February 2024

City of FRESNO

URBAN FOREST MANAGEMENT PLAN

PREPARED BY
DUDEK

CAL FIRE SINCE 1885

PROP 68
State of California Parks • Water Bond 2018

TABLE OF CONTENTS

TABLE OF CONTENTS

EXHIBITS

TABLES

ACRONYMS & ABBREVIATIONS

ANSI	American National Standards Institute
BMP	Best Management Practice
DPW	Department of Public Works
ISA	International Society of Arboriculture

ACKNOWLEDGMENTS

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California Department of Forestry and Fire Protection (CAL FIRE)

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VISION STATEMENT

Fresno's urban forest is a collection of water-wise, diverse, mixed-aged trees that are strategically planted and well-maintained to promote a sustainable urban forest that forms a thriving, flourishing environment for all community members to enjoy for generations to come.

URBAN FOREST MANAGEMENT PLAN

1

INTRODUCTION

1.1 Healthy Trees, Healthy Fresno

Environmental stressors impact the day-to-day activities of communities across California's landscape. Extreme heat, drought, longer fire seasons, increasing levels of air pollutants, and severe flooding events expose community members to a variety of climate and health risks. Many of these existing and projected environmental conditions are already impacting Fresno. One effective mitigation strategy to help alleviate these risks is to have a well-managed sustainable urban forest. A functioning urban forest provides multi-benefit solutions to environmental issues that result in a healthier, more resilient city **(Exhibit 1-1)**.

Exhibit 1-1. The Benefits of Trees

BENEFITS *of* TREES *in an* URBAN ENVIRONMENT

HEALTH

CLEANER AIR
Trees absorb pollutants and filter particulates out of the air by trapping them on their leaves and bark.

CONNECTING WITH NEIGHBORS
Trees can encourage civic pride while tree plantings provide opportunities for community involvement.

FRESH FOOD
Trees provide food in the form of fruits, nuts, leaves, bark, and roots.

HEALTHIER COMMUNITIES
Trees improve mental health and public health by decreasing respiratory illnesses and encouraging outdoor recreation.

ENVIRONMENTAL/INFRASTRUCTURE SERVICES

SAVING ENERGY
Shade trees can lower air-conditioning costs 56% annually, burning fewer fossil fuels.

BEAUTY
Trees add character to city streets and residential areas as they radiate with colors, flowers, textures, and shapes.

SHADE
Trees cool cities by up to 10˚F and shaded areas can be 20-40˚F cooler than peak temperatures.

WILDLIFE HABITAT
Trees support the lives of many wildlife and insect species and provide them with food, shelter, and nesting sites.

1.2 City History

Fresno was founded in 1872 on "barren sand plains" (City of Fresno 2023), when the Fresno station was established by the Central Pacific Railroad (City of Fresno 2014). The introduction of irrigation in the 1880s allowed the area to develop as an agricultural community.

The City was incorporated in 1885 with a population of approximately 4,000 (City of Fresno 2014), which quickly grew to over 10,000 by 1890 (City of Fresno 2023.). By the early 1900s, 50 miles of streetcar track and a bustling downtown area was developed (City of Fresno 2023.). Mid-rise buildings were constructed from 1915 to 1925, followed by another construction wave in the 1960s (City of Fresno 2014). Connecting population centers throughout California continued to be a priority as the California Department of Highways called for the construction of several State routes in 1957. These highways allowed the City to expand away from city centers to develop single family homes and residential neighborhoods (City of Fresno 2014). This economic and population boom resulted in major development during the 20th century establishing Fresno as a destination where land was affordable, and families found opportunity to thrive. Fresno currently occupies 113 square miles with the surrounding area mostly used for rural residences and agriculture (City of Fresno 2014). The City is the most populated city in the Central Valley, and fifth largest in California, with a 2022 population of 545,567 (U.S. Census 2023). The population is projected to grow to 656,323 by 2035 (City of Fresno 2017).

Irrigation

In the early 1900s, Fresno benefited from a high-water table (30 feet below ground) when the population was around 12,470. These levels allowed easy water access for the population, trees, and agriculture to flourish. By 1960, Fresno's population grew to 45,879, and annually extracted 16.4 billion gallons of water from their aquifer (City of Fresno 2023). Fresno residents were charged a flat rate for their potable water

CENTRAL PACIFIC RAILROAD

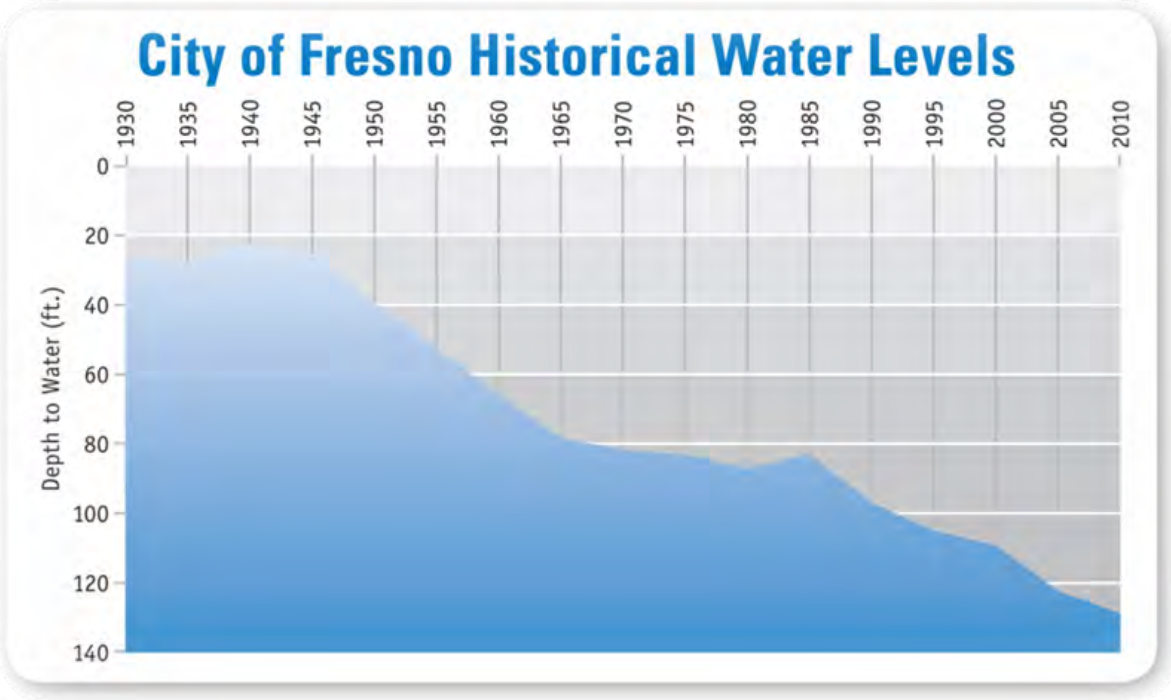
Fresno station was established by the Central Pacific Railroad in 1872. (City of Fresno 2014).

AGRICULTURE & WATER

The introduction of irrigation in the 1880s allowed the area to develop as an agricultural community. (Fresno Irrigation District 2024)

use, regardless of usage amounts. The increase in population, further development of Fresno, and its growing irrigation network sparked concerns of Fresno's water usage sustainability. In 1996, Fresno adopted the Fresno Metropolitan Water Resource Plan to address concerns of growth and correct historic groundwater over drafting. A decade later, the City Council authorized a Utility Rate Commission to study the potential necessity to increase utility rates. In total, Fresno's water table decreased from 30 feet below grade in 1945 to 130 feet below grade in 2010. The research supported the installation of residential water meters in 2010 to assist in curbing water usage and to comply with federal requirements. **Exhibit 1-2** visualizes the depletion of the Fresno's water table.

Exhibit 1-2. Fresno's Historical Water Levels



Source: City of Fresno 2023b.

URBAN DEVELOPMENT

The City was incorporated in 1885 with a population of approximately 4,000 (City of Fresno 2014), which quickly grew to over 10,000 by 1890 (City of Fresno 2023a). By the early 1900s, 50 miles of streetcar track and a bustling downtown area was developed (City of Fresno 2023a).

Before 2010 and the installation of water meters, Fresno residents used approximately 290 gallons of water per person per day (Khokha 2009). By comparison, Las Vegas used approximately 250 gallons, and the U.S. average was 100 gallons per person per day (Khokha 2009). Since the introduction of meters, Fresno residents' water usage has declined by 17%. Though beneficial for curbing water usage, this effort has resulted in a negative impact on the urban green landscape. Residents now are not meeting the watering needs of their plants and trees, and as a result, a decline in the overall number of trees and the heath of the urban forest. Many residents believe that watering their trees is too costly, and that Fresno's high-water table allows trees to access water below ground. However, water absorbing roots of a tree are in the upper 6-12 inches of soil. Additionally, many residents are unaware that the average cost to properly water each newly planted tree is less than $2 per year **(Exhibit 1-3)**. As trees mature and establish into landscape, the watering needs of trees decrease.

Exhibit 1-3. Annual Cost to Water a New Tree in Fresno

1.3 Overview of Fresno's Tree Inventory

The City's most recent inventory of City-managed (public) tree sites was collected in 2021 and includes street trees, park trees, and identified plantable vacant sites (**Table 1-1**). The inventory includes 131,732 trees, 29,086 vacant sites, and 276 stumps (City of Fresno 2021). **Table 1-2** details the annual amount of carbon sequestered, stormwater diverted, and air pollution removed, and the associated estimated annual economic benefit values of the City's managed trees.

Table 1-1. Fresno's City-Managed Tree Inventory Locations

Location	Tree	Stump	Vacant Site	Total
Street	91,954	239	28,855	121,048
Buffer	14,862	0	0	14,862
Median	8,384	23	105	8,512
Park	16,347	13	126	16,486
Parking Lot	185	1	0	186
Grand Total	**131,732**	**276**	**29,086**	**161,094**

Sources: Fresno Tree Inventory

Table 1-2. Annual Environmental Services and Benefits Provided by City-Managed Tree Inventory

Service	Annual Environmental Service Quantity	Annual Environmental Impact	Annual Economic Benefit Value
Carbon Sequestration (carbon dioxide removed from air by trees)	2,085 tons	The carbon removed from the City's air by the urban forest is equivalent to annual carbon emissions from 1,500 cars	$356,000
Avoided Runoff	20,893,090 gallons	This benefit is equivalent to the average annual water usage of 191 American homes.	$187,000
Air Pollution Removal (ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, particulate matter <2.5 µm)	79.49 tons	The pollution removed by the City's tree inventory is equivalent to the annual nitrogen dioxide, carbon monoxide, and sulfur dioxide emissions from 9,611 cars	$783,000

Sources: Fresno Tree Inventory i-tree Analysis

The financial value of Fresno's tree inventory is presented in **Table 1-3.** Each tree in Fresno's inventory has an average City asset value of $4,798. The functional value represents the annual value of the environmental services that the trees provide ($10.07 per year). Each tree delivers approximately $82.42 in ecosystem services based on the combined functional and carbon storage values each year. This value is lower than the California average of $110.63 (McPherson et al. 2016), which is likely due, in large part, to the age of the inventoried trees, with nearly 81% classified as either immature or young (see Section 4.2.3, Diameter at Standard Height Distribution Summary). The quantity of environmental benefits trees provide will increase as they age. The City can expect that, with proper maintenance and care of its inventory, the environmental benefits and services will continue to increase as the trees mature.

Table 1-3. Financial Value of City-Managed Trees

Value	Description	Asset Amount	Per-Tree Value
Carbon Storage (55,860 tons)	Amount of Carbon held in trees	$9,530,000	$72.35
Structural	Tree replacement cost	$632,000,000	$4,798
Functional	Value based on the services trees perform	$1,326,000	$10.07

Sources: City of Fresno 2021; i-Tree 2023.

2

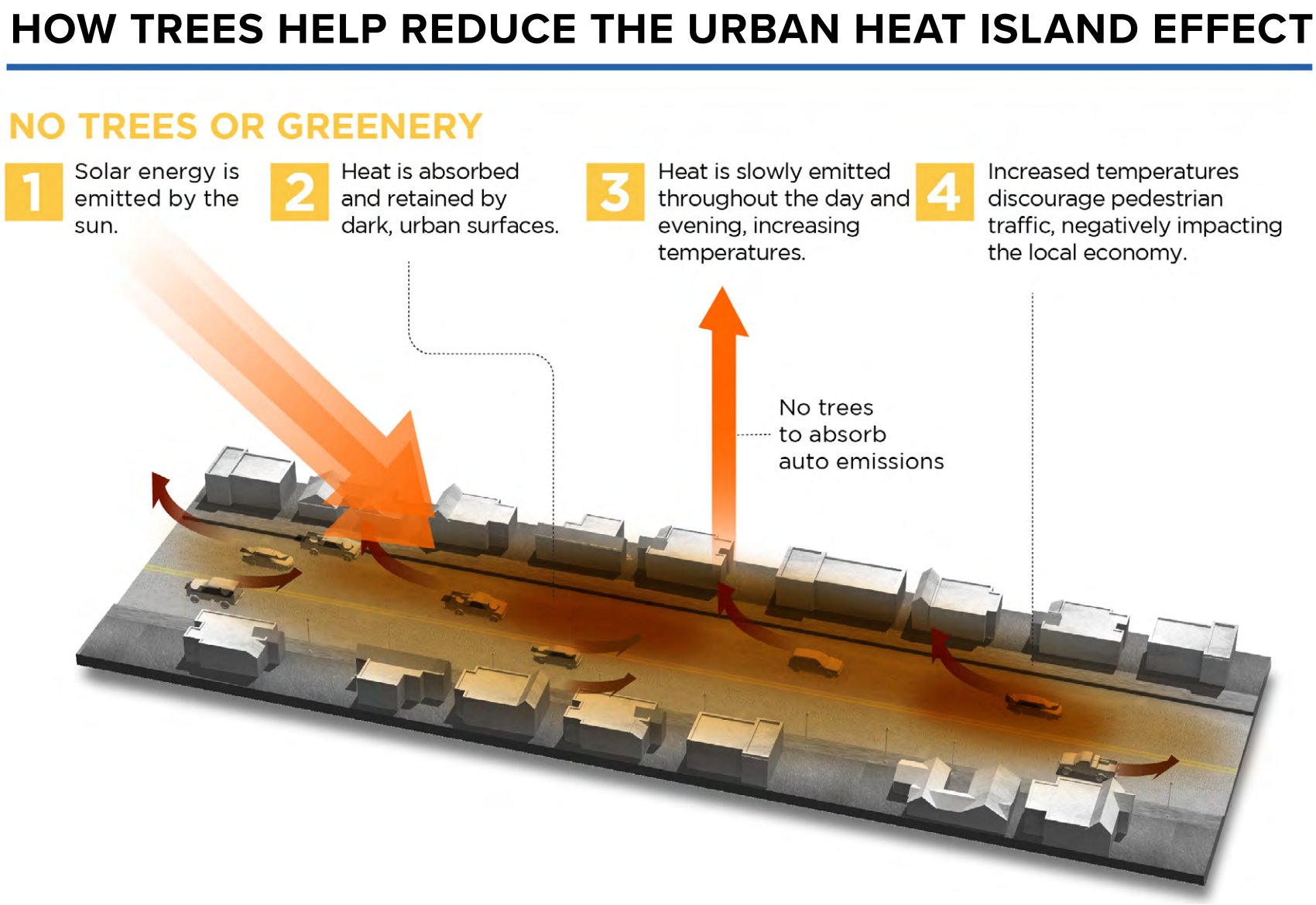
CHALLENGES FACING THE URBAN FOREST

A series of City staff interviews revealed several internal challenges regarding Fresno's urban forest management program, including shortage of staff and high turnover rates, backlog of maintenance requests, and severe lack of funding. A resilient urban forest that is well-managed and maintained can provide multi-benefit solutions to alleviate these issues that result in a higher quality of life for all community members in Fresno. Fresno's trees face further challenges from irrigation needs, climate factors, years of deferred maintenance, and new development codes that do not accommodate trees, resulting in significant tree care issues that need to be addressed in the implementation of this UFMP.

Climate Factors

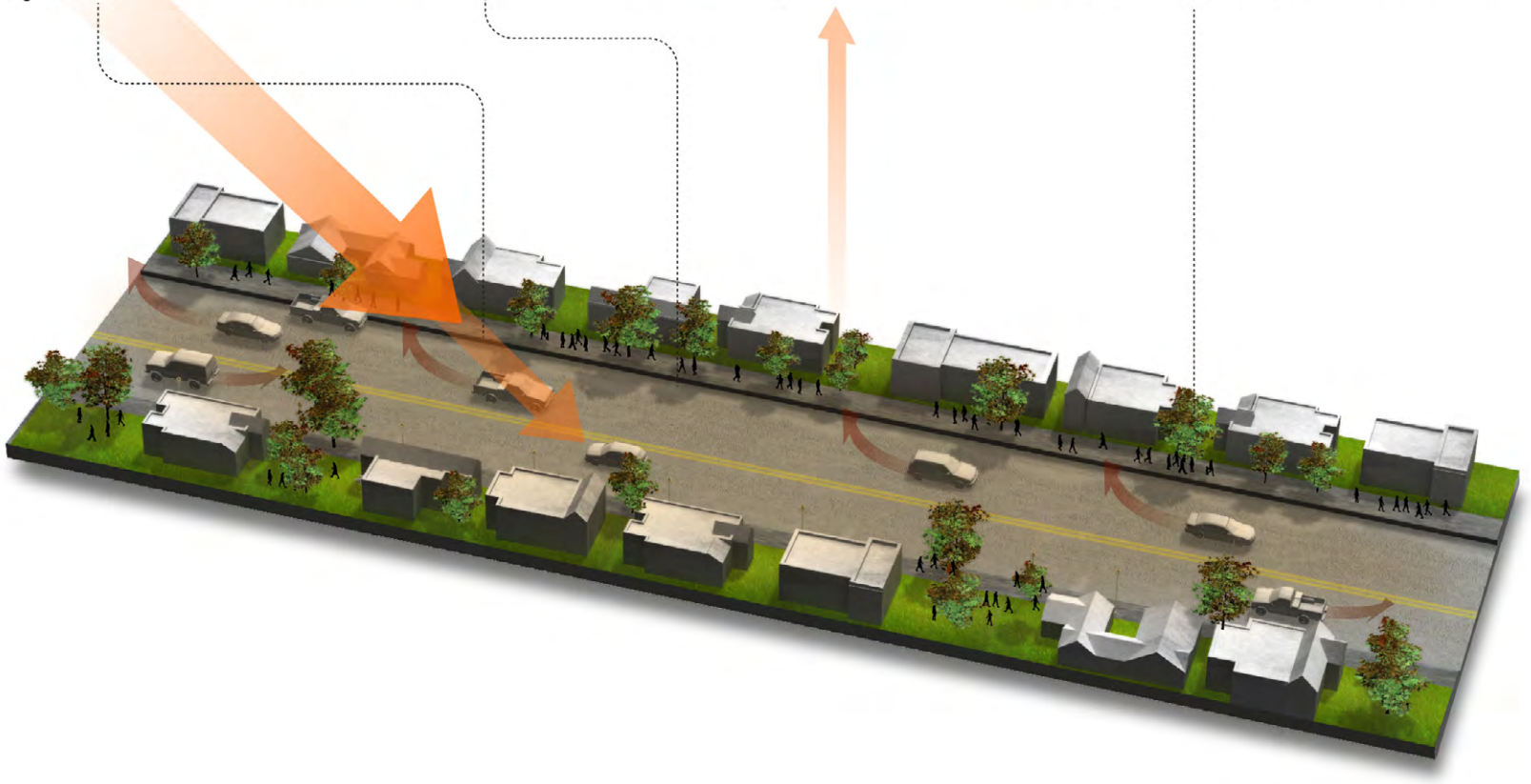
If trends continue, by 2099, the annual average air temperature of Fresno County is projected to increase by 4.3-7.4 ^{0}F) (Maizlish et al. 2017). Those living within the City, or the suburbs will experience higher temperatures due to the urban heat island effect where hardscape such as roads, buildings, and parking lots absorbing heat throughout the day and slowly releasing heat at night **(Exhibit 2-1)**. Furthermore, a combination of high heat and drought create stressful environments for trees to survive. Trees that experience both drought conditions and high heat events experience stress, decreasing their potential to recover from high heat events and decreasing their ability to defend against pest or disease, leading to tree mortality (Allen et al. 2010). The selection of drought- and heat-resistant trees species plays a significant role in creating a sustainable urban forest capable of withstanding and mitigating the effects of climate change.

Exhibit 2-1. Urban Heat Island Effect



WITH TREES AND GREENERY

1. Solar energy emitted by the sun is partially absorbed by trees.
2. Shaded surfaces absorb and retain less heat.
3. Auto emissions are partially absorbed by trees.
4. Cleaner air, cooler weather creates a pedestrian-friendly environment positively impacting local businesses.



Deferred Maintenance

In the early 2000s, Public Works had sufficient funding and staffing to perform tree maintenance of City-managed trees. During the recession of FY11, significant funding cuts eliminated the ability to hire contractors to maintain the previous twelve-year tree trimming cycle of maintenance on City trees. Between FY11 and FY21, $0 in funding was allocated for proactive tree maintenance. As a result, the City's trees currently suffer from years of deferred maintenance. Fresno injected $2.8M to reach a 10 year tree maintenance cycle in both FY22 and FY 23. However, despite the new funding, contractors are not able to perform all required tree maintenance. Additionally, there is more than one year's worth of backlog of tree related maintenance requests submitted by the public.

The City Has Never Had an Urban forest Management Plan

An Urban Forest Management Plan is a roadmap that provides the framework to track and effectively manage the urban forest over the long term. While Fresno has managed its urban forest for many years, it has never had an urban forest management plan to establish targets and goals that mobilize the City toward a shared vision for the future state of the urban forest.

Existing Planning Documents and Relation to Trees

The City of Fresno has robust city planning guidelines and a tree code that is in line with existing best management practices. Existing city plans include opportunities to integrate trees through planning efforts, policies, and municipal codes, supporting urban forestry and canopy cover goals of the UFMP.

2.1 Acknowledging Fresno's Urban Forest Needs

Climate Ready Tree Species

Tree species selected for planting need to thrive in the predicted future climate of the area. Impending climate change predicts that drought conditions and high heat events will be more frequent and more severe, both which impact tree longevity. When selecting tree species to plant, consideration of climate ready species will further the resilience of newly planted trees for the future urban forest (McBride and Lacan 2018).

Right Tree Right Place

When planting a new tree, one of the most important considerations is the concept of “right tree, right place.” Trees in the urban environment are often planted without consideration of the mature stature of the tree outgrowing their planting site, and causing infrastructure conflicts, or without considerations for irrigation needs. Planting trees with mature stature in mind enables trees to age to maturity. Locations with elevated noise or air pollution, such as neighborhoods next to industrial districts or train tracks should consider planting more evergreen trees to filter noise and pollution year-round. Locations that experience heavier rainfall can create larger planters or bioswales which house larger trees which aid in stormwater mitigation. Keeping the intended use and the ‘right tree, right place’ concept in mind while planning for tree planting will benefit the City for decades to come, by increasing longevity of street trees and decreasing infrastructure conflicts and unnecessary mature tree removal.

Adequate Staffing

The key to keeping trees maintained, reducing the risk of limb failure, and increasing their lifespan is having a robust and proactive maintenance program. Educated and trained staff are required to implement and ensure that proper maintenance is being conducted and monitor contracted work for quality throughout the maintenance program. Fresno’s urban forestry program is currently significantly understaffed. Section 4.3.4, Staffing and Contractors, highlights the recommendations to grow Fresno’s urban forestry staff to match the industry’s best management practices and the increased canopy cover goal of Fresno.

Strategic Tree Planting

With the City’s 1,000 tree initiative and goal of providing canopy cover to historically underserved communities, having a strategic management plan on where to plant these trees is needed. Targeting neighborhoods that have the least canopy cover and have limited access to urban green spaces will be a key metric to ensure that the canopy of Fresno is equally distributed to communities that already have a low canopy percentage.

Irrigation

Community engagement highlighted the desire for the City to provide irrigation for street trees located in City’s right-of-way. Watering a newly planted tree one time per week for three years at 15 gallons, costs an average of under $2 per year. The City will need to invest in community education programs to convey the tree watering needs for adjacent property owners.

3

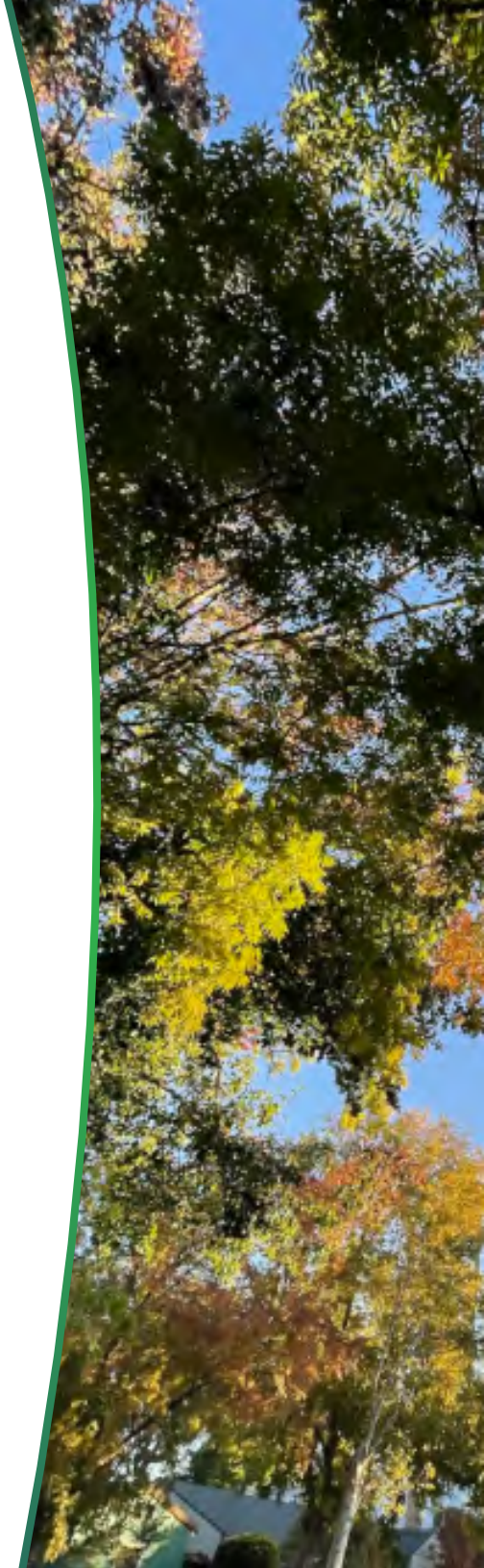
DEVELOPING THE FRESNO URBAN FOREST MANAGEMENT PLAN

In FY 2020, the California Department of Forestry and Fire Protection (CAL FIRE) awarded the City of Fresno grant funding from Proposition 68 to complete an Urban Forest Management Plan and plant 68 trees in disadvantaged community areas. By March 2023, Public Works planted 15 trees above the required amount for a total of 83 trees. The City's Public Works Department, Landscape Division is the main entity responsible for overseeing the UFMP's development and implementation. The Department provided key insights into City practices, coordinated with internal and external interested parties, and participated in community engagement events.

3.1 Tree Inventory Analysis

An inventory of all City-managed trees was conducted in 2021, including 131,732 trees, 29,086 vacant sites, and 276 stumps. The inventory is housed in an asset management software, which is also used to record maintenance activities. The inventory data was used to analyze the City-managed trees based on sustainability metrics and to estimate the environmental services and economic benefits provided by these public trees. The sustainability metrics analyzed include species diversity, age distribution based on diameter at standard height, water use rating, and climate preparedness. These metrics determine the condition of the City-managed urban forest and help identify what management practices will need to be improved to have the most meaningful impact on tree health and safety.

The inventory analysis used the i-Tree Eco software developed by the U.S. Forest Service (USFS 2020) to model the environmental services and economic benefits of the inventoried trees. These include annual carbon sequestration ($356,000 annually), diverted runoff ($187,000 annually), pollution removal ($783,000 annually), total carbon storage ($9.53 million), and functional ($1.33 Million) and structural dollar values ($632 Million)**.** Dollar amounts are equated to the environmental services and are useful for public education, City planning, and exploring long-term funding mechanisms.



3.2 Canopy Cover Assessment

A current City-wide canopy cover assessment was conducted for Fresno using 2022 aerial imagery (Section 2.1.1 City Wide Canopy Cover). A canopy change analysis was conducted comparing the 2022 results to a 2018 canopy cover analysis. The results of this analysis revealed that the City has an existing canopy of 14.6%, and the City's canopy cover increased by 0.7% from 2018 to 2022.

3.3 Analysis of Current Plans, Policies, and Ordinances

A comprehensive review of the status of Fresno's urban forestry program provides a baseline for understanding the effectiveness of City tree management. This review included extensive analyses of urban forest policies, funding mechanisms, tree management practices, ordinances, and procedures. Long-range planning documents related to the urban forest were identified by the City and reviewed as part of the UFMP, including the General Plan (City of Fresno 2014), Southwestern Fresno Specific Plan (City of Fresno 2017a), Parks Master Plan (City of Fresno 2017b), Fresno Housing Element, and Specification and Standard Details. Understanding the existing conditions provided a baseline to compare current actions against best management practices (BMPs) and goals, and to identify areas for improvement to ensure the City meets the standards of sustainable urban forest management. The results of the analysis are included in the UFMP Technical Assessment, and incorporated into the Strategic Plan.

3.4 Department Interviews

The internal review of the Fresno urban forestry program was conducted through a series of interviews with 15 City staff, and other involved parties. Each was asked how their role affects tree management, tree planting, protection, internal City procedures, and maintenance efforts. The list of City staff who participated in the interview process are identified in **Table 3-1**.

The following is a sample of some of the questions explored during these interviews:

- How do you envision the Fresno urban forest in the next 30 years?
- Do you have suggestions/thoughts for improving your department's role regarding tree management?
- Are existing policies considered appropriate for efficient tree management?
- Are there specific locations that need to be prioritized for tree planting?
- What are the biggest challenges facing the expansion of the urban forest?

The interviews highlighted reoccurring themes of the urban forest program and areas of greatest needs and concerns.

Table 3-1. List of Interviews

Department	Staff
City Departments	
Public Works	Assistant Director
	Community Coordinator
	Forestry Supervisor
	GIS Specialist
	Landscape Manager
Office of the City Manger	Assistant City Manager
	Assistant City Manager
Office of the Mayor	Deputy Mayor
Parks, After School, Recreation, and Community Services	Parks Director
	Parks Supervisor II
Personnel Services	Senior Risk Analyst
Planning	Supervising Planner
External Involved Parties	
CAL FIRE	CAL FIRE Project Liaison
Tree Fresno	CEO
West Coast Arborist	Vice President

3.5 Community Engagement

Meaningful community engagement is essential to developing a UFMP that reflects the goals, needs, and priorities of the City's community members. During the UFMP development process, the City and the consultant team conducted community engagement activities to better understand the views community members hold about trees in Fresno and how these perceptions affect the City's urban forest. Below is a summary of the City's outreach efforts.

- Public tree survey was circulated via social media and community meetings for 16 weeks in English, Hmong, Punjabi, and Spanish (1,352 responses).
- Urban Forest Summit events at two City-wide clean up events (in collaboration with Beautify Fresno), attended by more than 1,000 community members with educational materials and resources about the City's tree inventory.
- Online outreach through the City's social media channels and networks (Website, E-newsletter, NextDoor, Instagram, Facebook).
- Local outreach to community-based organizations and establishments such as University of California Master Gardeners and Tree Fresno.
- Four Working Group meetings with City staff from seven City departments along with representatives from Tree Fresno, San Joaquin River Conservancy, San Joaquin Valley Air Pollution Control District and PG&E.
- Four virtual public meetings.
- Approximately 30 presentations at community meetings targeting the City's Spanish, Hmong, and Punjabi speaking populations.

3.5.1 Public Meetings

During June 2023, the consultant team hosted four virtual public meetings via Zoom. Participants were asked to respond to three questions and provide comments surrounding their opinions on Fresno's urban forest. When asked if they felt like they had proper resources to provide care for private property trees, participants noted that they would benefit from more accessible maintenance and watering information, more educational materials on how to plant trees, and financing programs to help incentivize proper tree maintenance. When asked how more trees can get planted on private property, participants listed opportunity in park strips along corner lots, allowing the planting of fruit trees, providing informational guides on what species of trees are allowed in different planting areas, adopting consistent pruning schedules, partnering with new development projects, and connecting arborists with community organizations. Finally, when asked what aspects of trees they want to learn more about, participants discussed not having adequate knowledge on how trees are managed in general and a need for education surrounding trees, their benefits, and how to properly care for the urban forest.

3.5.2 Outreach Events

The consultant team and City of Fresno representatives attended the City's Great American Clean Up event on April 22, 2023, and the Mayor's City-Wide Community Cleanup on August 5, 2023, to engage with local community members about trees. Graphic boards with various categories acted as a voting system for where more trees are needed and what benefits of trees are the most valued. Community members also were guided through a series of brainstorming activities that answered questions about improvements needed for the urban forest. Table **3-2** through Table **3-6** describe the activity results.

98%

believe that trees contribute to their quality of life

Table 3-2 shows the results of the "where do we need more trees" activity. Of the total responses at the first event, the top two categories were schools and transit stops. At the second event, the top two categories were schools and biking and walking paths. Responses to the activity are shown below and in **Image 3-1**.

Table 3-2. Results of "Where do we need more trees" Activity

Where do we need more trees?	**Great American Clean Up** (April 22, 2023)		**Mayor's City-Wide Community Clean Up** (August 5, 2023)	
Category	**No. of Responses**	**Percentage**	**No. of Responses**	**Percentage**
Schools	22	16%	29	14%
Transit Stops	18	13%		
Parking Lots**	18	13%	3	1%
Biking and Walking Paths	17	13%	27	13%
Parks	17	13%	21	11%
Sidewalks	15	11%	18	9%
Apartment Communities	10	7%	21	11%
Retail/ Commercial Areas	9	7%	19	9%
Front and Back Yards	8	6%	19	9%
Streets*			22	12%
Medians*			20	10%
Open lots downtown*			1	0.5%
Canal*			1	0.5%
Total	**134**	**100%**	**201**	**100%**

*Option added by participants during August 5, 2023 event

Table 3-3 describes the results of the second activity, which asked participants what they love most about trees. Of the total responses at the first and second event, the top two categories were shade and cleaner air.

Table 3-3. Results of "What do you love most about trees" Activity

What do you love most about trees?	Great American Clean Up (April 22, 2023)		Mayor's City-Wide Community Clean Up (August 5, 2023)	
Category	No. of Responses	Percentage	No. of Responses	Percentage
Shade	38	24%	40	20%
Cleaner Air	37	23%	39	19%
Wildlife Habitat	22	13%	25	12%
Beauty	18	11%	19	9%
Food	17	11%	23	11%
Energy Savings	8	5%	18	9%
Healthier Communities	7	4%	16	8%
Rainwater Capture	7	4%	14	7%
Connecting with Neighbors	6	4%	8	4%
Smell good*			1	.05%
Total	**160**	**100%**	**203**	**100%**

Notes: *Option added by participants during 8/5/23 event

92%

view trees as more important than or equally as important as other City-maintained infrastructure

Participants were also guided through a series of brainstorming questions to receive broad and creative feedback about the urban forest. Results from each event are included in **Tables 3-4** and **3-5**, and **Exhibit 3-1**.

Table 3-4. Results of Idea Generating Activity 1

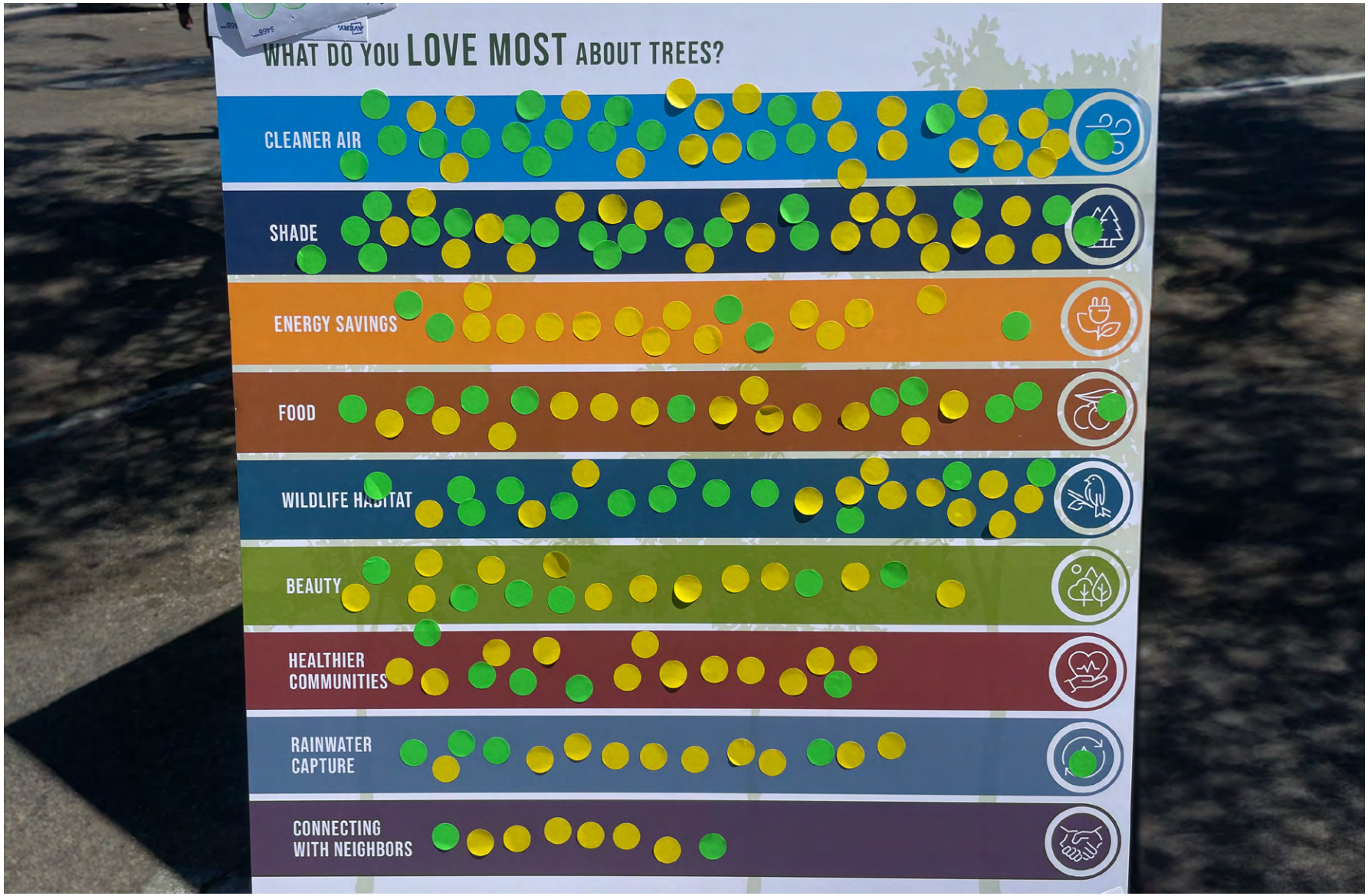
How can we get more trees planted on private property?	Write words or draw a sketch of the ideal urban forest.		How can we incorporate trees in public education?
• Encourage neighbors that don't have trees on their property about the benefits of having them • More education about choosing trees that don't have obstructive roots • City to assist with funding for maintenance or tree planting • Tree giveaways and educate the public about them • Better communication from the City about trees • Educate people about the benefits- shade, wildlife habitat, fresh food source • Plant local trees • Limit fees for cutting trees	• Full of life • Green scenery • Green-lined walkways • Lots of trees and fresh air • Mental health benefits • Mixture of fruit and shade trees • Palm trees; they make the City beautiful • Fruit trees near apartment complexes • Incentives to water parkway trees • Secco art • Flowers, colors, tall • I picture there are lots of green trees and green grass with more animals, flowers, and bushes	• Lots of trees, lots of space to walk and play, wildlife and people together • I wish trees lined our streets making everywhere look as if we live in a forest. Vines, leaves, and green gardens giving off tranquility and refreshing feelings. • Fruit trees and bird-friendly • I want Fresno to be green, too many people with breathing illnesses • Bigger planter areas along the streets • A scenery that mother nature originally intended • Maintained, pruned, and watered • Fresh air and shade	• Community center treehouse • Make trees fun to learn about • Teach students and staff the benefits of having trees • More trees around Olmos Elementary so kids can breathe fresh air • Make it mandatory teach about native trees • Put it in the curriculum

Exhibit 3-1. Idea Generating Activity Board 1

Table 3-5. Results of Idea Generating Activity 2

What role should the City play in protecting the urban forest?	How can we help preserve, maintain, and protect trees in Fresno?	How can we plant more trees on non-City-owned property?	If you have trees on your private
• Tree dedication for victims of domestic violence • Cutting old trees • Intersection of trees + homelessness • Free tree program • Removing dead trees • Plant more shade trees** • Tree canopy + clearance • Forestry background and master tree planting list • Plant fruit trees* • More education about what trees to plant* • How to properly water trees • Proper planting so roots don't destroy the sidewalk • Promoting the planting of native trees • Maintenance and re-planting • City-endorsed programs + incentives • Plant fruit trees	• Watering • Proper pruning • Make sure they are watered • Trim the trees, it will lift them* • Hire people to take care of them • Be aware of the importance of trees • Drip system install* • Plant trees in ways that don't change pipes, roads, sidewalks in long-term • Training arborist companies • Native trees	• Donate more to Tree Fresno • Tax incentives + rebates** • Trees in Kindergarten curriculum • On sidewalk because City owns that • L2G advertisements • Talk to owners • Normalize collecting seeds • Make locations available • Promoting the option for free trees & help with maintenance • Community partnership	• TLC • Watering and talking to them more often • Prune trees as needed • Topping, clearing dead debris, water • Pruning • Watering + good sun + keep from animals • Watering + trimming- educating ourselves on the types of trees we have* • Gardener + watering regularly • Prune, drip system, mulch • Arborist job availability • Friends, family, homeless incentive • Clean up, homeless, trash quicker

Note: * Vote added by other participants during event


WHAT DO YOU LOVE MOST ABOUT TREES?
CLEANER AIR
SHADE
ENERGY SAVINGS
FOOD
WILDLIFE HABITAT
BEAUTY
HEALTHIER COMMUNITIES
RAINWATER CAPTURE
CONNECTING WITH NEIGHBORS

3.5.3 Survey Results

An online survey was created to identify the public's perception and understanding of the City's trees, and to offer a space for public feedback as the City develops its UFMP. The 24-question survey was open between March 1, 2023, and June 16, 2023, and was distributed through various City social media outlets, outreach events, neighborhood association meetings and communications sent by City staff. The public survey was offered in English, Spanish, Hmong, and Punjabi. In total, 1,357 responses were received. A summary of themes is included in **Table 3-6.**

Table 3-6. Summary of Fresno Tree Survey Responses

Topic	Responses
Views of trees as a City asset	• 98% believe that trees contribute to their quality of life • 92% view trees as more important than or equally as important as other City-maintained infrastructure • Top three most important benefits of trees: shade, cleaning the air, and creating more aesthetically pleasing neighborhoods
Public participation	• Top concerns of respondents to growing trees on their property were damage to infrastructure and the cost to trim trees • To assist the City with reaching its canopy cover goals, 25% respondents willing volunteer at a community tree planting and 23% would plant a tree on their private property • 33% believe providing financial support to trim trees, and 34% want labor support for planting and maintenance, would best help them plant and care for trees in their own yard
Trees in public spaces	• 64% believe trees in public spaces are in fair or poor condition • An even split (12%–13%) want more trees planted across all mentioned locations (sidewalks, biking/walking paths, and parks)
Opinions on tree protection ordinances	• 77% were in support or neutral of a tree protection ordinance that protects trees on private property in the same way it protects trees on public property
Goals of the Urban Forest Management Plan	• Increase number of trees planted annually • Removing dead, dying, or hazardous trees • Ensure Fresno's trees will survive in high heat and drought conditions

3.5.4 Working Group

The City's UFMP Working Group was formed to bring together City staff, individuals from the environmental field, and community advocates to help advise the UFMP's development. A list of Working Group members is provided in **Table 3-7.** Four Working Group meetings were held between August 2022 and February 2024, and each meeting was facilitated by the consultant team.

Table 3-7. Fresno Urban Forest Management Plan Working Group Members

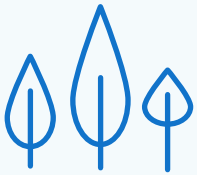
Name	Affiliation
Aaron Aguirre	City of Fresno, Parks After School, Recreation and Community Services, Director
Heidi Briggs	City of Fresno, Personnel Department, Principal Labor Relations Risk Analyst
Bret Conner	City of Fresno, Public Works Department, Street Maintenance Manager
Wendy Cornelius	City Of Fresno, Department of Public Utilities, Water Conservation Supervisor
Matthew Grundy	City of Fresno, Office of the Mayor, Deputy Mayor
Pastor Booker Lewis	City of Fresno, Community Liaison
Brendan Mills	City of Fresno, Parks After School, Recreation and Community Services, Parks Supervisor II
Robin O'Malley	City of Fresno, General Services Department, Facilities Manager
Vincent Patlan	City of Fresno, Public Works Department, Landscape Manager
Erika Pelayo-Lopez	City of Fresno, Public Works Department, Community Coordinator
Phillip Siegrist	City of Fresno, Planning and Development Department, Planning Manager
Dan Turner	City of Fresno, Public Works Department, Forestry Supervisor I
Mona Cummings	CEO, Tree Fresno
Patrick Denney	PG&E Vegetation Management, VOI Supervisor
Sarah Parkes	San Joaquin River Parkway and Conservation Trust, Assistant Director
See Thao	San Joaquin Valley Air Pollution Control District, Air Quality Specialist I


APARTMENT COMMUNITIES
RETAIL AREAS
BIKING & WALKING PATHS
SCHOOLS
Write words or draw a sketch of the ideal Fresno urban forest
How can we
trees in public
Urban Forest Management
Plan de Manejo Forestal Urba

3.6
Key Findings

The City's tree inventory can be better prepared for threats from pests, diseases, and climate change.

The City's current street tree palette has resulted in an overrepresentation of species in the inventory. Many of these species are simultaneously not prepared for the impacts of climate change, and susceptible to invasive pests and pathogens. The City can better prepare for these expected changes by selecting and planting species that are predicted to perform well in future climate conditions, thereby increasing species diversity in the City. This UFMP includes a recommended species palette to implement upon adoption (see Section 4.3.2).



Installation and repair of irrigation systems throughout the City are essential for new trees to survive.

The City has recognized the need to increase canopy cover in the City by adopting the 1,000 Tree Resolution in April 2022. Fresno's current and predicted future climate make it difficult for new trees to survive without dedicated irrigation. Simultaneously, Public Works has one watering truck to use to water City trees. While Fresno relies on adjacent property owners to water parkway trees, which covers a large portion of Fresno, the amount of watering trucks to cover areas without irrigation or no adjacent property owner is inefficient and not feasible to depend on for the remaining City-managed tree inventory. Furthermore, areas of the City without established irrigation are less likely to receive new trees, due to lack of water available for survival. The City will need to allocate additional funding to improve or establish irrigation to ensure trees can thrive in all areas of the City.

The City's canopy cover is not equitably distributed.

The UFMP's canopy cover assessment revealed that Fresno currently has an 14.6% canopy cover. However, spatial analysis of the canopy cover throughout the City showed that it is not equally distributed. Within the analysis area, canopy cover by census tracts range from 4.9% to 35.5%. Areas with higher pollution burden and vulnerability have lower tree canopy cover and proportionally more low-income and marginalized community members. The City will need to examine the reasons canopy is lower in these areas, strengthen its tree planting and preservation strategies, and ensure focus is put on low canopied areas first to increase the overall canopy cover equitably throughout the City.

Key Findings

Community members value trees as a vibrant resource.

Open discussions with City staff and community members show that the Fresno community believes trees are a valuable City asset. Community members expressed the desire and need for more trees and public education about the benefits of the urban forest. Overall, community members would like to become more involved in the City's efforts to increase tree canopy. Investments in the Urban Forest program will need to occur for City staff to create a balance of allocated resources toward a sustainable maintenance and tree planting program, and to update community outreach and education campaigns.

The City's long-range planning efforts should prioritize the urban forest.

Updates are needed to the City's long-range planning efforts and municipal code efforts, as there is currently some inconsistency regarding planning for trees. As the overall blueprint for the City, updating the General Plan to prioritize trees will help to achieve the goals of this UFMP.

Policies and ordinances that protect trees on private property should be enhanced.

The City's Municipal Code protects street trees and other trees grown on City-managed property. However, the chapter could be significantly strengthened to improve tree protection policies during construction, to identify stricter penalties for violation of the ordinance, and to add specificity for the types of trees that are protected. Additionally, other sections in the municipal code specifically exempt protection of trees on single family home lots. The City should consider its tree protection policies and partner with community members to secure irrigation, plant, and protect more trees, to meet canopy cover goals.

4

FRESNO'S URBAN FOREST PROGRAM

4.1 Urban Forest Sustainability

This section covers the current status of Fresno's urban forest and analyzes canopy cover, tree equity, tree species sustainability indicators, and the costs and funding required to meet best management practices. Benchmarks are measured against best management practices of the International Society of Arboriculture, American Forests, and industry standards to progress towards sustainable urban forest management.

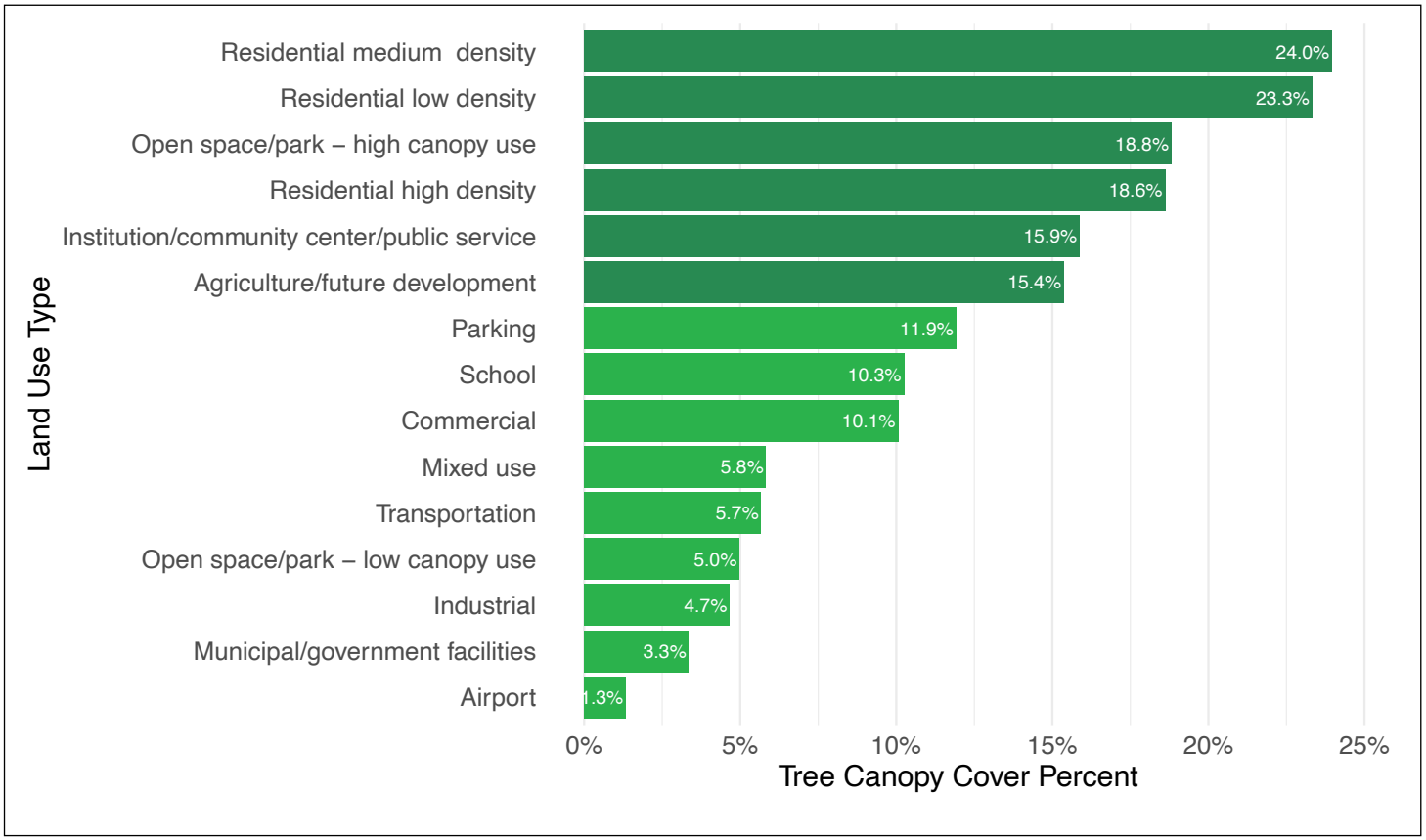
4.1.1 Citywide Canopy Cover

Canopy cover refers to the layer of leaves, branches, and stems that provide tree coverage of the ground when viewed from above. Tree canopy cover can have a positive impact on communities as it provides many environmental benefits and services. A City-wide canopy cover assessment was conducted for Fresno using satellite imagery and spatial analysis. The results of the canopy cover analysis are shown in **Exhibit 4-1,** Land Use Classification, and **Exhibit 4-2,** Map of Tree Canopy Cover in Fresno. The canopy cover analysis revealed that Fresno has an existing canopy cover of approximately 14.6%.

Exhibit 4-1. Land Use Classification

City of Fresno Land Use

2022 CANOPY COVER BY LAND USE TYPE

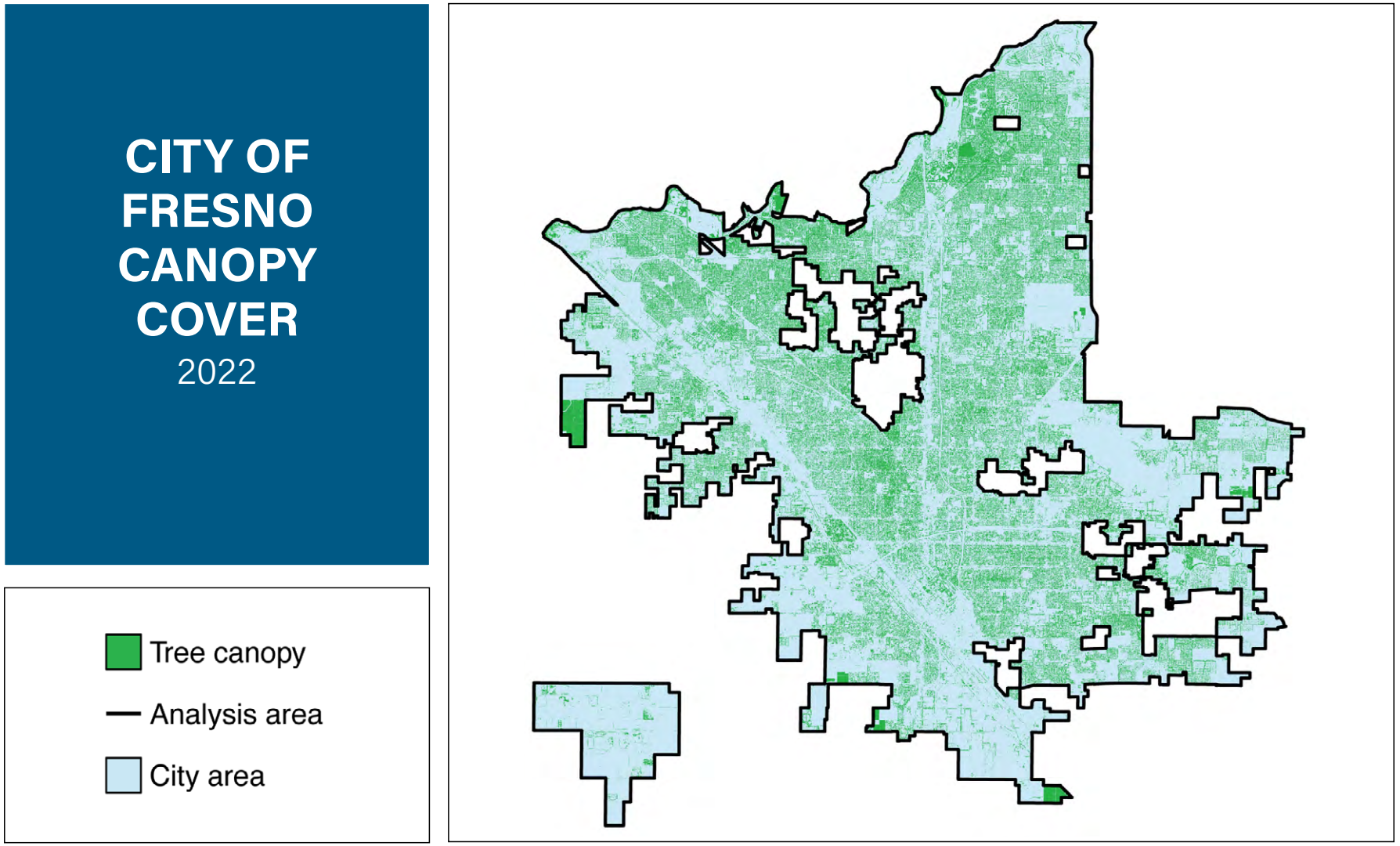


CITY-WIDE CANOPY COVER

14.6%

*Where 2022 imagery was not usable, 2020 imagery was used to create the canopy cover product

Exhibit 4-2. Map of Tree Canopy Cover in Fresno

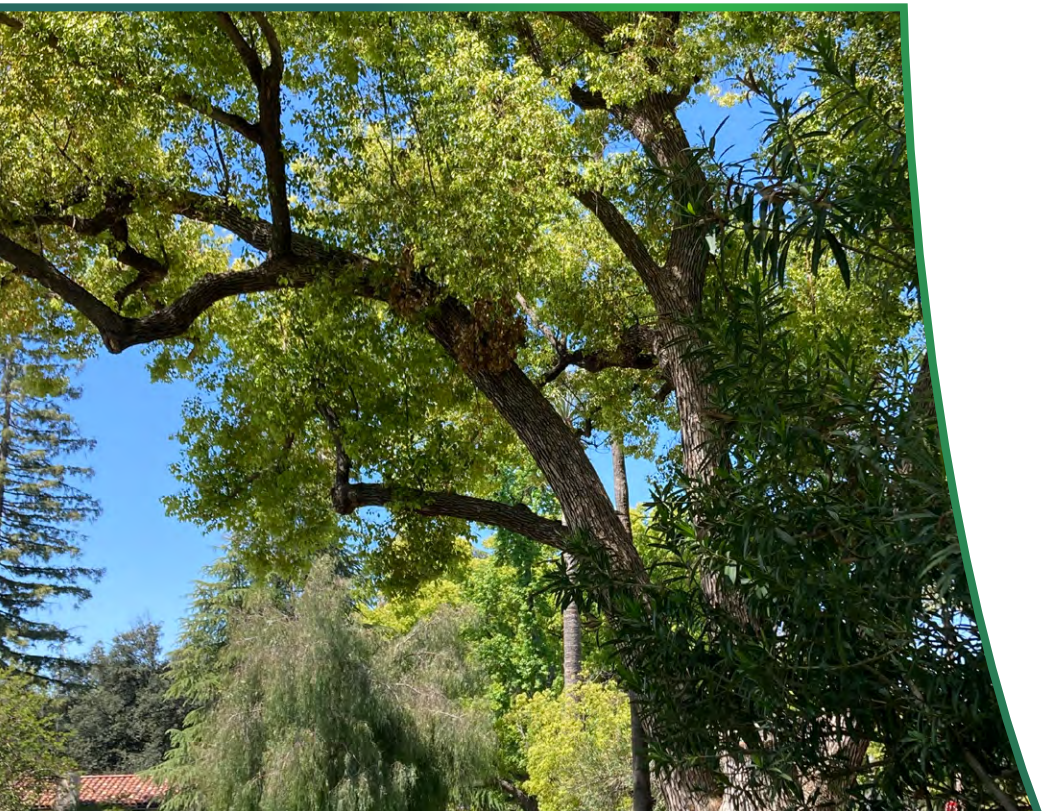


Source: City of Fresno, 2021. * Where 2022 imagery was not usable, 2020 imagery was used to create the canopy cover product.

ASPIRATIONAL GOAL FOR FRESNO:

20%

canopy cover Citywide to be achieved over the next 40 years



4.1.2 Increasing Canopy Cover

The potential canopy cover that can be achieved in any city is based on historical and existing conditions. A variety of factors influence canopy cover, such as development demands, land use patterns, historical canopy cover, and growing conditions. Recommended canopy cover for an urban forest that was traditionally forested land is 40-60%, while 20% for grassland and 15% in desert cities are a realistic goal (Leahy, 2017). Fresno's aspirational canopy cover goal was determined through analysis of the current canopy cover (14.6%), identifying the potential growth of the canopy, and the amount of space available for planting.

Fresno already has a goal of planting 1,000 new trees per year throughout the City. Taking the 1,000-tree initiative one step further, Dudek analyzed the number of trees that should be planted per year to reach a 20% canopy cover goal and accounted for estimated mortality of newly planted trees (5%) and mature trees (2%), to generate a planting target. If the existing canopy were to remain static (no tree mortality), roughly 80,000 new trees would need to be planted to meet a 20% canopy goal. This equates to planting approximately 4,600 trees per year over the 40 year timeframe. The method for how this number was calculated is presented in **Table 4-1**.

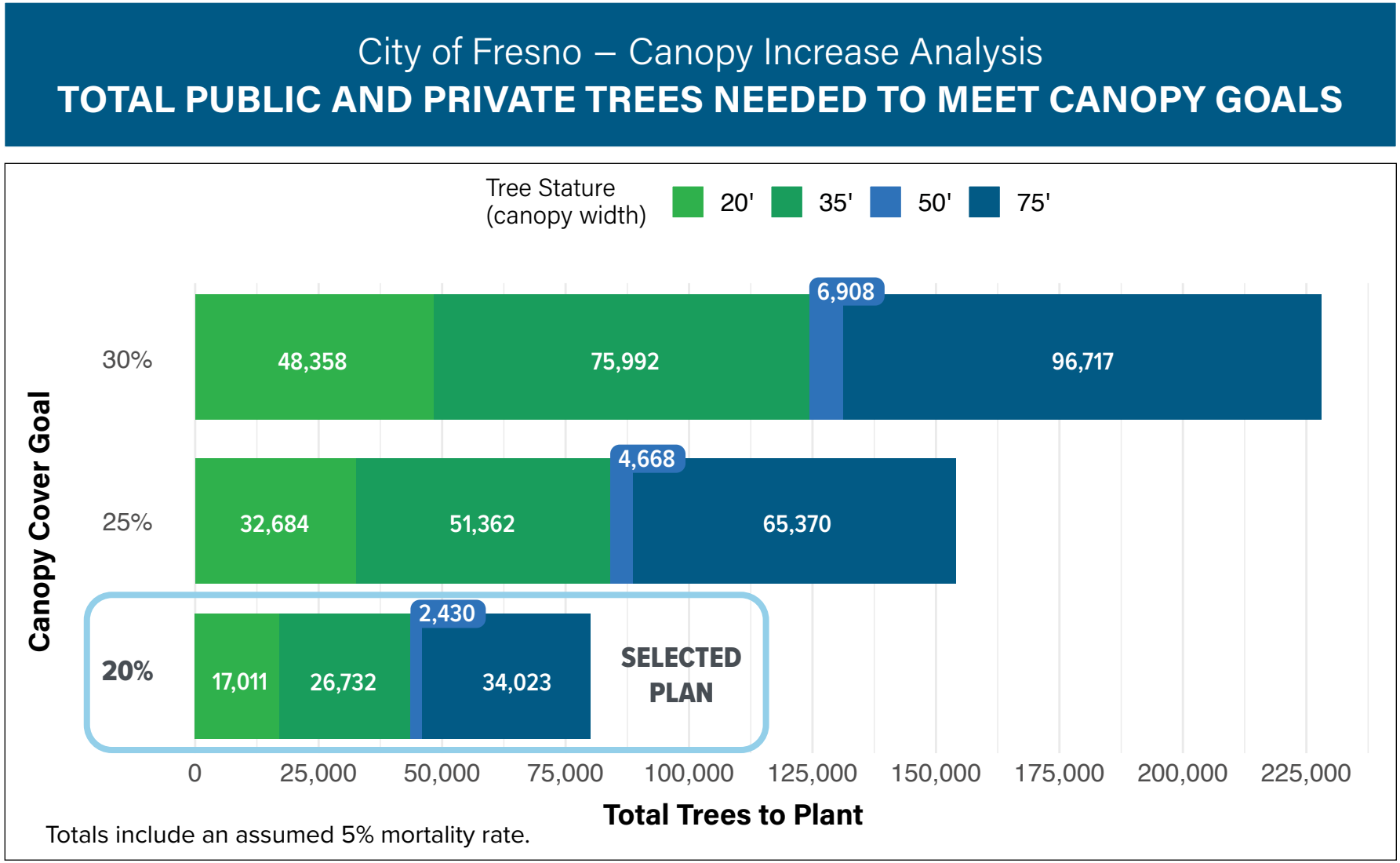
Table 4-1. Annual Tree Planting to Reach 20% Canopy Cover Calculation Method

Metric	Value	How it was calculated
Number of trees to plant to Grow Canopy	2,004	(Number of trees to plant over 40 years to reach 20% canopy cover (80, 196) * mortality rate of newly planted trees) / 40 years
Estimated number of young trees to plant to replace dead mature trees	2,635	The mature tree mortality rate (2%) multiplied by the total tree inventory (131,725).
Total number of trees to be planted.	4,639	The mature tree mortality rate (2%) multiplied by the total tree inventory (131,725).

4.1.3 Planting Scenarios to Increase Canopy Cover

Exhibit 4-3 shows the total number of trees of different statures that would need to be planted to reach a canopy cover of 20%, 25%, or 30% city-wide. For this analysis the ratio of tree statures is based on the ratio of all planting spaces currently included in the City-managed inventory. To meet a 20% canopy cover goal, a total of 80,196 trees (17,011 trees with 20-foot spread, 26,732 trees with 35-foot spread, 2,430 with 50-foot spread, and 34,023 with 75-foot spread) will need to be planted on private or public properties within the City.

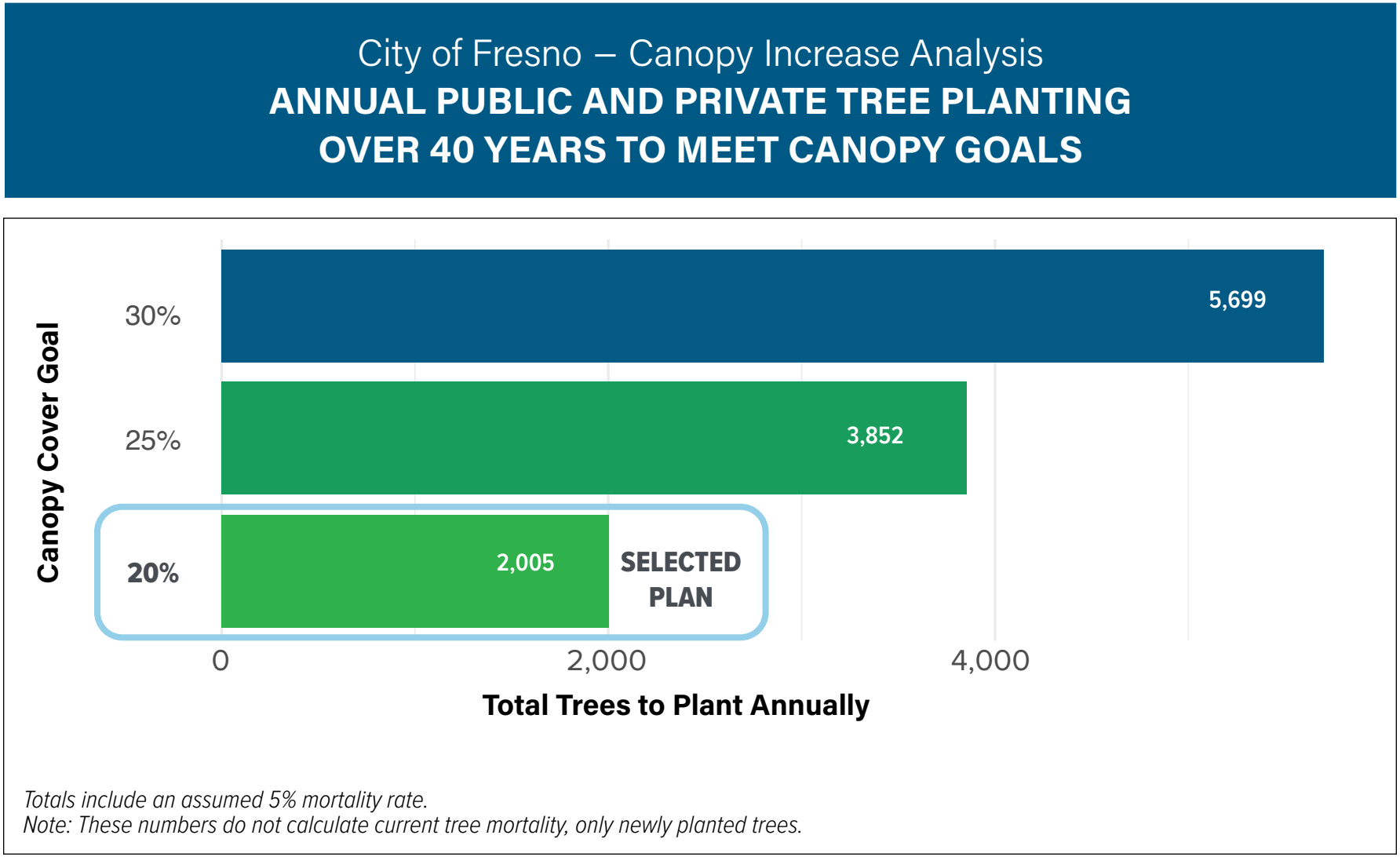
Exhibit 4-3. Total Number of Trees Needed to Increase Canopy Cover Above 14.6%



Sources: USDA 2020; City of Fresno 2021 Tree Inventory

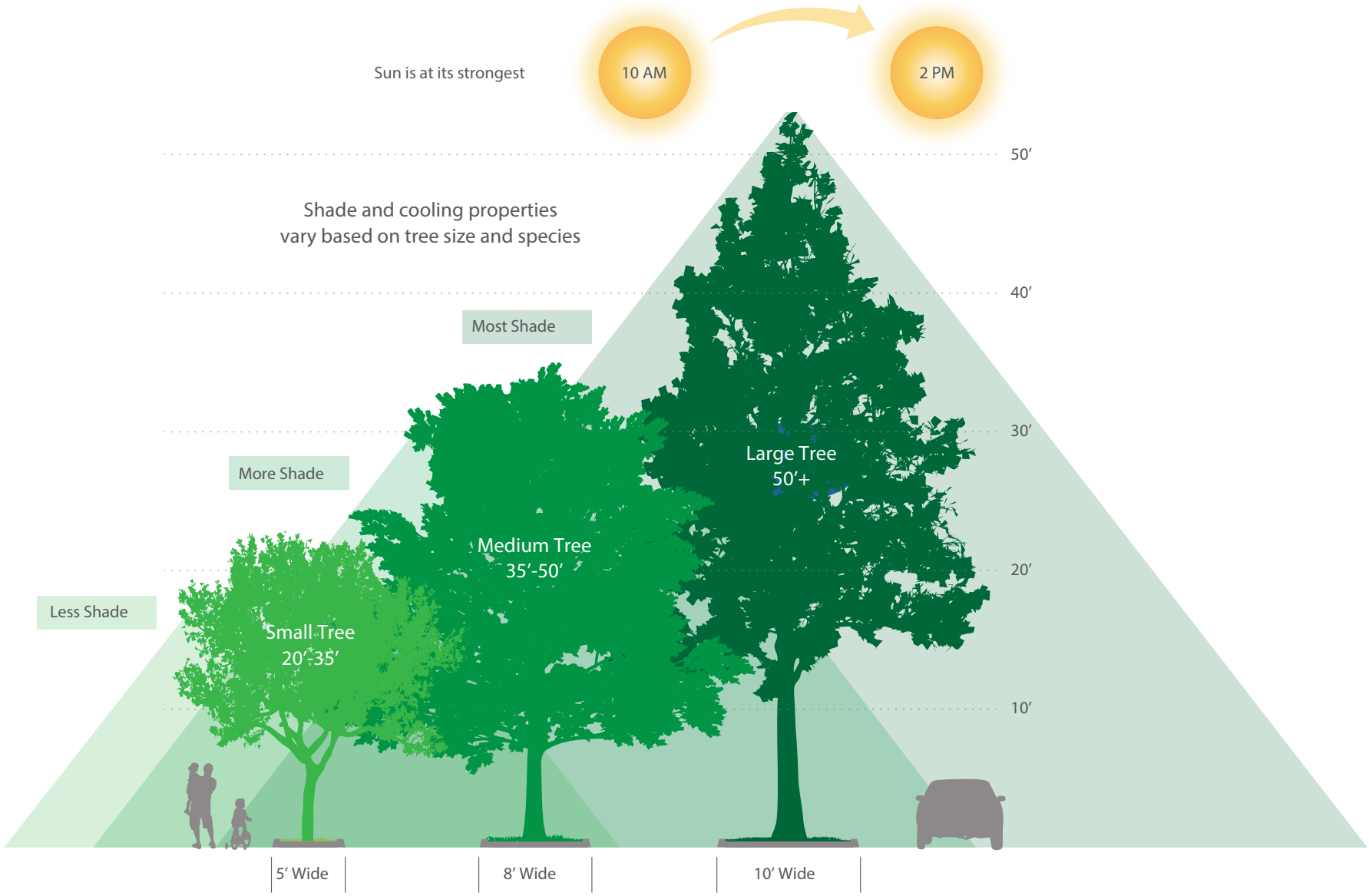
Exhibit 4-4 shows the total number of trees needed to be planted annually to reach a canopy cover of 20%, 25%, or 30% city-wide. An estimated total of 4,639 newly planted trees per year are needed to reach a canopy cover goal of 20% within 40 years.

Exhibit 4-4. Annual Public and Private Tree Planting Over 40 Years needed to Meet Canopy Goals



Sources: USDA 2020; City of Fresno 2021 Tree Inventory

Exhibit 4-5. Right Tree, Right Place



It is important to note that if more large stature trees are planted then fewer trees will need to be planted overall and vice versa. Tree planting efforts for both public and private properties should therefore encourage planting large stature trees whenever possible. See **Exhibit 4-5** for a visual representation.

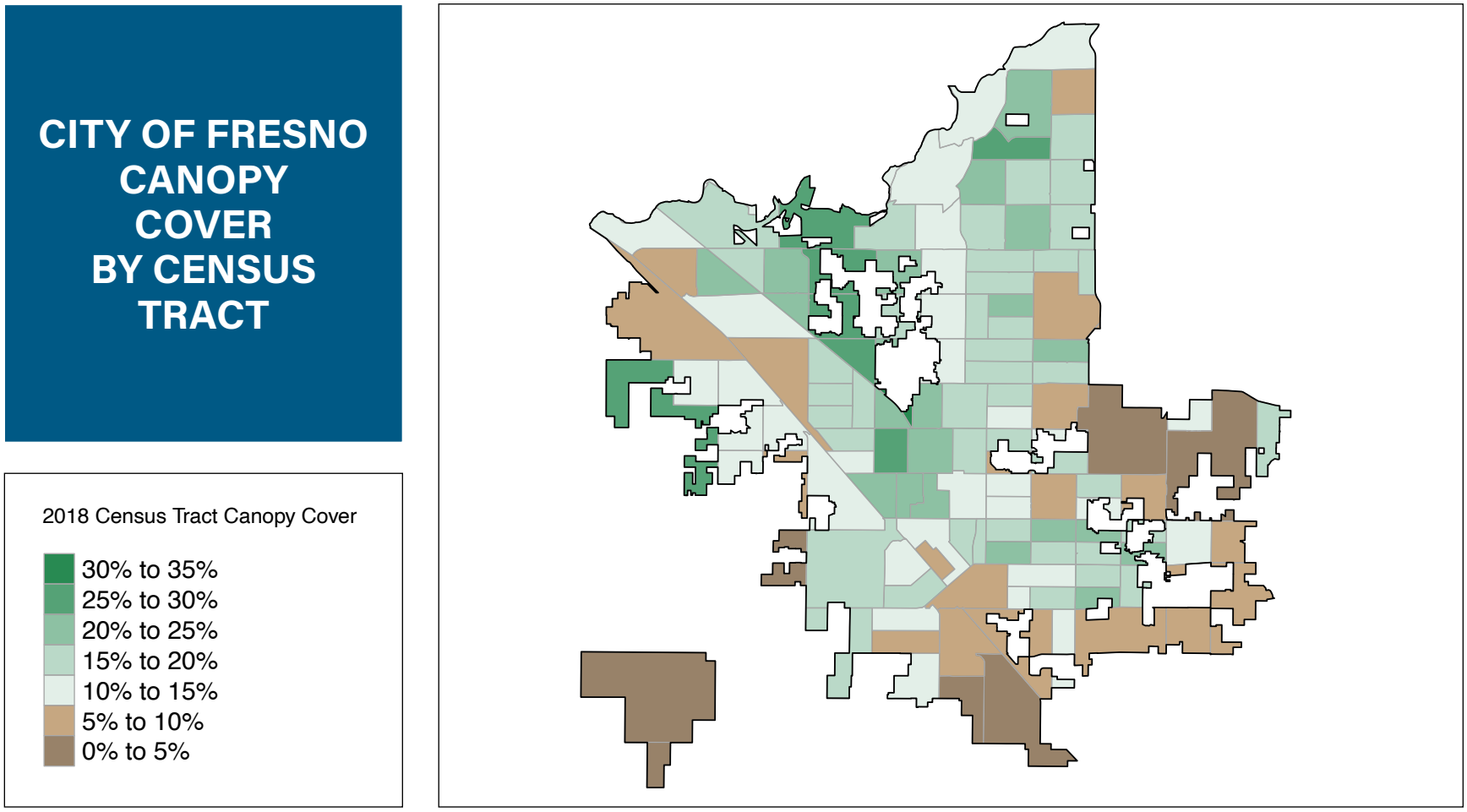
4.1.4 Tree Equity

Canopy cover, heat severity, pollution burden, and other environmental factors are often distributed inequitably throughout a city. Studies have shown that due to identifiable systemic injustices and socioeconomic factors, inequitable canopy cover and pollution vulnerability disproportionately affects low-income and marginalized communities (Locke et al. 2020). When addressing this issue of inequity, it is important to consider and understand the ways in which parts of the city differ in terms of population, land use, current canopy cover, existing planting spaces, and other environmental factors. This section uses census tracts to examine equity issues pertaining to canopy cover and pollution burden in Fresno.

The canopy and equity analyses conducted for this UFMP revealed the following key findings. For more information and context, including methodology and full analysis, see the Technical Assessment. Since 2022, Public Works has already begun addressing the equity issues identified in this section. In FY 2022, 740 trees were planted in City Council Districts 3 and 4, and 1,156 trees were planted in the same districts in FY 2023.

Canopy cover for census tracts within the analysis area ranges from 1% to 23.3%, as shown in **Exhibit 4-6.**

Exhibit 4-6. Map of Census Tracts within Canopy Analysis Area

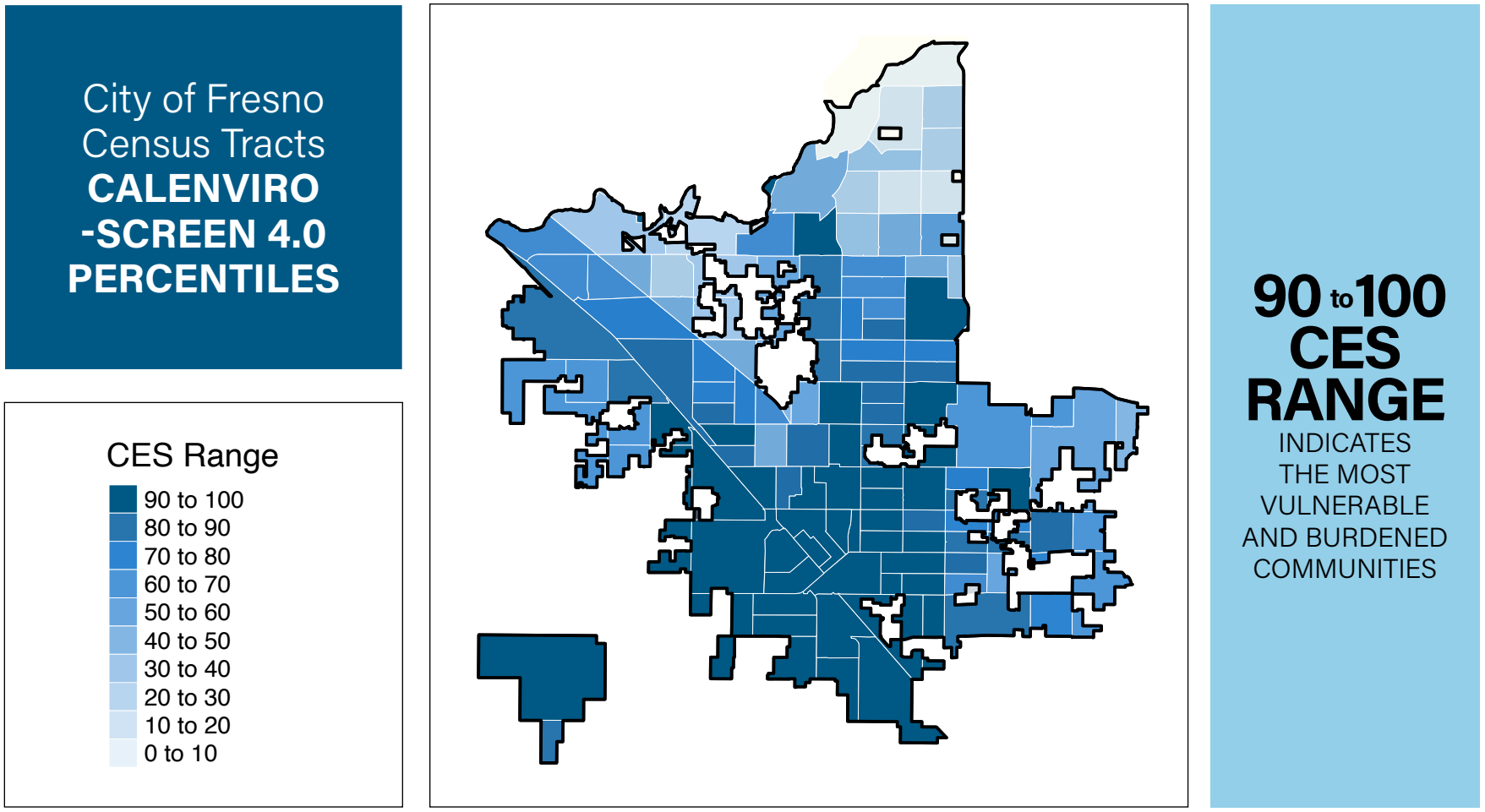


Sources: USDA 2020

The California Environmental Protection Agency's CalEnviroScreen 4.0 (CES) online tool identifies California communities that are disproportionately burdened by pollution and have a higher vulnerability to the health effects of pollution (OEHHA 2018). The tool uses indicators of exposure, environmental effects, sensitive population, and socioeconomic factors to assess the cumulative impact of pollution burden, health conditions, and socioeconomic stressors on California communities. CES does not include canopy cover as an environmental effects indicator. CES is a relative comparison of California pollution burden and vulnerability, with CES scores in the 1st–10th deciles indicating the least burdened and vulnerable communities and CES scores in the 90th–100th decile indicate the most vulnerable and burdened communities (OEHHA 2021). The City's census tracts range from a low CES of 3 to a high CES of 100 (see **Exhibit 4-7**)

Exhibit 4-7 displays the tree canopy cover of census tracts based on their CES range.

Exhibit 4-7. Map of Fresno CalEnviroScreen 4.0 Scores



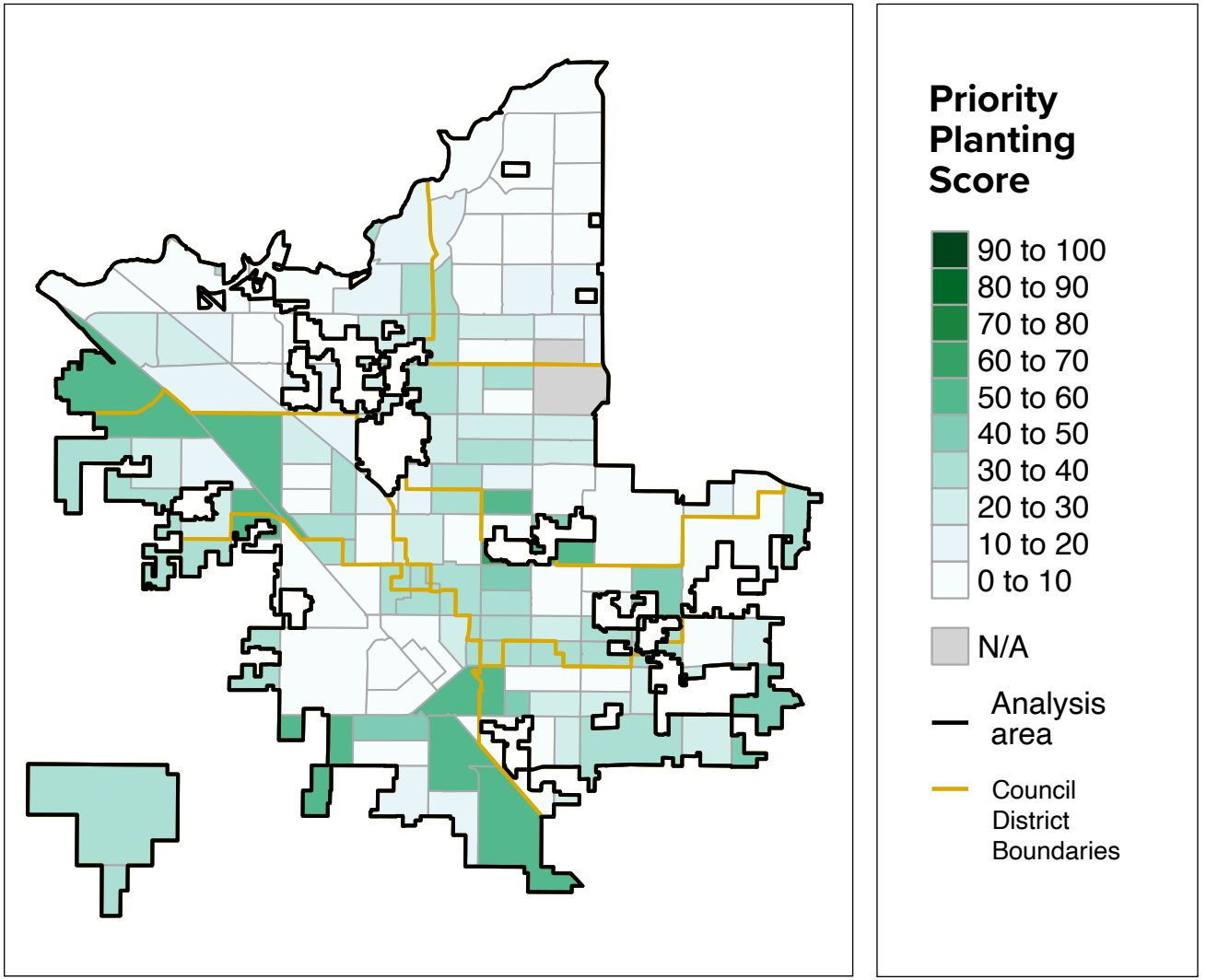
Source: CalEnviroScreen 4.0 (OEHHA 2021).

4.1.5 Opportunity and Priority Planting Areas

The Priority Planting Score, presented in **Exhibit 4-8,** indicates where the City should focus tree planting efforts by census tract for a more equitably distributed canopy cover. The study area for developing the PPS was limited to the canopy analysis study area, with the exception of the census tract marked as 'N/A' or 'Not Applicable'. This area is California State University, Fresno-owned property, where the City does not have authority to execute planting activities. A higher PPS indicates a higher priority for focused tree planting efforts. PPS considers current canopy cover, distribution of land use type, total recorded City-managed vacant planting sites, pollution burden and equity, and relative population and acreage (see the UFMP Technical Assessment for methodology details).

Exhibit 4-8. Planting Priority Score by Fresno Census Tract and Council District

City of Fresno
PRIORITY PLANTING ANALYSIS



Sources: USDA 2020; CalEnviroScreen 4.0 (OEHHA 2021).

4.2 Tree Inventory Sustainability

The City's most recent inventory of City-managed (public) tree sites was collected in 2021 and includes street and park trees and identified plantable vacant sites. The inventory includes 131,732 trees, 29,086 vacant sites, and 276 stumps. For this analysis, vacant sites were considered plantable if they were labeled as a vacant site or stump in the inventory. It is also important to note that the inventory is not an exhaustive list of all plantable vacant sites within the City. Generally, when inventory data is collected, potential planting sites that would require concrete removal to create a new tree well or potential planting sites within open spaces and parks are not included.

4.2.1 Species Diversity Summary

The genus and species diversity of a tree inventory is an indicator of overall resilience to threats. Because biological diversity is often regarded as the basis for ecological stability (Tilman and Downing 1994), urban forests with uniform tree species are more susceptible from catastrophic loss when invasive pests and pathogens enter a landscape or when significant weather events occur.

Historical best practices for species diversity standards in public tree inventories include a representation of no more than 10% of any one species, 20% of any one genus, or 30% of any one family (Miller and Miller 1991; Richards 1993; Santamour 1990). With anticipated increased threats from invasive pests and pathogens, using a more stringent metric is critical in planning for a more resilient urban forest. For this analysis, limitations of 10% of any one genus and 5% of any one species are used to provide additional protection of the tree inventory (Ball et al. 2007).

The City-managed street tree inventory contains 131,732 individual trees, comprised of 158 genera and 369 species. Additionally, 29,086 plantable vacant sites and 276 stumps were identified, making for a total of 161,094 current and potential tree sites. **Exhibits 4-9** and **4-10** show the top 10 genera and species for the City-managed tree inventory. The top 10 genera make up 51% of the total street tree inventory, with nine genera within the 10% recommendation. *Pistacia* exceeds the recommended distribution percentage, representing 11.6% of the inventory. The top 10 species make up 43.5% of the inventory, and the top two species, Chinese pistache (*Pistacia chinensis*) and crape myrtle (*Lagerstroemia indica*) exceed the 5% recommendation.

As the City continues to plan for street and park tree removals and replacements, it should plant species outside of the genera and species that are overrepresented in the City-managed street and park tree inventories.

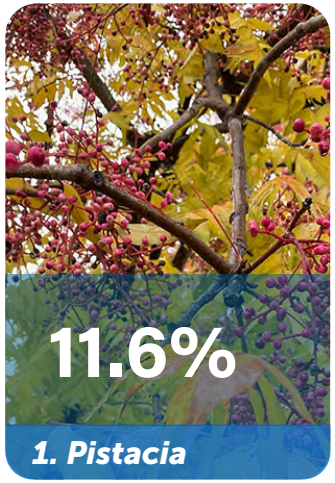

Fresno
Fraxinus angustifolia Vahl

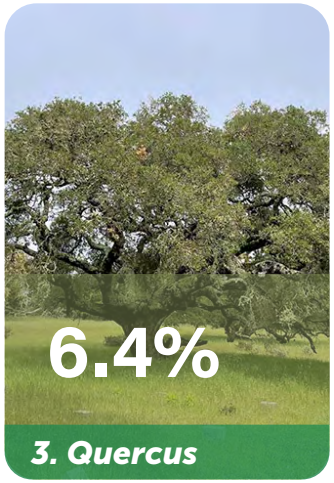
Exhibits 4-9. Top 10 Genera in the City Inventory

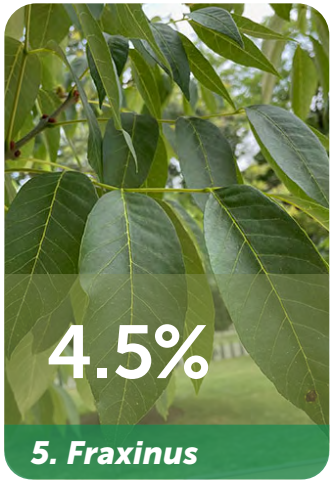
TOP 10 Genera *in the City Inventory*

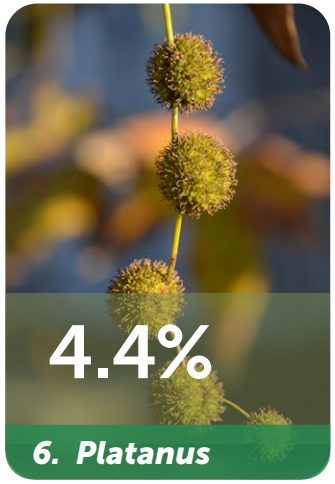
Sustainability Goal: No genus represents greater than 10% of Inventory

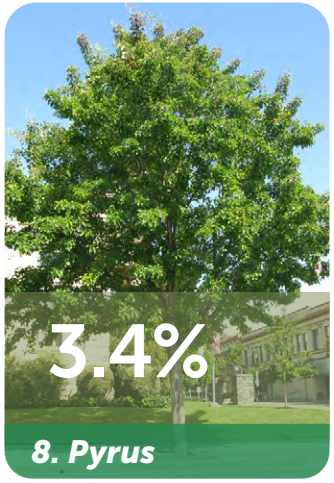
Meets Goal Does Not Meet Goal

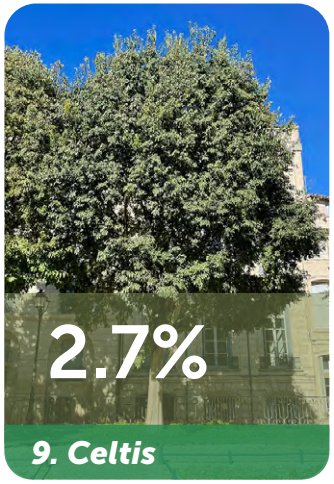


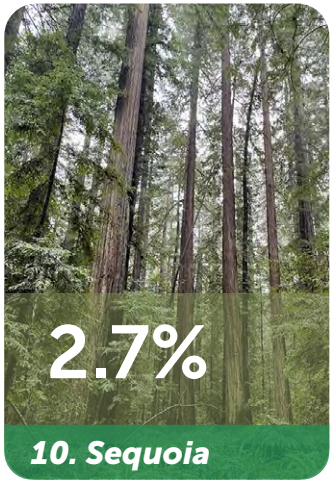












Source: City of Fresno Tree Inventory (City of Fresno 2021).

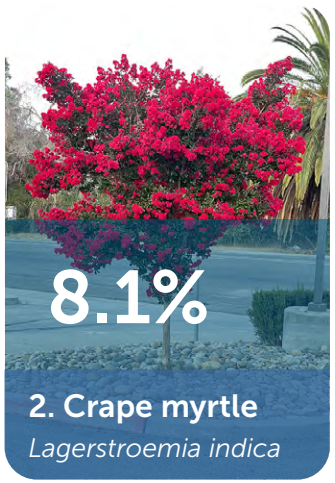
Exhibits 4-10. Top 10 Species in the City Inventory

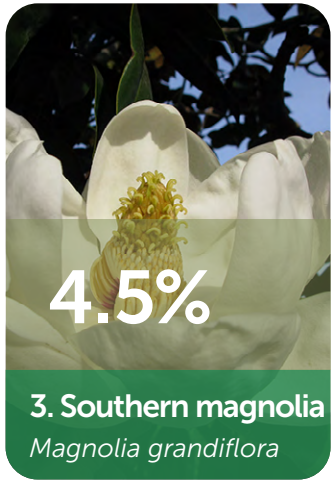
TOP 10 Species *in the City Inventory*

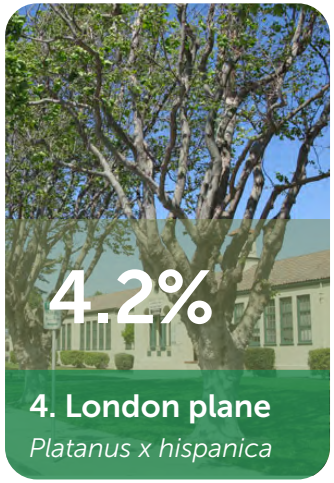
Sustainability Goal: No species represents greater than 5% of Inventory

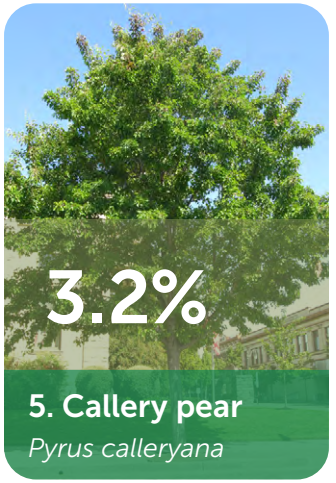
Meets Goal

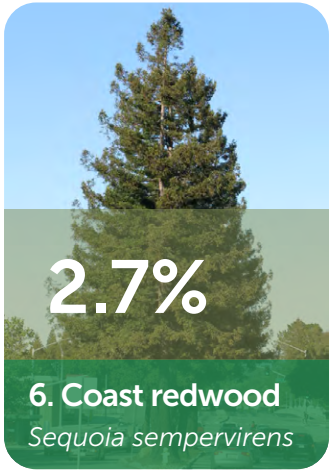
Does Not Meet Goal











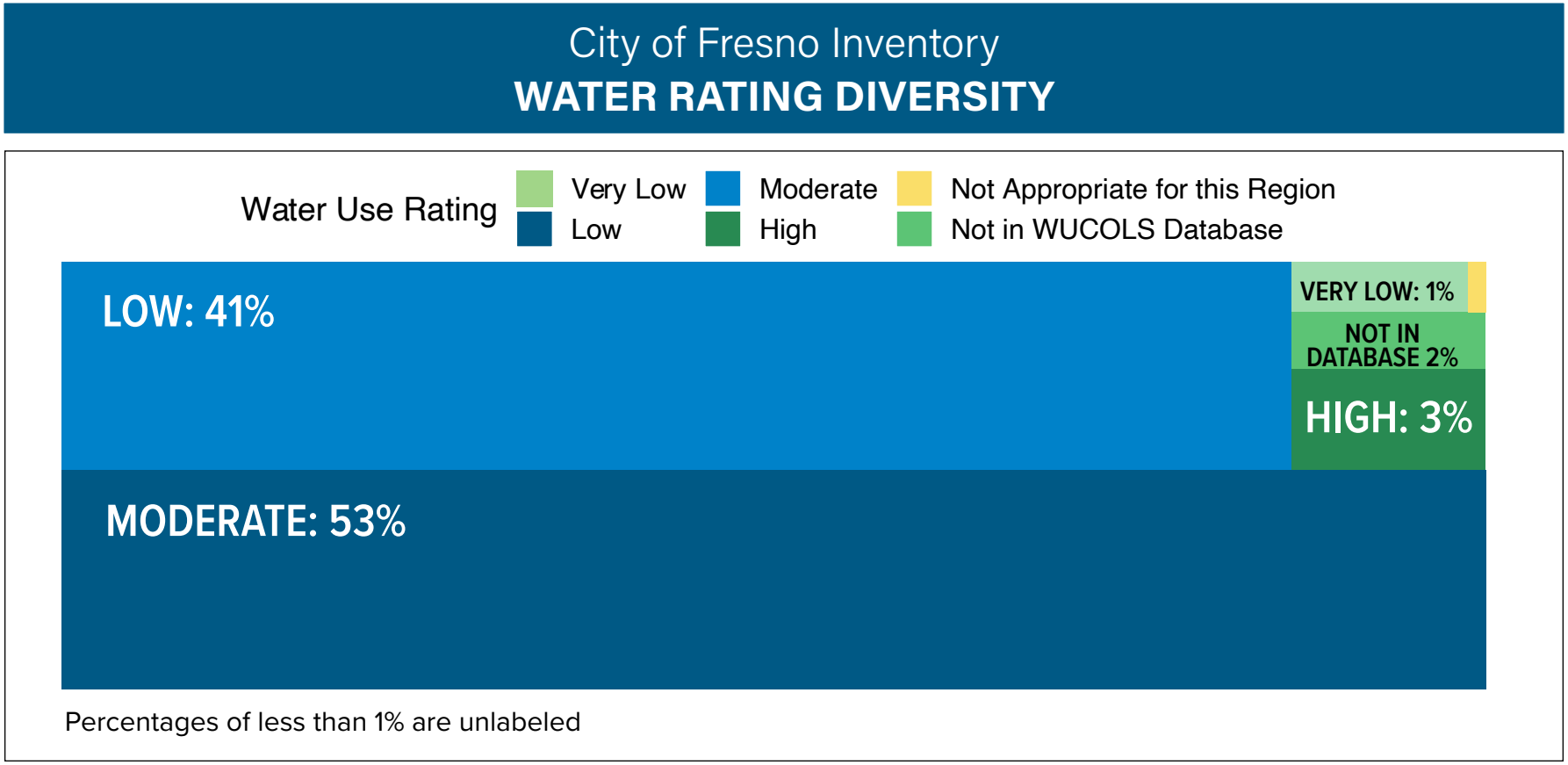
Source: City of Fresno Tree Inventory (City of Fresno 2021).

4.2.2 Climate Preparedness

Over the past century, average maximum temperatures in California have increased 1.6°F to 2.5°F, and these temperatures are expected to continue to rise over the coming years (WRCC 2018). Longer, more intense periods of drought and more variable periods of precipitation with increased flooding (Swain et al. 2018) will make finding additional irrigation water a challenge, and allocating funding for irrigation improvements for street trees a priority (McBride and Lacan 2018). The City can prepare for these expected changes by selecting and planting species that are predicted to perform well in future climate conditions. There are many considerations when looking at the climate appropriateness of urban tree species. This analysis considers tree species' water needs using Water Use Classification of Landscape Species (WUCOLS) and future climate suitability based on research conducted by McBride and Lacan (2018).

Exhibit 4-11 shows the percent of trees in the inventory that fall into each WUCOLS water use category. WUCOLS classifies plants as very low, low, moderate, or high-water users. WUCOLS water ratings are often part of the guidelines for selecting trees species palettes throughout California. Species that are rated as high or moderate water users will require more water resources to than lower rated species.

Exhibit 4-11. Water Use Rating Distribution of the City's Tree Inventory



Source: City of Fresno Tree Inventory (City of Fresno 2015): McBride and Lacan (2018).

In 2018, a climate suitability study was conducted for street trees in California. This research picked one California city to represent each of the 16 hardiness zones present in California. Common tree species in these representative cities were then compared to common tree species in cities with current temperatures equal to the predicted temperatures of the representative cities in 2099. A list of species that will be unsuitable for future climates was created based on their absence from warmer cities, professional opinions, and WUCOLS ratings of unsuitable or high.

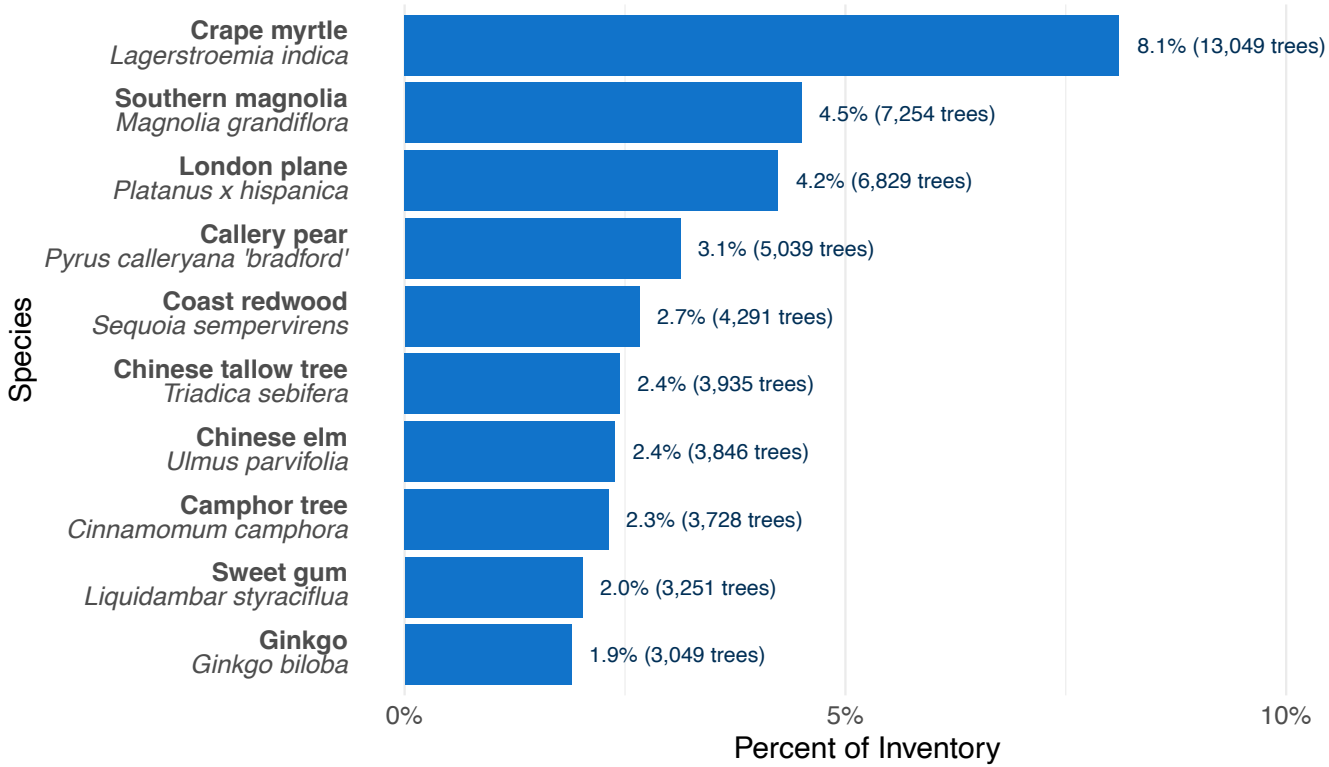
Using results from McBride and Lacan's research to compare to Fresno' inventory, there are 36 tree species in the City that are predicted to be heat and water sensitive in Fresno' future climate. These species make up 9,835 trees and 31% of the City's inventory.

Exhibit 4-12 presents the top 10 most commonly occurring of these species. This list indicates the potential for a gradual decline of tree canopy cover over time. Based on this list of species, the City will need to determine which species should remain on its palette and prioritize species that will be able to withstand hotter and dryer weather if future drought conditions persist.

Exhibit 4-12. Top 10 Species Predicted to be Unsuitable for Fresno's Future Climates

City of Fresno Inventory **CLIMATE RESILIENCY**

The top 10 species in Inventory Unsuitable for Future Fresno Climates



A total of 41 species (63,317 trees or 39.3%) in the City's inventory are predicted to be unsuitable for future climates.
Note: Research excluded palm species

Sources: City of Fresno 2021; McBride and Lacan 2018.

4.2.3 DSH Distribution Summary

The most common and least invasive method to approximate the age of a living tree is to measure the trunk diameter at 4.5 feet above the ground diameter at standard height. General age recommendations suggest an urban forest have a distribution of immature trees (40%) to replace failing or aging ones, young (30%) and middle-aged (20%) trees to provide the bulk of economic and environmental benefits, and relatively fewer mature trees (10%) that have most of their life behind them but that provided significant environmental benefits for many years (Morgenroth et al. 2020; Richards 1993). Since trees vary in maximum stature and growth patterns, using diameter at standard height to determine age can only be considered an estimate.

The age distribution of Fresno's tree inventory is presented in **Exhibit 4-13**.

Exhibit 4-13. Diameter at Standard Height Distribution of the City's Tree Inventory

City of Fresno Inventory

DIAMETER AT STANDARD HEIGHT (DSH) DIVERSITY

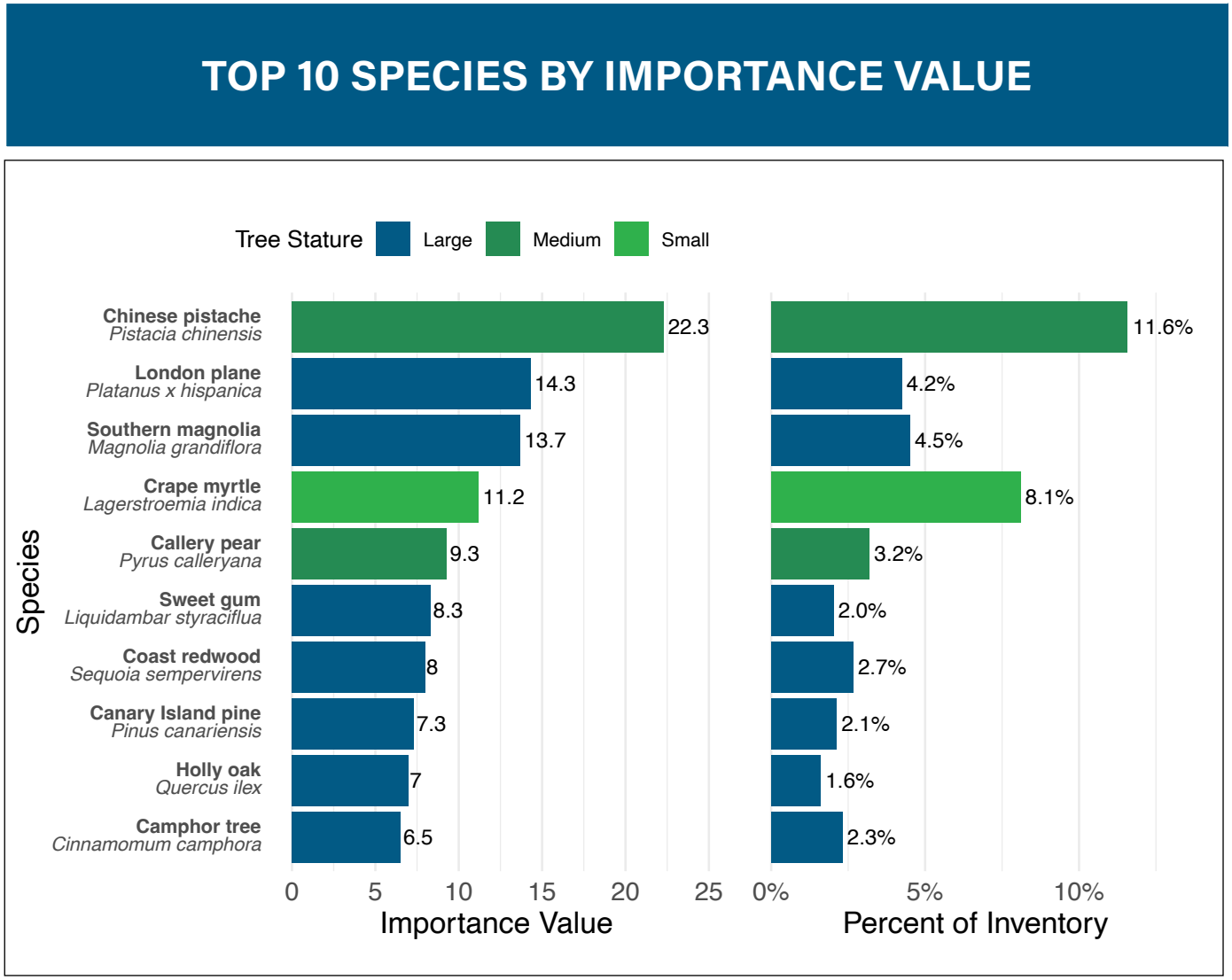
Immature: less than 6" DSH, *Young:* 6" – 18" DSH, *Middle–aged:* 18" – 24" DSH, *Mature:* greater than 24" DSH
Percentages less than 1% are unlabeled.

Source: City of Fresno Tree Inventory (City of Fresno 2014).

4.2.4 Importance Values Summary

The importance value of tree species combines the percentage of the species in the population of City-managed trees with its corresponding percentage of leaf area. The top 10 species with the highest importance values are shown in **Exhibit 4-14**.

Exhibit 4-14. Ten Species with the Highest Importance Values in the City's Inventory



Source: City of Fresno 2021

4.3 Urban Forest Management

4.3.1 Annual Service Data

Annual service data relating to tree maintenance and assessment are provided in **Table 4-2**. Due to decreased funding in FY 2011, tree maintenance has been reactive. With additional funding in FY 2022, the City contracted tree care maintenance to increase the current level of service with a goal to establish a 10-year tree pruning cycle. Although there is currently no tree risk assessment program, since the initiation of the tree maintenance contract the contractor, the contractor has provided a list of trees for the City to assess and determine if removal or mitigation is needed. With only one arborist in-house, assessment and inspection of this list and resident requests are delayed as in-house staffing remains to be a challenge. Recommendations for tree planting and maintenance can be found in **Appendices A–J**.

Table 4-2. Annual Tree Service Data

Tree Planting	Establishment Care	Tree Pruning	Tree Removal	Urban Wood Reuse	Tree Inspection and Assessment
An average of 339 trees were planted per year from fiscal year (FY) 2019 to FY 2022. In FY 2023, 2,253 trees were planted.	One year of watering after planting is required.	Since Fresno awarded a pruning contract in FY21, they have pruned 9,800 trees. To achieve the 10-year pruning cycle goal with the current inventory of 131,725 a total of 13,299 trees will need to be pruned per year.	Between FY 2019 and FY 2022, the City removed 103 trees.	Trees are either chipped and hauled off site, or used as mulch onsite	Currently, there is no systematic framework to assess tree risk.

4.3.2 Recommended Species Palette

The DDPW Landscape Division uses the General Use Tree list (last updated July 2022) when selecting trees to plant. The current list is organized by mature tree size (small, medium, and large), water use behavior, and trees for special use only (certain locations or parkway sizes). **Appendix K** provides a recommended species palette, developed using the following parameters:

- A preference for trees that are rated as very low or low by the WUCOLS
- Species that are expected to perform well in Fresno's future heat and drought conditions
- Inclusion of well-adapted local and regionally native species.
- Diverse planting size requirements to allow for various tree planting locations that encourage the "Right Tree, Right Place" philosophy of tree selection and planting
- A diversity of species to achieve species diversity goals identified in this UFMP
- Species options to reflect existing neighborhood character

4.3.3 Budget and Funding

Table 4-3 shows the funding sources that contribute to the DDPW's Urban Forestry Section funding for FY 24. **Tables 4-4** and **4-5** show the approximate percentage of how the budget is spent, shown by task area and tree activity, respectively. The budget that is allocated to DPW Urban Forestry Section salaries is presented in **Table 4-6.**

Table 4-3. Fresno's Funding Sources

Funding Source	In-House Allocation	Contractor Allocation
General Fund	$0	$2,830,300
Gas Tax	$1,274,700	$0
Tree Fees	$0	$0
Special Measures (SB1)	$50,000	$0
General Fund PARCS		
Subtotal	**$ 1,324,700**	**$2,830,300**
Grand Total	**$4,155,000**	

Table 4-4. Where DPW's Urban Forestry Section Funding is Spent by Task Area

Task Areas	In-House	Contractor Services
Budget	**$1,324,700**	**$2,830,300**
Street trees	90%	79%
Park trees	7%	18%
Natural area trees	0%	0%
Public ground trees	3%	3%
Total	**100%**	**100%**

Table 4-5. Where DPW's Urban Forestry Section Funding is Spent By Tree Activity

Tree Activity	In-House Services	Contractor Services
Budget	**$1,324,700**	**$2,830,300**
Tree planting	0%	1.63%
Tree pruning	55%	72.9%
Tree removal	15%	4.84%
Stump removal	7%	5.63%
Storm cleanup	23%	15%
Total %	**100%**	**100%**

Table 4-6. DPW's Forestry Section Salaries Spent on the Urban Forest

Title	Positions	FTE	Total Salary +Benefits +Fringe	Real Salary Expenditure on Urban Forestry Related Tasks
Tree Trimmer Lead worker	2	2	$168,297	$168,297
Park Maintenance Worker II	1	1	$68,645	$68,645
Forestry Supervisor I	1	1	$102,523	$102,523
Laborer	1	1	$65,041	$65,041
Parks Supervisor II	1	0.25	$104,536	$26,134
Total	**6**	**5.25**	**$509,042**	**$430,640**

FTE = full-time equivalent

4.3.4 Staffing and Contractors

Current Staffing

Currently, DPW's Forestry Section has a total of eight positions, and not all staff spend 100% of time on direct urban forest management activities. The time spent on urban forest management activities by the eight staff equates to 5.25 Full Time Equivalent (FTE) staff. Effectively, 5.25 staff manage 131,725 trees, or 25,090 trees per FTE employee and 26,345 trees per ground laborer. **Table 4-7 and Exhibit 4.15** breaks down the position title, the FTEs for each position, and the organizational chart that is currently implemented.

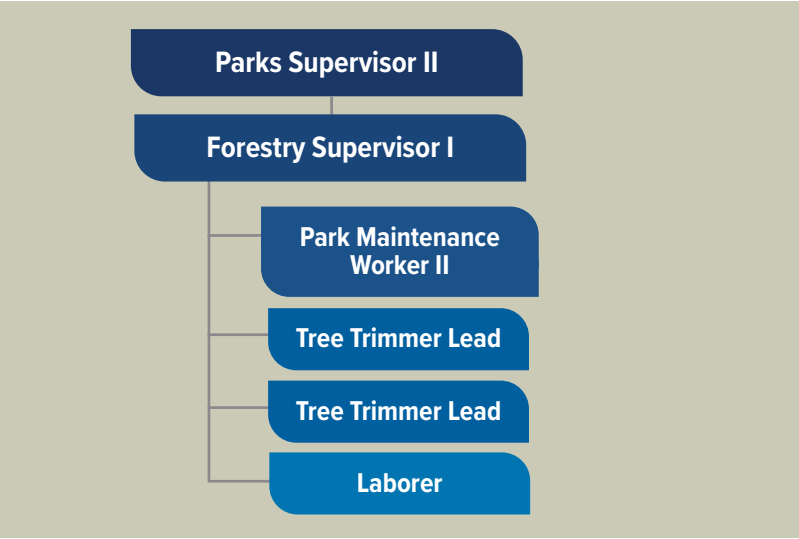
A forestry contractor handles the majority of proactive and routine pruning for the city, while the four-person city tree crew predominantly handles reactive hazardous tree removal and cleanup and FresGo maintenance requests. The City's contractor will adhere to ISA standards and be routinely evaluated by a City arborist, or an impartial (outside) entity/consultant to ensure preferred practices are followed.

According to staff interviews, the City's tree management budget increased in fiscal year FY22 but is still not adequate for all tree management needs within Fresno. City staff expressed a desire to maintain street trees on a 10-year pruning cycle, increase annual planting numbers, ensure proper establishment care, and address salary and continued education concerns

Table 4-7. DPW's Forestry Section Head Count and Position Title

Title	Positions	Full-Time Equivalent
Parks Supervisor II	1	0.25
Forestry Supervisor I	1	1
Tree Trimmer	3	2
Park Maintenance Worker II	1	1
Laborer	2	1
Total	**8**	**5.25**

Exhibit 4-15. DPW's Forestry Section Organizational Chart Title



for current staff and staff recruitment. Having a larger core team of City staff will help maintain institutional knowledge, support the development of new hires and seasonal employees, and build relationships with the community. City staff also expressed a need for an engagement and education program focused on the benefits of trees, importance of "right tree, right place", and ways to mitigate conflicts between trees and infrastructure other than tree removal. Insufficient budget and staffing were the main barriers identified in achieving these goals.

4.3.5 Funding Strategies

The analysis reflects additional funding needs for the Urban Forest Management Program. Recognizing the high demands for General Fund resources in Public Safety and Parks, After School, Recreation and Community Services and the significant backlog of deferred maintenance in City buildings and facilities, it should be noted that it is difficult for the City to propose substantial increases in General Fund resources for the urban forest. Other options for funding urban forest management include:

Sales Tax Measures

Voter approved sales tax measures can be one method to generate the additional revenue needed for the care of the urban forest. The level of funding required varies with the selected strategy.

Annexation of Existing Neighborhoods to Community Facilities Districts

Currently State law requires a 2/3 majority support on the ballots returned to form a new maintenance district or to annex property into an existing maintenance district under Mello-Roos law. This approach creates a new special tax to be levied, with revenue collected being limited to the specific neighborhood and for the specific services noted at time of formation or annexation. Funds would be protected specifically for the street trees or park trees within the boundary of the CFD annexation.

Enhanced Infrastructure Financing Districts (EIFD)

A certain geographic boundary of the City would be established as an EIFD, where a portion of the tax increment could be designated for urban forest maintenance along with other services benefitting the district. Recognizing the argument that healthy, well maintained urban forests of streetscapes, parks and greenways increase property values, allocating a portion of tax increment could be one consideration as a funding strategy.

5

STRATEGIC PLAN

5.1 Vision Statement

Fresno's urban forest is a collection of water-wise, diverse, mixed-aged trees that are strategically planted and well-maintained to promote a sustainable urban forest that forms a thriving, flourishing environment for all community members to enjoy for generations to come.

5.2 Urban Forest Management Pathways

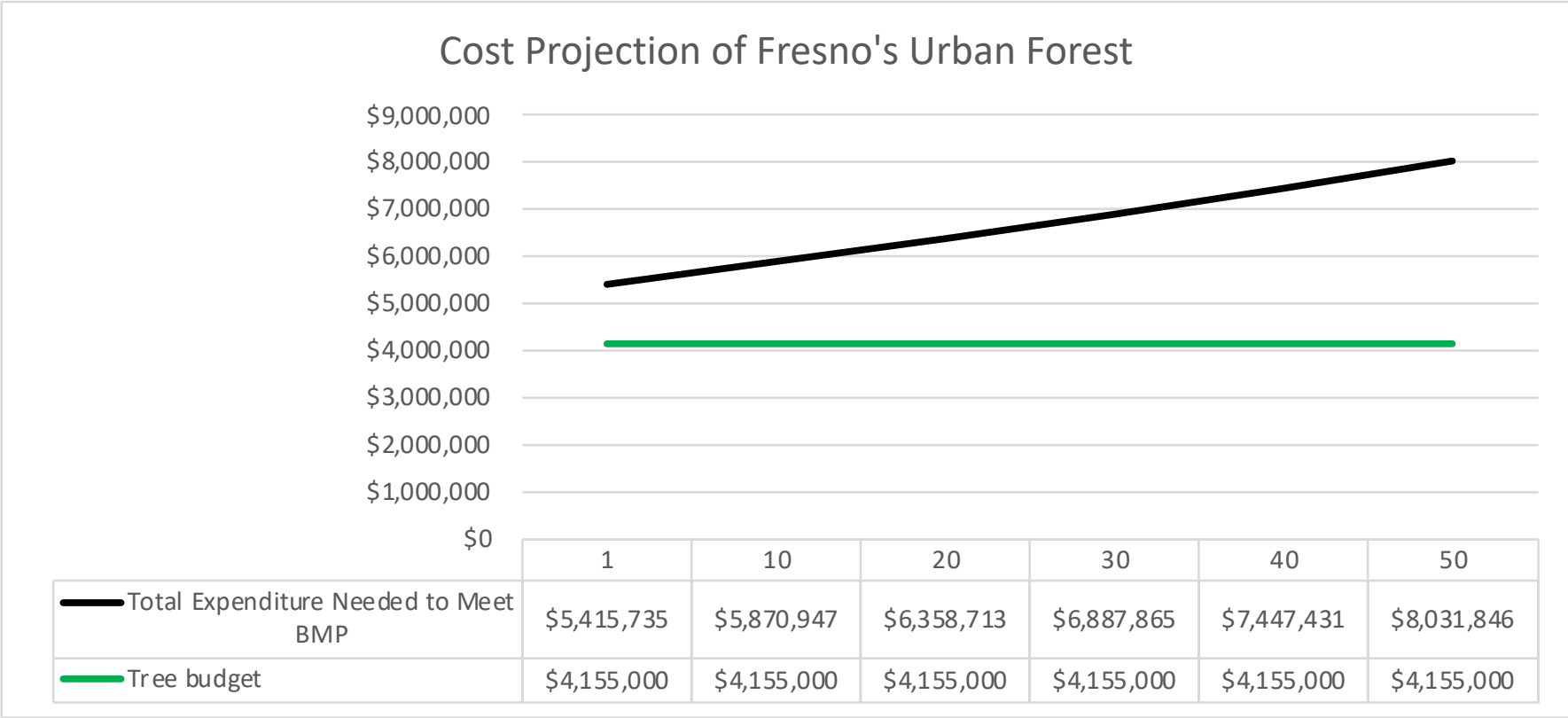
There are four recommended scenarios that Fresno's urban forest can take moving forward. Each scenario in this analysis will project Fresno's tree inventory 50 years into the future based on different management actions starting with "business as usual" and ending with reaching the aspiration goal of 20% canopy cover. For each scenario, 3% inflation rate was used to project costs in the future. Funding is also increased by 3% annually to show at what point funding could match costs. The purpose of these recommended scenarios is to provide options where sufficient funding and staffing can be reached. Those two key factors (funding and staff/contractors) are paramount to achieving a proactive urban forest management program, which will reduce the amount of reactive management occurs (emergencies, incidents, or inquiries from tree failures). Without staff/contractors to coordinate tree planting and management efforts, greater urban forestry goals identified in this UFMP cannot be implemented or achieved. Providing sufficient staffing and funding for the possible pathways allows the City to foster a more resilient, more sustainable, and more equitable urban forest.

Expanding canopy cover requires the planting and establishment of new trees into the landscape. Planting and establishment care require staff coordination, planning discussions, and planting efforts, as well as tree stock, tree watering, tree stakes, tree ties, irrigation, and personnel to water the trees for the first three years. In Fresno, newly planted trees need both funding and resources to grow to maturity in the urban landscape. To maintain a safe urban forest, industry standards outlines a 5-7 year pruning cycle, which can only be achieved with increased and annual funding and staff to coordinate these efforts.

5.2.1 Scenario One: Business as Usual

Business as usual has no changes to the current management practices and funding going towards the urban forest. This scenario holds pruning at a ten-year cycle, no establishment care, and the only planting is happening from the 1,000-tree

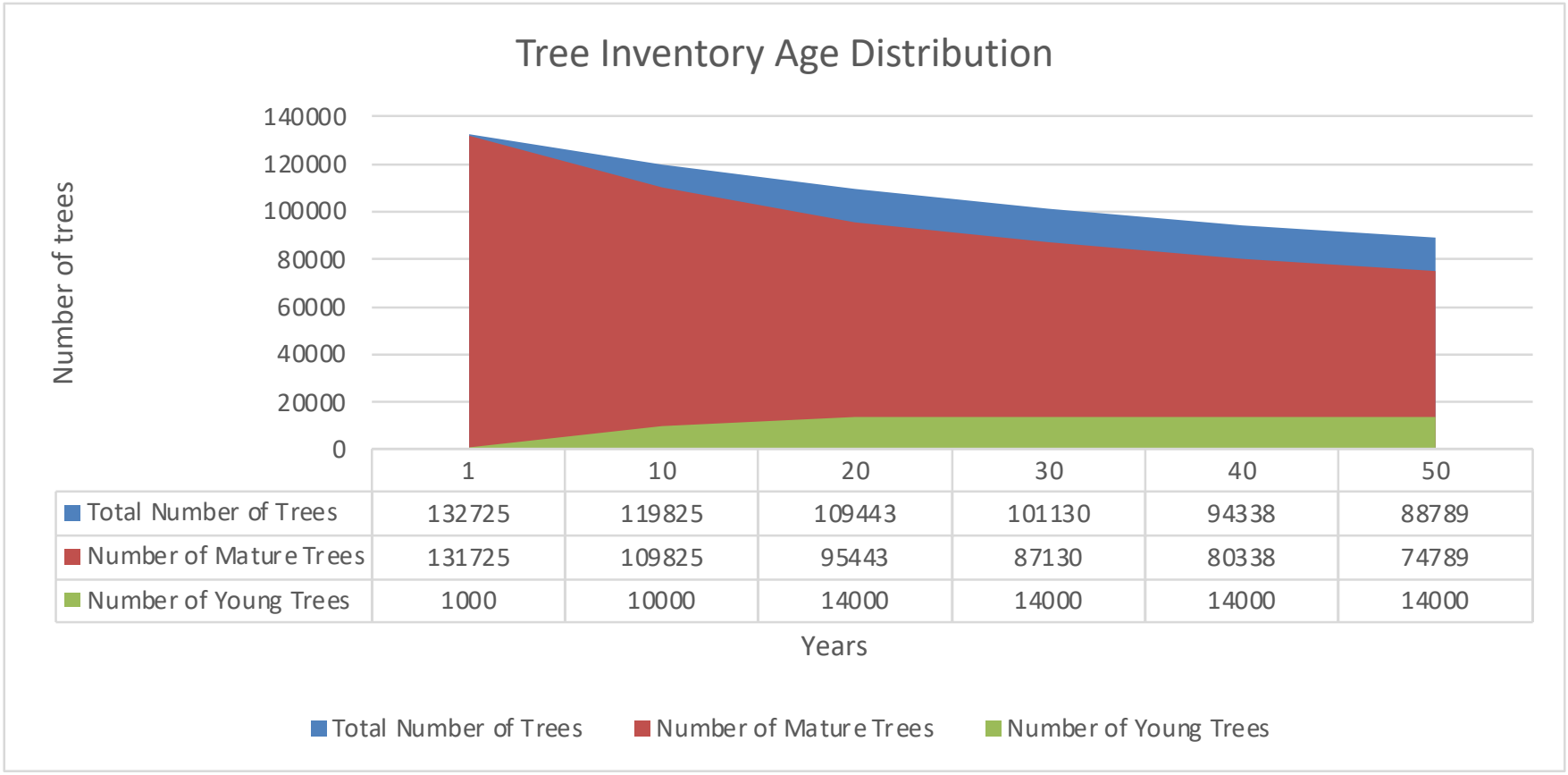
Exhibit 5-1. Fresno's Estimated Cost for Managing its Urban Forest with Current Practices



	1	10	20	30	40	50
Total Expenditure Needed to Meet BMP	$5,415,735	$5,870,947	$6,358,713	$6,887,865	$7,447,431	$8,031,846
Tree budget	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000

initiative. On average, an expected net loss of 1,600 trees annually is projected. **Exhibits 5-1 and 5-2** visualize the projected costs and the number of trees within Fresno's publicly managed trees.

Exhibit 5-2. Fresno's Tree Age Distribution

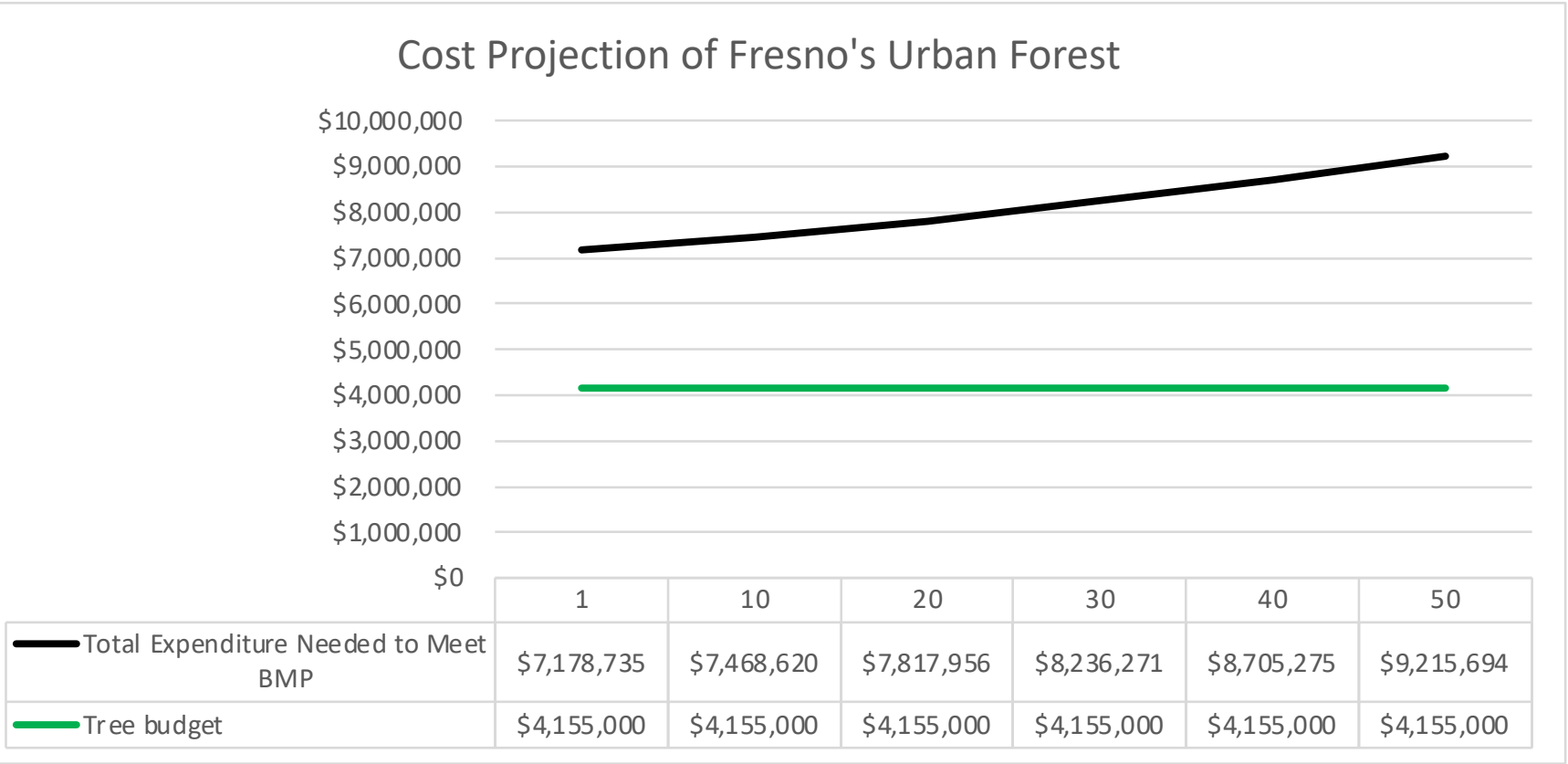


	1	10	20	30	40	50
Total Number of Trees	132725	119825	109443	101130	94338	88789
Number of Mature Trees	131725	109825	95443	87130	80338	74789
Number of Young Trees	1000	10000	14000	14000	14000	14000

5.2.2 Scenario Two: Reach Pruning BMP

Scenario two focuses on reaching Best Management Practices (BMP). Which will change the current management practice (of a ten-year pruning cycle) by meeting industry BMP of every tree being pruned every 5-7 years. This scenario still has no establishment care, and the only planting that is happening is from the 1,000-tree initiative. On average, an expected net loss of

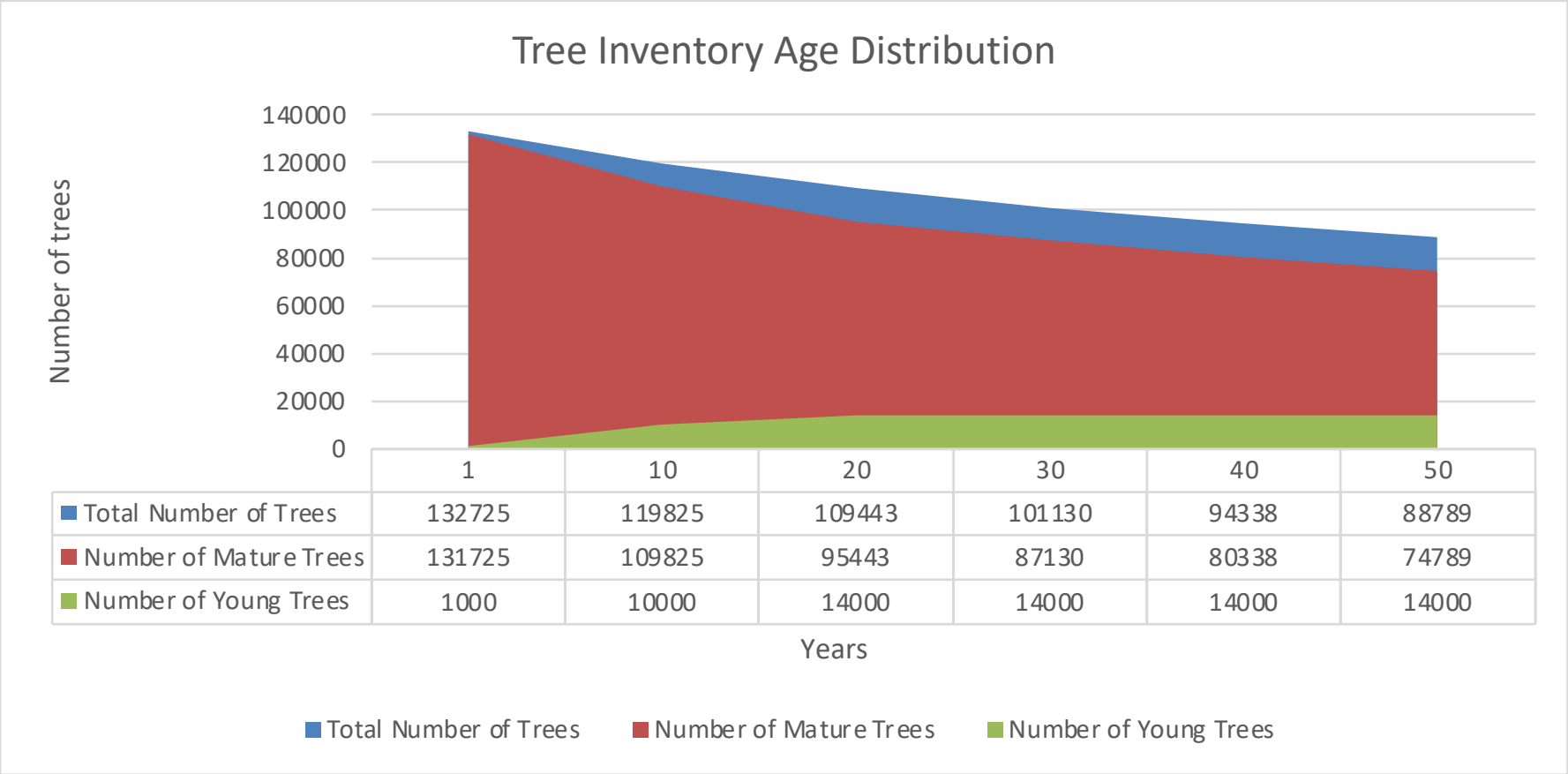
Exhibit 5-3. Fresno's Estimated Cost for Managing its Urban Forest with Pruning BMP



	1	10	20	30	40	50
Total Expenditure Needed to Meet BMP	$7,178,735	$7,468,620	$7,817,956	$8,236,271	$8,705,275	$9,215,694
Tree budget	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000

1,600 trees annually is projected. The benefit of this scenario comes from having the risk of tree accidents, due to limb failure or a fallen tree, reduced. **Exhibits 5-3 and 5-4** visualize the projected costs and the number of trees within Fresno's publicly managed trees.

Exhibit 5-4. Fresno's Tree Age Distribution

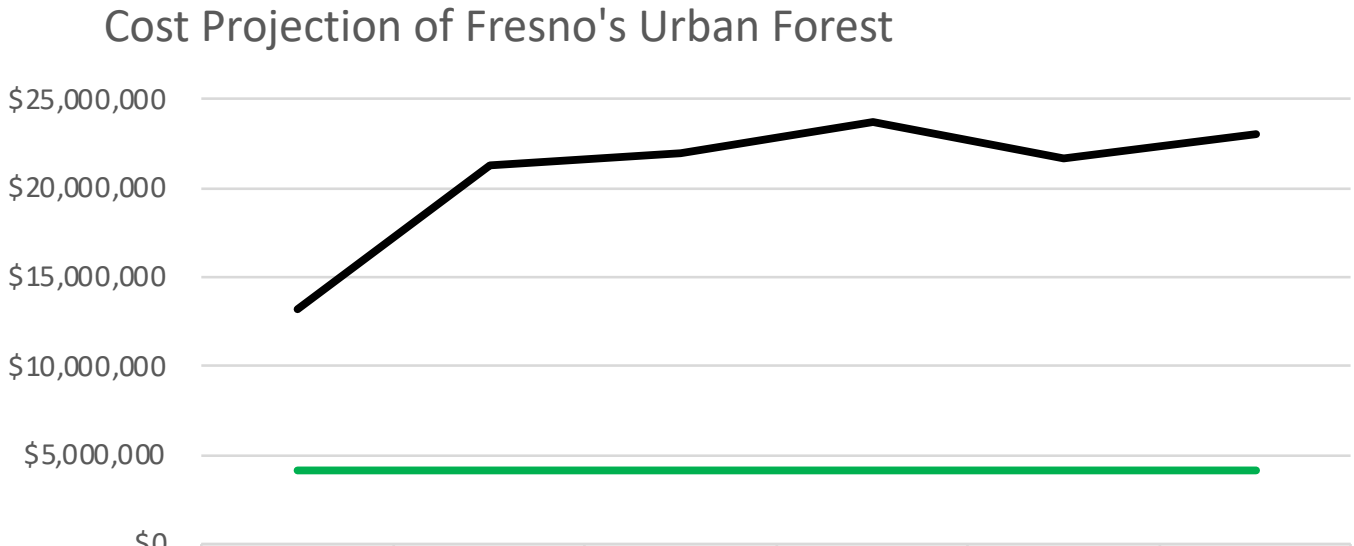


	1	10	20	30	40	50
Total Number of Trees	132725	119825	109443	101130	94338	88789
Number of Mature Trees	131725	109825	95443	87130	80338	74789
Number of Young Trees	1000	10000	14000	14000	14000	14000

5.2.3 Scenario Three: Fill Existing Vacant Sites

Fresno has just under 30,000 vacant tree wells that a tree used to occupy but has not been replaced. Scenario three fills those sites over 40 years and replaces dead trees with new ones. This scenario holds pruning at BMP, includes a three-year establishment care for newly planted trees, and to replace the dead trees and fill the vacant sites, planting an estimated

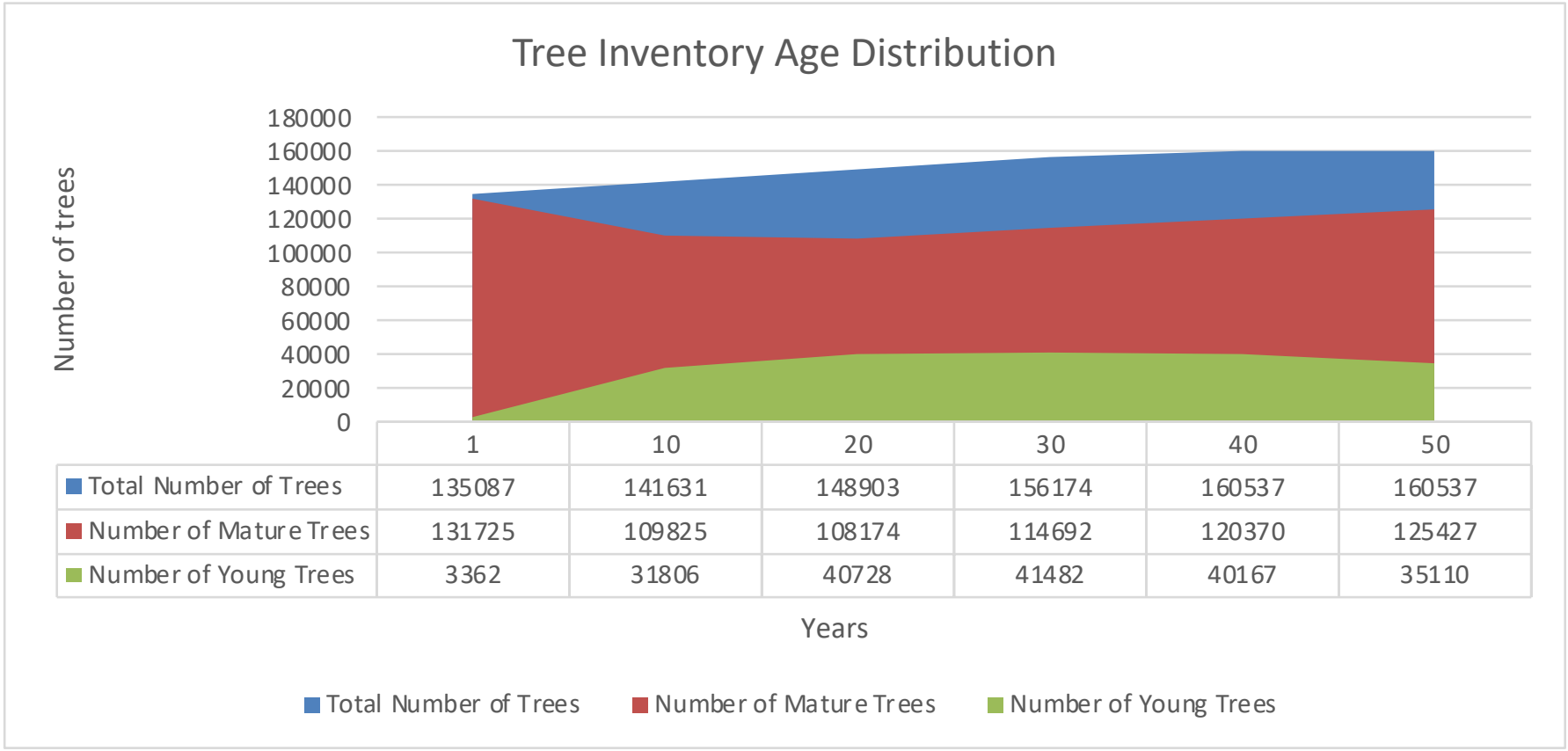
Exhibit 5-5. Fresno's Estimated Cost for Managing its Urban Forest with Filling the Vacant Sites



	1	10	20	30	40	50
Total Expenditure Needed to Meet BMP	$13,149,291	$21,300,318	$21,949,832	$23,699,363	$21,671,675	$23,023,650
Tree budget	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000

amount of 3,400 trees annually will be required. On average, an expected net gain of 727 trees annually is projected. **Exhibits 5-5 and 5-6** visualize the projected costs and the number of trees within Fresno's publicly managed trees.

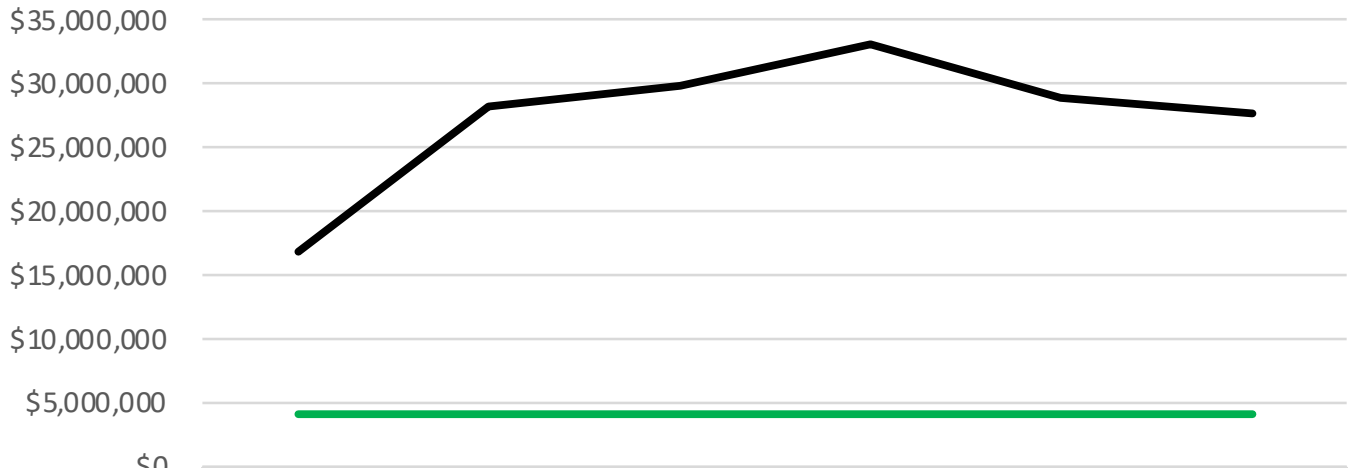
Exhibit 5-6. Fresno's Tree Age Distribution



5.2.4 Scenario Four: 20% Canopy Cover Goal

Scenario four reaches the aspirational goal of a 20% canopy cover within Fresno. To achieve this goal an estimated 80,000 trees will need to be planted over forty years to expand the canopy to 20%. This equals to 4,639 trees annually when considering the replacement of trees that died for that year as well. This scenario holds pruning at BMP, includes a three-

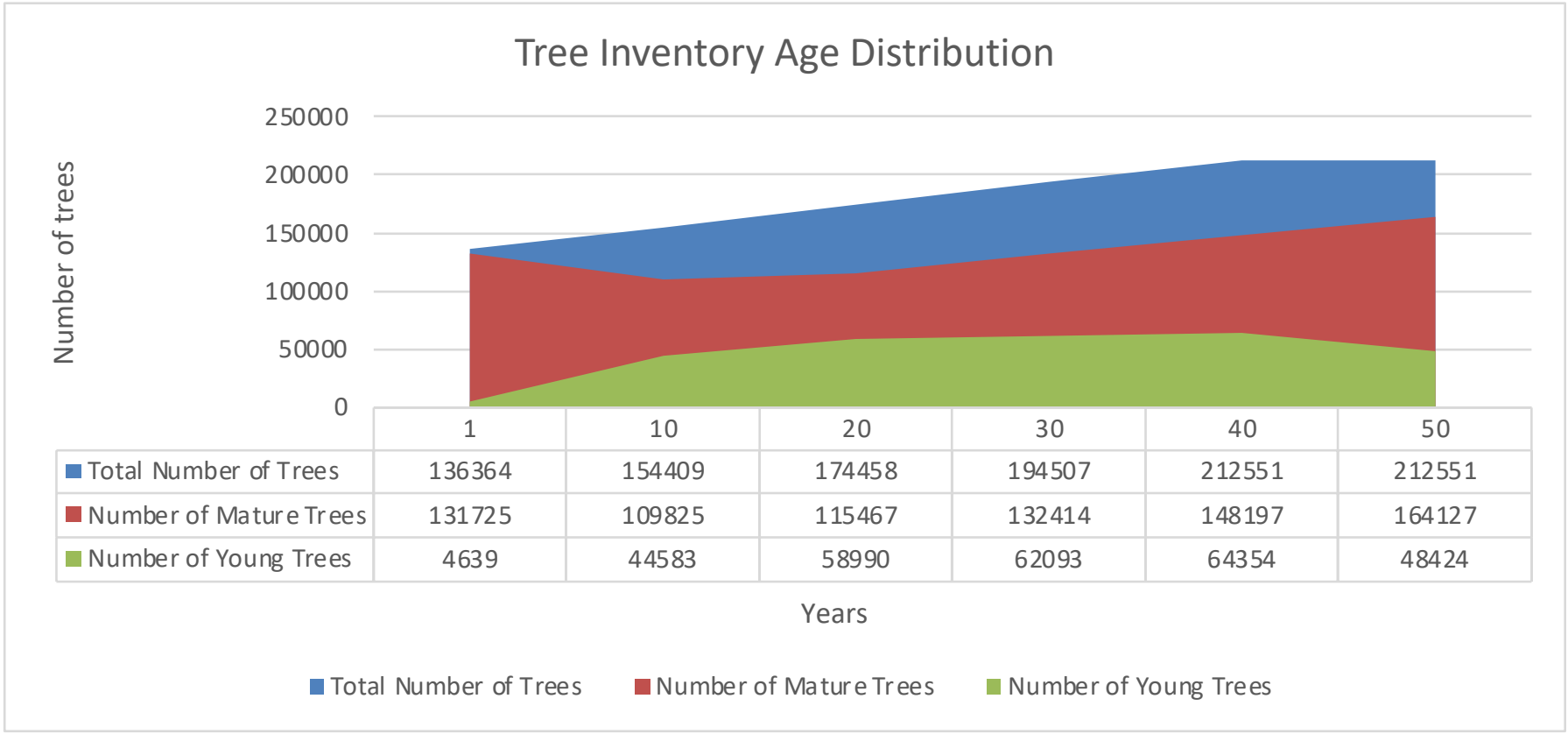
Exhibit 5-7. Fresno's Estimated Cost for Managing its Urban Forest with 20% Canopy Cover



	1	10	20	30	40	50
Total Expenditure Needed to Meet BMP	$16,794,925	$28,229,793	$29,793,231	$33,045,488	$28,917,670	$27,670,855
Tree budget	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000	$4,155,000

year establishment care for newly planted trees, filling the vacant sites, and creating an estimated 51,100 tree wells to plant the needed expansion of canopy. On average, an expected net gain of 2,004 trees annually is projected. **Exhibits 5-7 and 5-8** visualize the projected costs and the number of trees within Fresno's publicly managed trees.

Exhibit 5-8. Fresno's Tree Age Distribution



	1	10	20	30	40	50
Total Number of Trees	136364	154409	174458	194507	212551	212551
Number of Mature Trees	131725	109825	115467	132414	148197	164127
Number of Young Trees	4639	44583	58990	62093	64354	48424

5.3 Guiding Principles, Strategies, and Actions

STRATEGIC PLAN

The Fresno UFMP Strategic Plan lays out a roadmap to achieving Fresno's vision statement for the ideal urban forest.

Guiding Principle	Strategy
A sufficiently funded urban forest	The urban forest and its goals are achieved through sufficient financial investment and adequate staffing resources.
A maintained living asset	Trees are maintained according to best management practices to improve the health, longevity, safety, and functional capacity of the existing urban forest, and to ensure that the future urban forest can reach its potential to provide the full range of environmental benefits and services.
A flourishing tree canopy enjoyed by all	Existing trees are maintained, and new trees are strategically planted to increase canopy cover so that all Fresno residents have equitable distribution of tree canopy coverage.
An enhanced quality of life for community members	The quality of life in Fresno is enhanced by benefits and services provided by the urban forest.
An urban forest that is well prepared for climate change	The thriving urban forest contributes to reduced urban heat islands; increased energy efficiency; resilience to drought, heat, pests, and diseases; and landscapes that conserve water.
An urban forest that balances trees, housing needs, and infrastructure	Trees are included in the beginning of the planning process to provide landscaped settings and habitat, maximize environmental benefits, and reduce infrastructure conflicts.

GUIDING PRINCIPLES

GUIDING PRINCIPLE 1:

A Sufficiently Funded Urban Forest

STRATEGY	Action No.	ACTION	TIME FRAME
The urban forest and its goals are achieved through sufficient financial investment and adequate staffing resources.	**1A**	Apply for state grants and increase nonprofit and other partnerships to increase funding for tree planting and care establishment	Ongoing
	1B	Continue to pursue tree planting opportunities through community volunteer events or collaborating with local organizations to reduce the cost of tree planting	Ongoing
	1C	Communicate the economic value of trees to decision makers	Ongoing
	1D	Develop a strategy to increase tree maintenance funds as the City's trees age and require increased maintenance costs	Medium
	1E	Pursue CAL FIRE grant funding to develop an urban wood reuse program	Short
	1F	Identify opportunities to leverage future development projects to increase resources for urban forest management	Medium
	1G	Annually provide a report on the City's return on investment from the funding that is allocated to urban forest management	Ongoing

(continued)

GUIDING PRINCIPLE 1:

A Sufficiently Funded Urban Forest

STRATEGY	Action No.	ACTION	TIME FRAME
The urban forest and its goals are achieved through sufficient financial investment and adequate staffing resources.	**1H**	Hire additional City staff and/or increase current services from contractors to accommodate tree maintenance backlog	Short
	1I	Designate a City Arborist or City Urban Forester to oversee all urban forest activities in the City	Short
	1J	Increase funding to meet best management practice (BMP) recommendations, and annually match funding with the inflation rate increase	Ongoing
	1K	Improve continuing education opportunities for staff, to ensure they're operating under BMPs	Short
	1L	Establish an internship program to enhance the urban forestry workforce	Medium

GUIDING PRINCIPLE 2:

A Maintained Living Asset

STRATEGY	Action No.	ACTION	TIME FRAME
Trees are maintained according to best management practices to improve the health, longevity, safety, and functional capacity of the existing urban forest, and to ensure that the future urban forest can reach its potential to provide the full range of environmental benefits and services.	**2A**	Update the City's right-of-way tree inventory every 5 years to ensure the City has accurate information about all its tree assets	Ongoing
	2B	Continue the pruning cycle of 10 years, with an eventual 5–7-year goal for all City-managed trees	Long
	2C	Create a tree risk management program that includes risk assessments every 3 to 5 years	Medium
	2D	Align tree practices, such as planting, establishment care, and pruning with International Society of Arboriculture (ISA) BMP and American National Standards Institute (ANSI) Standards.	Short
	2E	Update planting guidelines according to ISA BMP and ANSI Standards. Ensure that planting guidelines are followed by city staff and contractors.	Long
	2F	Update plant material standards (Section 26-2.1 of the Standard Specifications) with current industry best management practices.	Medium
	2G	Adopt the Recommended Species List (Appendix K) for use by all City departments to guide tree planting.	Short
	2H	Implement an irrigation program so that new trees receive adequate water	Medium

(continued)

GUIDING PRINCIPLE 2:

A Maintained Living Asset

Strategy	Action No.	Action	Time Frame
Trees are maintained according to best management practices to improve the health, longevity, safety, and functional capacity of the existing urban forest, and to ensure that the future urban forest can reach its potential to provide the full range of environmental benefits and services.	**2I**	When experiencing extreme heat or drought events, check soil moisture for newly planted trees to determine if an additional watering event per week will benefit new tree establishment.	Short
	2J	Plant 2,600 new trees per year to maintain maintain current canopy cover	Ongoing
	2K	Implement a formative pruning program for young and newly planted trees to mitigate potential tree structure and safety issues	Medium
	2L	Explore partnerships for developing an urban wood reuse program, such as programs for tree removal and milling, to turn removed trees into usable lumber	Short
	2M	Monitor trees rated as poor or dead in the City's tree inventory to determine appropriate management actions	Short
	2N	Merge contractor and internal tree work records into a singular database.	Short
	2O	The City should continue to monitor its arborist contractor to adhere to ISA standards and be routinely evaluated by a City arborist.	Ongoing
	2P	Topping trees is discouraged throughout the city of Fresno for private and public land.	Ongoing

GUIDING PRINCIPLE 3:

A Flourishing Tree Canopy Enjoyed By All

Strategy	Action No.	Action	Time Frame
Existing trees are maintained, and new trees are strategically planted to increase canopy cover so that all Fresno residents have equitable distribution of tree canopy coverage.	**3A**	Achieve a 20% City-wide canopy cover over the next 40 years	Long
	3B	Prioritize planting throughout Fresno census tracts based on the Priority Planting Score and map to increase canopy cover equitably throughout the City	Medium
	3C	Assess causes of canopy loss for council districts, landscape maintenance districts, and census tracts with high canopy decrease from 2018 to 2022	Short
	3D	Focus tree planting initiatives on schools, mixed uses areas, and commercial areas and on census tracts with high priority planting scores	Ongoing
	3E	Increase tree planting near bus stops, paths, and tails with 0%–10% canopy cover	Ongoing
	3F	Ensure urban forestry policies and programs focus on increasing canopy cover for low-canopied areas in a way that is culturally and linguistically relevant and mitigates economic burdens on residents	Ongoing
	3G	Increase tree planting in zones that surround agriculture/future development areas, to mitigate the canopy loss in these areas	Ongoing
	3H	Prioritize large stature trees that contribute to more leaf area and importance value	Ongoing
	3I	Require tree replacements at a ratio greater than 2:1 for all permitted tree removals, especially with removals associated with development	Medium

GUIDING PRINCIPLE 4:

Enhance The Quality Of Life For Community Members

Strategy	Action No.	Action	Time Frame
The quality of life in Fresno is enhanced by benefits and services provided by the urban forest.	**4A**	Create a program for community members to participate in tree care and maintenance in their own neighborhoods (i.e., developing a community forester program, community tree care workshops, tree plantings)	Short
	4B	Provide guidance and educational materials to property owners regarding responsibility for maintaining trees in the public right-of-way and how to properly care for and water trees	Short
	4C	Create education programs that describe how planting more trees in Fresno will increase shade and cleaner air in the City	Short
	4D	Continue to work with Working Group members to regularly, and actively engage with community members to best plan for future urban forest- related endeavors	Ongoing
	4E	Create and provide a guide on how to properly plant, prune, water, and maintain private property trees	Short
	4F	Identify streets where trees are lacking and pursue tree planting opportunities along these routes, beginning with areas identified by community members during public input, including the Tower District, Florence Avenue site, Marketplace at El Paseo, Manchester Shopping Center, and others.	Short
	4G	Continue multilingual outreach to Spanish, Hmong, and Punjabi communities, to ensure their diverse prospectives are heard and valued	Ongoing

GUIDING PRINCIPLE 5:

An Urban Forest That Is Well Prepared For Climate Change

Strategy	Action No.	Action	Time Frame
The thriving urban forest contributes to reduced urban heat islands; increased energy efficiency; resilience to drought, heat, pests and diseases; and landscapes that conserve water.	**5A**	Decrease the frequency of tree species that are over represented in the inventory for new tree plantings	Ongoing
	5B	Plant trees rated by the Water Use Classification of Landscape Species (WUCOLs) as low and very low	Ongoing
	5C	Ensure that age classes of trees are sufficiently distributed to ensure environmental benefits continue, by consistently planting 2,600 trees per year	Ongoing
	5D	Implement a scouting program for Very High and High rated pests to better prevent or intercept a pest that could cause severe damage to the urban forest.	Short
	5E	Avoid planting of identified invasive species	Short
	5F	Annually review the City recommended tree species list and update it as appropriate to ensure species are suitable for current and future climate conditions, are low water use, will achieve species diversity standards, and will prioritize well-adapted local and regionally native species	Ongoing

GUIDING PRINCIPLE 6:

An Urban Forest That Balances, Trees, Housing Needs, And Infrastructure

Strategy	Action No.	Action	Time Frame
Trees are included in the beginning of the planning process to provide landscaped settings and habitat, maximize environmental benefits, and reduce infrastructure conflicts.	**6A**	Invest in a community outreach and education program focused on mitigating conflicts between trees and infrastructure	Ongoing
	6B	Consider recommendations discussed in Chapter 4 to strengthen tree replacement, protection and Code violations within Municipal Code Article 3: Street Trees and Parkways	Short
	6C	Consider removing the exemption of tree protection on single family zoned lots	Short
	6D	Consider updating Municipal Code Sections 25: Landscape Irrigation and 26: Planting Specifications per recommendations in Chapter 4 of the UFMP Technical Assessment	Short
	6E	Update Municipal Code Chapter 15: Traffic Divider Islands per recommendations in Chapter 4 of the UFMP Technical Assessment	Short
	6F	Consider updating the General plan per recommendations in Chapter 4 of the UFMP Technical Assessment to add tree protection goals, policies, and actions that align with this UFMP	Medium

GUIDING PRINCIPLE 6:

An Urban Forest That Balances, Trees, Housing Needs, And Infrastructure

Strategy	Action No.	Action	Time Frame
Trees are included in the beginning of the planning process to provide landscaped settings and habitat, maximize environmental benefits, and reduce infrastructure conflicts.	**6G**	Consider updating the Parks Master Plan per Chapter 4 of the UFMP Technical Assessment to align canopy cover goals, tree planting standards, and recommended tree species with this UFMP	Medium
	6H	Consider updating the Housing Element per Chapter 4 of the UFMP Technical Assessment	Medium
	6I	Ensure a City arborist is directly involved in reviewing new development designs, project permits, and removal applications to ensure best arboricultural practices are enforced and trees are protected where possible	Short
	6J	Review and update new subdivision standards. Currently, new subdivisions do not have street trees in the ROW.	Ongoing

6

IMPLEMENTATION PLAN

ONGOING ACTIONS

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
1A	Apply for state grants and increase nonprofit and other partnerships to increase funding for tree planting and care establishment	DPW	$
1B	Pursue tree planting opportunities through community volunteer events or collaborating with local organizations to reduce the cost of tree planting	DPW, PARCS	$
1C	Communicate the economic value of trees to decision makers	DPW, PARCS	$
1G	Annually provide a report on the City's return on investment from the funding that is allocated to urban forest management	DPW, PARCS	$
1K	Increase funding to meet BMP recommendations, and annually match funding with the inflation rate increase	DPW, PARCS City	$$$$
2A	Consider updating the City's right-of-way tree inventory every 5 years to ensure the City has accurate information about all its tree assets	DPW	$$$$
2J	Plant 3,447 new trees per year over 20 years to achieve 20% canopy cover goals	DPW	$$$$
2P	The City should continue to monitor its arborist contractor to adhere to ISA standards and be routinely evaluated by a City arborist.	DPW	$
3D	Focus tree planting initiatives on schools, mixed uses areas, and commercial areas and on census tracts with high priority planting scores	DPW, PARCS, Planning	$
3E	Increase tree planting near bus stops, paths, and trails with 0% to 10% canopy cover	DPW, PARCS	$$
3F	Ensure urban forestry policies and programs focus on increasing canopy cover for low-canopied areas in a way that is culturally and linguistically relevant, and mitigates economic burdens on residents	DPW, PARCS, Planning	$
3G	Increase tree planting in zones that surround agriculture/future development areas, to mitigate the canopy loss in these areas	DPW	$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

ONGOING ACTIONS

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
3H	Prioritize large stature trees that contribute to more leaf area and importance value	DPW, PARCS, Planning	$
4D	Continue to work with Working Group members to regularly, and actively engage with community members to best plan for future urban forest- related endeavors	DPW	$
4G	Continue multilingual outreach to Spanish, Hmong, and Punjabi communities, to ensure their diverse prospectives are heard and valued	DPW, PARCS, Planning	$
4H	Convene the UFMP Working Group twice per year to discuss UFMP implementation progress, solicit feedback, and strengthen partnerships.	DPW	$
5A	Decrease the frequency of tree species that are over represented in the inventory for new tree plantings	DPW, PARCS, Planning	$
5B	Plant trees rated by the Water Use Classification of Landscape Species (WUCOLs) as low and very low	DPW, PARCS	$
5C	Ensure that age classes of trees are sufficiently distributed to for environmental benefits continue, by consistently planting 2,600 trees per year	DPW	$
5F	Annually review the City recommended tree species list and update it as appropriate to ensure species are suitable for current and future climate conditions, are low water use, will achieve species diversity standards, and will prioritize well-adapted local and regionally native species	DPW	$
6A	Invest in a community outreach and education program focused on mitigating conflicts between trees and infrastructure	DPW, PARCS, Planning	$$$
6J	Annually retake the Vibrant Cities Lab Community Assessment and Goal Setting Tool to track, measure, and highlight UFMP implementation progress.	DPW	$
6K	Review, reassess, and update the UFMP every 5 years to ensure its recommendations meet current conditions of the City.	DPW, City	$$$$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

SHORT TERM ACTIONS 1-5 YEARS

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
1E	Pursue CAL FIRE grant funding to develop an urban wood reuse program	DPW, PARCS	$
1H	Hire additional City staff and/or increase current services from contractors to accommodate tree maintenance backlog.	DPW	$$$$
1J	Designate a City Arborist or City Urban Forester to oversee all urban forest activities in the City	DPW,	$$
1L	Improve continuing education opportunities for staff, to ensure they're operating under BMPs	DPW, PARCS	$$
1M	Conduct an urban forest financing study to determine the full scale of funding required to meet all actions in this UFMP, including potential funding options	DPW, City	$$
2D	Align tree practices, such as planting, establishment care, and pruning with ISA BMP and ANSI Standards	DPW, PARCS	$$
2G	Adopt the Recommended Species List (Appendix K) for use by all City departments to guide tree planting	DPW	$
2I	When experiencing extreme heat or drought events, check soil moisture for newly planted trees to determine if an additional watering event per week will benefit new tree establishment	DPW	$$
2L	Explore partnerships for developing an urban wood reuse program, such as programs for tree removal and milling, to turn removed trees into usable lumber	DPW	$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

SHORT TERM ACTIONS 1-5 YEARS *(CONTINUED)*

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
2M	Monitor trees rated as poor or dead in the City's tree inventory to determine appropriate management actions	DPW	$$$$
2O	Merge contractor and internal tree work records into a singular database	DPW	$$$
3C	Assess causes of canopy loss for council districts, landscape maintenance districts, and census tracts with high canopy decrease from 2018 to 2022	DPW	$$$
4A	Create a program for community members to participate in tree care and maintenance in their own neighborhoods (i.e., developing a community forester program, community tree care workshops, tree plantings)	DPW	$
4B	Provide guidance and educational materials to property owners regarding responsibility for maintaining trees in the public right-of-way and how to properly care for and water trees	DPW, Planning	$
4C	Create education programs that describe how planting more trees in Fresno will increase shade and cleaner air in the City	DPW, PARCS	$
4E	Create and provide a guide on how to properly plant, prune, water, and maintain private property trees	DPW	$

NOTES: DPW = Public Works; PARCS = Parks
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

SHORT TERM ACTIONS 1-5 YEARS *(CONTINUED)*

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
4F	Identify streets where trees are lacking and pursue tree planting opportunities along these routes, beginning with areas identified by community members during public input, including the Tower District, Hyde Park, Marketplace at El Paseo, Manchester Shopping Center, and others	DPW, PARCS	$$
5D	Implement a scouting program for Very High and High rated pests to better prevent or intercept a pest that could cause severe damage to the urban forest	DPW, PARCS	$$$
5E	Avoid planting of identified invasive species	DPW	$
6B	Update Municipal Code Article 3: Street Trees and Parkways per recommendations in Chapter 4 of the UFMP Technical Assessment to strengthen tree replacement, tree protection, and code violations	DPW, Planning	$
6C	Consider removing the exemption of tree protection on single family zoned lots	Planning	$
6D	Consider updating Municipal Code Sections 25: Landscape Irrigation and 26: Planting Specifications per recommendations in Chapter 4 of the UFMP Technical Assessment	DPW	$
6E	Consider updating Municipal Code Chapter 15: Traffic Divider Islands per recommendations in Chapter 4 of the UFMP Technical Assessment	DPW	$
6I	Ensure a City arborist is directly involved in reviewing new development designs, project permits, and removal applications to ensure best arboricultural practices are enforced and trees are protected where possible	DPW, Parks	$

NOTES: DPW = Public Works; PARCS = Parks
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

MEDIUM TERM ACTIONS 5-10 YEARS

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
1D	Develop a strategy to increase tree maintenance funds as the City's trees age and require increased maintenance costs	DPW, Parks, City	$
1F	Identify opportunities to leverage future development projects to increase resources for urban forest management	DPW, Planning	$
1I	Create a work plan with the tree contractor to increase pruning rates to achieve a 10-year pruning cycle	DPW, City	$$$$
1M	Establish an internship program to enhance the urban forestry workforce	DPW, PARCS, City	$$$$
2C	Create a tree risk management program that includes risk assessments every 3 to 5 years	DPW	$$$$
2F	Consider updating plant material standards (Section 26-2.1 of the Standard Specifications) with current industry best management practices.	DPW	$
2H	Implement an irrigation program so that new trees receive adequate water	DPW, PARCS	$$$$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

MEDIUM TERM ACTIONS 5-10 YEARS *(CONTINUED)*

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
2K	Implement a formative pruning program for young and newly planted trees to mitigate potential tree structure and safety issues	DPW	$$$
3B	Prioritize planting throughout Fresno census tracts based on the Priority Planting Score and map to increase canopy cover equitably throughout the City	DPW	$
2Q	Require tree replacements at a ratio greater than 2:1 for all permitted tree removals, especially with removals associated with development	DPW, Planning	$
6F	Consider updating the General plan per recommendations in Chapter 4 of the UFMP Technical Assessment to add tree protection goals, policies, and actions that align with this UFMP	Planning	$
6G	Consider updating the Parks Master Plan per Chapter 4 of the UFMP Technical Assessment to align canopy cover goals, tree planting standards, and recommended tree species with this UFMP	PARCS, Planning	$
6H	Consider updating the Housing Element per Chapter 4 of the UFMP Technical Assessment	Planning	$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)

LONG TERM ACTIONS 10 YEARS+

ACTION NO.	ACTION	RESPONSIBLE PARTY	COST
2B	Establish a pruning cycle of 10 years, with an eventual 5-7 year goal for all City-managed trees	DPW	$$$$
2E	Consider updating planting guidelines according to ISA BMP and ANSI Standards. Ensure that planting guidelines are followed by city staff and contractors.	DPW, PARCS, Planning	$
3A	Achieve a 20% City-wide canopy cover over the next 40 years	DPW, PARCS, Planning, City	$$$$

NOTES: DPW = Public Works; PARCS = Parks; City = City council action required
COSTS: $ Low (0–$25,000); $$ Medium ($25,000–$50,000); $$$ High ($50,000–$100,000) $$$$ Very High (>$100,000)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7

MONITORING PLAN

The City can use the Vibrant Cities Lab Community Assessment and Goal-Setting Tool to monitor the implementation of the UFMP. The tool is used as an assessment to define the City's current state of a specific area of urban forest sustainability. Each metric is assigned a point value, and the City is assigned a "Total Current Score" and a "Gap Score," or how far off the current state is from the desired goal. A gap score between 20 to 40 is not far from achieving the goals of its urban forest program. Conversely, gap scores of 40+ indicate that a City is still implementing programs and policies to close the gaps and develop a sustainable urban forest.

Public Works and the consultant team conducted Fresno's first assessment on July 15, 2023. This section provides the results from the first assessment, which set the baseline for the City's "Total Current Score" at its pre-UFMP metrics.

Based on the first assessment, the City has a current score of 11, with a gap score of 73. The City's UFMP monitoring plan should be based around the Vibrant Cities Lab Community Assessment and Goal Setting Tool and be retaken each year to track, measure, and highlight progress. The assessment can also be used to demonstrate successes and justify additional funding requests. Since the City first took the assessment, several of the responses that had significant gaps, such as the lack of a UFMP (gap of 5), have already been achieved. The monitoring plan can be found in **Appendix L: Monitoring Plan.**

8

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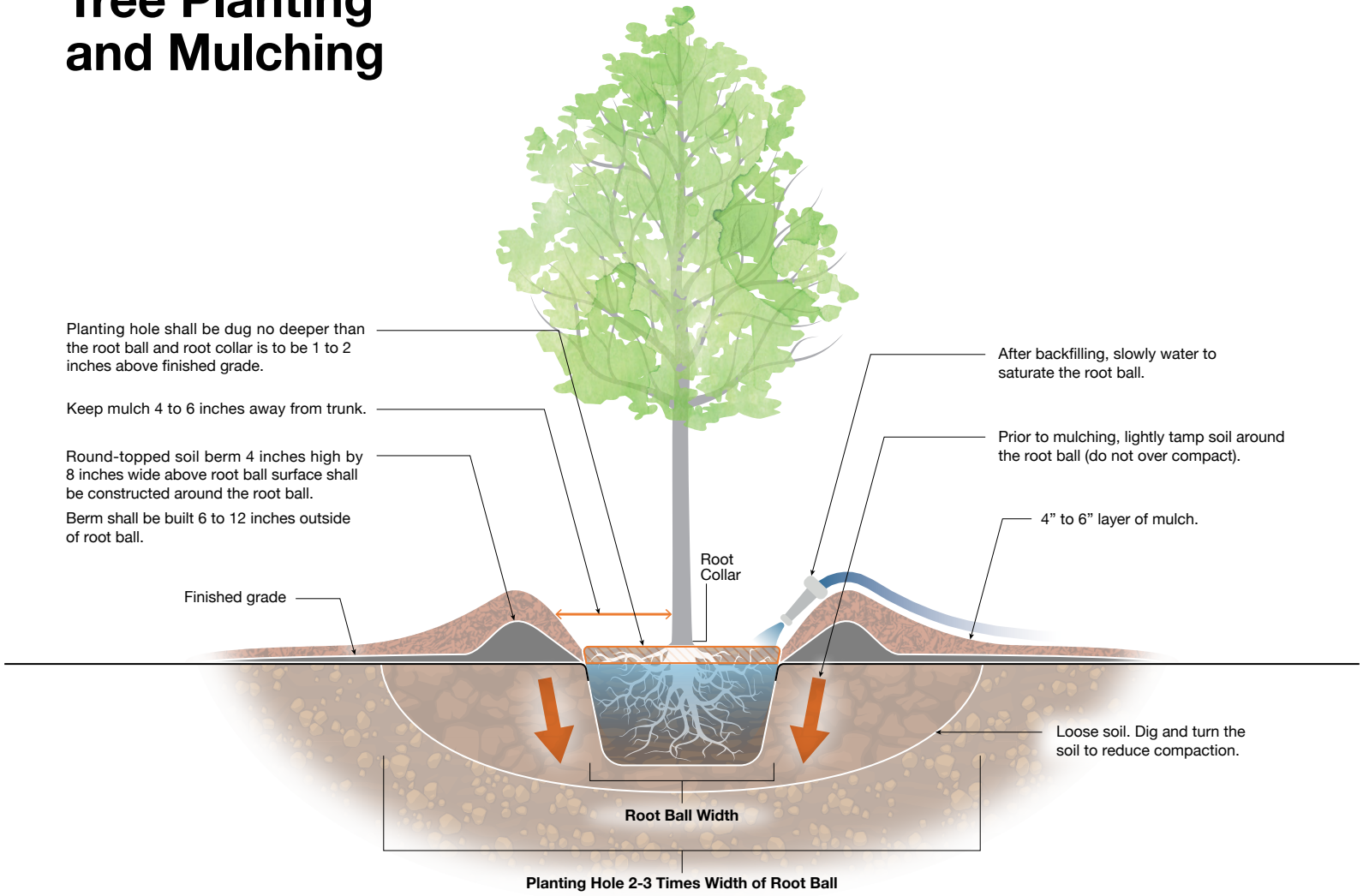
9

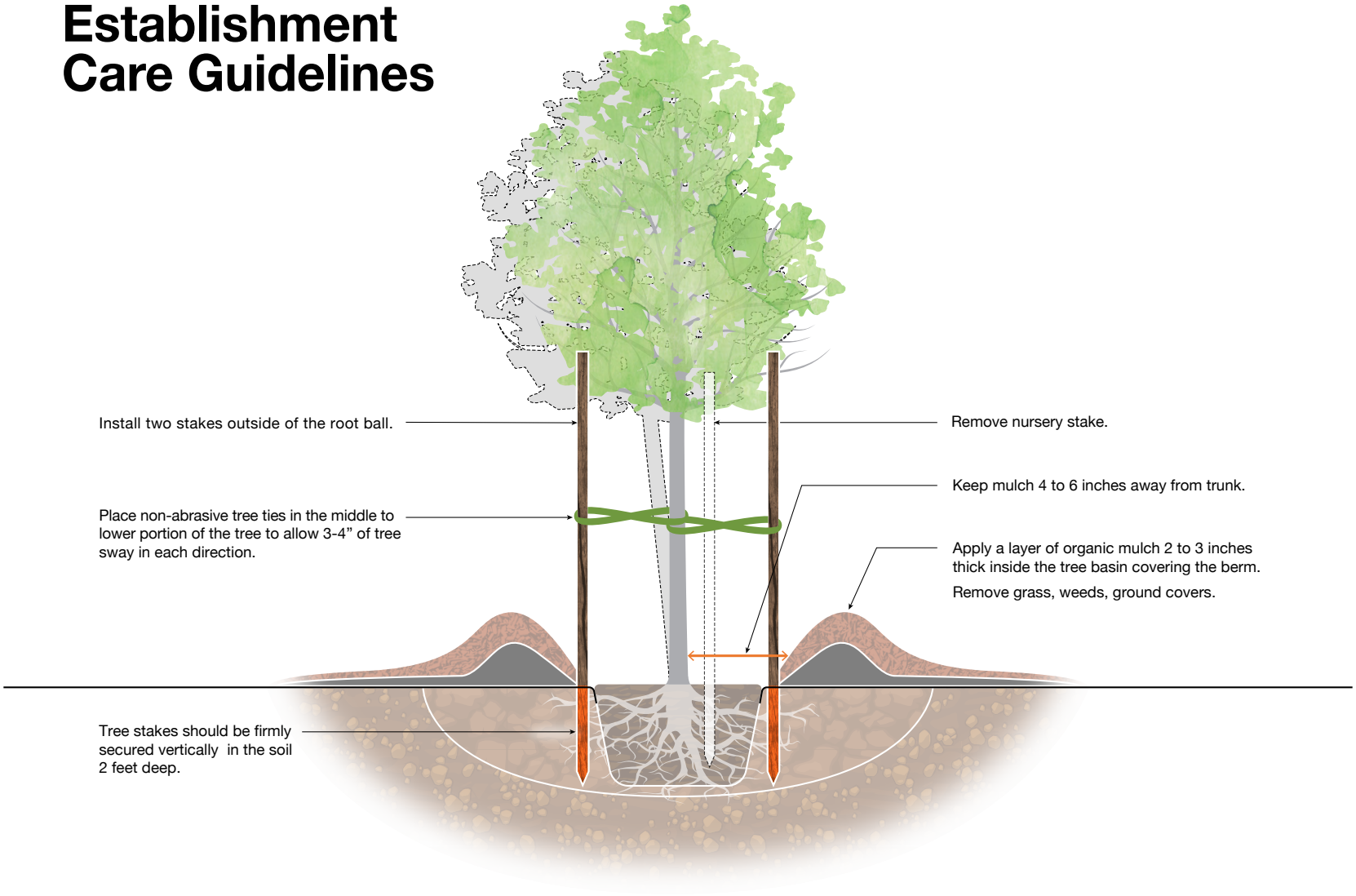
APPENDIX

Tree Planting and Mulching



URBAN TREE FOUNDATION
ADAPTED BY DUDEK

Establishment Care Guidelines



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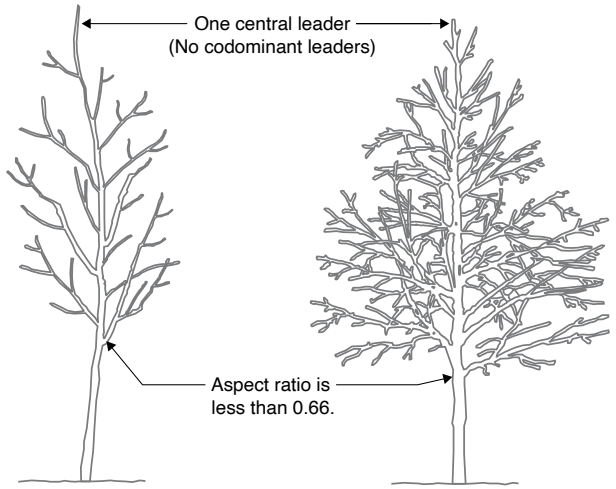
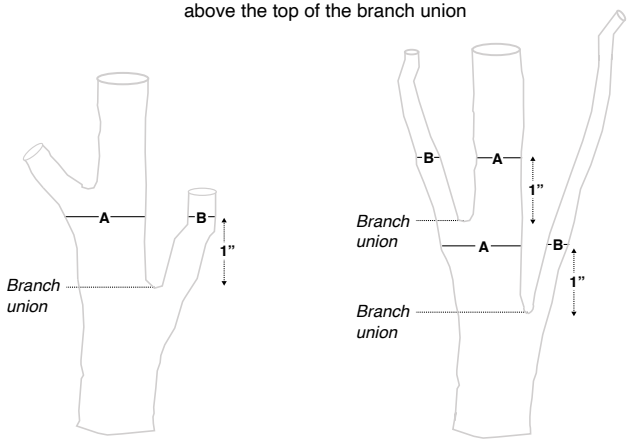
Nursery Stock Selection

Accept



Accept

Aspect ratio of B:A less than 0.66 as measured 1" above the top of the branch union



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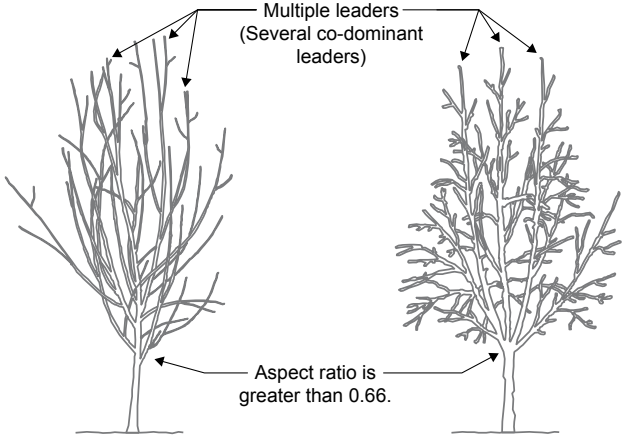

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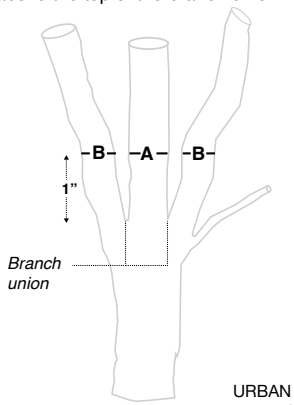

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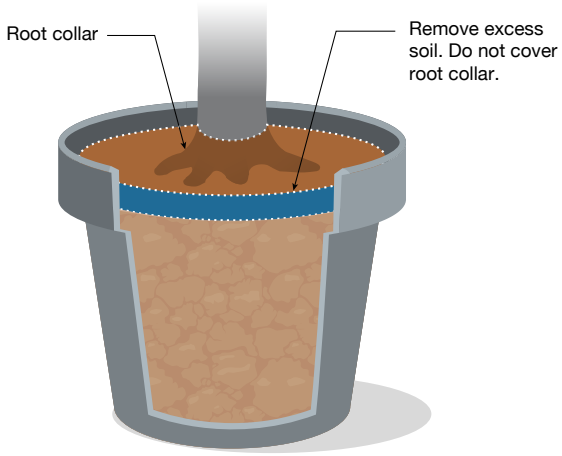
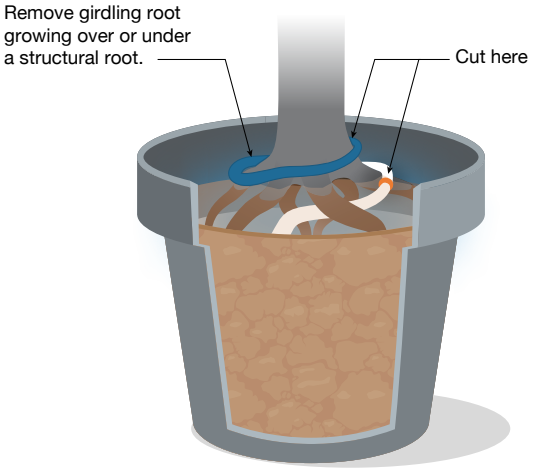
NOTE: 1. *Nursery stock with significant mechanical injury, serious root defects, and trees that show signs of dehydration are to be rejected.* ***2.*** *Aspect ratio shall be less than 0.66 on all branch unions. Aspect ratio is the diameter of branch (B) divided by the diameter of the trunk (A) as measured 1" above the top of the branch union.* ***3.*** *Any tree not meeting the crown observations detail may be rejected.*

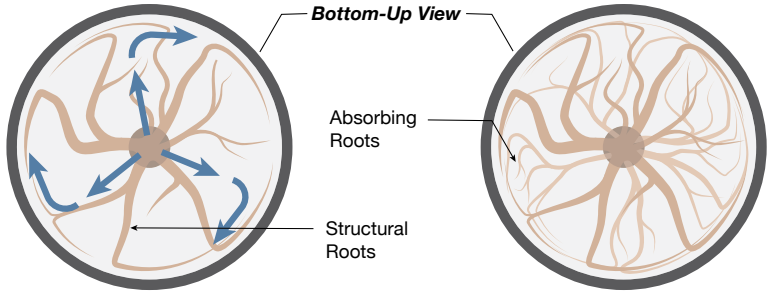
Root Correction for Container Grown Trees





Accept

Roots radiate from trunk and reach each side of root ball without deflecting down or around.



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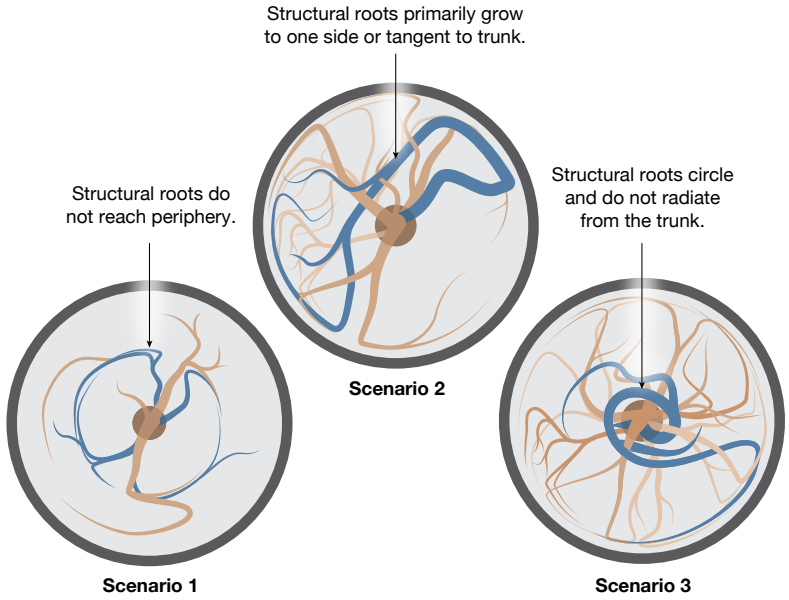


URBAN TREE FOUNDATION
ADAPTED BY DUDEK

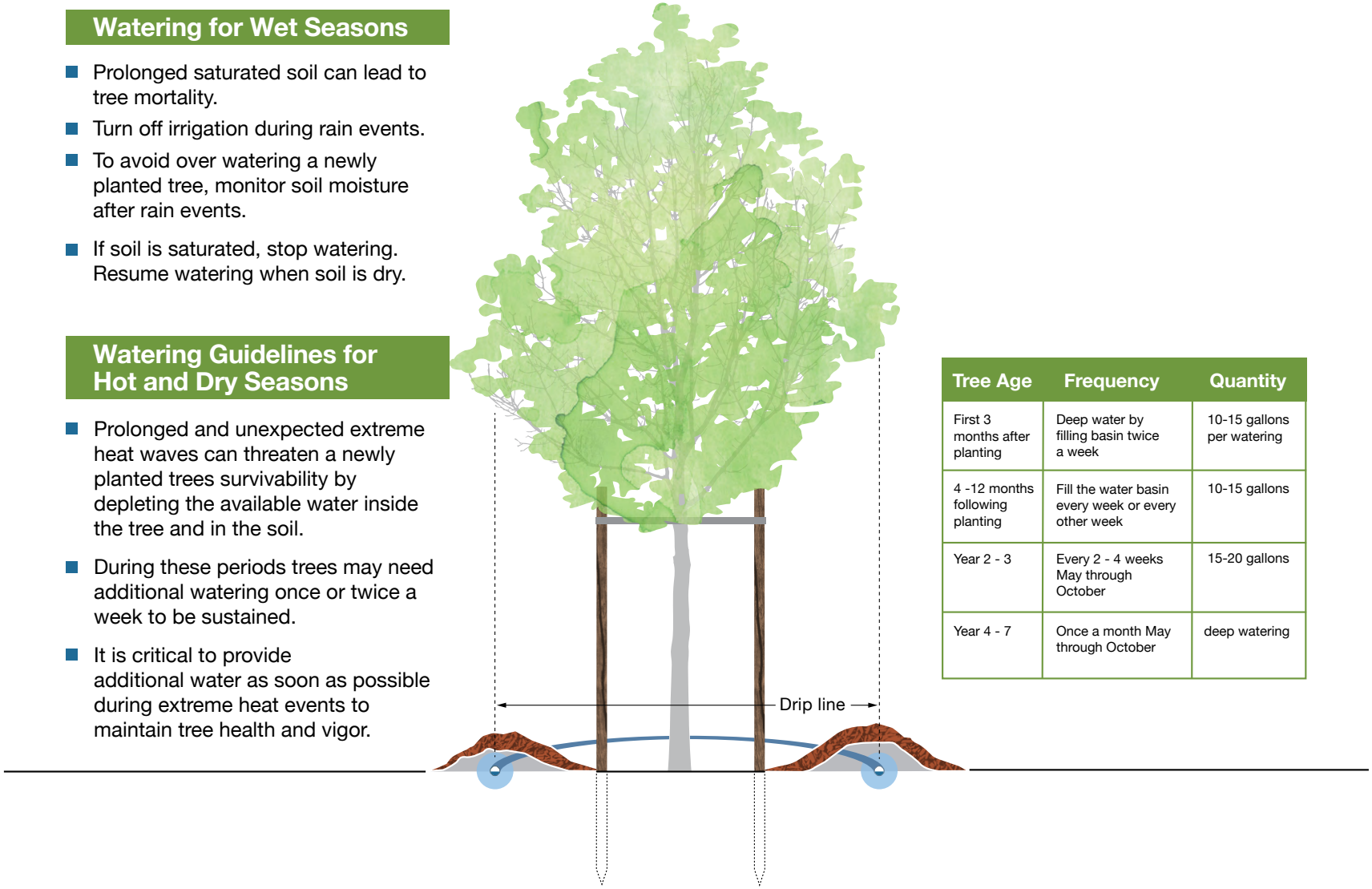
Watering Guidelines

Watering for Wet Seasons

- Prolonged saturated soil can lead to tree mortality.
- Turn off irrigation during rain events.
- To avoid over watering a newly planted tree, monitor soil moisture after rain events.
- If soil is saturated, stop watering. Resume watering when soil is dry.

Watering Guidelines for Hot and Dry Seasons

- Prolonged and unexpected extreme heat waves can threaten a newly planted trees survivability by depleting the available water inside the tree and in the soil.
- During these periods trees may need additional watering once or twice a week to be sustained.
- It is critical to provide additional water as soon as possible during extreme heat events to maintain tree health and vigor.

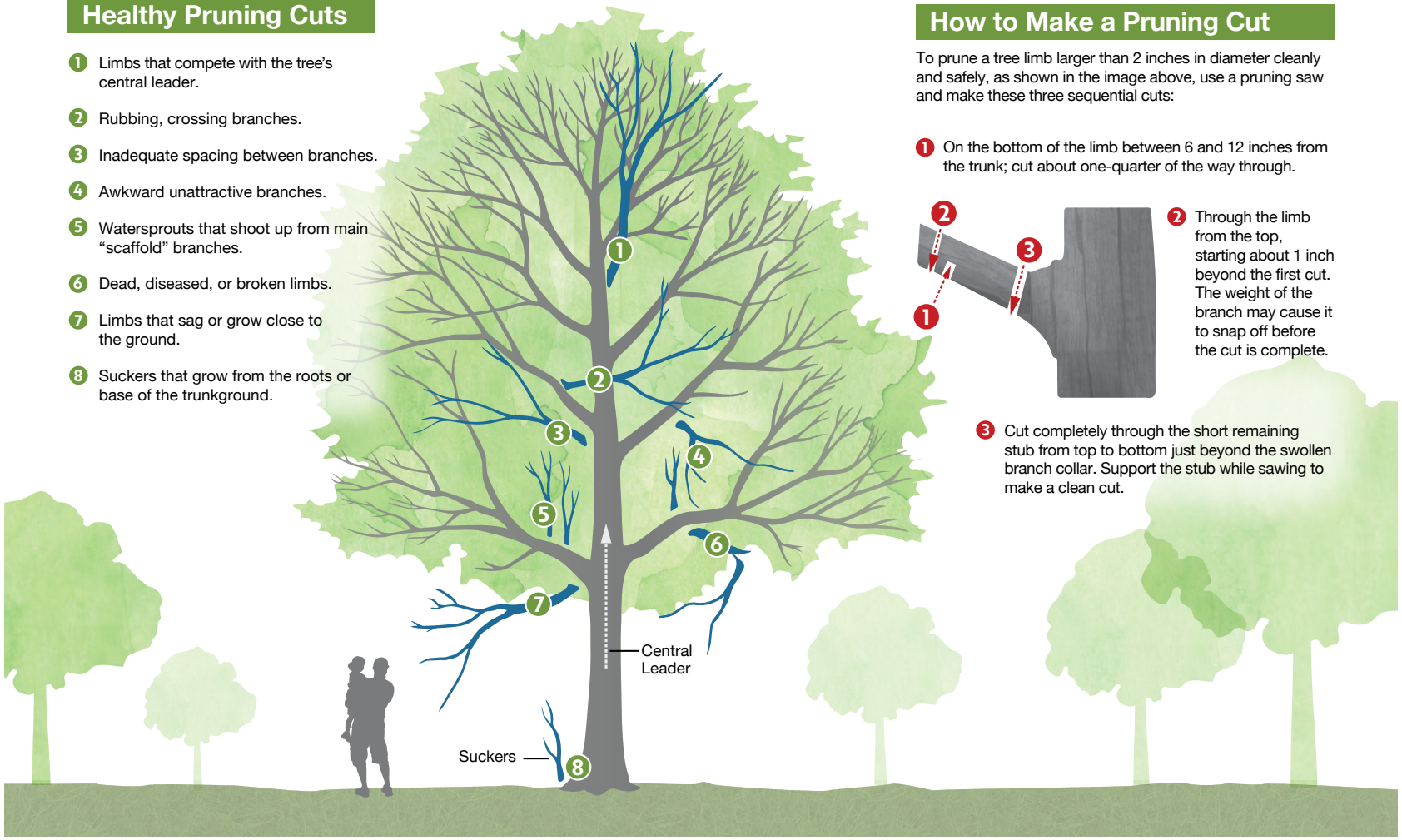


Tree Age	Frequency	Quantity
First 3 months after planting	Deep water by filling basin twice a week	10-15 gallons per watering
4 -12 months following planting	Fill the water basin every week or every other week	10-15 gallons
Year 2 - 3	Every 2 - 4 weeks May through October	15-20 gallons
Year 4 - 7	Once a month May through October	deep watering

Tree Pruning

Healthy Pruning Cuts

1. Limbs that compete with the tree's central leader.
2. Rubbing, crossing branches.
3. Inadequate spacing between branches.
4. Awkward unattractive branches.
5. Watersprouts that shoot up from main "scaffold" branches.
6. Dead, diseased, or broken limbs.
7. Limbs that sag or grow close to the ground.
8. Suckers that grow from the roots or base of the trunkground.



How to Make a Pruning Cut

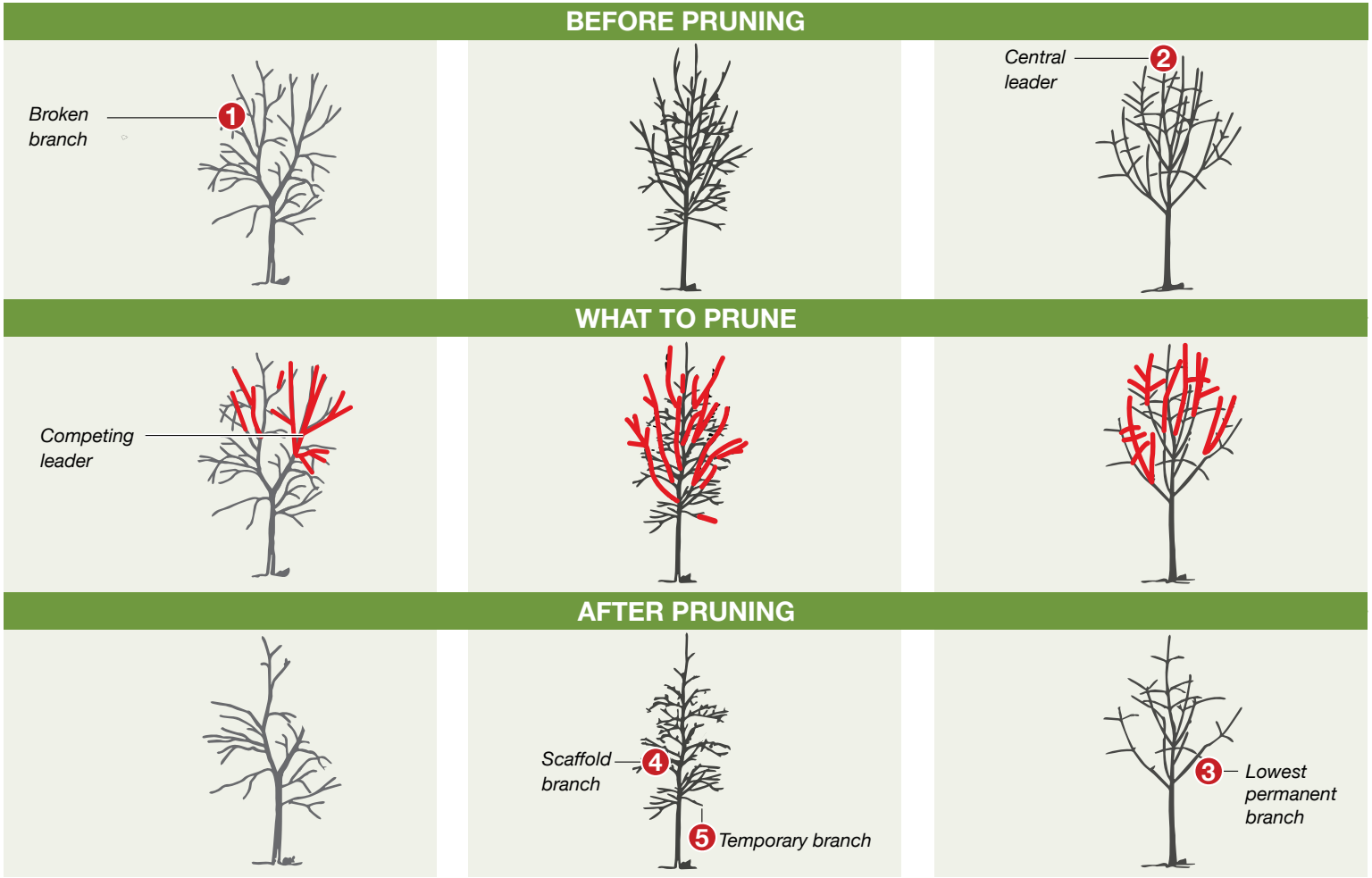
To prune a tree limb larger than 2 inches in diameter cleanly and safely, as shown in the image above, use a pruning saw and make these three sequential cuts:

1. On the bottom of the limb between 6 and 12 inches from the trunk; cut about one-quarter of the way through.

2. Through the limb from the top, starting about 1 inch beyond the first cut. The weight of the branch may cause it to snap off before the cut is complete.
3. Cut completely through the short remaining stub from top to bottom just beyond the swollen branch collar. Support the stub while sawing to make a clean cut.

Pruning to Improve Young Tree Structure

1. Remove broken branches.
2. Select central leader and remove competing leaders.
3. Select lowest permanent branch.
4. Select scaffold branches.
5. Select low temporary branches. Cut back and leave as temporary.

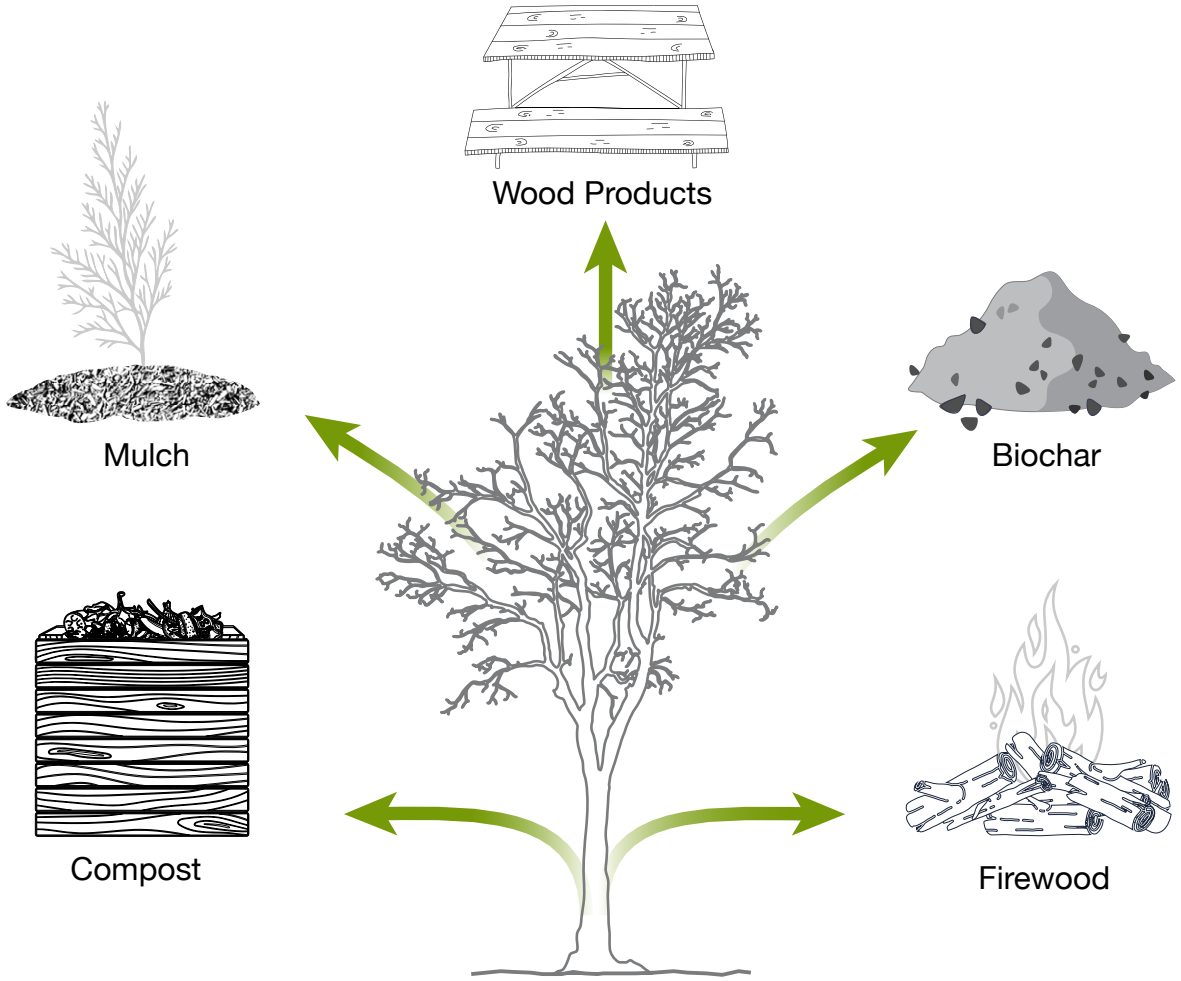


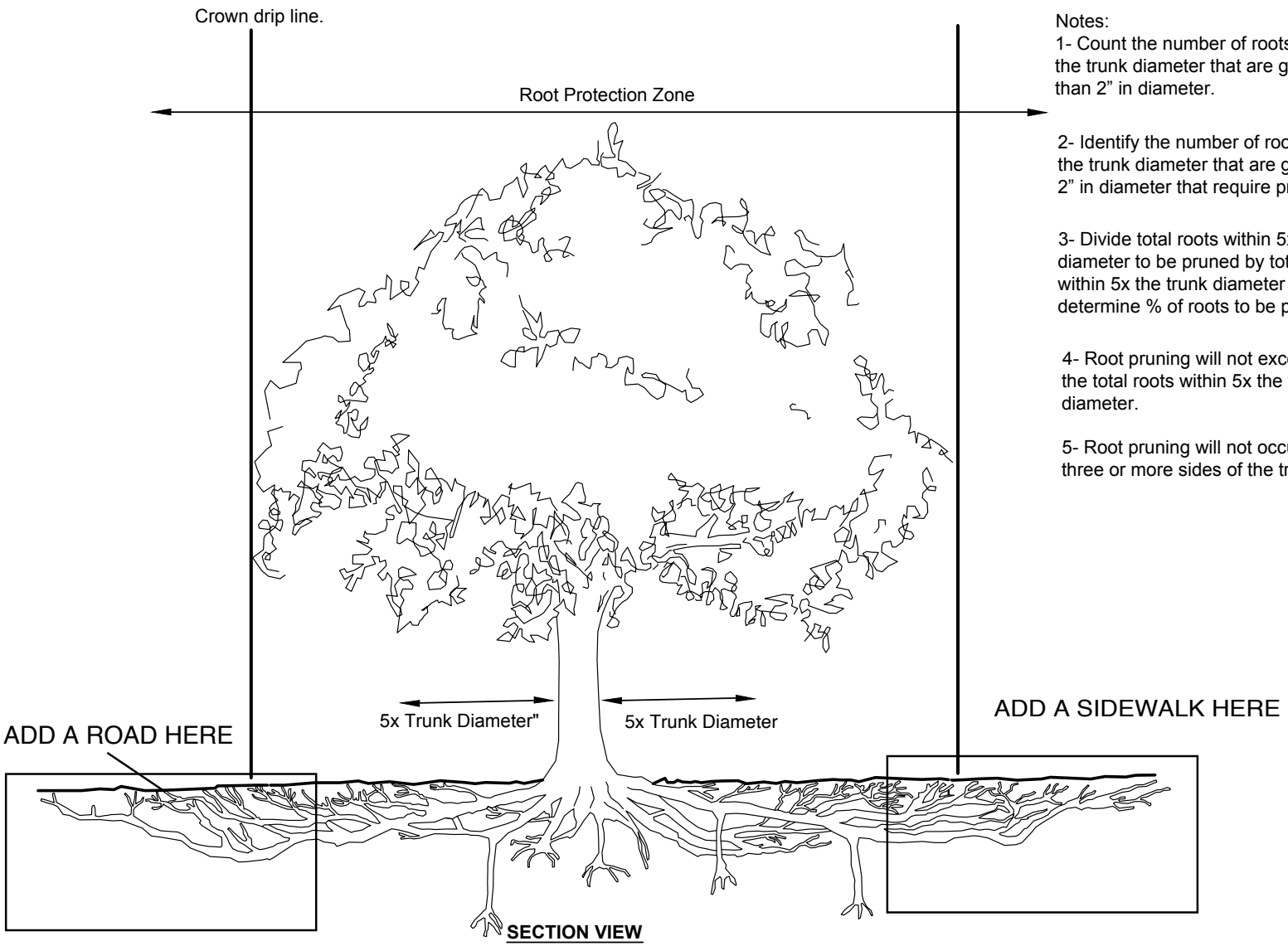
NOTE: 1. *At the time of planting, limit pruning to removal of broken, dead, or diseased branches only.*
2. *Young Tree Structural Pruning is to occur only after trees establish and resume normal growth rates following planting.*

Structural Pruning: A Guide for the Green Industry
URBAN TREE FOUNDATION | ADAPTED BY DUDEK

Tree Recycling

When a tree requires removal, the second life of the tree as urban wood begins. A removed tree can be processed into firewood, mulch, compost, biochar, or end-use wood products like a bench or table.





Notes:
1- Count the number of roots within 5x the trunk diameter that are greater than 2” in diameter.

2- Identify the number of roots within 5x the trunk diameter that are greater than 2” in diameter that require pruning.

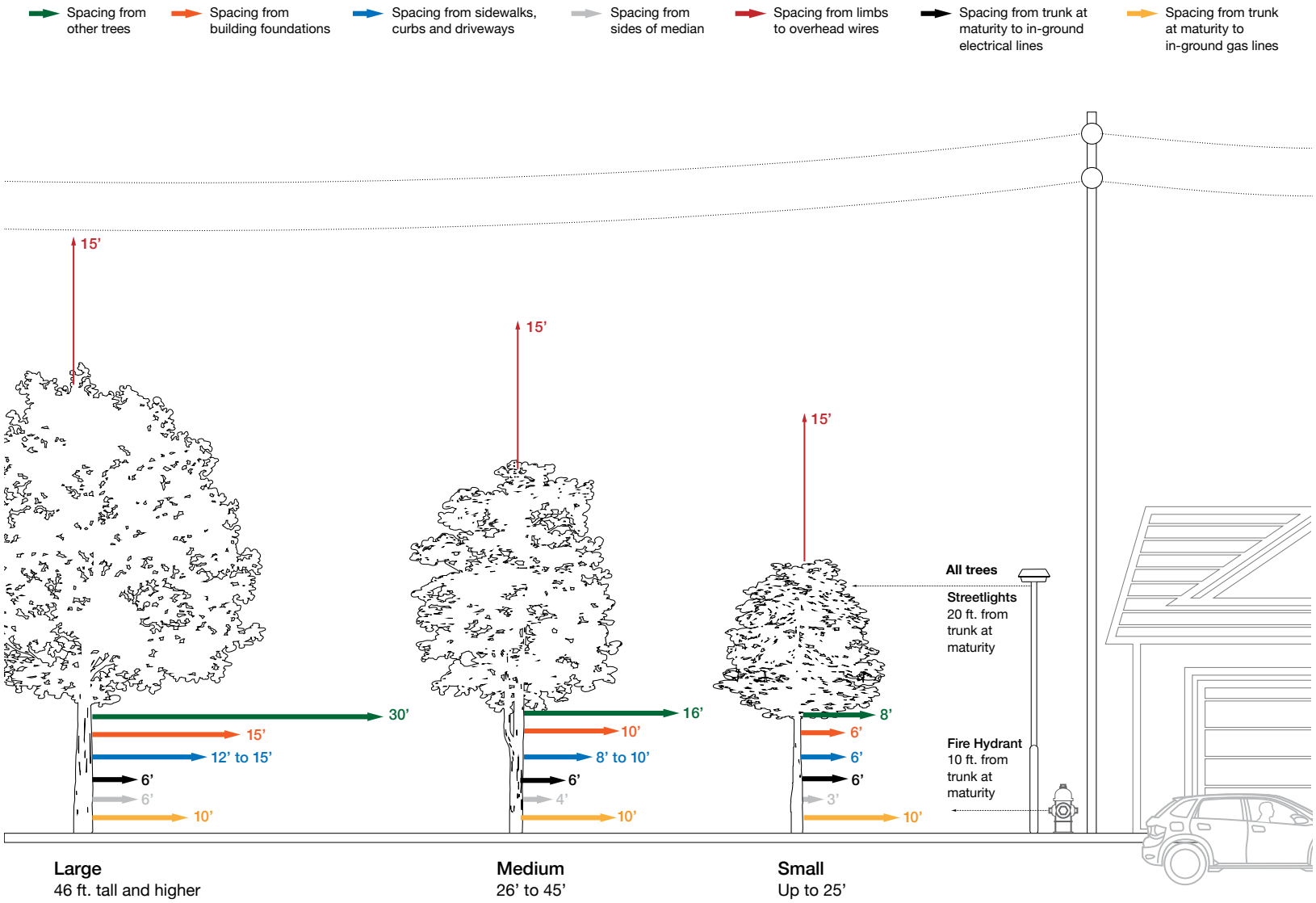
3- Divide total roots within 5x the trunk diameter to be pruned by total roots within 5x the trunk diameter to determine % of roots to be pruned.

4- Root pruning will not exceed 30% of the total roots within 5x the trunk diameter.

5- Root pruning will not occur on three or more sides of the tree.

ROOT PRUNING GUIDELINES

Spacing Guidelines Street Trees



APPENDIX: K

Genus	Species	Common Name (Click name for species fact sheet)	Foliage Type (Evergreen, Deciduous, Conifer)	Size	Height (Ft)	Crown Spread (Ft)	Spacing between trees (Ft)	Minimum Parkway Width (Ft)	Overhead Utility Friendly	Water Use Classification of Landscape Species (WUCOLS) rating	Regionally Native	California Native
4 ft Parkways												
Chionanthus	*retusus*	Chinese fringe tree (Male only)	D	Small	30	6-12	20-25	4	Yes	Moderate	No	No
x Chitalpa	*tashkentensis*	chitalpa	D	Medium	20-40	20-40	30-35	4	Yes	Low	No	No
Lagerstroemia	*indica*	crape myrtle	D	Small	15	6-10	10-15	4	Yes	Very Low	No	No
Acer	*tataricum subsp. ginnala 'Flame'*	Flame Amur maple	D	Small	20	15-20	20-25	4	Yes	Moderate	No	No
Photinia	*x fraseri*	Fraser photinia	E	Small	30	8-12	10-15	4	Yes	Moderate	No	No
Magnolia	*grandiflora 'Little Gem'*	little gem magnolia	E	Small	20	10	20-25	4	Yes	Moderate	No	No
Cercis	*canadensis var. texensis 'Oklahoma'*	Oklahoma redbud	D	Small	15	15	20-25	4	Yes	Moderate	No	No
Prunus	*cerasifera 'Purple Pony*	Purple Pony flowering plum	D	Small	12	10 -12	20-25	4	Yes	Moderate	No	No
Laurus	*nobilis 'Saratoga'*	sweetbay	E	Medium	15-40	15-30	20-25	4	No	Low	No	No
Ebenopsis	*ebano*	Texas ebony	E	Medium	40	30-40	15-40	4	No	Low	No	No
Callistemon	*viminalis*	weeping bottlebrush	E	Small	20	15-20	15-20	4	Yes	Low	No	No
Cercis	*occidentalis*	western redbud	D	Small	<20	<20	20-25	4	Yes	Very Low	Yes	Yes
4-6 ft Parkways												
Acer	*tataricum subsp. Ginnala*	Amur maple	D	Small	25	20-25	30-35	4 to 6	Yes	Moderate	No	No
Nyssa	*sylvatica*	black tupelo	D	Medium	35	20	30-35	4 to 6	No	Moderate	No	No
Lophostemon	*conferta*	Brisbane box	E	Medium	20-40	20-40	30-35	4 to 6	No	Moderate	No	No
Prosopis	*chilensis*	Chilean mesquite	D	Small	30+	30+	20-25	4 to 6	No	Low	No	No
Zelkova	*serrata 'City Sprite'*	City Sprite zelkova	D	Small	25	15-18	30-35	4 to 6	Yes	Moderate	No	No
Ulmus	*davidiana var. japonica 'Emerald Sunshine'*	Emerald Sunshine elm	D	Medium	35	15-25	30-35	4 to 6	No	Moderate	No	No
Pyrus	*kawakamii*	evergreen pear	E	Small	30	15-30	30-35	4 to 6	No	Moderate	No	No
Koelreuteria	*paniculata*	goldenrain	D	Medium	40	25-40	30-35	4 to 6		Moderate	No	No
Acer	*campestre*	hedge maple	D	Small	35	25-35	30-35	4 to 6	No	Moderate	No	No
Ginkgo	*biloba 'The President'*	Presidential Gold ginkgo	D	Medium	50	40	30-35	4 to 6	No	Moderate	No	No
Acacia	*stenophylla*	shoestring acacia	E	Small	30	10-20	15-20	4 to 6	Yes	Low	No	No
Arbutus	*unedo*	strawberry madrone	E	Small	35	20-35	20-25	4 to 6	Yes	Low	No	No
Prosopis	*glandulosa 'Maverick'*	thornless honey mesquite	D	Medium	35	25-35	15-25	4 to 6	No	Low	Yes	Yes
Prosopis	*glandulosa 'Phoenix'*	thornless honey mesquite 'Maverick'	D	Medium	35	25-35	15-25	4 to 6	No	Low	Yes	Yes
Tristaniopsos	*laurina*	water gum	E	Small	35	15-30	20-25	4 to 6	Yes	Moderate	No	No
Zelkova	*serrata 'Schmidtlow'*	Wireless zelkova	D	Small	24	36	30-35	4 to 6	Yes	Moderate	No	No
6 to 8 ft Parkways												
Pinus	*eldarica*	Afghan pine	C	Medium	40+	20-40	30-35	6 to 8	No	Very low	No	No
Afrocarpus	*falcatus*	African fern pine	C	Large	70	20-30	30-35	6 to 8	No	Moderate	No	No
Geijera	*parviflora*	Australian willow	E	Medium	35	20	15-20	6 to 8	No	Moderate	No	No
Prunus	*ilicifolia ssp. Lyonii*	Catalina cherry	E	Medium	35	20-30	15-20	6 to 8	No	Low	No	Yes
Koelreuteria	*bipinnata*	Chinese flame	D	Medium	20-40	20-40	30-35	6 to 8	Yes	Moderate	No	No
Melaleuca	*linariifolia*	flaxleaf paperbark	E	Medium	30	20-25	15-20	6 to 8	No	Low	No	No
Olea	*europaea 'Swan Hill'*	fruitless olive	E	Medium	20-40	<20	30-35	6 to 8	No	Very Low	No	No
Elaeocarpus	*sylvestris*	Japanese blueberry tree	E	Large	60	20-30	30-35	6 to 8	No	Low	No	No

Genus	Species	Common Name (Click name for species fact sheet)	Foliage Type (Evergreen, Deciduous, Conifer)	Size	Height (Ft)	Crown Spread (Ft)	Spacing between trees (Ft)	Minimum Parkway Width (Ft)	Overhead Utility Friendly	Water Use Classification of Landscape Species (WUCOLS) rating	Regionally Native	California Native
Pistacia	*chinensis 'Keith Davey'*	Keith Davey Chinese pistache	D	Medium	40+	40+	30-35	6 to 8	No	Low	No	No
Callistemon	*citrinus*	lemon bottle brush	E	Medium	25	25	15-25	6 to 8	No	Low	No	No
Arbutus	*marina'*	marina madrone	E	Medium	40-50	40	30-35	6 to 8	No	Low	No	No
Melaleuca	*styphelioides*	prickly melaleuca	E	Medium	40	10-20	15-20	6 to 8	No	Low	No	No
Ulmus	*wilsoniana*	Prospector elm	D	Large	40-50	25-30	20-25	4 to 6	No	Low	No	No
Vachellia	*farnesiana*	sweet acacia	D	Medium	25	15-25	15-25	6 to 8	Yes	Very Low	No	No
8+ ft Parkways and Parks												
Acer	*rubrum 'Armstrong'*	Armstrong red maple	D	Large	60	15-25	35-40	8+	No	Moderate	No	No
Acer	*x freemanii 'Jeffersred'*	Autumn Blaze red maple	D	Large	65	30-40	35-40	8+	No	High	No	No
Cinnamomum	*camphora*	camphor	D	Large	70	50-60	35-40	8+	No	Moderate	No	No
Quercus	*chrysolepis*	canyon live oak	E	Large	70+	30+	30-35	8+	No	Low	No	Yes
Quercus	*canbyi*	chisos oak	D/E	Large	50+	30-50	30-35	8+	No	low	No	No
Quercus	*agrifolia*	coast live oak	E	Large	70	40+	30-35	8+	No	Very Low	Yes	yes
Quercus	*suber*	cork oak	E	Large	70	70	35-40	8+	No	Low	No	No
Cedrus	*deodora*	deodar cedar	C	Large	40+	40+	35-40	8+	No	Low	No	No
Quercus	*engelmannii*	engelmann oak	D	Large	65	80-120	30-35	8+	No	Low	No	Yes
Fraxinus	*Fan-West'*	fan west ashn	D	Medium	50	30-40	35-40	8+	No	Moderate	No	No
Quercus	*wislizeni*	interior live oak	E	Large	70+	40-80	30-35	8+	No	Very Low	Yes	Yes
Sophora	*japonica 'Regent'*	Japanese pagoda tree	D	Medium	50	30-40	25-30	8+	No	Low	No	No
Ginkgo	*biloba*	maidenhair tree	D	Medium	70	25	35-40	8+	No	Moderate	No	No
Acer	*rubrum 'October Glory'*	October Glory red maple	D	Large	50	25 -35	35-40	8+	No	Moderate	No	No
Quercus	*rubra*	red oak	D	Large	80	50-70	35-40	8+	No	Moderate	No	No
Acer	*rubrum 'Franksred'*	Red Sunset maple	D	Large	50	30- 40	35-40	8+	No	Moderate	No	No
Casuarina	*cunninghamiana*	river she-oak	E	Large	70	30	20-30	8+	No	Low	No	No
Magnolia	*grandiflora 'Russet'*	Russet southern magnolia	E	Large	50	15-25	25-30	8+	No	Moderate	No	No
Quercus	*coccinea*	scarlet oak	D	Large	70	50	30-35	8+	No	Moderate	No	No
Quercus	*robur 'Skymaster'*	Skymaster English oak	D	Large	50	25	30-35	8+	No	Moderate	No	No
Quercus	*vriginiana*	southern live oak	E	Large	80+	60-100	30-35	8+	No	Moderate	No	No
Quercus	*lobata*	valley oak	D	Large	50-70	50	30-35	6 to 8	No	Low	No	Yes
Zelkova	*serrata 'Village Green'*	Village Green sawleaf zelkova	D	Large	60	45-50	30-35	8+	No	Moderate	No	No
Platanus	*racemosa*	western sycamore	D	Large	80	20-50	35-40	8+	No	Moderate	Yes	Yes

URBAN FOREST ASSESSMENT

Fresno 8.2.23

Measure Your Current Tree Canopy and Set Goals

CANOPY COVER: NO DATA, NO ACTION

Achieve desired degree of tree cover, based on potential or according to goals set for entire municipality and for each neighborhood or land use.

	CURRENT	GOAL
LOW (-1) The existing canopy cover for entire municipality is <50% of the desired canopy.	☒	☐
FAIR (1) The existing canopy is 50%-75% of desired.	☐	☒
GOOD (2) The existing canopy is >75%-100% of desired.	☐	☐
OPTIMAL (4) The existing canopy is >75%-100% of desired – at individual neighborhood level as well as overall municipality.	☐	☐

Urban Forest Inventory and Assessment

INVENTORY

Current and comprehensive inventory of tree resource to guide its management, including data such as age distribution, species mix, tree condition, and risk assessment.

	CURRENT	GOAL
LOW (-1) No inventory	○	○
FAIR (1) Complete or sample-based inventory of publicly owned trees.	○	○
GOOD (2) Inventory guides planning, management decisions.	⊗	○
OPTIMAL (4) Systematic comprehensive inventory system of entire urban forest – with information tailored to users and supported by mapping in municipality-wide GIS system. Provides for change analysis.	○	⊗

ASSESSMENT METHODOLOGY

Urban forest policy and practice driven by accurate, high-resolution, and recent assessments of existing and potential canopy cover, with comprehensive goals municipality-wide and at neighborhood or smaller management level.

	CURRENT	GOAL
LOW (-1) No assessment.	☒	○
GOOD (2) Low-resolution and/or point-based sampling of canopy cover using aerial photographs or satellite imagery, for example i-Tree Canopy.	○	○
BETTER (3) Complete, detailed, and spatially explicit, high-resolution Urban Tree Canopy (UTC) assessment based on enhanced data (such as LIDAR) – accompanied by comprehensive set of goals by land use and other parameters.	○	☒
OPTIMAL (4) As described for "Better" rating – and all utilized effectively to drive urban forest and green infrastructure policy and practice municipality-wide and at neighborhood or smaller management level.	○	○

Know What's Happening to Trees in Your Community

ASSESSMENT OF PUBLICLY-OWNED TREES

Current and detailed understanding of the condition and risk potential of all publicly owned trees that are managed intensively (or individually).

	CURRENT	GOAL
LOW (-1) No information.	○	○
FAIR (1) Sample-based tree inventory indicating tree condition and risk level.	○	○
GOOD (2) Complete tree inventory that includes detailed tree condition ratings.	⊗	○
OPTIMAL (4) Complete GIS tree inventory that includes detailed tree condition and risk ratings.	○	⊗

ASSESSMENT OF PUBLICLY-OWNED NATURAL AREAS

Detailed understanding of the ecological structure and function of all publicly owned natural areas (such as woodlands, ravines, stream corridors, etc.), as well as usage patterns.

	CURRENT	GOAL
LOW (-1) No information.	☒	○
FAIR (1) Identified only in natural area survey.	○	○
GOOD (2) Level and type of public use documented.	○	☒
BETTER (3) Ecological structure and function of all natural areas assessed and documented.	○	○
OPTIMAL (4) Management plan focused on sustaining and, where possible, improving overall ecological structure and function while facilitating appropriate public use. Plan should consider impacts on contiguous natural areas [open space corridors] outside the community's borders	○	○

ASSESSMENT OF TREES ON PRIVATE PROPERTY

Understanding of extent, location, and general condition of privately owned trees across the urban forest.

	CURRENT	GOAL
LOW (-1) No information.	☒	☐
FAIR (1) Aerial, point-based assessment – capturing extent and location.	☐	☒
GOOD (2) Bottom-up sample based assessment, as well as basic aerial view.	☐	☐
OPTIMAL (4) Bottom-up sample based assessment, as well as detailed UTC analysis of entire urban forest, including private property, integrated into municipality-wide [multi-agency] GIS system. LIDAR and hyper-spectral imaging most helpful.	☐	☐

Urban Forest Characteristics

RELATIVE PERFORMANCE INDEX BY SPECIES

Understanding the age, health and condition of publicly-owned trees, by species. Note: **Establishing an RPI for common public tree species** requires at least a sample-based field inventory and assessment.

	CURRENT	GOAL
LOW (-1) No information.	☒	○
FAIR (1) Six most common species have lower RPI scores than the average of all species in community. (<1.)	○	○
GOOD (2) Half of the six most common species have higher RPI scores than the average of all species in community. (>1.)	○	○
OPTIMAL (4) All six most common species have higher RPI scores than the average of all species in community. (>1.)	○	☒

USE OF NATIVE VEGETATION

Preservation and enhancement of local natural biodiversity.

	CURRENT	GOAL
LOW (-1) No coordinated focus on native vegetation.	☒	☐
FAIR (1) Voluntary use of native species on publicly and privately owned lands; invasive species are recognized.	☐	☐
GOOD (2) Use of native species is encouraged on a project-appropriate basis in all areas; invasive species are recognized and discouraged on public and private lands.	☐	☒
OPTIMAL (4) Native species are widely used on a project-appropriate basis in all areas; invasive species are proactively managed for eradication to the full extent possible.	☐	☐

Engaging Peers and Residents in Process

ALIGN MUNICIPAL DEPARTMENTS

Align affected municipal departments, county and regional authorities and state agencies behind common agenda.

	CURRENT	GOAL
LOW (-1) Municipal departments/agencies take actions impacting urban forest with no cross-departmental coordination or consideration of the urban forest resource.	○	○
FAIR (1) Municipal departments/agencies recognize potential conflicts and reach out to urban forest managers on an ad hoc basis – and vice versa.	⊗	○
GOOD (2) Informal teams among departments and agencies communicate regularly and collaborate on a project-specific basis.	○	⊗
OPTIMAL (4) Municipal policy implemented by formal interdepartmental/interagency working teams on all municipal projects.	○	○

ENGAGE RESIDENTS IN PLANNING AND IMPLEMENTATION

Enable community stakeholders to participate in and help shape planning process.

	CURRENT	GOAL
LOW (-1) Little or no citizen involvement or neighborhood action.	○	○
FAIR (1) Some neighborhood groups engaged across the community but no minimal outreach to assure underserved neighborhoods participate effectively.	○	○
GOOD (2) Many active neighborhood groups engaged in advancing urban forest goals, but with little or no overall coordination with municipality or its partnering NGOs.	⊗	○
OPTIMAL (4) Proactive outreach and coordination efforts by municipality and NGO partners resulting in widespread citizen involvement and structured engagement among diverse neighborhood groups.	○	⊗

ENVIRONMENTAL EQUITY

Ensure that the benefits of urban forests are made available to all, especially to those in greatest need of tree benefits.

	CURRENT	GOAL
LOW (-1) Tree planting and outreach is not determined equitably by canopy cover or need for benefits.	○	○
FAIR (1) Planting and outreach includes attention to low canopy neighborhoods or areas.	○	○
GOOD (2) Planting and outreach targets neighborhoods with low canopy and a high need for tree benefits.	⊗	○
OPTIMAL (4) Equitqable planting and outreach at the neighborhood level is guided by strong resident involvement in low canopy/high need areas. Residents participate actively in identifying needs for their neighborhoods, planning, implementation and monitoring.	○	⊗

TREES ACKNOWLEDGED AS VITAL COMMUNITY RESOURCE

Stakeholders from all sectors and constituencies within municipality – private and public, commercial and nonprofit, entrepreneurs and elected officials, community groups and individual citizens – understand, appreciate, and advocate for the role and importance of the urban forest as a resource.

	CURRENT	GOAL
LOW (-1) General ambivalence or negative attitudes about trees, which are perceived as neutral at best or as the source of problems. Actions harmful to trees may be taken deliberately.	○	○
FAIR (1) Trees generally recognized as important and beneficial.	⊗	○
GOOD (2) Trees widely acknowledged as providing environmental, social, and economic services – resulting in some action or advocacy in support of the urban forest.	○	○
OPTIMAL (4) Urban forest recognized as vital to the community's environmental, social, and economic well-being.	○	⊗

Creating Essential, Effective Public/Private Partnerships

ENGAGE LARGE PRIVATE LANDOWNERS AND INSTITUTIONS

Large private landholders – including school systems, universities and corporate campuses – embrace and advance municipality-wide urban forest goals and objectives by implementing specific resource management plans.

	CURRENT	GOAL
LOW (-1) Large private landholders are generally uninformed about urban forest issues and opportunities.	☒	☐
FAIR (1) Municipality educates landowners, provides technical assistance, sets goals and provides incentives for managing resources in accordance with plan.	☐	☐
GOOD (2) Landowners develop tree management plans that advance municipal urban forest goals.	☐	☒
OPTIMAL (4) Tree management plans developed with input from community, and public access to the property's forest resource.	☐	☐

ALL UTILITIES WORK WITH MUNICIPALITY, EMPLOY BMPS

All utilities – above and below ground – employ best management practices and cooperate with municipality to advance goals and objectives related to urban forest issues and opportunities.

	CURRENT	GOAL
LOW (-1) No utility consideration of the health of the urban forest resource.	○	○
FAIR (1) Utilities take actions impacting urban forest with no municipal coordination.	○	○
GOOD (2) Utilities employ best management practices, recognize potential municipal conflicts, and reach out to urban forest managers on an ad hoc basis – and vice versa.	⊗	○
BETTER (3) Utilities are included in informal municipal teams that communicate regularly and collaborate on a project-specific basis.	○	⊗

GREEN INDUSTRY EMBRACES GOALS, HIGH STANDARDS

Green industry works together to advance municipality-wide urban forest goals and objectives, and adheres to high professional standards.

	CURRENT	GOAL
LOW (-1) Little or no cooperation among segments of green industry or awareness of municipality-wide urban forest goals and objectives.	☒	☐
FAIR (1) Some cooperation among green industry as well as general awareness and acceptance of municipality-wide goals and objectives.	☐	☐
GOOD (2) Specific collaborate arrangements across segments of green industry in support of municipality-wide goals and objectives.	☐	☐
OPTIMAL (4) Shared vision and goals and extensive committed partnerships in place. Solid adherence to high professional standards, and commitment to credentialing and continuing education.	☐	☒

Resource Management: Planning

DEVELOP URBAN FOREST MANAGEMENT PLAN

Develop and implement a comprehensive urban forest management plan for public and private property.

	CURRENT	GOAL
LOW (-1) No urban forest management plan.	☒	☐
LOW (-1) Modest planting on public lands primarily for replacement on case-by-case basis, reactive risk management.	☐	☐
GOOD (2) Community adopted a city-wide canopy goal as official policy, based on best available canopy data, and scaled from community to neighborhood level.		☐
GOOD (2) New or recent urban forest management plan developed to achieve goal for publicly-owned forest resources.	☐	☐
BETTER (3) New or recent urban forest and green infrastructure management plan which targets public tree planting sites, protection and maintenance based on assessment of anticipated benefits ranging from stormwater to heat island mitigation, public health, etc.		☐
OPTIMAL (4) New or recent urban forest and green infrastructure management plan which targets public and private tree planting and protection based on assessment of anticipated benefits – and assures these benefits are distributed equitably among neighborhoods.		☒

COOPERATIVE PLANNING WITH OTHER MUNICIPALITIES

Cooperation and interaction on urban forest plans among neighboring municipalities within a region, and/or with regional agencies.

	CURRENT	GOAL
LOW (-1) Municipalities have no interaction with each other or the broader region. No regional planning or coordination on urban forestry.	○	○
FAIR (1) Some neighboring municipalities and regional agencies share similar urban forest policies and plans.	⊗	○
GOOD (2) Some urban forest planning and cooperation across municipalities and regional agencies.	○	○
OPTIMAL (4) Widespread regional cooperation resulting in development of regional urban forestry strategy.	○	⊗

FORESTRY PLAN INTEGRATED INTO OTHER MUNICIPAL PLANS

Forestry plan is designed to reinforce, and be reinforced through comprehensive plans, sustainability plans, park development, storm water and watershed plans, neighborhood revitalization, climate mitigation and sustainability plans, etc.

	CURRENT	GOAL
LOW (-1) Urban forestry plan mentions how it could meet other municipal objectives, or inform other planning efforts.	☒	☐
FAIR (1) Urban forestry planning team presents plan to other agencies, encouraging them to consider how forestry might help achieve their objectives.	☐	☐
GOOD (2) Once completed, urban forestry planning team works with other agencies to align current and future objectives.	☐	☒
OPTIMAL (4) All agencies whose goals are served by urban forestry practices, participate in creation of forestry plan, and commit to designated roles and responsibilities.	☐	☐

Resource Management: Implementation

URBAN FORESTRY PROGRAM CAPACITY [APPLIES TO IN-HOUSE AND CONTRACTED STAFF]

Maintain sufficient well-trained personnel and equipment – whether in-house or through contracted or volunteer services – to implement municipality-wide urban forest management plan.

	CURRENT	GOAL
LOW (-1) Lack of personnel and/or adequate equipment severely limits needed maintenance. Few resources, if any available to achieve new goals.	○	○
FAIR (1) Lack of staff training and/or access to adequate equipment limits effectiveness.	⊗	○
GOOD (2) Team has capacity in terms of trained staff and equipment to achieve many of the goals of the urban forest management plan.	○	⊗

MUNICIPALITY-WIDE URBAN FORESTRY FUNDING

Develop and maintain adequate funding to implement municipality-wide urban forest management plan.

	CURRENT	GOAL
LOW (-1) Little or no dedicated funding.	○	○
FAIR (1) Ad hoc funding for emergency, reactive management.	○	○
GOOD (2) Funding sufficient for some proactive management based on urban forest management plan.	⊗	○
OPTIMAL (4) Sustained, long-term funding from multiple municipal, regional and/or state angencies, along with private sources to implement a comprehensive urban forest management plan, and provide for maintenance and adaptive management as circumstances change.	○	⊗

GROWING SITE SUITABILITY

All publicly owned trees are selected for each site and planted in conditions that are modified as needed to ensure survival and maximize current and future tree benefits.

	CURRENT	GOAL
LOW (-1) Trees selected and planted without consideration of site conditions.	○	○
FAIR (1) Appropriate tree species are considered in site selection.	○	○
GOOD (2) Municipality-wide guidelines for the improvement of planting site conditions and selection of suitable species.	⊗	○
OPTIMAL (4) All trees planted in sites with adequate soil quality and quantity, and with sufficient growing space and overall site conditions to achieve their genetic potential and thus provide maximum ecosystem services. Where growing conditions are poor, guidance provided on how to improve soil volume, quality, other factors.	○	⊗

TREE ESTABLISHMENT AND MAINTENANCE

Comprehensive and effective tree planting and establishment program is driven by canopy cover and goals and other considerations according to plan.

	CURRENT	GOAL
VERY LOW (-2) Little or no tree planting. Tree establishment is ad hoc.	○	○
LOW (-1) Some tree planting and establishment occurs, but with limited overall municipality-wide planning and post-planting care.	○	○
FAIR (1) Limited planning and post-planting care. Planting takes place on plan-identified sites. None or only fragmentary planting and maintenance protocols.	☒	○
GOOD (2) Planting and post-planting care and maintenance protocols in place.	○	○
OPTIMAL (4) Comprehensive tree establishment plan provides concrete guidance on most of the following criteria: site selection, size, age class, diversity of species, native plant choice; planting protocols [e.g. minimum soil volumes, soil conditions]; young tree care, including region appropriate irrigation requirements. Includes provisions and funding for maintenance.	○	☒

MANAGEMENT OF PUBLICLY-OWNED NATURAL AREAS

The ecological integrity of all publicly owned natural areas is protected and enhanced – while accommodating public use where appropriate.

	CURRENT	GOAL
LOW (-1) No natural areas management plans or implementation in effect.	○	○
FAIR (1) Only reactive management to facilitate public use, e.g. hazard abatement, trail maintenance.	⊗	○
GOOD (2) Management plan in place for each publicly owned natural area to facilitate appropriate public use.	○	⊗
OPTIMAL (4) Management plan for each publicly owned natural area focused on sustaining and, where possible, improving overall ecological integrity (i.e., structure and function) – while facilitating appropriate public use.	○	○

POLICIES THAT FOSTER GOOD URBAN FORESTRY ON PRIVATE LANDS

Because private lands comprise the majority of canopy cover for most municipalities, plans and policies should address – through rules, fees and incentives – how owners contribute to the overall health of the urban forest and the benefits it delivers.

	CURRENT	GOAL
LOW (-1) No tree protection ordinance, or one that's weak and rarely enforced.	☒	☐
FAIR (1) Strong tree protection ordinance focused on maintaining mature trees with effective procedures.	☐	☐
GOOD (2) Policies regarding stormwater, site and subdivision planning, zoning and other issues that affect private forests are included in management plan.	☐	☒
OPTIMAL (4) All relevant municipal policies require or incentivize adherence by private owners to standards incorporated in the plan. Incentives and sanctions applied when appropriate. SEE LIST OF POLICIES.	☐	☐

Resource Management: Monitoring and Maintenance

TREE PROTECTION POLICY AND ENFORCEMENT

The benefits derived from trees on public and private land are ensured by the enforcement of municipality-wide policies, including tree care "best management practices."

	CURRENT	GOAL
LOW (-1) No tree protection policy	○	○
FAIR (1) Policies in place to protect public trees and employ industry best management practices, but rare or inconsistent enforcement.	☒	○
GOOD (2) Policies and practices in place to protect public trees, generally enforced. As a companion to the public tree care policy, community issues a guide to aid compliance for all affected agency staffs and contractors.	○	○
BETTER (3) Policies include construction standards for on-site tree protection, establishment and maintenance. Conforms to and references ANSI Standards for arboricultural practices (A300), safety (Z133), and nursery stock (Z60.1), as well as applicable ISA BMPs.	○	☒
OPTIMAL (4) Integrated municipality-wide policies and practices to protect public and private trees, consistently enforced and with penalties sufficient to deter violations.	○	○

MONITORING

Periodic, cyclical inspection of urban trees to identify health, pests and disease, growth, canopy, site conditions, and potential risks. Regular inspections guide urban forest management activities, including regular maintenance, species selection, planting sites, preventative and reactive disease and pest control.

	CURRENT	GOAL
LOW (-1) No monitoring.	○	○
FAIR (1) Monitoring is infrequent and reactive to reported changes in tree health, site condition.	⊗	○
GOOD (2) Monitoring on a regular basis with rotating schedule for each area. Monitors are professionals or volunteers trained to collect specific data required by municipality. Multi-year data available for trend analyses.	○	⊗
OPTIMAL (4) Monitoring adheres to the standards and protocols established by the Urban Tree Growth and Longevity network.	○	○

TREE RISK MANAGEMENT

Comprehensive tree risk management program fully implemented, according to ANSI A300 (Part 10) "Tree Risk Assessment" standards, and supporting industry best management practices.

	CURRENT	GOAL
LOW (-1) No tree risk assessment or risk management program. Response is on a reactive basis only.	○	○
FAIR (1) Citizens and city staff report tree safety issues to the forestry department or manager (e.g. 3-1-1 system, online form, etc.). System tracks the time between damage report and mitigation action.	☒	○
GOOD (2) The community has written tree risk management policy (aka, 'standard of care') and an operational plan for inspecting and mitigating reported tree problems, including a timetable for mitigating potential hazards.	○	○
BETTER (3) Policies and ordinances in place to minimize tree damage and removal on commercial developments, and public capital. Protection measures conform to ANSI A300 standards and ISA BMPs.	○	☒
OPTIMAL (4) Includes "better" but with TRAQ-qualified contractors on city projects. Educate tree care companies and public about importance of TRAQ qualifications.	○	○

URBAN WOOD AND GREEN WASTE UTILIZATION

Create a closed system diverting all urban wood and green waste through reuse and recycling.

	CURRENT	GOAL
LOW (-1) No utilization plan; wood and other green waste goes to landfill with little or no recycling and reuse.	○	○
FAIR (1) While most green waste does not go to landfill, uses are limited to chips or mulch.	⊗	○
GOOD (2) The majority of green waste is reused or recycled – for energy, products, and other purposes beyond chips or mulch.	○	○
OPTIMAL (4) Comprehensive plan and processes in place to utilize all green waste one way or another, to the fullest extent possible.	○	⊗

FINAL SCORECARD

COMMUNITY ASSESSMENT & GOAL-SETTING

TOTAL CURRENT	TOTAL GOAL	SCORE GAP
13	84	71

SECTION	CURRENT	GOAL
Measure Your Current Tree Canopy and Set Goals	-1	1
Urban Forest Inventory and Assessment	1	7
Know What's Happening to Trees in Your Community	0	7
Urban Forest Characteristics	-2	6
Engaging Peers and Residents in Process	6	14
Creating Essential, Effective Public/Private Partnerships	0	9
Resource Management: Planning	-1	10
Resource Management: Implementation	6	18
Resource Management: Monitoring and Maintenance	4	12

Funding Opportunities

Grants	
Environmental Enhancement Mitigation Program (California Natural Resources Agency)	With up to $7 million allocated each fiscal year, this program encourages projects that produce multiple benefits including reducing greenhouse gas emissions; increasing water use efficiency; reducing risks from climate change impacts; and demonstrating collaboration with local, state, and community entities. Eligible projects, including tree planting and habitat restoration must be directly or indirectly related to the environmental impact of the modification of an existing transportation facility or construction of a new transportation facility.
Urban Flood Protection Grant Program (California Natural Resources Agency)	The Urban Flood Protection Program was created by Proposition 68 targeting multi-benefit projects in urbanized areas to address flooding. Projects must address flooding in urban areas, protect people, and protect property from flood damage. Examples of eligible projects include tree planting, establishment care, and creating native landscapes with stormwater capture features like bioswales. There have been two funding cycles between 2020 and 2022, amounting in $92.5 million.
Urban and Community Forestry Program (CAL FIRE)	Multiple grant programs supported by the Urban and Community Forestry Program have funded tree planting, tree inventories, urban wood and biomass utilization, blighted urban lands improvements, and green schoolyards to advance the goals and objectives of supporting healthy urban forests and reducing greenhouse gas emissions. .
Urban Greening Grant Program (California Natural Resources Agency)	Consistent with Assembly Bill 32 (2006), the Urban Greening Grant Program funds projects that reduce greenhouse gases by sequestering carbon, decreasing energy consumption, and reducing vehicles miles traveled, while also transforming the built environment into more sustainable, enjoyable, and effective places, creating healthy and vibrant communities. In previous years, approximately $20-30 million was available for selected project applicants, which included public agencies, nonprofit organizations, and qualifying districts. As of February 2024, budget allocations are uncertain.
Active Transportation Program (California Department of Transportation)	This program provides funding to encourage increased use of active modes of transportation, such as biking and walking. Trees and other vegetation are significant components of several eligible projects under the Active Transportation Program, including parks, trails, and safe routes to schools. Applicants include public agencies, transit agencies, school districts, tribal governments, and nonprofit organizations.

Grants	
Affordable Housing and Sustainable Communities (California Strategic Growth Council)	The Strategic Growth Council is authorized to fund land use, housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas emissions. Urban Greening is a threshold requirement for all Affordable Housing and Sustainable Communities funded projects. Eligible urban greening projects include, but are not limited to, rainwater recycling; flow and filtration systems including rain gardens, stormwater planters, and filters; vegetated swales; bioretention basins; infiltration trenches; and integration with riparian buffers, shade trees, community gardens, parks, and open space. Funding for 2024 is estimated at $675 million and will be available to locality (e.g., local agencies), developer (entity responsible for project construction), or program operator (day-to-day operational project administrator) applicants.
Storm Water Grant Program (California State Water Resources Control Board)	The State Water Resources Control Board is funding surface and groundwater storage, ecosystem and watershed protection and restoration, and drinking water protection through the Storm Water Grant Program. The program prioritizes multiple benefit projects, including projects that increase tree canopy. Approximately $200 million in grant funding have been awarded.
Extreme Heat and Community Resilience Program (California Office of Planning and Research)	This program funds and supports local, regional, and tribal efforts to reduce the impacts of extreme heat. The Extreme Heat and Community Resilience Program coordinates the state's efforts to address extreme heat and the urban heat island effect and will allocate $20 million in grant funding. Eligible projects include increasing shade. Planning and implementation projects include studies, development of planning documents, providing shade, increasing building and surface reflectance, and developing passive or low-energy cooling strategies.

*Fees, Assessments, Taxes	
Parcel Tax	A parcel tax is a special tax levied for the provision of special benefits. Revenues from special taxes must be used for the specific purpose for which they are intended, so a parcel tax would create a dedicated funding stream for street trees. Similar to a special assessment, a parcel tax cannot be based on the value of property; however, the amount levied on each parcel need not be directly related to the benefits provided (ILG 2008). Cities have the flexibility to levy parcel taxes as they see fit, but they are typically based on lot square footage or levied as a flat tax, with the same amount per parcel (CTD 2012a). Parcel taxes are designed to encompass entire cities and therefore, are good candidates for a citywide street tree program, as opposed to the district-level approach that often occurs under special assessments.

*Fees, Assessments, Taxes	
Landscape and Lighting Assessment Districts	LLADs are a form of special assessment that finance improvements to landscaping, lighting and open space, along with open space acquisition. The Landscape and Lighting Act of 1972 authorizes municipal agencies in California to initiate and administer LLADs. The creation of a LLAD, as with any special assessment, requires the preparation of an Engineer's Report that demonstrates the nexus between fees assessed and benefits provided, followed by majority (50 percent plus one) approval via a special ballot, pursuant to Proposition 218. LLADs are widely used throughout California to fund a range of public realm improvements and services related to street trees, streetscape improvements, street and traffic lights, and recreational facilities, among others. As with parcel taxes, LLADs typically fund more than just street tree planting, establishment care, and maintenance. While a LLAD could be designed for street trees alone, the process may attract other agencies in need of additional revenue and interested in expanding the scope to services, such as park and recreation maintenance. One caution would be to avoid setting the assessment so high as to generate voter backlash. Local municipalities have often convened focus groups to determine the appropriate assessment level.
General Obligation Bonds	Local governments commonly use General Obligation (GO) bonds to fund construction and improvement of projects involving real property (e.g., buildings, infrastructure, and parks). GO bonds typically carry low interest rates, making them attractive for capital projects, which may include tree planting. However, funding is available for discrete projects, often over a limited time rather than an extended period. In addition, ongoing maintenance is ineligible for GO bond funding pursuant to federal tax law. California cities pay debt service from GO bonds through ad valorem property taxes, where assessments are based on property value. As a result, the issuance of GO bonds requires two-thirds voter approval (State Treasurer 2008).
Maintenance Assessment Districts	The Landscape and Lighting Act of 1972 authorizes Maintenance Assessment Districts (MADs), which are closely related to LLADs. The key difference is that charter cities, can create MADs for the provision of services not specifically authorized under state law, thereby broadening their use (Griffin, pers. comm., 2012). MADs may be used to finance street tree care, but as with a LLAD, a MAD intended for street trees alone could also attract the attention of other agencies interested in funding the provision of additional non-related services.
Community Benefit Districts	Community Benefit Districts (CBDs) are used to finance neighborhood revitalization, commonly in commercial areas. Special benefits typically include public safety, economic development, beautification, and streetscape improvements. Formation of a CBD requires property owners to petition the appropriate local agency and demonstrate an interest in paying for additional services. A non-profit Board of Directors typically comprised of property owners, businesses, and government representatives administers a CBD. While CBDs may include street tree planting and maintenance, this is rarely the focus.

* Source: City of San Francisco, Financing San Francisco's Urban Forest 2013

Urban Forest Management Plan

City of FRESNO

CAL FIRE

PREPARED BY DUDEK