TREE INVENTORY SUMMARY AND RECOMMENDATIONS

FREMONT, CA
DECEMBER 2020

CITY OF Fremont California

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TABLE OF CONTENTS

1 **FREMONT CALIFORNIA TREE INVENTORY SUMMARY**

2 ..... INVENTORY RESULTS AT-A-GLACE

3 **STRUCTURE**

3 ..... TREE DIVERSITY AND COMPOSITION

4 ..... SIZE AND AGE DISTRIBUTION

5 **MANAGEMENT**

5 ..... URBAN FOREST CONDITION

6 ..... TREE OBSERVATIONS AND PRIMARY MAINTENANCE NEEDS

7 **DISTRIBUTION & GROWING SPACE**

7 ..... LAND USE AND PLANTING SITE WIDTH

8 ..... GROWING SPACE

9 **ECONOMIC AND ECOSYSTEM BENEFITS**

10 ..... ECONOMIC AND ECOSYSTEM BENEFIT ANALYSIS SUMMARY AND RESULTS

11 **MAINTENANCE COSTS & COST/BENEFIT ANALYSIS**

12 ..... COST/BENEFIT ANALYSIS AND COST/BENEFIT ANALYSIS SUMMARY

13 **SUMMARY OF RECOMMENDATIONS**

15 **APPENDIX**

15 ..... APPENDIX A | TREE OBSERVATION TERMS & DEFINITIONS

16 ..... APPENDIX B | TREE MAINTENANCE NEEDS TERMS & DEFINITIONS

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PREPARED FOR
City of Fremont, California

INVENTORY PERFORMED
January-October 2020

TREE INVENTORY

EXECUTIVE SUMMARY

77,387

CITY TREES

INVENTORIED AND ANALYZED

Having a healthy, diverse urban forest can provide many benefits to residents as well as the ecosystem. In addition to being aesthetically pleasing, trees also provide a number of ecosystem services for the city. For example, they scrub the air of pollutants, slow the release of stormwater runoff into the watershed, filter stormwater, provide oxygen, reduce energy costs, provide shade, and offer habitat and food for wildlife.

Trees in urban environments not only contribute services to the city, but also provide residents with invaluable green space and health benefits. Proximity to green space has been linked to better mental health (Barton, et al. Environmental Science & Technology, 2010) as well as increases in social connections (Holtan, et al. Environment and Behavior, 2014) and physical well-being (Takano, Journal of Epidemiology & Community Health, 2002).

The inventory data were analyzed in Microsoft Excel and Fremont's own TreePlotter app (https://pg-cloud.com/FremontCA/) to determine the state, characteristics, and trends of the city's urban forest. Analyses and summaries were completed for the inventoried trees to determine the health and diversity of the trees in the city.

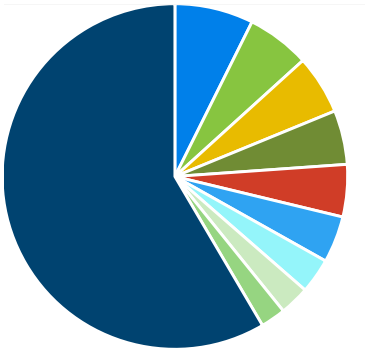
The data include 77,387 trees and 23,781 planting sites that were inventoried in 2020 by Certified Arborists accredited by the International Society of Arboriculture and analyzed for site quality, health observations, and structural defects among other data points.

It should be noted that while the city does not maintain all the trees included in this inventory, the data analysis contained in this report typically looked at the city's urban forest as a whole. In cases where the analysis was separated by city-maintained or privately-maintained trees, it is noted in this report.

Lastly, it is important to remember that the key to maintaining a sustainable and healthy urban forest is species and age diversity, proper tree maintenance, risk management, and community support, which can be accomplished with an urban forest management plan. The information in this report is provided to guide future maintenance and management and to better plan for the health and longevity of Fremont's urban forest.

INVENTORY RESULTS AT-A-GLANCE

The following report sections provide the results and recommendations based on the city's tree characteristics and organized by Structure, Management, Distribution & Growing Space, and Economic & Ecosystem Benefits . The summary results presented below will be discussed in greater detail in the following sections.

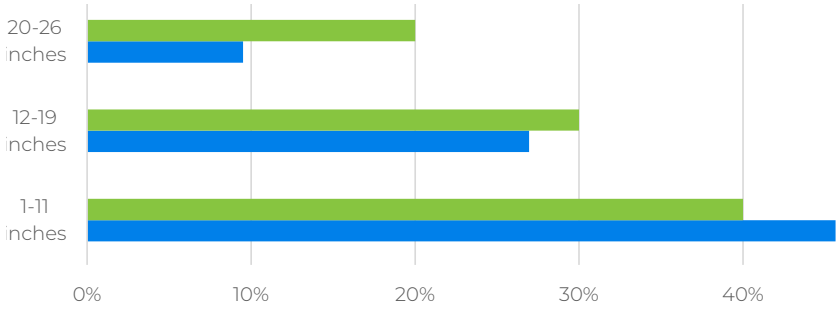


SPECIES DIVERSITY

A total of 510 species were identified. The top nine species comprise 42% of the inventory, with Chinese pistache (*Pistacia chinensis*) being the most prevalent at 7% of the total inventory.

- Chinese pistache - 7%
- Common crapemyrtle - 6%
- Sweetgum - 6%
- Raywood ash - 5%
- Coast live oak - 5%
- London planetree - 4%
- Callery pear - 3%
- Southern magnolia - 3%
- Canary island pine - 2%
- All other species - 58%

SIZE DISTRIBUTION



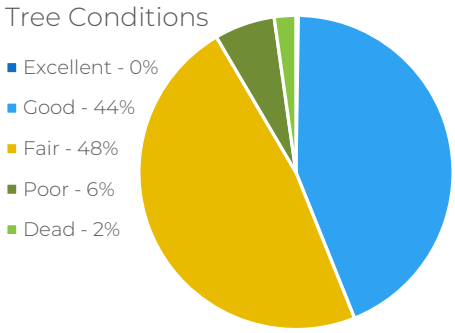
Small trees with a diameter of 1-11 inches made up a majority of the inventory with 58% of all trees. This is 18% higher than the recommended "ideal" distribution.

- Ideal Distribution
- City Distribution

MAINTENANCE NEEDS

Most trees inventoried had a condition of "Fair" (48%) or "Good " (44%). 69% of all trees surveyed had some type of maintenance need, with 47% being recommended for a crown cleaning.

Most Common Maintenance Needs	Percent of Trees
Crown Cleaning	47%
Prune-Clearance	13%
Sidewalk Damage	7%



TREE INVENTORY STRUCTURE

Urban forest structure describes the tree population in the city in terms of its species composition, number of trees, age classes, and tree distribution. These summaries assist city tree managers in proper tree management and planting to ensure long-lasting canopy and benefits are distributed equally throughout the city. It's important to note again that the city does not maintain street trees and this inventory includes a mix of both publicly and privately maintained trees.

TREE DIVERSITY AND COMPOSITION

Species composition data are essential since the types of trees present throughout the city dictate the amount and type of benefits produced, tree maintenance activities required, and budget considerations.

The 77,387 trees inventoried consist of 510 different species and cultivar classifications. The highest percentage consists of Chinese pistache with 7% (5,699 trees) of the total tree population, followed by common crapemyrtle at 6% (4,578 trees) and sweetgum with 6% (4,281 trees). Figure 1 below shows the remaining top species and their percentages compared to the other 501 species that were inventoried.

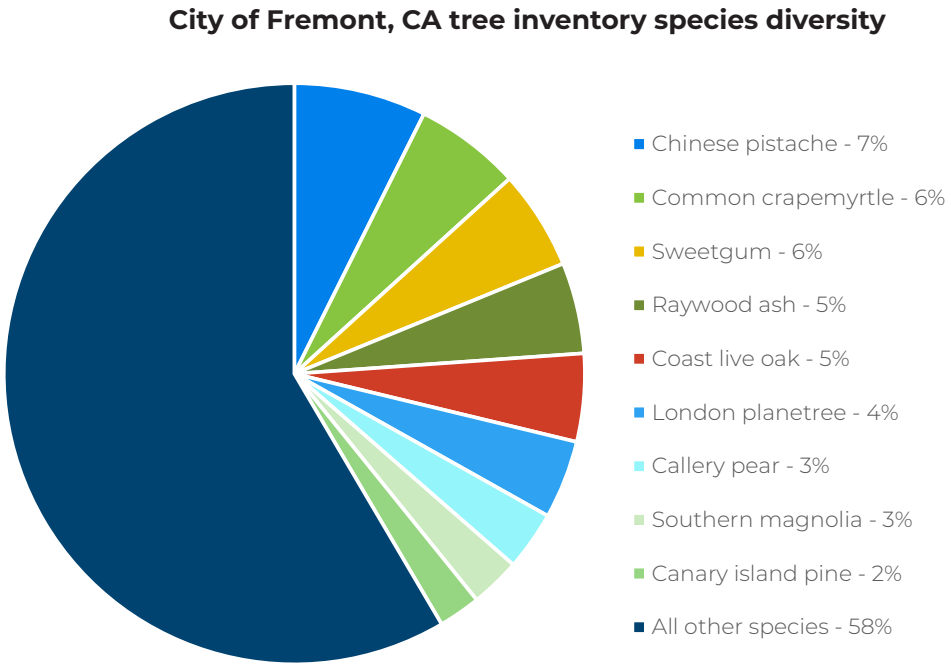


Figure 1. | City of Fremont tree species composition

SIZE AND AGE DISTRIBUTION

The distribution of tree ages influences the structure of the urban forest as well as the present and future costs. An unevenly aged urban forest offers continued flow of ecological benefits and a more uniform work flow allowing managers to more accurately allocate annual maintenance schedules and budgets.

To optimize the value and benefits of Fremont's trees, the urban forest should have a high percentage of large canopy trees which provide greater ecosystem benefits. On the other hand, there must be a suitable number of younger, smaller trees in the urban forest to account for and eventually replace large and mature trees in decline. Having a healthy percentage of young trees in the urban forest will ensure a sustainable tree population as well as age distribution in future years. To compare Fremont's urban forest structure to industry-recommended standards, the "ideal distribution" is used (McPherson et. al, 2011).

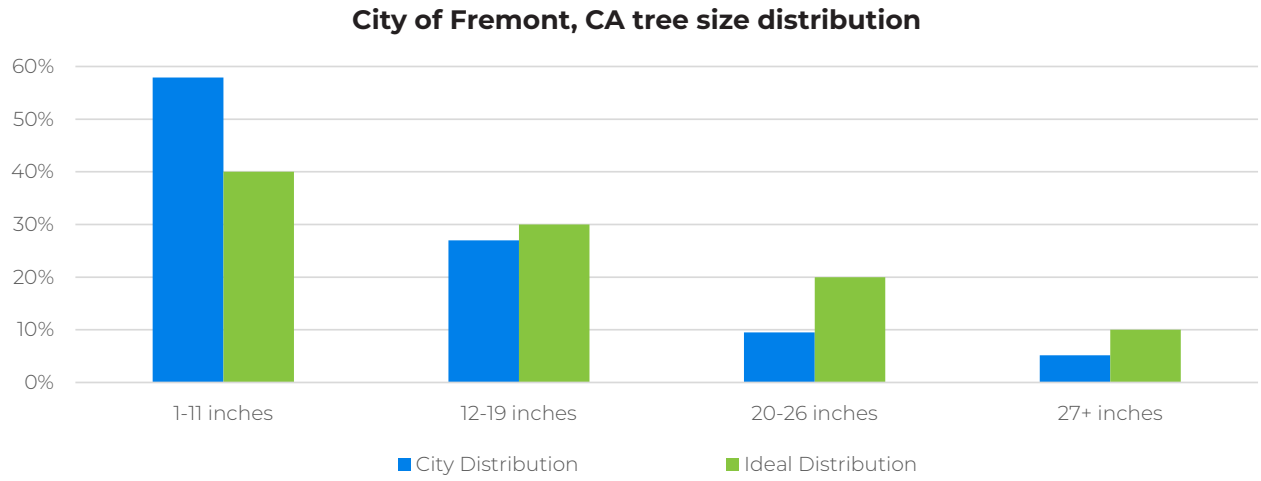


Figure 2. | Comparison of Fremont, CA's tree size distribution to an ideal distribution

Overall, the age distribution of Fremont's urban forest (blue bars) is similar to the ideal age distribution (green bars). As Figure 2 above shows, 58% of the urban forest (44,811 trees) is composed of trees with a DBH (or "diameter at breast height," measured at 4.5 feet above grade) ranging from 1 to 11 inches. This indicates that the majority of trees are young or small-statured. Trees in this size class are crucial for a healthy urban forest, however the inventory found that there are 18% more trees in this category than the ideal distribution of 40%. This could be due to increasing devlopment in the city over the last 2-3 decades and the prioritization of planting smaller trees that are more popular with property owners, such as the Chinese pistache and crape myrtle. Development often shapes the tree diversity in a city and the city should work with developers to ensure that the species they are planting allow for larger species where possible.

Trees with a DBH of 27 inches or greater make up just 5% (3,981) of Fremont's trees. City trees in this DBH range can offer larger ecological benefits if the trees are properly maintained and remain healthy, but trees of this size should be monitored frequently to determine maintenance needs, potential risks, and signs of decline. The DBH range of 20 to 26 inches, which makes up 10% of the tree population (or 7,352 trees) is 11% below the ideal distribution and extra care should be taken to ensure the health of these trees to maintain an ideal distribution in the future. The average DBH for the entire population is 11 inches, and the largest recorded DBH is 125 inches.

An ideal age distribution in the tree population allows managers to allocate and project annual maintenance costs uniformly. This ensures continuity in overall tree canopy coverage and associated benefits which are often dependent on the growing space of individual trees (e.g. open grown versus restricted growing areas). It is recommended to monitor and strategically manage large trees throughout the city and weigh the risks and benefits that are associated with large, mature trees.

TREE INVENTORY MANAGEMENT

Tree characteristics and environmental factors affect the management needs for urban trees. An analysis of the condition and maintenance requirements assists managers in planning Fremont's urban forest.

Tree condition indicates how well trees are managed and how well they perform, given site-specific conditions. Tree maintenance needs are assigned for public safety reasons and for the health and longevity of the trees themselves. Understanding the maintenance needs assists tree managers in establishing daily work plans and maintaining public safety.

URBAN FOREST CONDITION

The inventory data were analyzed to identify potential trends in tree condition and management needs. Information on the condition of trees plays an important role in planning, budgeting, and use of resources. Each inventoried tree's health was evaluated by ISA Certified Arborists based on the condition of the wood and the foliage as well as the structure.

Figure 3 summarizes the 77,387 trees that were assigned a condition rating and shows the detailed information for each condition class.

The data show that a majority of the trees inventoried are classified as being in "Fair" condition, comprising 48% or 36,857 trees, followed by those in "Good" condition comprising 44% (33,800 trees).

4,820 trees are noted as being in "Poor" condition and 1,722 trees are classified as dead / removal required. The dead trees or trees noted for removal should be adressed and planned for immediately.

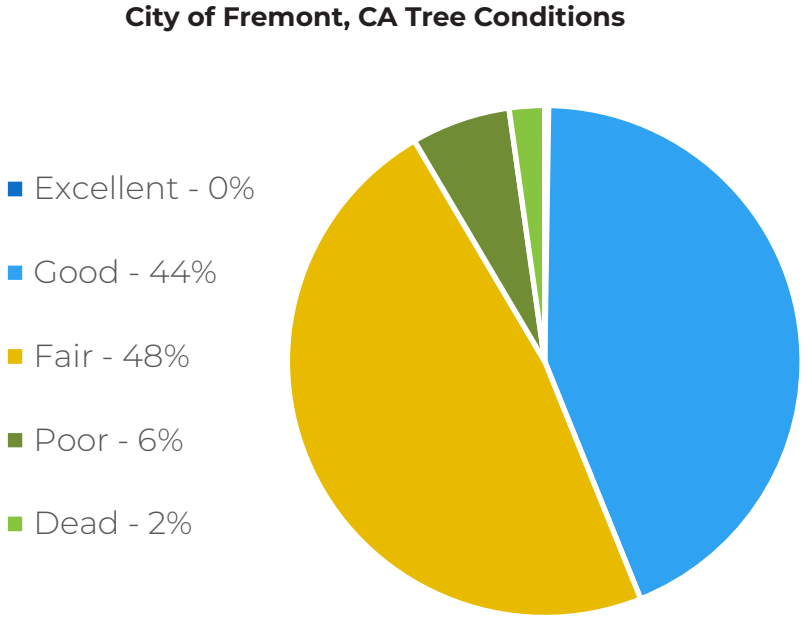


Figure 3. | Fremont, CA tree health conditions

TREE OBSERVATIONS

Tree observations were recorded during the 2020 inventory to further describe a tree's health, structure, or location when more detail was needed. A total of 21 unique observations were included in the inventory. The complete list of observations, including their definitions, can be found in Appendix A.

Table 1 to the right provides a summary of the observations for Fremont's trees. A total of 81,189 observations were recorded during the tree inventory, with 44,288 sites (57%) noted as having at least one observation while 33,099 sites (43%) have no observation recorded. Poor structure was the most frequent observation recorded (26% or 19,741 trees) during the 2020 tree inventory. 1 out of every 4 trees (25% or 19,138) were noted as having crown dieback, and nearly 1 in 5 (18%) were observed to have been pruned improperly.

Observation	Count	%
Poor Structure	19,741	26%
Crown Dieback	19,138	25%
Improperly Pruned	13,721	18%
Cavity Decay	6,978	9%
Poor Root System	6,854	9%
Remove Hardware	4,791	6%
Hardscape Damage	4,366	6%
Mechanical Damage	1,060	1%
Poor Location	1,014	1%
Serious Decline	921	1%
Vines	679	1%
Canker	430	1%
All Other Observations	1,496	2%
Total	81,189	

Table 1. | Observations of Fremont's trees

PRIMARY MAINTENANCE NEEDS

The inventory required an assessment of the maintenance needs, if any, for each tree. This information along with location and the TreePlotter application were used to guide the maintenance recommendations. A total of 18 unique maintenance needs were included in the inventory. The complete list of maintenance needs, including their definitions, can be found in Appendix B.

Table 2 below provides a summary of the maintenance and pruning recommendations for all of the inventoried trees. Of the 77,387 trees that were inventoried, 53,571 (69%) trees were assigned a maintenance task. 31% of inventoried trees did not have any maintenance recommendation, however these trees should be routinely monitored to assess for any new maintenance issues that may arise in the future.

Maintenance Need	Count	%
Crown Cleaning	35,683	47%
Prune-Clearance	10,300	13%
Sidewalk Damage	5,541	7%
Remove Hardware	4,955	6%
Raise	3,851	5%
Monitor	3,200	4%
Prune-Structural	2,831	4%
Remove	2,094	3%
Utility	1,836	2%
Thin	1,692	2%
All Other Maintenance Needs	1,117	1%
TOTAL	73,100	

Table 2. | Maintenance needs for Fremont's trees

Crown cleaning, the selective removal of dead, dying, diseased, and broken branches from the tree's crown, was recommended for 47% of the city's trees and clearance pruning, or pruning to provide clearance for pedestrians, vehicles, utilities, and buildings, accounted for 13% of maintenance needs. Sidewalk damage was noted at 5,541 trees (7%).

Properly maintained and healthy trees are key to the success of Fremont's urban forest. Since the city does not maintain street trees, it is recommended that the city implement an education campaign to address the maintenance needs with property owners. Working with property owners to prioritize high risk tree removals and to educate them about the proper maintenance of their trees will ensure a successful urban forest for future generations. If possible, it is recommended that the city identify funding sources to assist homeowners in properly caring for their trees where needed.

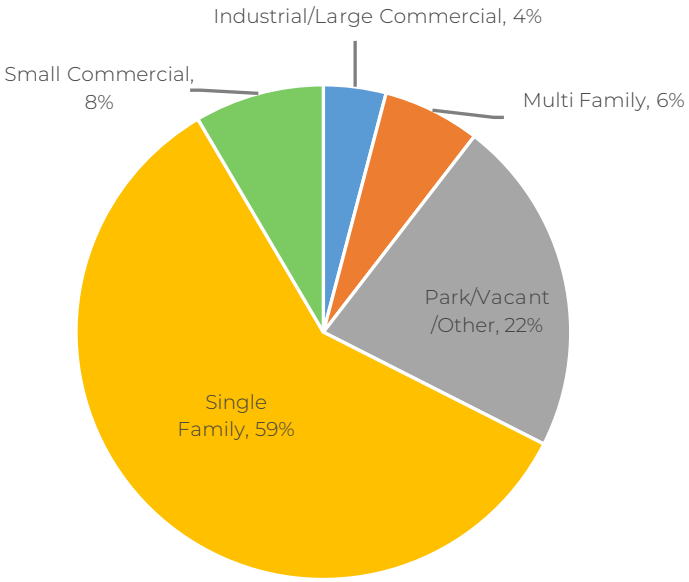
TREE INVENTORY DISTRIBUTION & GROWING SPACE

Tree distribution across land uses can affect maintenance costs, schedules, potential risks such as pests or diseases, and the effects of climate change. Adequate distribution of trees also contributes to Fremont's pursuit for equitable distribution of tree canopy and associated benefits and equal access to the resource by all residents.

LAND USE

Trees located near a Single or Multi-Family residence made up a majority of the inventory with a combined 65% or 50,677 trees. 22% (17,055) of trees in the inventory dataset are in a Park/Vacant/Other land use type. The reamainder (9,655 trees) are in the Industrial and Commercial parts of the city. Figure 4 to the right shows the complete breakdown of the land use type for the entire tree inventory.

Figure 4. | Land use type of Fremont's trees



PLANTING SITE WIDTH

The planting site width for tree roots can impact tree growth, health and maintenance costs over time. Adequate space and soil volume should be considered for each site based on tree species requirements and root biology. Frequency of maintenance is also a consideration for tree selection when a tree needs to be replaced. An analysis of growing space can assist tree managers in making future tree species selections for sites with similar characteristics.

The smallest planting site width measurements were collected for each inventoried tree. Table 3 to the right shows the number of trees and percentage of each planting site width classification. 37,749 (49%) of the inventoried trees are growing in a Class I (Small) site with 1-5 feet of space. 19%, or 14, 919 trees, are growing in a Class II (Medium) site with 6-10 feet of growing space. The remaining 32%, or 24,719 trees, are growing in a Class III (Large) site with widths greater than 11 feet.

Table 3. | Planting site width of Fremont's trees

Planting Site Width	Count	%
CLASS I (SMALL): 1-5 Feet	37,749	49%
CLASS II (MEDIUM): 6-10 Feet	14,919	19%
CLASS III (LARGE): >11 Feet	24,719	32%
Total	**77,387**	**100%**

GROWING SPACE

Tree growing space was identified for each inventoried tree. The area of land between the curb and a sidewalk, or the curbside strip, accounted for nearly half of the city's trees (44% or 34,020). 15,926 or 21% of trees are growing in a Tree Lawn in the Righ-of-Way (ROW), or the open and maintained area opposite of a curb. The Open/Parks growing space was identified for 10,408 trees, or 13% of the inventory. The remaining growing spaces, along with their respective quantities and percentages, are listed below in Figure 5.

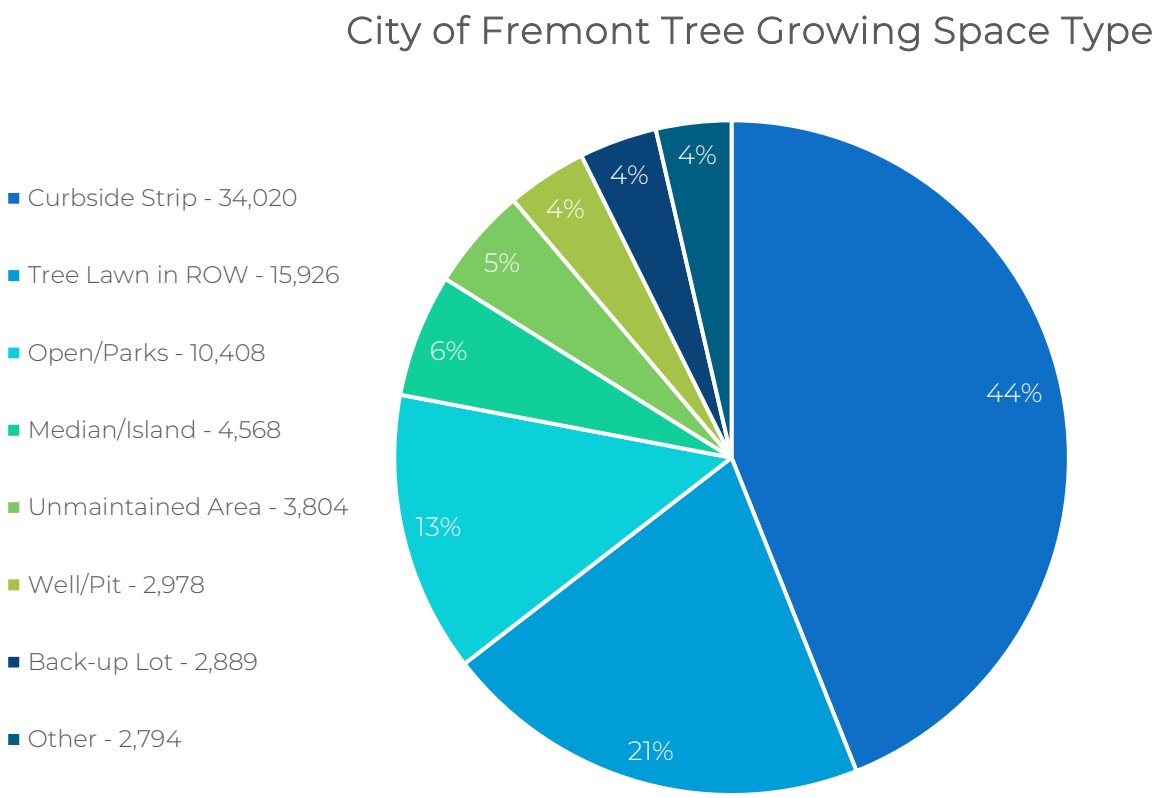


Figure 5. | Growing space type of Fremont's trees

TREE INVENTORY

ECONOMIC & ECOSYSTEM BENEFITS

To identify the dollar value provided and returned to the community, the city's TreePlotter software application provided by PlanIT Geo was used which incorporates i-Tree research to quantify the benefits of individual trees and the tree inventory population. This tool in TreePlotter creates an annual benefit report that demonstrates the value public trees provide.

These quantified benefits and the reports generated are described below:

- *Property Value:* Shows the tangible and intangible benefits of trees reflected by increases in property values (in dollars).
- *Stormwater:* Presents monetary savings due to reductions in annual stormwater runoff due to rainfall interception by tree canopy, as well as the reduction in annual stormwater runoff due to rainfall interception by tree canopy.
- *Carbon Monetary Benefit:* Calculates the dollar value associated with the amount of carbon stored or sequestered by trees based on calculations of the social cost of carbon.
- *Carbon Sequestered:* Presents annual reductions in atmospheric CO2 due to sequestration by trees and reduced emissions from power plants due to reductions in energy use. This is measured pounds and has been translated to tons for this report. The model accounts for CO2 released as trees die and decompose and CO2 released during the care and maintenance of trees.
- *Carbon Stored:* Tallies all of the carbon dioxide (CO2) stored in the urban forest over the life of its trees as a result of sequestration. Carbon stored is measured in pounds.
- *Energy:* Presents the contribution of the urban forest towards conserving energy in terms of reduced electricity use for air conditioning in the summer (measured in Megawatt-hours ([MWh]).
- *Natural Gas:* Monetary increase due to the contribution of the urban forest toward conserving energy in terms of reduced natural gas use in winter.
- *Therms:* Contribution of the urban forest toward conserving energy in terms of reduced natural gas use in winter (measured in therms).
- *Air Quality:* Quantifies the air pollutants (ozone [O3], nitrogen dioxide [NO2], sulfur dioxide [SO2], particulate matter less than 10 micrometers in diameter [PM10]) deposited on tree surfaces, and reduced emissions from power plants (NO2, PM10, volatile organic compounds [VOCs], SO2) due to reduced electricity use in pounds. The potential negative effects of trees on air quality due to biogenic volatile organic compounds (BVOC) emissions is also reported.

ECONOMIC & ECOSYSTEM BENEFIT SUMMARY

The data collected from the inventory of trees completed in October 2020 were analyzed in TreePlotter for an understanding of the value and benefits of Fremont's urban forest. The following provides a summary of the results:

Benefit	Total ($)	Quantity	$/Tree	$/Capita
Property Value	$5,065,170	77,387 trees	$65.45	$21.01
Stormwater	$402,271	73,758,200 gallons	$5.20	$1.67
Carbon	$105,664	8,746,990 lbs C sequestered 14,235,700 lbs C stored	$1.37	$0.44
Energy	$801,043	6,576,220 kWh	$10.35	$3.32
Natural Gas	$238,846	210,653 therms	$3.09	$0.99
Air Quality	$261,666	36,469 pounds	$3.38	$1.09
Total Benefits	**$6,874,580**		**$88.83**	**$28.51**

Table 4. | Annual economic and ecosystem benefit analysis of Fremont's trees

*Distribution of benefits per tree and per capita based on 77,387 trees and a population of 241,110 people (based on 2019 US Census Estimate).

RESULTS

The trees in Fremont provide value in terms of increased property values, air quality improvements, reduction in stormwater volumes and an improvement in water quality, energy savings from the shade of their canopy and protection from cool winds, and their ability to sequester and store carbon. These values, originating from research conducted by the U.S. Forest Service, and implemented in i-Tree software, equate to nearly:

$6.8 million total annual value of benefits
$89 in annual benefits per tree
$28 in annual benefits per capita
$488,377,524 estimated dollar value**

**The "estimated dollar value" is calculated separately from iTree and is meant to represent an approximate depreciated dollar cost for the trees based solely on their location, species, trunk size, condition, and current replacement estimates factored by data recorded in the most recent inventory capture date. It may fluctuate depending on multiple factors as evaluated by the City Urban Forester.

TREE INVENTORY BENEFITS SUMMARY

TREE INVENTORY

MAINTENANCE COSTS & COST/BENEFIT ANALYSIS

ESTIMATED MAINTENANCE COSTS

Utilizing the arborist's field observations, a maintenance cost analysis was performed for the inventoried trees to provide Fremont with some guidance on future tree maintenance.

The cost estimates below do not include appraised values, only eco system services. They also only provide an annual ratio without increasing return or cumulative benefits calculated. Costs also do not include installation costs or tree care activities like watering, irrigation, stakes/ties, mulching, and/or plant health care activities such as fertilizing or pesiticide application. It is recommended that the city take on a full, comprehensive budget and urban forestry program review as part of an Urban Forest Management Plan to provide the city with a more comprehensive cost analysis and program recommendations. Given that the city does not maintain street trees, the cost estimates outlined in Table 5 are based on cost estimates for similarly sized cities.

Table 5 below provides a summary of the costs per tree maintenance activity. Costs were distributed across a 7-year planning horizon and the accumulated total costs are included for city-maintained and privately-maintained trees.

Cost Summary-22,169 City Maintained Trees			
Activity	***1 Year Cost***	***Per Tree/Year***	***7 Year Total***
Routine Tree Pruning	$212,559	$103	$1,487,916
Training Prune	$122,720	$78	$859,040
Recommended Removal	$20,093	$437	$140,650
Stump Removal - from Recommended Removals	$4,607	$100	$32,250
Stump Removal - for sites marked as stumps	$8,889	$162	$62,225
TOTAL	**$368,869**		**$2,582,081**

Based on 2,055 trees/year receiving "Routine Tree Pruning", 1,568 trees/year receiving "Training Pruning", 46 trees/year "Recommended Removal", 46 stumps/year "Stump Removal" after tree is removed, and 55 stumps/year needing to be removed.

Cost Summary-55,218 Privately Maintained Trees			
Activity	***1 Year Cost***	***Per Tree/Year***	***7 Year Total***
Routine Tree Pruning	$547,580	$99	$3,833,059
Training Prune	$266,119	$52	$1,862,831
Recommended Removal	$38,229	$510	$267,600
Stump Removal - from Recommended Removals	$8,543	$114	$59,800
Stump Removal - for sites marked as stumps	$10,896	$149	$76,275
TOTAL	**$871,366**		**$6,099,565**

Based on 5,547 trees/year receiving "Routine Tree Pruning", 5,118 trees/year receiving "Training Pruning", 75 trees/year "Recommended Removal", 75 stumps/year "Stump Removal" after tree is removed, and 73 stumps/year needing to be removed.

Table 5. | Estimated maintenance costs for city and privately maintained trees

COST/BENEFIT ANALYSIS

The ecosystem benefits results from Table 4 were also split up between city-maintained trees and privately-maintained trees and were compared to the estimated costs from Table 5 to form a basic cost benefit analysis. The results are shown in Table 6 below.

	City Maintained	Privately Maintained	All Trees
Total Costs	$368,869	$871,366	$1,240,235
Total Benefits	$1,684,600	$5,189,950	$6,874,550
Cost:Benefit Ratio	**$1:$4.57**	**$1:$5.96**	**$1:$5.54**

Table 6. | Annual cost benefit analysis for city and privately maintained trees

COST/BENEFIT ANALYSIS SUMMARY

For city-maintained trees, the estimated yearly maintenance costs are $368,869 and the annual benefits provided by those trees equals $1,684,600. For every $1 that the city invests in caring for these trees, $4.57 is returned in benefits to the city. For privately maintained trees, the estimated yearly maintenance costs are $871,366 and the annual benefits provided by those trees equals $5,189,950, for $5.96 in benefits for every $1 spent. Overall, the entire urban forest in Fremont provides $5.54 in monetary benefits for every $1 spent.

It should be noted that the $1.39 difference between city and privately maintained cost benefit ratios likely has to do with how TreePlotter utilizes iTree's benefit calculations and the land use types that were identified by the arborists in the field. Almost 73% of privately maintained trees are located in the "Single Family" land use type, which yields the highest increase in property value according to iTree benefits calculations. On the other hand, nearly 61% of city-maintained trees are located in the "Park/Vacant/Other" land use type, which yields the lowest property value benefits, according to iTree.

Since most of the city-maintained trees are within parks and open space areas where there are no buildings or pavement to shade, the monetary benefits for energy savings and property value are going to be lower than in areas where there are buildings and pavement. In contrast, the trees in privately maintained areas are typically located close to buildings and along streets where their canopies not only provide shade to help reduce energy costs in those buildings but they also help to lower costs associated with managing stormwater runoff along the streets.

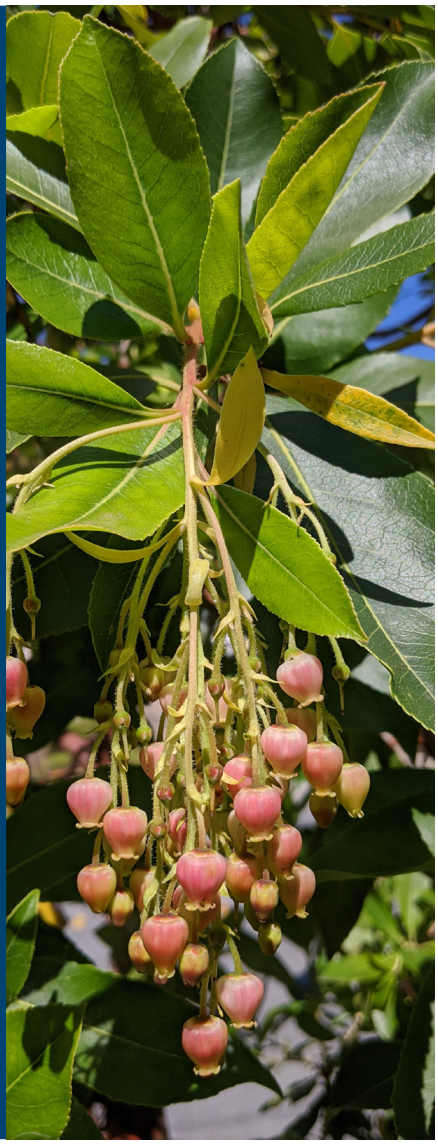
SUMMARY OF RECOMMENDATIONS

The city's trees are a defining and valued characteristic of Fremont, making it a desirable place to live, work and play. It is a resource that has a history and legacy of care and management; however, certain trees require immediate removal or maintenance.

The city should strive to achieve a routine monitoring and maintenance schedule of all trees and continue to plant trees, especially after removal, to enhance the beauty of the city and the benefits that trees provide. While it will take work and additional resources to address the maintenance needs, its implementation will help ensure Fremont's trees will continue to be valued by its residents and visitors.

CITY TREE INVENTORY RECOMMENDATIONS

- *Provide guidance to property owners on removal of hazardous trees.*
- *Monitor trees in less than fair condition.*
- *Conduct routine tree maintenance as described.*
- *Maintain or establish a cyclical, routine tree monitoring and maintenance schedule.*
- *Ensure industry standards and best management practices are followed during the planting and care of trees.*
- *Educate the community about the tree inventory population, the associated benefits, and how to properly care for their trees.*
- *Continue to track maintenance, plantings, and removals in the TreePlotter application.*
- *Consider engaging with a local urban forestry organization in the care of young trees (watering, structural pruning, mulching, etc.) under supervision.*
- *Conduct a complete inventory of the city tree population 5-10 years from the 2020 inventory, and*
- *Complete a comprehensive urban forest management plan.*



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APPENDIX

APPENDIX A | Tree observation terms and definitions

Observation	Definition
Canker	Localized diseased area on stems, roots, and branches. Often shrunken and discolored.
Cavity Decay	Open or closed hollow within a tree stem, usually associated with decay
Crown Dieback	Condition in which the branches in the tree crown die from the tips toward the center.
Frost Cracks	Vertical split in the wood of a tree, generally near the base of the bole, caused by internal stresses and low temperatures.
Girdling Roots	Root that encircles all or part of the trunk of a tree or other roots and constricts the vascular tissue and inhibits secondary growth and the movement of water and photosynthates.
Grate/Guard	Grating installed at the same level with the pavement around a tree or guard installed around the tree's trunk
Hardscape Damage	The tree has caused damage to the hardscape around it
Improperly Installed	Tree has been improperly installed.
Improperly Mulched	Tree has been improperly mulched.
Improperly Pruned	Tree has been improperly pruned.
Landmark Tree	Tree included in Fremont's Landmark Tree list.
Mechanical Damage	Tree or tree parts show signs of damage caused by mechanical equipment or vehicles
Memorial Tree	Tree was planted in memory of a loved one
Nutrient Deficiency	Condition in which the supply or availability of an essential element results in cessation of critical plant processes, resulting in visible, physical symptoms such as chlorotic leaves or necrotic margins
Pests	Organism (including, but not limited to, weeds, insects, or fungi) that is damaging, noxious, or a nuisance.
Poor Location	Location is not suitable for the tree
Poor Root System	Tree exhibits exposed roots or is growing in confined spaces causing roots to possibly girdle or not provide enough anchorage for the tree.
Poor Structure	Tree exhibits poor structure for the species.
Remove Hardware	Remove hardware from a tree.
Serious Decline	Tree shows signs of serious decline
Vines	Vines are overgrown on tree

APPENDIX

APPENDIX B | Tree maintenance needs terms and definitions

Maintenance Need	Definition
Amend Mulch	Turn or replenish mulch
Crown Cleaning	Prune to remove dead, dying, diseased, and broken branches from the tree crown
Disease	Condition that impairs the performance of one or more vital functions of the tree. Usually associated with infectious agents
Insects	Tree shows signs of damage caused by insects
Monitor	Monitor tree's condition
Other (Describe Below)	Check here and describe in notes below
Prune-Clearance	Prune to remove branches to provide clearance from structures, vehicles, and other objects
Prune-Structural	Prune to establish a strong arrangement or system of scaffold branches
Raise	Prune to remove lower limbs from a tree crown to provide clearance
Reduce	Prune to reduce the height and/or spread of a tree crown
Remove	Remove tree
Remove Hardware	Remove hardware from a tree.
Remove-Foreign Object	Remove foreign object located in the tree
Remove-Girdling Root	Remove girdling roots that may be present
Remove-Hanger	Remove hanging branch from tree
Restoration	Prune to improve the structure, form, and appearance of trees that have been improperly trimmed, vandalized, or damaged.
Sidewalk Damage	Tree has caused sidewalk damage that needs to be repaired
Thin	Prune to remove live branches to reduce crown density.
Utility	Pruning needed around or near utility facilities

DEC | 2020

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CALIFORNIA
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