

CITY OF COSTA MESA

Urban Canopy and Land Assessment



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1: INTRODUCTION



1,408 Acres of
Canopy Cover

13.88% Urban
Canopy Cover

1.1 EXECUTIVE SUMMARY

Purpose of This Analysis

The City of Costa Mesa, located in Orange County, California, spans approximately 15.7 square miles. The city's urban forest consists of trees along streets, within parks, residential areas, and natural spaces, forming an essential component of Costa Mesa's green infrastructure. These trees contribute significantly to environmental quality, public health, water management, economic stability, and overall aesthetics. The primary goal of this assessment is to provide a baseline evaluation of Costa Mesa's tree canopy, analyze its distribution, and guide future strategies for urban forestry development across various geographic areas.

Urban Tree Canopy in Costa Mesa

The City of Costa Mesa currently has 13.88% Tree Canopy Cover citywide. Additionally, 5.63% of the city consists of areas suitable for future tree planting, while 80.49% of land is unsuitable due to existing land use constraints such as buildings, roads, and water bodies.

The percentages for UTC and possible planting areas are based on total land area.

- Non-canopy vegetation: 13.37%
- Soil/dry vegetation: 2.01%
- Impervious surfaces: 66.62%
- Water coverage: 0.79%

Further analysis of Costa Mesa's urban tree canopy reveals that 42.2% of the tree population is deciduous, while 57.8% consists of evergreen species. This classification informs strategic planning efforts for tree diversity, climate resilience, and future planting initiatives.

Assessment Boundaries

This study evaluated Urban Tree Canopy (UTC) and Possible Planting Areas (PPA) across multiple geographic scales to provide relevant insights for different stakeholders. By identifying the distribution of tree canopy and planting opportunities across these scales, the City can take a more strategic and data-driven approach to urban forestry management. The assessment considered several geographic boundaries, including the citywide boundary(1), six city council districts (6), thirty-seven census tracts (37), twenty land-use groups (20), and thirty-four designated park areas(34). This multi-scale approach allows for targeted decision-making to enhance Costa Mesa's urban forest.

Comparison

In 2024, Costa Mesa's tree canopy cover was measured at 13.88%. While direct comparisons are limited due to differences in data collection years, figures from the CAL FIRE and USDA Forest Service's California Urban Tree Canopy project provide helpful regional context. Neighboring cities reported the following canopy coverage based on earlier assessments: Newport Beach (12.6%), Irvine (12.7%), Santa Ana (11.6%), Huntington Beach (8.8%), and Tustin (10.1%). For broader context, the City of Los Angeles reported an overall canopy cover of 21%, with district-level variation ranging from 7% to 37%.

These figures indicate that many Southern California cities maintain canopy coverage around a regional average of approximately 15%. While this reflects typical conditions for the region, organizations such as American Forests recommend a minimum urban canopy cover of 20% in arid and semi-arid climates to promote environmental resilience, mitigate urban heat, and enhance overall livability. Costa Mesa's current canopy cover underscores ongoing progress and helps identify opportunities for future urban forestry efforts.

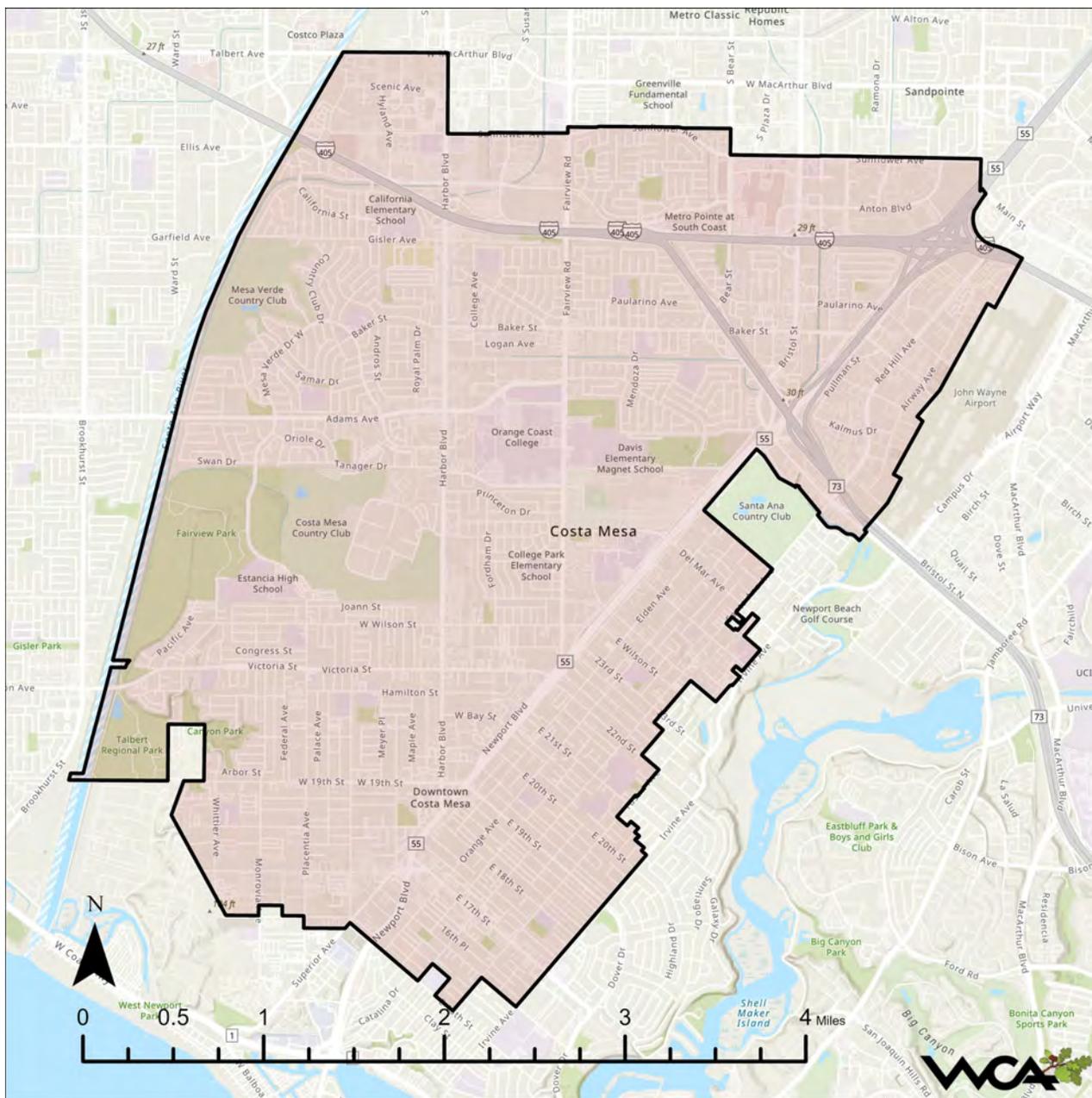


Figure 1.1a. City of Costa Mesa's boundary.



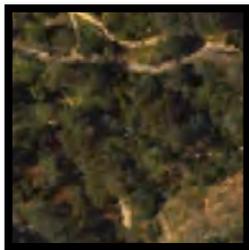
2: METHODOLOGY

2.1 Data Sources

This assessment used high-resolution 4-band multispectral imagery from the U.S. Department of Agriculture’s National Agriculture Imagery Program (NAIP), collected in Summer of 2024, to generate the land cover dataset. The NAIP imagery facilitated the classification of all major land cover types, allowing for an accurate evaluation of Costa Mesa’s urban tree canopy and potential planting areas. To improve spatial accuracy and ensure consistency with local land use classifications, additional GIS layers provided by the City of Costa Mesa were also integrated into the analysis.

2.2 Land Classification

Following the initial classification process, manual refinement and quality control measures were applied to enhance the accuracy of the remote sensing products. To further refine the dataset and improve classification precision, additional GIS layers provided by the city—including buildings, water bodies, and wetlands—were incorporated. These supplemental data sources ensured greater spatial accuracy and alignment with local land use characteristics.



Canopy



Vegetation



Soil



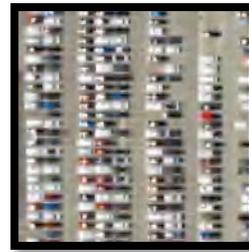
Water



Building



Road



Other



Shadow

2.3 Pervious vs Impervious

Land cover is classified as Pervious or Impervious based on water absorption and vegetation support.

Pervious Land allows water infiltration and includes Canopy, Vegetation, Soil, and Water, which contribute to stormwater management and ecological health. Impervious Land prevents water absorption and includes Buildings, Roads, and Other Impervious Surfaces, leading to increased runoff and heat retention.

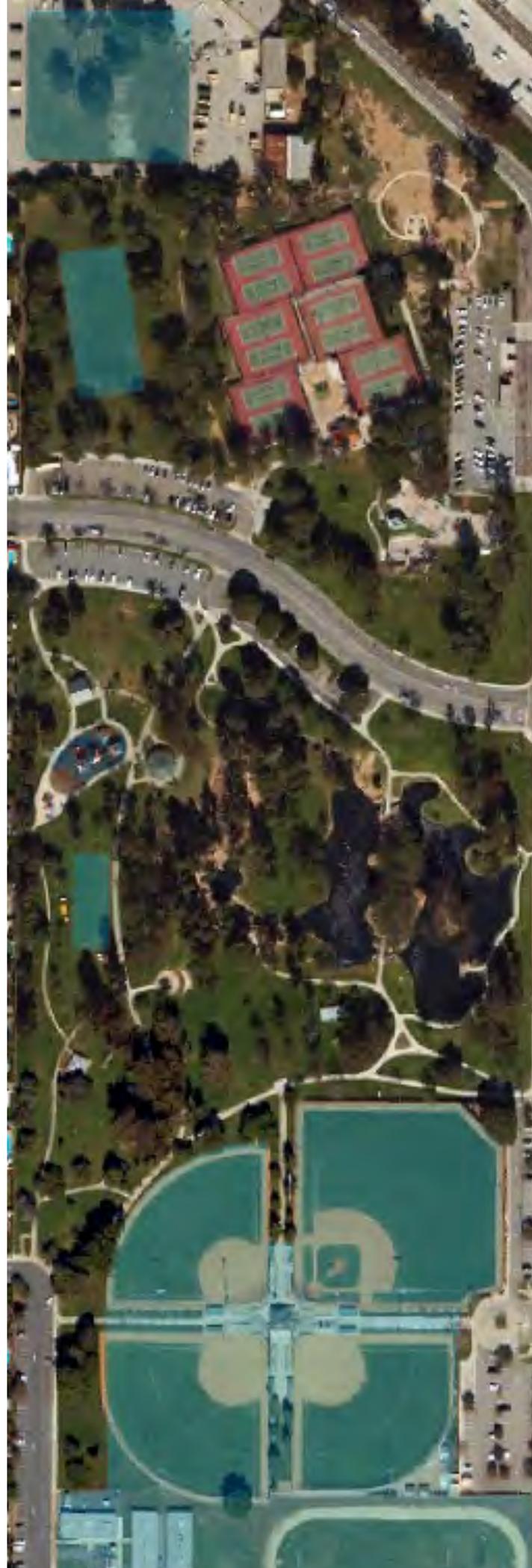
2.4 Suitable vs. Unsuitable Planting Areas

In the context of urban forestry and strategic canopy expansion, suitable planting areas refer to land classifications where tree establishment is both feasible and beneficial. These areas typically include vegetated spaces and exposed soil that are not obstructed by existing infrastructure. They present optimal conditions for tree growth, allowing for improved canopy expansion, enhanced stormwater absorption, and increased environmental resilience.

Conversely, unsuitable planting areas are locations where tree planting is impractical or conflicts with existing land functions. These include impervious surfaces such as roads, buildings, and other developed infrastructure, as well as ecologically or functionally restricted areas, such as water bodies, transportation corridors, and utility easements. Additionally, certain open spaces that might otherwise be considered plantable—such as sports fields, school tracks, designated recreational fields, and maintained open lawns in parks—have been classified as unsuitable to preserve their intended use. These areas are essential for community recreation, athletics, and public events, and as such, are excluded from tree planting initiatives to maintain their functional integrity.

Of Costa Mesa's approximately 441.9 million square feet of total land area, 1.87% has been specifically designated as *unsuitable sports areas*, while an additional 12.31% falls under other types of *unsuitable planting area*. This includes large community spaces such as Fairview Park, the Costa Mesa Golf Course, and Talbert Regional Park, as well as open space associated with schools and maintained park lawns.

By distinguishing between suitable and unsuitable planting areas, this assessment ensures that urban forest expansion efforts are strategically placed in locations where they will provide the greatest ecological, social, and economic value while respecting existing land use priorities.





3: KEY FINDINGS

3.1 City Wide

This urban tree canopy assessment used a detailed land cover classification to determine potential planting areas across Costa Mesa. Additional data layers identifying unsuitable planting areas, such as developed infrastructure and designated open-use spaces, were incorporated into the analysis. It is important to note that this study evaluates land area, to provide a more accurate representation of possible planting opportunities.

The results indicate that 61,314,990 SqFt (13.88%) of Costa Mesa's total land area is covered by tree canopy, while 24,897,493 SqFt (5.63%) consists of suitable planting areas, including existing vegetation and soil where trees could be planted. The remaining 355,630,861 SqFt (80.49%) is classified as unsuitable for planting, encompassing impervious surfaces such as buildings, roads, and developed infrastructure, as well as designated open-use spaces like athletic fields and recreational areas. This analysis provides a foundation for targeted tree planting efforts to enhance Costa Mesa's urban forest while maintaining the functionality of existing land uses.

Suitable vs Unsuitable

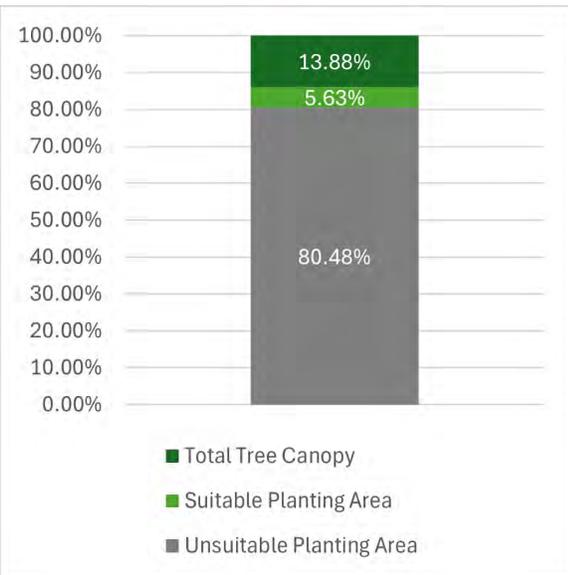


Figure 3.1b. This chart illustrates the proportions of total tree canopy, suitable planting areas, and unsuitable planting areas within the city boundary.

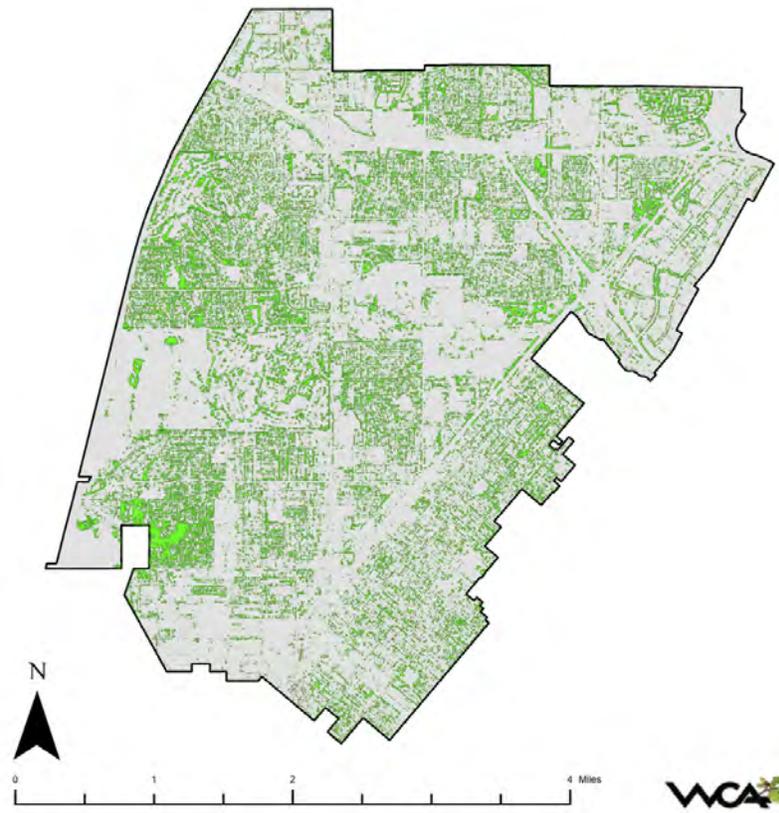


Figure 3.1a. Tree canopy (in green) distributed across the city's boundary.

Land Classification

Classification	Area SqFt	%
Impervious Unsuitable - Building	144,651,840.44	32.74
Impervious Unsuitable - Other	1,534,901.56	0.35
Impervious Unsuitable - Road	148,154,875.53	33.53
Pervious Suitable - Canopy	55,825,374.74	12.63
Pervious Suitable - Soil	2,193,413.22	0.50
Pervious Suitable - Vegetation	22,704,080.40	5.14
Pervious Unsuitable - Canopy	5,489,616.23	1.24
Pervious Unsuitable - Soil	6,696,583.24	1.52
Pervious Unsuitable - Vegetation	36,365,538.24	8.23
Pervious Unsuitable - Water	3,473,248.37	0.79
Shadow	14,753,873.52	3.34
Grand Total	441,843,345.50	99.99

Summary

Costa Mesa currently has approximately 13.88% total tree canopy coverage citywide, with an additional 5.63% of land area identified as suitable for future tree planting. The remaining 80.49% of land is considered unsuitable due to existing uses like roads, buildings, or other hard surfaces. While overall canopy coverage is modest, the presence of plant-able areas indicates room for strategic expansion, especially in zones where trees could support heat mitigation, walkability, and neighborhood greening.

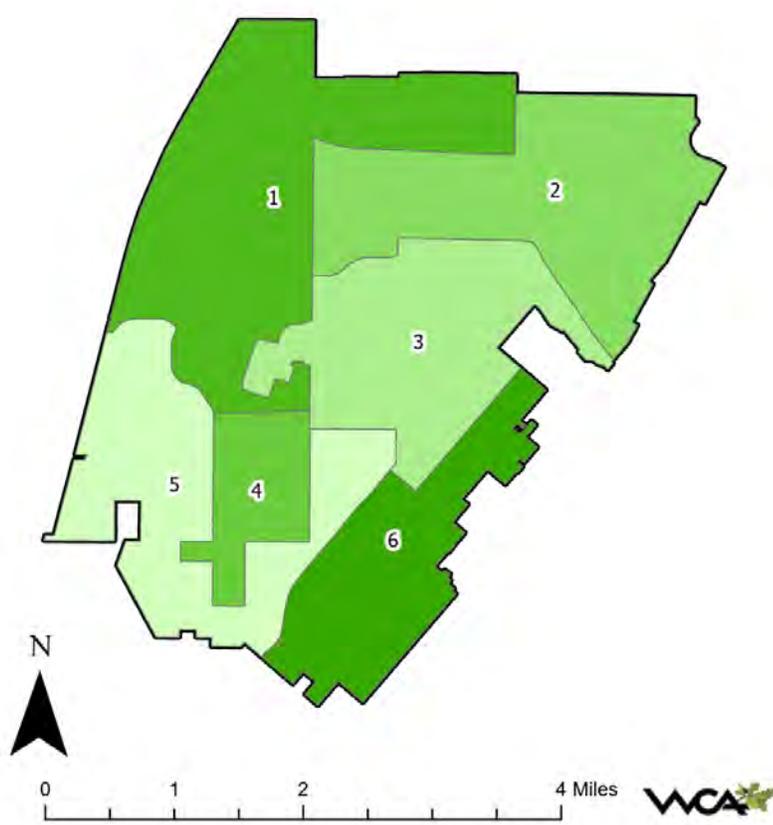


Figure 3.2a. Tree canopy distributed across Council Districts.

3.2 Council District

The assessment of Urban Tree Canopy (UTC) and Possible Planting Area (PPA) across Costa Mesa’s six council districts highlights key differences in canopy coverage and planting potential. District 1 has the highest tree canopy at 16.34%, while District 5 has the lowest at 12.73%, with the other districts falling within a 4% range. In terms of planting opportunities, District 1, while having a lower percentage of PPA, possesses the most square foot of land with 146.9 acres of plant-able space. Conversely, District 4, with just 19.78 acres available, presents fewer opportunities for tree expansion. These findings provide valuable insights for prioritizing future tree planting efforts and enhancing Costa Mesa’s urban forest.

Suitable vs Unsuitable Percentage

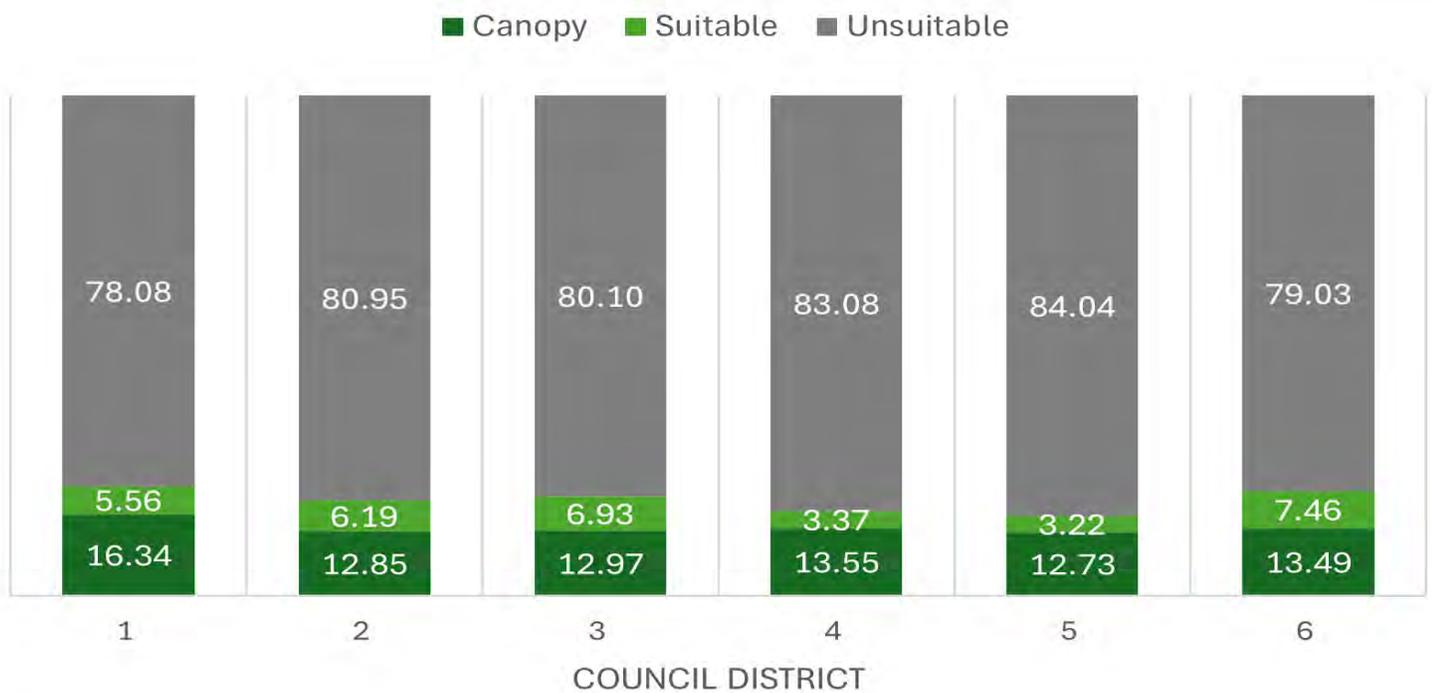


Figure 3.2b. This chart illustrates the proportions of total tree canopy, suitable planting areas, and unsuitable planting areas within each council district.

District	Canopy (Sqft)	Suitable (Sqft)	Unsuitable (Sqft)	Total Area (Sqft)
1	18,789,743.95	6,400,041.64	51,731,990.22	115,026,391.30
2	12,009,395.78	5,790,041.72	33,642,265.02	93,479,583.35
3	9,802,908.63	5,237,125.25	27,502,277.33	75,596,229.03
4	3,464,911.76	861,709.18	10,990,825.62	25,574,421.83
5	9,770,084.24	2,475,327.11	41,432,486.49	76,767,708.46
6	7,475,158.18	4,132,294.40	27,411,033.16	55,405,142.28

Figure 3.2c. This table shows canopy cover, suitable planting area, and Unsuitable planting area in relation to each council district in square feet.

3.2 Council District (cont'd)

Summary

Canopy coverage varies between Costa Mesa's six council districts, ranging between 12.73% to 16.34%. The highest canopy coverage was found in District 1, while District 5 had the lowest. Potential planting space also differs across districts, with the highest amount of suitable planting area in District 1, suggesting strong opportunities for future expansion. Conversely, District 4 and 5 have the least amount of suitable space, reinforcing the need to prioritize protection and maintenance of its existing canopy.



3.3 Census Tracts

Tree canopy and potential planting areas were analyzed across Costa Mesa’s 37 Census Tracts. Canopy cover ranged notably between tracts, with the highest concentration found in Tract 636.01 at 24.26%, and the lowest in Tract 525.01 at 3.6%. Similarly, suitable planting areas (vegetation and soil combined) varied, with Tract 525.01 offering the greatest opportunity at 23.71%, while Tract 636.05 had the least at only 1.38%. Most Census Tracts fell within a middle range of canopy coverage, between 10% and 15%, showing a relatively even distribution of established trees across neighborhoods. However, disparities in available planting areas highlight key opportunities for expanding canopy in under-resourced tracts, especially where space exists in grassy or soil-rich zones. Shadow and water classifications were minimal across tracts and do not significantly impact overall trends.

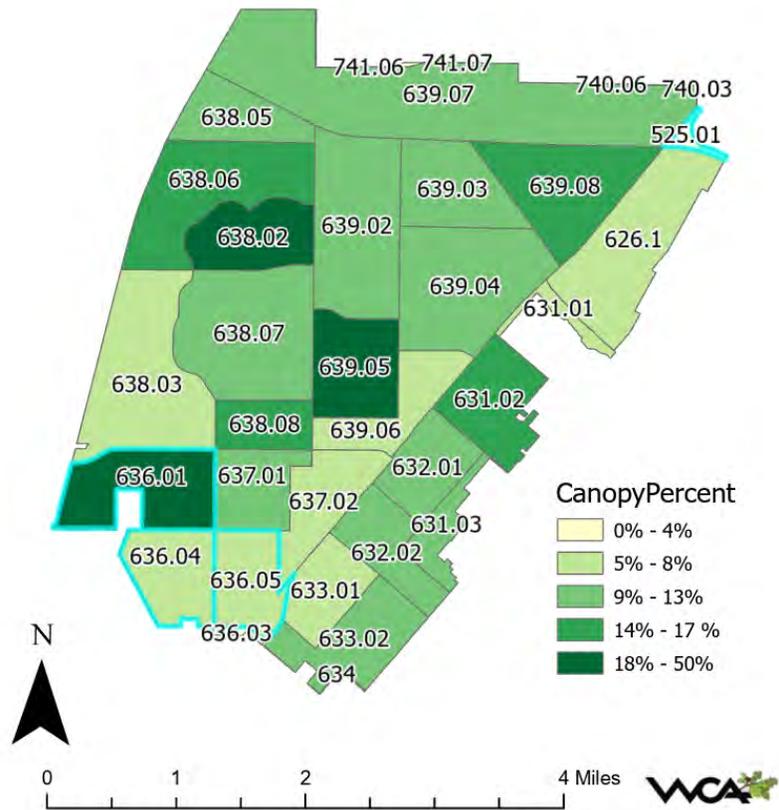


Figure 3.3a. Shows Canopy in Costa Mesa by Census Tracts

Suitable vs Unsuitable Square Footage

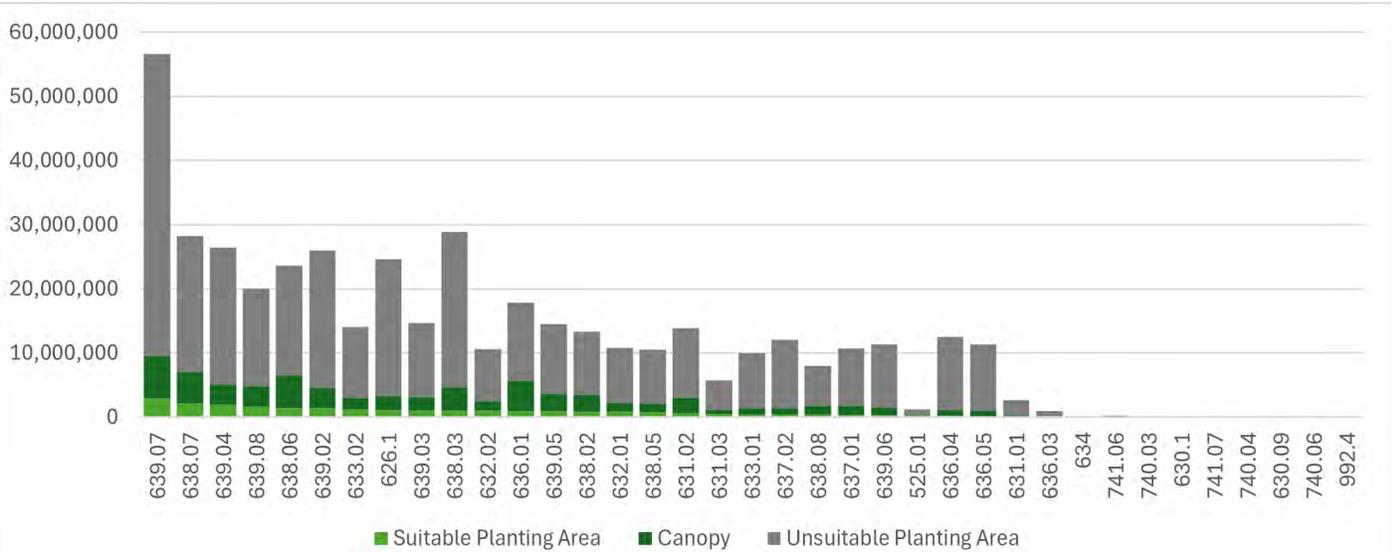


Figure 3.3b. Graph displays the distribution of suitable planting areas, existing canopy, and unsuitable planting areas across census tracts, sorted from highest to lowest suitable planting area. See Appendix A, Table A.1 for full dataset

Summary

Canopy cover across Costa Mesa’s Census Tracts ranged from 3.6% to 24.26%, while suitable planting opportunities varied from 1.38% to 23.7%. The most promising tracts for expansion include Tract 525.01, due to its high percentage of suitable space. Tracts with lower canopy and available area, such as 636.04 and 636.05, may require alternative strategies for greening efforts.

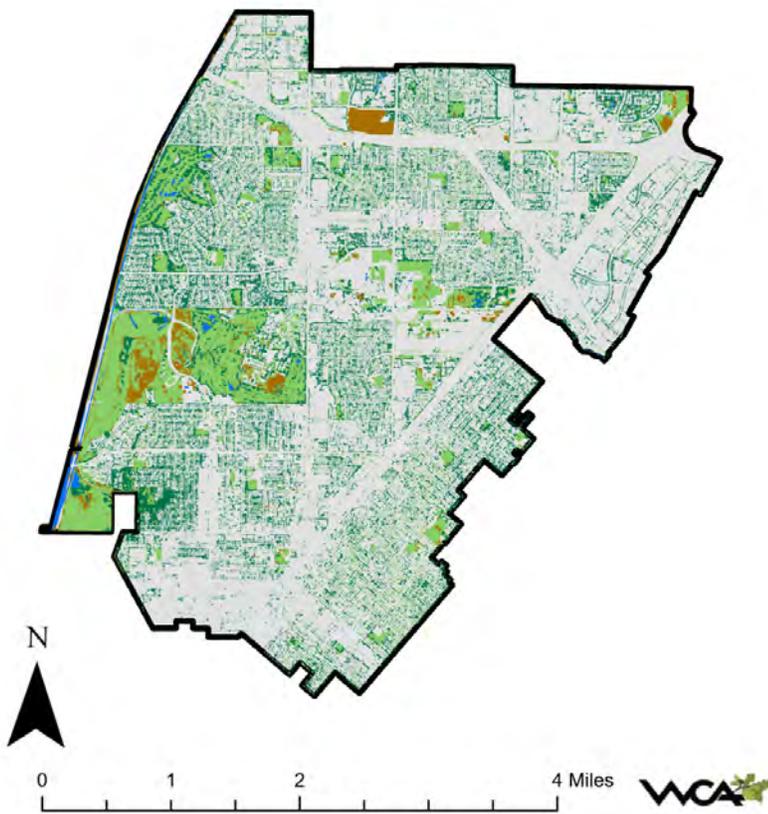


Figure 3.4a. This map shows all pervious features across Costa Mesa.

3.4 Land Use

Tree canopy, suitable planting areas, and land constraints were analyzed across Costa Mesa’s land uses. Low-Density Residential areas, covering nearly 99 million square feet, contribute the most to the city’s canopy at 23.82%, while Agriculture (0.47%) and Mobile Homes (1.34%) have minimal impact due to their small total areas.

Medical and Right-of-Way also offer significant planting potential, with 26.19% and 11.91% of their land suitable for canopy growth. In contrast, Mobile Homes (98.13% unsuitable) and Agriculture (93.72% Unsuitable) have limited space for new plantings.

Tree Canopy Potential

Land Use	Acres	Canopy %	Suitable %	Unsuitable %
Low Density Res	2281.01	23.82	9.13	67.05
Golf	379.72	17.85	0.16	81.99
Medium Density Res	264.03	17.52	7.55	74.93
Medical	114.39	17.32	26.19	56.49
High Density Res	1115.17	15.78	4.47	79.75
Open Space	746.66	14.66	8.02	77.33
Senior Housing	21.92	12.38	5.58	82.04
Private School	34.51	12.12	6.59	81.29
Church	63.64	9.31	5.49	85.2
Hotel / Motel	60.46	9.24	1.3	89.46
College/University	209.80	8.59	5.19	86.22
Mixed Use	5.99	8.58	5.11	86.3
City Facilities	193.84	7.98	4.33	87.69
Vacant	20.35	7.98	3.91	88.11
Right-of-Way	83.22	6.92	11.91	81.17
Commercial	1925.91	6.8	1.9	91.29
School (non private)	288.85	6.74	0.98	92.28
Railroad	0.74	4.08	8.44	87.48
Mobile Homes	33.70	1.34	0.53	98.13
Agriculture	66.62	0.47	2.81	96.72

3.4 Land Use (cont'd)

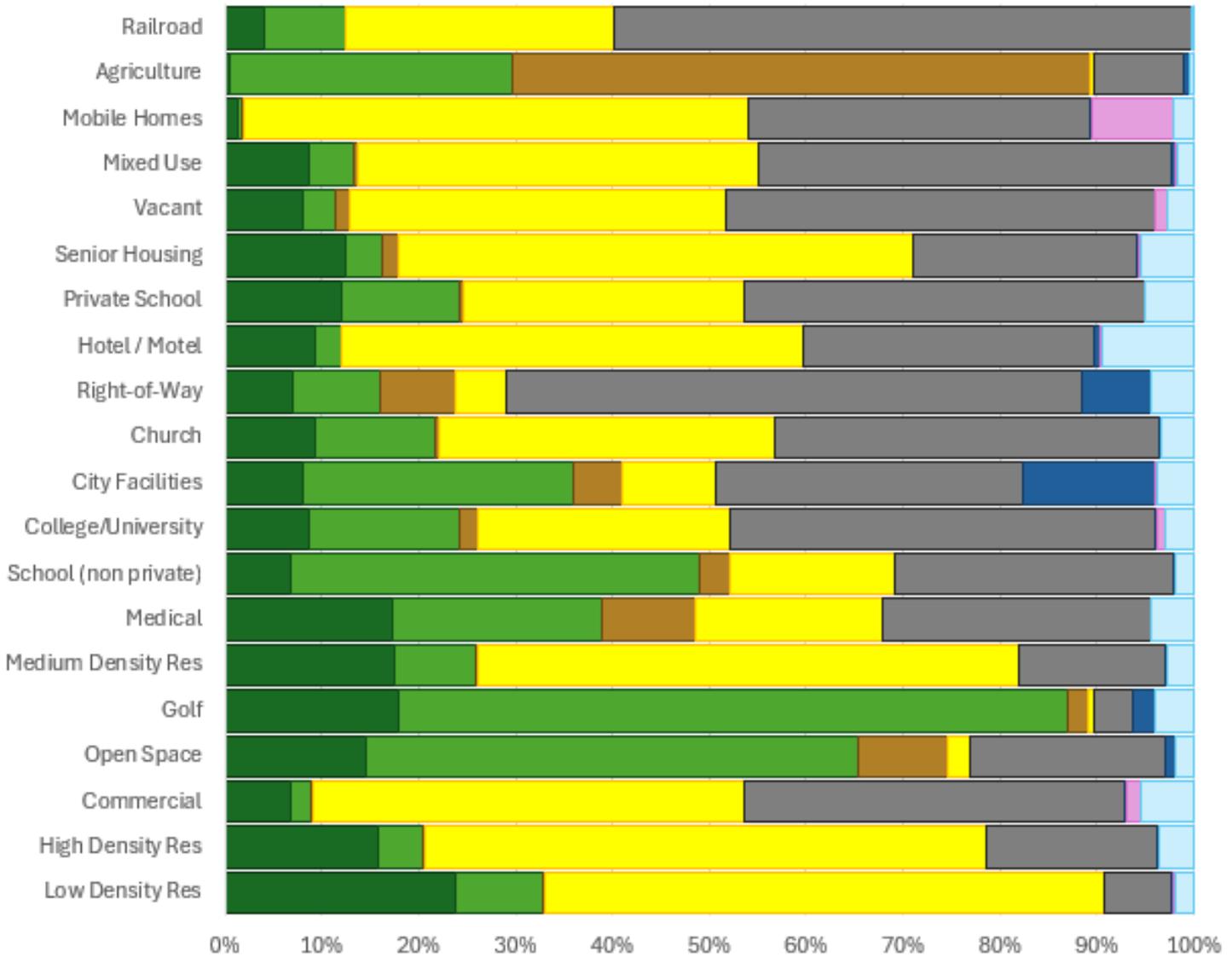


Figure 3.4b. This chart illustrates the proportions of total tree canopy, suitable planting areas, and unsuitable planting areas within the city boundary. See Appendix A, Table A.2 for the full dataset .

Summary

Costa Mesa’s tree canopy is highest in Low-Density Residential areas (23.82%) while the Agriculture (0.47%) and Mobile Homes (1.34%) contribute the smallest Canopy and have the highest unsuitable planting area. Planting efforts should be focused in Medical, Right-of-Way, and Low Density Residentials due to their high percentage of suitable planting area. Planting in Right-of-Way areas, which currently have the lowest canopy cover, would have a strong impact on increasing Costa Mesa’s overall canopy due to the potential for significant gains.

3.5 Parks

Urban Tree Canopy (UTC) and Possible Planting Areas (PPA) were assessed across 34 parks in Costa Mesa, showing considerable variation in coverage.

Canyon Park had the highest UTC at 78.1%, while Fairview Park had the lowest at 4.48%. Suitable planting areas also varied widely, with Shalimar Park having the least at 0.74%, while Costa Mesa Bark Park had the highest at 75.36%. This doesn't prioritize Costa Mesa Golf Course, Fairview Park, and Talbert Regional Park due to unsuitable planting parks. Parks that offer significant opportunities for canopy expansion, based on the size of their suitable planting areas, include TeWinkle Park with approximately 270,000 sq ft of PPA, and Wakeham Park with 177,000 sq ft of PPA. These results help identify key locations for targeted tree planting efforts to enhance Costa Mesa's urban forest.

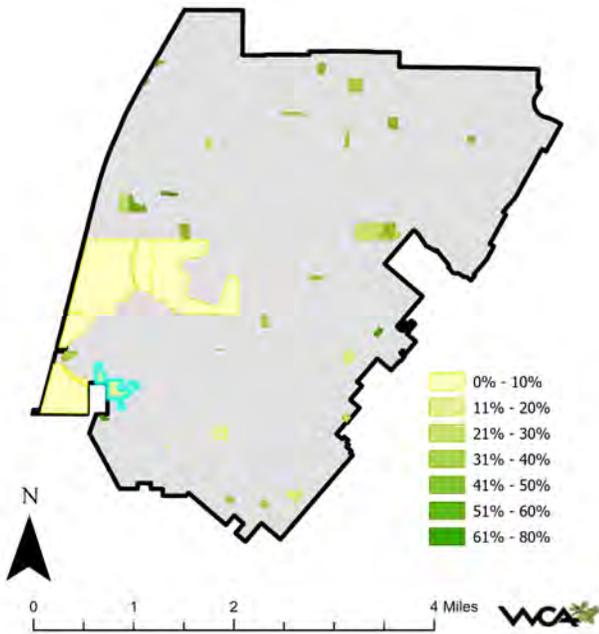


Figure 3.5a. This map shows the canopy percentage per park.

Suitable vs Unsuitable

	Canopy(%)	Suitable Planting Area(%)	Unsuitable Planting Area(%)
Balearic Park	21.7	18.8	59.4
Brentwood Park	60.1	31.0	8.9
Canyon Park	78.1	17.0	4.7
Costa Mesa Bark Park	21.9	75.4	2.7
Costa Mesa Golf Course	13.6	0.0	86.4
Costa Mesa Skate Park	36.2	25.1	38.7
Costa Mesa Tennis Center	42.3	13.4	44.3
Del Mesa Park	49.2	29.5	21.3
Estancia Park	54.9	23.1	21.9
Fairview Park	4.5	0.0	95.5
Gisler Park	37.5	54.6	7.8
Harper Park	14.3	22.9	62.8
Heller Park	39.0	31.8	29.2
Jordan Park	29.4	29.2	41.4
Ketchum-Libolt Park	53.8	13.5	32.7
Lindbergh Park	11.3	23.9	64.8
Lions Park	8.8	22.6	68.7
Marina View Park	70.1	8.5	21.4
Mesa Verde Park	65.4	21.1	13.4
Moon Park	54.0	22.6	23.5
Neath Park	31.0	62.8	6.2
Paularino Park	39.8	53.3	6.9
Pinkley Park	38.8	28.5	32.7
Shalimar Park	23.0	0.7	76.3
Shiffer Park	48.6	17.8	33.6
Smallwood Park	21.8	47.2	30.9
Suburbia Park	60.8	18.4	20.8
Talbert Regional Park	6.9	0.0	93.0
Tanager Park	47.9	30.3	21.8
TeWinkle Park	29.5	23.7	46.8
Vista Park	31.6	46.2	22.3
Wakeham Park	32.3	40.7	26.9
Wilson Park	32.4	43.9	23.7
Wimbledon Park	46.5	21.5	32.0

Summary

Urban tree canopy coverage in Costa Mesa's parks varies significantly, ranging from just 4.5% at Fairview Park to 78.1% at Canyon Park. While parks like Talbert Regional Park, Fairview Park, and the Costa Mesa Golf Course are not currently prioritized for new canopy planting due to limited suitable planting areas or specialized land use, several other parks present strong opportunities for expansion. For example, Costa Mesa Bark Park has over 75% of its area classified as suitable for planting, and Neth Park, Paularino Park, and Gisler Park each have more than 50% of their land available for potential tree canopy growth. These parks—many with low to moderate existing canopy—offer ideal conditions for targeted planting efforts that can enhance shade, environmental benefits, and overall park experience for the surrounding communities.

3.6 Prune Districts

Tree canopy and planting opportunities were assessed across Costa Mesa’s 30 prune districts. Canopy cover ranged widely, with the highest levels in District 11 (30.25%) and in starred districts 10* and 21*—areas dominated by golf courses and parks and therefore not considered priorities for canopy expansion. The lowest canopy appeared in Districts 17, 23, 24, and 1, all below 9%. Most districts fell within a middle range of 12% to 18% canopy.

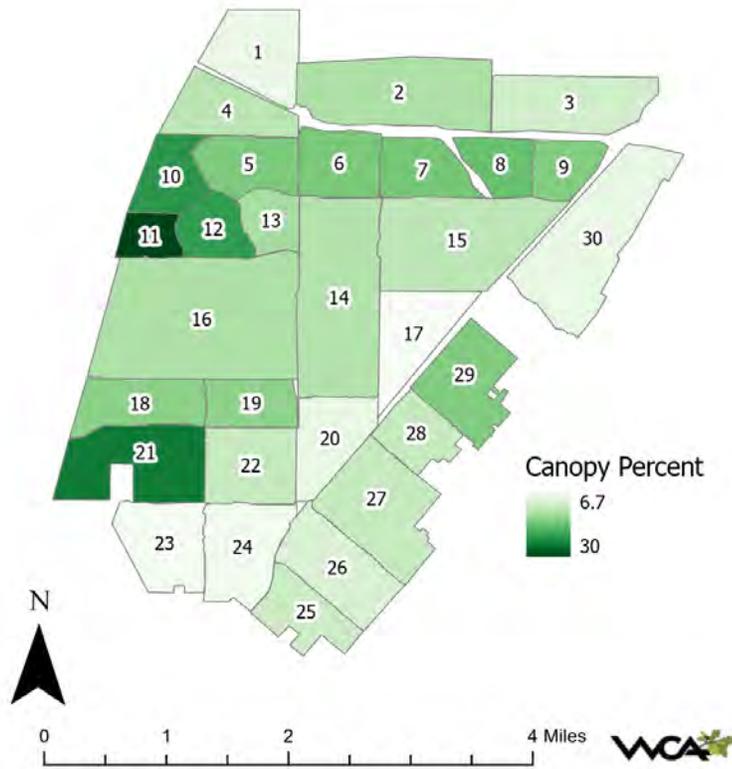


Figure 3.6a. This map shows the canopy percentage per prune district.

Suitable planting areas showed similar variation. Districts 18, 15 and 5 offered the greatest genuine opportunity for new trees, while highly built-out districts such as 20, 23, and 24 had very limited space. The starred districts (10*, 16*, 21*) are large recreational open spaces that the City considers unsuitable for planting, though their data is included for reference.

Canopy & Suitable

Prune District	Canopy	Suitable	Unsuitable
1	8.62	4.30	86.99
2	14.50	13.57	69.37
3	11.59	11.20	71.79
4	13.40	12.48	74.12
5	17.81	17.05	65.14
6	17.99	9.32	72.69
7	18.21	10.11	71.68
8	19.00	9.13	71.88
9	17.43	5.94	76.63
10*	23.43	48.73	27.84
11	30.25	15.61	54.14
12	22.75	9.79	67.46
13	15.03	5.74	79.23
14	13.95	8.04	78.01
15	13.24	16.55	70.21
16*	14.49	50.17	35.34
17	6.70	11.50	81.80
18	16.82	25.16	57.38
19	16.70	4.93	78.37
20	8.97	2.40	88.63
21*	25.90	26.51	46.74
22	12.52	5.49	81.99
23	6.97	2.72	88.92
24	7.66	3.10	88.94
25	11.91	6.47	80.01
26	10.79	8.24	80.84
27	12.62	12.69	73.82
28	12.61	8.79	74.27
29	17.48	4.68	77.11
30	8.88	4.24	86.14

Summary

In an effort to increase canopy cover, it is recommended to focus planting efforts in areas with a high to moderate percentage of suitable planting area and low existing canopy. This will create the greatest impact on overall canopy cover. For example, District 17 has a moderate amount of suitable area and the lowest canopy cover. Trees planted here would influence the citywide canopy more than trees planted in District 18, which already has strong canopy cover and the highest suitable area (excluding districts primarily covered by golf courses and parks). Focusing on areas with lower canopy in relation to their suitable planting area will lead to maximizing canopy growth impact per tree planted.



4: TREE BENEFITS

4.1 Ecological Benefits

Understanding an urban forest's structure, function and value can promote management decisions that will improve human health and environmental quality. An assessment of the vegetation structure, function, and value of the City of Costa Mesa urban forest was conducted during 2025. Data from 23221 trees located throughout City of Costa Mesa were analyzed using the i-Tree Eco model developed by the U.S. Forest Service, Northern Research Station.

How Costa Mesa's City Trees Benefit the Community



Pollution Removal

12.61 tons/year (\$173 thousand/year)

This value represents the amount of air pollutants that trees remove from the atmosphere through leaf surfaces. Common pollutants include ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), and particulate matter (PM₁₀). By intercepting these pollutants, trees help improve air quality and support public health.



Carbon Storage

12.85 thousand tons (\$5.56 million)

Carbon storage refers to the total amount of carbon currently held within a tree's biomass—its trunk, branches, leaves, and roots. As trees grow, they absorb carbon dioxide (CO₂) from the atmosphere and store it as carbon in their tissue, helping to offset greenhouse gas emissions.



Carbon Sequestration

556.9 tons (\$241 thousand/year)

This is the rate at which trees absorb and store carbon from the atmosphere each year. Unlike carbon storage, which is a cumulative total, carbon sequestration is an annual measurement that reflects the ongoing environmental service of reducing atmospheric CO₂ levels.



Avoided Runoff

2.327 million gallon/year (\$20.8 thousand/year)

Avoided runoff quantifies the volume of stormwater that is intercepted or absorbed by trees, preventing it from flowing directly into storm drains or local waterways. Trees reduce surface runoff by capturing rainfall on their leaves and branches and by increasing soil infiltration through their root systems.



Oxygen Production

1.485 thousand tons/year

Oxygen production measures the amount of oxygen generated by trees during photosynthesis. As trees convert carbon dioxide and water into glucose, they release oxygen as a byproduct. This natural process is essential for maintaining breathable air and supporting life on Earth.

Ton: short ton (U.S.) (2,000 lbs)

Monetary values \$ are reported in US Dollars throughout the report except where noted. Ecosystem service estimates are reported for trees. With Complete Inventory Projects, oxygen production is estimated from gross carbon sequestration and does not account for decomposition. Oxygen production in Plot Inventory Projects is estimated from net carbon sequestration.

4.2 Tree Characteristics

The urban forest of City of Costa Mesa has 23,221 trees with the most common being Liquidambar. The three most common species are Liquidambar styraciflua (8.8 percent), Pyrus calleryana (7.5 percent), and Pinus canariensis (7.5 percent).

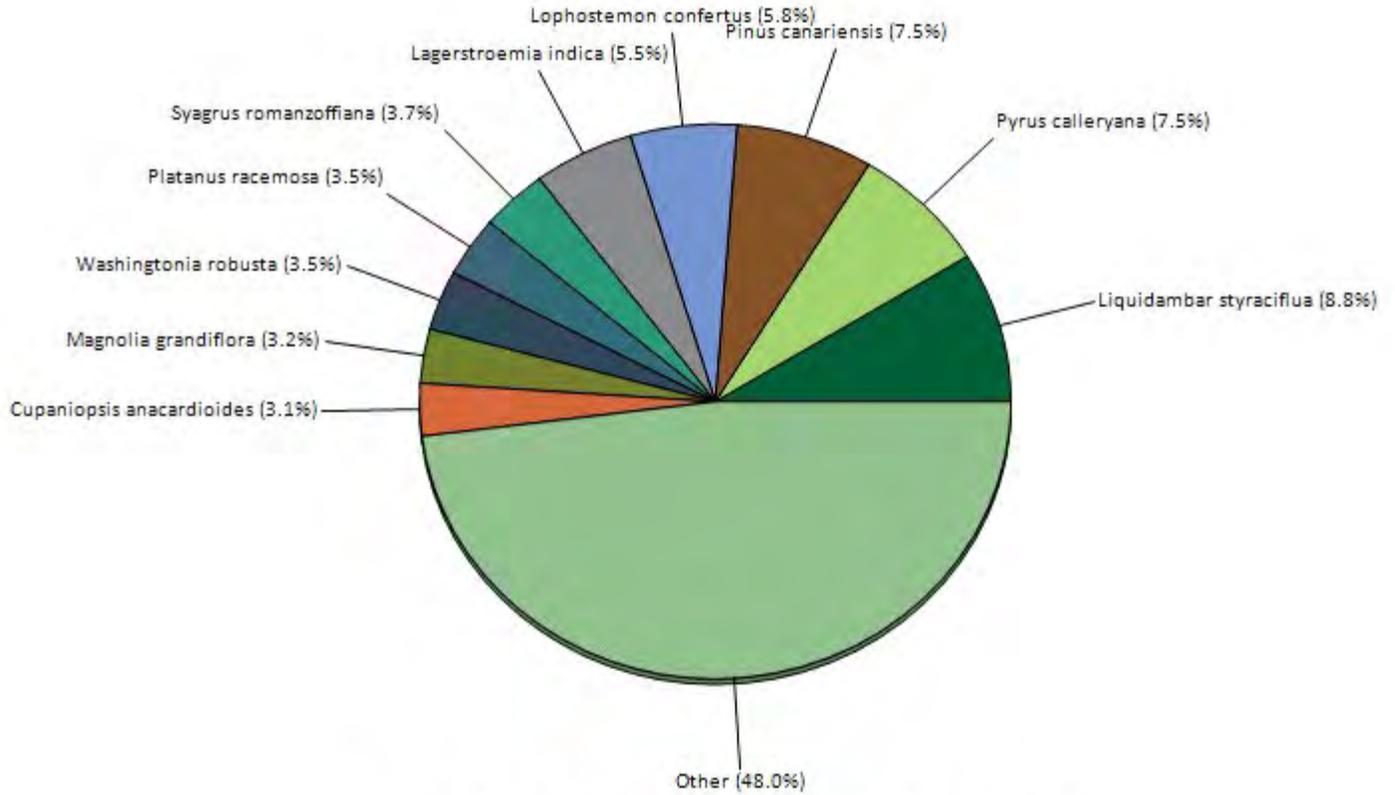


Figure 4.2a. Tree species composition in City of Costa Mesa

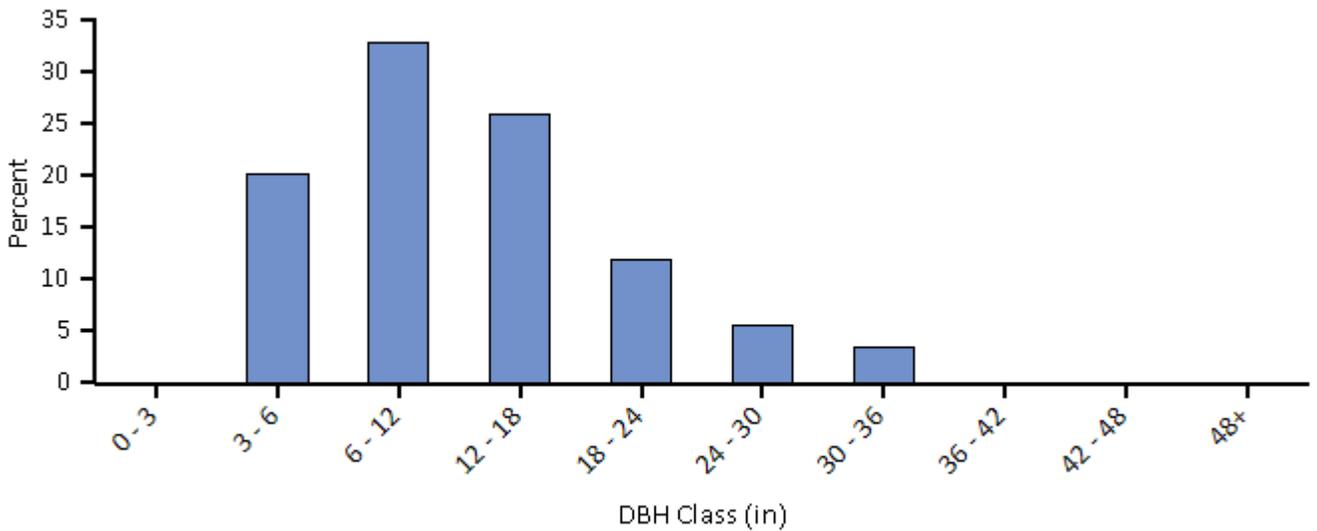


Figure 4.2b. Percent of tree population by diameter class (DBH—stem diameter at 4.5 feet)

4.3 Urban Forest Composition and Risk Assessment

In City of Costa Mesa, the most dominant species in terms of leaf area are *Pinus canariensis*, *Liquidambar styraciflua*, and *Platanus racemosa*. The 10 species with the greatest importance values are listed in Table 1. Importance values (IV) are calculated as the sum of percent population and percent leaf area. High importance values do not mean that these trees should necessarily be encouraged in the future; rather these species currently dominate the urban forest structure.

Scientific Name	Common Name	Percent Population	Percent Leaf Area	IV
<i>Pinus canariensis</i>	Canary island pine	7.5	14.8	22.3
<i>Liquidambar styraciflua</i>	Sweetgum	8.8	8.7	17.5
<i>Pyrus calleryana</i>	Callery pear	7.5	5.2	12.7
<i>Lophostemon confertus</i>	Vinegartree	5.8	4.7	10.5
<i>Platanus racemosa</i>	California sycamore	3.5	6.1	9.6
<i>Fraxinus uhdei</i>	Shamel ash	2.4	4.7	7.1
<i>Washingtonia robusta</i>	Mexican fan palm	3.5	3.4	6.9
<i>Lagerstroemia indica</i>	Common crapemyrtle	5.5	0.9	6.4
<i>Cupaniopsis anacardioides</i>	Carrotwood	3.1	2.7	5.7
<i>Corymbia citriodora</i>	Lemonscented gum	1.2	4.5	5.6

Potential Risk of Pests

Fifty-three insects and diseases were analyzed to quantify their potential impact on the urban forest. As each insect/ disease is likely to attack different host tree species, the implications for will vary. The number of trees at risk reflects only the known host species that are likely to experience mortality.

Code	Scientific Name	Common Name	Trees at Risk (#)	Value (\$ millions)
PSHB	<i>Euwallacea nov. sp.</i>	Polyphagous Shot Hole Borer	11936	49.54
PSB	<i>Tomicus piniperda</i>	Pine Shoot Beetle	2445	20.46
SPB	<i>Dendroctonus frontalis</i>	Southern Pine Beetle	2445	20.46
SW	<i>Sirex noctilio</i>	Sirex Wood Wasp	2445	20.46
SOD	<i>Phytophthora ramorum</i>	Sudden Oak Death	2202	9.13
ALB	<i>Anoplophora glabripennis</i>	Asian Longhorned Beetle	940	4.1
SLF	<i>Lycorma delicatula</i>	Spotted Lanternfly	836	3.16
EAB	<i>Agrilus planipennis</i>	Emerald Ash Borer	620	5.8
BM	<i>Euproctis chryorrhoea</i>	Browntail Moth	619	2.49
WM	<i>Operophtera brumata</i>	Winter Moth	444	1.52
OW	<i>Ceratocystis fagacearum</i>	Oak Wilt	443	1.56
LWD	<i>Raffaelea lauricola</i>	Laurel Wilt	399	1.61
GSOB	<i>Agrilus auroguttatus</i>	Goldspotted Oak Borer	343	1.17
LAT	<i>Choristoneura conflictana</i>	Large Aspen Tortrix	93	0.32
RPS	<i>Matsucoccus resinosae</i>	Red Pine Scale	34	0.1
DED	<i>Ophiostoma novo-ulmi</i>	Dutch Elm Disease	16	0.09
FTC	<i>Malacosoma disstria</i>	Forest Tent Caterpillar	15	0.13
ARD	<i>Armillaria spp.</i>	Armillaria Root Disease	4	0.03
TCD	<i>Geosmithia morbida</i>	Thousand Canker Disease	3	0.02
AL	<i>Phyllocnistis populiella</i>	Aspen Leafminer	1	0.01



5: RECOMMENDATIONS & CONCLUSIONS

5.1 Summary

Where Canopy is Lacking

Tree canopy is significantly lacking in Districts 2, 5, and 6, where canopy coverage falls between 12.73% and 13.49%, notably below the citywide average of 13.88%. This pattern is reflected in census tracts such as Tract 637.01 and 626.01, which show the lowest canopy percentages citywide, ranging from 9.8% to 11.7%. High-density residential zones and commercial corridors — such as those surrounding Harbor Boulevard, Bristol Street, and the South Coast Plaza area — are particularly short on possible planting area. These areas contain extensive impervious surfaces, minimal public green space, and limited planting within private parcels, all contributing to their reduced canopy footprint limitation. Prioritize prevention maintenance in these areas to ensure minimal loss in canopy cover.

Where the Most Opportunity Lies

The most suitable areas for new tree planting are found in Districts 3 and 6, which contain the highest possible planting area percentages, at 6.93% and 7.46% respectively. Land use categories with the most available planting space include Right-of-Way (11.91% suitable area), Medical (26.2%), and Low-Density Residential (9.13%). Individual locations like TeWinkle Park (270,000 Sqft plant-able area) and Wakeham Park (177,000 Sqft plant-able area) have the largest amount of plant-able area within their boundaries. These spaces feature existing soil or vegetated ground and manageable impervious barriers, making them ideal for canopy expansion that supports cooling, aesthetics, and stormwater control.

Areas Most in Need of Protection vs. Expansion

Neighborhoods such as Eastside Costa Mesa and parts of District 1 contain large residential lots with existing mature tree canopy — up to 16.34% in some districts — and should be prioritized for canopy protection through proactive maintenance and enforcement of preservation policies. In contrast, commercial zones (with only 6.8% canopy) and school properties (averaging under 8% UTC) require focused expansion efforts. Specific targets include public schools like Estancia High and Fairview Developmental Center, both of which have large pervious surfaces and poor canopy coverage. These land uses offer meaningful expansion potential with long-term environmental returns.

General Citywide Trends or Disparities

Canopy coverage in Costa Mesa is unevenly distributed, favoring low-density residential areas (23.83% canopy) while under-serving high-density residential (15.77%) and commercial (6.73%) zones. Large parcels such as Talbert Regional Park, Fairview Park, and the Costa Mesa Golf Course contain extensive canopy and open space but offer limited benefit to street-level urban canopy goals, as they do not align with equity-driven or pedestrian-oriented planting strategies. In contrast, census tracts in central and west Costa Mesa — including Tracts 638.02 and 639.02 — show a combination of low existing canopy and high planting suitability, identifying them as key focus areas for bridging environmental disparities.



APPENDIX A

Table A.1

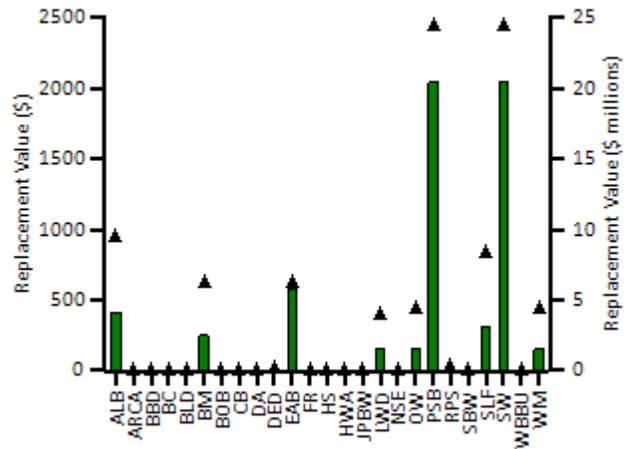
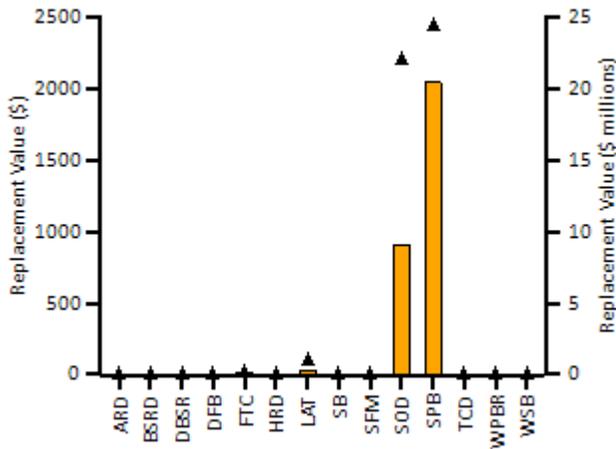
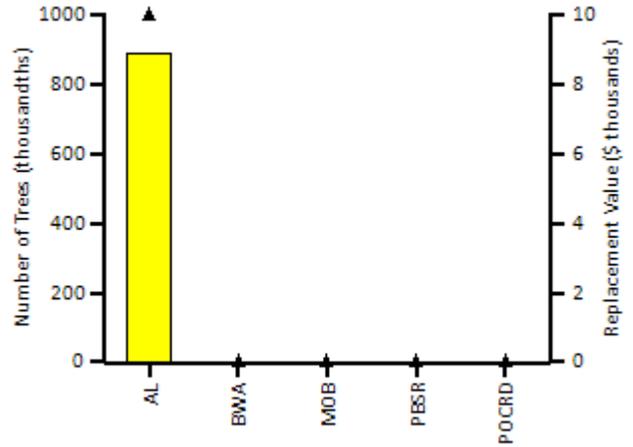
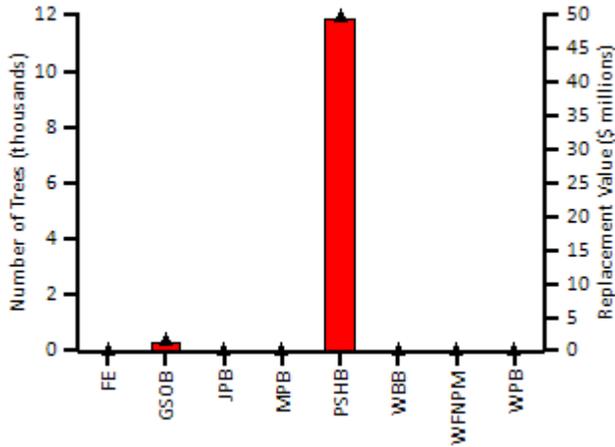
Census	Canopy	Suitable Planting Area	Unsuitable Planting Area	Total Area
639.07	6,558,877.70	2,944,861.21	47,133,271.84	56,637,010.75
638.03	3,582,526.14	1,057,422.73	24,267,416.53	28,907,365.40
638.07	4,841,509.68	2,125,886.71	21,235,993.59	28,203,389.98
639.04	3,214,109.84	1,896,370.27	21,348,668.02	26,459,148.13
639.02	3,216,234.52	1,374,398.43	21,385,044.52	25,975,677.47
626.10	2,202,204.02	1,114,325.69	21,317,953.44	24,634,483.14
638.06	5,186,084.87	1,401,095.76	17,006,288.75	23,593,469.39
639.08	3,192,094.19	1,656,214.22	15,185,185.33	20,033,493.74
636.01	4,682,432.14	920,066.26	12,244,200.31	17,846,698.72
639.03	2,059,494.52	1,070,864.18	11,562,239.57	14,692,598.28
639.05	2,789,845.78	901,784.08	10,840,905.03	14,532,534.90
633.02	1,815,464.02	1,207,381.43	11,060,096.83	14,082,942.28
631.02	2,434,339.18	624,256.77	10,812,813.82	13,871,409.76
638.02	2,663,168.33	845,398.68	9,814,274.21	13,322,841.22
636.04	892,906.14	188,918.70	11,407,312.83	12,489,137.67
637.02	980,936.03	404,354.15	10,686,574.26	12,071,864.45
639.06	1,161,444.30	330,131.23	9,834,636.35	11,326,211.88
636.05	895,803.38	156,770.51	10,267,787.69	11,320,361.59
632.01	1,364,701.41	844,214.37	8,597,788.40	10,806,704.18
637.01	1,418,207.11	349,564.65	8,968,258.79	10,736,030.55
632.02	1,458,695.31	1,015,942.40	8,125,089.04	10,599,726.75
638.05	1,400,789.14	745,663.05	8,404,155.86	10,550,608.05
633.01	927,970.64	442,359.04	8,573,519.32	9,943,849.00
638.08	1,377,498.60	368,761.71	6,267,097.67	8,013,357.98
631.03	672,123.55	465,701.63	4,621,776.06	5,759,601.24
631.01	222,715.36	117,226.43	2,314,231.92	2,654,173.71
525.01	42,919.56	282,092.43	864,056.37	1,189,068.36
636.03	47,435.76	35,208.57	865,346.60	947,990.93
741.06	10,400.72	3,377.65	243,418.50	257,196.87
634.00	275.50	6,319.95	163,683.91	170,279.36
740.04	19.37	35.39	68,545.13	68,599.89
992.40	1,001.54	-	57,962.19	58,963.74
740.06	14.28	3.88	48,022.98	48,041.14
741.07	719.93	91.05	24,509.96	25,320.94
630.10	-	154.99	18,404.52	18,559.51
740.03	5.58	259.92	5,723.51	5,989.01
630.09	-	15.51	1,086.05	1,101.56

Table A.2

Row Labels	Canopy	Vegetation	Soil	Building	Road	Water	Other	Shadow	Grand Total
Grand Total	51,125,340.57	53,820,537.93	7,460,119.37	140,934,220.59	75,253,326.34	2,772,136.29	1,464,997.52	11,751,233.02	344,581,911.63
Low Density Res	23,668,186.12	8,853,592.76	305,261.91	57,299,833.34	6,918,203.78	315,855.39	12,711.90	1,987,282.96	99,360,928.16
Commercial	5,708,246.06	1,710,605.75	236,734.23	37,266,296.23	33,036,149.75	83,587.05	1,175,995.04	4,674,906.80	83,892,520.91
High Density Res	7,664,144.85	2,269,444.06	116,365.43	28,158,685.66	8,486,576.94	121,306.10	46,920.98	1,713,548.81	48,576,992.83
Open Space	4,766,557.83	16,521,426.26	2,939,518.00	809,980.18	6,501,300.79	356,424.38	1,436.08	627,757.29	32,524,400.81
Golf	2,953,260.65	11,447,926.80	314,078.18	125,839.91	664,622.85	365,415.38	3,906.69	665,414.25	16,540,464.73
School (non private)	847,438.67	5,318,823.61	381,456.06	2,138,654.94	3,617,652.88	27,839.32	7,889.23	242,356.45	12,582,111.16
Medium Density Res	2,015,468.10	954,138.10	21,187.33	6,426,462.73	1,748,679.09	21,397.93	3,133.82	310,555.60	11,501,022.71
College/ University	784,920.99	1,428,468.05	181,949.36	2,360,618.10	4,019,946.56	24,084.35	62,169.60	276,675.29	9,138,832.31
City Facilities	673,804.41	2,369,808.69	420,798.14	806,054.30	2,685,130.91	1,158,434.47	6,218.73	323,256.39	8,443,506.04
Medical	862,948.89	1,077,231.00	484,706.90	956,069.52	1,377,716.83	950.11	4,362.32	218,811.32	4,982,796.89
Right-of-Way	251,031.33	332,057.69	283,362.82	187,472.82	2,155,425.26	256,267.94	1,418.74	158,152.55	3,625,189.14
Agriculture	13,598.66	848,056.28	1,726,226.16	13,803.51	268,484.73	16,248.49		15,544.15	2,901,961.98
Church	258,096.56	344,546.91	11,645.76	958,696.80	1,102,103.35	570.46	711.49	95,669.58	2,772,040.90
Hotel / Motel	243,244.20	73,053.30	821.01	1,255,149.97	790,196.69	17,349.80	2,229.42	251,646.62	2,633,691.01
Private School	182,192.10	182,088.38	5,443.78	437,112.19	619,042.32	818.70	1,307.73	75,117.23	1,503,122.44
Mobile Homes	19,622.62	7,568.36	215.30	764,550.04	520,303.02	1,718.68	121,966.98	32,202.64	1,468,147.64
Senior Housing	118,150.26	36,144.71	17,110.70	507,072.30	219,934.99	2,153.97	1,152.19	52,917.15	954,636.26
Vacant	70,714.08	30,672.42	12,056.61	344,804.88	391,838.12	365.09	10,835.30	25,103.98	886,390.48
Mixed Use	22,400.50	12,166.08	1,181.69	108,180.60	110,829.79	1,338.75	631.27	4,229.64	260,958.31
Railroad	1,313.67	2,718.73		8,882.57	19,187.69	9.96		84.31	32,196.93

Table A.3

In the following graph, the pests are color coded according to the county's proximity to the pest occurrence in the United States. Red indicates that the pest is within the county; orange indicates that the pest is within 250 miles of the county; yellow indicates that the pest is within 750 miles of the county; and green indicates that the pest is outside of these ranges.



Note: points - Number of trees, bars - Replacement value

Table A.4

Spp.	Risk Weight	Species Name	AL	ALB	ARCA	ARD	BBD	BC	BLD	BM	BOB	BSRD	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	FTC	GSOB	HRD	HS	HWA	JPB	JPBW	LAT	LWD	MOB	MPB	NSE	OW	PBSR		
	4	<i>Platanus racemosa</i>																																			
	4	<i>Washingtonia robusta</i>																																			
	4	<i>Magnolia grandiflora</i>																																			
	4	<i>Cupaniopsis anacardioides</i>																																			
	4	<i>Afrocarpus falcatus</i>																																			
	4	<i>Platanus mexicana</i>																																			
	4	<i>Jacaranda mimosifolia</i>																																			
	4	<i>Archontophoenix cunninghamiana</i>																																			
	4	<i>Pistacia chinensis</i>																																			
	4	<i>Koelreuteria bipinnata</i>																																			
	4	<i>Bauhinia variegata</i>																																			
	4	<i>Schinus molle</i>																																			
	4	<i>Tipuana tipu</i>																																			
	4	<i>Eucalyptus polyanthemos</i>																																			
	4	<i>Arbutus unedo</i>																																			
	4	<i>Olea europaea</i>																																			
	4	<i>Eucalyptus camaldulensis</i>																																			
	4	<i>Cassia leptophylla</i>																																			
	4	<i>Ficus benjamina</i>																																			
	4	<i>Koelreuteria paniculata</i>																																			
	4	<i>Corymbia ficifolia</i>																																			
	4	<i>Callistemon viminalis</i>																																			
	4	<i>Cocculus laurifolius</i>																																			
	4	<i>Brachychiton populneus</i>																																			
	4	<i>Pittosporum undulatum</i>																																			
	4	<i>Washingtonia filifera</i>																																			
	4	<i>Ceiba speciosa</i>																																			
	4	<i>Brachychiton acerifolius</i>																																			
	4	<i>Ceratonia siliqua</i>																																			
	4	<i>Eriobotrya japonica</i>																																			
	4	<i>Ficus macrophylla</i>																																			
	4	<i>Acacia stenophylla</i>																																			
	4	<i>Cedrus atlantica</i>																																			
	4	<i>Howea forsteriana</i>																																			
	4	<i>Citrus limon</i>																																			
	4	<i>Gleditsia triacanthos</i>																																			
	4	<i>Hymenosporum flavum</i>																																			

Table A.4

Spp. Risk	Risk Weight	Species Name	AL	ALB	ARCA	ARD	BBB	BC	BLD	BM	BOB	BSRD	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	FTC	GSOB	HRD	HS	HWA	JPB	JPBW	LAT	LWD	MOB	MPB	NSE	OW	PBSR		
4	4	<i>Harpephyllum caffrum</i>																																			
4	4	<i>Erythrina caffra</i>																																			
4	4	<i>Eucalyptus torquata</i>																																			
4	4	<i>Acacia melanoxylon</i>																																			
4	4	<i>Cercidium</i>																																			
4	4	<i>Magnolia x soulangeana</i>																																			
4	4	<i>Salix babylonica</i>																																			
4	4	<i>Triadica sebifera</i>																																			
4	4	<i>Inga edulis</i>																																			
4	4	<i>Macadamia integrifolia</i>																																			
4	4	<i>Prosopis chilensis</i>																																			
4	4	<i>Acacia baileyana</i>																																			
4	4	<i>Bombax ceiba</i>																																			
4	4	<i>Calodendrum capense</i>																																			
4	4	<i>Casuarina cunninghamiana</i>																																			
4	4	<i>Eucalyptus cinerea</i>																																			
4	4	<i>Liquidambar formosana</i>																																			
4	4	<i>Parkinsonia aculeata</i>																																			
4	4	<i>Prunus caroliniana</i>																																			
4	4	<i>Psidium guajava</i>																																			
4	4	<i>Schinus polygama</i>																																			
3	3	<i>Lophostemon confertus</i>																																			
3	3	<i>Pyrus</i>		■						■																											
3	3	<i>Sequoia sempervirens</i>																																			
3	3	<i>Laurus nobilis</i>																																			
3	3	<i>Ulmus pumila</i>		■														■																			
3	3	<i>Citrus</i>																					■														
3	3	<i>Acer saccharinum</i>		■																																	
3	3	<i>Calocedrus decurrens</i>					■																														
3	3	<i>Malus</i>		■						■																											
3	3	<i>Photinia x fraseri</i>																																			
3	3	<i>Heteromeles arbutifolia</i>																																			
3	3	<i>Juglans hindsii</i>																																			
3	3	<i>Alnus</i>																																			
3	3	<i>Juglans californica</i>																																			
1	1	<i>Celtis occidentalis</i>		■																																	
1	1	<i>Fraxinus angustifolia</i>																				■															
1	1	<i>Punica granatum</i>																																			
1	1	<i>Prunus armeniaca</i>																																			
1	1	<i>Robinia pseudoacacia</i>																																			

Table A.4

Spp. Risk	Risk Weight	Species Name	POCFD	PSB	PSHB	RPS	SB	SBW	SFM	SLF	SOD	SPB	SW	TCD	WBB	WBBU	WFNPM	WM	WPB	WPBR	WSB	
5		Melia azedarach																				
4		Liquidambar styraciflua																				
4		Pyrus calleryana																				
4		Platanus racemosa																				
4		Washingtonia robusta																				
4		Magnolia grandiflora																				
4		Cupaniopsis anacardioides																				
4		Afrocarpus falcatus																				
4		Platanus mexicana																				
4		Jacaranda mimosifolia																				
4		Archontophoenix cunninghamiana																				
4		Pistacia chinensis																				
4		Koelreuteria bipinnata																				
4		Bauhinia variegata																				
4		Schinus molle																				
4		Tipuana tipu																				
4		Eucalyptus polyanthemos																				
4		Arbutus unedo																				
4		Olea europaea																				
4		Eucalyptus camaldulensis																				
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4		Eriobotrya japonica																				
4		Ficus macrophylla																				
4		Acacia stenophylla																				
4		Cedrus atlantica																				
4		Howea forsteriana																				

Table A.4

Spp. Risk	Risk Weight	Species Name	POCRD	PSB	PSHB	RPS	SB	SBW	SFM	SLF	SOD	SPB	SW	TCD	WBB	WBBU	WFNPM	WM	WPB	WPBR	WSB	
4	4	Citrus limon																				
4	4	Gleditsia triacanthos																				
4	4	Hymenosporum flavum																				
4	4	Harpephyllum caffrum																				
4	4	Erythrina caffra																				
4	4	Eucalyptus torquata																				
4	4	Acacia melanoxylon																				
4	4	Cercidium																				
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4	4	Parkinsonia aculeata																				
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4	4	Psidium guajava																				
4	4	Schinus polygama																				
3	3	Lophostemon confertus																				
3	3	Pyrus																				
3	3	Sequoia sempervirens																				
3	3	Laurus nobilis																				
3	3	Ulmus pumila																				
3	3	Citrus																				
3	3	Acer saccharinum																				
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3	3	Photinia x fraseri																				
3	3	Heteromeles arbutifolia																				
3	3	Juglans hindsii																				
3	3	Alnus																				
3	3	Juglans californica																				
1	1	Celtis occidentalis																				

Table A.4

Spp. Risk	Risk Weight	Species Name	POCRD	PSB	PSHB	RPS	SB	SBW	SFM	SLF	SOD	SPB	SW	TCD	WBB	WBBU	WFNPM	WM	WPB	WPBR	WSB	
	1	Fraxinus angustifolia																				
	1	Punica granatum																				
	1	Prunus armeniaca																				
	1	Robinia pseudoacacia																				
	1	Platycladus orientalis																				
	1	Ligustrum lucidum																				
	1	Prunus domestica																				
	1	Malus fusca																				
	1	Quercus tomentella																				

Note:

Species that are not listed in the matrix are not known to be hosts to any of the pests analyzed.

Species Risk:

- Red indicates that tree species is at risk to at least one pest within county
- Orange indicates that tree species has no risk to pests in county, but has a risk to at least one pest within 250 miles from the county
- Yellow indicates that tree species has no risk to pests within 250 miles of county, but has a risk to at least one pest that is 250 and 750 miles from the county
- Green indicates that tree species has no risk to pests within 750 miles of county, but has a risk to at least one pest that is greater than 750 miles from the county

Risk Weight:

Numerical scoring system based on sum of points assigned to pest risks for species. Each pest that could attack tree species is scored as 4 points if red, 3 points if orange, 2 points if yellow and 1 point if green.

Pest Color Codes:

- Red indicates pest is within Orange county
- Red indicates pest is within 250 miles county
- Yellow indicates pest is within 750 miles of Orange county
- Green indicates pest is outside of these ranges