9]

Positively Influence Climate . . . and Ensure San Diego's Sustainability
Trees absorb carbon dioxide and store carbon in wood, which helps to reduce greenhouse gases. Carbon emissions from vehicles, industries, and power plants are a primary contributor to increased air temperatures in metropolitan areas, because they slow the passage of heat through the Earth's atmosphere. Urban trees in the United States store 700 million tons of carbon valued at $14 billion with an annual carbon sequestration rate of 22.8 million tons per year valued at $460 million annually.[10]

Clean Air . . . and Breathe Easy
Shade trees reduce pollution and return oxygen to the atmosphere. In addition to carbon dioxide, trees' leaves or needles absorb pollutants, such as ozone, nitrogen dioxide, sulfur dioxide, and some particulate matter. As of 2002, San Diego's community forest removed 4.3 million pounds of pollutants from the air annually, a benefit worth $10.8 million.[11]

Save Energy . . . and Lower the Cost of Cooling and Heating Buildings
As natural screens, trees can insulate homes and businesses from extreme temperatures, keep properties cool, and reduce air conditioning utility bills. A 20 percent tree canopy over a house results in annual cooling savings of 8 to 18 percent and annual heating savings of 2 to 8 percent.[12] By planting shade trees on sunny exposures, residents and businesses can save up to 50 percent on hot-day energy bills.[13]

[6]Alliance for Community Trees. 2011. Benefits of trees and urban forests: A research list. Unpublished white paper, 19 pp. Available at http://www.actrees.org/files/Research/benefits_of_trees.pdf . Refer to this report for full citations of the source documents.

[7] Greg McPherson, USDA Forest Service, http://www.fs.fed.us/psw/programs/uesd/

[8] David Nowak, USDA Forest Service, http://www.nrs.fs.fed.us/units/urban/

[9] Kathleen Wolf, University of Washington, http://naturewithin.info/

[10] Alliance For Community Trees 2011, reference 52

[11] American Forests 2003

[12] Alliance For Community Trees 2011, reference 13

[13] Alliance For Community Trees 2011, reference 91

Reduce Street Maintenance . . . and Save Money
Shaded streets last longer and require far less pavement maintenance, reducing long-term costs. Canopy diminishes pavement fatigue, cracking, rutting, and other damage, reducing repair costs up to 60 percent.[14] A study from University of California at Davis found that 20 percent shade cover on a street improves pavement condition by 11 percent, which is a 60 percent savings for resurfacing over 30 years.[15]

Raise Property Values . . . and Compound Assets
Trees are sound investments, for businesses and residents alike, and their value increases as they grow. Sustainable landscapes can increase property values up to 37 percent.[16] The value of trees appreciates over time, because the benefits grow as they do. For businesses, trees have added value, including higher revenues. Shoppers seek out leafy promenades that frame storefronts. Research shows that shoppers spend more on products in tree-lined business districts—between 9 and 12 percent more.[17, 18]

Clean Water . . . and Conserve Water and Soil
A tree's fibrous roots, extending into the soil, are premier pollution filtration and soil erosion prevention systems. In 2002, more than 39 percent of San Diego was covered with impermeable surfaces.[19] In contrast to an impervious hardscape, a healthy urban forest can reduce annual storm water runoff up to 7 percent.[20] Highly efficient trees also utilize or absorb toxic substances such as lead, zinc, copper, and biological contaminants.[21] One study estimated that eliminating the need for additional stormwater filtration systems would result in savings exceeding $2 billion.[22]

Cool Pavement . . . and Diminish Urban Heat Islands
Broad canopy trees lower temperatures by shading buildings, alphalt and concrete; deflecting radiation from the sun, and releasing moisture into the air. The "urban heat island effect" is the resulting higher temperature of areas dominated by buildings, roads, and sidewalks. Cities are often 5 to 10°F hotter than undeveloped areas, because hot pavement and buildings have replaced cool vegetated land.[23] In addition, high temperatures increase the volatility of automobile oil and oil within the asphalt itself, releasing the fumes into the atmosphere. Shade trees can reduce asphalt temperatures by as much as 36°F, thus diminishing the fumes and improving air quality.[24]

[14] Alliance For Community Trees 2011, reference 42
[15] Alliance For Community Trees, 2011, reference 96
[16] Alliance For Community Trees, 2011, reference 13
[17] Alliance For Community Trees, 2011, reference 45
[18] Alliance For Community Trees, 2011, reference 46
[19] American Forests 2003
[20] Alliance For Community Trees, 2011, reference 10
[21] Alliance For Community Trees, 2011, reference 19
[22] *San Diego Canyon Policy Portfolio*, 2006, Preamble, Ecosystem Services Analysis.
[23] Alliance For Community Trees, 2011, reference 15
[24] Alliance For Community Trees, 2011, reference 42

Protect Wildlife . . . and Restore Ecosystems
Planting and protecting trees can provide habitat for hundreds of birds and small animals. San Diego is often cited as a region with more plant and animal species than any other in the United States, yet urbanization and the destruction of valuable ecosystems have led to the decline of many of these species. Only 10 percent of San Diego's native coastal sage scrub and five percent of wetland habitats remain. Adding trees, particularly native trees, provides valuable habitat for wildlife.

Build Safe Communities . . . and Decrease Crime
Police and crime prevention experts agree that trees and landscaping cut the incidence of theft, vandalism, and violence by enhancing neighborhoods. Thriving trees on well-maintained streets indicate pride of ownership. Public housing residents with nearby trees and natural landscapes reported 25 percent fewer acts of domestic aggression and violence.[25] Apartment buildings with high levels of greenery had 52 percent fewer crimes than those without any trees. Buildings with medium amounts of greenery had 42 percent fewer crimes.[26]

Calm Traffic . . . and Make Neighborhoods Safer and Quieter
People drive more slowly and carefully through tree-lined streets, because trees create an illusion of narrower streets. One study found a 46 percent decrease in crash rates across urban arterial and highway sites after landscape improvements were installed.[27] The presence of trees in a suburban landscape reduced the cruising speed of drivers by an average of three miles per hour. Faster drivers and slower drivers both drove at decreased speeds in the presence of trees.[28]

Trees reduce noise pollution, buffering against as much as half of our urban noise. By absorbing sounds, a belt of trees 100 feet wide and 50 feet tall can reduce highway noise by 6 to 10 decibels.[29] Buffers composed of trees and shrubs can reduce 50 percent of noise.[30]

Live Well . . . and Reduce Stress
Neighborhoods with generous canopies of trees are uplifting and good for public health. Greater contact with natural environments correlates with lower levels of stress, improving performance.[31] Studies show that children with attention deficit disorder function better after activities in green settings. A green environment impacts worker productivity; workers without views of nature from their desks claimed 23 percent more

[25] Alliance For Community Trees, 2011, reference 69
[26] Alliance For Community Trees, 2011, reference 82
[27] Alliance For Community Trees, 2011, reference 38
[28] Alliance For Community Trees, 2011, reference 40
[29] Alliance For Community Trees, 2011, reverence 90
[30] Alliance For Community Trees, 2011, reference 39
[31] Alliance For Community Trees, 2011, reference 31

sick days than workers with views of nature.[32] Residents of areas with the highest levels of greenery were three times as likely to be physically active and 40 percent less likely to be overweight than residents living in the least green settings.[33]

Estimating the Economic Value of San Diego's Urban Forest

The San Diego County Tree Map[34] has functions to calculate the environmental benefits trees provide: gallons of stormwater retained, pounds of air pollutants captured, kilowatt-hours of energy conserved, and tons of carbon dioxide removed from the atmosphere. The benefits of the 200,000 trees in the City's recent tree inventory are:

- Estimated annual greenhouse gas benefits are 10,800,000 pounds CO_2 reduced (4,889 metric tons (MT), rounded to 5,000 MT), for a value of $215,000.[35]
- These trees conserve an estimated 47,000,000 gallons of water per year (savings of $86,145).[36] Rather than being a net user of water (and thus indirectly energy), trees conserve water by intercepting rainfall, increasing stormwater retention, and requiring only limited water after initial establishment.
- The estimated annual energy savings are 4,970,000 kWh conserved, for a value of $800,000 (about $4 per tree per year).
- The trees also capture 32,000 pounds of air pollutants annually, an estimated annual value of $1,700,000.

[32] Alliance For Community Trees, 2011, reference 29

[33] Alliance For Community Trees, 2011, reference 25

[34] San Diego County Tree Map, www.sandiegotreemap.org, Type location as "San Diego" and search. This database underestimates the trees in San Diego, as it only includes street trees that were inventoried in the past ten years and does not include trees in parks, residential or commercial properties

[35] Benefits and economic values computed with iTree software from the USDA Forest Service, www.itreetools.org

[36] San Diego County Tree Map, www.sandiegotreemap.org

Status of San Diego's Urban Forest

Tree Resource Assessment

Canopy Cover

Tree canopy is an important measure of the urban forest resource. The urban tree canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. Estimates of San Diego's tree cover vary based on image type, resolution, and type of study/author.

American Forests[37]conducted a study of aerial imagery for San Diego comparing 30-meter (m) resolution data from 1986 and 2002. Tree cover was estimated at seven percent with this data. The land uses were calculated as 110,044 acres of urban land (51%), 48,674 acres of grassland (22%), 32,956 acres of shrub land (15%), and 14,738 acres of tree canopy (7%). According to this analysis, the City lost 32% of its grassland, 27% of its tree cover, and 7% of its shrub land from 1985 to 2002, while the city's developed urban areas increased by 39% in those years.

In a national study by the U.S. Department of Agriculture (USDA) Forest Service, tree canopy and impervious surface cover were estimated from maps at 30m resolution from 2001 Landsat satellite imagery and published in 2007[38] in conjunction with 1990 and 2000 census and geographic data (1:5,000,000 scale cartographic boundary files) to assess current urban and community forest attributes. This analysis of Landsat imagery showed that the City of San Diego's tree cover is about 4.2 percent.[39]

The city is seeking funding to obtain a current urban tree canopy assessment that will enable the city to have a baseline of the status of the current urban tree canopy and to set future tree planting goals. Using high-resolution remotely-sensed light detection and ranging (LiDAR) data recently obtained by the City, urban parcels will be ranked on their suitability for establishing new tree canopy, including plantable space, ownership, topography, soils, and other inputs.

Street Tree Inventory

The Streets Division completed the most recent tree inventory in 2002. It includes all trees in public rights-of-way, but not those in assessment districts. City employees and interns walked the streets with GPS units, identified and recorded data for existing trees, and identified vacant sites.[40] This data is part of the "Street Tree Inventory" database at

[37] American Forests. 2003. Urban ecosystems analysis, San Diego, CA. 20 p. Available at http://www.ufei.org/files/pubs/sandiegouea.pdf, accessed 2/10/12

[38] Homer, C.; Dewitz, J.; Fry, J.; Coan, M.; Hossain, N.; Larson, C.; Herold, N.; McKerrow, A.; VanDriel, J.N.; Wickham, J. 2007. Completion of the 2001 national land cover database for the coterminous United States. Photogrammetric Engineering and Remote Sensing. 73(4): 337-341. Cited in Nowak and Greenfield, 2010.

[39] Nowak and Greenfield, 2010.

[40] Drew Potocki, Urban Forester, City of San Diego, Transportation and Streets Department, personal communication March 2014

the City, in the "Trees_SD" database at the San Diego Association of Governments,[41] and in the online San Diego Tree Map.[42] The database includes about 200,000 trees. The number of trees and palms varies greatly by community, Table 1 displays trees by community, sorted in descending order of number of trees per street mile. Values of 0 (zero) indicate that data has not been recorded for that area.

This database likely underestimates the number of trees in the City since it has only been updated where tree care management companies (contractors to the city) have pruned, planted, or otherwise treated a tree, entered information into their data base, and provided that data to the city. The database generally does not include trees in parks, residential, or commercial properties, although citizens can now add data directly into San Diego County Tree Map.[43]

Data from the Tree Map is summarized in Table 2 by community planning area for the number of street trees and palms, with calculations made for the percent of street trees planted. (The total number of trees and palms is lower than the value in Table 1, likely due to different queries of the data.)

While San Diego's streets are lined with an estimated 200,000 trees and palms, it is estimated that they could accommodate more than double that amount. Assuming that full capacity would be one tree every 50 feet (on both sides of the street), or 200 trees per street mile, the tree and palm species were tabulated for each community planning area. Many planting opportunities exist in the city, such as along under-planted arterials; in older, established neighborhoods where trees may have been lost; in new, treeless neighborhoods; around schools; and in areas around freeway interchanges.

As summarized in Table 3, the tree inventory is dominated by eight genuses: *Afrocarpus, Cupaniopsis, Pinus, Platanus, Liquidambar, Lophostemon, Jacaranda*, and *Eucalyptus*. This table does not list the palm species.

[41] Mike Klein, GIS Specialist, Planning Department, personal communication, October 8, 2014.

[42] San Diego Tree Map, www.sandiegotreemap.org

[43] San Diego Tree Map, www.sandiegotreemap.org

Table 1: Street Tree Count, Miles of Streets, and Acreage in Community Planning Areas[44]

Community Planning Area (CPA)	Tree Count	Miles of Street in CPA	Mean Trees/Mile Street	CPA (acres)	Mean Trees/ acre
Mid-City: Kensington-Talmadge	4487	51	88.0	1157	3.88
Torrey Hills	2003	23	87.1	833	2.41
Miramar Ranch North	3657	44	83.1	1894	1.93
Carmel Valley	8406	103	81.6	4525	1.86
Torrey Highlands	2474	31	79.8	1506	1.64
Sabre Springs	2688	34	79.1	1595	1.68
Uptown	9626	125	77.0	2647	3.64
Downtown	4852	66	73.5	1516	3.20
Carmel Mountain Ranch	2566	37	69.4	1523	1.69
Reserve	332	5	66.4	281	1.18
Pacific Beach	8145	123	66.2	2609	3.12
Greater Golden Hill	2976	45	66.1	746	3.99
La Jolla	10736	167	64.3	5719	1.88
Mid-City: Normal Heights	2638	42	62.8	846	3.12
Greater North Park	7465	121	61.7	2254	3.31
Mira Mesa	11903	204	58.3	10729	1.11
Ocean Beach	2357	41	57.5	641	3.67
San Ysidro	3238	57	56.8	1862	1.74
Scripps Miramar Ranch	5033	91	55.3	4197	1.20
Otay Mesa	5334	103	51.8	9316	0.57
Navajo	9297	180	51.7	9087	1.02
Skyline-Paradise Hills	6986	139	50.3	4585	1.52
Encanto Neighborhoods, Southeastern	5544	117	47.4	3811	1.45
Rancho Penasquitos	6384	135	47.3	6456	0.99
Peninsula	9142	194	47.1	5282	1.73
Serra Mesa	3195	68	47.0	2211	1.45
Clairemont Mesa	11407	249	45.8	8539	1.34
Otay Mesa-Nestor	6117	135	45.3	5368	1.14
College Area	2705	60	45.1	1969	1.37
Rancho Bernardo	7115	159	44.7	6583	1.08
Southeast San Diego, Southeastern	6031	146	41.3	2929	2.06
Old Town San Diego	486	12	40.5	275	1.77
Mid-City: Eastern Area	4124	103	40.0	3115	1.32
University	6114	161	38.0	8676	0.00
Tierrasanta	3624	96	37.8	7247	0.50
Mid-City: City Heights	5321	145	36.7	2936	1.81
Via de la Valle	107	3	35.7	133	0.81
Linda Vista	2851	82	34.8	2732	1.04
Midway-Pacific Highway	1088	37	29.4	918	1.18

[44] Tree data from www.sandiegotreemap.com, street and acreage data from SanGIS. Analysis done by Amanda Schochet, student at University of California San Diego, October 1, 2012.

Community Planning Area (CPA)	Tree Count	Miles of Street in CPA	Mean Trees/Mile Street	CPA (acres)	Mean Trees/ acre
Barrio Logan	814	29	28.1	552	1.48
Fairbanks Ranch Country Club	195	7	27.9	788	0.25
Torrey Pines	1553	57	27.2	2722	0.57
Mission Beach	621	23	27.0	220	2.82
Kearny Mesa	2240	95	23.6	4423	0.51
Mission Valley	2076	99	21.0	3216	0.65
North City Future Urbanizing Area Subarea II	117	6	19.5	849	0.14
Tijuana River Valley	157	13	12.1	3589	0.04
Mission Bay Park	503	50	10.1	4293	0.12
Balboa Park	219	27	8.1	1299	0.17
Black Mountain Ranch	207	55	3.8	5091	0.04
Rancho Encantada	47	20	2.4	2699	0.02
Los Penasquitos Canyon	8	5	1.6	1213	0.01
San Pasqual	42	38	1.1	10599	0.00
Military Facilities	64	165	0.4	23474	0.00
East Elliot	0	8	0.0	2920	0.00
Del Mar Mesa	0	16	0.0	2093	0.00
Pacific Highlands Ranch	1	34	0.0	2644	0.00
Total	207,418	4481		211,932	

Table 2: Total street trees and palms inventoried and calculation of planting percentages, City of San Diego, 2003 inventory

	No. of Street miles	Total trees	Total palms	Total = Trees + palms	Capacity # trees (200/street mi)	% trees planted (total/ capacity)
District 1	507	33,494	5,642	39,136	101,376	33
District 2	422	20,692	17,429	38,121	84,316	25
District 3	296	12,629	11,376	24,005	59,198	21
District 4	312	15,883	2,743	18,626	62,360	25
District 5	418	28,798	2,330	31,128	83,500	34
District 6	407	18,939	3,066	11,505	81,320	23
District 7	273	13,904	2,267	16,171	54,600	25
District 8	282	15,266	3,752	19,018	56,410	27
Sum of all Districts	2,915	159,605	48,605	197,710	583,080	27

Park and Open Space Trees

The city of San Diego oversees nearly 40,000 acres of developed and undeveloped open space; more than 340 parks including Balboa Park, Mission Trails Regional Park, and Mission Bay Park; and 25 miles of shoreline from Sunset Cliffs to La Jolla. The trees in San Diego's parks are not part of the recent street tree inventory. There is little current data regarding park trees, and an inventory is needed to effectively manage those trees.

For many communities, only the canyons located throughout San Diego remain as undeveloped natural landscapes. Canyons provide the citizens of San Diego with such benefits as scenic vistas, preservation of natural resources, outdoor recreation, and other benefits to health and well-being. Maintenance is only done in these natural areas to control invasive species or to provide for safety. The recommendations in this Plan, related to planting and maintenance of trees, do not apply to the open space areas.

The Park and Recreation Open Space Division oversees 55 of the city's 63 (Maintenance Assessment District) MADs. The Economic Development Department oversees eight MAD's . Management activities conducted by MADs in this Plan are referred to as "MAD staff," to differentiate them from staff in the Open Space program who manage the canyons and other undeveloped areas. The districts are, for the most part, adequately funded to maintain trees.

Tree Planting Goals

Community plans set goals for tree planting and acknowledge the benefits they provide for livability and sense of place. These goals need to be translated into tree planting projects and funded using a variety of sources.

The estimate of tree canopy in the City ranges from 4.2 percent[45] to 7 percent.[46] The Draft Climate Action Plan[47] sets out a goal of increasing tree canopy to 15 percent by 2020, at least a doubling of percent tree cover. An estimate of the number of trees that need to be planted to double tree cover:

- The most recent tree inventory shows that there are about 200,000 street trees in San Diego.[48]
- As there is no recent inventory of trees on private land, the assumption (for this report) is that street trees are 20% of the total trees, and therefore about 1,000,000 trees in the City.

[45] Nowak and Greenfield, 2010

[46] American Forests. 2003. Urban ecosystems analysis, San Diego, CA. 20 p. Available at http://www.ufei.org/files/pubs/sandiegouea.pdf, accessed 2/10/12

[47] City of San Diego Draft Climate Action Plan 2013, http://www.sandiego.gov/planning/genplan/cap/pdf/draft_climate_action_plan_dec_2013.pdf

[48] San Diego County Tree Map, www.sandiegotreemap.org, Type location as "San Diego" and search. This database underestimates the trees in San Diego, as it only includes street trees that were inventoried in 2003 and does not include trees in parks, residential or commercial properties.

- To double the tree canopy, 1,000,000 more trees would be planted on public and private land.
- Larger trees need to be favored, as they provide larger canopies and sequester more carbon.
- Trees need to be watered, trimmed, and protected in order to maximize their health and life span.
- Alternate estimates of tree planting targets can be made by projecting mature canopy sizes of planted trees to cover public and private properties that are currently unoccupied by buildings, streets, and other designated uses.

The following tree planting opportunities could be pursued to reach the goal of doubling tree canopy:

- Streets and parkways
- Parks, community centers, schools, colleges, and other public properties
- State and Federal properties, including California Department of Transportation (CalTrans) rights of way and military installations
- Residential properties (front and back yards)
- Commercial and industrial properties, especially parking lots
- Few trees would be planted in canyons, as much of their acreage is committed to Multiple Species Habitat Areas for native vegetation

Table 3: Total street trees inventoried and tabulation of most common trees in each community, City of San Diego, 2003

	1	2	3	4	5	6	7	8	All Districts
Acacia	570								570
African fern pine	880	826	463	-	1,035	95	-	31	3,330
Ash	66	40	-	-	-	807	378	-	1,291
Bradford Pear	64				239			170	473
Brazilian pepper			560	313					873
Brisbane Box	874	409	406	369	1,810	1,525	506	149	6,048
Calif. pepper	52	67	-	491	-	-	-	-	610
Calif. Sycamore	2,363							656	3,019
Camphor	414								414
Coral Tree		26	-	-	-	-	-	-	26
Carob		459	-	-	-	-	-	-	459
Carrot wood	1,157	1,793	1,446	1,479	1,852	2,263	1,089	1,410	12,489
Chinese Flame	340	39	237	-	316	310	-	-	1,242
Crape Myrtle			134					13	147
Eucalyptus	2,097	502	194	473	3,561	1,793	1,168	-	9,788
Ficus		19	-	-	-	-	99	221	339
Fig	96	52	-	-	-	177	-	-	325
Italian Cypress	340			1,639				35	2,014
Jacaranda	323	2,529	1,223	868	289		134	672	6,038
Juniper		183	-	-	-	1,028	-	781	1,992
London plane	294	31	-	-	270	-	-	-	595
Magnolia		240	-	-	128	-	-	-	368
Melaleuca	450	803	-	-	220	209	-	-	1,682
Myoporum	641					-		33	674
New Zealand Christmas Tree	209	51	-	-	-		-	266	526
Oleander	346	161	-	-	-	-	-	-	507
Olive		17	-	-	-	-	-	-	17
Poplar	388					-		-	388
Pine	3,622	1,025	-	867	3,708		492	13	9,727
Siberian Elm		203	-	-	-	450	-	761	1,414
Sweet Gum	2,677	1,524	798	-	166	-	1,012	-	6,177
Torrey Pine	168					1,048		89	1,305
Victorian Box								39	39
White Alder								328	328
Tipu								223	223
Yucca		10	-	438	-		-	359	807
Total number of trees	18,431	11,009	5,461	6,937	13,594	9,705	4,878	6,249	76,264

Tree Resource Management

At the city staff level, the urban forestry programs are currently managed in five departments:

- Planning (community plan updates)
- Development Services (code compliance)
- Parks and Recreation (parks, open space, and maintenance assessment districts)
- Economic Development Department (business districts)
- Transportation and Storm Water (street trees)

The success of an urban forestry program depends not only on the expertise of professionals trained in this field, but also on the commitment of allied professionals, appointed and elected public officials, and the citizens and local businesses in the community. In many cities, the urban forestry program is placed within the public works department because the street trees must be managed together with the streets, sidewalks, water and sewer lines, and other underground utilities. Other cities place the program in the planning department, to ensure that trees and proper tree management are incorporated into planning decisions and development applications.

In San Diego, the majority of street tree maintenance is conducted by the Streets Division of the Transportation and Storm Water department. Within the Streets Division, the Tree Maintenance Supervisor helps to update the street tree inventory. To conduct tree maintenance, there are five tree trimmers, one arborist, and one supervisor in Streets Division.

The Streets Division has a contract with the Urban Corps, a local non-profit, to plant trees for the city. Irrigating young trees regularly after planting so that they can become established has been an ongoing issue. Currently, the Urban Corps endeavors to get an agreement from the property owner to water the trees.

The Streets Division has been conducting a sidewalk assessment. There are approximately 5,000 miles of sidewalk throughout the city. Property owners are responsible for sidewalk damage when city trees are not involved. If a city tree is involved, an arborist assesses for root pruning and in some cases, the tree is removed and replaced (within six months). Funding for tree replacement is from the city's general fund.[49]

The Park and Recreation Department, Open Space Division manages more than 26,000 acres of open space, including open space canyons and parklands. Maintenance Assessment District (MAD's) maintain approximately 3,886 acres of the City's 26,000 acres of open space. Some 3,200 acres are citywide neighborhood canyons and parklands

[49] According to July 23, 2014, telephone interview with John Helminski, Deputy Director of Transportation, Storm Water, Streets Division.

that are overseen by the Open Space Canyon Program staff.[50] Those trees within the city's rights- of-way and managed by the MAD program are regularly pruned and maintained.

The general fund is used to maintain trees in Open Space and work is only done to remediate safety issues. The MAD program also manages hundreds of acres of open space, primarily in Tierrasanta and Scripps Ranch, wherein trees are maintained at the same level as the Open Space's general fund program. The Open Space Division Canyon Program supports various "Friends of Canyons" groups by assisting with environmental education, canyon enhancement planning, weed management, trail maintenance, and kiosk installation.[51] Within the city's parks, maintenance is primarily performed in-house. There is a reliance on park personnel to inform the division about tree issues. There are three tree trimmers, a park arborist, and two groundskeepers. There is no pruning cycle in place.

Applicable Regulations

The City of San Diego policies, council resolutions, ordinances, and planning documents establish a framework for developing and managing the city's urban forest. The recent economic challenges and fiscal budgeting have curtailed their implementation, resulting in a depleted urban forest canopy. The city's documents and publications range from the guiding General Plan to the specific recommendations of individual tree species in the Street Tree Selection Guide.

The Community Forest Advisory Board (CFAB) provides recommendations related to the city's policies and programs, meeting the second Wednesday of every month.[52] Board responsibilities include providing recommendations for a comprehensive urban forestry master plan and tree inventory; reviewing and recommending necessary revisions to urban forestry-related policies and programs; networking with other boards, agencies and community residents; sharing information and promoting volunteerism; reviewing the implementation and compliance with urban forestry policies and programs; advocating for funding for the establishment and maintenance of an urban forestry program; and promoting and fostering a strong sense of community through urban forestry.

The following policies and regulations are applicable to urban forestry activities in the city of San Diego.

[50] www.sandiego.gov

[51] www.sandiego.gov

[52] Community Forest Advisory Board information at http://www.sandiego.gov/economic-development/about/cfab.shtml

City of San Diego's General Plan. The Plan's Conservation Element, Section J. Urban Forestry, provides the most in-depth description and discussion of urban forestry and identifies the benefits of and policies relating to trees.[53]

City of San Diego Draft Climate Action Plan. The February 2014 draft calls for increasing urban tree coverage by 15 percent by 2020 and by 25 percent by 2035. It also specifies completing an urban tree canopy assessment, implementing the urban forest management plan, and hiring an urban forest manager.[54]

Municipal Code Article 2: General Regulations, Division 6: Landscape Regulations.[55] These regulations establish rules and regulation to control and protect planting on city streets. The following changes should be considered to create a more sustainable urban forest:

> *§142.0403 General Planting and Irrigation Requirements, pages 6-9 (Table 142-04B, Plant Point Schedule)*
> Incentives need to be given for planting, protecting, maintaining, and establishing smaller nursery stock, as the long-term tree vigor is greater when trees can establish root systems in their street parkway or other location. Monitoring and maintenance requirements could be added for smaller tree planting stock. Soil structure and volume need to be modified in some planting conditions, to provide adequate space for tree roots.
>
> *Table 142-04B, Plant Point Schedule* should be revised to value the mature size (long-term value) of trees and to reduce the value given to palms. Palms provide far fewer benefits at the pedestrian scale than shade trees. Palms can invade creek bottoms, and stormwater channels, and have high maintenance costs. Palms are usually approved for visual effect or when an existing adopted community plan includes palms as an approved street tree.
>
> Some of the requirements for tree planting and care could be replaced by referral to industry standards: International Society of Arboriculture (ISA),[56] American National Standards Institute (ANSI)[57] and Urban Forest Ecosystems Institute.[58]

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[53] City of San Diego General Plan 2008, http://www.sandiego.gov/planning/genplan/pdf/generalplan/fullversion.pdf

[54] City of San Diego Climate Action Plan 2013, http://www.sandiego.gov/planning/genplan/cap/pdf/draft_climate_action_plan_dec_2013.pdf

[55] Municipal Code Article 2: General Regulations, Division 4, posted at http://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art02Division04.pdf and Division 6, posted at http://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art02Division06.pdf

[56] http://www.isa-arbor.com/education/onlineresources/cadplanningspecifications.aspx,

[57] http://tcia.org/business/ansi-a300-standards

[58] http://ufei.calpoly.edu/tree_standards.lasso

§142.0412 Brush Management
Consider revising the requirement that tree canopy (drip line) of planted trees be 10 feet or more from habitable structure in Zone One. The ignition of urban trees from embers in San Diego's high-wind wildfire conditions is highly unlikely if the trees are watered and vegetation under the tree is restricted to one-third of the height of clearance between the ground and tree branches.

For replacing trees that die within three years of installation (section (b)(8)), regulations should require the correction of site conditions that contributed to that mortality, including soil, irrigation, and protection.

Council Policy 200-05, Planting of Trees on City Streets, effective November 15, 1993. This policy establishes guidelines for the planting and removal of trees from city street rights-of-way. [59] The Park and Recreation Department has authorized Development Services to issue the No Fee Permit, which is required for all street tree planting, pruning, and removal.[60]. It is recommended that the policy be modified to require the property owner to remove stakes and grates that restrict trunk growth.

Council Policy 900-19, Public Tree Protection, effective June 13, 2005. This policy protects designated trees.[61] There are categories for requests for protection, and stated penalties for unauthorized removals. Restrictions in Multiple-Habitat Planning Areas may limit the designation of Protected Trees and their trimming, and the policy may need to be revised to reflect this.

Council Policy 100-21, Funding for Maintenance Assessment Districts, effective September 7, 2004.[62] This document sets criteria for establishing new maintenance assessment districts and funds landscape maintenance within the districts.

Street Tree Selection Guide. This document suggests trees suitable for planting as street trees.[63] In fall 2014, 20 local tree professionals reviewed it, and the proposed revised list and text are provided as Appendix A.

There was considerable discussion about palms suitable for street trees, and the following palms are included in the list: King Palm, Mexican Blue Palm, Hesper Palm (San Jose Hesper Palm), Guadalupe Palm, Pindo Palm, Mediterranean Fan Palm, Triangle Palm, Chilean Wine Palm, Australian Cabbage Palm (Australian Fan Palm), Ribbon Fan Palm, Medjool Date Palm, Pygmy Date Palm, and Windmill Palm.

[59] Council Policy 200-05, posted at http://docs.sandiego.gov/councilpolicies/cpd_200-05.pdf
[60] No Fee Street Tree Permit, posted at http://www.sandiego.gov/nccd/pdf/streettreepermitapplication.pdf.
[61] Council Policy 900-19, posted at http://docs.sandiego.gov/councilpolicies/cpd_900-19.pdf
[62] Council Policy 100-21, Funding for Maintenance Assessment Districts, posted at http://docs.sandiego.gov/municode/MuniCodeChapter14/Ch14Art02Division06.pdf
[63] Street Tree Selection Guide, posted at http://www.sandiego.gov/street-div/pdf/treeguide.pdf

Multiple Species Conservation Plan (MSCP).[64] The MSCP involves a regional effort to preserve a network of habitat and open space, protecting biodiversity and enhancing the region's quality of life. San Diego is one of several jurisdictions participating in the MSCP. The city's MSCP includes agreements with state and federal wildlife agencies that established endangered and sensitive species conservation requirements. City regulations conform to or have been amended to be consistent with the MSCP requirements.

Landscape Standards of the Land Development Manual.[65] This document establishes the minimum plant material, irrigation, brush management, and landscape-related standards for work done in accordance with requirements of the Land Development Code. Development Services is currently evaluating the street tree criteria in this document with an eye toward expanding the urban forest.

Clarification of Brush Management Regulations and Landscape Standards.[66] This document pertains to development within the wildland/urban interface. It describes brush management and fire protection requirements including thinning and pruning of vegetation. It provides specific horizontal and vertical distance requirements for trees and shrubs. Indigenous, native trees are exempt. The Fire Prevention Bureau does not require permits, but does require a brush management plan and program to be processed for any development. The Fire-Rescue Department issues notices of violation for noncomplying properties.

Pedestrian Master Plan. This plan promotes the contribution of shade trees in enhancing the pedestrian experience, protecting walkers from the elements, providing visual interest, increasing safety from passing traffic, and buffering adjacent uses. [67]

Community Plans.[68] There are 52 community planning areas that comprise the city, each with a community plan. Some of the plans address tree selection, while others do not. The Planning Department refers to the Street Tree Selection Guide for plans without tree lists, and when community plans are updated, the department includes street tree plans.

Public Tree and Community Forest Ordinance. Consideration should be given to providing a comprehensive Public Tree and Community Forest ordinance for tree planting,

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[64] City of San Diego, 1997. Multiple Species Conservation Program: City of San Diego MSCP Subarea Plan. 175 pp. Available at http://www.sandiego.gov/planning/programs/mscp/pdf/subareafullversion.pdf

[65] Landscape Standards of the Land Development Manual, posted at http://www.sandiego.gov/development-services/pdf/industry/standards09.pdf

[66] Clarification of Brush Management Regulations and Landscape Standards, posted at http://www.sandiego.gov/fire/pdf/brushpolicy.pdf

[67] City of San Diego. 2006. Pedestrian Master Plan, posted at http://www.sandiego.gov/planning/programs/transportation/pdf/pmpfv.pdf

[68] Community planning is outlined at Community Planning, outlined at http://www.sandiego.gov/planning/community/

protection, removal, and replacement.[69] The regulations are currently in several sections of the Municipal Code and in Council Policies. In 2004, a comprehensive ordinance was drafted, but not further reviewed or considered, by CFAB members, other local urban forestry professionals, and landscape architects.

Issues and Trends

The following were identified as issues or trends to be addressed in the Urban Forest Management Plan (UFMP). They were derived from numerous interviews in spring and summer 2014 with city staff from the Streets Division, Open Space Division, Park and Recreation Department, Planning and Development Services, Transportation and Storm Water Department, Environmental Services, and members of the UFMP Working Group that included CFAB members, city staff, and citizens at large.

Tree Planting. Policies need to be implemented to ensure that appropriate species are planted in the appropriate location. There is a need to have nurseries supply trees to the city that meet minimum standards. There is no replacement policy when trees are removed. Concerns have been raised about increasing water consumption if more trees are planted.

The spacing of trees should be extended to allow for trees of larger size to grow without root crowding and the soil compaction should be loosened to optimize growing conditions. Soil structure and volume often limit tree growth and create conflicts with sidewalks and other infrastructure. The soil structure required in the City's Low Impact Development (LID) guidelines should be examined for compatibility with tree growth. A soil structure should be pursued that serves a dual purpose to promote tree growth and treat stormwater.

Tree Planting Adjacent to Open Space

There is a concern that non-native and invasive tree species are found in the City's Open Space. Non-native and/or invasive tree species should not be planted adjacent to Open Space areas. Planting non-native trees in close proximity to Open Space increases the chances of those species invading open space. Once non-natives and/or invasive species are found in Open Space areas, the city uses resources for removal. A buffer should be established wherein only local native street trees are planted adjacent to Open Space.

Tree Care. Young trees need to be irrigated in the first years after planting. Maintenance is performed reactively. Drought, pests and diseases should be addressed proactively.

Conflicts with Infrastructure. The root structures of trees are often in the rights-of-way, in spaces that must also accommodate water and sewer lines and other underground utilities. Trees should be integrated into the planning process as they can successfully

[69] Guidance on tree ordinances is available from the Arbor Day Foundation, at http://www.isa-arbor.com/education/resources/educ_TreeOrdinanceGuidelines.pdf.

coexist with gray infrastructure. Some past planning decisions did not fully take into account the location of trees. Aging sewer lines develop cracks, and tree roots grow into them. The conflicts with trees is part of the sidewalk assessment of the approximately 5,000 miles of sidewalks conducted in 2014-15 by the Streets Division.

Parks. Within the city's parks, there is no inventory and no regularly scheduled maintenance program. There are limited areas for increasing the urban tree canopy within parks.

Enforcement. Currently, property owners face few consequences when they use bad pruning practices. Lack of proactive enforcement of tree-related regulations is an ongoing issue (code compliance). Vandalism is an issue in parks.

Education. Public and city staff education is needed about the benefits of trees as well as planting the right tree in the right place.

Management. Additional staff is needed to better manage the urban forest. Mechanisms need to be implemented for identifying issues in the field. Risk should be managed proactively. Some policies and department priorities may contradict each another. A stable source of funding is needed to manage and maintain safe trees.

Other City Programs. A holistic approach to urban forestry is lacking. Air quality, storm water, climate action, and carbon sequestration policies should employ urban trees to meet city goals. The urban forest is not always viewed as a resource. The Storm Water Division incorporates tree planting only for mitigation of low impact development projects. Policies need to incorporate the need to manage for wildlife habitat.

Community Values

Citizen support plays a vital role in supporting urban forestry. Tree-related advocacy groups are now common in many cities. They marshal volunteer support and voice support for urban forestry programs to local officials. Tree-planting volunteers join professional arborists on the front lines. More importantly, citizens can provide the political support to sustain public investment in green infrastructure and the urban forest. Effective urban forestry depends ultimately on the public policy supporting it—financially, administratively, and legally.

The first steps in preparing this plan were to gather information from City residents. Presentations about urban trees and the Urban Forest Management Plan were given to 40 community-planning groups, business improvement districts, and other community groups from May to September 2014. Each attendee was invited to provide input on community forestry benefits and issues in their community. Table 4 summarizes the responses to four of the questions, from 487 attendees at the presentations, and 220 who completed the online survey, for a total of 707 respondents.

The results of the survey showed that the respondents have a general understanding about the benefits of trees, identifying the most important as creating more pleasant neighborhoods and business districts, shading streets and parks, reducing air pollutions, and mitigating climate change. Two-thirds would like to have more trees in their neighborhoods. They would like to see more trees in the city, and they would support regulations that protect trees.

More than half were concerned about the impacts of trees on the gray infrastructure, particularly damage to sidewalks, pavement, and underground pipes. Approximately half of all respondents were willing to support new regulations, plant new trees on their property, and increase the city's budget for tree planting and maintenance. Other major concerns were leaves and fruit droppings, and tree watering.

Table 4. Summary of Responses from Community Groups

Question 1: What are the three (3) most important benefits of trees?

	% total
a. Clean the air by absorbing pollutants	49%
b. Create more pleasant neighborhoods and business districts	53%
c. Increase property values	11%
d. Provide food and shelter for wildlife	26%
e. Reduce greenhouse gases, summer temperatures and address climate change	45%
f. Shade buildings and lower energy bills	28%
g. Shade streets for walking and parks for playing	35%
h. Stabilize soil and reduce storm water runoff	24%
i. Other	2%

Question 2 = In your neighborhood, are there are too many or too few public trees?

Too few trees	68%
Too many trees	2%
Enough trees	24%

Question 4: What are your top two (2) concerns relating to tree planting and care?

a. Sidewalks and pavement cracking	53%
b. Leaves and fruit dropping/ongoing maintenance	29%
c. Tree roots and underground pipe problems (similar to A-sidewalks-pavement)	28%
d. Blocking traffic, sidewalks, signs, and/or street lights	16%
e. Creating safety problems from trees and limbs falling	9%
f. Attracting bugs and other pests	3%
g. Trees cost too much money	5%
Other: Watering and water costs	6%
Other: Maintenance, trimming, and pruning	3%
Other: Fire hazards	2%
Other (not identified)	12%

Question 5: What are you willing to do to ensure San Diego's trees are maintained and protected for future generations? (check all that apply)

a. Support new legislation or rules about planting and tree protection	52%
b. Plant new trees on my property when trees die or need to be removed	54%
c. Increase the city's budget for tree planting and maintenance	49%
d. Volunteer to plant and maintain trees on public property	34%
e. Support a 1% fee or tax, dedicated to tree care and maintenance	28%
f. Other (none)	10%

Goals, Objectives, and Actions

The Conservation Element of the 2008 General Plan includes CE-J.1 to CE.J.5 Urban Forestry, with the overall goal of "protection and expansion of a sustainable urban forest." There are five policies in that element, and they drive the following objectives and actions in this Urban Forest Management Plan. There are also policies relating to urban forestry in other sections of the Conservation Element (climate change and sustainable development, water resource management, and air quality), Historic Preservation, and Urban Design elements. Those policies are incorporated into the five policies of CE-J.1 to CE-J.5

This section is organized in the following way:

- The underlined headings are policies from the 2008 General Plan and serve as goals for this Urban Forest Management Plan.
- The objectives in the 2008 General Plan are listed immediately below and are numbered a, b, c, etc.
- Specific objectives were developed in this Urban Forest Management Plan for the goals, and they are numbered 1, 2, 3, etc.
- Each is followed by a paragraph *in italics* that describes the urban forestry activities that would need to be undertaken.
- The actions follow, and are numbered a, b, c, etc.

Appendix B provides a schedule of actions, by staff area and Fiscal Year. Appendix C contains recommended expenditures for tree trimming and planting to grow and maintain a successful urban forest.

CE-J.1. Develop, nurture, and protect a sustainable urban/community forest.

a. Seek resources and take actions needed to plant, care for, and protect trees in the public rights-of-way and parks and those of significant importance in our communities.
b. Plant large canopy shade trees, where appropriate and with consideration of habitat and water conservation goals to maximize environmental benefits.
c. Seek to retain significant and mature trees.
d. Provide forest linkages to connect and enhance public parks, plazas, and recreation and open space areas.

CE-J.1. Objectives:

1. ***Inventory all public trees and update the tree inventory every seven years.***
   A tree inventory is necessary to determine the number, type (species), age, and condition of the trees to make informed decisions about what is needed to manage and maintain them. Inventories can quickly become inaccurate and updating the inventory every seven years is an industry standard. Trees can drop limbs or fail due to storms,

accidents, or vandalism and these incidents might not be recorded. Trees also can be planted, removed, and/or trimmed by others rather than city staff and that work might not be recorded.

a. Establish inventory of public trees.
b. Record all permits and completed maintenance work in the inventory.
c. Identify designated and potential heritage trees in the inventory.

CE-J.1.1 Actions – Inventory and Inventory Update

1. Urban Forest Manager will prepare a request for proposal (RFP) for a complete inventory. The RFP shall require the identification of landmark trees and potential planting sites.
2. Urban Forest Manager will ensure that the new inventory is completed and accurate.
3. Urban Forest Manager will administer the inventory contract. The Streets, MAD, and Park staff will require all contractors doing tree work in the city to update work records in the city's tree inventory database. It should be clear in the contract that payment for services rendered will not be issued until work records and inventory update are completed.
4. The city will make available electronic tablets to employees to update the inventory.
5. Each employee will be required to complete work orders that update the tree inventory each time a tree is planted, trimmed, removed, or serviced in any way, such as hardscape repairs.
6. The Development Services department will update the inventory database when tree permits are issued.
7. Every seven years, Urban Forest Manager will request funding and/or seek grant opportunities to completely re-inventory the city trees.

2. ***Increase canopy cover (land area covered by trees) to optimize public benefits.***
Canopy cover is an aerial image of the city's urban forest. It is measured by the percentage of the city's land area is covered by trees. As trees are removed and others planted, this figure can change.

a. Obtain a canopy cover assessment using LiDAR remote sensing.
b. Develop a citywide tree canopy optimum target consistent with the Climate Action Plan goal of increasing canopy cover.
c. Establish canopy cover goals for each community.
d. Develop a long-term tree-planting program for achieving established canopy goals.
e. Plant trees that maximize public health benefits, carbon sequestration, air quality, energy reduction, water conservation, storm water retention, ground water recharge, wildlife habitat including those for urban birds, and other benefits.
f. Encourage the planting of large canopy trees to maximize environmental benefits.
g. Identify potential planting sites on public lands.

h. Encourage the planting of trees on private properties.
i. Reduce the urban heat island through actions such as planting trees and other vegetation to produce shade.
j. Develop greening plans.
k. Plant non-invasive species as a buffer near open space/natural areas to keep invasive and potentially invasive species from seeding into these areas.

CE-J.1.2 Actions – Canopy Cover Assessment and Goals

1. Urban Forest Manager will work with canopy assessment experts to complete a LIDAR remote sensing canopy assessment of the entire city.
2. Planning Department and the Urban Forest Manager will work with each community to set canopy cover goals to be completed within 12 months of completing the canopy cover assessment.
3. Using the vacant planting sites as identified in the tree inventory, Urban Forest Manager will develop a 20-year planting plan to achieve the identified canopy cover goals using primarily large, broad-leaf, evergreen trees.
4. Urban Forest Manager, Streets, MAD, and Park staff will begin to address the tree-planting goal in the Draft Climate Action Plan by annually increasing the tree population in areas identified as lacking in trees while the long-term plan is being developed.
5. The city's Streets, MAD, and Park staff will begin planting trees in the fall of 2015 through the spring of 2016 using a combination of volunteers, city staff, and contract services.
6. Urban Forest Manager through the public outreach/educational program identified in CE-J.5 will encourage tree planting on private property.

3. ***Develop a master tree-planting plan that encourages optimal age and species diversity.***

Age and species diversity help ensure that the city's urban forest is healthy and viable. Species diversity addresses diseases and insects that potentially could destroy large portions of the urban forest if there are too many trees of the same kind. Age diversity helps keep a balance between young and old trees. The goal of effective implementation of age and species diversification is to mimic a natural forest where new trees are sprouting and old trees are dying while nature keeps a balance.

a. Plant a variety of species to create a more resilient urban forest.
b. Plan for age diversity, pest susceptibility, and species diversity (recommending no more than 10 percent of any one genus and no more than 2.5 percent of any one species within a genus).
c. Review and update at least every five years, the city's approved Street Tree Selection Guide based on collaboration with and knowledge of local tree care professionals. Document reasons for removal/additions of a species from the list.
d. Encourage where appropriate, the use of native, noninvasive, and water efficient species and collaborate with nursery owners on species selection.

e. Incorporate trees and other green infrastructure as assets that are measurable in economic benefits.
f. Include evergreen species to maximize stormwater retention.

CE-J.1.3 Actions – Diversity and Street Tree List

1. Urban Forest Manager, through an analysis of the city's tree inventory, will develop a master tree-planting plan that encourages an optimal level of age and species diversity and the use of native, noninvasive, and water-efficient species. The approved street tree list will be used for this master tree-planting plan.
2. Urban Forest Manager will develop and/or revise this master tree-planting plan in conjunction with the community plan updates that are scheduled and managed through the Planning Department.
3. Urban Forest Manager will review the community plans updated in the last five years to assess whether each urban forest element is consistent with this master tree-planting plan and recommend revisions.

4. ***Improve tree-planting success.***

Interviews with staff and city contractors determined that there is a need to improve the success rate of establishing new trees. Poor nursery quality of trees and planting methods are two of the main challenges in establishing young trees. Some trees are of poor quality and this plan suggests guidelines to purchase better quality trees. Some trees are improperly planted such as planting a tree too deep can lead to decline and eventual death. This objective establishes planting guidelines for staff and contractors to follow.

a. Review and revise tree planting specifications and guidelines and incorporate physical protections for young trees.
b. Improve tree stock selection and purchase through qualified inspectors that follow city specifications and guidelines.
c. Check and monitor planting sites for compliance.

CE-J.1.4 Actions – Planting Success

1. Urban Forest Manager, Horticulturalist, MAD, and Park staff will review and modify, if needed, specifications and guidelines for the purchase and selection of street tree stock for planting in the city public rights-of-way. These will be completed and sent to all department managers purchasing trees and nursery vendors providing city trees.
2. The Horticulturalist, MAD, and Park staff will begin spot-checking purchases for compliance beginning in 2016.
3. Urban Forest Manager, Horticulturalist, MAD, and Park staff will review and modify, if needed, specifications and guidelines for the planting of street trees in the city public rights-of-way. This will be completed and sent to all department managers and contractors providing tree-planting services.
4. The Horticulturalist, MAD, and Park staff will begin spot-checking newly planted trees for compliance beginning January 2016.

5. ***Improve care and maintenance of street trees through a comprehensive management program addressing newly planted trees, mature, and large trees.*** *There is a need to improve the manner in which trees are managed and maintained in the city. A proactive schedule of tree maintenance includes watering, structural pruning, trimming, and clearance. Trees should be maintained using best management practices (BMPs) using standards established by the International Society of Arboriculture and the American National Standards Institute. For example, strong structure is vital for the development of a good tree, and BMPs prescribe how to make proper pruning cuts. A three-point cut is made along the branch collar so that the tree tissue can rapidly compartmentalize. Reduction cuts are made to a side branch that is one-third or greater in diameter of the size of the limb that is being removed. Mature trees require thinning and shortening of branches to minimize breakage, and heritage trees require no pruning except to keep the tree safe. This plan focuses on three programs—one for managing young trees, one for adult trees, and another for heritage trees.*
    a. Implement BMPs policy for all tree care activities and contract work, following ISA and ANSI standards.
    b. Implement young tree maintenance program that includes tree protection, watering, structural pruning, stake removal, and six-month inspections for two years.
    c. Prune trees on a regular schedule to maintain tree health, reduce risk of failure, provide clearance, and improve aesthetics.
    d. Establish a maintenance program for mature and large trees, including regular inspections and minimal pruning.
    e. Identify current and potential pests and diseases.
    f. Ensure that tree care relating to insect and disease problems follow integrated pest management practices (IPM).
    g. Develop management program for the preservation of heritage trees.
    h. Ensure proper maintenance throughout the life of the tree.

    CE-J.1.5 Actions – Implement BMPs

    1. The Urban Forester Manager, Horticulturalist, MAD, and Park staff will develop polices for the maintenance of all trees based on ISA and ANSI 300 standards. Staff and contractors will follow these approved BMPs in their daily activities.

    CE-J.1.5 Actions – Implement Young Tree Care Program

    2. The Urban Forest Manager, Horticulturalist, MAD, and Park staff will develop a young tree maintenance program that includes watering, structural pruning, stake removal, and regular inspections.
    3. The Streets Division will be responsible for watering trees or contracting for tree watering immediately after planting and for the next three years.
    4. A supplemental watering program using contract services is to commence at the same time as the tree-planting program begins.
    5. Residents receiving trees will be given a guide to watering and general care at the time of planting.

6. Young trees require structural pruning twice within the first four years. The first pruning should take place when the tree is planted and the second pruning at four years of age.
7. A drive-by visual inspection is needed every six months for the first two years to identify and address any cultural needs.
8. Stakes and ties will be checked during these visual inspections and removed when the tree is strong enough to stand on its own.

CE-J.1.5 Actions – Implement Mature Tree Care Program

9. Urban Forest Manager, Horticulturalist, MAD, and Park managers will develop adult and mature tree care programs for each area of responsibility. The programs for parks, open space areas, and streets will be different because of location and management responsibilities.
10. Before this is completed, Streets Division staff will request funding and begin a program of trimming street trees based on a frequency of once every seven years. Staff will set priorities for trees to be pruned.
11. After a detailed inventory of the city is completed and a master plan developed, a more balanced trimming program can be developed.

CE-J.1.5 Actions – Develop Protected Tree Program

12. Urban Forest Manager will review and make changes to the Protected Tree Program to make it effective and relevant. Urban Forest Manager and Horticulturalist will evaluate all new trees identified in the inventory project (outlined in actions for objective CE-J.1.1) as potential candidates for the Protected Tree Program.
13. Candidates identified for the Protected Tree program will be combined with the current identified landmark, heritage, grove, and parkway resource trees.
14. Urban Forest Manager will consult with the Community Forest Advisory Board and guide the list of trees through the approval process.

6. ***Improve care of public trees through a comprehensive water management program addressing newly planted trees, mature, and large trees.***

Water and the current drought are concerns in California. Many question why we are planting and watering trees when water is scarce. Yet trees provide important benefits and are needed to shade and cool cities.

a. Review current programs, practices, and procedures, including the City of San Diego's Water Implementation Task Force report.
b. Recognize trees need to be watered to maximize environmental and social benefits.
c. Develop and implement a variety of programs that will ensure adequate water for all of the City's trees.

CE-J-6 Actions

1. The Horticulturalist, MAD, and Park managers will use a diverse watering program for newly planted trees that encourages property owners to water

trees, use tree water bags, engage volunteers, and contract for watering services.

2. The Horticulturalist, MAD, and Park managers will identify water-stressed public trees and use identified methods to provide supplemental water to these trees.
3. The Urban Forest Manager and the Public Information Officer will develop and implement a public information strategy to encourage property owners to water drought-stressed mature trees.

7. ***Develop a tree removal and replacement program to address aging, diseased, poor-structured, and problem trees***.

Some trees have poor structures or disease and insect problems due to either lack of or improper maintenance practices. A poorly structured tree is more likely to break and drop a limb with the possibility of causing damage to its surroundings. For trees that cannot be saved, a tree removal program schedules their removal and replacement over a long timeframe so that neighborhoods are not denuded. In cases where large trees were planted in the wrong place (such as under utility lines), trees should be removed and replaced with a tree that can grow in a restricted space without causing damage to the infrastructure.

a. Use these removals to implement age and species diversity, and street tree master plans (in community plans).
b. Replace all dead or removed trees on a 2:1 basis.

CE-J.1.6 Actions

1. Urban Forest Manager, Horticulturalist, MAD, and Park managers will develop a 20-year tree removal and replacement program for each area of responsibility based on current inventory data, severity of problems, and historical knowledge.
2. Staff is to identify trees that have reached their live expectancy, trees that continue to cause infrastructure damage because they are the wrong trees for their locations, trees that are dying from known insects or diseases, trees that are poor street tree candidates because of structure or growth pattern, and invasive tree species.
3. Urban Forest Manager, Horticulturalist, MAD, and Park staff will identify and prioritize the problem trees and areas.
4. Urban Forest Manager, Horticulturalist, MAD, and Park staff will detail implementation of the program for each area and request budgets for removal and then replant two trees for everyone removed.
5. Urban Forest Manager, Horticulturalist, MAD, and Park staff will implement their individual programs per duties with the Urban Forest Manager providing oversight and coordination if needed.

8. ***Identify funding sources for planting, care, maintenance, and protection of trees in the public rights-of-way, parks, and trees of significant importance*.**

Adequate funding is needed for San Diego to have a strong, viable, and sustainable urban forest. During the past several years funding been inadequate to expand and maintain the city's urban forest and none to expand it. This objective challenges the city to explore ways of consistently funding the urban forestry program.

a. Adequately fund the Streets Division as the primary maintenance provider of all trees in public rights-of-way.
b. Secure dedicated funding for tree planting, establishment and maintenance of all public trees.
c. Develop and implement a plan to capture all funding opportunities to meet these goals.
d. Investigate incentive opportunities for property owners to care for city trees.
e. Consider establishment of additional maintenance assessment districts.

CE-J.1.7 Actions

1. With the Urban Forest Manager taking the lead, Streets, MAD, and Park staff will strategize and develop funding sources and opportunities for generating revenue to cover the costs for the planting, care, and protection of the city's urban forest.
2. Urban Forest Manager will project annual revenue needs with the ultimate goal of providing sustainable funding for San Diego's urban forest. Funding sources may include additional maintenance assessment districts, capital improvement funds, and state grants.

9. ***Review, revise and/or write policies that address green and gray infrastructure conflicts.***

A tree may be causing damage to gray infrastructure (streets, sidewalks, pipes and other improvements), but that does not always mean it should be removed. Policies should be developed to preserve and protect trees as much as reasonably possible when there are gray and green infrastructure conflicts. When the benefits that a tree provides are compared with the nominal cost of replacing the sidewalk once every ten years, it might be more feasible to preserve the tree and repair the sidewalk.

a. Use emerging technologies in soil science and pavement engineering to reduce hardscape repairs and tree removals.
b. Develop a policy to minimize conflicts between tree roots and water and sewer lines.
c. Develop a policy to minimize impacts of tree roots on curbs, gutters, and sidewalks.
d. Develop a policy to minimize tree canopy conflicts with power lines.
e. Implement a tree root management program to address root conflicts.

CE-J.1.8 Actions

1. With other city departments, Urban Forest Manager will review and revise with each impacted department, practices and policies that address green infrastructure conflicts, i.e., water and sewer lines, overhead wires, curbs, gutters, and sidewalks.

2. Urban Forest Manager will review the current sidewalk improvement project with the Street Division Managers to ensure that BMPs are followed to preserve and protect existing trees.
3. Urban Forest Manager will work with all departments impacted by these potential conflicts to develop new policies and procedures where needed to ensure a strong and viable urban forest with minimal loss of trees due to these conflicts.
4. Urban Forest Manager will propose revised policies for review and approval by all impacted city departments, appropriate boards and commissions, and the city council.
5. The appropriate departments will submit new budget requests resulting from these new policies.

10. ***Ensure that tree care relating to insect and disease problems shall follow integrated pest management practices (IPM).***

IPM is an industry standard used to solve pest problems while minimizing risks to people and the environment. Approaches for managing pests are often grouped in the following categories:

<u>Biological control</u> refers to the use of natural enemies—predators, parasites, pathogens, and competitors—to control pests and their damage.

<u>Cultural controls</u> are practices that reduce pest establishment, reproduction, dispersal, and survival. They include proper installation, maintenance, watering, pruning, and thinning.

<u>Mechanical and physical controls</u> kill a pest directly or make the environment unsuitable for it. Physical controls include mulches for weed management, steam sterilization of the soil for disease management, or barriers such as screens to keep birds or insects out.

<u>Chemical control</u> is the use of pesticides, used only when needed and in combination with other approaches for more effective, long-term control and minimal harm to humans and the environment.

a. Identify current and potential pests and diseases.
b. Develop a program for addressing these based on IPM.

CE-J.1.9 Actions

1. Urban Forest Manager, Horticulturalist, MAD, and Park staff will will identify current and potential pest and disease problems that have the potential to negatively impact San Diego's urban forest.
2. Urban Forest Manager will develop in conjunction with other departments an IPM program that will address current and future insect and disease problems in an environmentally responsible way.
3. Any additional budgetary requests to cover the cost of this program will be submitted by each impacted department.

11. ***Develop a biomass reuse program for the city's green trimmings and removals.***

Biomass from the trimming and removal of trees is often ground into mulch and used either as a landfill cover or for weed control. However, large urban trees can have a higher and better use, including furniture, benches and other wood.

a. Identify current biomass reuse programs in the city.
b. Identify potential biomass reuse programs for the city.
c. Develop a biomass reuse program based on the above information that focuses on highest and best use of the material.
d. Require all city staff and contractors to follow the established program.

CE-J.1.10 Actions

1. Urban Forest Manager will identify and assess the current biomass reuse program and make recommended changes to focus on the highest and best use of the material.

CE-J.2. Include community street tree master plans in community plans.

a. Prioritize community streets for tree planting.
b. Identify the types of trees proposed for those priority streets by species (with acceptable alternatives) or by design form.
c. Integrate known protected trees to glossary trees and inventory other trees that may be eligible to be designated as a protected tree.
d. Review current urban greening plans that are in use.

CE-J.2 **Objectives**:

1. ***Review street tree plans and urban forest elements to optimize benefits to the community*.**

   Each updated community plan has a landscape element and Street Tree Master Plan. As placement and species selection can optimize the benefits of trees to the community each Community Plan can be reviewed and updated to incorporate more trees.

   Actions CE-J.2.1

   1. Urban Forest Manager will review community specific street tree plans and urban forest elements as part of the Community Plan Update process to provide guidance to optimize tree benefits prior to Community Plan adoption.
   2. Planning Department will include the need to update the urban forestry element as an important factor to consider when prioritizing Community Plan Updates.

2. ***Prioritize community areas for public tree planting programs*.**

   This objective helps set priorities for tree planting in each neighborhood. The priorities are based on neighborhood needs and the goals outlined in each Community Plan.

   a. Identify primary and secondary streets for developing and implementing the urban forest elements in the approved community master plans.

b. Prioritize streets for tree planting based on need for improvement, number of vacant planting sites, existing species, and the condition of trees designated in the approved community plan.
c. Incorporate trees for noise attenuation in street plans.
d. Identify and plant trees that complement and expand on the surrounding street trees.
e. Unify communities by using street trees to link residential areas.
f. Integrate street trees when planning and retrofitting roadways consistent with complete streets concepts.

Actions CE-J.2.2

1. Urban Forest Manager and Planning staff will set priorities based on need for improvement, number of vacant planting sites, existing species, tree condition and species of trees designated in each approved Community Master Plan. Include these priorities in CE-J-1.5.
2. In addition to priorities established in the Community Plan process, Urban Forest Manager will work with the Horticulturalist, MAD, and Park staff to prioritize streets for urban forestry improvements. Twenty percent of the streets are to be completed each year beginning in 2016/17.
3. Urban Forest Manager, Horticulturalist, MAD, and Park staff will use these established priorities to implement the city's tree planting program.

3. ***Integrate known protected trees and inventory other trees that might be eligible to be designated as a protected tree in each community.***

Protected trees are community assets, and policies should be strengthened to ensure they are identified, protected, and provided with extra care to maintain them. Potential heritage trees can be identified and tracked in the city's tree inventory, and the tree protection policy provides extra care in maintaining them.

Actions CE-J.2.3

1. Urban Forest Manager and Planning Department staff will integrate known protected trees and inventory other trees that might be eligible to be designated as a protected tree in each community as outlined in CE-J-1.1.
2. Horticulturist, Parks and MAD staff will implement the tree protection policy to provide extra care in maintaining these trees.

CE-J.3. Develop a citywide urban forest master tree-planting plan comprised of the community plan street tree master plans.

CE-J.3. **Objectives:**

1. ***Develop the Urban Forest Master Plan.***

The difference between the Urban Forest Management Plan and an Urban Forest Master Plan is that the former looks into the future and sets goals and objectives to move the city toward achieving its vision. The latter is a tree-planting plan that designates where specific species of trees will be planted to maximize benefits.

Actions CE-J.3.1

1. Urban Forest Manager, based on the citywide urban tree canopy assessment and street tree inventory, and urban forest element in each Community Plan and the Street Tree Selection Guide, will formulate a master tree-planting plan. This master tree-planting plan will be completed and approved as part of the process identified in CE-J.2.1.
2. Urban Forest Manager will also develop a master tree-planting plan for those Community Plans lacking an urban forest element as outlined in CE-J.2.2.

2. ***Review plan and update as needed***.
New information on tree species and new cultivars is constantly emerging. Reviewing the plan every five years will provide the opportunity to evaluate the current species list and delete trees that are performing poorly or that are now under attack from a new disease or insect. It also enables new cultivars to be planted and their performance assessed in San Diego's environment
Actions CE-J.3.2
    1. Urban Forest Manager will review the urban forest master tree-planting plan and update as necessary.

CE-J.4. Continue to require the planting of trees through the development permit process.

a. Consider tree planting as mitigation for air pollution, stormwater runoff, and other environmental impacts as appropriate.

CE-J.4. **Objectives**:

1. ***Develop policies that encourage and incentivize developers, homeowners associations, and other organizations to adopt trees as green infrastructure assets*.**
Much of the available space for planting trees for San Diego's urban forest is located on private property. To help reach the canopy cover goals set out in the draft Climate Action Plan, this objective focuses on encouraging the planting of trees on private property through incentive programs and regulations.
    a. Develop policies for tree preservation during construction.
    b. Encourage developers to incorporate existing trees and vegetation into building and site designs when redeveloping sites.
    Actions CE-J.4.1
        1. Urban Forest Manager and city planners will review the current development policies and process to ensure that maximum benefit from street tree planting is reached.
        2. If the process needs revision or improvement, Urban Forest Manager and city staff will begin a process of revising the policies and procedures for implementing the city's urban forest element into the development process.

2. ***Increase enforcement of the city's policies and regulations related to the urban forest and consider implementing fines***.
   The City's policies and regulations related to the urban forest should be met and equally enforced. Developers must comply with planting requirements and residents must water and care for trees in the public rights-of-way. Property owners that remove a tree without a permit and approval from the city should be penalized. The public should understand that trees are vital to city health and that the city's policies will be enforced, for a stronger and more sustainable urban forest.
   Actions CE-J.4.2
      1. Urban Forest Manager, Planning staff and Code Enforcement will develop an improved enforcement program that may include fines.

3. ***Re-assess No Fee Permit process for planting, trimming, removing, and replacing trees in public rights-of-way***.
   The No Fee Permit process is difficult to manage and needs to be streamlined to be more effective.
   Actions CE-J.4.3
      1. Planning staff and Land Development Review Division to review and rewrite the No Fee Permit process as needed.

4. ***Use trees to shade paved areas, especially parking lots; and use trees and other landscaping to provide shade, screening, and filtering of storm water runoff in parking lots***.
   Trees are needed to shade paved areas to reduce the 'heat island effect' and help reduce global warming. Heat from the sun reflects off of paved surfaces and this raises ambient temperatures. Shading has an all around cooling effect.
   Actions CE-J.4.4
      1. Planning staff and the Urban Forest Manager will review policies to achieve an increase in tree canopy as set out as a goal in the Draft Climate Action Plan.
      2. Planning staff and Urban Forest Manager will request budgets, and implement tree plantings, tree care, and other programs to achieve the Draft Climate Action Plan goals.
      3. Consistent with the city's Climate Action Plan, develop guidance for determining when/where tree planting versus other shading opportunities (e.g., raised solar panel arrays) would be most effective.
      4. Begin compliance inspections and enforcement for the trees in development permits, replacing missing trees.

5. **Implement programs that use tree planting, bio-swales, permeable pavement, and other green infrastructure activities to reduce storm water runoff.**
   The canopy of trees and tree roots are able to capture significant amounts of rainwater and to reduce storm water runoff. If bio-swales, permeable pavement, and other green infrastructure activities are used in conjunction with tree planting, the city can capture

a significant amount of rainwater for percolation and refilling of underground water tables.

Actions CE-J-4.5

1. The Urban Forest Manager and the Storm Water Division will investigate ways of using trees and other green infrastructure activities to reduce storm water runoff.

CE-J.5. Support outreach efforts to educate city staff, the business community, and the public on the environmental and economic benefits of trees.

CE-J.5. **Objectives**:

1. ***Partner with non-profits, academic institutions, and other community organizations***.

   The city cannot maintain a healthy urban forest without support and help from the public. Nonprofits and other community groups can help seek grants to plant and maintain young trees. Academic institutions can support the urban forest through research on tree benefits and management. Student groups can volunteer to plant, water, and care for young trees, both on and off campus.

   a. Develop programs that involve student and youth groups in the planting, care, and protection of trees.
   b. Develop a program to provide training to landscape and design committees for homeowners associations and other community groups.

      Actions CE-J.5.1

      1. Urban Forest Manager, Streets, MAD, and Park staff will identify potential non-profit and other community organizations for partnerships that would enhance the city's urban forest.
      2. Urban Forest Manager and other city staff will engage potential partners to discuss mutual interests and working relationships.
      3. Urban Forest Manager and other city staff will develop a program that provides opportunities for partnerships.
      4. Urban Forest Manager and other city staff will hold a partnership kick-off event in conjunction with "Make a Difference Day" in October 2017.

2. ***Establish a community education outreach program and develop materials to increase public awareness about the value of trees and their benefits to public health and well-being***.

   It is vital for the public to understand the health benefits of trees to gain support for trees and to promote the actions to maintain and enhance it.

   a. Educate the public on street tree selection, proper tree care, watering, pruning, and pests and diseases.
   b. Make property owners aware of their responsibility regarding street trees.
   c. Identify potential economic benefits from planting trees and share this information with elected officials and business and community leaders.

d. Assess current and future educational outreach programs that promote the benefits of the urban forest.
Actions CE-J.5.2
    1. Urban Forest Manager and the city Public Information Officer will assess the current educational outreach programs to determine their effectiveness.
    2. Urban Forest Manager and the city Public Information Officer will develop new educational outreach programs that promote the benefits of trees.
    3. Urban Forest Manager will compile a cost/benefit analysis using cutting-edge metrics of the city's urban forest.
    4. Urban Forest Manager will identify the public health benefits derived from the city's urban forest.

3. ***Incorporate tree watering guidelines and information about water conservation to retain healthy urban trees on public and private properties***.
If the public is expected to water and take care of private and public trees, standard watering guidelines need to be in place. Detailed information about San Diego's microclimates, how much water is needed for an individual tree, and how frequently it needs to be watered should be available for public distribution.
Actions CE-J.5.3
    1. Urban Forest Manager and the Public Information Officer will develop tree watering and conservation guidelines as part of their educational outreach program as outlined in CE-J.5.2.

Monitoring Plan

The goal of the monitoring plan is to provide data to understand what is happening, why it is happening, and how specific management adjustments will change the outcome. The possible situations that may arise over the course of a 20-year plan period cannot all be projected. Actions and plans need to be adjusted over time. By monitoring the urban forest system, information can be gathered to make these adjustments. The overall scope of the monitoring activities is defined by what will be monitored, when the data will be collected, how the monitoring data will be gathered and analyzed, and who will collect, analyze, and use the information. Table 5 outlines the monitoring actions for this Urban Forest Management Plan. Generally the term "tree" refers to both shade trees and palms in this table.

Table 5. Monitoring Plan for Selected Objectives and Actions

Objective	Monitoring Plan Actions
CE-J.1.1 Objective: Inventory	1. Track all inventory gathering methods. a. Actual inventory work. b. Records of tree related work. 2. Formal inventory work may be recorded once every seven years as recommended or one-seventh of the city every year. a. Formal inventory work, contracted by a professional firm, will record the inventory data as specified by the city. 3. Records of the following tree related work will be kept as it occurs by staff and contractors, and the tree inventory updated with the following information weekly. a. Trimming b. Removal c. Root Pruning d. Infrastructure damage e. Disease and insect damage/treatment f. Others 4. Urban Forest Manager will compare updated inventory data annually to monitor and assess progress towards age and species diversity. 5. Urban Forest Manager will track from inventory data in objective CE-J-1.1 the age and species of each tree removed and planted.
CE-J.1.2 Objective: Canopy Cover	1. Urban Forest Manager will conduct an aerial study of the urban tree canopy every five years. 2. Urban Forest Manager will oversee coordination of tree planting and recommendations for increasing the urban tree canopy assessment.
CE-J.1.3	1. Urban Forest Manager will compare updated inventory data

Objective	Monitoring Plan Actions
Objective: Age and Species Diversity	annually to monitor and assess progress towards age and species diversity. 2. Urban Forest Manager will track from inventory data (CE-J-1.1) on the age and species of each tree removed and planted.
CE-J.1.4 Objective: Tree-planting Success	1. Horticulturalist, MAD, and Park staff or their designee will spot-check tree stock at the nursery prior to delivery of city trees or for compliance. 2. Horticulturalist, MAD, and Park staff or their designee will spot-check all trees planted by in-house staff, contractors, or developers for compliance. 3. Horticulturalist, MAD, and Park staff will submit semiannual reports to the Urban Forest Manager that contain the number of trees inspected, number and species accepted and number and specimens rejected.
CE-J.1.5b Objective: Young Tree Maintenance	1. Inspect young trees every six months, for the first four years after planting. 2. Urban Forest Manager, Horticulturalist, and MAD, and Park staff annually review the six-month inspections of young trees.
CE-J.1.5c Objective: Adult Tree Maintenance	1. From tree inventory records will be kept in CE-J.1.1, Horticulturalist, MAD and Park staff compare projected and actual trimmings of shade trees and palms each year 2. Records will be kept on the number of complete tree failures and limb drops, species, approximate age, when last trimmed, and the probable cause of failure. 3. Urban Forest Manager will meet annually with the Horticulturalist and MAD, and Park staff to determine if the current tree-trimming program is reducing the number of failures
CE-J.1.5g Objective: Heritage Tree Maintenance	1. Urban Forest Manager will track identified Heritage trees for health and safety by accessing the work history on those trees.
CE-J.1.6 Objective: Tree Removal and Replacement Program	1. Horticulturalist, MAD and Park staff will track progress on the 20-year tree removal and replacement program, and review annually with the Urban Forest Manager.
CE-J.1.8 Objective: Green and Gray Infrastructure Conflicts	1. Urban Forest Manager, Horticulturalist, and MAD, and Park staff will establish baseline of the current level of conflicts 2. Horticulturalist, MAD and Park staff, Street, Electric, Sewer and Water Managers will track daily and report damage and repairs to green and gray infrastructure. conflicts to establish a base line.
CE-J.2.1	1. Urban Forest Manager and Planning Staff will estimate current

Objective	Monitoring Plan Actions
Objective: Optimize Benefits in Neighborhood Communities.	and future neighborhood tree benefits using I-Tree or similar application based on proposed investments in tree planting and care. 2. Urban Forest Manager and Planning Staff will update benefit estimates every five years.
CE-J.2.2 Objective: Neighborhood Tree Planting Programs	1. Urban Forest Manager will track success of tree planting programs by looking at vacancies and progress toward community plans.
CE-J.3.1 Objective: Urban Forest Master Tree Plan	1. Ensure the development of a Master Tree Plan that is reviewed and updated every ten years. 2. Urban Forest Manager will renew and update Tree Master Plan every ten years.
CE-J.4.1 Objective: Tree Planting Incentives	1. Urban Forest Manager and Planning Department staff will track tree planting after implementing an incentive program. This could include development plantings above the standard requirements; increase in No-Fee tree planting permits; and canopy cover increases on private commercial property.
CE-J.4.2 Objective: Enforcement	1. Urban Forest Manager will assess effectiveness of Code Enforcement of illegal activity regarding public trees.
CE-J.4.4 Objective: Climate Action Plan	1. Urban Forest Manager and Planning Department staff will use data from CE-J.1.2 to determine compliance with the tree planting goals of the approved Climate Action Plan.
CE-J.4.5 Objective: Stormwater Reduction	1. Urban Forest Manager will work with the Storm Water Division on projects that use green infrastructure to estimate the volume of pre-project storm water runoff and track the volume of post-project storm water runoff for ten years after construction.
CE-J.5.2 Objective: Community Outreach	1. Urban Forest Manager and the Pubic Information Officer will use public surveys to assess public awareness, attitudes and actions resulting from public education programs.

Financing the Urban Forestry Program
Budget History

*Street Trees***.** Information provided by the Transportation and Storm Water Department (Streets Division) about urban forestry expenditures for street trees is displayed in Table 6. The Urban Forestry line item was eliminated from the budget document in FY 2010. City crews continued to respond to urgent tree requests including trimming trees for vehicular and pedestrian clearance, picking up fallen palm fronds, performing selective tree trimming, and evaluation of health and stability of trees as needed. In addition, staff continues to coordinate with Urban Corps on tree planting and issues permits for tree planting, trimming or removal in accordance with established City policies.

Parks. The Department of Park and Recreation has an annual budget of approximately $200,000 for tree management for Balboa Park, Mission Hills Park, Golden Hill Park, Morley Field, 28th Street Park, and Grape Street Park. No estimate is available for other city parks.

Maintenance Assessment Districts (MADs). Tree management has shifted to MADs in many parts of the City.[70] MADs are authorized by the state of California through the Landscaping and Lighting Act of 1972 and subsequent legislation. The city provides for MADs through the San Diego Maintenance Assessment District Ordinance, and the city assesses properties based on the amount of benefit each property will receive.

Funds for the MADs in FY 2011 were $56,000 for tree planting and $1,030,000 for tree trimming and maintenance; in FY 2012, $131,000 for tree planting and $1,510,000 for tree trimming and maintenance; and in FY 2013, $142,000 planned for tree planting and $1,510,000 for tree trimming and maintenance. Some of the funding has been allocated from the Gas Tax fund, which totaled $22 million to the city in 2013. Of this, $1,268,498 was allocated to MADs, and $774,382 for street median maintenance program. The City's Gas Tax Median Program is also managed by the Open Space Division, which maintains approximately 86 landscaped medians and parkways.

San Diego's per capita expenditures are far below those of virtually every city in California. Information collected by CAL FIRE staff about urban forestry programs in California cities in 2013 indicates that San Diego spends $1.73 per capita on trees. For example, Los Angeles spends $3.08 per capita; San Francisco, $5.01; Anaheim, $6.52; and Sacramento, $9.47.

[70] Information and documents available at http://www.sandiego.gov/park-and-recreation/general-info/mads/index.shtml

Table 6: Urban Forestry Activities for Street Trees ($1000)[71]

Budget Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Palm Trimming	$284	$400	$100	$600	$150	$60	$200	$300	$0	$0	$257	$390	$400
Broadleaf Trimming	$252	$300	$100	$150	$600	$700	$300	$200	$0	$0	$0	$0	$0
Tree Planting	$207	$335	$335	$50	$50	$75	$75	$25	$25	$100	$50	$100	$100
Root Pruning and Barriers	$132	$150	$150	$327	$327	$207	$290	$0	$0	$0	$0	$0	$0
Tree Removal	$68	$50	$150	$250	$250	$104	$185	$0	$200	$0	$300	$0	$0
Total for Tree Management	$943	$1,235	$835	$1,377	$1,377	$1,146	$1,050	$525	$225	$100	$607	$550	$500
Weed Abatement	$70	$75	$75	$425	$425	$350	$390	$100	$300	$400	$400	$400	$400
Total including Weed Abatement [72]	$1,013	$1,310	$910	$1,802	$1,802	$1,496	$1,440	$625	$525	$500	$1,007	$950	$1,400
Sidewalk Repair Project Support *	$268	$262	$256	$250	$228	$207	$185	$0	$0	$450	$300	$0	$0
Total including Weed Abatement and Sidewalk Repair	$1,281	$1,572	$1,166	$2,052	$2,030	$1,703	$1,625	$625	$525	$950	$1,307	$950	$1,400
Salaries and miscellaneous**	$4,900	$4,024	$3,905	$3,500	$3,431	$3,218	$4,100	$0	$0	$0	$0	$0	$0
Street Sweeping	$0	$0	$3,700	$3,700	$3,700	$3,700	$0	$0	$0	$0	$0	$0	$0
Salaries, miscellaneous, and street sweeping	$4,900	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$6,181	$5,596	$8,771	$9,252	$9,161	$8,621	$5,725	$625	$525	$950	$1,307	$950	$1,400
Public Budget Request	$5,910	$5,596	$8,771	$8,293	$9,071	$8,621	$5,544	$0	$0	$0	$0	$0	$0

* Sidewalk repair includes root pruning, root barrier installation, unstable tree removal, stump grinding, and other as needed.
**Supporting street Division emergency services

[71] Urban forestry line item in City budgets from 2003 to 2009, available at http://www.sandiego.gov/iba/reports/index.shtml
[72] Table provided in April 2012, Hassan Yousef, for broadleaf and, palm trimming, tree planting, root pruning/barriers, tree removal, and weed removal.

Costs of Tree Planting and Trimming

Tree Planting

Urban forestry professionals recommend planning for replanting 2% of all trees annually. This generally covers the number of trees lost each year to mortality, vandalism, and storm damage. San Diego's current inventory is approximately 200,000 shade trees and palms. Initially the City can begin by replanting slightly more than 1% of all trees, or 2,500 trees per year.

The City currently has 5-year contracts with local arborist companies for tree planting and trimming. Planting costs range from $90 for a #15 tree (15-gallon pot size) up to $700 for a 48" box tree. Table 7 lists the contract cost for planting the 24" box trees that the City requires in many planting areas. Watering costs are an estimate based on watering each tree approximately 20 times a year at an average of ten trees per hour. Young tree structural pruning are estimates based on trimming four trees an hour.

Table 7. Estimated costs for tree planting and maintenance

Description	Frequency	Per Tree Cost
Tree purchase and planting	First year	$215
Tree watering (estimated from hourly costs)	First three years	$300
Structurally prune young trees during first four years.	At time of planting	$20
Structurally prune young trees again at four years.	Four years after planting	$20
Perform windshield inspections of trees every six months in first year and address observed deficiencies/problems, and stake removal.	Every six months, for the first two years	$12
Trim shade trees	Every seven years	$58
Trim palms	Every three years	$60

Tree Trimming

The average trimming or pruning cycle for shade trees in municipalities is once every five to seven years, and three to five years for trimming palms. It is recommended that the city begin a seven-year proactive trimming program to keep its urban forest healthy and minimize potential tree failures.

The City has approximately 215,000 trees and 35,000 palms. On a seven-year cycle, about 30,000 trees and 5,000 palms would be trimmed annually. Table 5 lists the costs for pruning shade trees and trimming palms, drawn from the City's current 5-year contracts with local arborist companies for tree planting and care. Costs for pruning shade trees are for routine pruning ("grid pruning) and costs for trimming palms are averaged from estimates for various species and trimming cycles.

Options for Funding the Urban Forest

As noted, funding for the urban forest has declined during recent years due to revenue reductions. Public trees are not receiving the care they need. If the urban forest is to grow and meet climate action goals, a dedicated funding source is needed for planting and ongoing tree maintenance.

Regular programmed maintenance is more cost effective than daily work orders, as pruning trees and trimming palms based on work requests requires additional travel time, and set up and take down of equipment several times a day. A regular tree-pruning program reduces costs per tree pruned , except for emergencies , and calls from the public for services. Within this program, visual inspection of tree requirements results in optimal use of pruning and trimming budgets. While the average pruning cycles of most California municipalities is once every five years, pruning once every seven years is recommended to start the cycle.

Identifying and securing consistent funding is the challenge before the city. It will take an in-depth study of how work is currently processed to find areas where funds can be leveraged. Enterprise funds that are impacted by trees might be a source of revenue. To meet the goals of this plan and the Draft Climate Action Plan, it is imperative that consistent funding be secured to have a better standard of care for trees.

Some options that the city could consider are:

- Business improvement districts
- Capital improvement funds
- Charitable foundations
- Citywide assessment district
- Enterprise funds
- Grants
- Increasing the use of gas tax funds
- Local bonds
- Parcel tax
- Permit fees and fines
- Public/private partnerships

Generally, tree-planting grants are fairly easy to obtain. Using volunteers to plant and maintain young trees is also possible through various non-profit organizations such as

Tree San Diego and California ReLeaf. It is far more difficult to find resources for long-term maintenance. Non-traditional funding methods must be explored.

An analysis of financing options was recently completed for the City of San Francisco,[73] and some of their recommendations could be considered for the San Diego. They include:

- Pursue a program of moderate expansion, planting new street trees each year and replacement trees to keep pace with four percent annual mortality.
- Fund capital costs with outside sources, such as General Obligation bonds, state grants, capital improvement program funds, and in-kind contributions.
- Levy a special assessment or parcel tax to fund operations and maintenance for the average parcel.
- Complete the city's street tree inventory to provide for accurate data for all trees in the public right-of-way yielding considerable efficiencies, facilitating block pruning, and tracking of maintenance history, which ultimately will help to manage costs.
- Develop a Street Tree management plan that clearly outlines planting and maintenance plans over the long term. This would leverage economies of scale and reduce costs by implementing block pruning, while also clearly demonstrating the need for capital and operations and maintenance funding to the community and municipal leaders.

Park and street trees are the most visible component of the San Diego's urban forest. However, they face challenges. New and replacement trees are not keeping up with losses. Maintenance and funding are inadequate. Fiscal constraints resulting from local, state, and national economic conditions have required the city to cut funding for non-essential services. As long as San Diego's urban forestry program is a discretionary expenditure, its funding will remain unstable and continue to fluctuate. New funding revenue streams are necessary.

[73] AECOM. 2012. Financing San Francisco's Urban Forest. Report to the City of San Francisco. 60 pp. Available at http://www.sf-planning.org/ftp/files/plans-and-programs/planning-for-the-city/urban-forest-plan/121029FINAL_REPORT_SF_Urban_Forest_Financing_Report.pdf

Appendix A: Proposed Revised Street Tree Selection List

Revised text to accompany table of suitable trees:

Street trees will provide benefits for decades, if trees are selected that are hardy and require limited water and tree care. Tree selection needs to be guided by the soil, climate zone, planting space, and other site conditions. The goals is to plant the "right tree in the right place." Some tree species are not suitable for street trees, as they have serious pest problems, are invasive and spread to natural areas, drop a lot of edible or inedible fruit, and/or have structural weaknesses (such as limbs breaking off).

Parkway and planting areas have limited growing area for roots, and branches can spread into vehicle lanes and sidewalks. Trees that will grow to a large size are not suitable for narrow parkway sizes.

Due to the City's low annual rainfall and the recent drought conditions, it is best to plant tree species with low and medium water needs. Water requirements for trees are listed for trees grown near the coast and those grown inland, compiled from the Water Use Classification of Landscape Species (WUCOLS), at http://ucanr.edu/sites/WUCOLS/Download_WUCOLS_IV_List/.

Trees planted under utility lines must be small, so they do not grow into the lines. San Diego Gas & Electric identified the tree species marked suitable.

More information about each tree can be found at SelecTree http://selectree.calpoly.edu/, including soil type, seaside and salinity tolerance, and production of allergens or irritants. A certified arborist or other tree care professional can assist with tree selection and instruction about tree care.

For required canopy shade trees (planted every 30 feet in street rights-of-way), the minimum planting size is 24" box. Any trees planted at lower spacings are considered "non-required" canopy shade trees and the minimum planting size is #15 (15-gallon) containers. Minimum brown trunk height (BTH) size for palms is 10 feet and 14 feet at bus stops or red curbs.

Guidance for tree planting and care are provided by the International Society of Arboriculture at http://www.isa-arbor.com/education/onlineresources/cadplanningspecifications.aspx , American National Standards Institute (ANSI) at http://tcia.org/business/ansi-a300-standards, and Urban Forest Ecosystems Institute at http://ufei.calpoly.edu/tree_standards.lasso.

[The table will be posted on the City's website as a protected Excel spreadsheet, to allow for sorting and searching.]

Proposed Revised Street Tree Selection List

*(from SelecTree). & (E=evergreen, D=deciduous, C=conifer, P=palm). #(from WUCOLS), @ (from San Diego Gas & Electric)

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Acacia pendula	Weeping Acacia	25'	15'	2 to 4	E	M	M		Yes
Acacia stenophylla	Shoestring Acacia	20'-30'	10'-30'	2 to 4	E	L	L		Yes
Acacia subporosa aka Acacia cognata	River Wattle, Bower Wattle	20'-30'	20'-30'	2 to 4	E	L	?		
Acca sellowiana aka Feijoa sellowiana	Pineapple Guava	20'	15'	2 to 4	E	L	M		Yes
Afrocarpus gracilior aka Afrocarpus falcatus and Podocarpus gracilior	African Fern Pine	50'-65'	50'-60'	6 to 10	E	M	M		
Agonis flexuosa	(Peppermint Tree)	25'-35'	15'-30'	4 to 6	E	L	L		
Albizia julibrissin	Silk Tree	20'-30'	20'	2 to 4	D/F	L	L		
Angophora costata aka Angophora cordifolia	Gum Myrtle (Rose Gum)	50'	none listed	6 to 10	E	L	M		
Arbutus 'Marina'	Marina Madrone (Strawberry tree)	40'-50'	40'	4 to 6	E/F	L	M		
Arbutus unedo	Strawberry Tree (Strawberry Madrone)	20'-35'	20'-35'	2 to 4	E/F	L	L		Yes

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Archontophoenix cunninghamiana	King Palm	50'-70'	10'-15'	2 to 4	P	M	M		
Bauhinia blakeana	Hong Kong Orchid	20'	20'	2 to 4	D/F	M	M		Yes
Bauhinia forficata	White Orchid Tree, Brazilian Butterfly Tree	25'-35'	15'-20'	4 to 6	E/F	M	M		
Brachychiton acerifolius	Flame tree	65'	30'	6 to 10	D/F	L	M		
Brachychiton discolor	Queensland Lacebark, Pink Flame Tree	40'-65'	30'	6 to 10	SD/F	L	M		
Brachychiton populneus	Australian Bottle tree	30'-50'	30'	6 to 10	D	L	L		
Brahea armata	Mexican Blue Palm	20'-50'	12'-25'	2 to 4	P	L	L	Yes	
Brahea brandegii	Hesper Palm (San Jose Hesper Palm)	40'-50'	15'	4 to 6	P	M	L	SW	
Brahea edulis	Guadalupe Palm	35'	15'	2 to 4	P	L	L	SW	
Butia capitata	Pindo Palm	15'-25'	10'-15'	4 to 6	P	L	L		
Callistemon citrinus	Lemon Bottlebrush	20'-25'	25'	2 to 4	E/F	L	L		Yes
Callistemon salignus	White Bottlebrush	20'-25'	10'-15'	2 to 4	E/F	L	?		Yes
Callistemon viminalis	(Weeping) Bottlebrush	25'	15'	4 to 6	E/F	L	M		Yes
Calodendrum capense	Cape Chestnut	40'	25'-40'	4 to 6	D/F	M	M		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Cassia excelsa (aka Cassia Fistula) aka Senna spectabilis	Crown of Gold (Golden Shower)	25'-35'	25'-30'	4 to 6	E	M	M		
Cassia leptophylla	Gold Medallion tree	25'	20'-25'	4 to 6	D/F	M	M		Yes
Cercidium floridum aka Parkinsonia florida	Blue Palo Verde	35'	30'	4 to 6	D/F	VL	L	Yes	
Cercidium microphyllum aka Parksinonia microphylla	Little Leaf Palo Verde	35'	25'	4 to 6	D/F	VL	L	Yes	
Cercidium x 'Desert Museum' Thornless	Desert Museum Palo Verde	20'	20'	4 to 6	D/F	VL	L	SW	Yes
Cercis canadensis and var. 'Forest Pansy' and 'Mexicana'	Eastern Redbud (and Purple Leaf Eastern Redbud)	25' (20'-30')	20'-25'	2 to 4	D/F	M	M		Yes
Cercis occidentalis	Western Redbud	25'	15'-20'	2 to 4	D/F	L	L	Yes	Yes
Chamaerops humilis	Mediterranean Fan Palm	20'	10'-20'	2 to 4	P				
Chilopsis linearis	Desert Willow	25'	10'-20'	4 to 6	D/F	VL	L	Yes	Yes
Chionanthus retusus	Chinese Fringe Tree	20'	10'-15'	2 to 4	D/F	M	M		Yes
Chitalpa tashkentensis	Chitalpa	25'-35'	30'	4 to 6	D				Yes

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Cupressus arizonica var. glabra	Smooth Arizona Cypress	35'	20'	6 to 10	E	VL	L	SW	
Cupressus forbesi (Hesperocyparis forbesii)	Tecate Cypress	25'	20'	6 to 10	E	VL	VL	Yes	
Dypsis decaryi	Triangle Palm	20'	12'-15'	4 to 6	P	M	M		
Eriobotrya deflexa	Bronze Loquat	25'	25'	4 to 6	E	M	M		Yes
Erythrina Crista-Galli	Cockspur Coral Tree	20'	20'	4 to 6	D	L	L		Yes
Erythrina humeana	Natal Coral	25'	25'	4 to 6	D	L	M		Yes
Eucalyptus citriodora aka Corymbia citriodora	Lemon-Scented Gum	80'-160'	50'-100'	10+	E	L	M		
Eucalyptus ficifolia aka Corymbia ficifolia	Red-Flowering Gum	35'	15'-60'	6 to 10	E	L	M		
Eucalyptus leucoxylon	White Ironbark	30'-90'	18'-60'	6 to 10	E	L	L		
Eucalyptus polyanthemos	Silver Dollar Gum	65'	15'-45'	6 to 10	E	L	L		
Eucalyptus torquata	Coral Gum	20'	15'-30'	4 to 6	E	L	M		Yes
Fraxinus oxycarpa (Fraxinus angustifolia 'Raywood')	Raywood Ash	35'	20'	4 to 6	D	M	M		
Geijera parviflora	Australian Willow	30'	20'	4 to 6	E/F	L	M		Yes
Heteromeles arbutifolia	Toyon	25'	20'	2 to 4	E			Yes	Yes
Hymenosporum flavum	Sweetshade	20'-35'	15'-20'	2 to 4	E/F	M	M		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Ilex altaclarensis 'Wilsonii' (Ilex 'Wilsonii")	Wilson Holly	25'	10'-12'	6 to 10	E				Yes
Jacaranda mimosifolia	Jacaranda	50'	35'-60'	4 to 6	D/F	M	M		
Jubaea chilensis	Chilean Wine Palm	65'	25'	4 to 6	P	L	M		
Koelreuteria bipinnata	Chinese Lantern	35'	35'	6 to 10	D/F	M	M		
Koelreuteria paniculata	Chinese Flame Tree	35'	15'-25'	6 to 10	D/F	L	L		
Lagerstroemia indica hybrids (disease resistant varieties)	Crape Myrtle	25'	20'	2 to 4	D/F	M	M		Yes
Laurus nobilis	Sweet Bay	35'	30'	6 to 10	E	L	L		
Ligustrum lucidum	Glossy Privet	35'-50'	35'	6 to 10	E				
Liquidambar styraciflua 'Rotundiloba'	Rotundiloba Sweetgum	65'	20'-25-	10+	D	M	M		
Livistona australis	Australian Cabbage Palm, Australian Fan Palm	50'	12'	6 to 10	P	M	M		
Livistona decipiens	Ribbon Fan Palm	35'	10'	2 to 4	P	M	M		
Lophostemon confertus aka Tristania conferta	Brisbane Box	50'	40'	4 to 6	E	M	M		
Lyonathamnus floribundus and var 'Aspelinifolius'	Catalina Ironwood	50'-60'	40'	2 to 4	E/F	L	L	Yes	

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Magnolia grandiflora 'Little Gem'	Little Gem (Little Gem Magnolia)	20'	10'	4 to 6	E/F	M	M		Yes
Magnolia grandiflora 'Samuel Sommer'	Samuel Sommers (Samuel Sommer Southern Magnolia)	50'	30'	6 to 10	E	M	M		
Melaleuca linariifolia	Flaxleaf Paperbark	35'	35'	4 to 6	E/F	L	L		
Melaleuca quinquenervia	Cajeput Tree	35'	20'	4 to 6	E/F	L	M		
Metrosideros excelsa	New Zealand Christmas Tree	35'	35'	4 to 6	E/F	M	M		
Olea europaea fruitless	Olive "fruitless" (Swan Hill Olive?)	35'	60'	6 to 10	E	L	L		
Olneya tesota	Desert Ironwood	35'	30'	4 to 6	E			SW	
Parkinsonia aculeata	Jerusalem Thorn, Mexican Palo Verde	25'	25'	4 to 6	D	L	L	SW	
Phoenix dactylifera 'Medjool'	Medjool Date Palm	65'	20-25'	4 to 6	P	L	L		
Phoenix roebellini	Pygmy Date Palm	20'	10'	2 to 4	P	M	M		
Photinia x 'fraseri'	Fraser Photinia	20'	20'	2 to 4	E/F	M	M		Yes
Pinus canariensis	Canary Island Pine	50'-80'	20'-35'	6 to 10	E	L	M		
Pinus eldarica (Pinus brutia)	Afghan Pine, Mondell Pine	65'	15'-25'	6 to 10	E	VL	L		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Pinus pinea	Italian Stone Pine	40'-80'	40'-60'	6 to 10	E	L	L		
Pinus torreyana	Torrey Pine	65'	30'-50'	10+	E	L	M	Yes	
Pistacia chinensis	Chinese Pistache	65'	40'	4 to 6	D	M	M		
Pittosporum rhombifolium	Queensland Pittosporum	25'	12'-25'	4 to 6	E	M	M		
Pittosporum tenuifolium	Tarata Pittosporum	35'	10'-15'	4 to 6	E/F	M	M		
Platanus acerifolia 'Bloodgood'	London Plane	65'	30'-40'	6 to 10	D	M	M		
Platanus mexicana	Mexican Sycamore	65'	40'	6 to 10	D	M	M		
Platanus racemosa	California Sycamore	30'-80'	20'-50'	6 to 10	D	M	M	Yes	
Podocarpus gracilior (see Afrocarpus gracilior)									
Podocarpus henkelii	Long Leafed Yellowood	25'-35'	25'	4 to 6	E	M	M		
Podocarpus macrophyllus	Yew Pine	40'-50'	20'	4 to 6	E	M	M		
Prosopis glandulosa	Honey Mesquite	20' -25’	20'	4 to 6	D	Y	L	Yes	
Prosopis Thornless Hybrids	Chilean Mesquite cultivar	35'	35'	4 to 6	D	L	L		
Prunus caroliniana	Carolina Laurel Cherry	35'	15'-25'	4 to 6	E	M	M		
Prunus Ilicifolia and 'Lyonii'	Hollyleaf Cherry	25'	15'-25'	4 to 6	E	VL	VL	Yes	
Pyrus calleryana 'Chanticleer'	Callery Pear (Flowering	50'	15'	4 to 6	D/F	M	M		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
	Ornamental Pear)								
Quercus agrifolia	Coast Live Oak	65'	65'+	10+	E	VL	L	Yes	
Quercus engelmanii	Engelmann Oak or Mesa Oak	50'-65'	90'+	10+	D	VL	L	Yes	
Quercus ilex	Holly Oak	65'	65'	4 to 6	E	L	L		Yes
Quercus suber	Cork Oak	70'	70'	6 to 10	E	L	L		
Quercus virginiana	Southern Live Oak	50'	75'+	10+	E	M	M		
Raphiolepsis 'Majestic Beauty'	'Majestic Beauty' (Majestic Beauty Indian Hawthorn	20'	12'-15'	2 to 4	E/F	M	M		Yes
Rhus lancea	African Sumac	25'	20'-35'	4 to 6	E	L	L		Yes
Sapium sebiferum (Triadica sebifera)	Chinese Tallow Tree	35'	25'-35'	10+	D	M	M		
Schinus molle	California Pepper (Peruvian Pepper Tree)	25'-50'	25'-40'	10+	E	VL	L		
Senna spectabilis aka Cassia fistula	Crown of Gold (Golden Shower)	25'-30'	35'	4 to 6	E	M	M		
Spathodea campanulata	African Tulip (Tree)	50'	30'	6 to 10	D/F	M	/		
Stenocarpus sinuatus	Firewheel Tree	35'	15'	4 to 6	E/F	M	M		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Tabebuia chrysotricha aka Handroanthus chrysotrichus	Golden Trumpet Tree	25'	25'	6 to 10	D	M	M		Yes
Tabebuia impetiginosa aka Tabebuia ipi* aka Handroanthus impetiginosus	Pink Trumpet	25'	25'	4 to 6	D/F	M	M		Yes
Tecoma stans	Yellow Bells	20'	10'-20'	2 to 4	E	L	L		Yes
Tipuana tipu	Tipu Tree	50'	30'-55'	10+	D/F	L	M		
Trachycarpus fortuneii	Windmill Palm	35'	6'-10'	2 to 4	P	M	L		
Tristania laurina aka Tristaniopsis laurina	Water Gum-Elegant Brisbane	25'	6'-8'	4 to 6	E/F	M	M		Yes
Ulmus parvifolia 'Sempervirens' and "Drake'	Chinese Elm	65'	70'	6 to 10	E	M	L		
Zelkova serrata	Sawleaf Zelkova	65'	40'	6 to 10	D	L	M		
SUITABLE FOR PARKS	NOT STREET TREES								
Acrocarpus fraxinifolius	Pink Cedar	50-70'	40'		D	?	?		
Angophora costata aka Angophora cordifolia	Gum Myrtle (Rose Gum)	50'	none listed		E	L	M		
Araucaria heterophylla	Norfolk Island Pine	100'	60'		E	M	M		
Calocedrus decurrens	Incense Cedar	70'-90'	10'-15'	6 to 10	E	M	M	Yes	

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Calodendrum capensis	Cape Chestnut	40'	25'-40'	4 to 6	D/F	M	M		
Castanospermum australe	Moreton Bay Chestnut	65			E/F	M	M		
Catalpa speciosa	Western Catalpa (Northern Catalpa)	65'	50'-60'		D	M	M		
Cedrus atlantica and var. 'Glauca'	Atlas Cedar (and Blue Atlas Cedar)	65'	30'		E	M	M		
Cedrus deodara	Deodar Cedar	80'	40'	6 to 10	E	L	M		
Ceiba speciosa aka Ceiba Speciosa 'Los Angeles Beautiful'	Los Angeles Beautiful Silk Floss Tree	50-65'	40'-55'	10+	D/F	L	L		
Cinnamomum camphora	Camphor Tree	65'	65'-70'	10+	E	M	M		
Cupressus macrocarpa (Hesperocyparis)	Monterey Cypress	40'-65'	40'-65'	10+	E	L	/	Yes	
Eucalyptus deglupta	Mindanao gum/Rainbow gum	65'	20'-40'		E	M	M		
Eucalyptus ficifolia aka Corymbia ficifolia	Red-Flowering Gum	35'	15'-60'		E	L	M		
Ficus lutea aka Ficus nekbudu	Zulu Fig	25'	35'		E				
Ficus macrophylla	Moreton Bay Fig	75' - 180'	130'		E	M	M		

Botanical Name	Common Name	Height range (from SelecTree)*	Spread (from SelecTree)*	Parkway Size (ft)	Type &	Water Needs—Coastal #	Water Needs—Inland #	Native to California (yes) or southwest	Suitable under utility lines @
Ficus rubiginosa (var. australis)	Rustyleaf Fig	50'	30'-50'		E	M	M		
Ficus sycamorus	Sycamore Fig, Egyptian Sycamore, Mulberry Fig	60'	40'		E				
Liriodendron tulipifera	Tulip Tree	60'-80'	40'	10+	D/F	M	H		
Magnolia grandiflora	Southern Magnolia	65'	40'	6 to 10	E/F	M	M		
Pinus pinea	Italian Stone Pine	40'-80'	40'-60'	6 to 10	E	L	L		
Pinus torreyana	Torrey Pine	65'	30'-50'		E	L	M	Yes	
Platanus wrightii	Arizona Sycamore	50'	55'		D	M	M		
Platanus mexicana	Mexican Sycamore	65'	40'		D	M	M		
Platanus racemosa	California Sycamore	30'-80'	20'-50'	6 to 10	D	M	M	Yes	
Quercus agrifolia	Coast Live Oak	65'	65'+	10+	E	VL	L	Yes	
Quercus ilex	Holly Oak	65'	65'	4 to 6	E	L	L		
Quercus suber	Cork Oak	70'	70'	6 to 10	E	L	L		
Quercus virginiana	Southern Live Oak	50'	75'+	10+	E	M	M		
Tipuana tipu	Tipu Tree	50'	30'-55'	10+	D/F	L	M		

Appendix B: Objectives and Actions for FY 2016-2020

The following table outlines the recommended actions, by staff area and schedule, for the next five fiscal years.

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Inventory	CE-J.1.1.1	Prepare and Administer RFP for inventory	U								X						
Inventory	CE-J.1.1.2	Ensure inventory is complete	U										X				
Inventory	CE-J.1.1.3	Establish inventory updating procedure for all tree work	U										X				
Inventory	CE-J.1.1.4	Purchase 10 electronic tablets											X				
Inventory	CE-J.1.1.5	Update inventory as work is performed										X	X	X	X	X	X
Inventory	CE-J.1.1.7	Request funding for inventory update as needed.	U														X
Canopy Cover	CE-J.1.2.1	Conduct and complete LIDAR canopy assessment	U									X					
Canopy Cover	CE-J.1.2.2	Set canopy goals for each community.	U						C				X				
Canopy Cover	CE-J.1.2.3	Develop 20-year planting plan using vacancies identified.	U										X				
Canopy Cover	CE-J.1.2.4	Address Climate Action Plan's tree planting goal and request funding.	U								X						
Canopy Cover	CE-J.1.2.5	Plant trees each year.			H	O &P						X	X	X	X	X	X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Canopy Cover	CE-J-1.2.5	Half time inspector for this program			I							X	X	X	X	X	X
Canopy Cover	CE-J.1.2.6	Encourage tree planting on private property through public education programs.	U						C					X			
Master Tree Plan	CE-J.1.3.1	Analyze inventory and develop master planting plan for age and species diversity	U											X			
Master Tree Plan	CE-J.1.3.2	Develop/revise master planting plan as community plan updates are scheduled and managed	U											X			
Master Tree Plan	CE-J.1.3.3	Review community plans for consistency with urban forest element and establish schedule for revising	U	P									X				
Master Tree Plan	CE-J.1.3.1	Develop species selection guide based on habitat and water conservation goals	U						C					X			
Tree Planting	CE-J.1.4.1	Review specifications for tree purchase and selection	U		H							X					
Tree Planting	CE-J.1.4.2	Spot-check purchases for compliance			H							X	X	X	X	X	X
Tree Planting	CE-J.1.4.3	Review specifications for tree planting	U		H							X					

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Tree Planting	CE-J.1.4.4	Spot-check newly planted trees for compliance			H	O &P						X	X	X	X	X	X
Tree Care	CE-J.1.5.1	Develop policies for maintaining all trees based on ISA and ANSI 300 standards	U		H	O &P						X					
Tree Care	CE-J.1.5.1	Follow approved BMPs throughout daily activities			H	O &P						X	X	X	X	X	X
Tree Care	CE-J.1.5.2	Develop young tree maintenance program including watering, structural pruning, stake removal, and inspection	U		H	O &P						X					
Tree Care	CE-J.1.5.3	Supplemental water for trees planted			H	O &P						X	X	X			
Tree Care	CE-J.1.5.3	Supplemental Water for trees planted			H	O &P							X	X	X		
Tree Care	CE-J.1.5.3	Water trees planted			H	O &P								X	X	X	
Tree Care	CE-J.1.5.3	Water trees planted			H	O &P									X	X	X
Tree Care	CE-J.1.5.3	Water trees planted			H	O &P						X	X	X	X	X	X
Tree Care	CE-J.1.5.3	Water trees planted			H	O &P						X	X	X	X	X	X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Tree Care	CE-J.1.5.5	Distribute tree care and watering guide to residents who receive trees.			H							X	X	X	X	X	X
Tree Care	CE-J.1.5.6	Structurally prune young trees during first four years. First, at time of planting. Second, at four years.			H	O &P						X	X	X	X	X	X
Tree Care	CE-J.1.5.6	Structurally prune young trees again at four years.			H	O &P									X	X	X
Tree Care	CE-J.1.5.7	Perform windshield inspections of trees every six months in first year and address observed deficiencies/problems & stake removal.			H	O &P						X	X	X	X	X	X
Tree Care	CE-J.1.5.7/8	Perform windshield inspections of trees every six months in year two and address observed deficiencies/problems & stake removal.			H	O &P							X	X	X	X	X
Tree Care	CE-J.1.5.9	Develop adult and mature tree care program for each area of responsibility.	U		H	O &P							X				
Tree Care	CE-J.1.5.10	Trim 49,000 palms			H						X	X	X	X	X	X	X
Tree Care	CE-J.1.5.10	Request funding and begin seven-year street tree trimming cycle	U		H	O &P						X	X	X	X	X	X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
		24,000 shade trees ea yr.															
Tree Care	CE-J.1.5.10	One half FTE Inspector for this program			I							X	X	X	X	X	X
Tree Care	CE-J.1.5.11	Develop balanced and revised tree trimming program based on completed inventory and master plan development. Tree trimming should be based on species needs rather than trimming cycle.	U		H	O &P								X			
Protected Trees	CE-J.1.5.12	Review and revise Protected Trees program for effectiveness and relevancy.	U						C					X			
Protected Trees	CE-J.1.5.13	Combine candidates for Protected Trees program with current landmark, heritage, grove, and parkway resource trees.	U						C						X		
Protected Trees	CE-J.1.5.14	Submit revised program to city council for approval.	U						C							X	
Watering	CE-J.1.6.1	Diverse watering program for newly planted trees.			H	O& P						X	X	X	X	X	X
Watering	CE-J-1.6.2	Supplemental water for established trees			H	O& P						X	X	X	X	X	X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Watering	CE-J-1.6.3	Public education program	U					PIO	C			X	X	X	X	X	X
Removal-Replacement	CE-J.1.7.1/2	Develop 20-year tree removal and replacement program for each area of responsibility based on current inventory and history.	U		H	O &P								X			
Removal-Replacement	CE-J.1.7.4	Detail each area for implementation of the program and submit budget requests.	U		H	O &P								X			
Removal-Replacement	CE-J.1.7.5	Oversee and coordinate program implementation, replacement of 500 trees within each department	U												X	X	X
Funding	CE-J.1.8.1/2	Strategize to develop funding sources for maintaining the urban forest, and establish annual revenue goals to ultimately provide sustainable funding.	U		H	O &P			C								X
Infrastructure	CE-J.1.9.1	Review practices and policies that address infrastructure conflicts with each affected department.	U	P	H										X		
Infrastructure	CE-J.1.9.2	Review current sidewalk improvement project for BMP and preservation and protection.	U		H						X	X	X	X	X	X	X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Infrastructure	CE-J.1.9.3	Work with all affected departments to develop new policies and procedures that ensure a viable urban forest with minimal losses.	U													X	
Infrastructure	CE-J.1.9.4	Obtain approval of these policies from all affected departments, appropriate boards and commissions, and city council.	U														X
Infrastructure	CE-J.1.9.5	Submit budget requests for these policies.			H	O &P					X	X	X	X	X	X	X
Pest Management	CE-J.1.10.1	Identify current and potential pest and disease problems in the urban forest.	U		H	O &P						X					
Pest Management	CE-J.1.10.2	Develop IPM program that addresses current and future pest and disease issues.	U		H	O &P							X				
Pest Management	CE-J.1.10.3	Submit budget requests to cover the cost of this program.			H	O &P								X			
Biomass Reuse	CE-J.1.11.1	Identify and assess current biomass reuse program and make recommendations focusing on highest and best use.	U														X

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Community Plans	CE-J.2.1.1	Review community specific street tree plans and urban forest elements as part of the Commnity Plan Update process to provide guidance to optimize tree benfits.	U	P								X					
Community Plans	CE-J.2.1.2	Include the need to update the urban forestry element as an important factor to consider when prioritizing Community Plan Updates.		P									X				
Prioritize Planting	CE-J.2.2.1	Base prioritization on need for improvement, vacant planting sites, existing species, tree condition, and designations in Community Master Plan. Include in CE-J.1.5.	U	P									X				
Prioritize Planting	CE-J.2.2.2	Prioritize streets for urban forestry improvements. Complete 20 percent of streets each year.	U		H	O &P							X				
Prioritize Planting	CE-J.2.2.3	Use these priorities to implement city's tree planting program	U		H	O &P								X			
Protected Trees	CE-J.2.3.1	Identify and integrate trees to be protected as outlined in CE-J.1.1 and CE-J.2.1	U	P											X		
Urban Forest	CE-J.3.1.1	Formulate master tree planting plan while developing urban forest	U											X			

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Plan		elements of community plans.															
Urban Forest Plan	CE-J.3.1.2	Master tree planting plan to be completed and approved as part of CE-J.2.1.	U						C					X			
Urban Forest Plan	CE-J.3.1.3	Develop master tree planting-plan for areas not covered by a community plan as per CE-J.2.2.	U		H	O &P								X			
Urban Forest Plan	CE-J.3.2.1	Review Urban Forest Master Tree Planting Plan and update as necessary	U						C								X
Permitting	CE-J.4.1.1	Review current development policies and procedures to ensure that maximum benefit from street trees.	U	P								X					
Permitting	CE-J.4.1.2	Begin process to revise policies to implement urban forest element into development process	U	P									X				
Enforcement	CE-J.4.2.1	Develop enforcement program that may include fines.	U				C E						X				
No-fee Permits	CE-J-4.3.1	Review and rewrite the No Fee Permit Process based on current needs.	U	P			C E					X					

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
Climate Action Plan	CE-J.4.4.1	Review policies for compliance with Climate Action Plan regarding the use of trees.	U	P					C			X					
Stormwater	CE-J.4.5.1	The Urban Forest Manger and the Storm Water Division will investigate ways of using trees and other green infrastructure activities to reduce storm water runoff.	U		SWD				C								X
Partnerships	CE-J.5.1.1	Identify non-profit and other community organizations for possible partnerships to enhance the city's urban forest.	U		H	O&P			C			X					
Partnerships	CE-J.5.1.2	Engage partners to discuss partnerships.	U		H	O&P						X					
Partnerships	CE-J.5.1.3	Develop program with opportunities for partnerships	U					PIO					X				
Partnerships	CE-J.5.1.4	Organize partnership kick-off event in conjunction with 'Make a Difference Day.'	U		H	O&P		PIO	C					X			
Education	CE-J.5.2.1	Assess current educational outreach program for effectiveness.	U					PIO				X					
Education	CE-J.5.2.2	Develop new educational outreach programs to promote the benefits of	U					PIO	C			X					

Program Area	Action	Description	Urban Forest Manager	Planners	Horticulturalist (Streets)	Parks, Open Space, and MADs	Code Enforcement	Public Information	CFAB		FY 2015 (May-June)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	After FY 2020
		trees.															
Education	CE-J.5.2.3	Compile a cost/benefit analysis for the city's urban forest using cutting edge metrics.	U	P											X		
Education	CE-J.5.2.4	Identify public health benefits derived from city's urban forest.	U	P											X		
Education	CE-J.5.3.1	Develop tree-watering and conservation guidelines as part of educational outreach in CE-J.5.2.2.	U					PIO				X					

Appendix C: Projected Costs for Tree Planting and Trimming

Protected Costs for Tree Planting and Young Tree Care

Description	Per Tree Cost	Year 1 ($1000)	Year 2 ($1000)	year 3 ($1000)	Year 4 ($1000)	Year 5 ($1000)	Annually thereafter
Plant 2500 trees per year	$100 ea	$250	$250	$250	$250	$250	$250
Water 2,500 trees planted in year 1	$300 ea	$750	$750	$750	$750		
Water 2,500 trees planted in years 1 and 2			$750	$750	$750	$750	
Water 2,500 trees planted in years 1, 2, and 3				$750	$750	$750	$750
Water 2,500 trees planted in years 1, 2, 3, and 4					$750	$750	$750
Water 2,500 trees planted in years 2 ,3, 4, and 5						$750	$750
Water 2,500 trees planted in years 3, 4, and 5							$750
Structurally prune young trees during first four years. First, at time of planting. Second, at four years.	$20 ea	$50	$50	$50	$50	$50	$50
Structurally prune young trees again at four years.	$20 ea				$50	$50	$50
Perform windshield inspections of trees every six months in first year and address observed deficiencies/problems and stake removal.	$12ea	$30	$30	$30	$30	$30	$30
Perform windshield inspections of trees every six months in year two and address observed deficiencies/problems & stake removal.	$12ea		$30	$30	$30	$30	$30
One half FTE Inspector for this program		$30	$30	$30	$30	$30	$30
Annual total project costs		$1,110	$1,890	$2,640	$3,440	$3,440	$3,440

Projected Tree Trimming Costs

Description	Per Tree Cost	Year 1 ($1000)	Year 2 ($1000)	year 3 ($1000)	Year 4 ($1000)	Year 5 ($1000)	Year 6 ($1000)	Year 7 ($1000)	Annually thereafter ($1000)
Trim trees on 7-year cycle and palms on 5-yr cycle									
Trim 31,000 trees per year	$58 ea	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798
Trim 5,000 palms per year	$60 ea	$300	$300	$300	$300	$300	$300	$300	$300
One half FTE Inspector for this program		$30	$30	$30	$30	$30	$30	$30	$30
Annual totals		$2,128	$2,128	$2,128	$2,128	$2,128	$2,128	$2,128	$2,128
Trim trees on 7-year cycle and palms on 3-yr cycle									
Trim 31,000 trees per year	$58 ea	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798	$1,798
Trim 12,000 palms per year	$60 ea	$720	$720	$720	$720	$720	$720	$720	$720
One half FTE Inspector for program		$30	$30	$30	$30	$30	$30	$30	$30
Annual totals		$2,548	$2,548	$2,548	$2,548	$2,548	$2,548	$2,548	$2,548
Trim trees on 5-year cycle and palms on 3-yr cycle									
Trim 43,000 trees per year	$58 ea	$2,494	$2,494	$2,494	$2,494	$2,494			$2,494
Trim 7,000 palms per year	$60 ea	$420	$420	$420	$420	$420			$420
One half FTE Inspector for program		$30	$30	$30	$30	$30			$30
Annual totals		$2,944	$2,944	$2,944	$2,944	$2,944			$2,944
Trim trees on 5-year cycle and palms on 3-yr cycle									
Trim 43,000 trees per year	$58 ea	$2,494	$2,494	$2,494	$2,494	$2,494			$2,494
Trim 12,000 palms per year	$60 ea	$720	$720	$720	$720	$720			$720
One half FTE Inspector for program		$30	$30	$30	$30	$30			$30
Annual totals		$3,244	$3,244	$3,244	$3,244	$3,244	$3,244		$3,244