



# Urban Greening Master Plan

for the City of Clovis

Adopted July 20, 2015





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# Urban Greening Master Plan

for the City of Clovis



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EXECUTIVE SUMMARY ..... 1

1. INTRODUCTION AND HISTORY ..... 1-1

2. PLANNING CONTEXT AND CONSISTENCY..... 2-1

    2.1 Clovis Water Efficient Landscape Ordinance ..... 2-1

    2.2 California Mandatory Water Conservation Regulation ..... 2-1

    2.3 City of Clovis General Plan..... 2-2

    2.4 Relevant Planning Documents..... 2-2

    2.5 Specific Plans..... 2-8

3. GOALS OF THE URBAN GREENING MASTER PLAN ..... 3-1

4. COMMUNITY INPUT AND PUBLIC FORUMS ..... 4-1

    4.1 Round #1 Workshop Overviews ..... 4-1

    4.2 Round #2 Individual Workshop Summaries..... 4-10

    4.3 Round #3 Workshops ..... 4-19

5. JURISDICTIONS WITH AUTHORITY AND COMMUNITY PARTNERSHIPS ..... 5-1

    5.1 Jurisdictions with Authority..... 5-1

    5.2 Community Partnerships..... 5-3

6. NEIGHBORHOOD FOCUS AREAS ..... 6-1

    6.1 Existing Conditions ..... 6-2

    6.2 Parks and Open Space ..... 6-5

    6.3 Neighborhood Focus Areas ..... 6-8

7. GREEN SPACE ASSESSMENT ..... 7-1

    7.1 Existing Conditions ..... 7-1

    7.2 Opportunities ..... 7-3

    7.3 Policy Initiatives..... 7-8

    7.4 Neighborhood Specific Opportunities ..... 7-9

8. PLANT PALETTE AND LANDSCAPE INSTALLATION PLAN..... 8-1

    8.1 Existing Conditions and Needs ..... 8-1

    8.2 Existing Need..... 8-2

    8.3 Goals of the Plant Palette and Landscape Maintenance Plan..... 8-3

    8.4 Plant Palette ..... 8-4

    8.5 Neighborhood Identity..... 8-20

    8.6 Landscape Installation Plan ..... 8-28

8.7 Abbreviations .....8-29

8.8 Definitions.....8-29

8.9 Codes and Standards.....8-30

8.10 Planting Guidelines and Standards.....8-31

8.11 Irrigation Guidelines and Standards .....8-32

8.12 Landscape Products/Furnishings.....8-33

8.13 Landscape Maintenance .....8-33

8.14 References .....8-34

9. GREENHOUSE GAS EMISSIONS, CLIMATE ADAPTATION, AND PUBLIC HEALTH .....9-1

9.1 Climate Change .....9-1

9.2 Air Quality .....9-2

9.3 Urban Forest .....9-5

9.4 Water .....9-8

9.5 Public Health .....9-14

10. IMPLEMENTATION: THE 20-YEAR PLAN.....10-1

Goal: Educate the Community and Businesses.....10-2

Goal: Draw People Outside .....10-3

Goal: Utilize Green Infrastructure .....10-5

Goal: Promote Alternative Transportation.....10-6

Goal: Grow the Local Economy .....10-7

Goal: Implement Recommendations From Previous Planning Efforts.....10-8

Goal: Maximize Opportunities for Partnerships on Greening Efforts .....10-9

10.1 Funding Opportunities .....10-10

APPENDICES

- Appendix A: Round 1 Workshop Summaries
- Appendix B: Round 2 Workshop Summaries
- Appendix C: Round 3 Workshop Summaries
- Appendix D: Green Space Assessment
- Appendix E: Model Water Efficient Landscape Ordinance ~~September 10, 2009~~ June 12, 2015 (Public Draft)
- Appendix F: Model Bay-Friendly Landscaping Maintenance Specification
- Appendix G: Section 013521 Bay-Friendly Landscaping Requirements

## List of Figures

Figure 6-1	Delineated Neighborhood Focus Areas with Population.....	6-1
Figure 6-2	Helm Ranch Population.....	6-2
Figure 6-3	Old Town Population.....	6-3
Figure 6-4	Loma Vista Population.....	6-3
Figure 6-5	Northwest Population.....	6-4
Figure 6-6	Helm Ranch Half-Mile Park Walkability.....	6-13
Figure 6-7	Helm Ranch Quarter-Mile Park Walkability.....	6-13
Figure 6-8	Old Town Half-Mile Park Walkability.....	6-14
Figure 6-9	Old Town Quarter-Mile Park Walkability.....	6-14
Figure 6-10	Loma Vista Half-Mile Park Walkability.....	6-15
Figure 6-11	Loma Vista Quarter-Mile Park Walkability.....	6-15
Figure 6-12	Northwest Half-Mile Park Walkability.....	6-16
Figure 6-13	Northwest Quarter-Mile Park Walkability.....	6-16
Figure 7-1	Urban Forest Condition in Helm Ranch.....	7-4
Figure 7-2	Urban Forest Condition in Old Town.....	7-4
Figure 7-3	Basin Parks.....	7-5
Figure 7-4	Helm Ranch Greening Opportunities.....	7-10
Figure 7-5	Willow Avenue Existing and Possible Greening Opportunities.....	7-12
Figure 7-6	Old Town Greening Opportunities.....	7-13
Figure 7-7	Loma Vista Greening Opportunities.....	7-16
Figure 7-8	Northwest Greening Opportunities.....	7-19
Figure 9-1	Historic Depth to Groundwater.....	9-9
Figure 9-2	Change in Groundwater Storage in the Central Valley, Spring 2005–Spring 2010.....	9-11

## List of Tables

Table 2-1	Relevant General Plan Goals and Policies and Consistency with Goals of Urban Greening Master Plan.....	2-3
Table 7-1	Parks in the City of Clovis.....	7-1
Table 8-1	Evapotranspiration Rates.....	8-2
Table 8-2	Tree Species List.....	8-5
Table 8-3	Understory Plants.....	8-10
Table 10-1	Cal Fire Grant Opportunities.....	10-12



URBAN GREENING MASTER PLAN  
**Executive Summary**



*Dry Creek Trailhead at Sunnyside and Shepherd Avenues*

*“You can’t make positive choices for the rest of your life without an environment that makes those choices easy, natural, and enjoyable.”*  
- Deepak Chopra, Author



During the past 10 years, the Central Valley has gained more than one million new residents. By 2005, its population reached 6.5 million, more than the population in 38 other states. The California Department of Finance projects that by 2040 the Central Valley will be home to almost 12 million people.<sup>1</sup> In addition to a depletion of natural resources, urbanization results in impacts to the quality of the environment as well as human health.

Humans are highly dependent on natural systems for survival. California in particular has suffered from severe drought conditions in recent years, which is the result of several factors: how much precipitation we receive in rain and snow; how much water is available after taking into account reservoir storage, soil moisture, and groundwater; additional losses of water due to higher than normal temperatures; and the human demand for water. If the drought continues, increasingly difficult and costly decisions will have to be made, and the ecological, economic, and human impacts will grow. Currently the State only has about one year of water in reserves, and our backup groundwater supply is being depleted at an unsustainable rate for agricultural irrigation in the Central Valley.<sup>2</sup> The California Department of Water Resources says water conservation will be critical in stretching supplies to the maximum extent possible throughout the coming year.<sup>3</sup> Since there is no indication that the drought will end any time soon, drastic measures need to be taken to prevent conditions from becoming worse.

On April 1, 2015, Governor Jerry Brown issued Executive Order B-29-15 declaring a State of Emergency throughout the State of California due to severe drought conditions. Stringent water conservation requirements have been put in place and Clovis is required to reduce water use by 36 percent compared to the same time period in 2013. Clovis' Urban Greening Master Plan will serve as a key tool to help the City meet these requirements.

Urban greening efforts, including increasing urban forests, serve to moderate urban temperatures, reduce air pollutants, and help control stormwater runoff. These benefits are in addition to the aesthetic and quality of life improvements that result from urban greening. According to Timothy Beatley, an internationally recognized sustainable city researcher and author of *Native to Nowhere: Sustaining Home and Community in a Global Age*, the deepest ways in which our communities and regions are special and unique are typically ignored when making our most important public (and personal) decisions. To this effect, we are ignoring the natural beauty of place that is comforting, uplifting, and calming, which gives many of us joy and pleasure.<sup>4</sup>

Public health and its relationship to land use planning is also a growing concern of local governments as they are beginning to recognize how the built environment in which we live, work, and play can lead to a variety of chronic health issues related to heart disease, cancer, obesity, and respiratory problems. By recognizing opportunities to reestablish connections to nature and designing our communities to be more walkable, bikeable, and reduce dependency on the automobile, we can encourage healthier living.

As one of the fastest growing communities in the San Joaquin Valley, the City of Clovis has become one the Valley's most desirable communities, offering an appealing Old Town, a distinguished educational system, top-ranked public safety departments, and spectacular views of, and quick access to, the Sierra Nevada. Although the City has seen a tremendous amount of growth over the past few decades, thoughtful planning has led to well organized growth, focusing development inward to prevent sprawl, and allowing Clovis to retain its small-town charm.

As a continuation of these efforts to maintain its small-town character and advance development practices that promote a more livable and vibrant community, the City established a framework for community planning, and in 2010 began assessing

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<sup>1</sup> Public Policy Institute of California, Just the Facts, [http://www.ppic.org/content/pubs/jtf/JTF\\_CentralValleyJTF.pdf](http://www.ppic.org/content/pubs/jtf/JTF_CentralValleyJTF.pdf), accessed on March 20, 2015.

<sup>2</sup> Los Angeles Times, <http://www.latimes.com/opinion/op-ed/la-oe-famiglietti-drought-california-20150313-story.html>, March 12, 2015.

<sup>3</sup> California Department of Water Resources, accessed on March 20, 2015, <http://www.water.ca.gov/waterconditions/>.

<sup>4</sup> Beatley, Timothy. *Native to Nowhere: Sustaining Home and Community in a Global Age*, 2004, page 10.

community needs related to human and social capital. In addition to these assessments, Clovis also developed a Local Water Efficiency Ordinance which established water efficient landscape requirements for new and rehabilitated landscape projects which triggered the need for an urban greening plan. Based on a variety of different needs assessments and community support, the City of Clovis applied for, and was awarded funding from a Proposition 84 grant to prepare this Urban Greening Master Plan to improve the urban environment and quality of life of residents by increasing and connecting parks and open space, providing safe and accessible multi-modal transportation, using green infrastructure to manage and filter stormwater, and enhancing the urban forest.

The Urban Greening Master Plan is based on review of existing documents, GIS analysis, site visits, and input from the community during a variety of community workshops, City staff meetings, and Technical Advisory Committee meetings. The Urban Greening Master Plan provides a summary of the planning context and existing conditions for the City of Clovis. While the Urban Greening Master Plan focuses on four neighborhoods specifically, there are over-arching recommendations that can be applied to the entire city.

Implementation is the key to success and the 20-year vision provides general and specific recommendations for short-, medium- and long-range efforts to make Clovis greener. The City can lead by example but the residents, business owners, developers, and partner agencies also need to be actively engaged for there to be a successful implementation. Conscious and efficient use of resources can ensure that the Clovis “way of life” continues and thrives while creating a lighter environmental footprint.

The Urban Greening Master Plan is organized into the following chapters:

- » **Chapter One: Introduction and History.** Provides background information about the City of Clovis and an introduction into the history of the development of the Urban Greening Master Plan and its intended focus.
- » **Chapter Two: Planning Context and Consistency.** Summarizes other planning documents that provide existing conditions analyses and support the development and implementation of the Urban Greening Master Plan through standards, policies, and/or design guidelines.
- » **Chapter Three: Goals of the Urban Greening Master Plan.** Outlines the goals of the Urban Greening Master Plan and briefly describes the context in which they were developed.
- » **Chapter Four: Community Input and Public Forums.** Describes in detail a variety of community workshops held to gather feedback from community members and establish goals for the Urban Greening Master Plan as well as prioritize needs and opportunities within each neighborhood focus area.
- » **Chapter Five: Jurisdictions with Authority and Community Partnerships.** Describes the important relationships that the City of Clovis has established with surrounding jurisdictions and community organizations that will be essential in the successful implementation of the Urban Greening Master Plan.
- » **Chapter Six: Neighborhood Focus Areas.** Provides a description of existing demographics in the City, including a description of the existing conditions of the Clovis parks and trails system, as well as a more detailed description of each of the four neighborhood focus areas.
- » **Chapter Seven: Green Space Assessment.** Evaluates the existing conditions of and opportunities for various green features, including parks, trails, green streets, stormwater management, urban forestry, pedestrian and bicycle facilities, community gardens, and wildlife habitat.
- » **Chapter Eight: Clovis Plant Palette and Landscape Installation Plan.** Describes existing needs based on community input, climate and soil conditions, and urban benefits that would be provided by a refined plant palette. In addition to providing a recommended plant palette, this chapter describes the landscape design standards recommended for improvement projects in the City of Clovis and describes recommended planting, irrigation and maintenance best management practices.

- » **Chapter Nine: Greenhouse Gas Emissions, Climate Adaptation, and Public Health.** Provides background on the existing conditions in Clovis and the surrounding region related to air quality, water quality and availability, and public health. In addition, this chapter offers suggestions on how to promote environmental quality and public health through a variety of urban greening strategies including, reducing vehicle miles traveled, increasing the urban forest, and promoting public health by encouraging a multimodal transportation network.
- » **Chapter Ten: Implementation: The 20-Year Vision.** Outlines general citywide opportunities and policy initiatives and provides neighborhood specific recommendations to implement greening strategies. Strategies include but are not limited to green streets, vacant lot conversions, canal and trail restoration, joint use with schools, and low water use demonstration gardens.

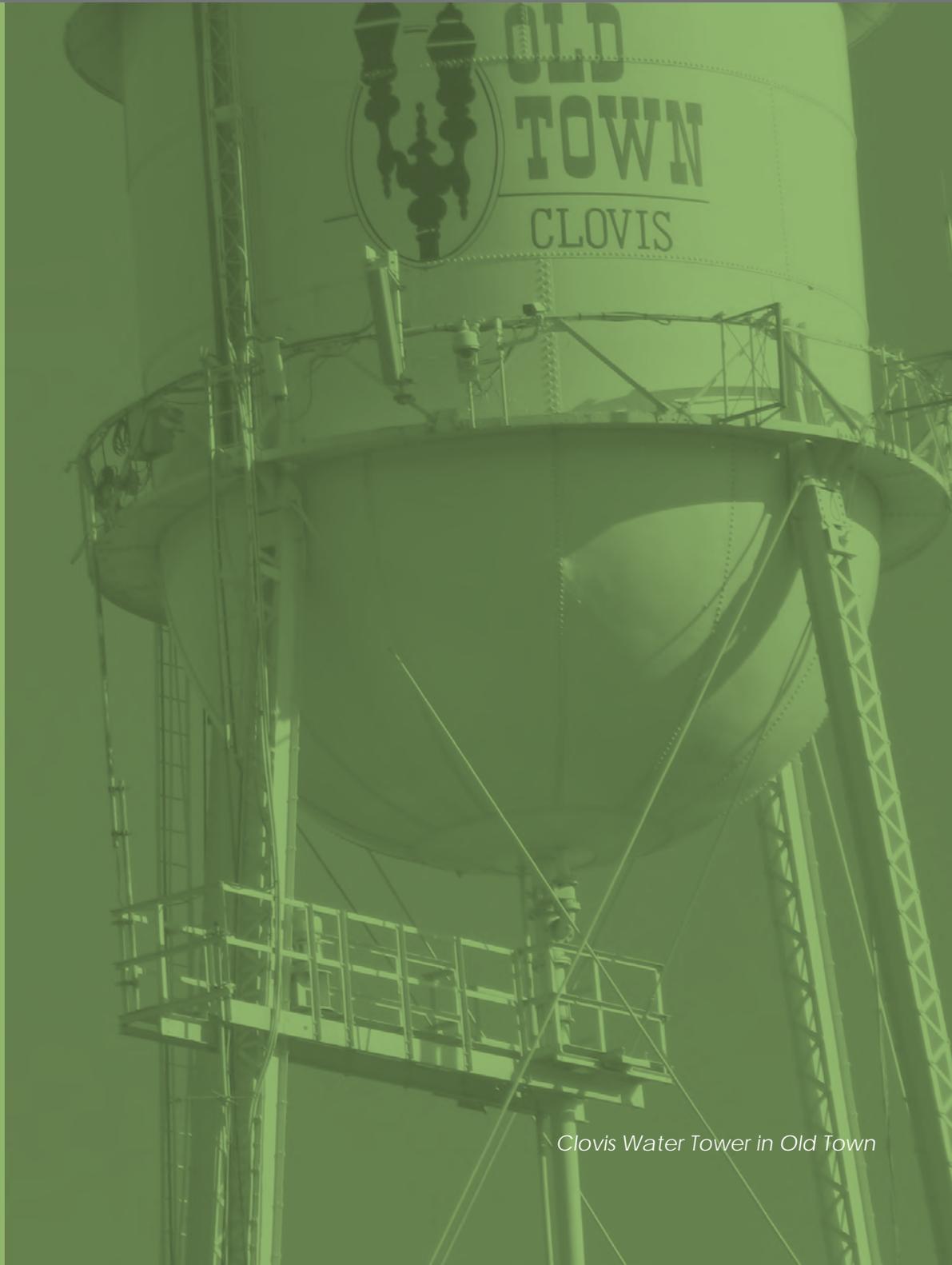
Let Clovis be green.



# 1

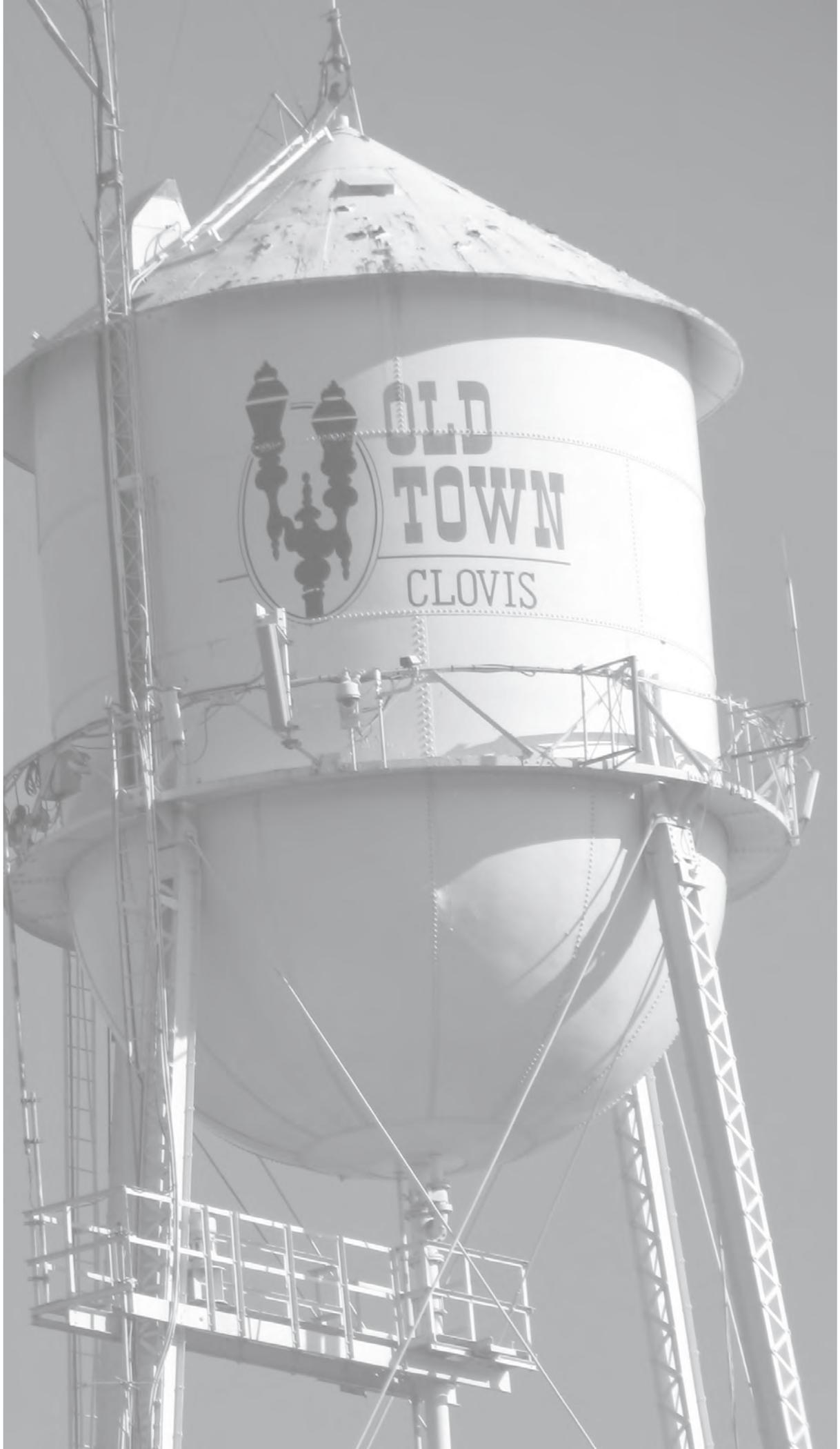
URBAN GREENING MASTER PLAN

## Introduction and History



*Clovis Water Tower in Old Town*

*"The point of cities is multiplicity of choice"*  
- Jane Jacobs, *American Cities*



The need for an urban greening plan was originally established under the 1993 Clovis General Plan, which envisioned a creative and sustainable way to develop a system of integrated green streets, sidewalks, trails, and paseos that would link the community to City parks, homes, community and commercial centers, and public schools. Since the adoption of the 1993 General Plan, Clovis has experienced a tremendous amount of growth, transforming from a small bedroom community of 56,500 residents into a suburb of nearly 100,000 people today. In order to address this rate of growth, the City has focused development inward to prevent sprawl into the Sierra foothills and surrounding agricultural lands.



*Pollasky Avenue in Old Town*

Over the years, the City has conducted community surveys and held public summits that address public landscaping interests. On March 29, 2010, the Clovis City Council hosted its bi-annual Citizen Summit to engage citizens in the strategic planning and goal setting process for Clovis. There were 76 participants in the Summit, with more than 200 citizens and community stakeholders invited, and general public participation was welcome. A major theme of the 2010 Summit was preservation and enhancement of the Clovis sense of community, identity, pride, and friendly atmosphere. Overall, citizens felt the City was well planned, provided good parks, friendly trails, and well utilized bicycle amenities.

In early 2011, a citywide Public Utilities Customer Service Survey was conducted. Results of the survey indicated that more than 50 percent of Clovis citizens are willing to pay monthly assessments to improve the appearance and condition of public landscaping (parks, median landscaping, and street landscaping) in the community. The Building Industry Association, a

membership-based group representing builders, developers, and subcontractors, originally expressed an interest in the development of an urban greening plan to the Planning Commission and City Council Members which stemmed primarily from the City's adoption of a Local Water Efficiency Ordinance in 2010. The ordinance established water efficient landscape requirements for new and rehabilitated landscapes that developers, including projects administered by the City, must adhere to.

In 2006, California voters passed Proposition 84, The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act, authorizing the State's Natural Resources Agency to distribute over \$5 billion in grants for various projects, including municipal urban greening plans through the Urban Greening for Sustainable Communities Program (Program) which is intended to assist entities in developing master urban greening plans and constructing urban greening projects that help the State meet its environmental goals and that help to create healthier communities.

The City of Clovis was one of the municipalities awarded funding from the Proposition 84 grant to prepare an urban greening plan. Urban greening is the practice of enhancing the quality of life and improving the environment within an urban area by increasing and connecting parks and open space, providing safe and accessible multi-modal transportation, using green infrastructure to manage and filter stormwater, and enhancing the urban forest. Clovis' Urban Greening Master Plan augments the vision of the General Plan by establishing water efficient plant guidelines for greening urban streets, public open space amenities, trails, and paseos that can be linked throughout the community to existing public open space amenities, thereby enhancing and encouraging public usage. The Urban Greening Master Plan will also be an important toolkit for the City of Clovis to meet the stringent water conservation requirements of Executive Order B-29-15, issued by Governor Jerry Brown in April 2015, declaring a State of Emergency throughout the State of California due to severe drought conditions.

The Urban Greening Plan Master Plan focuses on developing greening opportunities and amenities in four disadvantaged communities within the city: Old Town, Northwest, Loma Vista, and Helm Ranch neighborhoods. The Urban Greening Master Plan addresses a variety of topic areas and reviews parks and open space, school sites, stormwater retention basins, and other open spaces within the community to determine opportunities for connecting, expanding, or enhancing these areas. While the Urban Greening Master Plan has citywide implications, it provides greater attention on developing green neighborhood designs for the four neighborhood focus areas mentioned above. The neighborhood focus areas were selected to reflect the various urban conditions within the city, as discussed in further detail in Chapter 6. The neighborhood focus will allow for a greater level of design and the identification and development of implementable projects that will enhance the neighborhoods and inspire citywide transformations.

Throughout the process of developing the Urban Greening Master Plan, Clovis has concurrently updated its General Plan to include additional programs, policies, and standards to balance environmental issues such as water supply, air quality, greenhouse gas emissions, and sustainable development, while increasing urban services and green space to provide a healthy and economically-sustainable community.

# 2 URBAN GREENING MASTER PLAN

## Planning Context and Consistency



*Bullard Avenue east of Old Town*

*"The calendar year of 2013 was the driest on record for many locations in the state."*

*"The calendar year of 2014 was the warmest on record for California."*

*- Fresno Bee*



The City of Clovis and other agencies with jurisdiction have a number of planning documents addressing existing conditions analysis, short term and long-range land-use planning, as well as implementation-oriented plans and designs. The following planning documents include standards, policies, and/or design guidelines that are considered pertinent to the Urban Greening Master Plan and which the Urban Greening Master Plan supports and/or is in compliance with. Relevancy of these documents is outlined below.

## **2.1 CLOVIS WATER EFFICIENT LANDSCAPE ORDINANCE**

In 2010, the City of Clovis adopted a local Water Efficient Landscape Ordinance which established water efficient landscape requirements for new and rehabilitated landscapes that developers, including projects administered by the City, must adhere to. Specifically, the Water Efficient Landscape Ordinance is intended to promote the design, installation and maintenance of landscaping in a manner that conserves regional water resources by ensuring that landscaping projects are using water efficiently and that irrigation systems are appropriately implemented and managed to minimize water waste. Chapter 8, The Plant Palette and Landscape Installation Plan, incorporates and is consistent with these measures.

## **2.2 CALIFORNIA MANDATORY WATER CONSERVATION REGULATION**

In April 2015, Governor Jerry Brown issued an executive order directing the State Water Resources Control Board to implement a 25 percent reduction on the State’s 400 local water supply agencies, which serve 90 percent of California residents, through February 2016.<sup>1</sup> The agencies will be responsible for coming up with restrictions to cut back on water use and for monitoring compliance.

The executive order imposes varying degrees of cutbacks on water use that will affect homeowners, farms, and other businesses. In addition, the owners of large farms will be required to offer detailed reports to State regulators about water use. The executive order also calls for the Department of Water Resources to work with local governments to replace 50 million acres of ornamental turf with drought-tolerant landscapes statewide. The Department is responsible for providing funding to allow for lawn replacement programs in underserved communities, which will compliment local programs already in existence statewide.<sup>2</sup> Additionally the State Water Resources Control Board (SWRCB) will prohibit irrigation with potable water of ornamental turf on public street medians, and irrigation that is not delivered by drip irrigation or microspray systems outside of newly-constructed homes and buildings.

The City of Clovis is considered to be a “high user” and is required to reduce water use by 36 percent compared to the same time period in 2013. Effective April 2015, water customers in the city may only water outside two days per week April through October; even-numbered addresses may water on Sunday and Wednesday, odd-numbered addresses may water on Saturday and Tuesday. No outdoor watering is allowed during and within 48 hours after measurable rainfall. Fees for violation of meeting water conservation goals are going into place. In May 2015, the City started capping 39,000 irrigation heads in landscaped areas along city streets; trees will be maintained but lawn in rights-of-way will not and the City may use mulch or convert lawn to ornamental shrubs between the trees and consider drip-irrigation systems to keep trees and shrubs healthy. As the drought continues, more regulations and restrictions to conserve water are likely to be enacted.

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<sup>1</sup> New York Times, *California Imposes First Mandatory Water Restrictions to Deal With Drought*, April 1, 2015.

<sup>2</sup> State of California, Office of the Governor Executive Order B-29-15, accessed on April 8, 2015.

## 2.3 CITY OF CLOVIS GENERAL PLAN

The City's General Plan was adopted in 2014, as an update of the 1993 version. The elements of the General Plan that are particularly relevant to the Urban Greening Master Plan include the Land Use Element, Circulation Element, Open Space and Conservation Element, and the Public Facilities and Services Element. Relevant goals and policies from each element are listed in Table 2-1 below along with an analysis of consistency with the goals of the Urban Greening Master Plan.

## 2.4 RELEVANT PLANNING DOCUMENTS

In addition to the City's recently adopted General Plan, there are numerous other planning documents that the Urban Greening Master Plan is consistent with and supports. These are summarized below.

### 2.4.1 City of Clovis Draft Parks Master Plan (2010)

The City of Clovis Parks Master Plan, drafted in 2010 by the Clovis Engineering Division, is intended to guide the development of park facilities in Clovis consistent with the vision of the Clovis General Plan. The Parks Master documents existing conditions, and primarily provides an inventory of City parks and their equipment, defines level-of-service standards, and outlines a classification system as well as general development criteria for each classification. Furthermore, the Plan establishes standard park equipment for the park system. The Parks Master Plan does not include any needs assessment, was never adopted, and primarily serves as an internal document of existing conditions.

### 2.4.2 Clovis Bicycle Transportation Master Plan (2011)

The City of Clovis' first Bicycle Transportation Master Plan was adopted in 2003 and updated in 2011. The Master Plan establishes goals, policies, implementation actions, and priorities for the development of bicycle facilities in the city as envisioned in the General Plan. Overall, the purpose of the Master Plan is to increase the number of persons in Clovis that bike for both utilitarian and recreational purposes by developing and maintaining an interconnected system of bicycle facilities. Additionally, the development of the Master Plan ultimately improves the accessibility of funding for bicycle-related improvements through grant funds issued by the California Department of Transportation. Key elements of the Master Plan describe existing conditions of bicycle facilities and their proximity to major activity centers, as well as project priorities, locations, improvement descriptions, facility types, and cost estimates. It is intended that the Bicycle Master Plan be revisited and updated periodically to ensure that it accurately reflects changing conditions and priorities within the community. The Urban Greening Master Plan embraces the proposed bicycle paths, lanes, and routes as a means to further addressing connectivity between neighborhoods, providing non-vehicular mobility, and addressing public health concerns.

### 2.4.3 City of Fresno Bicycle, Pedestrian, and Trails Master Plan

The Bicycle, Pedestrian, and Trails Master Plan is intended to guide and influence bikeway and pedestrian related policies, programs, and development standards to make biking and walking in Fresno more safe, comfortable, convenient, and enjoyable for all. The overarching goal of the Master Plan is to increase the number of people who bike and walk to work, school, and for recreation. As of 2010, when the Master Plan was prepared, the City of Fresno had nearly 140 miles of bikeways within the city. The City of Fresno shares an 11-mile-long border with the City of Clovis, so continuity and connectivity between the two jurisdictions were considered during the development of the Master Plan. The Master Plan identifies current trail connections such as the Sugarpine trail, which connects Fresno with the Clovis Old Town Trail, as well as desirable regional connections that include Class I bike paths along Herndon Canal, Herndon Avenue, and Veterans Boulevard. City Staff and Public Works and Planning Departments from both jurisdictions, as well as the county and regional agencies, will continue to pursue efforts to create a truly regional bikeway network in years to come.

TABLE 2-1 RELEVANT GENERAL PLAN GOALS AND POLICIES AND CONSISTENCY WITH GOALS OF URBAN GREENING MASTER PLAN

Number	Policy	Consistency with Goals of Urban Greening Master Plan
<b>Land Use Element</b>		
Policy 1.3	<b>Priority for public investments.</b> Assign a high priority to public investments (infrastructure, services, facilities, and open space) in areas defined in Figure LU-5.	Policy 1.3 is supported by the goal to draw people outside. Specifically to invest in new green space, develop pedestrian linkages, create a landscape improvement district, and formalize joint use agreements with schools.
Policy 2.2	<b>Diverse businesses and activities.</b> Encourage a diverse range of businesses and activities in Old Town, including businesses that operate in daytime and evening hours.	Policy 2.2 is consistent with the goal to grow the local economy by promoting increased activity in retail areas, which includes Old Town.
Policy 2.4	<b>Public Spaces.</b> Create and maintain public spaces in Old Town.	This policy is consistent with the goal to draw people outside which encourage creating new green space, the development of pedestrian linkages and trails, the creation of a city-wide landscape improvement district, and formalizing joint-use agreements with schools.
Policy 3.8	<b>Land use compatibility.</b> Within Urban Centers, new development that is immediately adjacent to properties designated for rural residential and agricultural uses shall bear the major responsibility of achieving land use compatibility and buffering.	The goal to grow the local economy through protecting agricultural production, increased property values, and increased activity in retail areas is consistent with Policy 3.8 to ensure that new development supports existing residential and agricultural uses.
Policy 3.9	<b>Connected development.</b> New development in Urban Centers must fully improve roadway, pedestrian, and bicycle systems within and adjacent to the proposed project and connect to existing urbanized development.	Policy 3.9 is consistent with the goal to promote alternative transportation and increase connectivity to green space and other activity centers for all transportation modes.
Policy 4.4	<b>Farmland Conservation.</b> Participate in regional farmland conservation, including the establishment of comprehensive agricultural preserves or easements, through efforts such as the Fresno County Model Farmland Conservation Program or the San Joaquin Valley Greenprint.	Policy 4.4 which encourages the City to participate in regional farmland conservation efforts, supports the goal to grow the local economy by protecting agricultural production.
Policy 5.4	<b>Transit-oriented development.</b> Encourage the provision of retail and employment opportunities in areas served by transit, recognizing the needs of the transit-dependent population.	Policy 5.4 is consistent with the goal to promote alternative modes of transportation.
Policy 6.2	<p><b>Smart Growth.</b> The City is committed to the following smart growth goals.</p> <ul style="list-style-type: none"> <li>a. Create a range of housing opportunities and choices.</li> <li>b. Create walkable neighborhoods.</li> <li>c. Encourage community and stakeholder collaboration.</li> <li>d. Foster distinctive, attractive communities with a strong sense of place.</li> <li>e. Make development decisions predictable, fair, and cost-effective.</li> <li>f. Mix land uses.</li> <li>g. Preserve open space, farmland, natural beauty, and critical environmental areas.</li> <li>h. Provide a variety of transportation choices.</li> <li>i. Strengthen and direct development toward existing communities.</li> <li>j. Take advantage of compact building design.</li> <li>k. Enhance the economic vitality of the region.</li> <li>l. Support actions that encourage environmental resource management.</li> </ul>	<p>Policy 6.2 is consistent with the goal to draw people outside which encourages creating new green space, the development of pedestrian linkages and trails, the creation of a city-wide landscape improvement district, and formalizing joint-use agreements with schools.</p> <p>Policy 6.2g and Policy 6.2l are consistent with the goal to utilize green infrastructure which intends to increase and maintain the urban forest, conserve water and natural wildlife habitats, and enhance the overall beauty of neighborhoods.</p> <p>Policy 6.2h is consistent with the goal to promote alternative modes of transportation.</p> <p>Policy 6.2j is consistent with the goal intended to grow the local economy.</p>

TABLE 2-1 RELEVANT GENERAL PLAN GOALS AND POLICIES AND CONSISTENCY WITH GOALS OF URBAN GREENING MASTER PLAN

Number	Policy	Consistency with Goals of Urban Greening Master Plan
<b>Circulation Element</b>		
<b>Goal 3</b>	<b>A multimodal transportation network that is safe and comfortable in the context of adjacent neighborhoods.</b>	
<b>Policy 3.2</b>	<b>Neighborhood compatibility.</b> Periodically review and update design standards to ensure that new and redesigned streets are compatible with the context of adjacent neighborhoods.	Policy 3.2 is consistent with the goal intended to implement the recommendations of previous planning efforts, including the Urban Forest Resource Analysis, Bicycle Transportation Master Plan, Parks Master Plan, and General Plan, which all contain design standards and need to be updated periodically to ensure that streets are designed to be compatible with surrounding neighborhoods.
<b>Policy 3.3</b>	<b>Old Town and mixed use village centers.</b> Transportation decisions on local streets in Old Town and mixed use village centers shall prioritize pedestrians, then bicyclists, then mass transit, then motorists.	Policy 3.3 is consistent with the goal to promote alternative modes of transportation as well as the goal to implement recommendations from previous planning efforts, including the Bicycle Transportation Master Plan which promotes increasing utilitarian and recreational uses of the bicycle.
<b>Goal 4</b>	<b>A bicycle and transit system that serves as a functional alternative to commuting by car</b>	
<b>Policy 4.1</b>	<b>Bike and transit backbone.</b> The bicycle and transit system should connect Shaw Avenue, Old Town, the Medical Center/R&T Park, and three Urban Centers.	The goal to promote alternative transportation specifically supports Policy 4.1 by promoting increased connectivity between neighborhoods and to activity centers.
<b>Goal 5</b>	<b>A complete system of trails and pathways accessible to all residents.</b>	
<b>Policy 5.1</b>	<b>Complete streets amenities.</b> Upgrade existing streets and design new streets to include complete streets amenities, prioritizing improvements to bicycle and pedestrian connectivity or safety, consistent with the Bicycle Transportation Master Plan and other master plans.	Policy 5.1 is consistent with the goal to utilize green infrastructure to offset the impact of impervious surface by pursuing “green streets” pilot.  Policy 5.1 is consistent with the goal to implement strategies from previous planning efforts, including the Bicycle Transportation Master Plan.
<b>Policy 5.2</b>	<b>Pathways.</b> Encourage pathways and other pedestrian amenities in Urban Centers and new development 10 acres or larger.	Policy 5.2 supports the goal to promote alternative modes of transportation by increasing pedestrian connectivity promoting the development of pedestrian linkages and trails.
<b>Policy 5.5</b>	<b>Pedestrian access.</b> Require sidewalks, paths, and crosswalks to provide access to schools, parks, and other activity centers and to provide general pedestrian connectivity throughout the city.	Policy 5.5 is consistent with the goal to develop alternative modes of transportation by developing pedestrian linkages and trails as well as increasing connectivity between residential neighborhoods and green space, and other activity centers.
<b>Open Space and Conservation Element</b>		
<b>Goal 1</b>	<b>Park and recreation facilities that are environmentally and fiscally sustainable and meet the needs of existing and future residents.</b>	
<b>Policy 1.1</b>	<b>Parkland standard.</b> Provide a minimum of 4 acres of public parkland for every 1,000 acres.	Policy 1.1 is consistent with the goal to draw people outside by creating new green space and developing pedestrian linkages and trails.
<b>Policy 1.2</b>	<b>Existing parks.</b> Upgrade and rehabilitate existing parks as necessary to meet the needs of the community and as the financial resources of the city allow.	Policy 1.2 is consistent with the goal to draw people outside to create new green space. Additionally this policy is consistent with the goal to implement recommendations previous planning efforts including the Parks Master Plan.
<b>Policy 1.3</b>	<b>New parks and recreational facilities.</b> Provide a variety of parks and recreation facilities in underserved and growing areas of the community.	Policy 1.3 is consistent with the goal to draw people outside by creating new green space, developing pedestrian linkages and trails, and formalizing joint use agreements with schools. Additionally this policy is consistent with the goal to implement

TABLE 2-1 RELEVANT GENERAL PLAN GOALS AND POLICIES AND CONSISTENCY WITH GOALS OF URBAN GREENING MASTER PLAN

Number	Policy	Consistency with Goals of Urban Greening Master Plan
		recommendations from previous planning efforts including the Parks Master Plan.
Policy 1.4	<b>Joint use of educational facilities.</b> Provide a balanced system of parks and recreation facilities through joint use of facilities owned by school districts.	Policy 1.4 is consistent with the goal intended to draw people outside, specifically by formalizing joint use agreements with schools.
Policy 1.5	<b>Multipurpose open space.</b> Design public facilities as multipurpose open space and recreation to serve the community’s infrastructure needs while preserving and enhancing open space and water features. Prioritize the use of existing basins for existing areas, and for future areas prioritize the development of separate park facilities available year round.	Policy 1.5 is consistent with the goal to utilize green infrastructure to preserve water and open space, while serving the communities needs and enhancing the overall beautification of the community.
Policy 1.6	<b>Linkages.</b> Link open space, parks, and recreation facilities by incorporating flood control channels into the city’s bicycle and trail system.	The goal to draw people outside supports Policy 1.6 as it aims to develop pedestrian linkages and trails. Also, the goal to promote alternative transportation supports this policy by increasing connectivity between green space, residential neighborhoods, and other activity centers.
Policy 1.7	<b>Sustainability.</b> Develop new and maintain existing parks and recreation facilities to achieve fiscal and environmental sustainability.	Policy 1.7 is supported by the goal intended to utilize green infrastructure which encourages green streets pilot projects and plantings that are designed for minimal maintenance and encourage conservation of water resources and wildlife habitat.
Policy 1.8	<b>Funding.</b> Require new development to provide pocket and neighborhood parks, dedicate land area for parks, and pay impact fees for community and regional parks. Require new development to establish lighting and landscape maintenance districts to fund operations and maintenance.	Policy 1.8 is consistent with the goal to implement recommendations from previous planning efforts including those in the Parks Master Plan, which outlines funding strategies for developing new and maintaining existing parks, and includes imposing land dedication and developer impact fees on new development.
Policy 1.9	<b>Master Plan.</b> Periodically update the Parks Master Plan to direct the implementation of the city’s open space facilities.	Policy 1.9 is consistent with the goal to implement recommendations from previous planning efforts including those recommended in the Parks Master Plan.
Policy 2.7	<b>Native plants.</b> Encourage the use of native and climate-appropriate plant species and prohibit the use of plants that are known to be invasive.	The goal to utilize green infrastructure is consistent with Policy 2.7 as it is intended to promote green infrastructure as a means to increase and maintain the urban forest, develop water-efficient guidelines and a plant palette for new development, and enhance the overall beautification and neighborhood identity through plantings that are designed for minimal maintenance.
Policy 2.8	<b>Urban Forest.</b> Maintain and enhance a diverse and healthy urban forest on public and private lands.	The goal to utilize green infrastructure specifically promotes increasing and maintaining the urban forest which is consistent with Policy 2.8.
Goal 3	<b>A built environment that conserves and protects the use and quality of water and energy resources.</b>	
Policy 3.4	<b>Drought tolerant landscaping.</b> Promote water conservation through the use of drought-tolerant landscaping on existing and new residential properties. Require drought-tolerant landscaping for all new commercial and industrial development and city-managed landscaping, unless used for recreational purposes.	Policy 3.4 is consistent with the goal to educate the community and businesses by providing information about conservation and the multiple benefits of urban greening as well as the goal to utilize green infrastructure which encourages the development of water-efficient guidelines and a plant palette for new development.
<b>Public Facilities and Services</b>		
Goal 4	<b>Community facilities and programs that connect members of all ages and abilities to a broad range of informational, communication, and recreational resources.</b>	

TABLE 2-1 RELEVANT GENERAL PLAN GOALS AND POLICIES AND CONSISTENCY WITH GOALS OF URBAN GREENING MASTER PLAN

Number	Policy	Consistency with Goals of Urban Greening Master Plan
Policy 4.4	<b>Recreational programs.</b> Provide and/or sponsor recreational programs and services that are accessible and affordable to residents of all ages and abilities and encourage active and healthy living.	The goal to promote alternative transportation and increase connectivity to green space and other activity centers, as well as the goal to implement recommendations from previous planning efforts including the Parks Master Plan and to include new open space opportunities, are consistent with Policy 4.4 to encourage active and healthy living through accessible and affordable recreation programs.
Policy 4.5	<b>Youth programs.</b> Coordinate with public and private schools, local non-profits, service clubs, and other agencies to provide opportunities for youth to explore and enjoy sports, creative and performing arts, future career paths, civic activities, and volunteer opportunities.	Policy 4.5 is consistent with the goal intended to implement recommendations from previous planning efforts. Specifically, when considering policies and programs for the Draft General Plan Update, to continue to grow and sustain the values that make Clovis special by fostering stewardship to conserve resources while contributing to a healthy community.
Policy 4.6	<b>Senior programs.</b> Collaborate with service providers to provide a wide variety of senior services and programs, including daily opportunities for seniors to have physical activity, social interaction, and mental stimulation.	Policy 4.6 is consistent with the goal to implement recommendations from previous planning efforts. Specifically, when considering policies and programs for the Draft General Plan Update, to continue to grow and sustain the values that make Clovis special by fostering stewardship to conserve resources while contributing to a healthy community.
Policy 4.8	<b>Access to community facilities.</b> Improve transit connections to community facilities for people who are transit dependent.	Policy 4.8 is consistent with the goal to promote the use of alternative modes of transportation and supporting infrastructure, specifically to reduce vehicle miles traveled and fossil fuel dependency.

Source: City of Clovis General Plan 2014.

## 2.4.4 The Clovis Trails Pedestrian and Bicycle Count and Survey (2014)

In 2014, the City of Clovis Department of Planning and Development conducted a screenline count of all pedestrians and bicyclist passing two points on the Clovis trails system. These counts were conducted at the Dry Creek Trail at the northeast corner of Dry Creek Park (located at the intersection of Clovis and Alluvial Avenues), and the Old Town Trail at a point behind the Parkway Trails Shopping Center (located at the intersection of Willow and Nees Avenues). The intent of the survey was to assess the cost benefits, economic impacts, impacts on quality of life, and identify potential future improvements associated with the trails system in the City of Clovis. The survey concluded that the trails provided specific benefits by offering a more scenic route that is absent of motorized vehicles, ultimately leading to increased safety for pedestrians and bicyclists. Suggested improvements to the trail system related to maintenance included, but were not limited to the need for weeding, tree trimming, uneven pavement surfaces, broken sprinklers, graffiti, and trash. Additionally, the survey identified safety issues to be addressed, which included dogs being walked off leash, broken glass on trails, danger from cars at street crossings, and the need for additional lighting.

## 2.4.5 County of Fresno Bicycle Master Plan

The County of Fresno Bicycle Master Plan provides a comprehensive long-term plan for the development of an extensive regional bikeway network that connects cities and unincorporated areas countywide. Goals of the plan include:

- » Creating a comprehensive and safe system of bikeways and bicycle facilities that focus on travel to work, commercial and government centers, schools, and recreational areas in the County.
- » Create a system of bicycle facilities that enables more multimodal trips with other forms of transportation by bicyclists.

- » Increase bicycle ridership by implementing bicycle facility improvements.
- » Promote bicycle safety and reduce the number of bicycle accidents.
- » Implement the Master Plan as part of the Fresno County General Plan Transportation and Circulation Element.

Policies and goals of the Master Plan are also intended to promote cooperation between Fresno County, the City of Fresno, the City of Clovis, the Fresno Irrigation District, and other agencies for the development and implementation of regional bikeways that link activity centers and regional recreational destinations. With implementation of the goals and programs of the Master Plan, it is anticipated that overall commuter trips within urban areas of Fresno County will double by the year 2035. These proposed and planned regional bikeways were reflected in discussions and goals to look at a broader network of non-motorized and alternative transportation options in the Urban Greening Master Plan.

### 2.4.6 City of Clovis Urban Forest Management Plan (2012)

The Clovis Urban Forest Management Plan provides a framework for the long-term care and preservation of the community's public trees. The plan recognizes the significance of the environmental and socioeconomic benefits from public trees and their relationship with community values and expectations for a high quality of life. The Management Plan includes recommendations for both long- and short-term objectives for achieving the goals of sustainability, environmental quality, and complementing regional planning efforts. While the Management Plan is specifically concerned with publicly-owned trees, it also recognizes the benefits and contributions of private trees to the overall well-being and livability of the community. The Urban Forest Management Plan is a critical document that identified specific actions and needs for a healthy urban forest which directly shaped, and which is supported by, the Urban Greening Master Plan.

### 2.4.7 Fresno-Clovis Stormwater Quality Management Program (2012-2013)

The Fresno-Clovis Stormwater Quality Management Program (SWQMP), prepared by the Fresno Metropolitan Flood Control District in 2013 to improve watershed conditions and water quality, provides best management practices (BMPs) to reduce the discharge of pollutants into the water system and meet National Pollutant Discharge Elimination System (NPDES) permit requirements. According to the SWQMP, the Fresno Metropolitan Flood Control District and the other co-permittees coordinate stormwater management program tasks to effectively and efficiently use existing resources and, as needed, create new programs to reduce or eliminate stormwater pollutants and runoff. This includes combining similar public and technical outreach messages, community events and presentations, multi-agency training and inspections, complaint referrals, development planning and review, and program evaluation. The current drought makes the SWQMP more critical as first-flush from any rain event will likely have more pollutants to pick up in the runoff. The Urban Greening Master Plan actively includes multi-benefit projects to ensure that stormwater is addressed citywide and at project specific levels.

### 2.4.8 Urban Forest Resource Analysis (2011)

In 2010, the City of Clovis contracted with Davey Tree Resource Group to complete an Urban Forest Resources Analysis which inventories public trees on streets, in parks, and at City facilities. The analysis was conducted by a team of certified arborists who recorded information on the species, size, condition, location, and current maintenance needs of public trees in the City of Clovis. The inventory identified 34,729 publicly managed trees, which included over 130 different species, and 2,769 available planting sites. The analysis determined that the City's tree population provides cumulative benefits to the community at an average value of \$61.89 per tree, for a gross value of \$2,149,435 per year. Overall, the Urban Resource Analysis concluded that the City's public tree population is a valuable resource that is worth continued investment to maintain as it has the potential to increase in value with time and proper management. According to the analysis, for every one dollar invested in public trees, Clovis receives \$2.40 in benefits. These benefits include energy savings, air quality improvements, storm water interception, atmospheric CO<sub>2</sub> reduction, and aesthetic contributions to the social and

economic health of the community. The inventory identified specific street tree planting locations that are included as implementation actions for the Urban Greening Master Plan.

## 2.5 SPECIFIC PLANS

### 2.5.1 Central Clovis Specific Plan

The Central Clovis Specific Plan includes a 640-acre area that extends from Sierra Avenue to the north, Barstow Avenue to the south, Sunnyside Avenue to the east, and Minnewawa Avenue to the west. The area includes Old Town Clovis, which is considered the community's primary social and cultural heart, as well as the Central Business District on the west side of Clovis Avenue, and the Clovis Rodeo Grounds. Unlike other planning areas in the city, the Central Clovis Specific Plan does not focus on urban expansion. Instead, it concentrates on a variety of programs relating to economic revitalization, adaptive reuse, capital improvements, infill development, historic preservation, and housing rehabilitation. Although adopted in 1983, the vision of the Specific Plan and many of its goals and policies are still relevant today. The City is currently in the process of updating the Specific Plan to be consistent with the goals, policies, and programs in the recently-updated General Plan. Old Town is one of the neighborhood focus areas of the Urban Greening Master Plan and the implementation actions identified should be considered as the Central Clovis Specific Plan moves forward.

### 2.5.2 Herndon-Shepherd Specific Plan

The Herndon-Shepherd Specific Plan was prepared by the City of Clovis Department of Planning, and adopted in 1988. The Specific Plan was developed to provide land use, circulation, open space, and utility plans for the 5,800-acre plan area that extends from Herndon Avenue to the south, Willow Avenue to the west, DeWolf Avenue to the east, and Shepherd Avenue to the North. The Specific Plan encourages development that will meet the needs of current and future residents and intends to integrate future development with the surrounding community. Specifically, land uses are arranged to promote compatibility between existing and proposed uses. Circulation and open spaces are designed to link neighborhoods within the Plan Area and connect to other neighborhoods in the city. Overall, the Specific Plan acts as a framework for future development to ensure the development of a healthy community by allowing for a wide range of uses that promote an active lifestyle.

### 2.5.3 Loma Vista Specific Plan

The Loma Vista Specific Plan, adopted in 2003, envisions Loma Vista, formerly known as the Southeast Urban Center, as a community that will eventually be home to about 30,000 residents over the next 20 years. The Specific Plan envisions an environmentally-friendly village that recognizes the value of protecting natural resources, higher density residential areas that are joined with over 25 miles of planned bicycle and pedestrian trails and paseos with shared open spaces, all linked to activity-filled urban streetscape areas. In addition to providing an overall description of the existing conditions within Loma Vista, the Specific Plan provides a set of standard and criteria for development in the area. Specifically, the Loma Vista Specific Plan establishes the planning concept, design and development guidelines, administrative procedures, and implementation measures necessary to achieve the orderly and compatible development of the area and maintain consistency with the goals, objectives, and policies of the Clovis General Plan.

### 2.5.4 Northwest Area Specific Plan

The Northwest Specific Plan was originally developed in 1978 to refine the goals, policies, and principles of the General Plan, so that the individual characteristics and concerns of the Northwest Specific Plan Area are identified and addressed. The Specific Plan is also designed to serve as a guide to public and private decisions regarding future development in the area. Although potentially relevant to this Urban Greening Master Plan, the Northwest Specific Plan is outdated and has

been repealed in full. The Urban Greening Master Plan will help direct development in Northwest to be more sustainable and in keeping with City goals to keep Clovis green.

### 2.5.5 Shaw Avenue Corridor Plan

The Shaw Avenue Corridor Plan was originally adopted in 1994 and is currently in the process of being updated to reflect the adopted policies and specific changes to the Plan Area that have occurred since its adoption. The Shaw Avenue Corridor Plan covers a 2½-mile stretch of Shaw Avenue from State Route 168 on the west to Clovis Avenue on the east. This area encompasses the City of Clovis, the City of Fresno, and the California State University, Fresno (Fresno State) campus. In addition to defining the land right-of-way that would be regulated, the Corridor Plan considers the physical, social, and economic context of the surround neighborhoods. The Corridor Plan is intended to describe land use patterns, circulation patterns, and strategies for property development standards to carry out the concept of Shaw Avenue as a landscaped boulevard. Helm Ranch, one of the neighborhood focus areas, is immediately south of the Shaw Avenue Corridor Plan area and will be impacted by the outcomes of future development around Shaw Avenue and surrounding areas.

### 2.5.6 Harlan Ranch Master Plan

The Harlan Ranch master planned community is an approximately 890-acre, triangular-shaped property located in the northeastern part of the Fresno-Clovis metropolitan area. The area is bound by Shepherd Avenue to the north, Highway 168 to the south, and DeWolf Avenue to the west. The Master Plan establishes guiding principles, a land use pattern, and design standards for the orderly development of the community. The Master Plan envisions a community composed of a variety of residential neighborhoods, public and private recreational facilities, and a local-serving commercial center with an intimate main-street component. Additionally, the Master Plan outlines specific streetscape standards that include landscaping and lighting requirements, as well as standards pertaining to future residential and non-residential development, and recreational development. Harlan Ranch does not directly affect any of the four focus areas but as a recent and near fully-built master-planned community, it is often referenced when new development is discussed and therefore serves as a relevant reference to the Northwest focus area.



# 3 URBAN GREENING MASTER PLAN

## Goals of the Urban Greening Master Plan



Helm Ranch Park

*“Efforts and courage are not enough without purpose and direction.”  
- John F. Kennedy, Former US President*



### 3 URBAN GREENING MASTER PLAN

#### Goals of the Urban Greening Master Plan

The Urban Greening Master Plan focuses on developing greening opportunities and amenities in four disadvantaged areas within the community: Helm Ranch, Old Town, Loma Vista, and Northwest. Existing parks and open space, school sites, storm water retention basins, and other open spaces within the community were identified and reviewed to determine opportunities for connecting, expanding, or enhancing these areas.

The Urban Greening Master Plan provides smart growth strategies that promote Clovis as a healthy community by planning for more green space that will improve air and water quality, reduce the consumption of natural resources and energy, while encouraging healthy lifestyles. Development of this Urban Greening Master Plan augments the vision of the City's General Plan by establishing water efficient plant guidelines for greening urban streets, sidewalks, trails, paseos, parks and open space amenities. Connecting these enhanced public spaces will encourage public use and begin to address the need for public open space to balance diminished private open space that results from increasing densities.

The Urban Greening Master Plan was funded through an Urban Greening Grant Program administered by the California Natural Resources Agency and the State of California Strategic Growth Council. The Program is intended to assist entities in developing master urban greening plans and constructing urban greening projects that help the State meet its environmental goals and create healthy communities.

It is intended that the Urban Greening Master Plan be consistent with the State's planning policies pertaining to infill development and equity, protection of environmental and agricultural resources, and encouragement of efficient development patterns. The Urban Greening Master Plan must also be consistent with the City of Clovis' General Plan, reduce greenhouse gas emissions, and comply with the California Environmental Quality Act (CEQA).

In 2014, a variety of community workshops were held to introduce the Urban Greening Master Plan and to gather feedback from residents regarding their concerns and goals for developing a plan that fits their community. At each of the community workshops, three interactive stations were set up to solicit community members' opinions regarding preliminary goals for the Urban Greening Master Plan, environmental issues to be addressed, and urban greening actions to be incorporated into the Urban Greening Master Plan. The goals that participants voted and commented on during the Round #1 workshops were refined, reviewed by City staff and a Technical Advisory Committee, and presented back to the community during Round #2 workshops. The revised list of goals is shown on the following pages.



**EDUCATE THE  
COMMUNITY AND  
BUSINESSES**

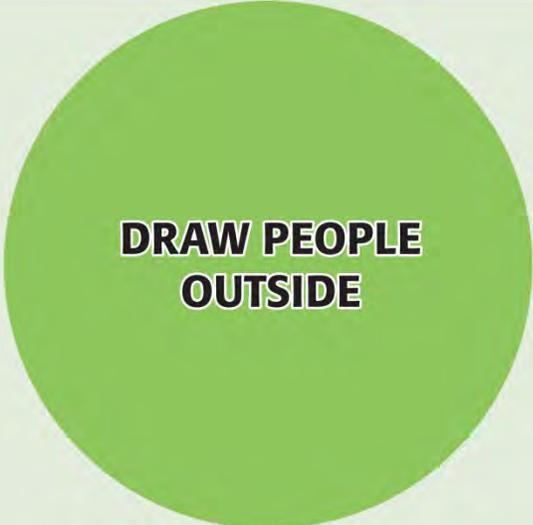
Provide information about conservation and the multiple benefits of urban greening

Encourage healthy eating habits and experiences through support of agricultural education

Support environmental and agricultural education

Inform the public about 2010 Local Water Efficiency Ordinance

Inform the public about Tree Protection Standards in updated City Development Code



**DRAW PEOPLE  
OUTSIDE**

Create new green space

Develop pedestrian linkages and trails

Support provision of outdoor dining

Consider creating a citywide landscape improvement district

Formalize joint use agreements with schools



**UTILIZE GREEN  
INFRASTRUCTURE**

Offset the impact of impervious surfaces by pursuing “Green Streets” pilot projects

Increase and maintain the urban forest

Enhance overall beautification and neighborhood identity through plantings that are designed for minimal maintenance

Develop water-efficient guidelines and plant palette for new development

Encourage conservation and restoration of wildlife habitat



**PROMOTE  
ALTERNATIVE  
TRANSPORTATION**

Reduce vehicle miles traveled and fossil fuel dependency

Increase connectivity to green space and other activity centers

Improve pedestrian access from residential neighborhoods to everyday goods and services

Provide safe and accessible streets with shading and buffers to encourage walking and biking



**GROW THE LOCAL ECONOMY**

Protect agricultural operations

Increase property values

Increase activity in retail areas



**IMPLEMENT RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS**

Urban Forest Resources Analysis:  
2,512 available planting sites

Bicycle Transportation Master Plan:  
Increase utilitarian and recreational uses of bike system

Parks Master Plan:  
New open space opportunities

General Plan:  
Continue to grow and sustain the values that make Clovis special; foster stewardship to conserve and enhance natural resources while contributing to a healthy community

**MAXIMIZE  
OPPORTUNITIES FOR  
PARTNERSHIPS ON  
GREENING EFFORTS**

County of Fresno

County of Fresno Public Health Department

City of Fresno

Clovis Unified School District

Fresno Unified School District

Sanger Unified School District

Clovis Community Medical Center

Clovis Community Foundation

Clovis Chamber of Commerce

California Urban Forests Council

Tree Fresno

Clovis Botanical Garden

UCCE Master Gardeners of Fresno County

Clovis Rodeo Association

Building Industry Association

Fresno Metropolitan Flood Control District

Fresno Irrigation District

Climate Change Institute at Fresno State

To enhance the unique character and beauty of the existing landscape, establish guidelines for future urban greening, promote a multimodal transportation system, and encourage healthier living for residents throughout the community, the goals presented in this chapter provide a framework and long-term guide for effective and sustainable growth in Clovis. The intended goals of the Urban Greening Master Plan are consistent with the goals and policies of the recently updated 2014 General Plan as outlined in Table 2-1 of Chapter 2, and will ensure that the Urban Greening Master Plan will promote sustainable development practices and create a more livable and vibrant community consistent with the vision of the General Plan.



# 4 URBAN GREENING MASTER PLAN Community Input and Public Forums



*Round #1 community workshop in Helm Ranch at Tarpey Elementary School*

*“The only way forward, if we are going to improve the quality of the environment, is to get everybody involved.”  
- Richard Rogers, Architect*



Citizen involvement is an essential part of the development of the Urban Greening Master Plan to not only ensure that the community is supportive of the Urban Greening Master Plan and its elements, but to establish a knowledge base among citizens about the role of the Urban Greening Master Plan into the future.



*Round #1 community workshop in Helm Ranch*

In 2014 and 2015, a variety of community workshops were held to introduce the Urban Greening Master Plan and to gather feedback from residents regarding their concerns and goals for developing a plan that fits their community. Two rounds of workshops for each of the four focus areas were organized at different stages of the development of the Urban Greening Master Plan. Helm Ranch and Old Town each had a third round of workshops to address the additional constraints they each have given their lack of open space and their status as built-out neighborhoods. During April and May 2014, preliminary public open workshops were held in each of the four focus areas. A summary of these meetings follows.

## **4.1 ROUND #1 WORKSHOP OVERVIEWS**

Round #1, included four interactive stations intended to solicit community member opinions regarding goals and strategies for the Urban Greening Master Plan, circulation needs, a plant palette to be used for each neighborhood, and urban greening strategies to be incorporated into the Urban Greening Master Plan.

### **4.1.1 Goals and Strategies**

The goals and strategies station encouraged participants to vote on the intended goals and strategies they found most relevant to their community. The goals and strategies that participants voted on are listed in Chapter 3. This station also included an interactive board where participants voted on environmental issues that they considered most important to themselves and their community. In addition to the environmental issues listed below, participants were encouraged to suggest strategies of their own. The environmental issues that were voted on at this station were:

- » Street trees and planting.
- » Water efficient planting.
- » Community gardens.
- » Habitat restoration.
- » Parks and open space.
- » Rain gardens and swales.
- » Alternative transportation.

In addition to addressing environmental issues at this station, participants voted on which features they wanted to see incorporated into the Urban Greening Master Plan for their community based on urban greening strategies used in other areas. Following is a summary of the intended goals and strategies, environmental concerns, and issues and opportunities expressed by each community.

### 4.1.2 Circulation

Another station was set up to address Circulation, which included a board with a map of Clovis showing all roads. At this station participants were encouraged to use different colored markers to draw the areas where they currently walk or bike, areas where they found it difficult to walk or bike, and areas where they hope to walk or bike in the future. This station additionally included an interactive board intended to gauge preference for trail design. The board presented three types of trails that could be incorporated into new development:

- » An open air trail along an irrigation canal.
- » An enclosed concrete paseo with lawn and trees.
- » A semi-enclosed concrete paseo with increased groundcover, shrubs, and openings for residences along the trail.

### 4.1.3 Urban Greening Needs Assessment

A third station displayed a draft map of potential greening opportunities in each of the four neighborhoods. Participants were asked to mark sites that they liked or disliked, as well as sites that were not presented but should be considered in the Urban Greening Master Plan. A second interactive feature at this station asked participants to brainstorm words they considered to represent their community. This exercise was intended to provide residents a way to define the character of their neighborhood in order to provide City Staff a better understanding of how to shape the plan to match the desired character of the neighborhoods.

### 4.1.4 Plant Palette

This station encouraged participants to think about the style of plant features they wanted to include in their neighborhood, as well as the layout of their streets. This station included three interactive boards to help facilitate the creation of a vision for each neighborhood. The first station presented a variety of trees types showing only the general shape and look the participants envisioned characterizing their neighborhood. A second station presented different views of street trees, asking participants their preferred look, including small versus large trees and examples of differing plant palettes. The final board presented different configurations of a conceptual four-lane street. Community members voted on their favorite street layout.



Round #1 community workshop in Helm Ranch

Summaries of the Round #1 Individual Workshops follow; see Appendix A: Round 1 Workshop Summaries for additional detail.

## ► HELM RANCH (SOUTHWEST AREA)

### Goals and Strategies

On the board outlining goals and strategies, participants indicated support for “Increased Public Health, Community Amenities and Quality of Life” and “Improved Government Operations.” They also supported for a strategy to achieve these goals to “design for minimum maintenance.” Participants also added the following items:

- » Electric scooter path.
- » Plant without creating hiding places.
- » Code enforcement.

At the environmental issues board, participants also voted that air quality was a major concern while water was secondary. To address air quality concerns, participants suggested that air quality could be improved by installing smart left turn lights at key intersections to reduce the time that cars idle at these intersections. Participants indicated support for “Street Trees and Planting” as a potential urban greening strategy. Additionally, participants voted for “Alternative Transit,” and expressed the need to consider offering easy and convenient modes of transportation to accommodate an aging population. Emphasis was placed on alternative transit opportunities that do not solely target highly active mode such as biking adjacent to moving cars. Other participants added the following strategies:

- » Smarter irrigation: mix of perennials and native species.

- » Consider safety in plant selection (to avoid creating hiding places).

## Circulation

Participants identified dangerous streets and areas of safety concern as well as areas that were in need of extra maintenance such as lighting and landscape improvements. Dangerous streets included Willow, Gettysburg, and Peach Avenues, as well as Villa. A street that posed conflicts between pedestrians and bicyclists was Shaw Avenue to the north of Helm Ranch. Residents identified the irrigation canal along the northern edge of the basin park, and sections of Willow, Gettysburg, and Santa Ana Avenues, as places where they currently liked to walk. Areas that could be enhanced to improve safety and connectivity included Gettysburg Avenue between Helm and Minnewawa Avenues, Villa, Peach, Helm, and West Holland Avenues, as well as a connection to the irrigation trail at the basin park on Minnewawa and Ashlan Avenues.

## Urban Greening Needs Assessment

Participants used the urban greening needs assessment map to identify areas of improvement as well as sites for new potential parks. Sites for new parks included vacant lots on Willow, Gettysburg, and Santa Ana Avenues. Blighted areas were also identified along Villa Avenue north of Gettysburg, and participants indicated that these are potential opportunity areas for improvement. Community members also expressed the desire for more parks and covered bus shelters in Helm Ranch. Residents brainstormed ideas and keywords that described the current conditions of their neighborhood, as well as ideas for improvements to be considered in the development of the Urban Greening Master Plan, which included:

- » Keep density down.
- » Plant trees and roses on Willow.
- » Ugly.
- » Want to be a part of Clovis Unified.
- » Disconnected.
- » Blighted.
- » Too many dollar stores.
- » Build what you can maintain.
- » Increase public safety.
- » Want clean air.
- » Great school (Tarpey Elementary).
- » Friendly.
- » Close to Old Town.
- » Keep maintenance effort up on Willow Avenue median.

## Plant Palette

Generally, participants expressed that did not have a specific preference for the look of the trees in their neighborhood; however they did indicate that they would like to see more. Some preference was taken for deciduous trees with red or yellow fall colors or large flowers, and there was mention of coniferous trees causing issues with visibility. Additionally, residents preferred trees that would minimally upset sidewalks with their roots. Community members also expressed a desire for a mixture of trees as compared to having the same type of tree along a corridor or median.

## ▶ OLD TOWN

### Goals and Strategies

Residents of Old Town voted that air quality and water were the issues that concerned them the most. Other concerns included, bicycle safety and the need for mosquito abatement. Participants indicated that they preferred “Street Trees and Planting” and “Parks and Open Space” as potential urban greening strategies with an emphasis on water efficient plantings and alternative transit. Participants noted the following issues and opportunities at the goals and strategies station:

- » Parking enforcement.
- » Parking opportunities.
- » Street crossing at Sierra and Old Town trail.
- » Improvements to Clovis to Fresno Area Express connections.
- » Connection to mass transit (Amtrak and rail).
- » Walking tour.
- » Improve parks.
- » SR 168: Sound walls should be on both sides.
- » Street trees on Cherry Lane between 2nd and 3rd.
- » Prevent use of leaf blowers (early morning).



Round #1 community workshop in Old Town

## Circulation

Major concerns in Old Town included speeding along major corridors, a need for four-way stops at major intersections, lack of sidewalks in areas where people like to walk, limited bike access on certain streets, plantings obstructing street signage, dangerous underpasses, and the need for lighting along urban trails. Residents expressed an interest in walking along the irrigation channel passing through Letterman Park, the Old Town trail, residential streets north of Bullard Avenue, Eighth Street between Clovis and Minnewawa Avenues, and Barstow Avenue in front of Sierra Vista Elementary School. Participants also identified areas near the irrigation canals that are not currently used for urban trails, expressing an interest in making these areas walkable. In addition, one participant identified the need for a buffer to reduce freeway noise from SR 168.

## Urban Greening Needs Assessment

Greening opportunities were proposed to transform the irrigation canal trail along Letterman Park into a paved trail. Additionally, residents identified opportunities for tree plantings in the southeastern part of the neighborhood and for an entry gateway along Clovis Avenue as people enter Old Town. Although specific locations were not identified, participants expressed an interest in having places to eat outside downtown and places to rent for parties and reunions.

During a brainstorming session, participants used the following words to describe their neighborhood:

- » Safe
- » I love Old Town
- » Historic
- » Love the old houses
- » Great balance of demographics
- » Leaf blowers should not be used when residents are trying to sleep
- » Cleanup the Post Office grounds
- » Downtown not quite so tourist oriented
- » Relaxing – benched – outdoor tables – safe – music
- » Peaceful
- » Love farmers market and Clovis fest
- » Bicycle friendly
- » United

## Plant Palette

With a preference for larger trees, participants provided information about the importance of trees providing shade during the summer months, and noted that street trees have been recently removed and replaced with smaller ornamental trees, which provide less shade benefit. Participants expressed a preference for evergreen trees with large branching structures and some indicated support for trees with large flowers or nut trees. Overall, residents in Old Town desire a streetscape layout with separated bike lanes as it posed fewer safety issues. However, one resident felt that the current streetscape layout was perfectly suitable to accommodate bicyclists and motorists, and there was no need for a separated bike lane. In general participants also liked the idea of having increased trees on private property. Issues and interests that arose during a discussion about plants and trees included but were not limited to: a lack of maintenance of new trees; new trees being

planted upon the roots of dead trees, which cause structural issues for new trees; interest in phasing out old trees to be replaced with drought tolerant varieties; and minimizing trees that block the vision of street signs or traffic.

## ► LOMA VISTA

### Goals and Strategies

At the environmental issues board, participants expressed that their highest concern was air quality, while their secondary concern was related to water. Climate Change and Public Health were less of a priority. Participants had a strong preference toward “Parks and Open Space” as a potential urban greening strategy and specifically voiced concerns about the parks and how they are turning brown from a lack of water and are not valuable open spaces. Additionally, participants noted that they would like to see a better mixture of parks throughout the community that offered amenities that emphasize fitness and offer opportunities for exercise. “Alternative Transit” was also a preferred strategy, with one resident recommending a “Bike Buddies” program. Participants only added one particular comment to the board outlining goals and strategies with a desire to add lighting to the public picnic shelter in Los Arbolitos Park.

### Circulation

Participants identified major concerns in Loma Vista, emphasizing the need for wider sidewalks, lack of crosswalks across major streets, insufficient time to cross large streets, and bike lane right-of-ways not being honored by motorists. Areas of concern included the intersection of Locan and Barstow Avenues, as well as lengths of Barstow and Ashlan Avenues. Community members identified areas that they liked to walk, which included most of the internal paseos and sidewalk trails within the developed residential areas, as well as De Wolf Avenue and the trail along the irrigation canal to the south of the neighborhood. Participants also marked areas where they hoped to see improvement in the future that included



Round #1 community workshop in Loma Vista

incomplete sidewalks and sections of the irrigation canal where residential development has been constructed. Desire for a park to be located along the irrigation park was also indicated at the circulation station.

## Urban Greening Needs Assessment

Although participants did not support projects on the urban greening needs assessment map, they did use the map to discuss future development needs and maintenance they would like to see, including:

- » Well planned neighborhoods.
- » Bigger parks.
- » Curvilinear streets.
- » Quality development and quality apartments.
- » Elementary schools with higher basketball hoops for older youth and adults.
- » Trees are too close to median and sides along Temperance Avenue.

Participants also made suggestions to the City to look at examples of low-water use plants in developing a landscape plan for Loma Vista.

## Plant Palette

Participants indicated a preference for larger trees on the streets in Loma Vista, although some individuals emphasized the need for increased maintenance and pruning on larger trees. Concerns that were expressed at the visual preference board were related to turf in parks, and specifically the resources that are wasted in effort to keep these areas looking green. In terms of style and form, participants showed equal preference for evergreen and deciduous trees. Specific concerns were identified related to trees that have lower branching that pose visibility and safety concerns, noting that broadleaf evergreen trees were preferred as opposed to coniferous trees which tend to have lower branching. A strong preference was indicated for streetscapes with bike lanes separated from traffic with a plated buffer and participants preferred the planted center median as opposed to the planted median at the edge of the street.

## ► NORTHWEST

### Goals and Strategies

Participants showed support for a variety of greening strategies, which included but were not limited to: neighborhood identity through planting; stormwater management improvements; increasing utilitarian and recreational uses of the bike system; pedestrian access from residential neighborhoods to everyday goods and services; and improved air quality. Additionally, residents added community gardens and active sports as goals for the Northwest neighborhood. At the environmental issues board, participants voted that water was the issue that concerned them the most, while air quality was secondary. They also expressed that they preferred “Parks and Open Space” as potential urban greening strategies.



Round #1 community workshop in Northwest

## Circulation

Participants identified Willow Avenue as a dangerous crossing, finding it difficult to cross the street to get to the Old Town Trail on the west side of the street. They emphasized that as development occurs in this area, special crossing or underpasses would be necessary to allow residents to connect to the trail. Minnewawa and Behymer Avenues were also identified as a major pedestrian and bicycle corridors, noting these are opportunities for future connections. Participants indicated that they would like to see parkways installed along all major existing streets, including Minnewawa, Sunnyside, Willow, Copper, Behymer, and Shepherd Avenues, noting that these areas could be planted before other streets are developed in the Northwest, allowing planting to become established before residents move to the area.

On the trail preferences board, participants voted equally for open, naturalistic style trails and semi-enclosed, paved, and meandering trails. On both trail designs, participants indicated that there should be lighting to ensure that they are usable during the day and evening, with resting places along the way.

## Urban Greening Needs Assessment

At this station, participants provided feedback on proposed park locations and improvements including:

- » the proposed park located at the corner of Minnewawa and Shepherd Avenues, and the greenway park along the irrigation canal would be opportunities for active sports
- » realigning the connection to Auberry Road from Clovis Avenue could be a new greening opportunity
- » a historic house along Behymer Avenue and an existing alley of palm trees in the center of the neighborhood should be preserved

- » keywords and historical information to characterize their neighborhood included Garfield Water District, Garfield Grove, Clovis Hills, and Perrin Colony
- » integrate and acknowledge the heritage of the area as development comes.

## Plant Palette

Most of the participants indicated a preference for larger trees on the streets, with one participant emphasizing the need to consider the scale of surrounding building to determine type and form. In terms of style and form, residents showed the most support for evergreen trees and branching trees in a variety of colors. Fruitless olive trees were also recommended as potential gateway trees.

## 4.2 ROUND #2 INDIVIDUAL WORKSHOP SUMMARIES

In October 2014, a second set of community workshops were held to re-introduce the Urban Greening Master Plan process, reviewing the outcomes of the previous round of workshops. This workshop included a presentation that provided an overview of the Urban Greening Master Plan as well as a discussion that prioritized types of projects and/or locations of projects. To facilitate this discussion, the groups looked at sample projects from their neighborhood to help articulate community needs. Participants discussed urban greening priorities for their area and conceptually designed sample streetscapes, park projects, and trail projects.

Summaries of the Round #2 Individual Workshops follow; see Appendix B: Round 2 Workshop Summaries for additional detail.

### ► HELM RANCH

#### Priorities

In a discussion addressing existing conditions and possible projects in the Helm Ranch Neighborhood, participants marked up maps and inserted notes to prioritize and capture the intended goals and desires of the community. Community members envisioned the following types of projects as critical components to be addressed in the Urban Greening Master Plan for their neighborhood:

- » More trees but need to be limbed up for safety and vision.
- » Median trees along Willow Avenue.
- » Intersection improvements at Holland Avenue and Willow Avenue more important than greening between Peach Avenue/Villa Avenue and Santa Ana Avenue/Rialto Avenue.
- » Trail improvements at drainage basin, level out with better walking surface.
- » Intersection at Peach Avenue/Ashlan Avenue needs traffic calming.
- » Golf course not used - Fresno side of street desirable walking space.
- » Priority area at Gettysburg and Peach Avenue – Use vacant lot to create space for kids to get out on street and kick ball around, keep clear site lines by limbing up vegetation, greening space – high priority.
- » Low water/maintenance plants.

Community members also had a variety of concerns related to blight along Shaw Avenue, trash in alleys, lack of code enforcement, lack of ownership with apartments, water use and runoff, pedestrian safety at night, and safety at San Gabriel Park.



*Round #2 community input on potential improvements in Helm Ranch*

## Design: Sample Streetscape

Community members were asked to provide input on components of streetscapes that would support the City’s urban greening efforts. For this exercise, Willow Avenue was used as a sample street and participants illustrated their needs by placing stickers on a map to identify different amenities and locations to convey their desires. Their notes identified a variety of street designs and amenities, which included:

- » Explore balancing traffic and connectivity on Shaw and Santa Ana Avenues.
- » Green Shaw Avenue: Synchronize lights and enforce a 35 mph speed limit.
- » Plant street trees along both sides of the street.
- » Improve crosswalk specifically at intersections with Gettysburg and Ashlan Avenues.
- » Provide new low maintenance street planting on Ashlan Avenue between Willow and Peach Avenues.
- » Prune trees around Peach Avenue to improve sight lines.
- » Concern with bike lanes and traffic; a green parkway without losing lanes.
- » Create safe crossings with the audible “walk/don’t walk” and bulbouts to reduce pedestrian crossing distances.
- » Increase police presence – ‘block’ parties at apartments.

## Design: Sample Park Project

An undeveloped parcel along Willow Avenue was identified as potential park land. Priorities for amenities at this site included:

- » Look at Dry Creek as a good example of what they would like to see.
- » Program the park to be multigenerational.
- » Plant species that will attract hummingbirds and butterflies.
- » Include a picnic shelter and barbeque.
- » Install crosswalks on the perimeter streets for safe accessibility.
- » Plant street trees around the park perimeter and landscape the median on Willow Avenue.
- » Install pedestrian lighting.
- » Provide basketball court.
- » Include playground structure and swings.
- » Police neighborhood event and opening.

## Design: Sample Trail Project

A potential trail was located along a canal and the community recommended the following features:

- » Water bottle filler and dog water fountain.
- » Benches.
- » Shade – trees or structure.
- » Crosswalks at Willow Avenue and Peach Avenue.
- » Trees and pedestrian lighting along the trail.
- » Fitness areas.
- » Safer crossing at Peach Avenue with an audible signal and bulbouts to reduce crossing distance for pedestrians.
- » Paved with level surface, such as decomposed granite or dirt.
- » Pedestrian lighting.

## ► OLD TOWN

### Priorities

During a discussion of possible projects, existing conditions, and new developments, community members used a map to prioritize ideas and locations that they preferred to improvements in their neighborhood. In Old Town, the first priority expressed by participants was to increase the amount of trees in the community. The second priority for this neighborhood was the intersection of Dewitt Avenue and Bullard Avenue, and the third priority was to update and improve parks. Other ideas included power and water, removing parking to install trees, and increasing pedestrian linkages.



Round #2 community input on potential improvements in Old Town

## Design: Sample Streetscape

Community members were asked to provide input on components of streetscapes that would support the City's urban greening efforts. For this exercise, Shaw Avenue was used as a sample street and participants illustrated their needs by placing stickers on a map to identify different amenities and locations to convey their desires. Their notes identified a variety of street designs and amenities, which included:

- » Four-way stops where Bullard Avenue intersects with Dewitt Avenue and Woodworth Avenue.
- » Benches with bench sponsorship.
- » Shared streets with sidewalk plantings (no median plantings).
- » Pedestrian lighting at Seventh and Ninth Streets.
- » Crosswalks at Eighth and Tenth Streets, Dennis Drive, and Scott Avenue.
- » Pedestrian paths along both sides of the Shaw Avenue Corridor.

## Design: Sample Park Project

The sample park was proposed to be at the southwest corner of Ninth Street and Pollasky Avenue. However, participants decided to design the vacant lot on the northwest corner instead. Amenities included in this design were:

- » Racquetball courts.
- » Seating.

- » Basketball court (half court).
- » Teen hangout.
- » Crosswalks on Pollasky Avenue for both side of the intersection with Ninth Street.
- » Pedestrian lighting.
- » Street trees around perimeter of the park.
- » Fitness area and bike parking.

## Design: Sample Trail Project

The community did not get to the trail design exercise and focused on street and park exercises.

### ► LOMA VISTA

#### Priorities

In a discussion addressing exiting conditions and possible projects in the Loma Vista Neighborhood, participants marked up maps and inserted notes to prioritize and capture the intended goals and desires of the community. Community members envisioned the following types of projects as critical components to be addressed in the plan for their neighborhood:

- » Continuing paseos to expand the network of trails and paths.
- » Adding new or improving existing plantings.
- » Increasing water conservation with drought tolerant plantings.
- » Deincentivizing lawn.
- » Incentivizing healthier food options.
- » Encourage stores in walkable distances to residences.
- » Provide trails along the canals.
- » Planting trees with seasonal color at intersections.
- » Build a community center and village green with stage to the north of the Reagan Elementary/Clovis East campus.
- » Providing identification so visitors know they have arrived in Clovis.

## Design: Sample Streetscape

Community members were asked to provide input on components of streetscapes that would support the City's urban greening efforts. For this exercise, Shaw Avenue was used as a sample street and participants illustrated their needs by placing stickers on a map to identify different amenities and locations to convey their desires. Their notes identified a variety of street designs and amenities which included:

- » Give bikes their own ramps/driveway-like to cross street.
- » Street trees.
- » Pedestrian lights.

- » Sidewalks/pedestrian paths.
- » Crosswalks.



*Round #2 community input on potential improvements in Loma Vista*

## Design: Sample Park Project

Land along a canal has been identified as potential parkland. Priorities for amenities on this site included the following:

- » Lots of trees/shade.
- » Bike parking.
- » Benches.
- » Measured loop path.
- » Mix of active and passive recreation.
- » Potential lighting of fields.

## Design: Sample Trail Project

A potential trail alignment was identified and the main discussion in Loma Vista was focused on the following:

- » Benches.
- » Barriers/signage.

- » Continuity with existing trails and paseos.
- » Wayfinding with directions and locations.



Round #2 City staff discussion of potential improvements in Northwest

## ► NORTHWEST

Unfortunately only one community member attended this meeting in October 2014 and was only able to stay for 15 minutes, so this workshop included a brief overview of the process and a short discussion about ideas for the Northwest Neighborhood. City staff went through the exercises and discussed options to address greening in the neighborhood.

Given the low turnout, the City mailed and emailed attendees from the Round One Workshop, provided a link to access the Power Point, and asked them for input and comments to the following questions:

1. What are your priorities for urban greening in Northwest Clovis? Is it street improvements, trail connections, intersection improvements, new parks, or other ideas? Are there specific locations that are more important than others or specific types of improvements (parks, streets, trails) that are important? Which improvements are most important to you?

2. What kinds of amenities do you want to see in a new park, new streetscape, or a new trail? Trees, planted medians, improved crosswalks, separated trail from road, lighting, passive or active recreation, benches, fitness areas, paseos, community gardens, shade structures, bus shelters, playgrounds, natural open spaces, plazas, outdoor theater, vegetative buffers, drought tolerant plantings, public art, others?
3. What should the Northwest be identified as? The area has been called Northwest because it is geographically northwest of Old Town but should it have a different name? And, if so, what should it be called or be branded as? The City is interested in creating/identifying communities such as Harlan Ranch. A Clovis Community or Loma Vista: A Clovis Community. What should the Northwest be and what should represent it? Different suggestions for names include: Garfield District, Garfield Grove, Perrin Colony, and Clovis Hills; suggested graphic identification include some combination of foothills and agriculture, and the historic Garfield Elementary brick archway (corner of Shepherd Avenue and Minnewawa Avenue). What ideas do you have?

## Priorities

Listed below is a summary of the feedback from the City staff workshop, the one community member who stopped by, and comments submitted by phone or email:

- » Greenway or bikeway that connects the academic campuses with Old Town, perhaps along International and Minnewawa Avenues.
- » Separated bikeways at major intersections – consider street crossings underground.
- » Bike Trail Network.
- » Complete, green streets that prevent speeding and have trees in medians and along sidewalks.
- » Parks interconnected with wide bike lanes and walking trails.
- » Trees – plant more and try to get street trees in early so they are established by the time development comes.
- » Gateway Entry/Park at old Garfield site – the brick archway is iconic and should be incorporated into some public facility.
- » Traffic calming on Willow Avenue near International.
- » Incorporation of surface water treatment plants and ground water recharge.
- » Very drought resistant landscaping.

Some of the suggested names received for the Northwest included:

- » Garfield
- » Clovis Hills
- » Perrin Colony
- » Garfield Grove
- » Garfield District
- » Something related to the former Big Creek Train Depot or other historic association in the area.

In general, the community expressed interest in something that draws on the agricultural heritage of the area and something that helps them stand out as unique Clovis community. A name for this area will be developed in the future by the City and in collaboration with developers as projects move forward.

## Design: Sample Streetscape

Comments were solicited as to components for streetscapes that would support the City's urban greening efforts. A sample street and participants illustrated their needs by placing stickers on a map to identify different amenities and locations to convey their desires. Their notes identified a variety of street designs and amenities which included:

- » Bike lanes.
- » Median and pedestrian refuge islands.
- » Pedestrian lighting.
- » Street trees.
- » Bus shelters.
- » Signage/banners.
- » Public art.
- » Community kiosk.

A dimensioned cross section of a potential streetscape was drawn by community members. The cross section illustrated an 8-foot tree planting strip, a 12-foot multi-use trail, a 22-foot space for travel lanes, a 12-foot landscaped median, a 22-foot space for travel lanes, and an 8-foot tree planting strip.

## Design: Sample Park Project

Land along the Enterprise Canal has been identified as potential park land. Priorities for amenities on this site include the following:

- » Trees for shade.
- » A natural walk with a bridge across the creek and a gateway in the southern corner of the proposed General Plan park.
- » Passive recreation at the southern end with active recreation to the north.
- » Path lighting.
- » Picnic facilities.
- » Plutons (acorn grinding) – see City's new staging area on Shepherd at Sunnyside.
- » Table Mountain interpretive opportunities – teach how to grow, cultivate, harvest, and make things.
- » Sports fields with lights.
- » Concert venue – Shakespeare in park.
- » Bike parking.
- » Uniform trail surface.
- » Bus shelter.
- » Public art.

## Design: Sample Trail Project

Land along the Enterprise Canal has been identified for trails. Community comments included the desire to separate trails from streets and natural open areas where possible. Priorities included:

- » Benches.
- » Art.
- » Pedestrian lighting.
- » Street trees.

### 4.3 ROUND #3 WORKSHOPS



*Round #3 community discussion of implementation strategies in Helm Ranch*

In May 2015, a third set of community workshops were held in Helm Ranch and Old Town to re-introduce the Urban Greening Master Plan process and review the outcomes of the previous round of workshops. This third round of workshops included a presentation that provided an overview of the Urban Greening Master Plan process to date and the draft Implementation actions that have been identified. Small group discussions followed to review and discuss the draft short- (one to five years), mid- (six to ten years), and long-term (over ten years) implementation actions and provided comments to help articulate community needs. Implementation actions were pulled from the Draft Urban Greening Master Plan (dated March 31, 2015) and were organized by the seven urban greening goals identified in the plan.

Summaries of the Round #3 Individual Workshops follow; see Appendix C: Round 3 Workshop Summaries for additional detail.

#### ► HELM RANCH

Community members and City staff discussed the draft implementation actions and offered/suggested changes and additional actions that should be considered. Discussions covered all seven goals (Educate the Community and Businesses, Draw People Outside, Utilize Green Infrastructure, Promote Alternative Transportation, Grow the Local Economy, Implement Recommendations from Previous Planning Efforts, and Maximize Opportunities for Partnerships on Greening Efforts). Notes were taken to capture the main ideas, which included the following:

- » Provide more code enforcement.
- » Implement a water abuse reporting hotline residents could use to report code violations.
- » Implement a water saving hotline with tips on how to meet water conservation requirements.
- » Improve public safety (e.g., with improved sight lines, more patrols).
- » Provide more open space.
- » Remove lawns in public rights-of-way but include water efficient plantings where possible.
- » Strive for groundwater balance – capture water, be efficient, recycle water.
- » Increase recreation (active or passive) at basin parks (new and existing).

- » Acquire the vacant site at Willow and Holland; develop a park here.
- » Prioritize acquiring and developing gaps in trail network.
- » Brand bicycle wayfinding and install new signs to make trails, bicycle facilities, paths, routes, and lanes, and pedestrian paseos, more visible and more connected.
- » Increase use of recycled water.
- » Reduce waste.
- » Reduce undesirable uses and loitering to encourage positive outdoor activity.
- » Provide outdoor recreation space for children in Helm Ranch – currently not enough space(s) and kids play in street.
- » Look to improve pedestrian experience and address speeding on Willow, Peach, and Minnewawa.
- » Provide pedestrian lighting on streets and trails.
- » Provide more maintenance of street trees and plantings.
- » Make information on water conservation easy to find and access.
- » Create a turf removal incentive program.
- » Explore how to make swamp coolers more efficient and provide information to owners and renters.

## ► OLD TOWN

Community members and City staff discussed the draft implementation actions and offered/suggested changes and additional actions that should be considered. Discussions covered all seven goals (Educate the Community and Businesses, Draw People Outside, Utilize Green Infrastructure, Promote Alternative Transportation, Grow the Local Economy, Implement Recommendations from Previous Planning Efforts, and Maximize Opportunities for Partnerships on Greening Efforts). Notes were taken to capture the main ideas, which included the following:

- » Work with Fresno State as a partner to find ways to bring students to Old Town – advertise, provide areas for group studies, provide hangout spaces.
- » Improve wayfinding for pedestrians and bicyclists – more signs, lighted crosswalks, emergency “blue lights,” bike-activated crossings and/or bike lane activators (so bicyclists do not have to get off bike to press for signal).
- » Provide more bike racks.
- » Provide a bike storage service.
- » Encourage provision of bike valets at events.
- » Create and implement a “get out and meet your neighbors” campaign.
- » Consider a produce swap between neighbors.
- » Reduce lawns and establish demonstration gardens.



*Round #3 community discussion of implementation strategies in Old Town*

- » Reduce pool filling usage – encourage use of pool covers to reduce evaporation.
- » Provide workshops or team with partners to offer workshops on water conservation measures, tools, tricks, ideas.
- » Institute deep tree watering – not surface watering.
- » Conduct events announcing trail connectivity.
- » Reduce lanes on Clovis Avenue and replace parking with open spaces/benches.
- » Support bike rental businesses.
- » Promote walking – team with County Public Health to launch a public education campaign.
- » Install “Welcome to Old Town” signs.
- » Save the street trees.
- » Support neighborhood retail, including grocery stores, to encourage walking.
- » Evaluate Woodworth Avenue for lane narrowing and installing a planted median.
- » Provide doggie bag stations along trails.
- » Provide free trees.
- » Incentivize tree planting.
- » Keep Clovis beautiful – do not forget about beautification and building/keeping positive pride for the neighborhood (water conservation does not have to mean zero-scape).
- » Look at pavement updates to alleys – these are used as unofficial trails in Old Town.
- » Clarify process and requirements for, and/or make possible, residential gray water systems.
- » As possible, widen sidewalks on arterials near schools.
- » Add sidewalks where there are gaps in the existing sidewalk system, prioritizing school areas.
- » Implement successional street tree plantings so there is a continual tree canopy (there are lots of older trees in the neighborhood).
- » Provide small gathering spaces for chess, meditation, resting, and hanging out.
- » Explore using Rodeo Grounds as an Old Town park and ride with a shuttle to other locations – fairs, farmers’ market, events.
- » Require better, or more, pedestrian and bicycle connectivity in new developments.
- » Provide traffic calming on Sierra Avenue – no posted speed currently.
- » Provide traffic calming at the Bullard Avenue/Fifth Street split – no traffic light or crosswalks.



# 5

URBAN GREENING MASTER PLAN

## Jurisdictions with Authority and Community Partnerships



*Trail near Basin S Park*

*"I alone cannot change the world, but I can cast a stone across the waters to create many ripples."  
- Mother Teresa, Roman Catholic Missionary*



The City has a close working relationship with a variety of organizations and agencies with jurisdiction over portions of the Plan Area and is already partnering with them on ongoing projects. Involving these organizations in the planning process from the start will ensure the Urban Greening Master Plan encompasses their needs and respects their jurisdictions. As the lead agency, the City of Clovis will host regular meetings (proposed monthly) with its interagency stakeholders to address concerns and develop partnership agreements that might be required once implementation begins. Stakeholders will assist the City in synthesizing public input and reviewing and addressing concerns or interests of proposed project improvements.

To ensure the Urban Greening Master Plan is meaningful, effective, and successful, the City of Clovis created an Urban Greening Team to administer the Urban Greening Master Plan from start to finish. The team is comprised of Planning, Engineering, Public Utilities, and Parks staff. The team was responsible for organizing and helping facilitate public workshops to develop the goals of the Urban Greening Master Plan, which are outlined in further detail in Chapter 3.

In addition to assisting with community input and public forums, the Urban Greening Team hosted several meetings with its Technical Advisory Committee (TAC). The TAC members represented interagency stakeholders including: Clovis Unified School District, Clovis Rodeo Association, Building Industry Association of Fresno and Madera Counties, Clovis Botanical Garden, Clovis Community Foundation, and Fresno County Public Health Department. These advisors assisted the Urban Greening Team with synthesizing public input and reviewing and addressing concerns or interests of proposed urban greening goals, strategies, and implementation measures. These entities were also tasked with reviewing, recommending changes, and approving the draft needs assessment, plant palette, and overall body of the Urban Greening Master Plan to further ensure success of the Urban Greening Master Plan.

Additionally, the City of Clovis has developed on-going relationships with a variety of organizations and businesses, which will continue to provide benefits and services to the community through outreach efforts, educational opportunities, and partnerships with various agencies that have jurisdiction over future development projects throughout the City and surrounding areas.

## **5.1 JURISDICTIONS WITH AUTHORITY**

### **5.1.1 County of Fresno**

Clovis is located in the County of Fresno, approximately 6 miles northeast of downtown Fresno. The Clovis planning area consists of three distinct geographic areas which represent the incorporated portions of the city, the Sphere of Influence (SOI), and the Study Area. The Study Area includes unincorporated Fresno County lands outside the SOI. All lands outside the SOI are regulated by the Fresno County General Plan and Zoning Code; however, State law requires that cities plan for areas outside of their immediate jurisdiction, so long as the areas have a direct relationship to planning needs. In addition to the areas surrounding the City of Clovis' SOI, there are several unincorporated pockets located within the city that are regulated by the County of Fresno.

Because the City and county overlap in a variety of locations throughout the Plan Area, cooperation between them is necessary to avoid duplication of efforts and to provide a cohesive plan that is consistent with the goals and programs of each jurisdiction. Furthermore, cooperation between these two jurisdictions can lead to joint policy and program creation and collaboration on funding implementation of the Urban Greening Master Plan.

### **5.1.2 County of Fresno Public Health Department**

The City of Clovis is currently working with the Fresno County Department of Public Health on implementation of a Sustainable Communities Planning Grant, awarded in 2010, through Proposition 84 funds. The positive working relationship the City has established with the Health Department is a vital component of the development of the Urban Greening Master Plan. The goals and objectives of the Health Department are to improve public health benefits for current and future

residents through the implementation of “smart growth” strategies. The proposed Urban Master Greening Plan will incorporate these smart growth strategies, which create healthy communities by adding green space that promotes, preserves, protects, improves air quality, and increases access to physical activity, which in turn encourages healthy living.

### 5.1.3 Clovis Unified School District

Clovis Unified School District (CUSD) currently maintains an “open gate” policy for CUSD land and facilities available for recreational use. The school facilities include athletic fields, conference rooms, gymnasiums, auditoriums, and swimming pools. While these facilities are mainly for educational purposes during school hours, they are open to the public after hours, during the summer, and on the weekends for recreational use. Currently, 50 percent of the CUSD recreational acreage, approximately 181 acres, is credited toward meeting the City’s parkland goal. Although, CUSD allows for recreational use of their facilities, no formal joint-use agreement exists between the City of Clovis and CUSD. Continued discussions and formalization of a joint-use agreement would ensure that the future use and funding for this land is allocated for recreational purposes in years to come.

### 5.1.4 Fresno Unified School District

Fresno Unified School District (FUSD) does not have a shared use agreement with Clovis and their grounds are typically unavailable to the public during non-school hours. Viking Elementary School serves a portion of Helm Ranch which is one of the park-poorest areas of Clovis. Establishing a joint use agreement with FUSD would help address open space and recreation needs in Helm Ranch.

### 5.1.5 Sanger Unified School District

Sanger Unified School District (SUSD), similar to FUSD, does not have a joint use agreement with Clovis. SUSD has one elementary school, Fairmount Elementary School, which serves a small portion of Loma Vista. As Loma Vista develops, there will be more residents in the area served by the school. Establishing a joint use agreement with SUSD would help address open space and recreation needs in the area.

### 5.1.6 City of Fresno

Fresno is located approximately 6 miles southwest of Clovis, and due to its proximity, can play a major role in Clovis’ planning efforts. As a major metropolitan city with over 500,000 residents, Fresno continues to be a supportive community that provides Clovis residents with jobs, educational opportunities, goods and services, and additional parks and recreation space. As a bordering community to Clovis, Fresno will continue to be an important stakeholder in Clovis’ future planning efforts.

### 5.1.7 Fresno Irrigation District

The Fresno Irrigation District currently owns and operates 800 miles of canals that are spread over 245,000 miles within Fresno County. Water from their canals supplies the rapidly growing metropolitan areas of Fresno and Clovis. Although the District is primarily concerned with the conveyance of water, it has begun to discuss the joint use of the land surrounding the canals to provide pedestrian and bicycle linkages between neighborhoods.

During the 2011 update to the Clovis Bicycle Transportation Master Plan, the City of Clovis met with the Fresno Irrigation District to discuss strategies for implementing Class I bike paths along the irrigation canals. The City of Clovis and the Irrigation District agreed that there are many challenges to implementing Class I bike paths along irrigation canals and to continue to discuss individual project segments as they arise.

### 5.1.8 Fresno Metropolitan Flood Control District

The Fresno Metropolitan Flood Control District is located in the north-central portion of Fresno County between the San Joaquin and Kings Rivers. The District's Storm Drainage and Flood Control Master Plan includes 158 drainage areas, each providing service to approximately one- to two-square miles. All but five of the developed drainage areas are served by a retention or detention facility. Stormwater flows into storm drain inlets, and through a network of pipes to a nearby ponding basin. Here the water is stored to protect neighborhoods from flooding and to replenish the groundwater aquifer, which is the primary source of the community's drinking water. There are currently 21.13 acres of ponding basins in the Clovis that are also used for recreational purposes.

The District has a longstanding partnership with Tree Fresno to plant trees in ponding basins in the Fresno/Clovis area. The volunteer coordination and planting expertise are provided by Tree Fresno and the trees, site grading, irrigation system, and turf are put in by the District. The most recent plantings occurred at the basin located at Peach and Ashlan.

### 5.1.9 State Water Resources Control Board

In California, the State Water Resources Control Board (SWRCB) has broad authority over water quality control issues for the State. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the State by the federal government under the Clean Water Act (CWA). Additionally, the SWRCB oversees the allocation of the State's water resources to various entities and for diverse uses, from agricultural irrigation to hydro electrical power generation to municipal water supplies. In April 2015, Governor Jerry Brown issued an executive order which requires the SWRCB to impose restrictions to achieve a statewide 25 percent reduction in urban water usage. The SWRCB will impose restrictions that require commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, to implement water efficiency measures to reduce water usage in an amount consistent with the statewide reduction target. These measures include prohibiting irrigation with potable water on ornamental turf on public median strips and outside of newly-constructed homes and buildings that are not delivered by drip or microspray systems and developing rate structures, including but not limited to surcharges, fees, and penalties, to maximize water conservation consistent with statewide water restrictions. The Urban Greening Master Plan will serve as a useful toolkit to facilitate the implementation of the restrictions imposed by the SWRCB in Clovis.

## 5.2 COMMUNITY PARTNERSHIPS

### 5.2.1 Building Industry Association

The Building Industry Association (BIA) is a membership-based group representing builder, developers, and sub-contractors. The idea for developing an Urban Greening Master Plan stemmed from the City's adoption of a Local Water Efficiency Ordinance in 2010 and an expressed interest from BIA to develop such a plan.

### 5.2.2 Clovis Botanical Garden

The Clovis Botanical Garden is a one acre water-efficient demonstration garden located in the heart of Clovis that promotes conservation by developing gardens, programs, and exhibits that inspire and educate the community. The garden is on land owned by the City of Clovis and bordered by a bike trail and Dry Creek Park. Clovis Botanical Garden will continue to promote water conservation through exhibits and demonstration gardens and could play a vital role in the development of underutilized and vacant lands within the city in the future.

### 5.2.3 Clovis Rodeo Association

Located in Old Town Clovis, the Clovis Rodeo Association is an important asset to Clovis Residents. The Clovis Rodeo Association is a non-profit organization that operates on a volunteer basis and currently has more than 700 members. Proceeds from the Association and related events coordinated by the Clovis Rodeo Association benefit more than 21 local charities annually including, 4-H, Clovis Schools, Komen for the Cure, Clovis Community Hospital, California State University, Fresno Rodeo Team, and many others. Because the Clovis Rodeo Association is centrally located in the city, and a central part of the community, it will remain an actively-involved organization that will be poised to directly benefit from the Urban Greening Master Plan and future planning efforts.



*Clovis Botanical Garden*

### 5.2.4 Clovis Community Foundation

The Clovis Community Foundation is a non-profit organization established to promote and support the advancement of recreation, culture, and arts in the Clovis by building partnerships with foundations, businesses, non-profit organizations, and citizens. They support future and current projects including, but not limited to, the Boys and Girls Club, Center Stage, the Clovis Botanical Gardens, the Children’s Museum of Central California, the Clovis Performing Arts Center, the Clovis Trail System, and the Valley Nature Education Center. The Clovis Community Foundation served as a member on the Technical Advisory Committee (TAC) for the development of the Urban Greening Master Plan, and will continue to be a major stakeholder in its implementation as it relates to the advancement of recreation, culture, and arts in conjunction with the wide variety of organizations it partners within the Clovis community.

### 5.2.5 California Urban Forests Council

The California Urban Forests Council (CaUFC) was founded in 1968 as the first urban forest council in the nation. They are dedicated to the expansion and perpetuation of sustainable urban and community forests. CaUFC coordinates educational workshops, hosts an annual conference, runs a certified urban forestry program, supports seven regional councils, and manages the Invest From the Ground Up program, a public awareness campaign. With a focus on building a strong coalition, they work with other statewide organizations on education and support for local urban and community forest efforts, and community-based education and outreach efforts to build unified local collaborations to address issues, and opportunities to improve public policy and support for urban and community forestry, as well as to continue existing and create new public funding sources for the enhancement and maintenance of our trees and green spaces.

### 5.2.6 Tree Fresno

Tree Fresno is a local organization that promotes environmental stewardship through the planting and maintenance of trees with community involvement. This organization plays a vital role in maintaining Clovis' urban forest and assisting in the creation of trails and educating the public on the social, physical, and environmental benefits that trees, trails, and greenbelts can provide to the community. The City will continue to seek the professional advice and involvement of Tree Fresno in the development and maintenance of future green spaces throughout the community.

### 5.2.7 California State University Fresno

California State University, Fresno (Fresno State) is located in Fresno, just north of Shaw Avenue. Fresno State plays a key role in helping students increase their employability and achieve their individual potential. However, the contributions of Fresno State consist of more than just influencing the lives of students on campus. Fresno State serves a range of industries in the community and supplies businesses with skilled workers. Furthermore, Fresno State attracts students from other areas and is often the facilitator for major change within the community. In addition, Fresno State has an active body of students compiling research on relevant topics that impact the Clovis community directly, including the Institute of Climate Change, Oceans, and Atmosphere. Fresno State and its student body will continue to play a key role in community efforts to provide a healthy and active city for students and residents alike.

### 5.2.8 Institute of Climate Change, Oceans, and Atmosphere

Fresno State has formed the Institute of Climate Change, Oceans, and Atmosphere (ICOA) to conduct research and develop sustainable solutions in areas of climate change. The San Joaquin Valley region is especially at risk to climatic fluctuation due to a rapidly growing population, dependence on agriculture, and a decreasing supply of natural resources. The ICOA combines research in the areas of climate change with oceanography, and atmospheric science, as the study of physical, chemical, and biological processes in the oceans and the atmosphere are directly related to climate change. As climate change continues to impact the San Joaquin Valley and the City of Clovis, and the availability of water becomes increasingly scarce, the ICOA will play an important role in developing innovative solutions to these ongoing issues. Furthermore, given its location in the Central Valley and strong connections with the agricultural industry, Fresno State is well suited to address climate change and related food supply issues.

### 5.2.9 Clovis Chamber of Commerce

The Clovis Chamber of Commerce is essential to the economic growth of the community by connecting business members to improve the overall quality of life in Clovis. The Chamber acts as a business advocate for its members by focusing efforts on collaborating with local businesses to create a thriving business environment and promoting economic development.

The Chamber will play a vital role in the implementation of the Urban Greening Master Plan as it acts as a legislative voice for cost-effective programs and services that make Clovis a better place to live.

### 5.2.10 University of California Cooperative Extension Master Gardeners of Fresno County

The University of California, Division of Agriculture and Natural Resources Cooperative Extension of Fresno County has developed a Master Gardeners Program to educate students on home horticulture, pest management, and sustainable landscape practices. The Master Gardener vision is to promote a healthier environment, healthier communities, healthier plants, and healthier gardeners. In exchange for training from the University, UC Master Gardeners offer volunteer services and outreach to the general public in more than 50 California counties. Last year, 6,048 active UC Master Gardener volunteers donated 385,260 hours, and more than 4.2 million hours have been donated since the program's inception. As educators in gardening and sustainable landscape practices, Master Gardeners of Fresno County could be a vital resource for the City to increase green space throughout the community.

### 5.2.11 Clovis Community Medical Center

Clovis Community Medical Center is a locally owned, nonprofit community medical center. As the central San Joaquin Valley's largest healthcare provider and private employer, they are working to make healthcare more accessible and advocate with policy makers at every level to address the central San Joaquin Valley's myriad and often unique healthcare needs. Along with County of Fresno Public Health Department, the Clovis Community Medical Center provides another partnership with direct connection to public health and the environment that could assist with implementation of the proposed Urban Greening Master Plan while meeting their objectives.

# 6 URBAN GREENING MASTER PLAN Neighborhood Focus Areas



*Agricultural land and new development in Loma Vista*

*“My neighborhood is Loma Vista. I really like the bike trails. I often find myself wanting to go outside and bike, although in summertime, because of the heat, it is hard because not many trees are quite large enough to keep cool.”*  
- Braden Pope, Clovis Resident



As described in Chapter 1, Introduction and History, the intent of the Urban Greening Master Plan is to assess greening opportunities and amenities for four areas within the community: Old Town, Northwest, Loma Vista, and Helm Ranch neighborhoods and identify strategies necessary for smart growth that maintains Clovis’ small town feel while promoting it as a healthy community, by planning for more green spaces that improve air and water quality, reduce consumption of natural resources and energy, and encouraging healthy lifestyles. Figure 6-1 shows the location and boundaries of these neighborhoods which each represent a wide range of varying socio-economic conditions, population densities, and development patterns, with a variety of different land uses and amenities that pose distinctive opportunities and constraints.

Clovis’ outdoor public spaces have ample potential to be transformed through urban design using greening principles. These spaces can become exciting, beautiful, and healthy neighborhoods that the community takes pride in and where residents can relish being outdoors. This chapter discusses the four neighborhood focus areas, provides information on the existing conditions of these areas, and generally describes types of urban greening projects that could be undertaken and have a high potential to provide additional environmental and community benefits. The identification and prioritization of these neighborhood focus areas was based on community input and outcomes of the needs assessment, and together create a cohesive neighborhood urban design that improves the environment, increases public health, fosters a sense of community, and promotes well-being. Specific projects and design features are discussed in greater detail in Chapter 10, Implementation.

**Figure 6-1 Delineated Neighborhood Focus Areas with Population**

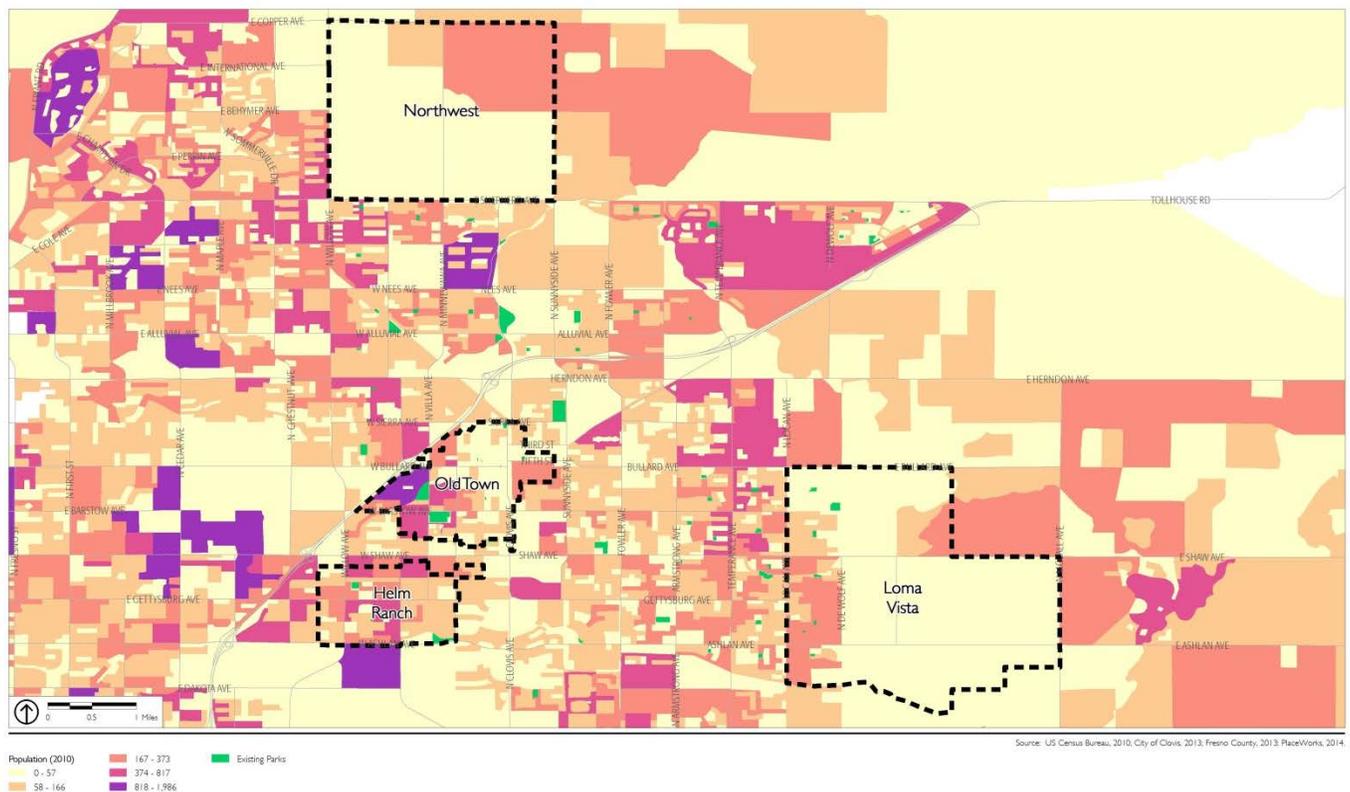




Figure 6-3 Old Town Population

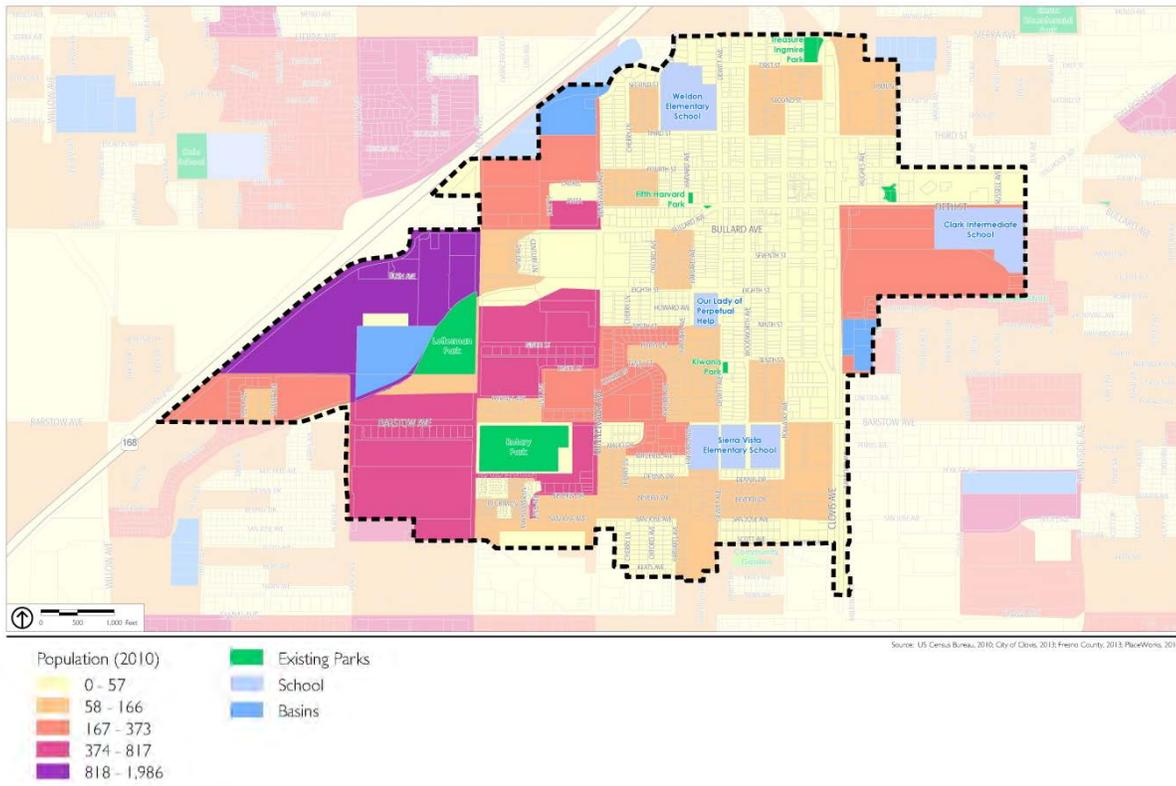


Figure 6-4 Loma Vista Population

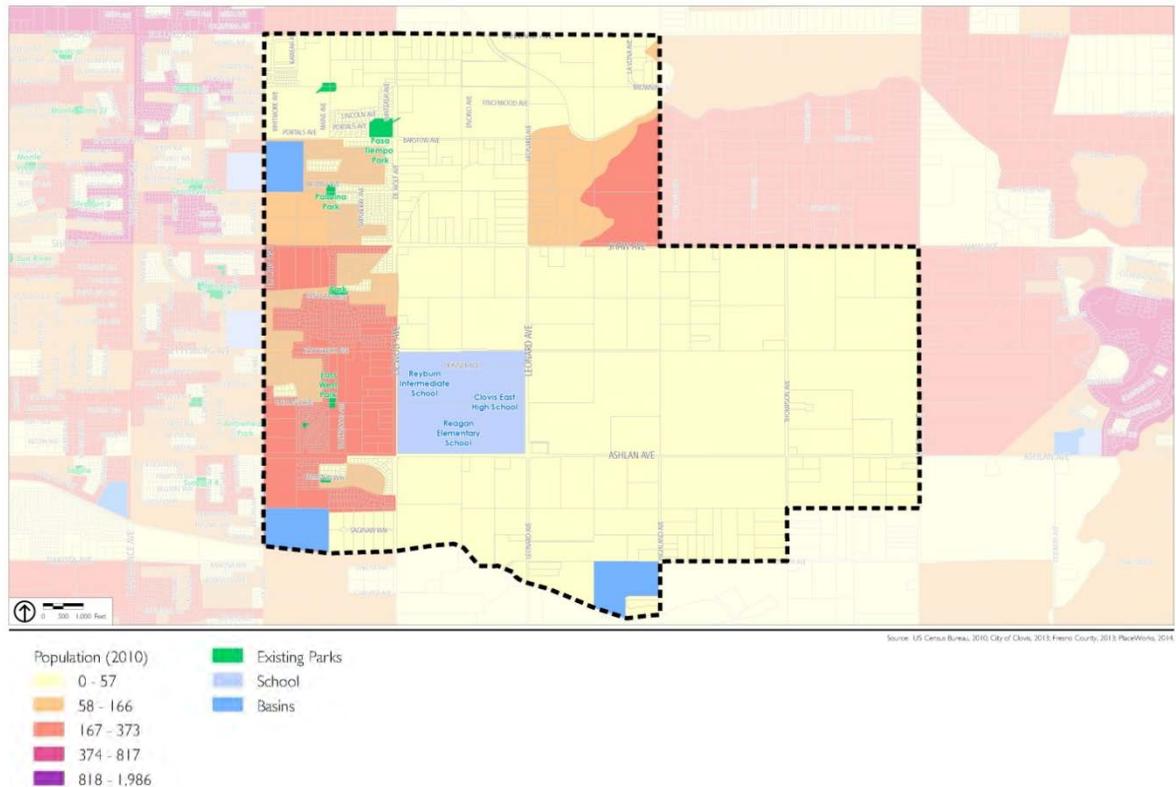
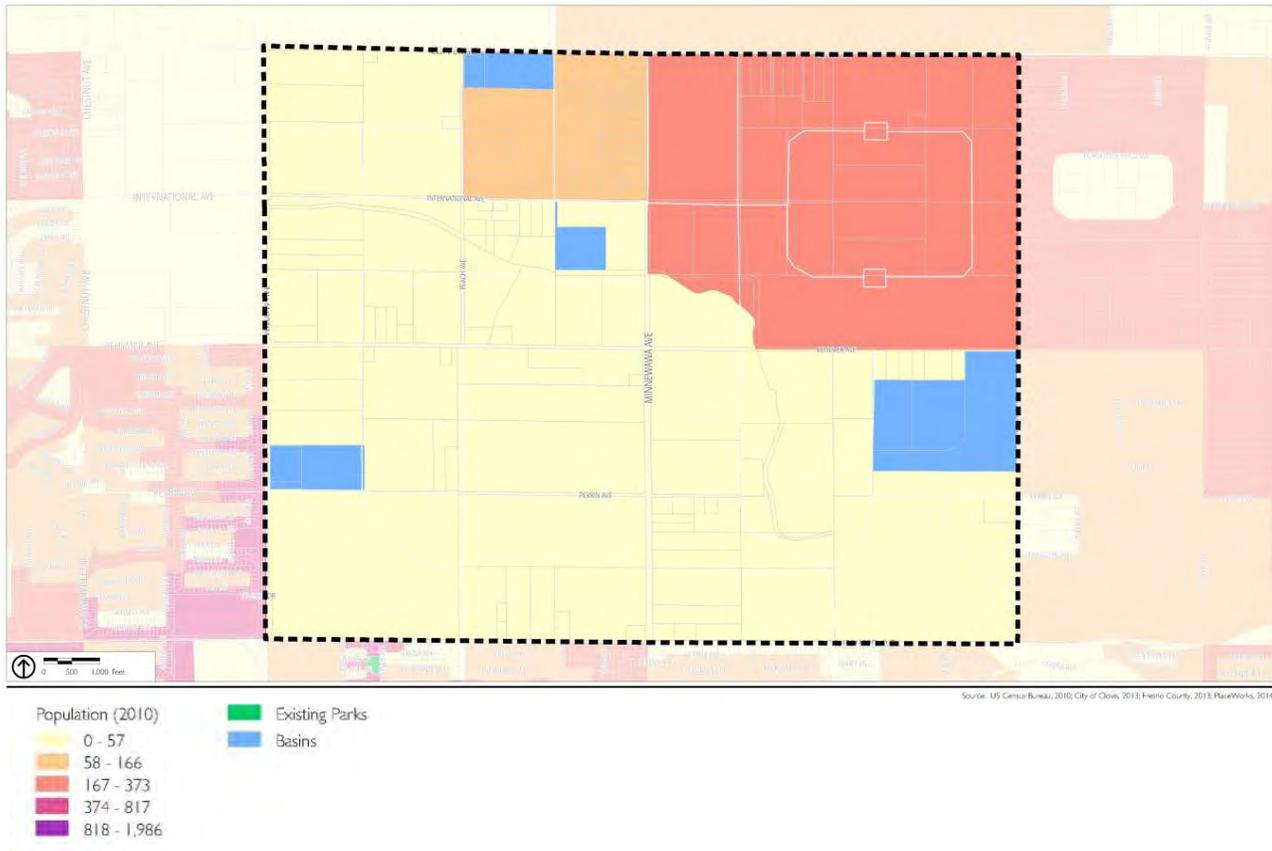


Figure 6-5 Northwest Population



The age, ethnicity, and income for the citywide population, as well as by neighborhood, are described below. The data identifies key trends in demographics, thus providing insight into the characteristics of parkland and community facilities that are currently, or anticipated to be, in high demand.

## AGE

Identifying a population’s age profile is important for urban greening because different age groups have different recreational, transportation, and community facility needs. For example, young children require more active play area, while seniors utilize more passive recreational amenities, such as walking paths, gardens, and plazas. Additionally, youth and seniors tend to be more dependent on transit, walking, and bicycling than adults that are able to drive. Understanding how the population shifts over time with respect to age is also an important consideration in planning future green space and community facilities.

The Helm Ranch population is significantly younger than the other neighborhoods, with approximately 40 percent of its residents between 22 and 44 years old. Residents between the ages of 45 and 64 comprise approximately 20 percent of the total Helm Ranch population. About 34 percent of Loma Vista is between the ages of 22 and 44 years old, approximately 22 percent are between the ages of 45 and 64, and approximately 10 percent are 65 or older. Old Town’s population is comprised of approximately 33 percent of its residents between the ages of 22 and 44 and less than 22 percent between 45 and 64. Residents above the age of 65 comprise about 10 percent of Old Town’s population. Northwest is predominantly comprised of residents between the ages of 45 and 60.

## ETHNICITY

The racial and cultural profile of a community often influences social patterns, community character, and aesthetic and recreational preferences and is important to consider along with other demographic trends. Numerous studies have shown that parks and recreation needs, preferences, and perceptions vary by race/ethnicity, place of origin, and length of residence in the U.S. According to the 2010 US Census, the Clovis' population is mostly White (58 percent), followed by Hispanic (26 percent), Asian (11 percent), Black/African American (3 percent), and less than two percent other ethnicities.<sup>2</sup>

Helm Ranch is predominately White at approximately 41 percent, followed by Hispanic at about 38 percent. The population of Loma Vista and Old Town are also predominantly White. Specifically, Loma Vista is comprised of approximately 55 percent White and 21 percent Hispanic, which is similar to the distribution citywide at 58 percent White and 21 percent Hispanic. Old Town also has a population of White people similar to the citywide distribution at approximately 55 percent. However, the Hispanic population in Old Town represents approximately 30 percent of the total population of the neighborhood, which is 9 percent higher than that of the city. Northwest is approximately 72 percent White and 17 percent Hispanic. The population of Asian and African/Black Americans reflects the citywide percentages within all neighborhoods.

## INCOME

Consideration of a community's income characteristics may be useful in developing a strategy to increase green space and access to green space. In general, lower-income populations have fewer opportunities to engage in physical activity and have poorer health outcomes than the average population.<sup>3</sup> This is due in part to the fact that low-income groups often face social and environmental barriers to physical activity and may have fewer means by which to overcome these obstacles when compared to other income levels. For example, lower-income residents are more likely to rely on public parks for recreation; and on public transit, walking and bicycling to meet their transportation needs. The median annual income in Clovis is \$65,260, with approximately 13 percent of Clovis residents below the poverty level.<sup>4</sup> The highest percentage of residents in the city earn between \$40,000 and \$100,000 annually. In both Helm Ranch and Old Town, a higher percentage of residents earn between \$50,000 and \$75,000. In Loma Vista and Northwest, the highest percentage of people earn between \$75,000 and \$100,000 annually.

## 6.2 PARKS AND OPEN SPACE

Clovis' parks and open spaces, including city-designated parkland, and the basins, irrigation canals, creeks, and waterways, are described in this section.

### 6.2.1 Parks

Population is an important indicator for assessing park and recreational needs. Traditionally, park and recreation standards have been based on the ratio of parkland provided to population (i.e. X acres/1,000 people). The Quimby Act, as established in State law, allows cities and counties to establish a standard of 3 acres of local parkland per 1,000 people. As mentioned earlier under relevant policies, the parkland standard in the City's General Plan is 4 acres/1,000 people, which exceeds the requirement set forth by the Quimby Act. In Clovis, there are currently 56 designated city parks that total 146 acres,

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<sup>2</sup> US Census Bureau, City of Clovis Quick Facts 2010, <http://quickfacts.census.gov/qfd/states/06/0614218.html>, accessed on February 27, 2015.

<sup>3</sup> Active Living by Design, 2012, "Low Income Populations and Physical Activity."

<sup>4</sup> US Census Bureau, City of Clovis Quick Facts 2010, <http://quickfacts.census.gov/qfd/states/06/0614218.html>, accessed on February 27, 2015.

providing approximately 1.46 acres / 1,000 people, which does not meet the standard set forth in Clovis' General Plan. As the city's population grows, it will be especially important to set aside land to meet Clovis' open-space standard.



*Pasa Tiempo Park*

All parks in the city are classified as Pocket, Neighborhood, Area, Community, Regional, School, or Basin Parks and are defined below, based on the City's Parks Standards.

- » **Pocket Park.** Pocket Parks are the smallest park classification at up to 1 acre in size. These parks are centrally located in residential neighborhoods and planned for families and children. Intended to offer a small open space/recreational venue of a more passive or intimate nature internal to a specified residential development. Typically these parks provide picnic and sitting areas and should be accessible by foot or bicycle.
- » **Neighborhood Park.** Typically, a neighborhood park ranges from 1 to 2 acres in size. These parks are uniquely tailored to the neighborhoods they serve and provide active recreation and a balance of amenities that appeal to a broad range of individuals.
- » **Area Park.** Area parks function much like neighborhood parks, but are typically larger, ranging from 3 to 20 acres, and serve a larger population. These are intended to provide amenities for multiple age groups and connect to neighborhoods via trails or sidewalks.
- » **Community Park.** Community Parks are considerably larger in scale, ranging from 15 to 100 acres. The intent of these parks is to meet a wide range of community recreation and social needs focused on both passive and active recreation. The purpose of a community park is to bring people together to recreate, socialize, and find quiet

space. Amenities may include those similar to a neighborhood park, as well as group picnic facilities, internal trails, and athletic facilities.

- » **Regional Park.** Regional Parks typically service multiple cities and cross political jurisdictions and exceed 100 acres in size. The purpose of the parks is to preserve natural resources, remnant landscapes, and open space. These parks can include passive activities, such as hiking and nature viewing, as well as active recreation areas, gardens, picnic facilities, and other special uses.
- » **School Park.** The school park classification pertains to school sites used in concert with, or in-lieu of, other classes of parks to meet open space needs. The City maintains an “open gate” policy for Clovis Unified School District land and facilities available for recreational use after normal school hours and during the summer. These sites are best suited for community-based recreational programs and youth athletic facilities.
- » **Basin Park.** This classification pertains to Fresno Metropolitan Flood Control basins used in concert with, or in-lieu of, other classes of parks to meet open space needs. These sites typically range from 5 to 20 acres and their use is generally limited to dry periods due to their main priority as flood control facilities. Basin parks offer connections to the larger community via trails or sidewalks.

## 6.2.2 Trails

There are four existing multipurpose trails in Clovis:

- » The Clovis Old Town Trail extends north-south and northwest-southwest through central and northwest Clovis
- » The Dry Creek Trail extend northeast-southwest through northwest Clovis
- » The Enterprise Trail extends northwest-southeast through northern Clovis
- » The PG&E Trail extends east-west north of Bullard Avenue from Temperance Avenue to near Fowler Avenue Greenbelt paths

Greenbelt paths are also located near Harlan Ranch in upper northeast Clovis, and the Shepherd Avenue Greenbelt path extends east-west along Shepherd Avenue between Willow and Sunnyside Avenues. The Clovis Old Town Trail and Dry Creek Trail together have eight rest stops, each containing a shelter as well as a drinking fountain. The John R. Wright rest stop/trail junction also contains restroom facilities. The 2014 General Plan also discusses proposed trails which include the Gould Trail, the Harlan Ranch Trail, and extension to the existing Dry Creek and Enterprise Trails. The Gould Trail will extend east-west along the southern boundary of the city limit and the Harlan Ranch Trail is expected to loop through upper northeast Clovis.

Additionally, Clovis includes a variety of bike paths which are classified as either Class I or Class II bike lanes. A Class I bike lane is defined as a bike path that provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflows by motorists. A Class II bike lane provides a striped lane for one-way bike travel on a street or highway.

Major existing Class I bike paths include the Clovis Old Town Trail, the Dry Creek Trail, Enterprise Trail, Loma Vista paseos, and Harlan Ranch areas. Class II bike lanes exist on a majority of the city’s collector and arterial streets. Clovis’ existing bikeways connect to the regional bikeway network through the city and Fresno County. Key connections include Class II bike lanes on Shepherd, Teague, Alluvial, Sierra, Barstow, Ashlan, and Fowler Avenues. In addition, the Old Town Trail connects to Fresno to the south near Fresno Yosemite International Airport and to the north on Willow Avenue between Nees and Teague Avenues.

## 6.3 NEIGHBORHOOD FOCUS AREAS

The four neighborhoods identified as focus areas for the Urban Greening Master Plan are Old Town, Helm Ranch, Loma Vista, and Northwest. The four neighborhoods represent a broad range of environmental and socio-economic conditions, population densities, development patterns, and demographic characteristics found in Clovis neighborhoods, and therefore, serve as design examples for other neighborhoods in the city, and potentially other jurisdictions. These neighborhoods are not officially designated in City documents. Therefore, the Urban Greening Master Plan identifies boundaries for the focus neighborhoods that generally coincide with changes in neighborhood character and key physical features, such as arterial streets and engineered waterways or channels. The four neighborhoods are summarized below.



*Helm Ranch entry markers*

### 6.3.1 Helm Ranch

Helm Ranch is located in the southwestern corner of Clovis and is fairly built out; however, it does include some larger underutilized parcels that lend themselves to more traditional open space development. The following topics and locations are detailed in Chapter 10, Implementation:

- » Vacant Lot Conversions: Community Parks
- » Joint Use with Schools
- » Channel Restoration or Channel Park
- » Green Streets

Helm Ranch consists mostly of residential uses. General Plan land uses primarily include Medium-Density Residential (M), Very-High Residential (VH), Office (O), and General Commercial (GC). Gould Canal, which runs along the southern edge of the neighborhood, forms an important corridor between Helm Ranch and the Old Town Trail. Basin “S” Park, located in the southeast corner of the neighborhood focus area, is approximately 6.96 acres and immediately east of a large retention basin. San Gabriel Park is also located in the Helm Ranch neighborhood just east of Willow Avenue and is approximately 2.89 acres in size.

Figures 6-6 and 6-7 address neighborhood walkability to existing parks looking at half-mile and quarter-mile walking distances, respectively. Tarpey Elementary provides significant recreation space to the underserved northeastern section of the neighborhood but only when school is not in session or when there are no other planned events. While a large percent of Helm Ranch residents have ready access to Helm Holland Park, the park is small and is challenged to meet the needs of all the residents in its proximity.

### 6.3.2 Old Town

Historic Old Town is primarily built-out with residential and commercial uses and is recognized for its historic buildings, cobble sidewalks, quaint streets, and unique shops and restaurants. As a part of the Urban Greening Master Plan, the following topics and locations within Old Town will be assessed and considered for improvement:

- » Canal and Trail Restoration
- » Basin Park
- » Low Water Use Demonstration Gardens
- » Green Streets
- » Green Alleys
- » Vacant Lot Conversions



*Treasure Ingmire Park*

Old Town Clovis is the historic center of the city which is comprised of a variety of land uses, including the Central Business District, government facilities located east of Clovis Avenue, and the surrounding single-family residential neighborhoods. General Plan land uses in the area include, Mixed-Use Village (MU-V) to the east along Clovis Avenue, Mixed Use/Business Campus (MU-MC) along Barstow near Clovis Avenue, General Commercial (GC), Very-High Residential (VH), pockets of High-Density Residential (H), Medium-High Density Residential (MH), and Medium-Density Residential (M) uses. Other than a few vacant and underdeveloped parcels, Old Town is completely built out.

Clovis and Pollasky Avenues have historically been the main streets of Clovis and play an important role in shaping the character of the community. Along these parallel corridors are a variety of establishments, including antiques stores, gift shops, convenience retailers, cafes and bars, and personal and business services. In addition to a vibrant and historic downtown, Old Town has a variety of parks and areas for recreation, including two Basin Parks, which are located adjacent to Highway 168 just south of Sierra Avenue and in Letterman Park just west of Villa Avenue.

Figures 6-8 and 6-9 address neighborhood walkability to existing parks looking at half-mile and quarter-mile walking distances, respectively. Sierra Vista and Weldon Elementary both provide significant recreation space to the neighborhood but only when school is not in session or there are no other planned events. While a large percent of Old Town residents have ready access to Kiwanis and Fifth Harvard Parks, these parks are small and are challenged to meet the needs of all the residents in their proximity. In April 2015, the City opened Centennial Plaza on Pollasky Avenue at Bullard Avenue. While small, this public space provides additional public gathering and event space in Old Town which, as planned development to either side materializes, will provide additional passive recreation space in the downtown core.

### 6.3.3 Loma Vista

As shown in Figure 6-1, Loma Vista is located southeast of Old Town and encompasses an area of approximately 3,307 acres. This area is bounded by Locan Avenue to the west, McCall Avenue to the east, portions of Bullard Avenue and Shaw Avenue to the north, and Gettysburg Avenue to the south. Fresno is located approximately ½-mile southwest of the Loma Vista Specific Plan area. State Highway 168 is located approximately 1½ miles north, and Highway 180 is approximately 2 miles south of the planning area.



*Los Arbolitos Park*

The Loma Vista Specific Plan is the guiding document to development in the neighborhood. Construction continues to be a constant in the area which is roughly 60 percent built. At build out, approximately 70 percent of the Loma Vista neighborhood is designated for residential uses, 22 percent is reserved for open space, recreational uses, and public facilities, and the remaining eight percent is devoted to employment and business related uses. Loma Vista contains a variety of residential neighborhoods including four Master Planned communities: Community Center South, Community Center North, Gettysburg/Ashlan, and the Eastern Village. These communities identify distinct areas that are unified around a central amenity such as a golf course, mixed use urban village, community center, or recreational feature.

Located near the center of the Loma Vista neighborhood is the Ronald W. Reagan Education Center, which is approximately 145 acres in size. The Educational Center contains Clovis East High School, Reyburn Intermediate School, and the Reagan Primary School. In addition, there are several irrigation canals located in the area, including the Jefferson Canal, Enterprise Canal, and Gould Canal which extend through Loma Vista, providing a pedestrian link as well as a recreational and visual amenity. Dog Creek, which is located south of Shaw Avenue is also utilized as trail space. Parkways also exist within the neighborhood focus area, which are characterized as landscaped buffer areas that run along arterial roadways and in within select residential areas.

Loma Vista is currently still in a development phase so greening opportunities are limited by the development schedule. In an effort to prepare for future development, the City could consider the following:

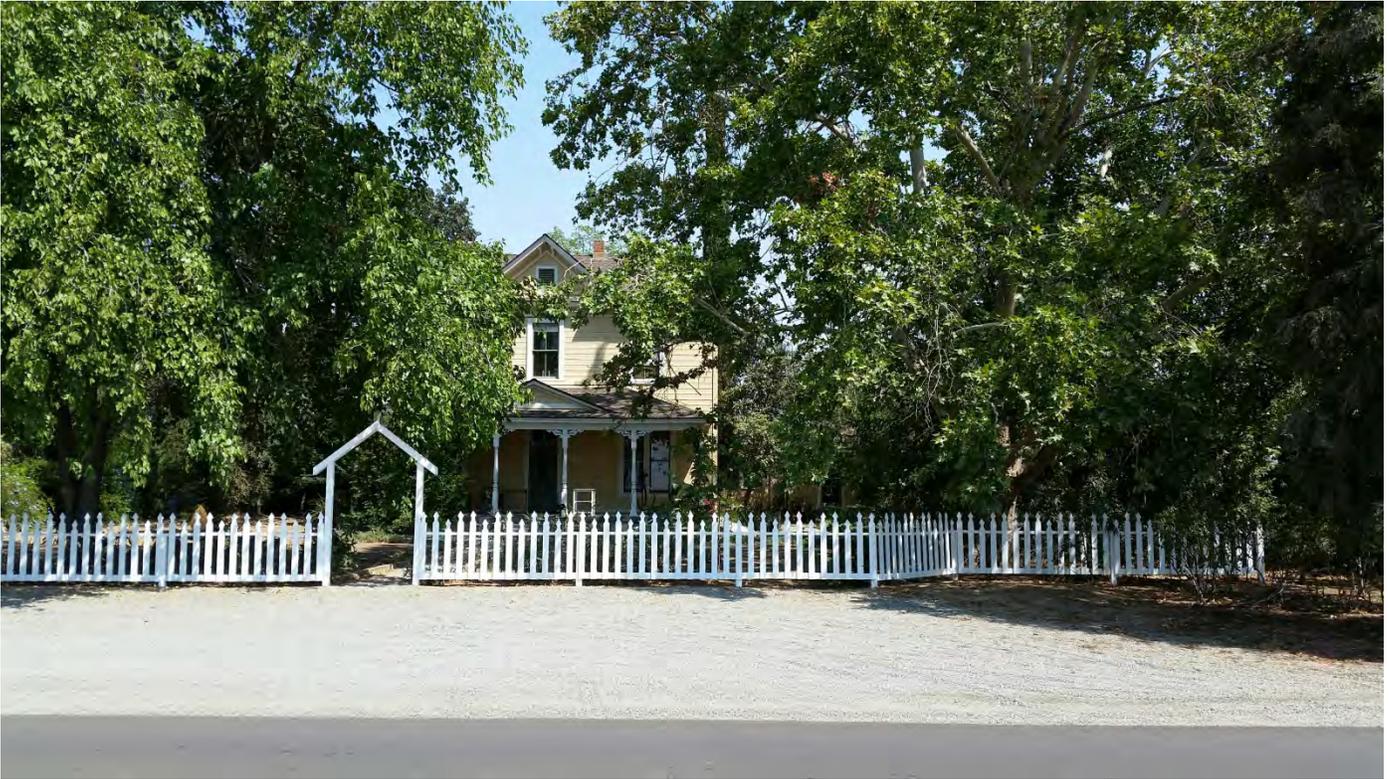
- » Temporary Uses of Proposed Green Space
- » Street Tree Planting
- » Public Art
- » Stormwater Targets
- » Water Conservation Standards

Figures 6-10 and 6-11 address current neighborhood walkability to existing parks looking at half-mile and quarter-mile walking distances, respectively. The newer housing developments on the western half of the neighborhood are fairly well served with parks in walking distance of most residents. Loma Vista has a large number of planned residential and mixed use developments including some in areas that are currently non-residential. The planned parks for the new developments, while not reflected in the figures, will help address recreation shortages in the areas. As new developments come in, they will need to provide parks to address existing and new residential needs.

### 6.3.4 Northwest

Northwest is aptly located in the northwest quadrant of Clovis, bound by Copper Avenue to the north, Shepherd Avenue to the south, Willow Avenue to the west, and Sunnyside Avenue to the east. This area is characterized by lower-density rural residential and agricultural uses but development is expected to occur in this area in years to come. The Northwest neighborhood has several unique qualities that set it apart from other neighborhoods in Clovis. It is adjacent to the California State University Agriculture Farm which reinforces the area's rural residential character. Several irrigation pipelines and irrigation canals including the Dry Creek Canal cross through the northwest area of Clovis. Unlike the other focus areas, Northwest is not built out nor does it have active development; however, residents can see that development is coming. The area has a rich history and this heritage will likely give rise to a name that is more than a relational direction.

Northwest is currently an active center for bicycling and is located along the popular cycling route from Clovis to the Sierra foothills, attracting a small but growing number of international visitors. Cycling and pedestrian passages and trails will continue to play a vital role in future development in the area. In November 2014, the City opened the Dry Creek Trailhead at Sunnyside and Shepherd Avenues connecting both the Enterprise and Dry Creek Trails and providing additional connectivity to Old Town and the foothills.



*Historic home in Northwest*

There are no parks in Northwest. Figures 6-12 and 6-13 show neighborhood walkability to existing parks looking at ½-mile and ¼-mile walking distances, respectively. The southern edge of Northwest has some walkability to neighborhood parks south of Shepherd Avenue but the small size of these parks and the need to cross a major arterial limit the efficacy of these parks in meeting Northwest residents' needs. The combined Granite Ridge Intermediate and Clovis North High School campus, while technically in Fresno and on the west side of Willow, does provide some active recreation for residents when not in use or during non-school hours. Clovis' General Plan has proposed new parks in this focus area. As development comes to the neighborhood, the active and passive recreational needs of both existing and new residents will have to be met.

Figure 6-6 Helm Ranch Half-Mile Park Walkability



Source: City of Clovis, 2013; Fresno County, 2013; Davy Resource Group, Urban Forest Resource Analysis, 2011; PlaceWorks, 2014

- Park Access
- Non-Residential Areas Not Within 1/2 Mile (10 minute walk) of a Park
  - Residential Areas Not Within 1/2 Mile (10 minute walk) of a Park
  - Existing Parks
  - School
  - Basins

Figure 6-7 Helm Ranch Quarter-Mile Park Walkability



Source: City of Clovis, 2013; Fresno County, 2013; Davy Resource Group, Urban Forest Resource Analysis, 2011; PlaceWorks, 2014

- Park Access
- Non-Residential Areas Not Within 1/4 Mile (5 minute walk) of a Park
  - Residential Areas Not Within 1/4 Mile (5 minute walk) of a Park
  - Existing Parks
  - School
  - Basins

Figure 6-8 Old Town Half-Mile Park Walkability



Figure 6-9 Old Town Quarter-Mile Park Walkability



Figure 6-10 Loma Vista Half-Mile Park Walkability

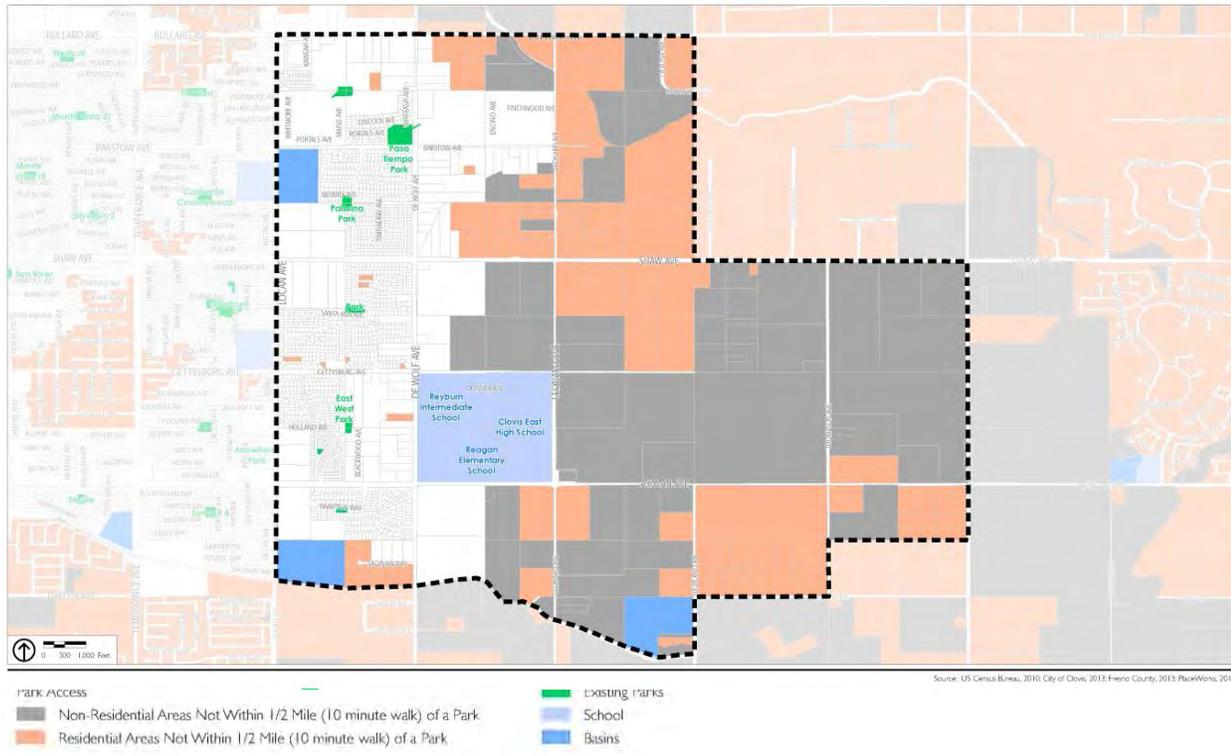


Figure 6-11 Loma Vista Quarter-Mile Park Walkability

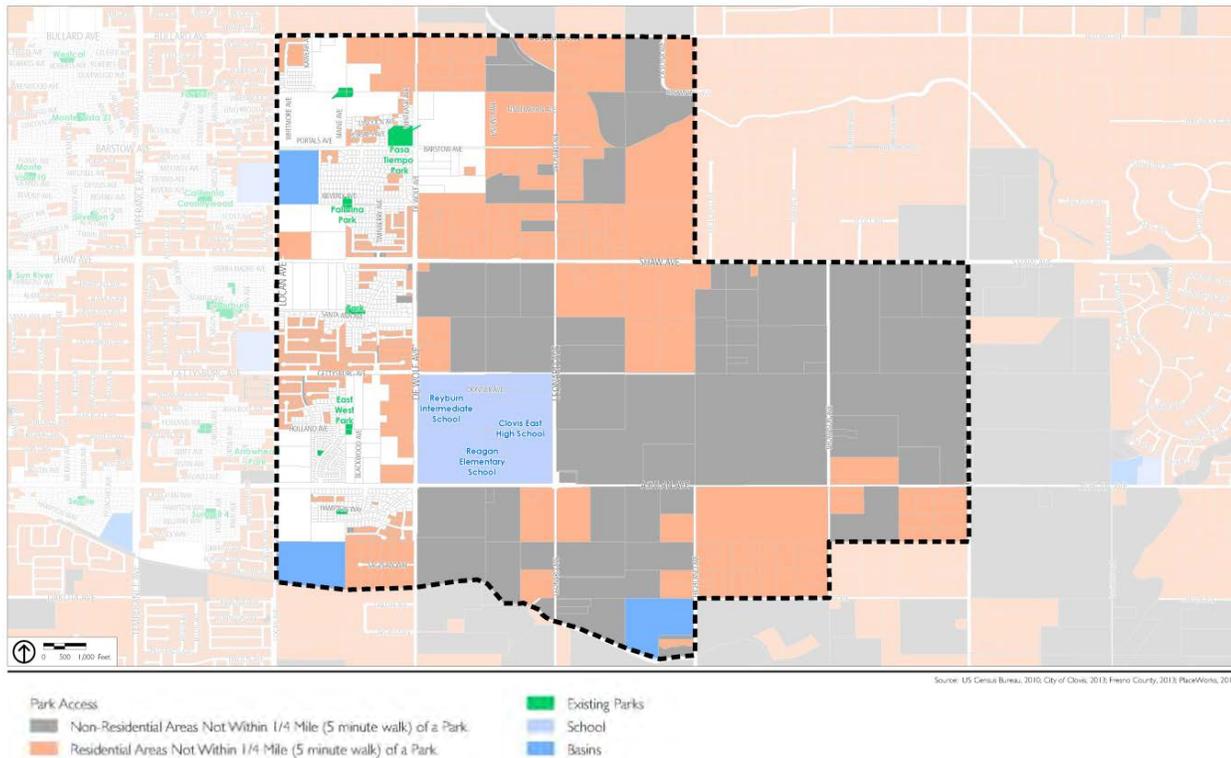


Figure 6-12 Northwest Half-Mile Park Walkability

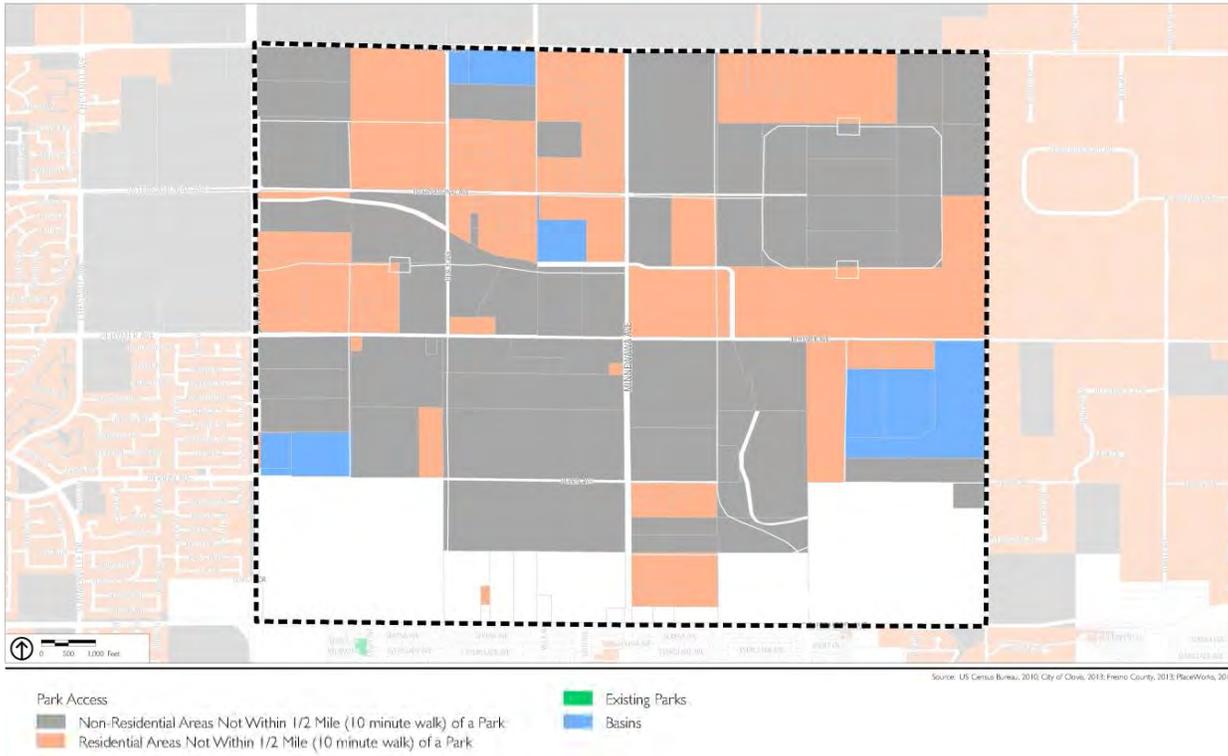
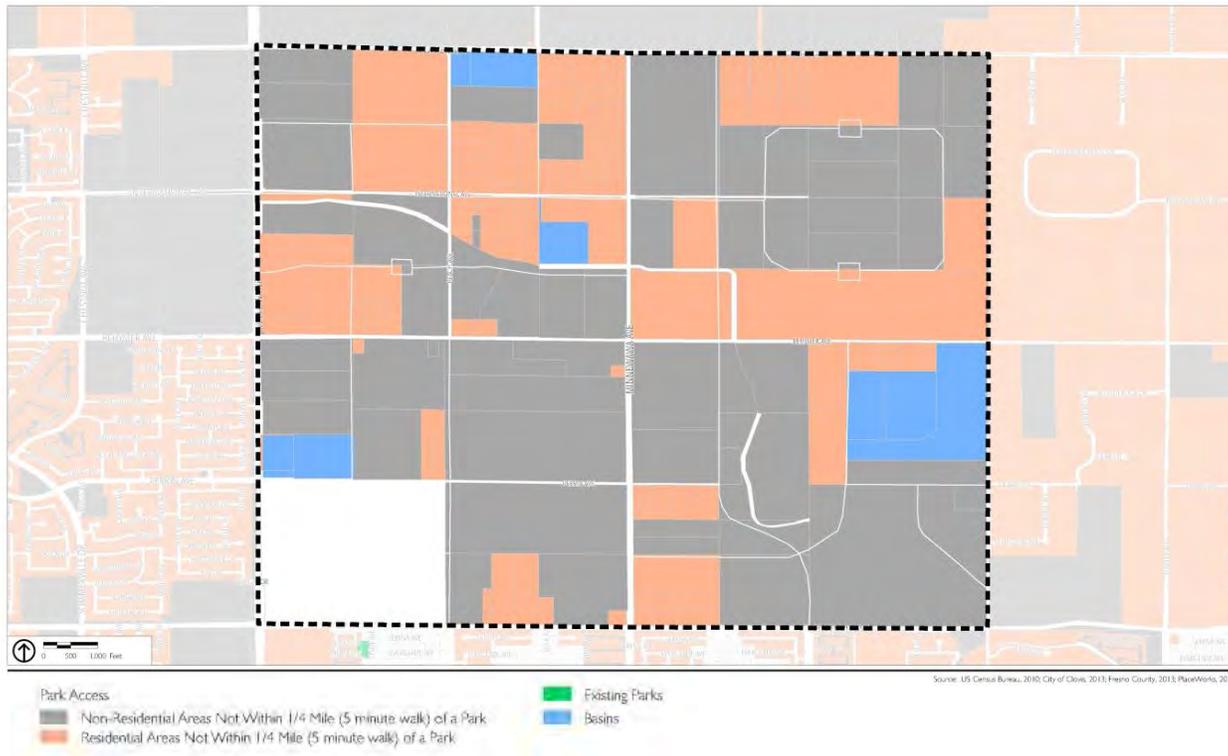


Figure 6-13 Northwest Quarter-Mile Park Walkability



# 7 URBAN GREENING MASTER PLAN Green Space Assessment



*Clovis Botanical Garden*

*“You can neither lie to a neighborhood park, nor reason with it. ‘Artist’s conceptions’ and persuasive renderings can put pictures of life into proposed neighborhood parks or park malls, and verbal rationalizations can conjure up users who ought to appreciate them, but in real life only diverse surroundings have the practical power of inducing a natural, continuing flow of life and use.”*

*- Jane Jacob, Author*



Urban “greening” can take many forms. Parks, trails, and open space provide a significant amount of the green space in urban areas; however, features such as street plantings, public plazas, and stormwater retention basins can also have a significant impact on the overall environmental quality of a place. In assessing the overall green space, it is important to consider a wide variety of sustainability options and provide a range of opportunities that will encourage public participation with open space, increase healthy environmental function within a community, and provide for long-term sustainability and resilience.

Clovis has a diverse and integrated green space system. The numerous public parks and the Clovis Old Town Trail, in particular, serve as important features within the everyday life of Clovis residents, providing a sense of attachment with open space amenities. However, the city is still not meeting the open space standard set forth in the General Plan for their current population size. In addition, there are numerous opportunities outside of the existing parks and trail network for enriching the overall environmental quality of the city, such as integrated green street improvements, enhanced multi-benefit use facilities, and interactive green space amenities. Population is growing quickly in Clovis and the city is expanding. As it grows, it will be especially important to set aside land to meet the city’s open space standard, as well as integrate green standards into new projects and work to address needs in established communities/neighborhoods that are currently underserved.

This assessment evaluates the existing conditions of and the potential for various green features, including parks, trails, green streets, stormwater management, urban forestry, pedestrian and bicycle facilities, community gardens, and wildlife habitat. In addition to identifying specific opportunity sites, this chapter discusses various policy initiatives that would assist in promoting urban greening throughout Clovis.

## 7.1 EXISTING CONDITIONS

Currently, Clovis has a number of existing green assets, such as its well-developed trails and bikeway network. This section describes these assets, summarizing Appendix D: Green Space Assessment.

### 7.1.1 Existing Parks Open Space Trails

According to the Draft 2010 Parks Master Plan, the City operates 56 public parks, totaling approximately 146 acres of publically accessible open space. The identified park types include pocket parks, neighborhood parks, area parks, community parks, regional parks, school parks, and basin parks. The City is in the process of updating its General Plan and has updated its inventory to reflect recent construction. Table 7-1 illustrates the number of each park type found in Clovis as of May 2014.

Clovis’ “basin parks,” represent a unique multi-beneficial approach to open space. These parks are located on land surrounding reservoir basins and controlled by the Fresno Metropolitan Flood Control District. These facilities represent a progressive approach to open space development in which single facilities provide both green infrastructural and public recreational needs. As the city grows, it will need to continue to consider sites with multiple benefits for attaining greening goals.

**TABLE 7-1 PARKS IN THE CITY OF CLOVIS**

Classification	Number of Parks	Total Acres
Pocket Parks	8	1.58
Neighborhood Parks	44	35.77
Area Parks	13	53.59
Community Parks	3	46.83
Basin Parks (FMFCD Flood Control Basins)	3	21.13
<b>Total</b>	<b>71</b>	<b>158.89</b>

Additionally, the Urban Greening Master Plan calls out potential Regional Park and School Parks within Clovis. Regional Parks represent large-scale park facilities that could accommodate visitors from the larger region. Due to limited space, these

types of spaces might be restricted to the edge of the existing city limits. School parks represent an excellent opportunity to provide increased access to recreational facilities for the general public utilizing existing green facilities. Through structured-use agreements with the Clovis Unified School District (CUSD), the City provides recreational access to people outside of school hours. The Urban Greening Master Plan suggests that the schools offer approximately 181 acres of open space that could be utilized for park functions and utilize this acreage in their analysis of park need for the city.

Clovis' General Plan was updated in 2014 and set a goal of providing 4 acres of parkland per 1,000 residents. Based on a 2010 population of 96,868, the City of Clovis would need to have approximately 387 acres of open space. Currently, the city has 146 acres, representing approximately 1.5 acres of parkland per 1,000 residents. The Urban Greening Master Plan incorporated the estimated school sites with a combined size of 181 acres into the calculation of park need and found that the city provides approximately 3.4 acres of parkland per 1,000 residents. There are new parks in development including the recently opened Dry Creek Trailhead and Centennial Plaza. Although this is close to its target, the city's population continues to rise and the City still falls short of the goal for the 2010 population by approximately 60 acres of parkland.

### 7.1.2 Existing Trails

There are approximately 14 miles of completed trails within Clovis and this mileage increases fairly constantly. Trails provide space for Clovis residents to exercise and travel throughout the city, as well as creating a unique draw for tourists to the area. The Clovis Old Town Trail serves as a valuable central corridor running from north to south through the city center. Spur trails, proposed expansions, and the completion of the beltway network will help to connect the trail system.



*Dry Creek Trail*

Bikeways and planted streets help to create a more hospitable pedestrian experience when moving within the city, particularly as a way to connect to the Clovis Old Town Trail from the east or west. Bike lanes on Teague, Nees, Alluvial, Sierra, Barstow, Gettysburg, and Ashlan Avenues provide valuable connection routes to intersect existing trails.

### 7.1.3 Existing Urban Forest

According to the 2011 Urban Forest Resource Analysis, the City of Clovis publically manages 34,729 trees, of which 74-percent are in good condition. The report also indicated sites for approximately 2,769 more tree plantings. These numbers do not reflect the currently undeveloped areas of the city, nor do they reflect privately maintained trees.

Figures 7-1 and 7-2 provide a snapshot of the urban forest conditions in Old Town and Helm Ranch, respectively. These maps show the pattern of publicly planted and maintained street trees in these neighborhoods and where new trees could be planted.

## 7.2 OPPORTUNITIES

The City of Clovis has a number of new opportunities to expand greening efforts throughout the city. This section describes opportunities to define the focus of the greening plan

### LAND USE ELEMENT

Development of the Draft Land Use Element for the General Plan update has identified several sites for future parks and open space opportunities. These sites include currently underutilized lands as well as existing multi-benefit sites such as basins. Importantly, new parks must maintain their current level of service, and provide spaces for field sports, such as baseball, soccer, rugby, and football.

The Draft Land Use Element also identifies future trail opportunities for the expansion of the trail network, and the City developed a Bicycle Master Plan for Clovis in 2011. In addition to implementing the recommendations for new open spaces and trails, the City could consider the following opportunities for increased urban greening.

### GREEN STREETS

Commonly, streets in urban areas are wider than necessary and can be more efficiently designed to create spaces for pedestrians and planted areas. Creating center medians or vegetated buffers at the edge could help reduce traffic speeds while providing beneficial environmental services, such as stormwater retention and greenhouse gas reduction. Additionally, increased pedestrian and bicycle use can improve the overall health of the population and reduce dependence on fossil-fuel based transportation.

A citywide street assessment could determine which streets in Clovis could be reduced in size to accommodate green street improvements.

### BASIN WALKING PATHS AND DEMONSTRATION GARDENS

Walking for exercise is the most popular recreation activity according to the California State Parks.<sup>1</sup> Increased opportunities for walking can increase a population's fitness and health. In addition to recreational park spaces around the basins, circuit trails with exercise nodes could provide a pleasant outdoor environment for residents to walk.

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<sup>1</sup> California State Parks, 2005, *Parks and Recreation Trends in California*.

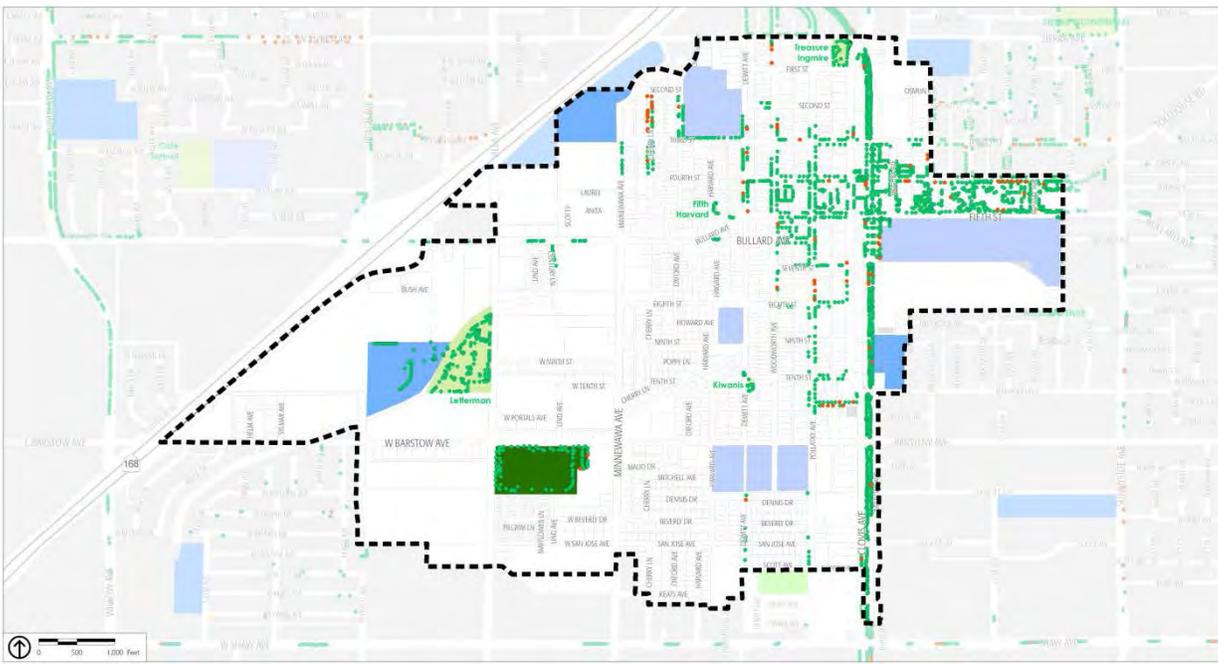
Figure 7-1 Urban Forest Condition in Helm Ranch



Source: City of Clovis, 2013; Fresno County, 2013; The Planning Center | DCAE, 2014

- Tree Conditions**
- New Tree Opportunities
  - Trees
  - Existing Parks
  - School
  - Basins

Figure 7-2 Urban Forest Condition in Old Town



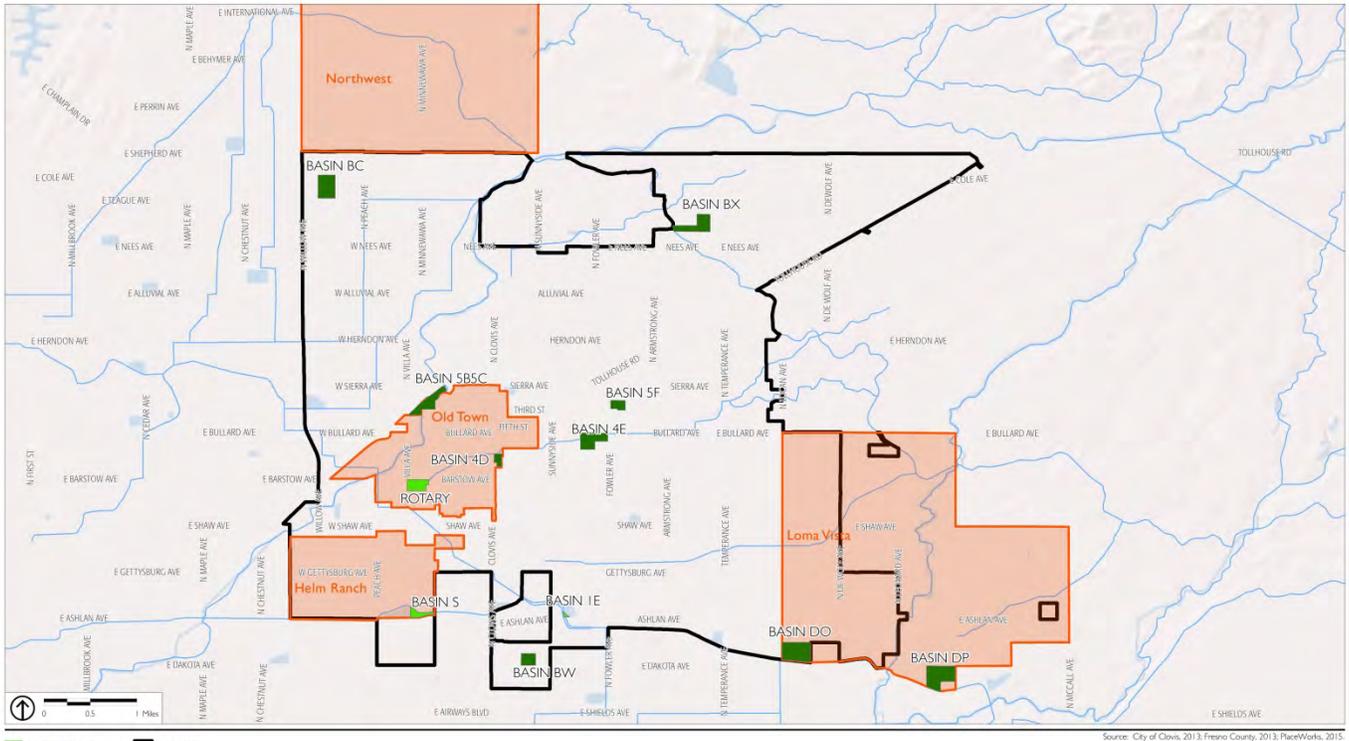
Source: City of Clovis, 2013; Fresno County, 2013; The Planning Center | DCAE, 2014

- Tree Conditions**
- New Tree Opportunities
  - Trees
  - Existing Parks
  - Community Garden
  - Proposed General Plan Park
  - School
  - Basins

The basins’ unique function also provides an opportunity to serve as a demonstration for water conservation. The basins serve as water storage and flood control, allowing visitors to create a connection with their water system. This makes these sites particularly well suited to publicly illustrate efficient water management in homes or to consider water usage in their day-to-day lives. Demonstrations could include drought-tolerant landscapes or informational signage on water supply.

Walking paths or water conservation demonstration gardens can be incorporated into existing basin parks or designed as part of future basin park development, such as basins 4D, 4E, 5B/5C, 5F, BC, BX, BW, DO, DP, and S.

Figure 7-3 Basin Parks



## SCHOOL JOINT USE AGREEMENTS

The 2010 Parks Master Plan identified approximately 181 acres of open space located on schools within the Clovis Unified School District (CUSD). CUSD has a structured use agreement with the City and generously opens their grounds and facilities to the public during non-school hours. By partnering with CUSD and formalizing a shared use agreement to utilize this space, the City could establish a long-term guarantee for continued public access to these recreation facilities and open space and ensure the public’s use of the these spaces during non-school hours.

Fresno Unified School District (FUSD) does not have the same agreement and their school grounds are typically unavailable for general use by the public during non-school hours. Establishing a shared used agreement with FUSD would help address open space shortfalls in currently park-poor areas of the city.

Sanger Unified School District (SUSD) has one elementary school that serves a small portion of Loma Vista. While the school is not within the Loma Vista focus area, it does serve some of the resident children. Establishing a shared use agreement with SUSD would help address open space and recreation needs in the greater Loma Vista area.

## FRESNO IRRIGATION DISTRICT CANAL TRAILS

Similarly to the basin parks, the Fresno Irrigation District (FID) channel network in the Clovis offers an opportunity for improved green infrastructure with channel restoration and trail renovation. There are a number of open channels that run through the city. Several include trails along their banks, which serve as unique and effective off-street connections through the city. However, additional landscape and restoration benefits could significantly improve both the pedestrian experience along the canals and the hydrologic ecology. Through partnership, the City of Clovis could work with FID to establish new trails on some channel banks and upgrade existing ones. Long-term liability and maintenance concerns would need to be addressed and agreed upon by both entities.



*Enterprise Trail*

## RODEO GROUNDS

The Clovis Rodeo serves as a landmark event every spring. The Rodeo and associated events bring in numerous tourists and provides a number of cultural activities to residents. Similarly to school sites, the rodeo site could serve as a municipal asset throughout the year. The City could reach out to the Rodeo for partnership efforts to provide greening infrastructure improvements, such as increased planting and stormwater control, and allow more regular access while maintaining the site's use during key rodeo events. Specific emphasis on the Rodeo's entry way could provide a landmark gateway for the facility and serve as a focal point for urban greening.

## COMMUNITY GARDENS

Allowing people to grow their own food not only provides new access to healthy food, it also provides new outlets for exercise and engagement in a community. Currently, there are two community gardens serving residents of Clovis: Fresno Interdenominational Refugee Ministries (FIRM)'s Clovis Garden located at 1726 Pollasky Avenue and Clovis Christian Church Garden located at Locan Avenue and San Jose Avenue. Both of these gardens are managed by non-profit groups. Through partnership with other groups or managing a municipal program, more Clovis residents could participate in a garden program.

In areas where housing is denser, currently vacant or underutilized lots could be used for community gardening. Additionally, spaces within a public park could be set aside for this use. In areas where housing is planned or less dense, large pieces of land could be set aside for community gardening, a demonstration farm space, or other form of community-supported agriculture.



*Community garden at Clovis Christian Church*

## URBAN FOREST

The 2012 Urban Forest Management Plan establishes a vision and mission statement that clarifies the need for a healthy, vibrant, and sustainable urban forest that is an integral part of the community's infrastructure. This plan articulated several recommendations including increasing urban forest plantings; developing both a parking-lot shade ordinance (Clovis now requires 50 percent shading within 15 years of development) and a heritage tree protection ordinance; creating an Urban Forester position and an Urban Forest Group charged with stewardship of the city's urban forest; creating a citywide park and landscape district to provide dedicated source funding; and expanding the Citizen Forester Program, among others. Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most

effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts.

## TRAIL NETWORK CONNECTIVITY AND WAYFINDING

The City has made major commitments to creating a network of trails with new trails being built every year. As gaps in the network are closed and additional trail mileage added to the network, the importance of wayfinding becomes key. Currently, there is no signage to indicate trail direction, length, or name, making it difficult in some locations, particularly intersections, to know where the trail continues. Development of wayfinding signage would help encourage continued and expanded use of trails by providing information immediately to the user. The City is currently developing a trail marker system which will allow trail users to scan markers with their smart phones and get trail information. Continued development, installation, and maintenance of this information would greatly help with wayfinding efforts.



*End of trail near Keats and Kaweah Avenues*

## 7.3 POLICY INITIATIVES

In addition to site-specific opportunities, various City policies could be implemented to promote urban greening throughout the city.

### 7.3.1 Citywide Park and Landscape District

The City has various landscape maintenance districts associated with recent developments to fund the public open spaces in those districts. However, existing neighborhoods have a disparity as they are reliant on General Funds for landscape maintenance and therefore receive less attention and investment than newer developed areas. A citywide park and Landscape District would allow a systemic approach to the City's public open space, parks, trees, and trails that would ease

the disparity between areas with special district funding and those dependent on General Fund fees, while providing a more consistent amount of funds for planning purposes.

### 7.3.2 Educational Opportunities, Demonstration Sites and Incentive Programs

Many cities and non-profits offer educational resources or incentive programs to residents as an effort to build momentum for greening efforts. Informational classes, such as water-efficient landscape design, tree maintenance, or bicycle repair, create an opportunity for citizens to take part in sustaining the city's ecological resources. Demonstration sites such as lawn alternatives or irrigation installation, allow residents to see first-hand opportunities what they could implement privately and can inspire them to make changes on their private property. Incentive programs such as reduced cost for trees, low-water use plants, or alternative-energy devices, could additionally motivate residents to make sustainable upgrades to their private property. These types of strategies decentralize greening efforts and potentially make it more feasible to have a large impact across the city. Such programs are also great opportunities for partnership with local utilities, educational centers or non-profit groups. The City of Clovis could look to local resources, such as the Clovis Botanical Garden or Fresno State for partnership for providing new educational opportunities or for demonstration sites.

### 7.3.3 Organic Waste Collection and Composting

Many cities in California collect residential green waste for large-scale urban composting. The City of Clovis provides this through a contract with Allied Waste. This significantly reduces residential organic waste going into landfills. Adding compost to soil significantly improves its capacity to hold water and could be an important asset in water efficient landscape practices in the future. There may be opportunities to expand the service and/or the availability of the resultant compost.

### 7.3.4 Sustainable Landscape Best-Practices Maintenance Manual

Implementing a citywide-maintenance manual that outlines best practices to minimize waste, conserve water, and protect natural ecosystems could present recommendations for labor practices, equipment and tools, as well as specific implementation practices to preserve water and promote healthy plant growth. This manual could be built on best practices developed by other organizations, such Appendix E: *Model Bay-Friendly Landscaping Maintenance Specifications*, and tailored to meet Clovis' needs.

## 7.4 NEIGHBORHOOD SPECIFIC OPPORTUNITIES

The following summarizes specific greening opportunities for individual neighborhoods within Clovis or in the City's sphere of influence.

### ► HELM RANCH

Helm Ranch neighborhood is fairly built-out, however it does include some larger underutilized parcels for more traditional open space development. As shown in Figure 7-4, the following areas could be considered as part of the overall greening plan:

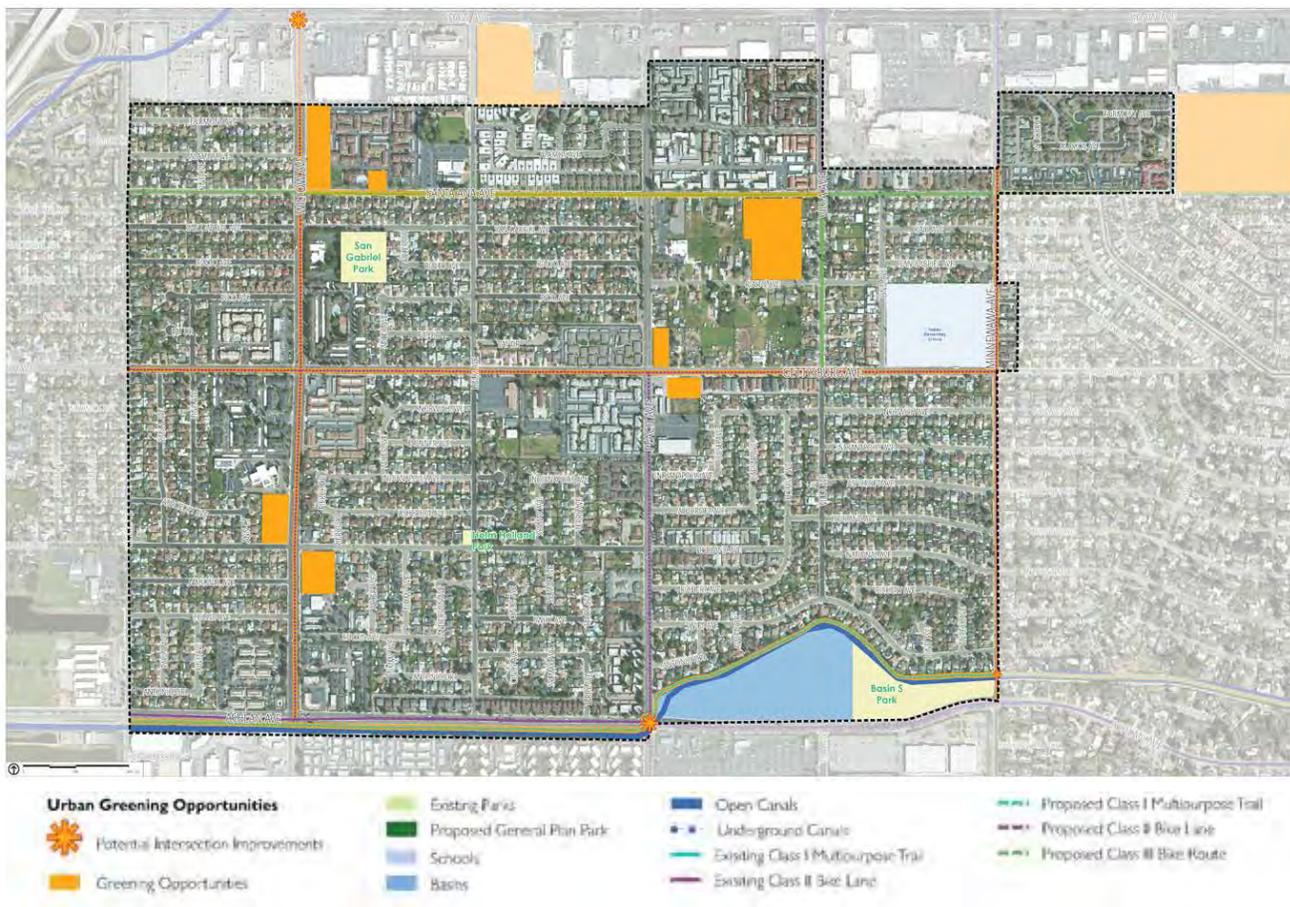
## Vacant Lot Conversions: Community Parks

There are some larger parcels in Helm Ranch that could serve as new community parks. Although they may not be able to accommodate larger sports complexes, they could accommodate smaller sports courts, gathering areas, fitness stations, or other play opportunities.

## Joint Use with Schools

Tarpey Elementary School, located on Gettysburg Avenue between Lind Avenue and Minnewawa Avenue, has a large green space on the west side of the school. The City could reach out to the school to establish a joint use agreement to formalize and guarantee the current structured use allowing public use of the site when school facilities are not in use.

**Figure 7-4 Helm Ranch Greening Opportunities**



## Channel Restoration or Channel Park

Gould Canal runs east-west along the southern edge of Helm Ranch, with a basin park located at Minnewawa and Ashlan Avenues. There is an informal trail along the canal behind the park and basin; however, connecting the trail to the east to connect to Old Town Trail could become an important pedestrian and bicycle corridor for Helm Ranch residents. Additionally, the canal continues to the west with an unimproved trail along the levee. This trail could be improved to

become a separated pedestrian and bicycle route along Ashlan Avenue to Fresno. Currently, the intersection at Peach Avenue and Ashlan Avenue is particularly difficult to navigate if a person wants to continue along the canal trail.

Pedestrian and bicycle improvements such as special street markings, bicycle signals, and larger median pedestrian refuges, as well as wayfinding signage, would improve the intersection. The unimproved canal trail west of Peach Avenue is bordered by oleander shrubs. Although the shrubs provide some shade, they could be replaced with larger trees to provide greater shade along the canal trail, making it a more comfortable travel route during the warmer parts of the year.



*Gould Canal*

## Green Streets

The major east-west connector streets, such as Gettysburg Avenue and Santa Ana Avenue could be improved with green street features to facilitate more pedestrian activity heading to and from the Old Town Trail. All of these streets were identified for proposed bike lanes. Other traffic calming devices such as bulb outs, would make these streets more accommodating to future bicycle travel.

Although used frequently by both cyclists and walkers, Willow Avenue at the eastern edge of Helm Ranch is extremely wide and somewhat unfriendly to pedestrian activities. The sidewalk is narrow with inconsistent width along the length of the street through Helm Ranch. As illustrated in Figure 7-5, Willow could be expanded and made consistent along the length of the street. Additionally, the proposed Class II bike lane on Willow will formalize the use of the street for bicycle travel. A painted bike lane could increase the visibility of the lane and potentially bring greater awareness of the cyclists traveling there. The central medians along Willow Avenue were recently improved to provide decorative signage for Helm Ranch, as well as new paving. These medians do not contain irrigation so planting would be difficult; however, if water could be provided at installation, new water-efficient planting could be established in these medians. Opportunities for new plantings as well as a greater sense of refuge for pedestrians crossing the streets could also materialize.

Figure 7-5 Willow Avenue Existing and Possible Greening Opportunities



► **OLD TOWN**

Old Town is fairly built-out with residential and commercial uses. In these conditions it can be difficult to find large spaces for new green spaces and attention must be focused on smaller interventions and multi-beneficial connections and green infrastructure. During the public outreach and writing of the Urban Greening Master Plan, the City pushed the conceptual drawings for a new public plaza forward and Centennial Plaza opened in April 2015, helping to provide additional public

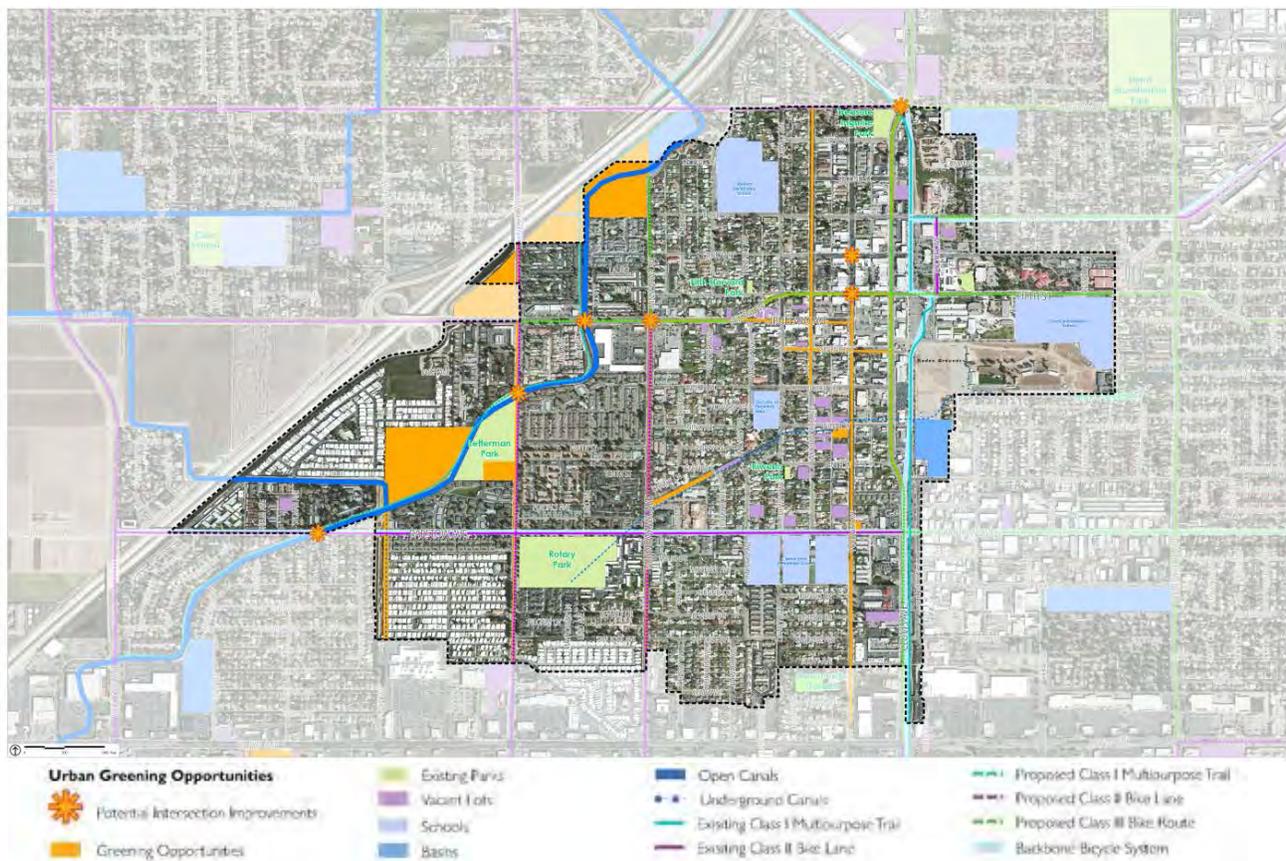
space in Old Town. As shown in Figure 7-6, the following areas could be considered for improvements as part of the overall greening plan.

## Canal and Trail Restoration

There are two canals running through Old Town. In addition to creating a more formalized pedestrian trail, these linear corridors provide an excellent opportunity for channel restoration. A plan for increased planting and aesthetic improvements could improve both the trail experience and the ecological function of these sites.

There are key nodes where the trails pass busy streets, identified on the map in Figure 7-6. Currently, there are no crosswalks or pedestrian amenities assuring safe passage at these intersections. These nodes serve as important opportunities for improving the pedestrian experience.

**Figure 7-6 Old Town Greening Opportunities**



## Basin Parks

Clovis has a legacy of creating public parks around existing retention basins. There are three opportunities for new basin parks in Old Town. The basin near Letterman Park would provide an opportunity to expand the capacity of the existing park and also connects to the existing canal and trail. The basins close to the Sierra Freeway may be less desirable as open space due to their freeway proximity; however, they provide unique open space opportunities for urban forestry along the basin edge.

Due to the use of basin parks to serve as water storage, these spaces will not be utilized as parks at all times and cannot be densely planted. Consequently, they might best serve as nature preserves or aquatic habitat restoration areas. Existing basin parks in Clovis provide this function and provide users with an experience to interact with their local urban ecosystem.

## Low Water Use Demonstration Gardens

As noted, Clovis successfully utilizes much of its water infrastructure with public space. These opportunities could be expanded by creating demonstration sites to inform the public about low-water use landscape options and conservation methods such as the garden installed at the Clovis Botanical Garden. There is a water tower at the southeastern edge of Letterman Park. Although this is not an accessible piece of water infrastructure, it could serve as the location of a new water-efficiency demonstration garden.

Additionally, the City could encourage private low-water use landscape conversion by sponsoring a program for demonstration front yards throughout the city, building on the Central Valley Friendly Landscaping Program that the City currently supports. The City could also reach out to non-profit groups to sponsor community work days to help residents transform their yards into low-water use gardens.

## Green Streets

The major north-south connectors through Old Town are Villa Avenue and Minnewawa Avenue. Filling in the gaps for street trees and adding in green street features, such as raingardens, bulb outs, and stormwater plantings, might enhance the pedestrian experience along these routes.

Several of the streets in Old Town, particularly those south of 5<sup>th</sup> Street, are very wide. Street trees would make the streets feel narrower and more pedestrian friendly, as well as potentially reduce traffic speeds. Streets identified for improvements include Woodworth Avenue between Sierra Avenue and 8<sup>th</sup> Street, 7<sup>th</sup> Street between Dewitt and Clovis Avenues, Bullard Avenue between Harvard and Pollasky Avenues, Pollasky Avenue between 5<sup>th</sup> Street and Shaw Avenue, and Villa Avenue between San Jose Avenue and Highway 168.

## Vacant Lot Conversions: Pocket Parks, Public Art and Community Gardens

Although there are relatively few underused spaces, there are a few vacant parcels in Old Town. These spaces could be acquired by the City for small pocket parks, public art installations, or community gardens. In particular, the vacant lot on Pollasky Avenue south of Ninth Street has a large shade tree, making it an existing refuge on a warm day. This small lot could be transformed into a pocket park with exercise equipment or other amenities. This intervention could potentially activate this section of Pollasky Avenue, which has significantly less pedestrian activity than the highly-active sections north of Bullard Avenue.

Public art is featured along the Old Town Trail, in plazas, and on buildings, celebrating the city's history and culture. Including public art in the conversion of vacant lots or in remnant public rights-of-way can add character and functionality to these other underutilized areas.

Fresno Interdenominational Refugee Ministries manages a community garden at the Memorial United Methodist Church located at 1726 Pollasky Avenue. Partnership with a similar group might allow the City to cede management of the site to a non-profit group, reducing maintenance costs while providing public access.



*Vacant lot on Pollasky Avenue between Ninth and Tenth Streets*

## Centennial Plaza

The City had conceptual plans for Centennial Plaza when the Urban Greening Master Plan process was started. The City fast-tracked the project and Centennial Plaza opened in April 2015, providing additional gathering and green space in Old Town.

## Downtown

The iconic Gateway to the Sierras marker could be expanded in meaning with the addition of more street trees and improvements to pedestrian and bicycle facilities. Existing intersection circles could be greened through the introduction of permeable pavers, where existing soil conditions allow, or plantings.

## Green Alleys

In Old Town, there are various alleyways that serve as back entrances for residential units. These alleys increase overall impervious surfaces in the neighborhood and increase runoff even though they have relatively low use. Converting these surfaces to more pervious materials or drivable green pavers could improve overall stormwater runoff in this part of the city.

## ► LOMA VISTA

Loma Vista is roughly 50-percent built out with varying levels of planned development for the remaining area; greening opportunities are limited by the timing and approval of development. In an effort to prepare for future development, the City could consider the greening opportunities listed below. Potential opportunity sites are identified in Figure 7-7.

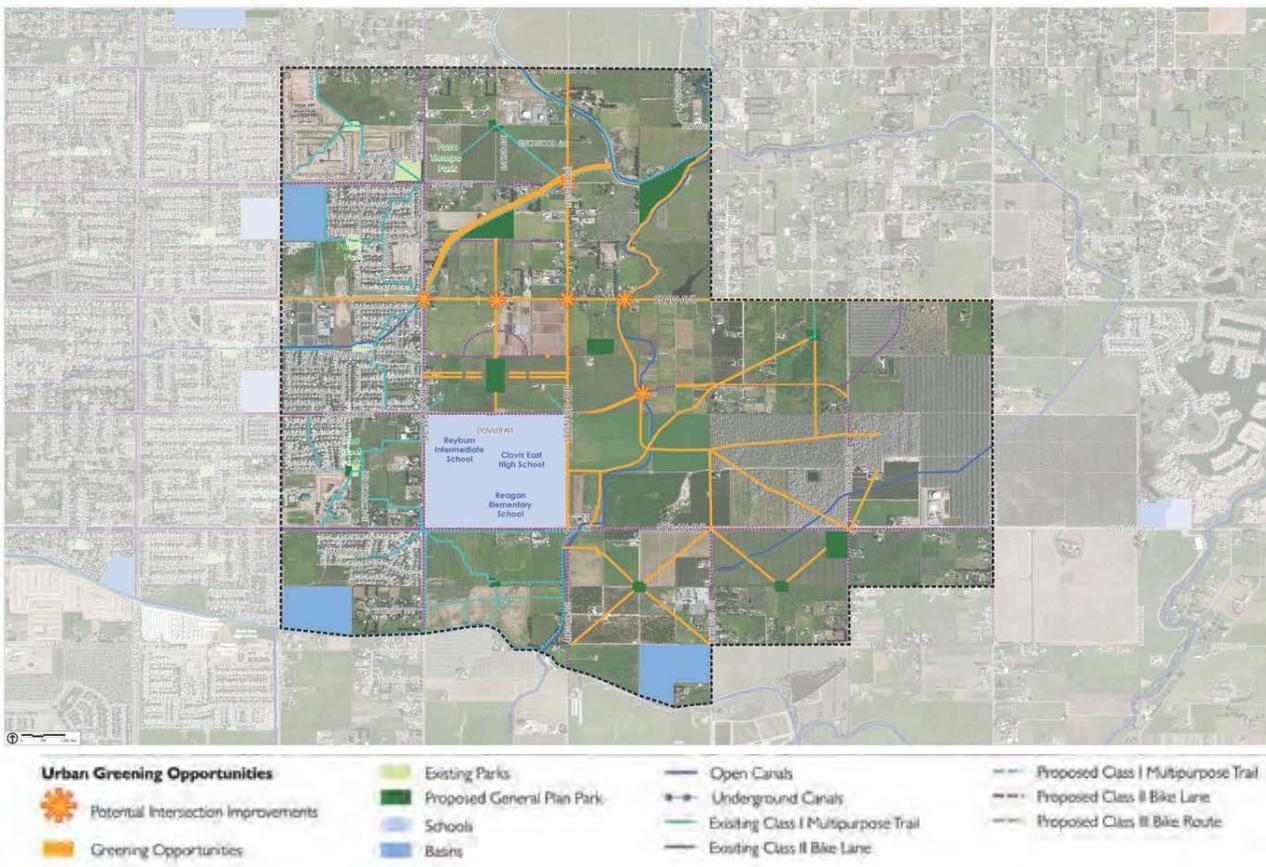
### Temporary Uses of Proposed Green Space

Currently, there are planned green spaces in Loma Vista. These future parks could be utilized temporarily for park use that does not require the construction of significant facilities such as a tree bosque/orchard, community garden or BMX bike track.

### Water Conservation Standards and Irrigation Training for Contractors

The City could require more intensive water conservation design strategies be implemented in the new development at Loma Vista. The City utilizes the standards set forth in California’s Water Efficient Landscape Ordinance (WELO) and could require following Central Valley Friendly landscaping principles or other water conservation standards. In addition to these standards, the City will need to consider the water efficiency measures required by Executive Order B-29-15, which prohibits irrigation with potable water on ornamental turf on public median strips and outside of newly-constructed homes and buildings that are not delivered by drip or microspray systems.

Figure 7-7 Loma Vista Greening Opportunities



Additionally, the City could partner with irrigation companies to provide classes to contractors on effective and efficient strategies for installing new irrigation. This training could both ensure that the contractors are using the most water-efficient technologies, properly installing and calibrating the equipment in the most efficient ways, and preventing maintenance issues.

## Public Art

The street design for Loma Vista includes landscaped circular intersection nodes. These features could serve as centers for public art, allowing a space for expression within these landscape areas.

## Stormwater Targets

The City is already requiring low-impact design strategies to be implemented in the new development at Loma Vista. New construction allows for new design standards and the new development could significantly offset its stormwater impact. There are additional opportunities to reduce stormwater impacts, such as utilizing more pervious paving material for new trails, where existing soil conditions allow, and stormwater basins with engineered soil for percolation.

## Street Tree Planting

The major streets in Loma Vista have been designated. As a first stage towards developing the green streets in this neighborhood, street trees could be planted along these corridors. This would improve the overall look of the streets as the neighborhood develops. Each major street could be designated with a specific thematic tree, creating a wayfinding mechanism using the urban forest.

Shaw Avenue will be the central commercial corridor in Loma Vista, and serving as the “Village Center.” By creating a pleasant pedestrian environment along this street, the City could promote pedestrian uses and make it easier for nearby residents to walk or bike to everyday goods and services.

Furthermore, the City could designate tree canopy coverage for the neighborhood as part of the development strategy. Research conducted by American Forests recommends an overall average canopy coverage of 25-percent as appropriate for urban areas in temperate and arid climates, such as Clovis, based on recommended coverage for specific land uses of 35-percent for suburban residential, 18-percent for urban residential zones, and 9-percent for central business districts. These targets could be utilized in setting standards.



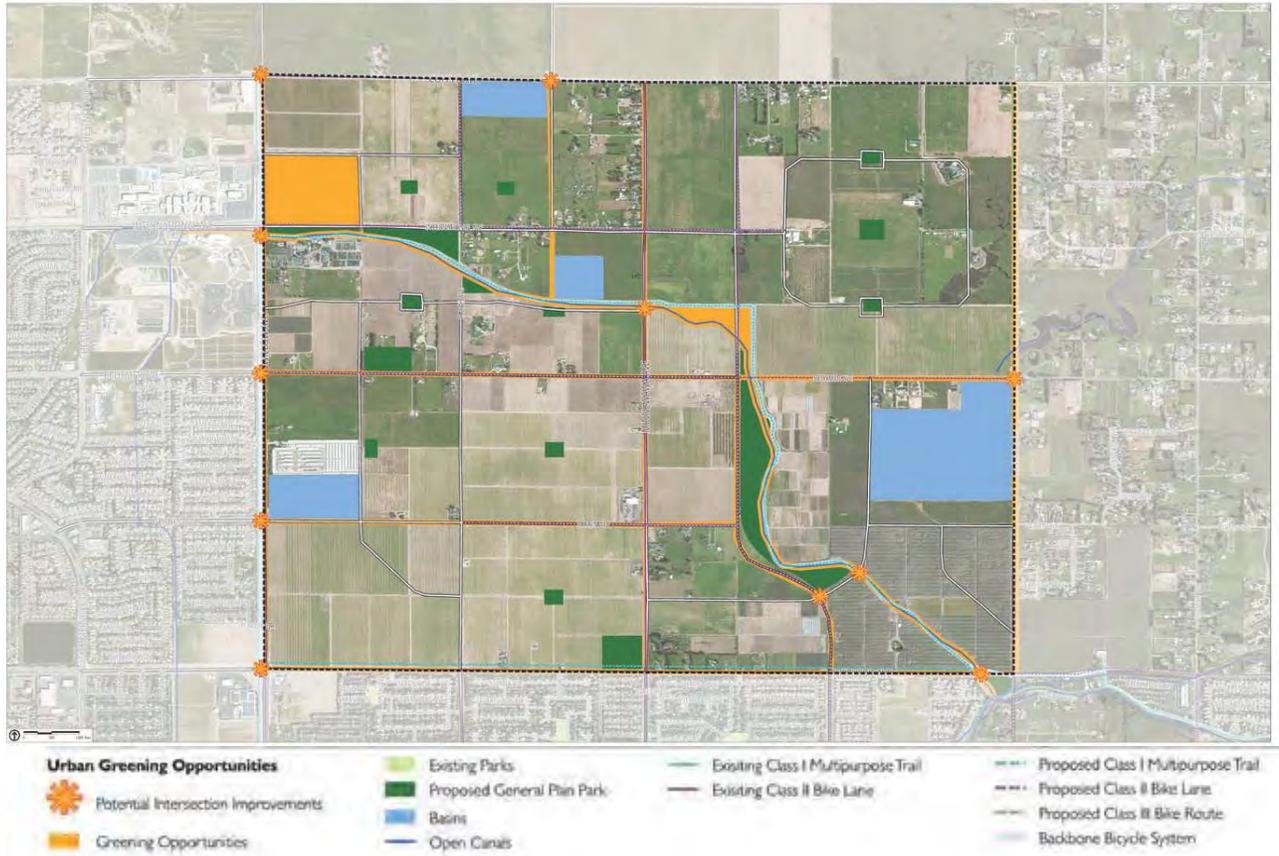
*Chinese elms create a shade canopy in Chico*

## ► NORTHWEST

Northwest has not yet experienced the changes development is bringing to Loma Vista and is still predominately comprised of rural residential and agricultural land uses. Unlike Loma Vista, much of the planned development and design is not yet complete for this neighborhood. The City could require more stringent design standards to meet environmental goals, such as urban forestry targets, stormwater standards, and water-conservation features. A comprehensive low-water use/maintenance palette should be designed for the neighborhood. The palette could serve as a demonstration for other “Valley” communities, while honoring the foothills meets orchard/agriculture theme that currently defines the neighborhood.

Greening opportunities for Northwest can be found in Figure 7-8. Existing streets in Northwest are largely unimproved with few pedestrian amenities or street trees. The major roads connecting Northwest to the rest of the city could begin to transition to green streets. This would increase the likelihood of an active pedestrian presence in the neighborhood. Trail connectors are already planned to connect the education campuses at International and Willow Avenues through Northwest and connecting to Old Town. Establishing parkways on major arterials, extending Clovis Avenue north past Copper Avenue and further extending to Auberry Road, and integrating bike lanes/paths/routes into circulation patterns would all continue to build on the existing bike staging and riding that occurs.

Figure 7-8 Northwest Greening Opportunities





# 8

URBAN GREENING MASTER PLAN

## Plant Palette and Landscape Installation Plan



*Paseo plantings in Loma Vista*

*“Someone’s sitting in the shade today, because someone planted a tree a long time ago”  
- Warren Buffett, Investor*



Trees and other landscape plantings offer significant urban greening benefit, including improved ecological function, enhanced health and quality of life for residents, and increased economic value of commercial and residential properties. Services like stormwater retention, carbon dioxide reduction, and shade production are extremely valuable and trees and plants offer an economically sensible and ecologically sensitive way of providing these services in urban areas. Furthermore, increased greening and well-maintained natural features provide an attractive urban condition that can positively impact resident and visitor experiences within the City. Appropriate plant selection and thoughtful short- and long-term maintenance can ensure that these green assets are maximized and retain their value over time.

Some neighborhoods in Clovis have excellent urban plantings, such as the large trees in Old Town or the new plantings in Loma Vista’s parks, greenways, and medians. These plantings contribute to the vitality and character of these neighborhoods and improve the overall condition of the areas. However, other locations, such as medians in Helm Ranch or large roadways and irrigation rights-of-way could be significantly improved by increasing tree canopy and installing new, water-efficient landscaping. The planting strategy for the Clovis Urban Greening Master Plan must be two-fold: 1) retain and enhance the existing plant resources, and 2) thoughtfully expand planting in underserved areas. The Plant Palette described below can be utilized for both strategies and the maintenance recommendations in the Landscape Installation Plan will ensure that these plantings are a long-term asset for the City.



*Chondropelatum tectorum*  
Cape rush



*Euphorbia characias wulfenii*  
spurge

## 8.1 EXISTING CONDITIONS AND NEEDS

In developing the plant palette for the City of Clovis, existing conditions helped to determine what types of species are appropriate for the area. Existing needs, based on community input and analysis of existing plants, further helped to refine the list to create a targeted plant palette reflective of the unique character of Clovis.

### 8.1.1 Existing Conditions

Existing conditions impacting the plant palette include the following:

- » **Climate Zones.** Clovis is located between Climate Zones 8 and 9 based on the categorization in the *Sunset Western Garden Book*, a planting resource guide for climate-specific planting. Zone 8, “cold air basins of California’s Central Valley,” and Zone 9, “thermal belts of California’s Central Valley,” are very similar in climate, except that Zone 8 may endure somewhat colder winter nights, down to 13°F, which might be harmful to warm weather plants that cannot endure the colder temperatures. Both zones have high summertime temperatures and limited cloud cover during the long summer-time growing season.

- » **Hot Summer Temperatures.** Average high temperatures in Clovis range in the high nineties throughout the summer, although it is possible to reach higher than 100°F for days at a time. Plants selected in Clovis must be able to withstand these temperatures or must be planted in a way to prevent exposure during this time, such as being planted under the canopy of more heat-tolerant species, in shady areas, or on the north or east side of buildings.
- » **Low Summer Water.** There is little to no summer precipitation in Clovis. Average precipitation levels drop to nearly zero during July and August with slightly higher levels from April to June and September to October but these are rarely higher than one inch. For purposes of plant selection, there is an assumption of no available summer water without irrigation and irrigation needs to be minimized given current drought conditions and anticipated water restrictions. Properly selected and maintained plants can survive in these harsh conditions.
- » **Evapotranspiration Zone.** During the hot, dry summer months, plants are losing a significant portion of their water as vapor through their leaves, a process called transpiring. Evapotranspiration rates in an area are important when evaluating the potential water budget for planting area and determining the plant species to select. Based on the California Irrigation Management Information System (CIMIS), Clovis is located in EvapoTranspiration (ETo) Zone 12, “East Side Sacramento-San Joaquin Valley;” however, the City of Clovis Ordinance has different monthly ETo rates. The Clovis ordinance rates should be used when calculating maximum applied water allowance (MAWA) and estimated total water use (ETWU) to meet Water Efficient Landscape Ordinance requirements for planting in the City of Clovis. ETo rates are listed below in Table 8-1.

**TABLE 8-1 EVAPOTRANSPIRATION RATES**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>Clovis Ordinance Rates</b>	1.0	1.5	3.2	4.8	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	<b>51.4</b>

- » **Soil.** Soil type and quality are important in plant selection, both because of the water holding capacity of the different soil types as well as general soil preferences for certain plant species. Although soil amendments, such as compost, can vastly improve the soil’s ability to sustain growth, it is important to consider existing soil restrictions. A full soil survey for the City of Clovis is available from the USDA, which indicates a variety of soil types. Some areas of Clovis are significantly restricted by a duripan layer. Duripan is a diagnostic soil horizon of the USDA where the soil is cemented by alluvial silica into a subsurface hardpan that obstructs root penetration and movement of air and water. While duripan is not present everywhere and it occurs at different depths, it can be a significant factor that can impede plant growth. Duripan is less an issue in Old Town and Helm Ranch where only three percent of the focus areas’ soils have duripan issues. However, approximately 22.5% of Northwest and 67% of Loma Vista’s soils have either duripan or bedrock layers that start at depths anywhere between 12- and 60-inches. Where duripan or similar limiting soils are present, site grading becomes critical. Keeping existing top soil, amending existing or importing additional top soil, building up soil with the use of berms, or other methods become critical approaches to help ensure plant growth.

## 8.2 EXISTING NEED

Urban needs helped to further refine the plant palette and include the following:

- » **Shade.** Large tree canopies provide shade. This creates a comfortable environment for people, as well as significantly lowering ambient temperatures, decreasing cooling needs and overall heat island effects, and allowing respite for understory plants from hot temperatures, which is a significant problem in summer months, as noted above. Increased shade is particularly important for the very young, elderly, and disabled residents who might be less able to withstand extreme conditions, as well as pedestrians and bicyclists who use the streets for transit without the benefit of air-conditioned cars. Increased shade on streets makes non-vehicular transit a much more enjoyable experience, a benefit both for air quality and the community’s health.

- » **Stormwater Retention.** Urban plantings can contribute to the management of street flooding and water quality by absorbing and filtering runoff from the streets. Clovis has an interesting and valuable urban resource in its irrigation canals and detention basins. These utilitarian spaces serve important functions for water management but could also serve as demonstration spaces for the value of plants in providing ecological services.
- » **Increased Diversity.** The current street tree population in Clovis consists of over 150 different species. Despite this diversity, there is an over-representation of several species that make up the bulk of the street tree population and many of these trees are of a similar age. Species and age diversity is extremely important in retaining a healthy urban tree population and the City must work toward maintaining a more diverse balance.



*Zelkova serrata*  
sawleaf zelkova



*Ginkgo biloba 'Fastigiata'*  
columnar ginkgo

## 8.3 GOALS OF THE PLANT PALETTE AND LANDSCAPE MAINTENANCE PLAN

As a tool of the Urban Greening Master Plan, the Plant Palette and Landscape Maintenance Plan can significantly contribute to the overall greening of the City of Clovis. These tools were devised with the following goals in mind:

### 8.3.1 Reduce Irrigation Needs

The State of California is currently in an extreme drought. Although these conditions may be ameliorated in future years, the realities of living in the State require a drought tolerant planting strategy. In 2010, the 20x2020 Water Conservation Plan was released with the goal of achieving a 20 percent reduction in per capita water use statewide by 2020. In 2012, Governor Jerry Brown passed Executive Order B-18-12 requiring 20 percent reduced water use by 2020 for State projects. The continuing drought in 2014 has brought on a variety of water conservation mandates across the State, including Executive Order B-29-15, which requires a 25 percent reduction in water use through February 2016. Progressive cities throughout the State should build on this momentum and reduce their water usage at a similar rate.

Plants selected for the Plant Palette have low to moderate water needs. Plants need to be grouped together based on similar water needs or hydrozone to avoid unnecessary watering and for efficient irrigation layout. Hydrozone refers to an area irrigated from the same valve where plants have similar water requirements.

### 8.3.2 Improve Aesthetic Conditions

Simply adding new plants will not directly improve aesthetic conditions. It is important to select plants that will thrive in Clovis and provide the type of aesthetic improvement residents want to see. During public outreach meetings, the

community frequently expressed disapproval of landscape installations that were not well-cared-for, dying, or blighted. To avoid these issues, the Plant Palette includes plants that are appropriate for Clovis and should require minimum maintenance. Furthermore, the practices set forth in the Landscape Installation Plan will ensure that the plants are well established and maintained, limiting potential issues with unsightliness and untidiness.

### 8.3.3 Increase Native and Climate Adapted Planting

Native plants can help define a region and draw attention to the area’s unique quality. Native plants are extremely well-suited for the climatic conditions of its home range; however, the soil compaction and environmental conditions of an urban setting may preclude the success of some species of native plants. Native species can be augmented by plants from similar climatic regions that are well adapted to urban environments. The Plant Palette builds on the native plants of the region and supplements with plants adapted to the climatic conditions of Clovis.



*xChitalpa tashkentensis*  
 chitalpa



*Cotinus coggygria*  
 smoke tree

## 8.4 PLANT PALETTE

The Clovis Plant Palette is divided into two groups: trees and understory plants, listed in Table 8-2 and Table 8-3, respectively. Understory plants include shrubs, vines, and groundcovers; many of these would be planted under tree species, although in some cases, such as in turf alternatives, they can be planted in full sun. Plants were selected based on their ability to thrive in the existing conditions described above, as well as their appropriateness based on the existing needs in Clovis. Please note that some plants have thorns or sharp edges; these are noted in the comments and should not be located adjacent to a path or where there would be direct contact with people. As new species and cultivars are introduced, these lists should be updated to reflect what plants successfully thrive with lower water needs. Plant selection should focus on using no, low, and moderate water needing plants.

TABLE 8-2 TREE SPECIES LIST\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population.

Scientific Name	Common Name	DESCRIPTION					PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Evergreen (E) or Deciduous (D)	Canopy Height (Feet)	Canopy Width (Feet)	Growth Rate: Fast (F), Moderate (M), Slow (S)	Allergen (Male/Female if applicable)	Spacing Between Trees	Water Needs	Irrigation Group	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Good for Use Under Utility Lines		Major Arterial Streets/Right-of-Ways/Paseos	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Aesculus californica</i>	California buckeye	D	10-20	30	S-M	7	20	Mod	2		●	cream colored bloom; attractive branching; loses all its leaves in summer; seeds are toxic			●			
<i>Arbutus unedo</i>	strawberry tree	E	20	15	S-M	3 (sp)	20	Low	2	CT							●	
<i>Arbutus 'Marina'</i>	marina madrone	E	>30	>30	F	3 (sp)	25	Low	2	CT		attractive bark; use multi-trunk when possible; pink fall flowers					●	
<i>Casuarina cunninghamiana 'Fastigiata'</i>	river she-oak	E	20-35	20-35	F	10	20	Low/Mod	2	CT		conifer; best as a massing tree; oval-vase shape			●			
<i>Carpinus betulus</i>	European hornbeam	D	40	40	S-M	8 (sp)	35	Mod	1			drooping outer branches; mature trees need little or no pruning; long lived	●					
<i>Cedrus atlantica 'Aurea'</i>	atlas cedar	E	>60	30	S-M	2 (sp)	30	Low/Mod	2			conifer; yellowish needles; less spreading than other cedars			●			
<i>Cedrus atlantica 'Glauca'</i>	atlas cedar	E	>60	30	S-M	2 (sp)	30	Mod	2			conifer; silvery blue needles; less spreading than other cedars			●			
<i>Cedrus deodara</i>	Deodar cedar	E	80	40	F	5/1	30	Low/Mod	2			large accent tree			●			
<i>Cercidium 'Desert Museum'</i>	Desert Museum palo verde	D	20	20	F	5 (sp)	15	Low	2			colorful bark; light green stems; large yellow blooms in spring; thornless; good for paseos	●	●	●	●	●	
<i>Cercidium microphyllum</i>	little leaf palo verde/ foothills palo verde	D	20	20	S	5 (sp)	15	Low	2			colorful yellowish-green bark; pale yellow spring blooms; has thorns	●	●		●	●	
<i>Cercis canadensis texensis 'Oklahoma'</i>	Texas redbud	D	25-35	25-35	F	5 (sp)	20	Mod	1			wine red winter bloom; glossy, heat resistant leaves; short lived	●	●			●	
<i>Cercis mexicana</i>	Mexican redbud	D	15	15	M	5 (sp)	20	Mod	2			blue-green leaves; pinkish purple bloom; short lived					●	
<i>Cercis occidentalis</i>	western redbud	D	10-18	10-18	S	5 (sp)	15	Low	2	CT	●	use multi-trunk where possible; short lived			●		●	
<i>Chionanthus retusus</i>	Chinese fringe tree	D	20	>20	M	10/1 (sp)	20	Mod	1			white bloom					●	
<i>Chilopsis linearis</i>	desert willow	D	15-30	10-20	F	5	20	Low/Mod	2	WD		grows fast at first then slows with age			●		●	
<i>x Chitalpa tashkentensis</i>	chitalpa	D	20-30	20-30	F	6 (sp)	20	Low/Mod	2					●	●		●	
<i>Cupressus arizonica 'Glauca'</i>	Arizona cypress	E	40	20	M	10	30	Very Low/Low	2	CT		silvery gray foliage; grows well on slopes			●			
<i>Eriobotrya deflexa</i>	bronze loquat	E	20	20	M	3	25	Mod	1			fruit producing			●			
<i>Eucalyptus citriodora</i>	lemon-scented gum	E	45-90	15-45	M	6-8 (sp)	35	No/Low	2			white to pinkish bark; lemon scented leaves	●	●				
<i>Eucalyptus pauciflora</i>	ghost gum	E	24-60	15-45	M	6-8 (sp)	40	No/Low	2			white trunk and branches	●	●				

TABLE 8-2 TREE SPECIES LIST\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population.

Scientific Name	Common Name	DESCRIPTION					PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Evergreen (E) or Deciduous (D)	Canopy Height (Feet)	Canopy Width (Feet)	Growth Rate: Fast (F), Moderate (M), Slow (S)	Allergen (Male/Female if applicable)	Spacing Between Trees	Water Needs	Irrigation Group	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Good for Use Under Utility Lines		Major Arterial Streets/Right-of-Ways/Paseos	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Eucalyptus rudis</i>	flooded gum	E	30-60	24-40		6-8 (sp)	40	No/Low	2				white flowers	●	●			
<i>Feijoa sellowiana</i>	pineapple guava	E	18-25	18-25	F	3	15	Low	2	CT			large shrub; must be pruned into tree; edible fruits; short lived		●	●		
<i>Fraxinus americana</i> 'Junginger'	autumn purple ash	D	45	40	M	9	35	Mod	1							●		
<i>Fraxinus americana</i> 'Skycole'	skyline ash	D	45	45	M	9	40	Mod	1							●		
<i>Fraxinus angustifolia oxycarpa</i> 'Raywood'	raywood ash	D	25-35	25	F	1	25	Mod	1				fairly compact; purple-red fall color; short lived	●				●
<i>Fraxinus pennsylvanica</i> 'Johnson'	leprechaun ash	D	18	16		9/1	15	Mod	1			●		●		●		●
<i>Geijara parviflora</i>	australian willow	E	25-30	20	M	6	25	Low	2				large shrub/small tree	●	●			●
<i>Ginkgo biloba</i> 'Autumn Gold'	autumn gold maidenhair tree	D	40	30	S	7/2 (sp)	30	Mod	1	CT			low, early pruning; train prune longer due to slow growth; long lived			●		●
<i>Ginkgo biloba</i> 'Fairmount'	fairmount maidenhair tree	D	50	20	F	7/2 (sp)	30	Mod	1	CT			faster growing than other Ginkgo; erect pyramidal form; long lived	●		●		●
<i>Ginkgo biloba</i> 'Fastigiata'	columnar ginkgo	D	30-50	10-15	S	7/2 (sp)	20	Mod	1	CT			columnar		●	●		●
<i>Ginkgo biloba</i> 'Magyar'	Magyar ginkgo	D	50	15	M	7/2 (sp)	20	Mod	1	CT				●		●		
<i>Ginkgo biloba</i> 'Princeton Sentry'	Princeton Sentry maidenhair tree	D	40	15	S	7/2 (sp)	20	Mod	1	CT			erect form; long lived			●		
<i>Gleditsia triacanthos</i>	honey locust	D	35-70	25-35	F	7/1	35	Mod	1				roots will upheave sidewalk			●		
<i>Grevillea robusta</i>	silk oak	E	50-60	30-35	F	6	40	Low/Mod	2				orange blooms	●		●		
<i>Juglans californica hindsii</i>	California black walnut	D	30-60	30-60	F	8-9	30	Mod	2				high VOC absorption/ CO2 sequestration; can be messy			●		
<i>Koelreuteria bipinnata</i>	Chinese flame tree	D	30	30	M		20	Mod	1	CT		●	summer orange, red, or salmon bloom		●	●		●
<i>Koelreuteria paniculata</i> 'Fastigiata'	goldenrain tree	D	25	3	M		20	Mod	1			●	yellow bloom		●	●		●
<i>Lagerstroemia</i> 'Muskogee'	Muskogee hybrid crape myrtle	D	25	12	S	5 (sp)	15	Mod	1			●	lavender bloom					●
<i>Lagerstroemia</i> 'Natchez'	Natchez hybrid crape myrtle	D	25	12	S	5 (sp)	15	Mod	1			●	white bloom					●
<i>Lagerstroemia</i> 'Tuscarora'	Tuscarora hybrid crape myrtle	D	22	12	S	5 (sp)	15	Mod	1			●	pink/rose bloom; orange-red fall color					●
<i>Laurus nobilis</i> 'Saratoga'	Saratoga bay laurel	E	12-40	12-40	S	9/2	15	Mod	2			●			●			●
<i>Liriodendron tulipifera</i>	tulip tree	D	60-80	25-40	M	4	30	Mod	1							●		

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Scientific Name	Common Name	DESCRIPTION					PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Evergreen (E) or Deciduous (D)	Canopy Height (Feet)	Canopy Width (Feet)	Growth Rate: Fast (F), Moderate (M), Slow (S)	Allergen (Male/Female if applicable)	Spacing Between Trees	Water Needs	Irrigation Group	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Good for Use Under Utility Lines		Major Arterial Streets/Right-of-Ways/Paseos	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Liquidambar formosana</i>	Chinese sweet gum	D	40-60	25	M	7 (sp)	25	Mod	1				drops seed pods; use as an accent only for fall color in appropriate hydrocarbons			●		
<i>Liquidambar orientalis</i>	Oriental sweet gum	D	20-30	20-30	M	7 (sp)	25	Mod	1				drops seed pods; use as an accent only for fall color in appropriate hydrocarbons			●		
<i>Liquidambar styraciflua</i>	sweet gum	D	60	20-25	M	7 (sp)	25	Mod	1				drops seed pods; use as an accent only for fall color in appropriate hydrocarbons			●		
<i>Liquidambar styraciflua</i> 'Rotundiloba'	seedless sweet gum	D	45	25	M	7 (sp)	25	Mod	1				drops seed pods; may upset sidewalk with roots			●		
<i>Malus</i> 'JFS-KW5'	Royal Raindrops crabapple	D	20	15	M	4 (sp)	15	Mod	1			●	use as an accent	●				●
<i>Maytenus boria</i> 'Green Showers'	mayten tree	E	30	30	S-M	7 (sp)	25	Mod	1				weeping willow-like form			●		
<i>Nyssa sylvatica</i> 'Forum'	black gum	D	35	26	S-M	1	20	Mod	1				pollenless female variety; bright red fall color	●		●	●	●
<i>Olea europaea</i> 'Swan Hill'	Swan Hill fruitless olive	E	25-30	25-30	S		25	Low	2				little to no pollen; fruitless; need to prune base suckers; long lived			●		
<i>Parkinsonia aculeata</i>	Mexican palo verde	D	15-30	15-30	F	6	15	Low-Mod	2			●	grows fast at first and slows with age; yellow-green bark; has thorns; given a B rating for invasiveness on California Invasive Plant Inventory, indicating moderate invasiveness	●	●		●	
<i>Paulownia tomentosa</i>	empress tree	D	40-50	40-50	F	4	40	Mod	1				dense shade; pink or lilac flowers			●		
<i>Pinus canariensis</i>	Canary Island pine	E	50-80	20-35	F	4 (sp)	20	Low/Mod	2				conifer; reddish bark; vertical form	●	●	●		
<i>Pinus coulteri</i>	Coulter pine	E	30-80	20-40	M	4 (sp)	20	Mod	2			●				●		
<i>Pinus halepensis</i>	Aleppo pine	E	40	30	M	4 (sp)	30	Mod	2	WD						●		
<i>Pinus pinea</i>	Italian stone pine	E	40-80	40-60	M	4 (sp)	40	Mod	2	WD			branches create an "umbrella" look; tolerates heat			●		
<i>Pinus thurborgii</i>	Japanese black pine	E	25	20	M	4 (sp)	20	Mod	1							●		
<i>Pistachia chinensis</i> 'Keith Davey'	Chinese pistache	D	35	35	M	8/1	20	Low-Mod	1			●	good under utilities; pruning required; 'Keith Davey' has no berries	●				●
<i>Platanus racemosa</i>	California sycamore	D	30-80	20-50	M	9 (sp)	30	Mod	2	WD		●	use sparingly; protected species, which creates pruning challenges; heavy seasonal pollen droppings; high VOC absorption/ CO2 sequestration; long lived	●			●	●
<i>Platanus x acerifolia</i> 'Yarwood'	Yarwood London plane tree	D	40-80	30-40	F	9 (sp)	30	Mod	1				allergy concern; long lived; mildew resistant	●	●			●
<i>Platanus x acerifolia</i> 'Columbia'	Columbia London plane tree	D	45	40	M-F	9 (sp)	40	Low-Mod	1				allergy concern; long lived	●	●			●
<i>Prunus x blireiana</i>		D	25	20	M	3	20	Mod	1				reddish-purple leaves; produces little/no fruit; use as an accent tree	●		●		

TABLE 8-2 TREE SPECIES LIST\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population

Scientific Name	Common Name	DESCRIPTION					PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Evergreen (E) or Deciduous (D)	Canopy Height (Feet)	Canopy Width (Feet)	Growth Rate: Fast (F), Moderate (M), Slow (S)	Allergen (Male/Female if applicable)	Spacing Between Trees	Water Needs	Irrigation Group	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Good for Use Under Utility Lines		Major Arterial Streets/Right-of-Ways/Paseos	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Pyrus calleryana</i> 'Aristocrat'	Aristocrat pear	D	35-40	20	F	3 (sp)	20	Mod	1				white bloom; yellow to red fall color	●		●		●
<i>Pyrus calleryana</i> 'Capital'	Capital pear	D	35	12	M	3 (sp)	15	Mod	1					●	●	●		
<i>Pyrus calleryana</i> 'Chanticleer'	Chanticleer pear	D	40	15	F	3 (sp)	20	Mod	1				white bloom; orange to reddish purple fall color	●				●
<i>Pyrus calleryana</i> 'Redspire'	Redspire pear	D	30	25	M	3 (sp)	30	Mod	1				white bloom; orange to reddish purple fall color	●		●		●
<i>Quercus agrifolia</i>	coast live oak	E	20-70	70	M	9	30	Low	2				long lived		●	●		●
<i>Quercus ilex</i>	holly oak	E	30-60	30-60	M	9	30	Low	2				very tolerant; protected species; long lived		●	●		●
<i>Quercus lobata</i>	valley oak	E	50	50	M	9	45	Low	2				fastest growing of recommended oaks; long lived	●		●		
<i>Quercus suber</i>	cork oak	E	40	40	M	9	30	Low	2				high VOC absorption and CO2 sequestration; long lived		●	●		●
<i>Quercus virginiana</i> 'Heritage'	southern live oak	E	40-80	80-160	F	9	30	Low	1				good for hot, interior climates; likes lawn habitats; long lived			●		●
<i>Rhus lancea</i>	African sumac	E	20-30	20-35	S	10/7 (sp)	15-20	Low	2				can be messy; heat tolerant; prefers well-drained soils		●		●	●
<i>Robina x ambigua</i>	purple robe locust	D	40	30	M	5	30	Mod	2					●		●		
<i>Sapium sebiferum</i>	Chinese tallow tree	D	30-40	25-30		10/5	30	Mod	1				needs pruning to prevent suckers; spreads easily (avoid habitat restoration areas or creeks); milky sap poisonous if ingested; bright fall color	●	●	●		
<i>Sophora japonica</i>	Japanese pagoda tree	D	35-60	25-40	M	5	30	Mod	1							●		
<i>Ulmus americana</i> 'Ascendens'	American elm	D	up to 100	up to 100	F	10 (sp)	30	Mod	1							●		
<i>Ulmus</i> 'Accolade'	Accolade elm	D	70	60	F-M	8 (sp)	40	Mod	1							●		
<i>Ulmus parvifolia</i> 'Frontier'	rontier elm	D	40	30	M	10 (sp)	30	Mod	1				weeping form			●		
<i>Umbellularia californica</i>	California bay	E	75	>100	S	8	40	Mod	2				high VOC absorption/ CO2 sequestration; grows very slowly without regular water			●	●	
<i>Vitex agnus-castus</i>	chaste tree	D	20	20	F	4	15	Low/Mod	2				small accent tree	●	●	●		

TABLE 8-2 TREE SPECIES LIST\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population

Scientific Name	Common Name	DESCRIPTION					PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Evergreen (E) or Deciduous (D)	Canopy Height (Feet)	Canopy Width (Feet)	Growth Rate: Fast (F), Moderate (M), Slow (S)	Allergen (Male/Female if applicable)	Spacing Between Trees	Water Needs	Irrigation Group	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Good for Use Under Utility Lines		Major Arterial Streets/Right-of-Ways/Paseos	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Zelkova serrata</i>	sawleaf zelkova	D	60	60	F	10 (sp)	30	Mod	1				provide room for roots	●	●	●		●
<i>Zelkova serrata</i> 'Autumn Glow'	Japanese grey-bark elm	D	40	30-40	M	10 (sp)	35	Mod	1				provide room for roots	●	●	●		●
<i>Zelkova serrata</i> 'Green Vase'	Japanese zelkova	D	60-80	40-50	M	10 (sp)	35	Mod	1				upright habit; tolerates air pollution	●	●	●		●
<i>Zelkova serrata</i> 'Halka'	Halka zelkova	D	45	35	F-M	10 (sp)	35	Mod	1				provide room for roots	●	●	●		●
<i>Zelkova serrata</i> 'Musashino'	Musashino columnar zelkova	D	45	15	F	10 (sp)	15	Mod	1				upright habit; good for narrow sidewalk with adjacent buildings; yellow to orange fall color	●				
<i>Zelkova serrata</i> 'Schmidtlow'	wireless zelkova	D	24	30	M	10 (sp)	15	Mod	1			●	provide room for roots	●	●	●		●
<i>Zelkova serrata</i> 'Village Green'	village green zelkova	D	40	40	M	10 (sp)	35	Mod	1				provide room for roots	●	●	●		●

TABLE 8-3 UNDERSTORY PLANTS\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population.

Scientific Name	Common Name	DESCRIPTION			PLANTING & MAINTENANCE					COMMENTS	SUITABLE AREAS				
		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native		Major Arterial Streets/Right-of-Ways	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
Shrubs															
<i>Achillea millefolium</i>	common yarrow	white	3ft	3f	Low	2	S	CT		grey-green leaves with flat topped flower clusters; some varieties have flowers in shades of cream, yellow, pink, and red	●	●	●	●	
<i>Agapanthus spp.</i>	lily of the Nile	purple white	4ft	3ft	Mod	1	SSH	CT		best in loamy soil but will tolerate clay	●	●	●	●	
<i>Amaryllis belladonna</i>	naked lady	rosy pink	1ft	2ft	Low	2	S	WD		pink blooms; plant with foundation plants to disguise bare stalks		●			
<i>Anigozanthus spp.</i>	kangaroo paw	red, purple, green, yellow	up to 6ft	up to 3ft	Low/Mod	2	S	WD		attracts hummingbirds	●	●	●	●	
<i>Artemisia 'Huntington'</i>	none		3ft	4ft	Low	2	S	WD		silvery grey or white aromatic foliage		●	●	●	
<i>Artemisia versicolor 'Sea Foam'</i>	none		6in-12in	1.5ft-3ft	Low	2	SSH	WD		lacy, silvery blue foliage		●	●	●	
<i>Berberis x stenophylla 'Corallina Compacta'</i>	coral barberry	orange	1.5ft	1.5ft	Low	1	SSH	WD		has thorns	●		●		
<i>Berberis thunbergii</i> var. <i>atropurpurea 'Nana'</i>	crimson pygmy Japanese barberry		4ft-6ft	4ft-6ft	Low	1	SSH			bronzy red to purple red foliage; has thorns	●		●		
<i>Berberis thunbergii 'Concord'</i>	Concord purple leafed barberry		1-2	2-3	Low	1	SSH			has thorns	●		●		
<i>Berberis 'Golden Abundance'</i>	Darwin barberry	orange	2ft	2-3	Low/Mod	1	SSH			suited for inland valley	●		●		
<i>Berberis thunbergii 'Kobold'</i>	Kobold barberry		>1.5ft	2.5ft	Low	1	SSH			bright green; has thorns	●		●		
<i>Bulbine frutescens</i>	bulbine	yellow	1ft	2-3	Low/Mod	2	S	WD		leaves are slippery when crushed	●	●	●	●	
<i>Caesalpinia gilliesii</i>	yellow bird of paradise	yellow with bright red stamens	up to 10ft	8ft	Low/Mod	2	S	WD		pods are poisonous if ingested			●	●	
<i>Callistemon viminalis 'Little John'</i>	dwarf bottlebrush	blood red	3ft-4ft	4ft-8ft	Low/Mod	2	S	CT		can be pruned up to small trees; heat tolerant		●	●	●	
<i>Ceanothus maritimus 'Valley Violet'</i>	California lilac	white to pale purple	1ft-3ft	3-8ft	Low	2	S			heat tolerant; best with part shade; short lived (>10 years)			●	●	
<i>Cercocarpus betuloides</i>	mountain mahogany		5ft-12ft	5ft-12ft	Very Low/Low	2	S		●	open habit; looks nice with oaks			●		
<i>Chaenomeles spp.</i>	flowering quince	white, pink, orange, red	up to 10ft	up to 10ft	Low	1	S	CT		use as accents; avoid varieties with thorns			●	●	
<i>Cistus ladanifer</i>	crimson-spot rockrose	white with crimson spot	3ft-5ft	3ft-5ft	Low	1	S	CT			●	●	●	●	

TABLE 8-3 UNDERSTORY PLANTS\*

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Scientific Name	Common Name	DESCRIPTION			PLANTING & MAINTENANCE					COMMENTS	SUITABLE AREAS				
		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native		Major Arterial Streets/Right-of-Ways	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets
<i>Convolvulus cneorum</i>	bush morning glory	white, pink	2ft-4ft	2ft-4ft	Mod/Low	2	S	WD		short lived (3-4 years); use as infill for slower foundation plants	●	●			
<i>Coprosma 'Evening Glow'</i>	Evening Glow mirror plant		4ft-5ft	4ft-5ft	Low	1	S			glossy green leaves with gold; turns orange red in fall and winter	●	●	●		●
<i>Coreopsis grandiflora</i>	coreopsis	yellow	1ft-2ft	3ft	Low	1	S	CT		limited use			●		●
<i>Cotinus coggygria</i>	smoke tree	purple	12ft-15ft	up to 25ft	Low	2	S	WD, CT		small tree/large shrub; flowers form smoke-like look around the plant; slow growing		●	●		●
<i>Cotoneaster dammeri</i>	bearberry cotoneaster	white	8in	10ft	Low	1	SSH			not good for traffic areas; good groundcover in shaded areas; red berries; tidy			●	●	●
<i>Cotoneaster lacteus</i>	parney's cotoneaster	white	up to 8ft	up to 10ft	Low	1	S			background plant	●	●	●	●	●
<i>Crassula capitella 'Campfire'</i>	Campfire crassula	white	6in-30in	1ft-3ft	Low	2	S			succulent/cacti; red foliage; small accent plant; freezes at 25°C			●		●
<i>Dendromecon rigida</i>	bush poppy	yellow	4ft-8ft	4ft-6ft	Very Low/Low	2	S	CT	●	large shrub/small tree; large poppy-like flowers; prune back to 2ft after bloom			●		●
<i>Dietes iridioides</i>	fortnight lily	pale yellow; light blue; white	up to 3ft	1ft-1.5ft	Low	1	S	CT			●	●	●		●
<i>Echeveria spp.</i>	hens and chicks	pink			Very Low/Low	2	S			succulent/Cacti; use in small areas; colorful foliage			●		
<i>Eleagnus angustifolia</i>	Russian olive	greenish yellow	up to 20ft	up to 20ft	Low/Mod	2	S			silvery-gray foliage; prune to small tree	●	●	●		
<i>Elaeagnus pungens 'Maculata'</i>	golden elaeagnus		10ft-15ft	10ft-15ft	Low	2				leaves have large gold blotch in center; dense, spiny growth	●	●	●		
<i>Eremophila spp.</i>	emu bush	white, pink, red, orange, yellow, green	up to 5ft	up to 10ft	Low	2	S	WD		does not like extreme cold; tolerate aridity and heat			●		
<i>Eriogonum spp.</i>	buckwheat sulfur flower	yellow			Very Low/Low	2	S	WD			●		●		●
<i>Eriogonum grande rubescens</i>	red buckwheat	rosy red	10in-12in	1ft-1.5ft	Very Low/Low	2	S		●	attracts butterflies and beneficial insects	●		●		●
<i>Euonymus japonicus 'Microphyllus' var. Butterscotch, Variegatus</i>	box leafed euonymus		1ft-2ft	0.5ft-1ft	Low	1	S			compact variety; formal-looking; yellow variegated leaves	●	●	●		●
<i>Euphorbia characias wulfenii</i>	spurge	lime green	4ft	4ft	Low	1	S	WD		milky white sap is irritating on contact or toxic when ingested - avoid use around play areas, use as background accent plant	●		●		
<i>Euryops pectinatus 'Viridis'</i>	shrub daisy	yellow	3ft-5ft	3ft-5ft	Low	1	S	WD		use as an accent	●		●	●	●
<i>Fremontodendron 'San Gabriel'</i>	San Gabriel fremontia	yellow	20ft	12ft	Very Low/Low	2	S		●	large shrub; showy yellow bloom; shallow roots, stake when young; fuzzy leaves can be skin irritants; allergen level: 6			●		

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		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native		Major Arterial Streets/Right-of-Ways	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets				
<i>Gaillardia x grandiflora</i>	none	yellow red	2ft-4ft	1.5ft	Low	2	S				use as an accent								
<i>Garrya elliptica</i>	silk tassel	white	10ft-20ft	10ft-20ft	Mod	2	SSH			●	interesting flowers hang in tassels; large shrub/small tree; allergen level: 7(male)/1(female)								
<i>Garrya elliptica 'James Roof'</i>	silk tassel	white	10ft-20ft	10ft-20ft	Mod	2	SSH			●	longer flowers; allergen level: 7(male)/1(female)								
<i>Gaura lindheimeri</i>	gaura	white	2.5ft-4ft	2ft-3ft	Low/Mod	2					white flowers from pink buds; long-lived; deep taproot makes it drought tolerant								
<i>Grevillea spp.</i>	grevillea	varies	varies	varies	Very low/Low	2						●	●	●					
<i>Grevillea 'Noelii'</i>	noel grevillea	pink, white	6	6	Mod	2	S				hardy; Good as a barrier	●	●	●	●				
<i>Helianthemum nummularium 'Henfield Brilliant'</i>	sunrose	red; red-orange	0.5-1	1.5-2	Low/Mod	2	S/SSH	WD			avoid overwatering; cut back after flowering								
<i>Hemerocallis hyb.</i>	daylily	varies	2.5ft-4ft	2ft-3ft	Mod	1	SH				partial shade in hottest microclimate; large flowers; use as an accent	●		●					
<i>Hesperaloe parviflora</i>	red yucca	red, yellow	3ft-4ft	3ft-4ft	Very Low/Low	2	S				succulent/cacti; heat tolerant; locate away from pedestrians	●	●	●					
<i>Heteromeles arbutifolia</i>	toyon	white	6ft-10ft	15f-20ft	Low	2	SSH			●	large shrub/small tree; red berries	●		●	●				
<i>Heuchera maxima</i>	island alum root	white, pink	1ft-2ft	3ft-4ft	Low	2	SSH	CT		●	needs shade; good edging plant								
<i>Iris spp.</i>	bearded iris	varies	8in-4ft	1ft-2ft	Low	2	S	WD, CT			numerous hybrids; use as an accent; will tolerate shade in hot areas								
<i>Juniperus spp.</i>	juniper	varies	varies	varies	Low	1/2	S/SSH	WD			form varies by species from groundcover to large trees; very little pruning is needed is select species that is the correct size for the space								
<i>Kniphofia spp.</i>	red-hot poker	orange, red, yellow	1.5ft-6ft	2ft-3ft	Low	1	SSH	WD, CT			use as an accent; size depends on species used; multicolored flowering stems	●		●	●	●			
<i>Lantana camara</i>	common lantana	yellow, orange, red	up to 6ft	up to 6ft	Low	2	S				prune back in spring to prevent woodiness	●	●	●	●	●			
<i>Lantana camara 'American Red'</i>	lantana	red with yellow center	4ft-6ft	4ft-6ft	Low	2	S					●	●	●	●	●			
<i>Lantana camara 'Christine'</i>	lantana	cerise pink	6ft	5ft	Low	2	S					●	●	●	●	●			
<i>Lavandula spp.</i>	lavender	purple	varies	varies	Low	2	S				size depends on species used; prune after bloom to keep shape								
<i>Leonotis leonurus</i>	lion's tail	orange	4ft-6ft	4ft-6ft	Low	2	S	WD				●	●	●					
<i>Leucophyllum spp.</i>	Texas ranger	varies	3ft-5ft	3ft-5ft	Very Low/Low	2	S	WD			flower color varies by species; tolerates heat; requires little pruning but old plants can be rejuvenated by cutting close to the ground								
<i>Lobelia laxiflora</i>	Mexican bush lobelia	orange-red	>3ft	>3ft	Very Low/Low	2	SSH				have to shear back (can be invasive); tolerates high aridity								

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		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native		Major Arterial Streets/Right-of-Ways	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swailes/Stormwater	Neighborhood Streets	
<i>Myoporum parvifolium</i> 'Putah Creek'	creeping myoporum	white	<1	10-15	Low	1	S	CT		dies in extreme heat if overwatered					●	●
<i>Myrtus communis</i> 'Compacta'	dwarf myrtle	white	2ft-3ft	2ft-3ft	Low	1	SSH	WD		flowers are sweet smelling; make a good low, formal hedge; requires little pruning; bluish black berries					●	
<i>Nandina domestica</i>	heavenly bamboo	pinkish white, creamy white	5ft-6ft	4ft-5ft	Low/Mod	1	SH/SSH			red berries; bell-like flowers; some shade needed in hottest areas	●	●	●		●	●
<i>Nandina domestica</i> 'Fire Power'	dwarf nandina	pinkish white, creamy white	>2ft	>2ft	Low	1	SH/SSH			turns bright red in winter	●	●	●		●	●
<i>Nandina domestica</i> 'Harbor Dwarf'	dwarf nandina	pinkish white, creamy white	2ft-3ft	2ft-3ft	Low	1	SH/SSH			spreads by rhizomes; makes good groundcover; foliage has an orange-red to bronzy red winter color	●	●	●		●	●
<i>Nandina domestica</i> 'Nana'	dwarf nandina	pinkish white, creamy white	>2ft	2ft-3ft	Low	1	SH/SSH			purplish green summer foliage; purplish red winter foliage; slow growing; no flowers or fruit; domed habit; use as an accent	●	●	●		●	●
<i>Narcissus</i>	daffodil	varies	6in-10in	6in-8in	Very Low	2				numerous hybrids exist for a variety of flower colors; trumpet-like flower; use as an accent; planted by bulbs					●	●
<i>Nerium oleander</i> 'Casablanca'	oleander	white	8ft-10ft	8ft-10ft	Low	2	S	CT		poisonous if ingested; do not use in areas where people can come into contact with plant	●	●				
<i>Nerium oleander</i> 'Little Red'	dwarf oleander	red pink	3ft-4ft	4ft	Low	2	S	CT		poisonous if ingested; do not use in areas where people can come into contact with plant	●	●				
<i>Penstemon spp.</i>	beard tongue	bright red, blues	>2ft	1ft	Very Low/Low	2	SSH	WD		variety of color based on species; use as an accent; needs shade in hot climates; short lived					●	●
<i>Penstemon heterophyllus</i>	beard tongue	reddish purple; deep blue	1.5ft-2ft	2ft-3ft	Very Low/Low	2	SSH	WD	●						●	●
<i>Perovskia atriplicifolia</i>	Russian sage	blue	3ft-4ft	3ft-4ft	Low	1				cut nearly to ground each spring before new growth starts	●	●	●		●	●
<i>Phlomis spp.</i>	Jerusalem sage	yellow, purple, lilac	2.5ft-6ft	4ft-6ft	Low	2	S	WD, CT		thick, furry/hairy leaves	●	●	●		●	●
<i>Phormium spp.</i>	New Zealand flax		varies	varies	Low	1	S/SSH	CT		colorful foliage; size varies greatly by species	●	●	●			
<i>Pinus mugo</i>	mugo pine		4ft-8ft	8ft-15ft	Low	2	S			conifer					●	●
<i>Punica granatum</i>	pomegranate	varies	varies	varies	Low	1	S	CT		fruitless; size varies greatly by species	●				●	●
<i>Punica granatum</i> 'Chico' 'Nana'	dwarf pomegranate	orange-red	3ft	3ft-5ft	Low	1	S			easy to keep low with pruning	●	●	●		●	●
<i>Pyracantha spp.</i>	firethorn	creamy white	8ft-15ft	6ft-10ft	Low	2	S			has thorns; good barrier planting		●				
<i>Rhamnus alaternus</i>	Italian hawthorn		10ft-20ft	10ft-20ft	Low	2	S/SSH			fast growing; heat tolerant; large shrub	●	●	●		●	●
<i>Rhamnus californica</i> 'Little Sur'	coffeeberry		3ft-4ft	3ft-4ft	Low	2	S/SSH		●	red berries	●	●	●		●	●

TABLE 8-3 UNDERSTORY PLANTS\*

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		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Major Arterial Streets/Right-of-Ways		Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swales/Stormwater	Neighborhood Streets	
<i>Rhamphiolepis</i> spp.	Indian hawthorn	pink	2ft-6ft	3ft-8ft	Low/Mod	1	S/ SSH				size varies by species; plants will burn in extreme heat	●	●	●	●	●
<i>Rhamphiolepis indica</i> 'Ballerina'	dwarf Indian hawthorn	deep rosy pink	2ft	4ft	Low	1	S/ SSH				leave have reddish tinge in winter	●	●	●	●	●
<i>Ribes viburnifolium</i>	evergreen currant	light pink, purple	3ft-6ft	12ft	Low	2	SH		●		good under oaks, needs shade			●		
<i>Romneya coulteri</i>	Matilija poppy	white with yellow center	6ft-8ft	varies	Very Low/Low	2	S				spreads easily and quickly by rhizomes to indefinite width			●		
<i>Rosa</i> 'Drift'	dwarf or groundcover roses	varies	1ft-3ft	varies	Low	1	S/ SSH					●	●	●	●	●
<i>Rosa</i> 'Floral Carpet'	dwarf or groundcover roses	varies	1ft-3ft	varies	Low	1	S/ SSH					●	●	●	●	●
<i>Rosa</i> 'Meidiland'	dwarf or groundcover roses	varies	1ft-3ft	varies	Low	1	S/ SSH					●	●	●	●	●
<i>Rosmarinus officinalis</i>	dwarf rosemary	purple blue	2ft-6ft	2ft-6ft	Low	2	S					●	●	●	●	
<i>Rosmarinus officinalis</i> 'Huntington Carpet'	rosemary	purple blue	2ft-3ft	2ft-3ft	Low	2	S	WD, CT				●		●	●	
<i>Rosmarinus officinalis</i> 'Golden Rain'	rosemary	purple blue	2ft-3ft	2ft-3ft	Low	2	S	WD				●		●	●	
<i>Rosmarinus officinalis</i> 'Tuscan Blue'	upright rosemary	purple blue	4ft-6ft	4ft-6ft	Low	2	S	WD				●	●	●	●	
<i>Salvia apiana</i>	California white sage	white	3ft-5ft	3ft-5ft	Low	2	S	CT	●		wooly, silver-grey leaves	●	●	●		
<i>Salvia</i> 'Bees Bliss'	Bee's Bliss sage	lavender blue	1ft-1.5ft	4ft-6ft	Low	2	S	CT			good on slopes; avoid overhead irrigation	●	●	●		
<i>Salvia leucophylla</i> 'Figueroa'	purple sage, grey sage	pinkish purple	3ft-4ft	6ft-8ft	Low	2	S	CT	●		silvery foliage; heat and drought tolerant	●	●	●		
<i>Santolina chamaecyparissus</i>	lavender cotton	yellow	2ft	3ft	Low	1	S	WD			silvery foliage; cut back yearly before spring growth	●	●	●		●
<i>Senecio cineraria</i>	dusty miller	yellow	2ft-3ft	2ft-3ft	Low	1	S				use as an accent; needs full sun or will become leggy			●		●
<i>Senna artemisioides</i> ( <i>Cassia artemisioides</i> )	feathery cassia	yellow	3ft-5ft	3ft-5ft	Low/Mod	2	SSH				very drought tolerant		●	●		
<i>Stachys byzantina</i>	lamb's ear	purple	1.5ft	varies	Low	2	S/ SSH				spreads easily and quickly by surface runners to indefinite width; soft foliage; good for edging			●		●
<i>Tagetes lemmonii</i>	copper canyon daisy	gold orange	3ft-6ft	3ft-6ft	Low	2	S				attracts butterflies	●	●	●		
<i>Teucrium fruticans</i> 'Compactum'	bush germander	dark blue	3ft	3ft	Low	2	S	WD, CT			tolerates heat, frost, and drought	●	●	●		
<i>Verbena</i> spp.	verbena	white, pink, blue	varies	varies	Low	1	S				use as an accent; size varies by species			●	●	
<i>Viburnum tinus</i>	laurustinus	pink buds with white flowers	6ft-12ft	3ft-6ft	Low	2	S/ SSH				dense foliage	●	●	●	●	●

TABLE 8-3 UNDERSTORY PLANTS\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population.

Scientific Name	Common Name	DESCRIPTION			PLANTING & MAINTENANCE						COMMENTS	SUITABLE AREAS				
		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native	Major Arterial Streets/Right-of-Ways		Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swales/Stormwater	Neighborhood Streets	
<i>Viburnum tinus</i> 'Dwarf'	dwarf laurustinus	pink buds with white flowers	3ft-5ft	3ft-5ft	Low	2	S/ SSH				good for low screens	●	●	●	●	●
<i>Yucca spp.</i>	yucca	white	varies	varies	Low	2	S				succulent/cacti; size varies by species		●			
<i>Zauschneria californica</i>	California fuchsia	orange	varies	1.5ft-3ft	Low	2	S		●		gray foliage; showy summer flowers; height varies by cultivar		●			●
GRASSES																
<i>Bouteloua gracilis</i> 'Blonde Ambition'	Blonde Ambition blue grama	tan	1.5ft-2ft	1ft	Low	1	S				can be mowed to 1.5-in high but best as a meadow; can be grown from seed; virtually no irrigation needed once established	●	●	●		●
<i>Calamagrostis x acutiflora</i> 'Karl Foerster'	feather reed grass	purple	2ft-3ft	2ft-3ft	Low/Mod	2	SSH				background plant	●		●		
<i>Carex divulsa</i>	Berkeley sedge	brown	1ft-2ft	1ft-2ft	Low/Mod	1	SSH	CT				●	●	●	●	●
<i>Chondropetalum elephantinum</i>	large cape rush	brown	3ft-5ft	4ft-6ft	Low/Mod	1	SSH					●	●	●		
<i>Chondropetalum tectorum</i>	small cape rush	brown	2ft-3ft	3ft-4ft	Low/Mod	1	SSH					●	●	●	●	
<i>Festuca glauca</i> 'Elijah Blue'	blue fescue		8in	10in	Low/Mod	1	SSH				forms clumps of silver-blue leaves; long lived; use as edging				●	●
<i>Helictotrichon sempervirens</i>	blue oat grass	light blue	1-2	1-2	Low	1	SSH		●			●	●	●		●
<i>Lomandra longifolia</i> 'Breeze'	dwarf mat rush		2ft-3ft	2ft-3ft	Low	1	S					●	●	●	●	●
<i>Muhlenbergia rigens</i>	deer grass	yellow	4ft	4ft-6ft	Low	2	S		●			●	●	●		
<i>Muhlenbergia capillaris</i>	pink muhly grass	pink	4ft	3ft-4ft	Low/Mod	2	SSH								●	●
<i>Sisyrinchium bellum</i>	blue-eyed grass	blue, yellow			Very Low	2	S		●		dies back in summer; use as a small accent plant				●	●
GROUNDCOVERS																
<i>Acacia redolens</i> 'Desert Carpet'	dwarf prostrate acacia	yellow	2ft	12ft	Low	2	S					●	●	●		
<i>Arctostaphylos uva-ursi</i>	bearberry, kinnikinnick	white	15in	15in	Low	2	S	CT	●		set out plants 2' apart for solid cover	●	●	●		●
<i>Cerastium tomentosum</i>	snow in summer	white	6in-8in	2ft-3ft	Mod	1	SH				prefers light shade in hot climates; good on slopes or for edging along paths					●
<i>Convolvulus sabatius</i>	ground morning glory	purple-blue	1ft-2ft	3ft or more	Low	2	SSH	CT			prefers well-drained soils but will tolerate clay if not overwatered		●	●		
<i>Lantana montevidensis</i>	trailing lantana	purple	1.5-2	up to 5	Low	2	SSH				continuous blooms	●		●		●
<i>Myoporum parvifolium</i>	myoporum		3in-6in	>9ft	Low	1	S				plant 6-8ft apart; small purple fruits; does not tolerate foot traffic	●		●		●
<i>Verbena peruviana</i>	Peruvian verbena	scarlet, white	1in-4in	2'-3'	Low	2	S	WD			set out plants 2' apart for solid cover	●	●			

TABLE 8-3 UNDERSTORY PLANTS\*

\*Grey designates species that are currently over used and should only be planted after the population drops below 10% of the total urban forest population.

Scientific Name	Common Name	DESCRIPTION			PLANTING & MAINTENANCE					COMMENTS	SUITABLE AREAS				
		Flower Color	Height	Spread	Water Needs	Irrigation Group	Exposure: Sun (S), Shade (SH), Semi-shade (SSH)	Soil Needs (if applicable): Well-drained (WD), Clay Tolerant (CT)	CA Native		Major Arterial Streets/Right-of-Ways	Medians/Parking Lots	Civic/Parks/Schools	Basin Parks/Swales/Stormwater	Neighborhood Streets
TURF ALTERNATIVES															
<i>Bouteloua gracilis</i>	blue grama	reddish white	1.5ft-2ft	1ft	Low	2	S			irrigate to 1ft to establish; after established needs no irrigation; nice as border planting; okay to mow down to 1.5in					
<i>Buchloe dactyloides</i>	buffalograss		<1ft	<1ft	Very Low	n/a	S			requires little or no mowing; grows to 4" tall; start from sod;					
<i>Cynodon dactylon</i>	hybrid Bermuda grass		<1ft	<1ft	Mod	n/a	S			tolerates heat					
	Native Meadow Mix: sample mix below	varies			Low	n/a	S								
<i>Asclepias fascicularis</i>	narrow-leaf milkweed	white	<1ft	<1ft	Low		S		●	attracts butterflies					
<i>Calandrinia ciliata</i>	red maids	magenta	1ft	<1ft	Mod		S		●						
<i>Clarkia unguiculata</i>	elegant clarkia	varies	1-4ft	<1ft	Mod		S		●						
<i>Coreopsis bigelovii</i>	Bigelow's coreopsis	yellow	1-1.5ft	1-1.5ft	Low		S		●						
<i>Eschscholzia californica</i>	California poppy	orange	1-2ft	1-2ft	Low		S		●						
<i>Lasthenia californica</i>	California goldfields	yellow	<1ft	<1ft	Low		S		●	special value to native bees					
<i>Trifolium wildenovii</i>	tomcat clover	purple	<1ft	<1ft	Low		S		●						
<i>Festuca idahoensis</i>	Idaho fescue		1ft	1ft	Low		S		●	blue foliage					
<i>Layia platyglossa</i>	tidy tips	yellow	1-3ft	1ft	Low		S		●						
<i>Leymus triticoides</i>	creeping wild rye		1-3ft	3ft	Low		S		●						
<i>Lupinus formosus</i>	summer lupine	blue-purple	1-3ft	1-3ft	L		S		●						
<i>Lupinus microcarpus var. densiflorus</i>	golden lupine	white - yellow	1ft	1ft	L		S		●						
<i>Lupinus succulentus</i>	Arroyo lupine	blue	1-3ft	1-3ft	L		S		●						
<i>Nassella pulchra</i>	purple needlegrass		1-3ft	1-3ft	L		S		●						
<i>Phacelia californica</i>	California phacelia	purple	1-3ft	1-3ft	L		S		●						
<i>Phacelia tanacetifolia</i>	tansy phacelia	pale blue	1-3ft	1-3ft	L		S		●						
<i>Sporobolus airoides</i>	alkali sacaton		1-3ft	1-3ft	L		S		●						

## 8.4.1 Description

General characteristics of the tree or understory plants are set forth in this section, including the following:

- » **Evergreen or Deciduous.** Evergreen species retain their leaves throughout the year, while deciduous species lose their leaves and regrow them each year. This distinction is important in considering passive solar access and whether shade is required year round or just during a specific time of year.
- » **Canopy Height (trees only) / Height (understory only).** The typical height of the species at maturity, measured in feet.
- » **Canopy Width (trees only) / Width (understory plants only).** The typical width of the species at maturity, measured in feet.
- » **Growth Rate.** How quickly a species grows to maturity, categorized by slow, medium, or fast. Some species grow at different speeds during different phases of their lives. This is noted in the comments section of the table.
- » **Allergen.** Certain species produce high levels of pollen, which can trigger allergic responses in humans. All species were reviewed utilizing the rating system from *Allergy Free Gardening*<sup>1</sup>, a highly referenced source for information on plant allergens. Species are measured on a scale from 1 to 10, with higher numbers representing higher allergy concerns. The Plant Palette tried to avoid species with high allergen ratings.
- » **Flower Color (Understory Plants only).** The color of the flower if the plant produces them. Size or unique quality of the flower is listed in the comments section of the table.

## 8.4.2 Planting and Maintenance Considerations

Tree roots require sufficient room to spread and grow in fertile, un-compacted soil. The minimum recommended area is 300 cubic feet of healthy living soil for a tree with an ultimate crown spread of 20 feet.<sup>2</sup> This translates to a growing area 12.5 feet square by 2 feet deep; the actual tree well at planting will be much smaller. When planting trees in constrained urban spaces, such as sidewalks and plazas, alternative planting solutions such as structural soil, Silva Cells, or similar under pavement support systems allow tree root establishment underneath the paved areas. Providing sufficient rooting area will encourage healthy growth and long-term viability of the urban forest.

This section includes direction on how to site plants in the field, including information useful in deciding which plants to use together in the same hydrozone and how much space to provide and where to position them.

- » **Spacing (trees only).** The space between the tree and the next closest tree, measured in feet. This distance is measured from the center point of the tree or tree well.
- » **Water Needs.** Specifies how much water the plant needs, categorized by no, low or moderate. Note that plants with high water needs were not included in the Plant Palette.
- » **Irrigation Group.** Rating based on *Landscape Plants for California Gardens*,<sup>3</sup> a reference for landscape planting in the State, determining the need for summer water. Plants in Group 1 need regular water throughout the year in response to fluctuations in evapotranspiration rates, with increased moisture needs during the hotter months. Plants in Group 2 have adapted to dry summer conditions and are typically native to California or similar Mediterranean, dry summer climates. These plants experience active growth cycles in the winter and spring, in response to seasonal winter-spring rains and temperate climates, and have adapted to reduced water availability in the summer. It is especially important not to put plants from both groups in the same hydrozone, as the amount of

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<sup>1</sup> Ogren, Thomas. Leo. *Allergy-Free Gardening: The Revolutionary Guide to Healthy Landscaping*. Berkeley: Ten Speed Press, 2000.

<sup>2</sup> Urban, James. *Up By Roots: Healthy Soils and Trees in the Built Environment*. Champaign, Ill.: International Assoc. of Arboriculture, 2008.

<sup>3</sup> Perry, Bob. *Landscape Plants for California Gardens*. Claremont, CA: Land Design Publishing, 2010.

water used to irrigate the plants from Group 1 will be excessive for Group 2 plants during the summer, and greatly extends the growing season, which can result in excessive growth, reduced life-span, increased pruning needs and additional risk of pest and disease problems.

- » **Soil Needs.** Specifies any soil requirements, such as well-drained soils, or tolerances of the plant such as clay.
- » **Exposure (Understory only).** Specifies how much sunlight the plant needs. Some plants may be planted under trees as a way of conserving summer water.

### 8.4.3 Suitable Areas

The suitable areas categories are sites where the species would be well-suited or useful. These areas are sites in Clovis that were identified as places where potential new planting could occur.

- » **Major Arterials Streets/Right-of-Ways/Paseos.** Generally characterized by wide street width and limited planting space in the sidewalk except paseos which are separated non-motorized circulation corridors. Plants in this category could be somewhat large as fitting with the scale of the corridor, but with an upright growing habit to not interfere with pedestrian passage and with extremely low maintenance needs.
- » **Medians/Parking Lots.** Characterized as being extremely hot due to the surrounding asphalt and having limited available planting space. Plants in this category are very tolerant of extreme heat and limited water but could also tolerate runoff from pervious surfaces during rain events. Some plants in this group are also selected for their ability to provide shade to these hot locations.
- » **Civic, Parks, Schools.** Characterized as having larger available planting space and more maintenance potential than in other areas. Plants in this category range in their characteristics as these spaces can accommodate more variety. This group of plants includes some iconic large trees with irregular branching patterns that may not be suitable for streets or other areas with pedestrians, as well as some specimen trees to make these spaces more unique than other planting spaces in the City.
- » **Basin Parks/Swales/Stormwater.** Characterized as having fast draining soils with some short-term standing water but primarily subject to long, dry periods. Plants in this category are accustomed to these conditions. Note that some of these plants may not be ideal for the levees along the irrigation canal as they might have aggressive root systems that may compromise the structure of the levees.
- » **Neighborhood Streets.** Characterized as narrower street width than major arterials and with the assumed planting area being either in private yards or in sidewalk planting wells. Trees in this category provide shade and understory plants use limited water, as maintenance will most likely be limited or the responsibility of the homeowner. If using trees in this group near a public sidewalk, use ones that are high branching and upright so as not to interfere with pedestrian activity or sight lines.



*Kniphofia citrine*  
 Yellow red hot poker



*Sapium sebiferum*  
 Chinese tallow tree



*Bouteloua gracilis 'Blonde Ambition'*  
 Blonde Ambition blue grama

The Clovis Plant Palette was developed to provide an update to the city’s existing plant list removing plants that are or potentially are invasive, removing plants with higher water needs, and providing some additional no and low-water using plants including additional ornamental grasses. As California’s drought continues, water conservation and restrictions will continue to influence landscaping choices. Non-recreational turf will give way to more drought-tolerant and climate appropriate plantings. These waterwise landscapes can be beautiful and provide wildlife habitat while adding to the aesthetics of the city. The shift from lawns to lower water plants is a cultural shift that has been in process for years; the drought is requiring a faster acceptance of the non-lawn trend.



*Paseo plantings in Loma Vista*

## 8.5 NEIGHBORHOOD IDENTITY

The four communities in the Urban Greening Plan have diverse qualities and unique characteristics, as documented in other sections of this Plan. Although plants in the palette may be used throughout Clovis, the plant palette has noted and identified specific species for each neighborhood to help differentiate each area with a unique identify, addressing the specific needs of that community or the aesthetic preferences of that area.

### 8.5.1 Helm Ranch

Community feedback in Helm Ranch suggested that residents think the landscape resources in their neighborhood are not well-maintained. Given that there is currently no landscape and lighting district associated with the neighborhood, Helm Ranch is dependent on general funds for maintenance; new plantings should require very little maintenance and very little water to maintain growth.

Additionally, residents in Helm Ranch indicated that they felt the City does not prioritize their community for new infrastructure. New plantings in Helm Ranch should be relatively fast growing as new plantings could serve as a symbol that the City is re-investing in the community and that they are determined to maintain this neighborhood at the same quality as newer communities.

Residents in Helm Ranch also indicated the importance that new plants should not impair safety, so it is recommended that new plantings follow Crime Prevention Through Environmental Design (CPTED) guidelines, which encourage visual corridors to be maintained throughout the public realm and that groundcover/shrubs should be maintained to remain below 36 inches, and tree canopies should be above head height (6 feet above the ground).

There are numerous cyclists using the streets in Helm Ranch, either to connect to other parts of the City or to move within the neighborhood. Additionally, Helm Ranch's population is aging and starting to prioritize walking, personal vehicles such as electric scooters or wheelchairs, or public transit as opposed to automobiles. The streets in Helm Ranch offer particularly good opportunities for increased plantings and increased shade, which could encourage walking and other forms of alternative transit.

Several specific ideas came out of meetings with City staff including establishing a home ownership planting program could provide incentive for additional tree plantings on private lands; improving or providing planted medians on Willow and Ashlan; and using *Platanus acerifolia* (London plane) and *Quercus lobata* (Valley oak) as primary species in this neighborhood.

Plants specified for Helm Ranch have the following characteristics:

- » Easy to maintain.
- » Low water use.
- » Fast growing and able to have a quick impact.
- » Look "tidy."
- » Safe.

HELM RANCH

trees



*Arbutus 'Marina'*  
marina madrone



*Cercidium 'Desert Museum'*  
Desert Museum palo verde



*Cercidium microphyllum*  
little leaf palo verde/ foothills  
palo verde



*Platanus x acerifolia*  
'Columbia'  
Columbia London plane tree



*Eucalyptus citriodora*  
lemon-scented gum



*Eucalyptus pauciflora*  
ghost gum



*Parkinsonia aculeata*  
Mexican palo verde



*Paulownia tomentosa*  
empress tree



*Chilopsis linearis*  
desert willow

understory



*Amaryllis belladonna*  
naked lady



*Ceanothus maritimus 'Valley Violet'*  
California lilac



*Senna artemisioides (Cassia artemisioides)*  
feathery cassia



*Erigonum spp.*  
buckwheat sulfur flower



*Gaura lindheimeri*  
gaura



*Hesperaloe parviflora*  
red yucca

## 8.5.2 Old Town

The plant palette in Old Town seeks to preserve and enhance the current landscape. Numerous members of the community emphasized the importance of their large old trees as providing shade and generally making the neighborhood more hospitable.

Although trees are highly praised in Old Town, new understory plantings could be more utilized in commercial areas to provide some diversity and color given the high level of foot traffic, and reduce hardscape stormwater runoff during winter months. Given the age of some street trees, it would also be wise to look at new street tree plantings so that there is successional planting.

Old Town has an established, historic commercial core with limited room for streets trees due to narrow sidewalks. Selected species in this area must be well adapted to these conditions and grow upright out of the way of pedestrians, adjacent buildings, and utilities.

Bullard Avenue serves as the east-west gateway into Old Town; providing shade along the length of the street would help identify the neighborhood as well as improve the pedestrian environment.

Plants specified for Old Town have the following characteristics:

- » Shade trees on neighborhood streets.
- » Upright or columnar trees on commercial streets.
- » Fall color.
- » Reminiscent of existing urban forest.
- » Iconic understory plants.

OLD TOWN

trees



*Casuarina cunninghamiana*  
'Fastigiata'  
river she-oak



*Eriobotrya deflexa*  
bronze loquat



*Fraxinus pennsylvanica*  
'Johnson'  
leprechaun ash



*Ginkgo biloba* 'Magyar'  
Magyar ginkgo



*Ginkgo biloba* 'Fastigiata'  
columnar ginkgo



*Koelreuteria paniculata*  
'Fastigiata'  
goldenrain tree



*Nyssa sylvatica* 'Forum'  
black gum



*Pyrus calleryana* 'Chanticleer'  
Chanticleer pear



*Zelkova serrata* 'Musashino'  
Musashino columnar zelkova

understory



*Euonymus japonicus*  
'Microphyllus'  
box leafed euonymus



*Gaillardia x grandiflora*



*Hemerocallis* hybrid  
daylily



*Diets iridioides*  
fortnight lily



*Narcissus*  
daffodil



*Myrtus communis* 'Compacta'  
dwarf myrtle

### 8.5.3 Loma Vista

Loma Vista is currently a branded community with a distinct character and quality to its new developments. The medians, streets, corridors, and yards are well-planted and should retain their high diversity as the neighborhood ages. The iconic image for Loma Vista with the acorn helps to guide the palette here as the developers utilize oak trees throughout its neighborhood.

As the town center develops for this area, the street and civic trees will help further brand the community. The plant palette here should stay consistent to build a relationship between plant and place. Gettysburg Avenue, in particular, was identified as a gateway street that could benefit from additional street and sidewalk shading as well as orchard-style plantings.

About half of the community is not yet built so as the community grows it will be important that low-water plants are used and plants from the same irrigation group are grouped together. Due to the growing importance of water conservation and the potential to have a beautiful landscape with no summer water, it is recommended that going forward, Loma Vista should exclusively utilize plants from Irrigation Group 2, or those plants that can withstand reduced summer water, to avoid grouping with plants that require irrigation.

Loma Vista has significant duripan concerns. Site grading in this area needs to be sensitive to the limited top soil and the potential need to supplement existing soil in order to improve the success of planting.

Plants specified for Loma Vista have the following characteristics:

- » Consistent with the “craftsman” look.
- » Emphasis on distinctive oaks.
- » Build off the agricultural center with orchard style plantings.
- » Irrigation Group 2.

LOMA VISTA

trees



*Arbutus unedo*  
strawberry tree



*Cercis occidentalis*  
western redbud



*Laurus nobilis 'Saratoga'*  
Saratoga bay laurel



*Rhus lancea*  
African sumac



*Olea europaea 'Swan Hill'*  
Swan Hill fruitless olive



*Quercus agrifolia*  
coast live oak



*Quercus ilex*  
holly oak



*Quercus suber*  
cork oak



*Vitex agnus-castus*  
chaste tree

understory



*Chaenomeles spp.*  
flowering quince



*Helianthemum nummularium 'Herfield Brilliant'*  
sunrose



*Crassula capitata 'Campfire'*  
Campfire crassula



*Perovskia atriplicifolia*  
Russian sage



*Lantana camara*  
common lantana



*Penstemon heterophyllus*  
beard tongue

## 8.5.4 Northwest

The plant palette for Northwest builds off the development theme of foothills meeting orchards. The neighborhood's unique setting of groves of fruit trees with views up to the mountains will help to shape this branding effort as the community develops. The neighborhood has yet to be built, and the plant palette can help to define the character of the place. A specific emphasis on foothills plants will additionally help with water conservation and habitat creation as these plants are well adapted to this area. The planting plans for Northwest should highlight the use of native species and create spaces for local diversity.

Northwest's important role as a cycling destination also makes its streets extremely valuable as corridors. Street trees with shade make riding much more desirable, especially in hot summer months. If these trees are planted prior to development of residential properties, they could become established and a valuable asset as the neighborhood grows around it.

Northwest is also an academic campus with several schools. Creating a strong link from Northwest to Old Town was viewed as a key goal by the City, such as establishing a campus corridor lined with shade trees from Buchanan High School north on Minnewawa, following the Enterprise Canal and connecting to the campuses at International and Willow.

Plants specified for Northwest have the following characteristics:

- » Foothills palette mixed with orchard trees.
- » Emphasis on providing native habitat.
- » Early emphasis on street trees.

**NORTHWEST**

trees



*Aesculus californica*  
California buckeye



*Cercis occidentalis*  
western redbud



*Grevillea robusta*  
silky oak



*Juglans californica hindsii*  
California black walnut



*Malus 'JFS-KW5'*  
royal raindrops crabapple



*Olea europaea 'Swan Hill'*  
Swan Hill fruitless olive



*Platanus racemosa*  
California sycamore



*Pyrus calleryana 'Redspire'*  
Redspire pear



*Quercus lobata*  
valley oak

understory



*Fremontodendron 'San Gabriel'*  
San Gabriel fremontia



*Dendromecon rigida*  
bush poppy



*Rhamnus californica 'Little Sur'*  
coffeeberry



*Heteromeles arbutifolia*  
toyon



*Cercocarpus betuloides*  
mountain mahogany



*Garrya elliptica 'James Roof'*  
silk tassel

## 8.6 LANDSCAPE INSTALLATION PLAN

The Landscape Installation Plan integrates information from the Urban Forest Management Plan and the Water Savers Checklist with sustainable landscape design standards to be applied on landscape improvement projects to increase aesthetics and functionality while also reducing water use and maintenance needs.

### 8.6.1 Clovis Urban Forest Management Plan

The 2012 Urban Forest Management Plan established a vision and mission statement that clarifies the need for a healthy, vibrant, and sustainable urban forest that is an integral part of the community's infrastructure. This plan articulates several recommendations including:

- » Increase urban forest plantings.
- » Develop parking lot, street, and sidewalk shade ordinances.
- » Develop a heritage tree protection ordinance.
- » Create an Urban Forester position within the City's Public Utilities Department and an Urban Forest Group charged with stewardship of the City's urban forest.
- » Create a City-wide park and landscape district to provide dedicated source funding.
- » Expand contract tree pruning services.
- » Expand the Citizen Forester Program.

Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts.

### 8.6.2 Water Savers Checklist

The City has established the Water Saver Homes program to help encourage water conservation in new home construction. Water Saver Homes are homes that include features that will save customers both water and money. The City has developed a Water Saver Home Checklist that builders can fill out and submit with their construction plans or other documentation for the Public Utilities Department to review. Successful projects earn the ability to carry the City of Clovis Water Saver Home seal as an enticement to customers to realize the benefits of buying a home that will save them water and money.

The Checklist awards points in 15 categories, 9 categories of which are related to landscape-based water application. The Checklist has a maximum of 50 points and only 15 points are needed to successfully earn the Water Saver Home designation. Points to be earned from various landscape-based categories include: Plant List (up to 4 points); Turf Water Requirement (up to 5 points); Turf Installation (up to 2 points); Turf limitations (up to 4 points); Shade Trees Planted (up to 3 points); Group Plants by Water Needs (2 points); High Efficiency Irrigation Systems (up to 5 points); Incorporated 2 Inches of Compost into the Top 6 to 12 Inches of Soil (3 points); and Mulch Planting Beds (2 points).

Encouraging water conservation is on-going effort; however, earning 15 points is fairly easy and many of the criteria for the points are standard best management practices. The City could consider making some of the criteria requirements for plan approval and/or increasing the number of points needed to earn the Water Saver Home designation in the future.

### 8.6.3 LANDSCAPE INSTALLATION PLAN

#### PURPOSE AND CONTENT

This section describes the landscape design standards recommended to be used for improvement projects in the City of Clovis and describes recommended planting, irrigation and maintenance best management practices.

#### 8.7 ABBREVIATIONS

ADA	American with Disabilities Act
ANSI	American National Standards Institute
CAWELO	California Water Efficient Landscape Ordinance
City	City of Clovis
ET	Evapotranspiration
ETWU	Estimated Total Water Use
FSC	Forest Stewardship Council
MAWA	Maximum Applied Water Allowance
OSHA	Occupational Safety and Health Administration
WELO	City of Clovis Water Efficient Landscape Ordinance 10-04

#### 8.8 DEFINITIONS

- » **Backfill:** The earth used to replace or the act of replacing earth in an excavation.
- » **Compost:** Compost is the product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and processed to further reduce and stabilize it to the point that it is beneficial to plant growth.
- » **Integrated Pest Management (IPM):** A holistic approach to managing insects, plant disease, weeds and other pests so that their populations do not exceed a tolerable level by fostering an environment favorable for plants and other beneficial organisms and unfavorable for pests. If pest problems arise, a variety of control techniques are considered, with least toxic pesticides being applied as a last resort.
- » **Multiple-use fields** are dedicated for other types of recreation such as playing catch, sitting or picnicking. Medians and areas less than 8 feet wide do not qualify as multiple use fields. Modified from CAWELO.
- » **Organic Materials Research Institute (OMRI):** approves amendments and fertilizers for use in crop production. [http://omri.org/OMRI\\_generic\\_list.html](http://omri.org/OMRI_generic_list.html).
- » **Planting Area:** Areas to be planted.
- » **Plants; Plant Material:** These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- » **Sheet Mulching:** A layered system of non-plastic weed barrier (e.g. recycled cardboard) overlain by 1 inch of compost and 2 inches of mulch for a total of 3 inches of cover. Alternatively 3 inches of mulch could be used. Sheet mulching improves soil and controls weeds.

- » **Turf:** An area planted with spreading or stoloniferous grasses that requires regular mowing to form a dense growth of leaf blades and roots.

## 8.9 CODES AND STANDARDS

All landscape architectural design and construction will be performed in accordance with the most current version of the following codes and standards, some of which will need to be updated to address the best management practices raised in this Urban Greening Plan:

- » City of Clovis Water Efficient Landscape Ordinance 10-04  
<https://www.ci.clovis.ca.us/Portals/0/Documents/PublicUtilities/Water/City%20of%20Clovis%20Water%20Efficient%20Landscape%20Ordinance.pdf>
- » City of Clovis Standard Drawings October 1, 2012  
<http://www.ci.clovis.ca.us/Portals/0/Documents/Engineering/Standards/MasterStandardDrawings.pdf>
- » City of Clovis Approved Plant List  
<https://www.ci.clovis.ca.us/Portals/0/Documents/PublicUtilities/Water/DroughtTolerantPlantlist.pdf>
- » City of Clovis Design Guidelines  
<https://www.ci.clovis.ca.us/Portals/0/Documents/Engineering/Standards/DesignGuidelines2006.pdf>
- » Central Valley Region MS4 Permit  
[http://www.swrcb.ca.gov/water\\_issues/programs/stormwater/docs/ms4permit\\_fresno\\_5\\_01\\_048..pdf](http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/ms4permit_fresno_5_01_048..pdf)
- » 2013 California Building Code with California amendments and errata  
<http://www.bsc.ca.gov/codes.aspx>
- » ADA Accessibility Guidelines for Buildings and Facilities  
<http://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/ada-standards>
- » CalGreen Code  
<http://www.bsc.ca.gov/Home/CALGreen.aspx>
- » State of California Occupational Safety and Health Administration (CAL/OSHA)  
<http://www.dir.ca.gov/dosh/>
- » Federal Occupational Safety and Health Administration (OSHA)  
<https://www.osha.gov/>

On June 12, 2015, a Public Draft of revisions to the Model Water Efficient Landscape Ordinance (WELO) dated September 10, 2009 was released to help address California's drought and water conservation needs. The Public Draft, currently set to activate on November 1, 2015, includes several changes including that the new WELO requirements would apply to any new construction projects with a landscape area greater than 500 square feet requiring a building or landscape permit, plan check or design review; and would apply to rehabilitated landscape projects with an aggregated landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review. The June 12, 2015 Public Draft will likely be formalized and City standards and permit requirements will need to be updated to reflect the new requirements. See Appendix E: Model Water Efficient Landscape Ordinance ~~September 10, 2009~~ June 12, 2015 (Public Draft) for full language and proposed changes.

## 8.10 PLANTING GUIDELINES AND STANDARDS

### 8.10.1 Plant Selection Criteria

Plants should be selected that require minimal water, are not invasive, and are adapted to Clovis' climate.

- » Native and climate adapted low water use plants are encouraged.
- » Do not plant species listed by Cal-IPC "Don't Plant a Pest" for the Central Valley region.
- » Choose and locate plants to grow to natural size to avoid shearing. Plants shall be spaced between their minimum and maximum plant spread according to a published third party reference.
- » Limit turf to sports and multiple use fields.
- » Do not plant trees with shallow roots adjacent to paving.

### 8.10.2 Planting Details

Proper soil preparation and planting is instrumental to increased plant vigor and growth. The following are suggested details for soil preparation and planting that the City should require on all City projects and encourage be incorporated into permitted projects. These will need to be revisited to match the final updates to WELO (see Appendix E).

- » Soil Preparation
  - » Remove and store horticulturally suitable topsoil: Identify areas to be paved as a place to store topsoil. Remove at least the top 6 inches of horticulturally suitable topsoil before grading. Do not remove and store subsoil. Store in piles less than or equal to 6 feet high. Protect stored topsoil from erosion.
  - » Collect representative soil samples and perform an analysis by a Certified Soil Testing Lab. Analyses to be performed include: pH, infiltration rate, total soluble salts, electrical conductivity, nitrate, ammonium, phosphorus, potassium, calcium, saturation percent, sodium, chloride, sodium adsorption ratio, boron, % sand-silt-clay, lime, % organic matter content.
  - » Ask the soil lab for recommendations for compost and non-synthetic fertilizers to improve soil fertility and bring the soil organic matter to 5%.
  - » Compost must be OMRI-certified and/or must participate in the USCC Seal of Testing Assurance Program and meet the parameters of Table 1 Physical Requirements for Compost found in USCC's Soil Amendment Compost Specifications <http://www.lowimpactdevelopment.org/epa03/soilamend.htm> (NOTE: Clovis' green waste currently goes to Allied Waste's facilities in Fresno and is then delivered to Kochergen Farms Composting in Avenal which makes OMRI-certified compost. Making this product available locally to the City, residential and commercial growers could reduce maintenance needs, increase plant viability, restore soil health, and reduce water needs.)
  - » Fertilizers prohibited in the Generic Materials List by the Organic Materials Review Institute (OMRI) are prohibited.
  - » Scarify or till subgrade to depth needed to achieve 12 inches of loosened soil after stockpiled topsoil and amendment are placed. Entire surface should be disturbed by scarifications. Do not scarify within drip line of existing trees to be retained. Do not scarify when soil is wet.
  - » Place stockpiled topsoil. Rototill recommended soil amendments into the top 8 to 12 inches of planting area. If 8 to 12 inches of aerated soil cannot be achieved due to a duripan layer consider bringing in topsoil.

- » Amend as specified in the soil analysis report to meet required organic matter content. Apply organic fertilizers and other amendments, including appropriate quantities of compost to bring soil organic matter content to 5%, as specified in the soils analysis report, to the surface of the aerated soil/subgrade. For bid purposes assume 6CY/1000sf quality, organic compost applied to all areas to receive planting. Mix to the depth required to achieve 8 inches of settled soil/amendment mix.
- » Rake beds to smooth and remove surface rocks larger than 2 inches diameter. Grade soil surface at edges of planting areas within 1' of adjacent to hardscape and drain inlets to an elevation of 3-4" below the finished surface of adjacent hardscape to allow adequate room for mulch.
- » Planting
  - » Excavate approximately two times as wide as ball diameter for container-grown stock. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
  - » Sheet mulching should be utilized for weed control. Synthetic pre-emergents are discouraged. IPM Integrated Pest Management (IPM) practices shall be used to control pests and diseases in the landscape.
  - » Keep mulch 6 inches away from tree trunks and away from shrub stems.
  - » A minimum 3-inch layer of recycled mulch shall be applied to all non-turf soil areas. Alternatively 1-inch of compost and 2 inches of recycled mulch may be used if sheet mulching (modified from WELO).
  - » A 3-inch high water basin shall be constructed out of soil around each shrub and tree.
  - » Stabilizing mulch products such as compost blankets shall be used on slopes greater than 3:1 (WELO).

## 8.11 IRRIGATION GUIDELINES AND STANDARDS

The following is required by the City of Clovis Water Efficient Landscape Ordinance for public agency and private development projects, with a landscape area equal to or greater than 2500 square feet as well as homeowner provided landscapes equal or greater than 5,000 square feet. See full text for additional exemptions.

- » Dedicated water meters are required for all non-residential landscapes. (WELO)
- » Install a weather-based (evapotranspiration) irrigation controller or soil moisture based controller including a rain shut off device for all irrigation systems. (WELO)
- » Each hydrozone (or irrigation valve) should irrigate plant material with similar water requirements, slope, sun, and soil conditions. Trees shall be placed on separate valves from shrubs and turf.
- » Install low volume irrigation (bubbler or drip-type irrigation, or other low-flow, non-spray technology) in the following areas: (WELO)
  - » Mulched planting areas.
  - » Narrow or irregularly shaped areas less than 8 feet in width in any direction.
  - » Areas within 24 inches of non-permeable surfaces unless landscape is adjacent to permeable paving or non-permeable surface drains into the landscape.
- » Slopes greater than 25 percent shall not be irrigated with a system with a precipitation rate exceeding 0.75 inches per hour. (WELO) Utilize an automatic controller with multiple start times to apply water in cycles to avoid run-off.
- » Landscape planting and irrigation shall be designed to meet a minimum water budget of 71 percent of reference ET and ETWU is less or equal to MAWA. (WELO)

- » Turf is not allowed on slopes greater than 25 percent where toe of slope is adjacent to an impermeable surface or hardscape. (WELO)
- » Conduct an irrigation audit. (WELO)

The 1990 CA WELO required an ET of 80%. The Current 2009 version requires a reference ET of 70%. Statewide WELO requirements for ET are likely to change in the near future based on ongoing drought and water restrictions and many cities and municipalities have already adopted lower ET than WELO allows. The City of Clovis may want to consider requiring a reference ET of 60% in the Water Budget Calculations in advance of any statewide requirement change. The City should consider requiring irrigation systems be designed and installed such that the Estimated Total Water Use (ETWU) is less than or equal to the budgeted water, i.e. the Maximum Applied Water Allowance (MAWA) using 0.60 as the ET adjustment factor.

Additionally, the City should consider requiring that all projects requiring permits and all City projects meet WELO requirements.

## 8.12 LANDSCAPE PRODUCTS/FURNISHINGS

Using locally sourced or recycled/recyclable products reduces the energy spent in delivery or waste generation.

- » Use local products and suppliers. The Contractor shall use local products and suppliers (produced within 150 miles from the project site) to the extent possible to minimize fuel consumption and emissions.
- » Use recycled-content, FSC and salvaged materials where possible.

## 8.13 LANDSCAPE MAINTENANCE

A regular maintenance schedule must be submitted with the Certification of Completion (WELO). The following outlines a list of maintenance practices that would assist landscape projects subject to WELO requirements in complying with this requirement. Appendix F: Model Bay Friendly Landscape Maintenance Specifications and Appendix G: Section 013521 Bay-Friendly Landscaping Requirements, while specific to the San Francisco Bay Area, can serve as models the City could reference in refining City standard specifications and/or for developing permit project requirements.

- » **Protect Soil from Compaction.** Soil shall not be worked when wet, generally between October and April.
- » **Soil Tests.** Once per year each February contractor shall collect and submit soil samples to an accredited and approved testing laboratory. One sample shall be collected from turf and one from shrub/ groundcover areas representative of the site conditions. Contractor shall request that the laboratory make recommendations for compost and natural fertilizers to bring the soil organic matter to 5% minimum.
- » **Mulch Regularly.** Maintain a minimum of 3 inches of (brand name or locally sourced) recycled chipped or shredded green waste, or chipped landscape prunings over all planting areas. Keep mulch 6 inches away from tree trunks and away from shrub stems. At a minimum replenish mulch once per year in November.
- » **Feed Soils Naturally and Avoid Synthetic Fertilizers** unless, per a soil scientist, soils are such that OMRI approved amendments will not suffice. Compost, compost tea, or other naturally occurring, non-synthetic fertilizers are used as the plant and soil amendment for all landscape areas as determined by soil analysis. Amendments that are prohibited by the Organics Materials Research Institute (OMRI) are prohibited for use in the landscape
- » **Irrigation Scheduling.** Irrigation frequency shall be adjusted at least monthly to reflect ET expected in next month; smart controllers should do this automatically but should still be checked periodically.
- » **Water Audit.** Perform an irrigation audit bi-annually (refer to [www.itrc.org](http://www.itrc.org)), or schedule an audit with the water district that is the service provider to that property.

- » **Irrigation Monitoring.** Record the irrigation meter, submeter or controller reading at each visit. Contractor shall monitor soil moisture with plant root zones using a soil probe or shovel and adjust irrigation schedules accordingly. Contractor shall maintain the irrigation system for optimum performance, as per manufacturer specifications. All malfunctioning equipment shall be repaired prior to the next scheduled irrigation. Smart controllers should track this information automatically but the data needs to be reviewed to confirm optimal performance.
- » **Integrated Pest Management (IPM)** practices shall be used to control pests and diseases in the landscape.
- » **Groundcover Pruning.** Woody groundcovers shall be selectively pruned and not edged on a regular basis. Herbaceous groundcovers shall be edged and may be mowed to a height of 4 to 6 inches in late winter/ early spring.
- » **Shrub Pruning.** Shearing of plants into formal shapes is strongly discouraged. Plants shall be selectively pruned.
- » **Tree Pruning.** Pruning shall be performed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning.
- » **Lawn Mowing.** Grasscycling shall be employed for all turf areas. Grass shall be mowed once a week during the growing season. Clipping shall be left on turf.
- » **Aerate Turf.** Aerate turf one to four times a year. Use equipment with hollow tines that removes a soil core. Topdress with ¼-inch fine compost. Overseed to fill in thin spots and to crowd out weeds.
- » **No Mow Turf Maintenance.** No mow turf shall be mowed once a year. Clippings should be collected and either used elsewhere on-site or transported to a plant debris recycling facility.
- » **Keep Plant Debris On-Site.** Leaves and or plant debris less than 4 inches (including cut or chipped woody prunings) are re-incorporated into the mulch layer of the landscaped areas away from storm drains. Chip large plant debris greater than 4 inches for use as mulch. If green waste must be removed from site they must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing of plant debris for composting.
- » **Stormwater BMP Care.** Examine downspouts or inlets, splash blocks, erosion, damage pipes for damage. Check underdrain to make sure it is functional. Check planter boxes for holes, cracks or failure. Report water that does not drain within 48 hours of a storm, clear obstructions and accumulation of sediment. Do not mow stormwater BMP areas.

## 8.14 REFERENCES

- » Central Valley Friendly Landscaping  
<http://ucanr.edu/sites/cvlandscape/Resources/>
- » Bay-Friendly Specification Section 329300 Plants  
<http://www.bayfriendlycoalition.org/BFLandscapeTools.shtml>
- » Model Bay-Friendly Landscape Maintenance Specifications  
<http://www.bayfriendlycoalition.org/BFLandscapeTools.shtml>
- » Organic Materials Review Institute (OMRI)  
<https://www.omri.org/>
- » US Composting Council  
<http://compostingcouncil.org/>

# 9

URBAN GREENING MASTER PLAN

## Greenhouse Gas Emissions, Climate Adaptation, and Health Related Hazards



*Bicycle riders on the Clovis Old Town Trail*

*“By creating car dependent communities, we are engineering exercise out of people’s lives”  
- Dr. Richard Jackson, M.D.*



Urban greening is more than planting more trees and vegetation or making the built environment more aesthetically appealing. Trees absorb carbon dioxide, pollutant gases, and filter out particulates; they provide oxygen; cool cities by shading heat-absorbing roads and buildings. Roger Ulrich, now with Texas A&M University, released a study in the journal *Science* in 1984 that demonstrated that views of nature can speed healing from surgery, infections, and other ailments. Studies since have continued to document the power of nature on our well-being. More people out and about can reduce crime levels as residents spend more time outdoors and interacting with their neighbors.

Clovis is located within the San Joaquin Valley Air Basin, which has some of the most polluted air in the nation. Pollutants typically come from two sources: ozone and particulate matter (PM). Ozone (or smog) is created by chemical reactions and sunlight. Pollutants like nitrogen oxides (NOx) and volatile organic compounds (VOCs) are called "ozone precursors." They combine in the presence of hot, stagnant, sunny weather to create ozone (or smog). Ozone precursors in the San Joaquin Valley come from cars, trucks, buses, agricultural equipment, dairies, and consumer products such as paint and even hair spray.

Particulate matter comes from agricultural operations, industrial processes, combustion of wood and fossil fuels, construction and demolition activities, and road dust kicked into the air. Windblown dust and wildfires also contribute to the problem. Diesel soot is of particular concern in the San Joaquin Valley, due to the high volume of trucks that use Highway 99.

The geography of the San Joaquin Valley acts as a trap for these pollutants. Surrounding mountains trap airborne pollutants near the San Joaquin Valley floor where people live and breathe. Population growth also contributes to the problem, as more people bring more activities that contribute to poor air quality, causing increased environmental effects as well as impacts to human health.

It is often said that pollution knows no boundaries. To this point, pollution can affect local, regional, and global environments. Air pollution for example, can easily blow from one country or continent where it is produced and cause air quality issues in another. Air pollution that travels from country to country, is called transboundary pollution. Although very small compared with the amount of air pollution produced by sources in the United States, a recent study was published by the *Proceedings of the National Academy of Sciences*<sup>1</sup>, and shows that strong westerly winds are pushing air pollution from China across the Pacific Ocean and toward the U.S. These pollutants include dust, ozone, and carbon, and are accumulating in the valleys of California. Much like other environmental concerns, issues related to air quality, water quality, and even the availability of water are not just local problems. The effects of these issues often grow to become regional issues, and in some cases, global matters.

As this chapter describes, there is a relationship between greenhouse gas (GHG) emissions, climate adaptation, and public health. Urban greening initiatives have the potential to promote healthier urban environments that can lead to increased physical activity and reduced levels of obesity while providing more trees, nature, and green infrastructure to our cities, and simultaneously absorbing pollutants, cooling our developed areas, and providing oxygen.

## 9.1 CLIMATE CHANGE

In 2008, the Climate Change Institute at Fresno State partnered with the City of Fresno to analyze the potential impact of climate change on the San Joaquin Valley, including the city of Clovis. The results of the study indicated that the impacts of climate change could impact water resources, public health, agriculture, landscapes and vegetation, and fire regimes.

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<sup>1</sup> University of Irvine News, 2014, <http://news.uci.edu/press-releases/made-in-china-for-us-air-pollution-as-well-as-exports/>, accessed on March 24, 2015.

The effects of climate change on the city include early snowmelt, reduced storms resulting in longer dry periods, and changes in rainfall intensity that will result in greater runoff, with a reduced potential for groundwater recharge and storage of water for future use. Additionally, an increase in smog will result from increased dependency on the single occupancy vehicle, impacting the quality of air in Clovis and surrounding communities. Higher temperatures would not only exacerbate pollution related health problems, but would cause changes in crop yields as a result. Overall, these climate change impacts will impact the quality of life in Clovis if they are not mitigated.

## 9.2 AIR QUALITY

According to the 2011 Urban Forest Resource Analysis, the SJVAB, including the City of Clovis, already exceeds State air quality standards for three of the six criteria pollutants, including ambient ozone and particulate matter. Through a reduction in vehicle miles traveled (VMT) by promoting alternative modes of transportation, and an increase in urban forests and green space, Clovis can directly and indirectly minimize their impact on local and regional air quality.

### 9.2.1 Vehicle Miles Traveled

In addition to being a relaxing and enjoyable way to improve health, walking is a great way to improve air quality. In addition to providing benefits in terms of personal health and pleasure, walking also protects the environment by minimizing vehicle trips, fossil fuel consumption, and emissions of “greenhouse gases” that contribute to global warming. Even short motor vehicle trips are a significant source of emissions due to the “cold start” problem, which is the high rate of emissions during the first few miles of travel due to the catalytic converter not functioning well when a car is first started. Walking for short trips helps to reduce these “cold start” vehicle emissions.

Bikes are also a very environmentally-friendly means of transportation as they minimize emissions and fossil fuel consumption. Additionally, bicycling can lead to less water pollution. Motor vehicles are a significant source of water pollution as oils, greases, antifreeze, and other fluids enter into nearby water bodies. Furthermore, bikes are quiet, so they do not contribute to noise pollution.

Through the implementation and maintenance of trails, bikeways, and paseos, the City of Clovis can promote alternative modes of transportation by providing better connections between neighborhoods and urban areas allowing residents to be less reliant on the single occupancy vehicle. Opportunities and implementation for increasing trails, bikeway, and paseos are discussed in Chapter 10, Implementation: The 20-Year Plan.

### 9.2.2 Transit-Oriented Development

In order to reduce GHG emissions, it is imperative that cities create strategies to reduce dependency on driving. Reducing dependency on the vehicle will involve making it possible for people to walk, bike, and take transit, in part by rebuilding our communities so that people live close to jobs, schools, shopping and other destinations. Transit-oriented development (TOD) offers a mechanism to create efficient urban form, and provides a choice for development with a lower carbon footprint than traditional development. Defined as a type of development that occurs around transit nodes, resulting in a compact, mixed-use, pedestrian-oriented type of neighborhood, TODs provide an opportunity to reduce household vehicle travel and a reduced carbon footprint.

As the population continues to grow, the City of Clovis can begin to implement plans for TOD developments and encourage a mixture of uses around specific transit nodes. These nodes can include bus stations and trails and paseos that offer pedestrian and bicycle connectivity to other parts of the city.



*San José VTA Station near transit-oriented development*

### 9.2.3 Fuel Efficiency

Vehicle emissions are known to negatively affect air quality and human health. Typically, strategies for optimizing vehicle efficiency include those focused on vehicles, and those that address urban design and transportation infrastructure. Strategies to improve infrastructure include promoting mass transit, toll pricing for road use, parking strategies that discourage the use of single-occupancy vehicles, and land use and zoning decisions that locate mixed uses at higher densities near to help reduce the need to travel. Cities can promote the use of fuel efficient and zero emissions vehicles in a variety of ways including converting their municipal fleet to alternative fuel vehicles.

### 9.2.4 Zero-Emissions and Hybrid Vehicles

In addition to creating more fuel efficient vehicles, automakers are focusing on promoting increased use of electric vehicles which can travel up to 40 miles on one charge which makes it ideal for more than 75 percent of the country's commuters. Hybrid vehicles, that use a combination of gasoline and electricity and can get over 50 miles per gallon, are now becoming increasingly common on our roads. To accommodate this growing trend, some cities are allowing single drivers of hybrid vehicles to utilize HOV lanes along with other carpoolers, and providing or encouraging new development to install and provide charging stations as part of their parking requirements.

## 9.2.5 Natural Gas Vehicles

Natural gas offers an excellent alternative to gasoline-powered cars and has been successfully used, especially on buses, in a variety of cities. One benefit of Natural Gas Vehicles (NGV) is that you can convert traditional gasoline engines to run on natural gas. Many car and light-truck makers, including Ford, Toyota, and Volkswagen, have natural gas versions of their vehicles available for sale. As far as the environment is concerned, natural gas has the highest energy/carbon ratio of any fossil fuel, meaning that it produces less carbon dioxide per unit of energy than any hydrocarbon.

## 9.2.6 Public Transportation

Access to public transportation gives transit dependent people options to engage in social, educational, recreational, and community activities. Currently, Clovis is served by two transit lines. Clovis Stageline operates along fixed routes with regularly scheduled stops. Clovis Round Up is a demand-response service for disabled residents who call in advance to schedule trips.

Clovis Roundup, transports elderly (55 years and older) and disabled residents within the city and adjacent unincorporated areas, primarily along Shepherd Avenue to the north, Dakota Avenue to the south, Locan Avenue to the east, and Winery Avenue to the west. Clovis Stageline operates four fixed routes, each running on 30 minute headways. The four buses have timed transfers at the Sierra Vista Mall and the Clovis Civic Center. A fifth bus operates as a limited hour express service.

The City has a fleet of seven diesel and gasoline buses which are used for transit service. Therefore, opportunities still exist for the City of Clovis to explore buses that run on alternative fuels such as clean natural gas which would help minimize emissions and health risks related to asthma and other respiratory ailments.

## 9.2.7 School Buses

The Clovis Unified School District provides one-way, to or from school, bus transportation to approximately 5,000 students each day with over 45 regular education routes. Home to school transportation is also provided for students who attend Clovis Unified schools and reside outside the established radius zone. For grades K-6, radius zones are drawn at a distance of 1 mile from the school site and for grades 7-12, radius zone are drawn at a distance of 2.5 miles from the school site. Typically, school buses run on diesel which contribute to the air quality problem by releasing particulates directly into the air and by emitting nitrogen oxides and sulfur oxides, which irritates the respiratory system, causing coughing, choking, and reduced lung capacity.

Riding the school bus has long been considered the safest way to get to school. But recent studies have shown that students exposed to diesel exhaust from school buses can experience adverse health effects. Diesel exhaust contains fine particles which can aggravate asthma and cause lung damage as well as contribute to poor air quality. To minimize health and environmental risks, Clovis Unified School District can explore alternative strategies to provide students a healthier alternative to taking the school bus. One strategy that has been implemented by many districts across the nation is the walking school bus. A walking school bus is a group of children walking to school with one or more adults. It can be as informal as two families taking turns walking their children to school to as structured as a route with meeting points, a timetable, and a regularly rotating schedule of trained volunteers. A variation on the walking school bus is the bicycle train, in which adults supervise children riding their bikes to school.

## 9.2.8 High Speed Rail

The California High-Speed Rail Authority is responsible for planning, designing and building the first high-speed rail system in the nation. The California high-speed rail will connect from San Francisco to the Los Angeles area at speeds capable of over

200 miles per hour. A recent study, conducted by the University of California, Berkeley, analyzed the environmental sustainability of the high speed rail network compared to flying and driving. The authors concluded that the high speed rail system, when completed, will consume less energy and emit fewer GHGs and less pollution than automobiles or planes. Their study not only considered reductions in GHGs, but also took into consideration the reductions in smog formation and human respiratory health effects that occur as a result.



*School busses*



*Artist rendering of high speed rail  
([https://en.wikipedia.org/wiki/California\\_High-Speed\\_Rail](https://en.wikipedia.org/wiki/California_High-Speed_Rail))*

## 9.3 URBAN FOREST

Urban vegetation can directly and indirectly affect local and regional air quality by altering the urban atmospheric environment. Specific benefits that trees can provide to affect air quality include temperature reduction, removal of air pollutants, and energy effects on buildings. Trees can also reduce annual storm water runoff volumes and protect local water resources by reducing sediment and pollution loading in nearby water bodies. In some circumstances, urban forests may also reduce electric energy consumption and annual natural gas consumption.

According to the 2011, Urban Forest Resource Analysis, the City of Clovis publically manages 34,729 trees, of which 74 percent are in good condition. The report also indicated sites for approximately 2,769 more tree plantings. These numbers do not reflect the currently undeveloped areas of the city, nor do they reflect privately-maintained trees. Therefore, opportunities still exists for the city to expand its urban forest and begin reducing impacts related to air quality and GHG emissions.

### 9.3.1 Carbon Sequestration



*Median planting on Bullard Avenue*

A major benefit of trees in the urban environment is their ability to “sequester” carbon by removing it from the atmosphere and storing it in their wood and in the soil. As described above, the City of Clovis manages approximately 34,729 trees, which according to the Urban Forest Resource Analysis, have sequestered a total of 8,391 tons of carbon dioxide (CO<sub>2</sub>), equivalent to 831.6 tons of CO<sub>2</sub> annually. Maintaining and increasing the current urban forest will ensure sustained or increased carbon sequestration in the future. In addition, selecting trees that have high capacity for carbon sequestration, especially for sites near freeways and other sites that have high levels of air pollution, can improve the contribution of the urban forest to GHG reduction.

### 9.3.2 Temperature Reduction and Heat Island Mitigation

Urban areas can become “urban heat islands” due to the abundance of dark surfaces like asphalt and buildings that absorb the sun’s heat and re-radiate the heat resulting in higher localized air temperatures. Tree transpiration and tree canopies can affect air temperature, radiation, absorption, and heat storage. Increasing the urban forest by incorporating tree plantings along streets, in parking lots, along trails, and in recreational areas throughout the city, can provide additional shade which can reduce temperatures and lead to other indirect benefits. This reduction in temperature not only lowers energy use, but it also improves air quality, as the formation of ozone is dependent on temperature.

### 9.3.3 Removal of Air Pollutants

Trees remove gaseous air pollution primarily by uptake via leaf stomata, though some gases are removed by the plant surface. In addition to the absorption of harmful gases, trees can also remove pollution by intercepting airborne particles and reducing the amount of harmful particulate matter in the air. The particles are captured by the surface area of the tree and its foliage. These particles temporarily rest on the surface of the tree, and are later washed off by rainwater, blown off by high winds, or fall to the ground with a dropped leaf. Although trees are only a temporary host to particulate matter, if they did not exist, particulate matter would remain airborne and be even more harmful to humans. By increasing the amount of urban forest, the city can improve air quality by removing unwanted harmful gases and particulate matter.

### 9.3.4 Energy Conservation

Trees offer a variety of benefits to the environment, including energy conservation. Planting the correct type of tree in a particular location can provide wind protection, shade, and cool air, while simultaneously providing additional wildlife habitat and aesthetic beauty to the urban landscape. There are various types, sizes, and behaviors of trees that play a vital role in energy conservation and by selecting the appropriate tree and location, the city can benefit greatly from these savings. Both evergreen and deciduous trees provide shade in the summer and if placed near a building, can minimize the need for use of air conditioning units. In winter months, deciduous trees (which lose their leaves each fall), allow sunlight to pass through windows, ultimately warming the building and decreasing dependency on heating systems. Minimizing the use of air conditioning units and heating systems, also means less fossil fuels consumed by the utility to create the energy, which in turn, means less carbon dioxide emissions.

Trees can also act as windbreaks, blocking cold winter winds which can enter homes and businesses through small openings and carry heat away from building surfaces. Effective windbreak trees generally have branching structures that extend to the ground and keep their leaves in the winter (evergreen). Although these types of trees may not be suited for placement in medians or street corners, which may pose safety issues due to visibility of oncoming traffic, they can be effective in other locations near commercial buildings and homes. Overall, through proper species selection and strategic placement of trees, Clovis residents and business owners can use trees to conserve energy on a larger scale.

### 9.3.5 Additional Benefits

In addition to the benefits listed above, an urban forest can also:

- » Reduce traffic speeds
- » Improve overall emotional and psychological health
- » Create safer walking environments
- » Screen unattractive street features
- » Increase security
- » Increase community character through consistent species selection
- » Add value to homes and businesses
- » Minimize flooding
- » Provide shade
- » Increase pavement life

## 9.4 WATER

Clovis is dependent on groundwater, surface water, and recycled water for its water supply. The city's primary water supply is drawn from over 30 groundwater wells. The Fresno Irrigation District (FID) draws water from the Kings Groundwater Subbasin which is then distributed to residents, businesses, and public facilities in Clovis by the public utilities department. Most of the groundwater supply is received between March and September when dry weather results in peak water demands.<sup>2</sup>

California as a whole is currently experiencing one of the most severe droughts in the last 30 years. Decreasing water supplies have had a wide range of impacts on the San Joaquin Valley's agricultural businesses leading to the conversion of farmland to urban development.

In addition to groundwater supplies from the Kings Groundwater Subbasin, which is generally considered to be overdrafted, reclaimed water is another important source of water for Clovis consumers. The Fresno-Clovis Regional Wastewater Treatment Plant and Clovis' Surface Water Treatment Plant provide water for nonpotable water uses and recharging the groundwater basin.

In 2005, the City adopted an Urban Water Management Plan to identify its water resources, service demands, and strategies to meet projected water needs. According to the Plan, projected normal year supply and demand comparisons indicate that future increases in demand will continue to decrease the overall available supply, and more importantly, the percentage of the supply provided by groundwater will also decrease. Other water resources will be necessary to ensure adequate water supply moving forward. For example, the city will draw supplies from the Surface Water Treatment Plant which captures and treats surface water before delivering it for public use. Wastewater recycling facilities and surface water treatment increase water production for other non-potable water needs such as agriculture and landscaping allowing the city to recharge its groundwater supply.

Effective May 1, 2015, Clovis residents are required to conserve water with a goal of 36 percent reduction based on 2013 levels in their personal use, particularly for landscape irrigation. To implement this reduction goal, the following outdoor watering schedule is currently in effect throughout the city:

- » Customers with EVEN-numbered addresses are allowed to use water outdoors on Sundays and Wednesdays.
- » Customers with ODD-numbered addresses are allowed to use water outdoors on Tuesdays and Saturdays.

Although the City has taken the necessary first steps to manage its water supply by completing the new Sewage Treatment Water Reuse Facility in 2009, and encouraging residents to reduce their personal water use, drought conditions are still imminent in the future and drastic conservation strategies need to be implemented.

In the past, partnerships with other cities and water districts have allowed the City to become an active participant in water resource planning, and creating regional domestic water, flood management, and wastewater management plans. Developing more partnerships, new facilities, increasing recycled-water supplies, and conserving current supplies are strategies Clovis will need to employ to ensure a sustainable water management system.

### 9.4.1 Groundwater Management

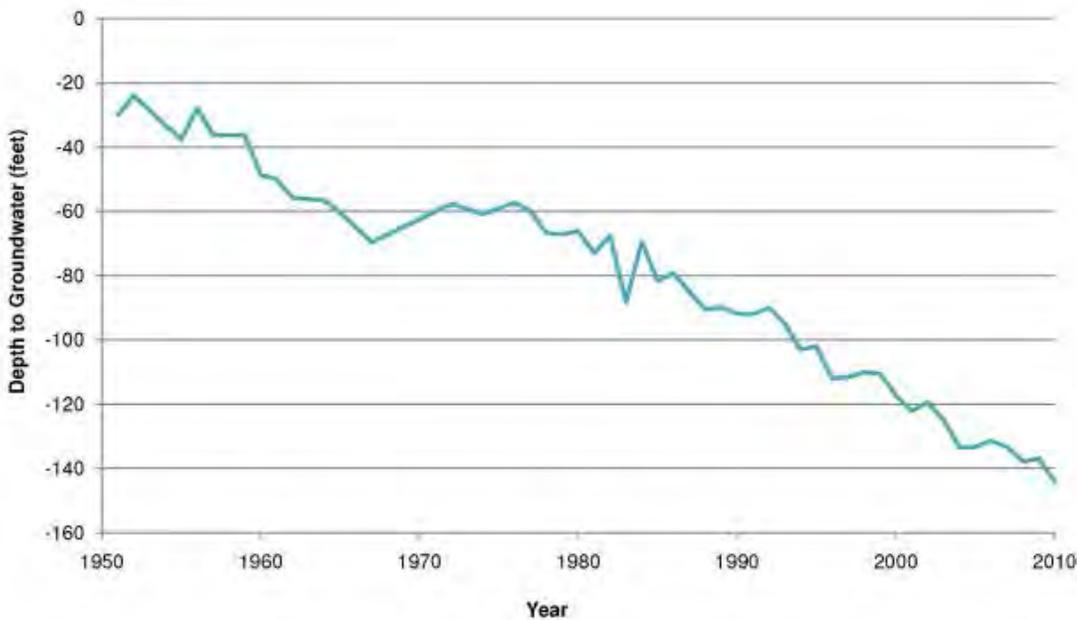
Californians have seen severe drought conditions for three years now, going on four, and residents are continuing to over-pump groundwater, which not only lowers the water table and collapses land at the surface, but it also lowers water quality,

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<sup>2</sup> City of Clovis, 2009 Community Profile, <http://www.ci.clovis.ca.us/Portals/0/Documents/Planning/GeneralPlanUpdate/GPUCommunityProfile.pdf>, accessed on March 13, 2015.

and requires more energy to pump to the surface. As water becomes increasingly scarce in California, and particularly in the San Joaquin Valley, Clovis' efforts to reduce its dependence on groundwater will be crucial in guarding against the impacts of ongoing drought conditions. According to the 2010 Clovis Urban Water Management Plan, the depth to groundwater has increased by nearly 80 percent in the past 60 years, from approximately 30 feet in 1950 to nearly 145 feet in 2010. Figure 9-1 below illustrates this historical depletion in groundwater, a trend that could continue without the implementation of more stringent conservation strategies.

Figure 9-1 Historic Depth to Groundwater



Source: City of Clovis, 2010 Urban Water Management Plan.

Efforts are under way in California to address groundwater management, and the Department of Groundwater Resources developed a Draft Strategic Plan in March 2015 for its Groundwater Sustainability Program. To support local agencies across California in achieving sustainable groundwater management, the program will implement the new and expanded responsibilities identified in the 2014 Sustainable Groundwater Management Act. The Sustainable Groundwater Management Act is a set of laws intended to protect the groundwater basins that provide more than half of the water Californians use in dry years. Responsibilities established in the program will include: developing regulations to revise groundwater basin boundaries; adopting regulations for evaluating and implementing Groundwater Sustainability Plans and coordination agreements; identifying basins subject to critical conditions of overdraft; identifying water available for groundwater replenishment; and publishing best management practices for the sustainable management of groundwater. Although this is a statewide effort, the Strategic Plan specifically states that severe drought in 2014 resulted in a lack of adequate surface water supplies, forcing many water users to increase groundwater pumping in the Central Valley from the 2010 levels. These changes are illustrated in Figure 9-2.

## 9.4.2 Stormwater Management

Stormwater runoff occurs when rain or snowmelt flow over the land surface. Land surfaces that greatly increase the volume of stormwater runoff include, roads, driveways, parking lots, rooftops, compacted soils, and other impervious surfaces. This runoff often causes flooding and soil erosion, and transports pollutants such as sediment, nitrogen, phosphorus, and grease

and oil found on paved surfaces into local streams and surface waters. There are a variety of approaches to manage stormwater in urban areas to reduce the rate of stormwater runoff and pollutants that enter our surface waters.

## LOW IMPACT DEVELOPMENT

Low-Impact Development (LID) is a watershed, land planning, and engineering design approach used to maintain pre-developed or natural site hydrology under post-development conditions.<sup>3</sup> The goal is to mimic a site's natural hydrology by using techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source. As opposed to treating stormwater in large costly facilities at the bottom of drainage areas, LID addresses stormwater through a variety of small-scale landscape practices and design strategies that preserve natural drainage features and patterns. Secondary goals include: groundwater recharge, habitat protection, flood prevention and mitigation, and reduced water treatment and energy costs. Implementation of these effective techniques in Clovis will conserve water, enhance ecosystem services, and improve land value.

Trees and plants improve the quality of stormwater by intercepting and filtering stormwater before it reaches the underground water system, thus reducing the total amount of runoff lost to storm drains or contributing to flood events. The leaves of trees and plants capture rain and other precipitation before it hits the ground. This slows the rate of infiltration, reduces lost runoff volume, and increases water percolation directly into the soil, which filters the water. Roots and fallen leaves also hold soil in place during storm events and allow more time for water to percolate into the soil.

## BIORETENTION (RAIN GARDENS)

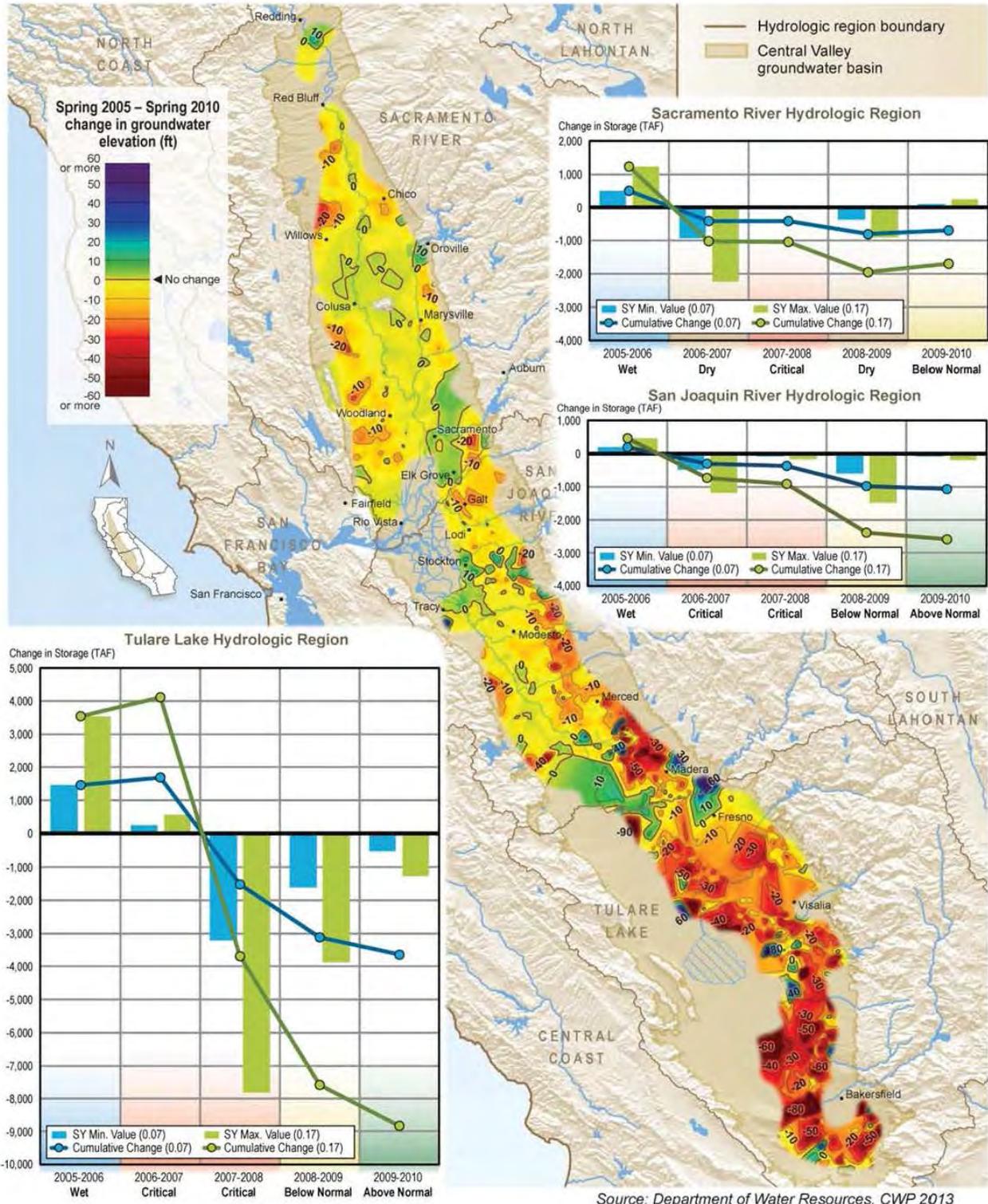
Bioretention planters (rain gardens) are depressions in the soil that are planted and designed to collect and absorb stormwater runoff from nearby paved surfaces like streets and sidewalks. These systems use vegetation, such as trees, shrubs, and grasses to remove pollutants from stormwater runoff. The size and design of the bioretention planter depends upon the area it is draining and the type of soil in which the planter is located. Trees and plants must be water tolerant as the retention area will hold approximately 1 inch of runoff water during first flush (the initial surface runoff of a rainstorm).

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<sup>3</sup> Low Impact Development Center, 2009. <http://www.lowimpactdevelopment.org>, accessed March 20, 2015.

Figure 9-2 Change in Groundwater Storage in the Central Valley, Spring 2005–Spring 2010

Groundwater Sustainability Program DRAFT Strategic Plan





*A parking lot bioretention planter in San Leandro*

## GREEN INFRASTRUCTURE

### 9.4.3 Water Conservation

According to the US Environmental Protection Agency (EPA), the average American uses about 100 gallons of water, or 320 gallons, per family per day, approximately 30 percent of which is used for outdoor purposes.<sup>4</sup> In April 2015, Governor Jerry Brown declared a State of Emergency throughout the State due to severe drought conditions and issued an Executive Order, requiring a 25 percent reduction in water use through February 2016. Due to severe drought conditions in California in recent years, water conservation will be critical in stretching water supplies to the maximum extent possible in the future. Below are a few strategies to minimize unnecessary water use in landscapes throughout the city. In addition to preventing water contamination caused by surface runoff, a bioretention system offers a variety of other benefits turning a problem area into a valuable asset. Other benefits include: aesthetic enhancement, a biodiverse habitat for birds, butterflies, and insects, and lower water costs.

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<sup>4</sup> United States Environmental Protection Agency, WaterSense, [http://www.epa.gov/WaterSense/our\\_water/water\\_use\\_today.html](http://www.epa.gov/WaterSense/our_water/water_use_today.html), accessed on March 20, 2015.



*Irrigation overspray in Loma Vista*

## NATIVE PLANTS

Once established, native and water efficient plants require little water beyond normal rainfall. Proper plant selection can minimize dependency on irrigation water.

### Group Plants According to their Water Needs

Grouping vegetation with similar watering needs into specific hydrozones reduces water use by allocating a specific amount of water to each zone's specific needs. Turf areas and shrub areas should always be separated into different hydrozones because of their differing water needs.

### Maintain Healthy Soils

Healthy soils are the basis for a water-efficient landscape; they effectively cycle nutrients, minimize runoff, retain water, and absorb excess nutrients, sediments, and pollutants.

### Reduce Turf Areas

Turf receives the highest percentage of irrigation water in a landscape. To improve the aesthetics of a landscape and better manage outdoor water use, plant turf only where it has a practical function.

## Water Efficiently

Understand each plant's water needs and avoid watering during the heat of the day. Make regular adjustments to irrigation systems to ensure proper watering.

## Use Mulch

Incorporating mulch around shrubs and plants helps reduce evaporation, inhibit weed growth, moderate soil temperature, and prevent erosion. Adding organic matter and aerating soil can improve its ability to hold water.

## 9.5 PUBLIC HEALTH

According to the American Planning Association (APA), local governments across the US are beginning to include goals, policies, and programs that promote public health as integral parts of their comprehensive plans. Planning with health in mind can impact how people make choices of where to live and how to get around, their ability to access healthy foods and opportunities for physical activity, and affect broader issues of social equity, clean air and water, and more.<sup>5</sup> By developing health related policies and programs, the City of Clovis can expand opportunities for physical activity, minimizing risks related to common health issues such as obesity and asthma.

The City of Clovis is working with the Fresno County Department of Public Health on implementation of a Proposition 84 Sustainable Communities Planning Grant. The positive working relationship the City has established with the Health Department on the Sustainable Communities Planning Grant will transition into the Urban Greening Master Plan and its implementation. The goals and objectives of the Health Department are to improve public health benefits for current and future residents through the implementation of "smart growth" strategies. The Urban Greening Master Plan incorporates these strategies which are intended to create a healthier community by adding green space that promotes healthy living, improves air quality, and increases access to physical activity. Encouraging a healthy living environment that focuses on improved pedestrian and bicycle access is important to the success of this plan.

The City has worked previously with the Fresno County Department of Public Health in developing a "Planner's Toolkit" of land use policies and implementation measures that promote public health. Many of the goals of the Toolkit are expressed in the Urban Greening Master Plan and are described below.

In addition to the County of Fresno Department of Public Health, Clovis Community Medical Center could also be a partner agency to help implement the Urban Greening Master Plan. Working together on outreach, advocacy, and education could help maximize efforts for a shared vision and desired outcomes.

### 9.5.1 Trails, Bicycle Lanes, and Connections

Over the past 30 years, aspects of our built environment have made it difficult to walk or ride a bicycle outdoors for transportation or recreational purposes. However, research shows that well-connected trails providing residents with access to community destinations is a low-cost approach to reducing some of the barriers individuals and families face in being physically active.<sup>6</sup> These barriers include cost, inconvenience, and inaccessibility. One effective method to increase physical activity in Clovis is to make bicycling and walking more viable modes of transportation, which can in turn help reduce obesity rates.

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<sup>5</sup> American Planning Association, *Healthy Planning: An evaluation of comprehensive and sustainability plans addressing public health*, <https://www.planning.org/research/publichealth/pdf/evaluationreport.pdf>, accessed on March 12, 2015.

<sup>6</sup> Leadership for Healthy Communities, 2009 Action Strategies Toolkit: A Guide for local and State Leaders Working to Create Healthy Communities and Prevent Childhood Obesity.

The City of Clovis can strategically plan the community to improve active living by making it more walkable. The “walkability” of a neighborhood determines whether community design encourages or inhibits walking. For example, lack of a sidewalks or lack of connectivity between trails can make walking unsafe, and a disconnected street or trail network can discourage walking. Conversely, having retail stores close to where people live and providing connected streets increases the likelihood that a person will incorporate walking into daily routines. By providing a well-connected system of trails and paseos, residents would be provided a healthy way to access community destinations and other recreational activity centers. Also, allowing people of all ages and abilities to have easy access to their community by walking or biking can also minimize dependency on the automobile, which can have secondary impacts on safety and environmental quality.



*Clovis Old Town Trail*

## 9.5.2 Public Transportation

Public transit is essential as it can extend the distance people can travel by foot or bicycle. An environment that supports access to alternative modes of transportation instead of primarily cars can help people maintain an active lifestyle. Built-environment features that place bus or train stops within walking distance of housing, offices, retail, and open spaces make it more convenient for people who live or work in these communities to travel on foot or by public transportation. People who use public transit walk more on a daily basis than non-transit users.<sup>7</sup> To encourage the use of bicycles, buses can install bicycle racks which provide the opportunity for bicyclists to utilize public transportation promoting healthier and active living.

<sup>7</sup> Prevention Institute, Strategies for Enhancing the Built Environment to Support Healthy Eating and Active Living, [http://www.calendow.org/uploadedfiles/publications/publications\\_stories/builtenvironment.pdf](http://www.calendow.org/uploadedfiles/publications/publications_stories/builtenvironment.pdf), accessed on March 13, 2015.

### 9.5.3 Asthma

In terms of impacts on human health, trees in urban areas are substantially more beneficial than rural trees due to their proximity to people. In general, increased tree cover can lead to greater pollution removal and removal of particulate matter, which ultimately leads to a variety of human health benefits, including reducing the amount of asthma and respiratory related illnesses.

Proper tree selection can also lead to improved respiratory health as certain species produce high levels of pollen, which can trigger allergic responses in humans. According to a rating system from *Allergy Free Gardening*<sup>8</sup>, a highly referenced source for information on plant allergens, species are measured on a scale from 1 to 10, with higher numbers representing higher allergy concerns. The Plant Palette described in Chapter 8, avoids species with high allergen ratings.

### 9.5.4 Safety, Crime Prevention, and Social Health

Bicycle and pedestrian crashes are the result of many different causes, including errant behavior of the traveler and the built environment that does little to protect pedestrians or bicyclists. Streets and intersections are often primarily designed to accommodate vehicular traffic, and the overall design of a street often does not provide enough safeguards for pedestrians or cyclists.

#### Traffic Calming

To address this, there are a variety of strategies that aim to modify features of the built environment to better accommodate pedestrians and cyclists and therefore, increase safety. Traffic calming is one of these design related approaches and can be accomplished in a variety of ways.

- » **Street trees** can give the impression of a narrower roadway and tend to encourage slower driving, and can act as a buffer between vehicular traffic and pedestrians on the sidewalk
- » **Bulbouts** and intersections with median refuges that provide pedestrians an opportunity to rest when crossing can also reduce vehicle speeds and improve the safety of pedestrians and bicyclists
- » **Street lighting** near heavily-used intersections also improves visibility for both pedestrians and motorists which can lead to increased pedestrian safety
- » **Raised pedestrian crossings** situated at major intersections or changing surface materials (for example, the selective use of brick or cobblestone) to indicate to drivers that they are in a pedestrian-centric zone, can ultimately slow traffic speeds on major thoroughfares

#### Crime Prevention Through Environmental Design (CPTED)

CPTED is a crime prevention philosophy based on the theory that proper design and effective use of the built environment can lead to a reduction in the fear and incidence of crime, as well as an improvement in the health and quality of life of residents. Some CPTED design tactics used to create a feeling of safety include: allowing clear views through proper placement of infrastructure and plant material, having appropriate lighting, increasing natural surveillance to maximize the ability of community members to see what is occurring at a given location, and keeping up with maintenance to support a high-quality environment.<sup>9</sup> These are all ways of increasing way finding, stewardship, ownership, and socialization to address crime and fear, and can lead to an overall feeling of safety and security throughout Clovis.

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<sup>8</sup> Ogren, Thomas. Leo. *Allergy-Free Gardening: The Revolutionary Guide to Healthy Landscaping*. Berkeley: Ten Speed Press, 2000.

<sup>9</sup> American Planning Association, Quick Notes No. 42: Community Crime Prevention Through Environmental Design, <https://www.planning.org/pas/quicknotes/open/pdf/QN42.pdf>, accessed on March 13, 2015.



*Example of a bulbout with street trees in South San Francisco*

## Mental Health

The social benefits that trees provide go beyond enjoying their aesthetic beauty. Humans feel a calming effect from being near trees. This can significantly reduce stress, fatigue, and even decrease recovery time from surgery and illness. Green spaces can also help lower the level of crime within urban environments. Trees are also known to reduce levels of stress which can have the potential to reduce aggressive driving and improve the attention of drivers.<sup>10</sup>

Increasing urban greening can also moderate mental fatigue. Attention restoration theory (ART) addresses how exposure to nature can have a restorative effect on the brain's ability to focus.<sup>11</sup> Common lifestyles and human behavior often require constant attention to navigating the daily demands of our jobs and school work. Prolonged attention to a single task can lead to difficulties in concentrating and irritability. ART suggests that nature is uniquely and inherently fascinating (flower color, leaf patterns, or wildlife behavior) and interactions are involuntary, giving our minds a chance to rest and restore. The

<sup>10</sup> Burden, Dan. Senior Urban Designer, Glattig Jackson Walkable Communities, 22 Benefits of Urban Street Trees 2006, [http://www.michigan.gov/documents/dnr/22\\_benefits\\_208084\\_7.pdf](http://www.michigan.gov/documents/dnr/22_benefits_208084_7.pdf), accessed on March 13, 2015.

<sup>11</sup> Wolf, K.L., & E. Housley. 2014 .Reflect and Restore: Urban Green Space for Mental Wellness, <http://www.bostonfed.org/commdev/c&b/2014/winter/greening-the-city-for-health.htm>, accessed on March 24, 2015.

result is that attentional reserves replenish, which can mean better performance on other tasks, and perhaps even reduced levels of stress.

# 10 URBAN GREENING MASTER PLAN Implementation: The 20-Year Plan



*Orchards in Northwest*

*"Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time."  
- Thomas Edison, Inventor*



As outlined in Chapter 3, Goals, the goals of this Urban Greening Master Plan will provide a framework to promote sustainable development practices and create a more livable and vibrant community consistent with the vision of the General Plan and previous planning efforts. The Land Use Element of the General Plan identified several sites for future parks and open space opportunities. These sites include currently underutilized lands as well as existing multi-benefit sites, such as basins. Importantly, new parks must meet the needs of existing and new residents, and provide spaces for field sports, such as baseball, soccer, rugby, and football. The Land Use Element also identifies future trail opportunities for the expansion of the trail network, incorporating and supporting the recommendations in the City's 2011 Bicycle Master Plan.

The design and function of public places is dependent upon multiple factors including the site's location, size, existing uses, and community interest. However, all green places should be designed so as to deliver the greatest benefits to the community and environmental quality as possible. For instance, a green place may serve as a community gathering space and also incorporate urban forestry (trees and plantings) and green infrastructure while simultaneously providing the added benefit of better air quality.

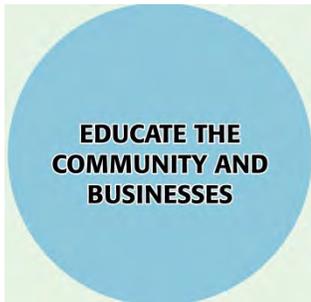
New green places also present an important opportunity to improve the parkland to population ratio, expand the urban forest, and create healthier neighborhoods. They can be created by reclaiming vacant and underutilized land as a public amenity; by carving out small nodes within street and creek corridors to create parklets, pocket parks, plazas, or community gardens; and through larger transformations, such as closing or undergrounding streets and changing travel lanes. The location, conditions, and consistency with City zoning and redevelopment planning will affect the feasibility of repurposing any site for urban greening. Vacant lots located in high-need areas and accessible by existing or planned pedestrian and bicycle paths are particularly important to consider as potential green spaces.

However, urban greening is more than creating and providing more parks and planting more trees. Urban greening is more than an aesthetic facelift; it is a multi-benefit approach to problem solving development impacts. All projects should include stormwater management and maximize opportunities to improve water quality. Urban greening provides increased functionality and efficiency to services and infrastructure while providing civic, environmental, public health, psychological, economic, social, and aesthetic value.

This chapter identifies opportunities for specific implementation actions to reach the community-developed urban greening goals. Many actions are multi-benefit and help address multiple goals simultaneously, some actions are citywide in scope, meaning all neighborhoods would benefit, and other actions are specific to a neighborhood focus area: Helm Ranch, Old Town Loma Vista and Northwest.

Implementation actions are organized by urban greening goal and are noted as being short-term (immediate to 5 years out), mid-term (6 to 10 years out), or long-term (11 to 20 years out). Many implementation actions apply to Clovis as a whole; actions that are specific to a focus area have that area noted in parentheses at the end of the bullet. The seven urban greening goals and their implementation actions are as follows:

## GOAL: EDUCATE THE COMMUNITY AND BUSINESSES



- » Provide information about conservation and the multiple benefits of urban greening
- » Encourage healthy eating habits and experiences through support of agricultural education
- » Support environmental and agricultural education
- » Inform the public about the 2010 Local Water Efficiency Ordinance

Many cities and non-profits offer educational resources or incentive programs to residents as an effort to build momentum for greening efforts. Informational classes, such as water-efficient landscape design, tree maintenance, or bicycle repair, create an opportunity for citizens to take part in sustaining the city's ecological resources. Demonstration sites, such as examples of lawn alternatives or irrigation installation, allow residents to see first-hand opportunities that they could implement privately and can inspire them to make changes on their own property. Incentive programs, such as reduced cost for trees, low-water use plants, or alternative energy devices, could additionally motivate residents to make sustainable upgrades to their private property. These types of strategies decentralize greening efforts and potentially make it more feasible to have a large impact across the city. These types of programs are also great opportunities for partnership with local utilities, educational centers or non-profit groups. Clovis could look to local resources, such as the Clovis Botanical Garden or Fresno State University, for partnership for providing new educational opportunities or for demonstration sites.

### IMPLEMENTATION ACTIONS:

#### Short-Term (immediate to 5 years out)

- » *Create a median mulch demonstration site to showcase landscape practices that improve soil health*
- » *Require the use of urban green waste compost in city projects*
- » *Develop pilot projects to test new plant species and landscape installation practices (such as sheet mulching) with the dual goals of reducing future maintenance while increasing community aesthetics and green infrastructure*
- » *Consider implementing a water saving hotline with tips on how to meet water conservation requirements*
- » *Explore funding to provide the public with more education about codes and code enforcement*
- » *Support farmers markets*
- » *Consider a produce swap between neighbors*
- » *Team with County Public Health to educate the community on healthy eating habits*
- » *Initiate a water conservation program for demonstration front yards throughout the city seeking volunteers based on higher outdoor water users; consider building on the Central Valley Friendly Landscaping Program that the city currently supports*
- » *Initiate a front-yard water conservation recognition program for low-water yards and/or conversions*
- » *Consider providing or supporting partner entities to offer workshops on water conservation measures, tools, tricks, and ideas*
- » *Create a demonstration soil preparation project on a Shaw Avenue (Loma Vista)*
- » *Partner with developers to implement soil preservation/enhancement protocols following earthmoving, including tilling or ripping soil to a minimum depth of one foot (1') in planted areas, and applying green waste compost*

- » *Require and develop topsoil replacement, amendment, and proper soil preparation practices for all new development, including public rights-of-way, especially in Loma Vista and Northwest due to duripan soil issues*

### Mid-Term (6 to 10 years out)

- » *Create an urban forestry program to provide free trees for residents who want them planted in the right-of-way adjacent to their properties*
- » *Require use of 1-inch minimum of green waste compost in all permitted projects*
- » *Develop a heritage tree protection ordinance*
- » *Encourage incorporating or allowing plot-based community gardens or urban farming on public or private land*

## GOAL: DRAW PEOPLE OUTSIDE



- » Create new green space
- » Develop pedestrian linkages and trails
- » Support provision of outdoor dining
- » Consider creating a citywide landscape improvement district
- » Formalize joint use agreements with schools

One element of a successful streetscape involves sidewalk design. Specifically, sidewalk width has significant implications for streetscape design and the quality of the pedestrian environment. Sidewalks that are too narrow prevent pedestrians from moving safely and comfortably, and also make it difficult to provide important additional streetscape elements and pedestrian amenities. Well-designed sidewalks offer pedestrians enough space to walk at their chosen pace, stand, sit, socialize, and enjoy their surroundings. Sidewalks should also offer more space for landscaping and amenities, making the streetscape more useful and attractive, and also acting as a buffer between traffic and pedestrians.

Streets should also be designed to accommodate bicyclists in addition to motorists so that residents have another safe option to travel to work, school, or for recreational purposes. The bicycle network should be a safe, continuous, and well-connected system of bikeway and trail facilities that provide access to a wide variety of locations and neighborhoods throughout the city.

Clovis has various landscape maintenance districts associated with recent developments to fund the public open spaces in those districts. However, existing neighborhoods have a disparity as they are reliant on General Funds for landscape maintenance and therefore receive less attention and investment than newer developed areas. A citywide Park and Landscape District would allow a systemic approach to funding the maintenance of the city’s public open space, parks, trees, and trails. This approach would ease the disparity between areas with special district funding and those dependent on General Fund fees, while providing a more consistent amount of funds for planning purposes.

### IMPLEMENTATION ACTIONS:

#### Short-Term (immediate to 5 years out)

- » *Construct Centennial Plaza (Old Town) (NOTE: Clovis fast-tracked this project and it opened in April 2015)*
- » *Increase urban forest plantings*

- » *Consider requiring temporary or permanent shade structures in parks to supplement the shade capacity of newly planted trees*
- » *Create a plan for successional street tree plantings to ensure a continuous urban canopy in the downtown core (Old Town)*
- » *Explore options to acquire land and provide outdoor recreation space in Helm Ranch (Helm Ranch)*
- » *Develop a citywide residential street tree canopy-coverage goal of 25% minimum*
- » *Add wayfinding to the intersection of Sierra Avenue and Clovis Avenue to direct trail users to trail and make drivers aware of busy trail intersection. Consider painting directional signage on pavement or using pavement markers (Old Town)*
- » *Develop trail wayfinding throughout the city to make trails more visible and connected*
- » *Consider installing flashing crosswalks at intersections of Sierra Avenue and Clovis Avenue, Minnewawa and Bullard Avenues, Bullard Avenue and 5<sup>th</sup> Street, and Bullard and Pollasky Avenues (Old Town)*
- » *Encourage outdoor dining in commercial areas by reviewing and updating zoning and permitting requirements*
- » *Consider updating zoning to allow conversion of a limited number of existing parking spaces into outdoor seating/dining areas and into motorcycle/bicycle/electrical vehicle parking*
- » *Formalize joint use agreements with Fresno and Clovis Unified School Districts for use of recreation space*
- » *Install doggie bag stations along trails*

### Mid-Term (6 to 10 years out)

- » *Develop residential street, and sidewalk shade ordinances to match city's parking lot shade requirement of 50 percent coverage within 15 years of development*
- » *Consider establishing a citywide park and landscape district to provide dedicated source funding for maintenance throughout the city*
- » *Develop plans for and construct new Basin Parks at Basins 4d, 4E, 5B/5C, 5F, BC, BX, BW, DO, and DP*
- » *Create canal trail north from Letterman Park to Sierra Avenue, create pedestrian/bicycle crossings at canal intersections with Villa and Bullard Avenues (Old Town)*
- » *Consider acquiring and developing a new community park at intersection of Willow Avenue and Holland Avenue (Helm Ranch)*
- » *Work with Fresno Metropolitan Flood Control District to explore increasing recreation (active or passive) at basin parks (both new and existing)*
- » *Explore widening sidewalks on arterials, especially near school*
- » *Consider pavement updates to alleys (Old Town)*

### Long-Term (11 to 20 years out)

- » *Create a Basin Park adjacent to Highway 168 at the end of 3rd Street (Old Town)*
- » *Consider creating a new pocket park at Gettysburg Avenue and Peach Avenue (Helm Ranch)*

## GOAL: UTILIZE GREEN INFRASTRUCTURE



- » Offset the impact of impervious surfaces by pursuing “Green Streets” pilot projects
- » Increase and maintain the urban forest
- » Enhance overall beautification and neighborhood identity through plantings that are designed for minimal maintenance
- » Develop water-efficient guidelines and plant palettes for new development
- » Encourage conservation and restoration of wildlife habitat

Efficient use of resources also saves time and money. While the city can lead by example in its own projects, the city also establishes thresholds that permitted projects must follow or maintain. Creating and/or supporting Central Valley Friendly Landscaping to develop a landscape best practices maintenance manual, along with updating City standards, details, plant lists, and design guidelines, can help ensure that development in Clovis is sustainable, functional, aesthetic, and efficiently uses resources.

### IMPLEMENTATION ACTIONS:

#### Short-Term (immediate to 5 years out)

- » *Consider capping all non-recreation turf in public rights-of-way watered by potable water spray; consider removing turf and replacing with low-water shrubs and groundcover or mulch while maintaining tree irrigation (NOTE: Clovis is fast-tracking this implementation action and began capping turf sprayheads in May 2015)*
- » *Require all new city facilities to be waterwise*
- » *Identify existing city facilities and implement retrofits for waterwise landscaping, gardens, and/or green roofs*
- » *Identify potable water irrigated areas where non-potable water supply exists and convert to non-potable*
- » *Develop a pedestrian-friendly, green street plan for Willow Avenue (Helm Ranch)*
- » *Update City of Clovis Standard Drawings, October 1, 2012, to incorporate WELO requirements*
- » *Update City of Clovis Approved Plant List with the recommendations from the Urban Greening Master Plan*
- » *Update City of Clovis Design Guidelines to incorporate waterwise guidelines reflecting the changes/ideas from the Urban Greening Master Plan including soil preparation*
- » *Replace incandescent light bulbs with light emitting diode (LED) fixtures to provide better light quality on neighborhood streets, less light trespass into the night sky, lower electricity bills, eliminate toxic gases found in current lighting fixtures (thereby reducing landfill pollution), and reduce greenhouse gas emissions*
- » *Explore increasing pedestrian lighting on sidewalks and trails or retrofitting existing light poles with pedestrian lighting to increase safety and visibility*
- » *Continue developing a specific plan for Pollasky Avenue south of Bullard Avenue to draw pedestrian activity from the northern part of the street south, to create new opportunities for commercial activity along this route or incorporate this into the Central Clovis Specific Plan (Old Town)*
- » *Create a staggered planting plan to replace container trees along Bullard Avenue (Old Town)*

#### Mid-Term (6 to 10 years out)

- » *Create a sustainable landscape best practices maintenance manual that outlines best practices to minimize waste, conserve water, and protect natural ecosystems; this could be built off of existing manuals such as the Model Bay-Friendly Landscaping Maintenance Specifications, and tailored to meet Clovis’ needs*

- » *Acquire dedicated purple water trucks for non-potable irrigated water application use*
- » *Pursue expansion of recycled-water system and increase the use of recycled water throughout the city*
- » *Consider the water tower at the southeastern edge of Letterman Park for a new water-efficiency demonstration garden (Old Town)*
- » *Conduct traffic study of Willow Avenue, 5th Street, Bullard Avenue, Gettysburg Avenue, Barstow Avenue, Minnewawa Avenue, Sierra Avenue, Woodworth Avenue, and Shepherd Avenue to evaluate opportunities for roadway reduction or reallocation to accommodate green street improvements*
- » *Consider a program to help make swamp coolers more efficient and provide information to owners and renters*

## Long-Term (11 to 20 years out)

- » *Explore/install hydroelectric generation systems such as in-pipe turbines to harness the power of moving or falling water to produce mechanical or electrical energy when retrofitting or replacing existing city pipelines*
- » *Consider creating a free shuttle from Clovis Community College Center to Old Town*

## GOAL: PROMOTE ALTERNATIVE TRANSPORTATION



- » Reduce vehicle miles traveled and fossil fuel dependency
- » Increase connectivity to green space and other activity centers
- » Improve pedestrian access from residential neighborhoods to everyday goods and services
- » Provide safe and accessible streets with shading and buffers to encourage walking and biking

In addition to the economic benefits, street trees also provide benefits to the safety of residents within the community and especially along roadways. Trees can help improve road safety in a variety of ways. For example, trees lining streets give the impression of a narrower roadway and tend to encourage slower driving. Also, street trees can act as a buffer between vehicular traffic and pedestrians on the sidewalk. Lastly, trees are known to reduce levels of stress which can have the potential to reduce road rage and improve the attention of drivers.

Commonly, streets in urban areas are wider than necessary and can be more efficiently designed to create spaces for pedestrians and planted areas. Creating center medians or vegetated buffers at the edge could help reduce traffic speeds while providing beneficial environmental services, such as stormwater retention and greenhouse gas reduction. Additionally, increased pedestrian and bicycle use can improve the overall health of the population and reduce dependence on fossil-fuel based transportation.

Many of the implementation actions in the goals Draw People Outside, and Utilize Green Infrastructure also help attain the goal to Promote Alternative Transportation; please see the implementation actions under those goals as well.

### IMPLEMENTATION ACTIONS:

## Short-Term (immediate to 5 years out)

- » *Create crosswalks across Ashlan Avenue, Gettysburg Avenue, and Shaw Avenue at paseo and internal roadway intersections (Loma Vista)*
- » *Develop master plan for Enterprise Canal Trail and community park space adjacent to trail (Northwest)*

- » *Consider bicycle-phased or bicycle-priority intersection signals with activation from designated bike lanes and trails*
- » *Provide more bicycle racks in Old Town (Old Town)*
- » *Support the development of bicycle storage services*
- » *Support bicycle rental businesses*
- » *Encourage the provision of bicycle valets at large events*
- » *Consider an all-cross pedestrian and bicycle signal at Alluvial and Clovis Avenues (Old Town)*
- » *Encourage developers to increase pedestrian permeability such as by creating open corner pedestrian connections or paseos at arterial intersections such as Shepherd Avenue, Minnewawa Avenue, and Willow Avenue, and providing pedestrian breaks to connect internal development, neighborhood streets and trails to adjacent arterial streets midblock between primary entry streets into residential development to promote pedestrian activity along these corridor*
- » *Incentivize developers to install landscape elements, including street trees, prior to construction of residential and commercial properties along streets without houses, fronting collectors and where recycled water is available*
- » *Explore narrowing Woodworth Avenue and installing a planted median (Old Town)*
- » *Explore improvements to the pedestrian experience while calming traffic on Willow, Peach and Minnewawa Avenues (Old Town)*

### Mid-Term (6 to 10 years out)

- » *Install crosswalk improvements at the intersection of Peach Avenue and Ashlan Avenue, consider painting street to create wayfinding and alert drivers to pedestrians and cyclists (Helm Ranch)*
- » *Replace and increase sidewalk width on Willow Avenue in Helm Ranch and improve the central median; consider a road diet and improved crosswalks (Helm Ranch)*
- » *Develop master plan for regional park at center of Northwest along Enterprise Canal*
- » *Install crosswalks at Willow Avenue intersections with Shepherd Avenue, Perrin Avenue, Behymer Avenue, International Avenue, and Copper Avenue (Northwest)*

### Long-Term (11 to 20 years out)

- » *Create Gould Canal Trail along canal adjacent to Ashlan Avenue to create connection to Fresno (Helm Ranch)*
- » *Extend Gould Canal Trail to the east from Basin "S" Park (Helm Ranch)*

## GOAL: GROW THE LOCAL ECONOMY



- » Protect agricultural operations
- » Increase property values
- » Create activity in retail areas

Planting trees along streets can bring a variety of other benefits to the city in addition to environmental benefits. Street trees can also add to the economic stability of a district or neighborhood, as well as provide benefits related to the safety and well-being of residents. Through reductions in greenhouse gases, carbon sequestration, removal of air pollutants, and socioeconomic value, Clovis’ public trees were valued at \$61.89 per tree, providing the community with substantial economic benefits. The attractiveness of a street is also an important factor in attracting investment, as both consumers and businesses have been found to favor areas with more street tree cover.

Many cities in California, including Clovis, collect residential green waste for large-scale urban composting. This significantly reduces residential organic waste going into landfills and potentially provides a source of compost for local landscape projects. Adding compost to soil significantly improves its capacity to hold water and could be an important asset in water efficient landscape practices in the future.

**IMPLEMENTATION ACTIONS:**

**Short-Term (immediate to 5 years out)**

- » *Work with Fresno State to find ways to bring students to Old Town, explore advertisements, providing areas for group studies or other hangout spaces(Old Town)*

**Mid-Term (6 to 10 years out)**

- » Work with partners to make OMRI-certified compost, such as that made by Kochergen Farms Composting with Clovis’ green waste via Allied Waste’s facilities in Fresno, available locally to the City. Residential and commercial growers could reduce maintenance needs, increase plant viability, restore soil health, and reduce water needs

**Long-Term (11 to 20 years out)**

- » Provide compost to residents at no or reduced cost

**GOAL: IMPLEMENT RECOMMENDATIONS FROM PREVIOUS PLANNING EFFORTS**



- » Urban Forest Resources Analysis: 2,512 available planting sites
- » Bicycle Transportation Master Plan: increase utilitarian and recreational uses of bike system
- » Parks Master Plan: new open space opportunities
- » General Plan: continue to grow and sustain the values that make Clovis special; foster stewardship to conserve and enhance natural resources while contributing to a healthy community

The 2012 Urban Forest Management Plan establishes a vision and mission statement that clarifies the need for a healthy, vibrant, and sustainable urban forest that is an integral part of the community’s infrastructure. This plan articulated several recommendations including increasing urban forest plantings; developing both a parking lot shade ordinance and a heritage tree protection ordinance; creating an Urban Forester position and an Urban Forest Group charged with stewardship of Clovis’ urban forest; creating a citywide park and landscape district to provide dedicated source funding; and expanding the Citizen Forester Program, among others. Current staffing levels limit the city’s ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the city’s urban greening efforts.

**IMPLEMENTATION ACTIONS:**

**Short-Term (immediate to 5 years out)**

- » Pursue grant funding or other monies to implement the Urban Greening Plan, focusing on built improvements and maintenance and referencing the Greening Analysis work

**Mid-Term (6 to 10 years out)**

- » Implement the proposed Class II bike lane on Willow and consider painting it or using other pavement treatments for added visibility (Helm Ranch)
- » Update and complete the Parks Master Plan including a needs analysis

**Long-Term (11 to 20 years out)**

- » Implement the proposed bike paths, lanes, and routes proposed in the Bicycle Transportation Master Plan

**GOAL: MAXIMIZE OPPORTUNITIES FOR PARTNERSHIPS ON GREENING EFFORTS**



- » County of Fresno
- » County of Fresno Department of Public Health
- » City of Fresno
- » Clovis Unified School District
- » Fresno Unified School District
- » Sanger Unified School District
- » Clovis Community Medical Center
- » Clovis Community Foundation
- » Clovis Chamber of Commerce
- » California Urban Forests Council
- » Tree Fresno
- » Clovis Botanical Garden
- » UCCE Master Gardeners of Fresno County
- » Clovis Rodeo Association
- » Building Industry Association
- » Fresno Metropolitan Flood Control District
- » Fresno Irrigation District
- » Climate Change Institute at Fresno State

The City of Clovis can lead by example and incorporate the policies and practices outlined in the Urban Greening Master Plan in their own projects and those requiring City permits. However, they cannot green Clovis without support and actions

by residents, business, non-profits, schools and other entities working, living, developing, and influencing Clovis. Education and requirements go a long way to address the need to be efficient and effective with staffing, labor, and resources but partnerships are what will allow Clovis to thrive while it becomes greener.

## IMPLEMENTATION ACTIONS:

### Short-Term (immediate to 5 years out)

- » *Expand the Citizen Forester Program, among others (mid-term)*
- » *Look for opportunities to increase maintenance staffing*
- » *Actively create partnerships/training to address maintenance staffing shortfalls. Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts*

### Mid-Term (6 to 10 years out)

- » *Create an Urban Forester position and an Urban Forest Group charged with stewardship of the City's urban forest*
- » *Create multiple-benefits agreement program between City of Clovis and Fresno Irrigation District to formalize use of levees as trails.*
- » *Establish best practices handbook for construction of trails on levees.*
- » *Consider establishing a business-sponsored tree buying program to provide free trees to residents*
- » *Consider organizing corporate/organizational teaming building or work parties to address City-identified maintenance or beautification projects*

## 10.1 FUNDING OPPORTUNITIES

Expanding and enhancing the urban forest in the Clovis community will require funds to purchase, install, and maintain trees. Funding for urban forest improvements within existing and future parks may be provided through existing funding sources including the General Fund, as tree plantings and maintenance are included in current operations. However, funding for specific projects or programs may be obtained through grants or other sources.

Funding sources for urban forestry projects beyond the General Fund include grants, donation programs, assessment districts and developer contributions. These sources are described in greater detail below.

### 10.1.1 Conventional Funding Sources

The primary traditional sources of parks funding are the City's general fund and developer dedication of land or fees. The County's General Fund is primarily comprised of revenues from property taxes, sales tax, transient occupancy tax, and other revenues, and a portion of this amount is allocated to parks annually to address existing needs. To address needs created by new development, when new housing is built, land or fees in lieu of land are dedicated to parks. Under the Quimby Act, the City requires enough parkland be dedicated to fund land to meet their goal of 4 acres of parkland per 1,000 residents.

## 10.1.2 Grant Funding

Many grants are available for parks and parks-related construction. In addition to grants intended generally to build parks, specialized grants that may apply to various City-owned parks include environmental, trails, community development, waterways and urban forestry, or landscaping funds. Grants may require a local match in either funds or volunteer labor.

### **LISC/NFL FOUNDATION GRASSROOTS PROGRAM**

Local Initiatives Support Corporation and the National Football League provide grants to restore or build football fields as gathering places and recreational facilities to support the development of young people and their parents, particularly in poorer neighborhoods.

### **US EPA ENVIRONMENTAL JUSTICE**

The EPA Environmental Justice program is available to fund partnerships and programs. While these grants are not used for construction or implementation of projects, partnerships and programs are a key aspect of developing and operating successful parks and recreation facilities.

### **CALIFORNIA RIPARIAN HABITAT CONSERVATION PROGRAM**

This State program of the Wildlife Conservation Program provides grants for protecting, restoring, and enhancing riparian habitat systems.

### **NATIONAL TRAILS FUND**

The American Hiking Society provides micro-grants to trail crews specifically to support hiking trails. Grants are available in amounts between \$500 and \$5,000 to members of American Hiking Society's Alliance of Hiking Organizations for projects that have hikers as the primary constituency, are seeking to secure trail lands, including acquiring trails and trail corridors, and build and maintain trails resulting in visible and substantial ease of access, improved hiker safety, or avoidance of environmental damage. Higher preference is given to projects with volunteer labor.

### **PROJECT LEARNING TREE**

This environmental education grant program provides funding for schools and communities to enhance their local urban forest as a method of enhancing nature-based learning opportunities within the community.

### **CORPORATE GRANTS**

Many small-scale grants and sponsorships are available to support the development and revitalization of parks and recreation. Some of these are through established corporate giving programs such as PowerBar's Direct Impact on Rivers and Trails program, which has provided funds up to \$5,000 to create, maintain, improve or restore access to valued recreational areas. While smaller companies are less likely to have established programs, local businesses often designate funds for donation to their community and can be particularly tapped for sponsorships of local projects that support the community.

## CAL FIRE GRANTS

Table 10-1 that describes a variety of grants offered by the California Department of Forestry and Fire Protection (CAL FIRE).

### 10.1.3 California Natural Resources Agency

The California Natural Resources Agency awards grants to local, state, and federal governmental agencies and to nonprofit organizations. The Environmental Enhancement and Mitigation Program (EEMP) encourages projects that produce multiple benefits which reduce GHG emissions, increase water use efficiency, reduce risks from climate change impacts, and demonstrate collaboration with local, state and community entities. Eligible projects 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. Grants are generally limited to \$500,000 for development projects and up to \$1 million for acquisitions.  
[http://resources.ca.gov/bonds\\_and\\_grants/eemp/](http://resources.ca.gov/bonds_and_grants/eemp/)

## CALIFORNIA DEPARTMENT OF TRANSPORTATION

The California Department of Transportation offers the Active Transportation Program (ATP) which was created by Senate Bill 99 and Assembly Bill 101 to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidates various transportation programs, including the federal Transportation Alternatives Program, state Bicycle Transportation Account, and federal and state Safe Routes to School programs into a single program. There is currently \$138.5 million in available funding (paired with future state appropriations for granting over a 2-year cycle) for public agencies, transit agencies, school districts, tribal governments and non-profit organizations.  
<http://www.catc.ca.gov/programs/ATP.htm>

## CALIFORNIA DEPARTMENT OF WATER RESOURCES

The California Department of Water resources offers the Water-Energy Grant Program which provides funds to implement water efficiency programs or projects that reduce GHG emissions, and reduce water and energy use. There is currently \$19 million available to local agencies, joint powers authorities, and non-profit organizations.  
<http://www.water.ca.gov/waterenergygrant>

## STRATEGIC GROWTH COUNCIL

To qualify for funding under the Affordable Housing and Sustainable Communities Program, eligible projects include green infrastructure that explicitly includes shade trees, heat-island mitigation measures, community gardens, stormwater planters, parks and open space. Other related eligible projects include active transportation consistent with the ATP (see above), and planning to support sustainable communities' strategies.  
[http://www.sgc.ca.gov/s\\_ahscprogram.php](http://www.sgc.ca.gov/s_ahscprogram.php)

**TABLE 10-1 CAL FIRE GRANT OPPORTUNITIES**

Project Type	Description	Grant Amount
“Green Trees for the Golden State”	Urban tree planting projects and tree establishment care during the grant period. Preference will be given to the planting of trees to optimize the multiple benefits of urban forests in environmental justice communities with special attention given to GHG sequestration and avoided GHG emissions.	\$150,000- 750,000
Urban Forest Management For GHG Reduction	For cities, counties, and districts only. Establishing a new jurisdiction-wide tree inventory, and/or urban forest mapping and analysis, and/or long term management plan or updating existing versions of these critical management components. May include policy integration and ordinance development. Applicants must show how GHG will be reduced by the project. See RFP for requirements.	\$150,000- 750,000
Urban Wood and Biomass Utilization	Projects that will use urban woody biomass for its highest and best use, thereby diverting it from the urban waste stream and avoiding GHG emissions while sequestering GHG for a longer time period.	\$150,000- 500,000
“Woods in the Neighborhood” (Reclamation of blighted urban lands).	These projects are to assist local entities to purchase and improve unused, vacant urban neighborhood properties in environmental justice communities or to serve such communities for purposes consistent with the Urban Forestry Act. These projects must demonstrate how GHG will be reduced.	\$200,000- 1,500,000
“Green Innovations” Projects	For urban green infrastructure projects falling within the scope of the Urban Forestry Act of 1978 that are not able to fit in one of the other Urban Forestry Grant Programs above. These projects should be unique and forward-thinking. Projects must show how GHG will be reduced. Selection will be strongly focused on environmental justice communities.	\$200,000- 1,500,000

Source: California Department of Forestry and Fire Protection (CAL FIRE), [http://calfire.ca.gov/resource\\_mgt/resource\\_mgt\\_urbanforestry\\_grants.php](http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php).

## 10.1.4 San Joaquin Air Pollution Control District

### BIKE PATHS PROGRAM

This program provides funding to assist with the development or expansion of a comprehensive bicycle transportation network which will provide a viable transportation option for travel to school, work and commercial sites. Class I bike path projects are eligible to receive up to \$150,000 per project and class II bike path projects are eligible to receive up to \$100,000 per project.

### SCHOOL BUS PROGRAM

The District currently offers several school bus programs that provide funding to school districts and other qualifying agencies to reduce children’s exposure to harmful pollutants and assist with compliance of ARB’s in-use Truck and Bus Regulation. These programs provide funding of up to \$20,000 per bus for the following:

- » The purchase of new low-emission school buses to replace of old, high polluting school buses.
- » The installation of ARB-verified Level 3+ retrofit devices on school buses.
- » The replacement of expiring or expired compressed natural gas (CNG) tanks on existing school buses.

<http://valleyair.org/grants/schoolbus.htm>

### 10.1.5 Measure C: Transportation Sales Tax

Originally approved by voters in 1986, and extended in 2007 for a 20-year period, is a half-cent sales tax aimed at improving the overall quality of the transportation system, including Fresno County and all 15 cities within the County. The expenditure plan for Measure C, recognizes the transportation programs that maintain and improve the quality of life and positions Fresno County to deal with the type of infrastructure that will be needed to address the higher population and various mobility needs. The continuing 20-year tax is expected to generate approximately \$1.7 billion in new revenues for transportation needs through 2027.

Fresno County of Governments will be holding a series of meetings in 2015 to discuss a new Technology Program to set aside Measure C funds to finance new transit technologies that may be developed in the future, such as Personal Rapid Transit or similar systems. System benefit goals would include reducing traffic congestion and air emissions from less vehicular traffic and surface street congestion. Additionally, the program aims to include improved mobility in densely developed areas by providing convenient and direct transit service.

### 10.1.6 Maintenance

The City responds to maintenance demands for citywide improvements, such as those for parks, major arterials and civic spaces, as well as those for neighborhood-specific improvements. In responding to neighborhood-specific improvements, it is important that the City prioritize emergency situations while maintaining regular maintenance schedules, and that it provide equal care to each neighborhood. Should a neighborhood have a strong interest in seeking additional financing for landscaping, one possible option is to form special financing or landscape improvement districts with restricted boundaries and limited taxing authority.

## STRATEGIES FOR COMMUNITY INVOLVEMENT

- » Encourage community participation and community stewardship activities, such as selecting a community tree for a specific neighborhood
- » Coordinate stewardship activities with established volunteer groups like Tree Fresno, as well as school groups and environmental organizations
- » Notify residents and property owners of any project involving the planting or tree removal at city parks near their home or business
- » Build upon existing community service programs and education programs to establish opportunities for classroom and neighborhood based learning

A

URBAN GREENING MASTER PLAN

# Round 1 Workshop Summaries



# HELM RANCH ROUND 1 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY

*Tarpey Elementary School, Clovis, CA  
April 30, 2014 – 6:30pm-8:30pm*



## SUMMARY

On Wednesday, April 30, 2014, staff from the City of Clovis and PlaceWorks facilitated a community workshop aimed at introducing the City's Urban Greening Plan process and getting feedback from participants on their concerns and interest in developing the Plan in Helm Ranch. The workshop was paired with a community update regarding on-going planning for Shaw Avenue, located to the north of Helm Ranch.

Approximately 30 (31 signed in) members of the public attended the meeting, which began with a brief overview of the Shaw Avenue urban design plan and the introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and draft goals and strategies identified for the Urban Greening Plan in Clovis.

Following the presentation, participants independently visited urban greening and Shaw Avenue stations facilitated by staff from the City of Clovis and PlaceWorks. The interactive stations were developed to gain feedback on preliminary urban greening features and community concerns.

The Urban Greening stations included:

- **GOALS AND STRATEGIES** presented the draft goals and strategies developed by the City as guidelines for the Urban Greening Plan. Participants were encouraged to read through the goals and provide feedback by writing directly on the list or highlighting components that they agreed or disagreed with.

The station also included an interactive board where participants used stickers to vote on the environmental issues that they considered to be most important to themselves or their community.

The final interactive board of the station presented urban greening strategies from other areas. Using stickers, participants voted on which features they wanted to see in their community.

- **URBAN GREENING NEEDS ASSESSMENT** displayed a draft map of greening opportunities in the Helm Ranch, as well as separate board of greening precedents corresponding to the types of potential opportunities in the neighborhood. Participants were asked to mark



the map with sites that they liked or disliked, as well as sites that were not presented but should be considered for greening opportunities.

A second interactive feature at this station asked participants to brainstorm words that they considered to represent their neighborhood and write them inside a blank map of the community. Since implementing urban greening efforts requires community support and endorsement, each neighborhood within the Urban Greening Plan will have a unique character tailored to the community it represents. This free-form activity was intended to provide a way for Helm Ranch residents to start to define their neighborhood in their own terms and provide City Staff with a better understanding of how to shape the plan to match the character of the community.

- **PLANT PALETTE** encouraged participants to think about the style of plant features they wanted to include in their neighborhood. The station included one board representing qualities of different tree types. The exercise did not present specific trees, but rather the general shape and look that the participants wanted to see in the area. Using stickers, participants voted on the qualities that they preferred.

The station also included a second set of boards presenting different views of streets trees and asking participants to vote on their preferred look, including large trees versus small trees and consistent plantings versus diverse species.

The combined Urban Greening and Shaw Avenue station included:

- **CIRCULATION** invited participants to mark a series of maps showing how they move through their neighborhood. The exercise involved three identical maps of the neighborhood, showing streets, schools, community amenities, and major landmarks. On the first map, participants marked areas that they considered dangerous or unsafe in red. On the second map, participants marked the areas where they currently walk or travel to in green. On the third map, participants marked the places where they would like to see improved connections in orange.

An additional circulation board at this station presented different configurations of a conceptual four-lane street in the neighborhood. The new configurations presented opportunities for new plantings and bike lanes. Participants used stickers to vote for their preferred street layout.

The station also presented street layouts and proposed sections for Shaw Avenue. The street design reflected comments from previous community meetings and recommendations for improving pedestrian and multi-modal connections along the Shaw corridor.

The Shaw Avenue stations included:

- **PATTERN BOOK** introduced the proposed urban design interventions for Shaw Avenue, including potential retrofit options



and potential improvement strategies, including construction recommendations and cost estimates. The station included a draft version of the pattern book and encouraged participants to provide feedback on the usability of the product.

- **TIER 1, 2, AND 3 OPTIONS** presented voluntary improvement options for buildings located in the Shaw Avenue zoning overlay. This station provided the big picture vision of the Shaw Avenue improvements and the results of the planning efforts, provided participants with background information on the project and allowed them to ask questions about the process.

In addition to completing the scripted exercises listed above, facilitators at each station also encouraged participants to write comments directly on the boards or recorded their feedback on the exercise. In some situations, participants' responses fell beyond the scope of the exercise; however this input was recorded as a means of tailoring future workshops to residents' concerns.

## RESULTS FROM URBAN GREENING INTERACTIVE STATIONS

### Goals and Strategies

On the board outlining the City's draft goals and strategies, participants indicated support for "Increase Public Health, Community Amenities and Quality of Life," and "Improve Government Operations," as general goals. They also indicated support for "design for minimum maintenance," as a strategy for achieving these goals. Participants also added the following items:

- Electric scooter path
- Plant without creating hiding places
- Code enforcement

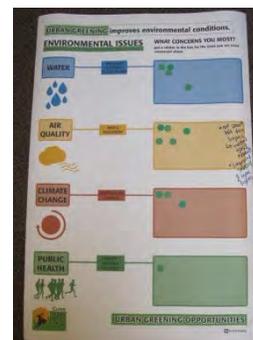
At the environmental issues board, participants voted that air quality was the issue that most concerned them, while water was the second highest concern. Participants also noted on the board that air quality could be improved by installing smart left turn lights at key intersections to reduce the time that cars idle in these areas.

Participants indicated that they preferred "Street Trees and Planting" as potential urban greening strategies. Participants voting for alternative transportation strategies pointed out the need to consider the needs of the community, emphasizing that the population is aging and needs opportunities to get from place to place that are easy, convenient, and not solely targeting highly active modes, such as biking adjacent to moving cars. Other participants added the following strategy considerations:

- Smarter irrigation: mix of perennials and native species,
- Consider safety in plant selection [to avoid creating hiding places].

### Urban Greening Needs Assessment

Utilizing the map of the urban greening needs assessment, participants identified plan options that they liked or other greening opportunities,



including new potential parks at the vacant lots on Willow, Gettysburg, and Santa Ana Avenues, as well as further improvements in the median along Willow Avenue. Participants also indicated new potential projects including improvements along N. Villa Avenue north of Gettysburg Avenue, which was described as blighted. Some participants also wanted to see improvements to the existing San Gabriel Park, writing that it feels unsafe there.

Participants also used the map to list amenities that they would like to see in Helm Ranch but did not identify a space for them. These included:

- More parks
- Covered bus shelters

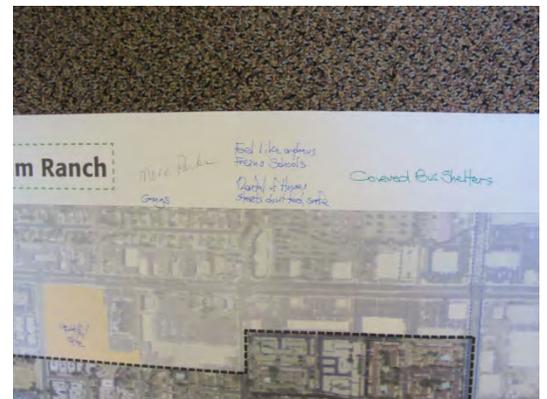
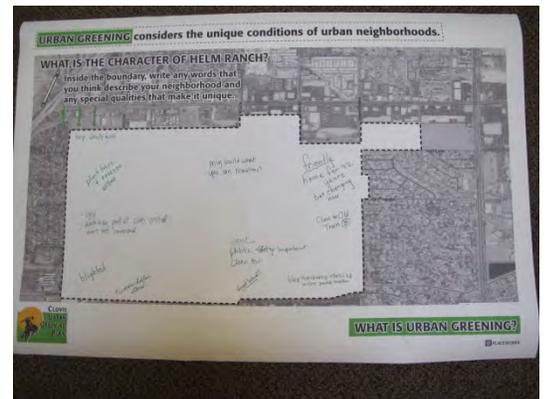
Participants also identified some circulation issues on the urban greening map. The intersection of Peach and Gettysburg Avenues was identified for having accidents and being unsafe and the alley connecting Peach and Gettysburg Avenues was called out for being unsightly.

During the brainstorming exercise for words that represent Helm Ranch, many participants decided to be more specific with their direction for future development in Helm Ranch. From discussion with participants, many felt that their neighborhood could be significantly improved and although some residents provided descriptive terms others preferred to use the activity to voice their concerns. These notes included the following:

- Keep density down
- Plant trees and roses on Willow
- Ugly
- Want to be part of Clovis Unified
- Don't feel connected
- Blighted
- No more dollar stores
- Only build what you can maintain
- Want public safety
- Want clean air
- Great school [Tarpey Elementary School]
- Friendly – home for 42 years but changing now
- Close to Old Town
- Keep maintenance effort up [on] Willow Avenue median

The urban greening map was also used to write down general comments from participants about their neighborhood or words they thought described it. Many of these specifically expressed the frustrations they have with the condition of the neighborhood and an interest in making changes. They included:

- Still waiting
- Gangs
- Fresno schools [Participants felt overlooked because they are not part of the Clovis Unified School District]
- Streets don't feel safe



- Rental of houses
- Citizens keep the weeds down in medians

## Plant Palette

Many of the participants at this station indicated that they did not have a precise preference for the look of streets trees but would simply like to see more; however, they had specific direction for keeping them safe and easy to maintain. Few participants voted on plant type, although some preference was indicated for deciduous trees with red or yellow fall color or large flowers. One participant indicated that conifers that go all the way to the ground are very hard to see around and numerous participants agreed with this concern. Additionally a number of participants agreed that they would prefer trees that minimally upset the sidewalk with its roots.

In the preference for large or small, more participants voted for large trees, although many asked to create a third category for medium trees due to people's concerns about not being able to see past the trees and not creating visual barriers between drivers and streets signs and in areas where people might be able to hide. Again, participants indicated their preference for trees that will not upset the sidewalk with its roots.

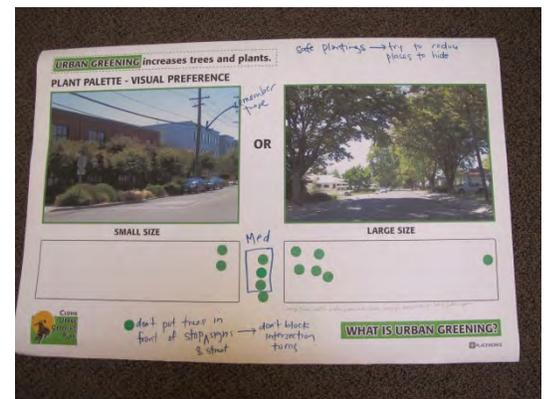
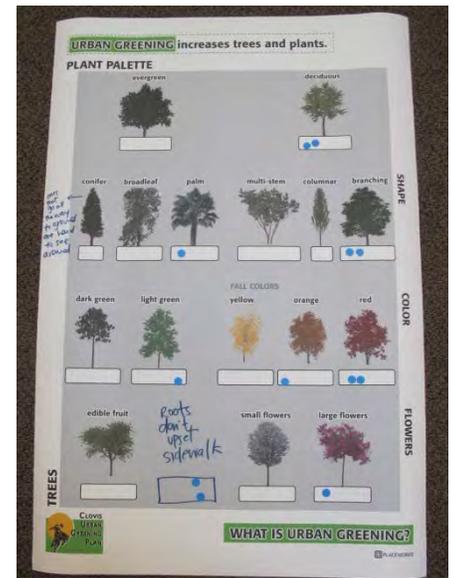
Participants did show a preference for having a mix of different trees as compared to having the same type of tree along a corridor, indicating that it would be preferred to have some variety in both shape and size along the streets. One participant expressed significant concern for the maintenance of the median along Willow Avenue, suggesting that it would be greatly improved by providing some water and creating a vegetated median area.

## Circulation

At the board indicating dangerous streets and areas, participants identified areas where they had safety concerns, as well as areas they believed to need maintenance attention from the City, such as street light replacements or landscaping improvements. Willow, Gettysburg, Peach Avenues, and part of N. Villa were identified as dangerous streets. Participants also identified Shaw Avenue north of Helm Ranch as a dangerous street with pedestrian conflicts with bikes on the sidewalk. The basin park on Minnewawa and Ashlan Avenues was identified as being difficult to access, particularity from the north.

Major areas of concern included the following:

STREET	CONCERN
Intersection of Peach and Gettysburg Avenues	Accidents in the intersection Jaywalking across streets outside of intersections Missing sidewalk Low wattage street lights
Willow Avenue	Needs trees and shrubs Lots of exhaust and fumes at intersection with Shaw Avenue Median improvements do not look maintained Artificial turf in the median is not a good alternative to real vegetation



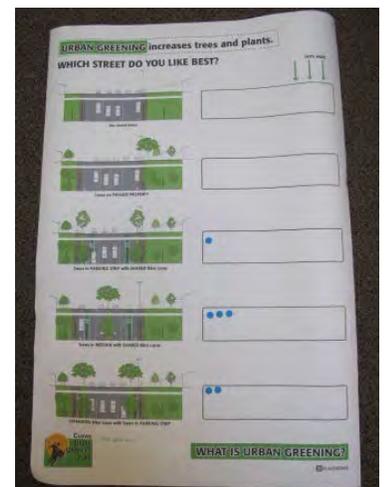
Ashlan Avenue at N. Winery Avenue	Needs trees and shrubs at the entrance to City of Clovis [along irrigation canal]
Minnewawa Avenue	Bikes on sidewalk create conflict with pedestrians Narrow street with high traffic
Median on Peach Avenue between Pico and Santa Ana Avenues	Not maintained by the city

Participants indicated where they liked to walk in green marker and identified the trail along the irrigation channel passing along the northern edge of the basin park at Minnewawa and Ashlan Avenues. The irrigation canal continues to the east towards Fresno, but this trail was not identified. Participants identified Peach Avenue, sections of Willow, Gettysburg, and Santa Ana Avenues, as well as residential east-west connector streets as places where they currently walk. There was a distinctive loop incorporating Gettysburg, N. Villa, W. Santa Ana, Rail and Crescent Avenues, which might make an effective walking circuit if formalized and improved with pedestrian amenities.

Participants noted in orange areas where they would like to walk or areas that could be enhanced to improve the pedestrian experience. Many of the streets indicated as dangerous streets in red, were identified here as places where participants would like to walk, suggesting that residents are not using direct connections within their neighborhood due to safety concerns and that streetscape investment might improve pedestrian quality along these streets. In particular, participants identified Gettysburg Avenue between Helm and Minnewawa Avenues, N. Villa, Peach, Helm, and W. Holland Avenues, as well as a connection to the irrigation trail at the basin park on Minnewawa and Ashlan Avenues.

Very few participants showed preference for any type of street layout with new bike lanes or tree plantings. The greatest preference was to provide shading through a central median and creating shared bike lanes on the street with cars.

As noted, some other circulation issues and recommendations were addressed at the urban greening needs assessment station, described above.



# OLD TOWN ROUND 1 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY

*Weldon Elementary School, Clovis, CA  
May 01, 2014 – 6:30pm-8:30pm*



## SUMMARY

On Thursday, May 01, 2014, staff from the City of Clovis and PlaceWorks facilitated a community workshop aimed at introducing the City's Urban Greening Plan process and getting feedback from participants on their concerns and interest in developing the Plan in Old Town. Approximately 40 (23 signed in) members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and draft goals and strategies identified for the Urban Greening Plan in Clovis.



Following the presentation, participants independently visited four urban greening stations facilitated by staff from the City of Clovis and PlaceWorks. The interactive stations were developed to gain feedback on preliminary urban greening features and community concerns. These stations included:

- **GOALS AND STRATEGIES** presented the draft goals and strategies developed by the City as guidelines for the Urban Greening Plan. Participants were encouraged to read through the goals and provide feedback by writing directly on the list or highlighting components that they agreed or disagreed with.

The station also included an interactive board where participants used stickers to vote on the environmental issues that they considered to be most important to themselves or their community.



The final interactive board of the station presented urban greening strategies from other areas. Using stickers, participants voted on which features they wanted to see in their community.

- **CIRCULATION** invited participants to mark a series of maps showing how they move through their neighborhood. The exercise involved three identical maps of the neighborhood, showing streets, schools, community amenities, and major landmarks. On the first map, participants marked areas that they considered dangerous or unsafe in red. On the second map, participants marked the areas where they currently walk or travel to in green. On the third map, participants marked the places where they would like to see improved connections in orange.



- **URBAN GREENING NEEDS ASSESSMENT** displayed a draft map of greening opportunities in Old Town, as well as separate board of greening precedents corresponding to the types of potential opportunities in the neighborhood. Participants were asked to mark the sites that they liked or disliked, as well as mark any sites that were not presented but should be considered for greening opportunities.

A second interactive feature at this station asked participants to brainstorm words that they considered to represent their neighborhood and write them inside a blank map of the community. Since implementing urban greening efforts requires community support and endorsement, each neighborhood within the Urban Greening Plan will have a unique character tailored to the community it represents. This free-form activity was intended to provide a way for Old Town residents to start to define their neighborhood in their own terms and provide City Staff with a better understanding of how to shape the plan to match the character of the community.

- **PLANT PALETTE** encouraged participants to think about the style of plant features they wanted to include in their neighborhood, as well as the layout of their streets. The station included one board representing qualities of different tree types. The exercise did not present specific trees, but rather the general shape and look that the participants wanted to see in the area. Using stickers, participants voted on the qualities that they preferred.

The station also included a second set of boards presenting different views of streets trees and asking participants to vote on their preferred look, including large trees versus small trees and consistent plantings versus diverse species.

The final board at this station presented different configuration of a conceptual four-lane street in the neighborhood. The new configurations presented opportunities for new plantings and bike lanes. Participants used stickers to vote for their preferred street layout.

In addition to completing the scripted exercises listed above, facilitators at each station also encouraged participants to write comments directly on the boards or recorded their feedback on the exercise. In some situations, participants' responses fell beyond the scope of the exercise; however, this input was recorded as a means of tailoring future workshops to residents' concerns.

There were two additional stations presenting other planning efforts impacting Old Town other than the Urban Greening Plan. One station presented the site design concept for Centennial Plaza. The other presented an update on the Central Clovis Specific Plan and offered community members the opportunity to sign up as members of the technical advisory committee for this plan.





Participants used orange to show the areas where they would like to walk or areas that could be enhanced to improve the pedestrian experience. In addition to some residential streets, participants identified irrigation canals that are not currently being used for urban trails as well as access points to trail to the north. One participant identified the need for a buffer to reduce freeway noise from SR168.

Some other circulation issues and recommendations were addressed at the urban greening needs assessment station. See below.

## Urban Greening Needs Assessment

Utilizing the map of the urban greening needs assessment, participants identified plan options that they liked or other greening opportunities, including transforming the irrigation canal trail along Letterman Park into a paved trail and a new paved trail along the irrigation canal in the center of the neighborhood. Participants also identified an opportunity for residential street tree plantings in the southeastern part of the neighborhood and an opportunity for a entry gateway along Clovis Avenue as people enter Old Town.

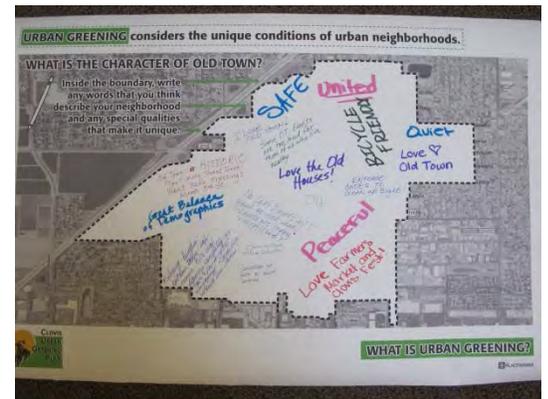
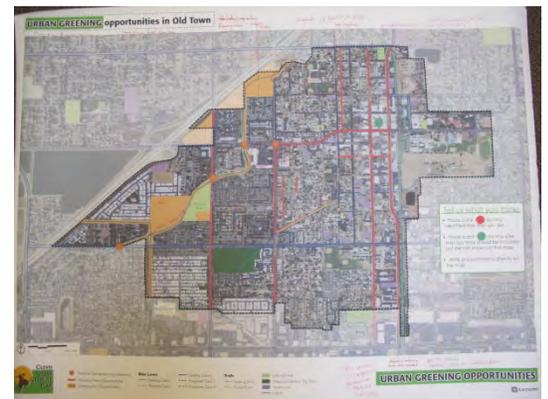
Participants also used the map to list amenities that they would like to see in Old Town but did not identify a space for them. These included:

- Places to eat [outside] downtown
- Places to rent for parties/reunions

Some participants also identified some circulation issues on the urban greening map including new sidewalks throughout the community and safer street crossing on Sierra Avenue between Dewitt and Wentworth.

For the brainstorming exercise for words that represent Old Town, participants wrote the following:

- Safe
- I love Old Town!
- Old Town is HISTORIC. Plant more street trees. Want safe crossings across 5<sup>th</sup> Street.
- Some O[lid] T[own] events are too loud for those of us who live nearby.
- Love the old houses
- Great balance of demographics
- No leaf blowers in O[lid] T[own] should be used when residents are trying to sleep (3am)
- Cleanup the Post Office grounds
- Downtown not quite so tourist oriented
- Relaxing- benches- outdoor tables – safe – music. Ban leaf blowers completely. We have and pay for street sweeping. Gardeners should use rakes!
- Peaceful
- Love farmers' market and Clovis Fest
- Bicycle friendly
- United



- Enforce codes to clean up blight!
- Quiet
- Love Old Town
- Old

## Plant Palette

Most of the participants indicated a preference for larger tree on the streets in Old Town, with a number of participants providing anecdotal information about the importance of trees to provide shade and make their yards more hospitable in the summer months. Many participants indicated that their large trees or the large trees on their streets have been removed recently and replaced with younger, less developed trees, providing less shade benefit. They indicated the need to stagger planting of large trees to provide a more consistent coverage over a longer period of time. One participant did indicate that they thought smaller sized trees are more appropriate for the business areas since they provide more of an urban feel.

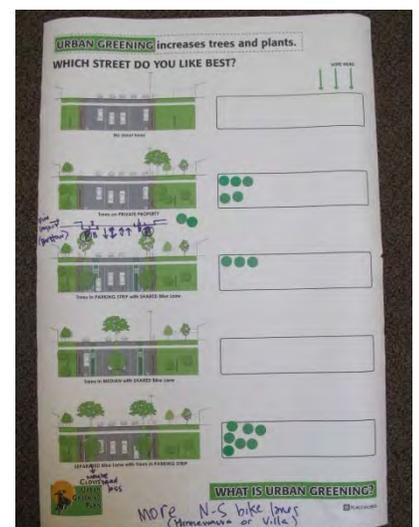
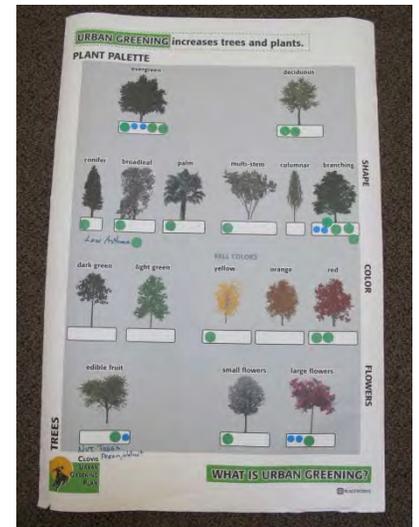
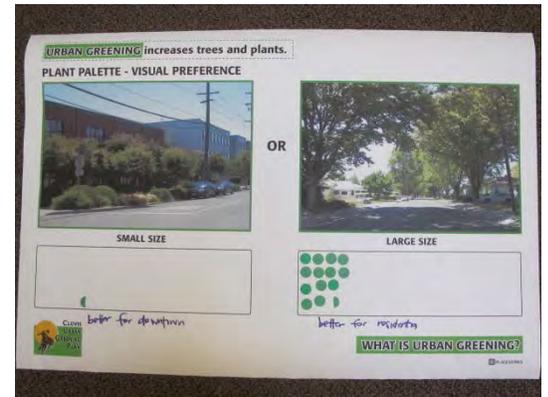
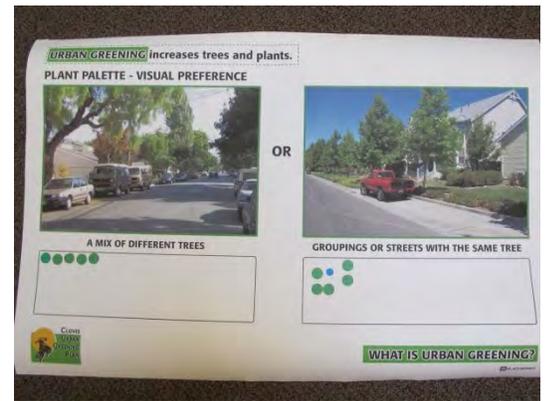
Participants did not show a preference for having a mix of different trees as compared to having the same type of tree along a corridor.

In terms of tree style and form, participants showed the most support for evergreen trees with large, branching shapes. Some participants expressed interest for trees with large flowers and nut trees, such as pecan or walnut. One participant pointed out the need to consider low-pollen trees that are less problematic for people with allergies or asthma.

Many participants expressed interest in a streetscape layout with separated bike lanes. One participant who does not bike indicated that they preferred the separated option because they felt like they were more likely to hit cyclists who used the street with cars and that this was a safer option. While another participant who bikes frequently indicated that they found the on-street bike lanes to be perfectly suitable for biking, and indicated that there was no need for separated lane. The participant who bikes frequently did indicate that there was a need for more north-south bike connections, other than the Old Town Trail, which is difficult to connect to from all arterial streets. Participants also indicated that they liked the option with increased trees on private property.

In the discussion of plants and trees in Old Town, participants also brought up the following issues or interests:

- Lack of maintenance of new city trees (particularly on Cherry Lane [where the participant lives]) and there need to be a process for getting the trees established and healthy,
- New trees have been planted on top of the roots of dead trees which has caused structural issues for the new trees, which seem to not be growing well,



- Since this is an older neighborhood (1950s), many of the city trees are at the end of their life. It is time to phase in new drought tolerant trees to replace the ones that are dying out,
- There should be no trees or bushes on the corner that may block drivers' vision of street signs or traffic,
- Tree trunks seem to be getting "strangled" by those iron grates at sidewalk level,
- Low growth ("suckers") often need trimming on trail trees and others around town.

ISSUES (plant palette & street trees)  
 + lack of maintenance  
 of NEW CITY TREES (cherry Lane)  
 → need process for establishing  
 + new trees planted on top of  
 roots of dead tree  
 ↳ need better planting  
 strategy.

Old  
 neighborhood  
 1950s city trees at end of  
 life — phase in new drought tolerant  
 trees.

**NO trees on corners that  
 may block a drivers vision  
 of bushes.**

Tree (trunks) seem to be getting "strangled"  
 by those iron grates at sidewalk level.  
 Low growth (suckers) often need trimming on  
 Trail Trees and others around town.

PLANT PALETTE & STREET TREES

# LOMA VISTA ROUND 1 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY

*Reagan Elementary School, Clovis, CA  
May 14, 2014 – 6:30pm-8:30pm*



## SUMMARY

On Wednesday, May 14, 2014, staff from the City of Clovis and PlaceWorks facilitated a community workshop aimed at introducing the City's Urban Greening Plan process and getting feedback from participants on their concerns and interest in developing the Plan in Loma Vista. Approximately 30 (16 signed in) members of the public, including approximately 10 youth from a local boy scout troop, attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and draft goals and strategies identified for the Urban Greening Plan in Clovis.

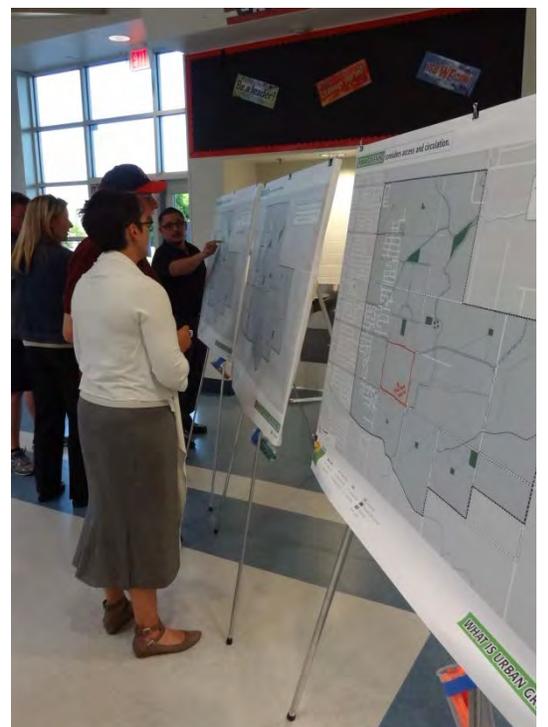
Following the presentation, participants independently visited four urban greening stations facilitated by staff from the City of Clovis and PlaceWorks. The interactive stations were developed to gain feedback on preliminary urban greening features and community concerns. These stations included:

- **GOALS AND STRATEGIES** presented the draft goals and strategies developed by the City as guidelines for the Urban Greening Plan. Participants were encouraged to read through the goals and provide feedback by writing directly on the list or highlighting components that they agreed or disagreed with.

The station also included an interactive board where participants used stickers to vote on the environmental issues that they considered most important to themselves or their community.

The final interactive board of the station presented urban greening strategies from other areas. Using stickers, participants voted on which features they wanted to see in their community.

- **CIRCULATION** invited participants to mark a series of maps showing how they move through their neighborhood. The exercise involved three identical maps of the neighborhood, showing streets, schools, community amenities, and major landmarks. On the first map, participants marked areas that they considered dangerous or unsafe in red. On the second map, participants marked the areas where they currently walk or travel to in green. On the third map, participants marked the places where they would like to see improved connections in orange.



This station additionally included a board intended to gauge preference for trail design. Loma Vista was designed to include a large number of pedestrian routes and paseos to travel within the residential neighborhoods within the larger Loma Vista community. As the community grows, the plan calls for new trails and this board presented three types of trails that could be incorporated into new development: an open-air trail traveling along an irrigation canal; an enclosed, concrete paseo with lawn and trees; and a semi-enclosed concrete paseo with increased groundcover, shrubs and openings for residences along the trail.



- **URBAN GREENING NEEDS ASSESSMENT** displayed a draft map of greening opportunities in Loma Vista, as well as a separate board of greening precedents corresponding to the types of potential opportunities in the neighborhood. Participants were asked to mark the sites that they liked or disliked, as well as mark any sites that were not presented but should be considered for greening opportunities.

A second interactive feature at this station asked participants to brainstorm words that they considered to represent their neighborhood and write them inside a blank map of the community. Since implementing urban greening efforts requires community support and endorsement, each neighborhood within the Urban Greening Plan will have a unique character tailored to the community it represents. This free-form activity was intended to provide a way for Loma Vista residents to start to define their neighborhood in their own terms and provide City Staff with a better understanding of how to shape the plan to match the character of the community.



- **PLANT PALETTE** encouraged participants to think about the style of plant features they wanted to include in their neighborhood, as well as the layout of their streets. The station included one board representing qualities of different tree types. The exercise did not present specific trees, but rather the general shape and look that the participants wanted to see in the area. Using stickers, participants voted on the qualities that they preferred.

The station also included a second board presenting different views of streets trees and asking participants to vote on their preferred look, including large trees versus small trees and consistent plantings versus diverse species.



The final board at this station presented different configuration of a conceptual four-lane street in the neighborhood, such as Gettysburg or Ashlan Avenue. The new configurations presented opportunities for new plantings and bike lanes. Participants used stickers to vote for their preferred street layout.



In addition to completing the scripted exercises listed above, facilitators at each station also encouraged participants to write comments directly on the boards or recorded their feedback on the exercise. In some situations, participants' responses fell beyond the scope of the exercise; however, this input was recorded as a means of tailoring future workshops to residents' concerns.

Since Loma Vista is in the midst of development, many residents were curious about future growth and development plans. The City brought the final land use map for the area, as well as some conceptual renderings of future green space, including the Central Green, to discuss with the residents.

## RESULTS FROM INTERACTIVE STATIONS

### Goals and Strategies

On the board outlining the City's draft goals and strategies, participants only added one additional comment: lights should be added to the public picnic shelter in Los Arbolitos Park.

At the environmental issues board, participants voted that air quality was the issue that most concerned them, while water was the second highest concern. Climate change and public health received very few votes.

Participants voted significantly for "Parks and Open Space" as potential urban greening strategies that they preferred; however participants pointed out that many of the existing parks were turning brown from lack of water and were not valuable open spaces. Additionally, participants noted that they would like to see a mix of park sizes and that it would be nice if some of the parks emphasized fitness or provided opportunities for exercise. "Alternative Transit" received the second highest vote, with one resident noting that the City should build on the momentum for alternative transit that they have built through the bike lane program and another resident recommending a "Bike Buddies" program.

### Circulation

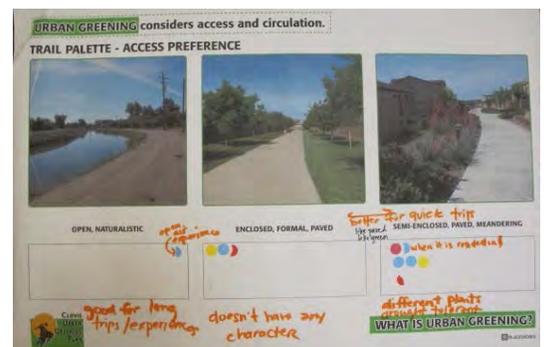
At the board indicating dangerous streets and areas, participants identified major concerns as: need for wider sidewalks, lack of crosswalks across major streets, traffic light timing not providing enough time to cross large streets, and bike lane right-of-way not being honored by motorists.

Major areas of concern included the intersection of North Locan Avenue and East Barstow Avenue, as well as the lengths of East Barstow and Ashlan Avenues.

Participants indicated where they liked to walk in green marker and identified most of the internal paseos and sidewalk trails within the developed residential areas, suggesting that they are happy with this system. Participants also identified De Wolf Avenue as a street that they walk on, as well as the trail along the irrigation canal to the south of the neighborhood.

Participants used orange to show the areas where they would like to walk or areas that could be enhanced to improve the pedestrian experience. Participants marked some sidewalk areas that have not yet been completed in the development, as well as sections of the irrigation canal outside of the areas where residential development has been constructed.

On the trail preferences board, the majority of participants selected the semi-enclosed paseo, stating that it allows more opportunity to get on and off the trail and also provides a more interesting view for the trail user. One participant did indicate that she would enjoy the open trail if it were not in a



residential area and that it might be an opportunity for a park located adjacent to an irrigation canal.

## Urban Greening Needs Assessment

Participants did not identify any projects that they supported on the urban greening needs assessment map nor any new projects to explore. They did use the map to discuss future development needs and maintenance they would like to see in the neighborhood, including:

- Well planned neighborhoods
- Bigger parks
- Curvilinear streets
- Quality development and quality apartments
- Elementary schools should have higher basketball hoops so that older youth and adults can play after hours
- Trees are too close to median and sides along Temperance Avenue

One participant suggested that the City look at examples of low water-use plant palettes in developing the landscape schemes for Loma Vista. They suggested looking at the cacti garden at “Ethel M” Chocolate factory in Henderson, NV, a publically accessible desert-style botanial garden.

Only one person participated in the brainstorming exercise for words that represent Loma Vista. They wrote the following:

*My neighborhood is Loma Vista. I really like the bike trails. I often find myself wanting to go outside and bike, although in summertime, because of the heat, it is hard because not many trees are quite large enough to keep cool.*

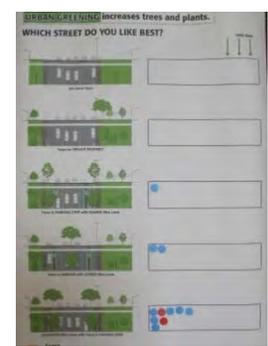
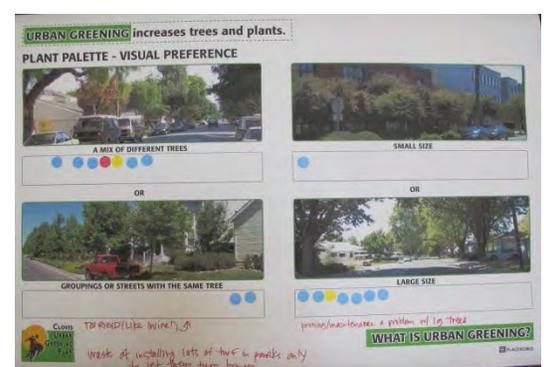
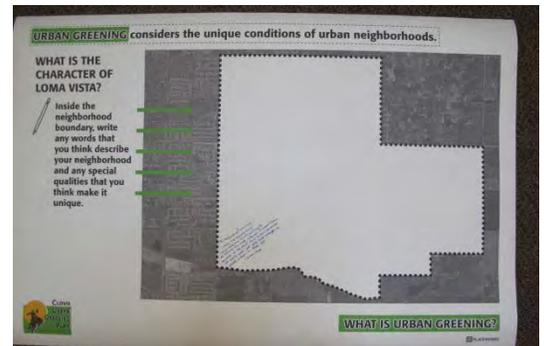
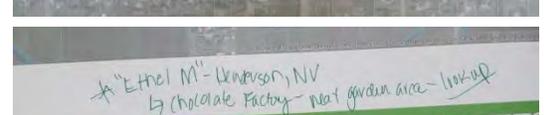
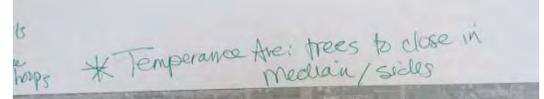
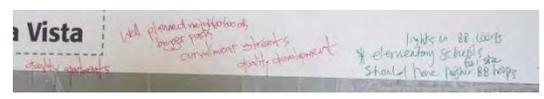
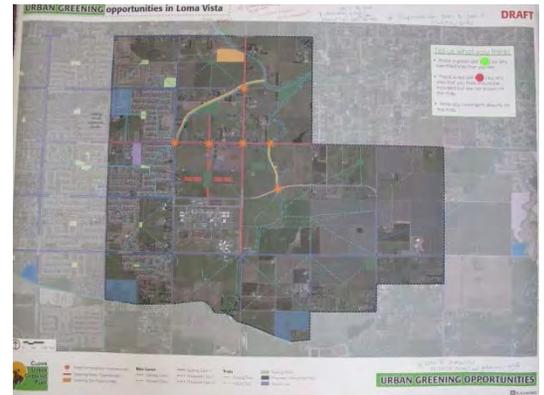
- Braden Pope.

## Plant Palette

Most of the participants indicated a strong preference for larger trees on the streets in Loma Vista, although some participant emphasized the extra need for maintenance and pruning on larger trees. Participants also indicated a strong preference for using a variety of different tree types, indicating that using too many of the same tree makes a neighborhood look “rigid.”

One participant additionally made a note on the visual preference board that is a waste of resources to install “lots of turf in parks only to let them turn brown.”

In terms of tree style and form, participants showed equal support for evergreen trees and deciduous ones. Participants did not bring up the issue that trees that grow all the way to the ground produce safety concerns, although they did indicate that they preferred broadleaf evergreen trees rather than conifers, suggesting that this could be an issue. Participants showed some preference for branching forms and trees with red or orange fall foliage, edible fruit and small or large flowers.



Many participants expressed strong preference for streetscapes with bike lanes separated from traffic with a planted buffer. The designs with no bike lanes received no votes, while the planted center median was slightly preferred to the planted median at the edge of the street.

# NORTHWEST ROUND 1 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY

*Clovis North High School, Fresno, CA  
May 15, 2014 – 6:30pm-8:30pm*



## SUMMARY

On Thursday, May 15, 2014, staff from the City of Clovis and PlaceWorks facilitated a community workshop aimed at introducing the City's Urban Greening Plan process and getting feedback from participants on their concerns and interest in developing the Plan in Northwest Clovis, further referred to here as "Northwest." Approximately 15 (14 signed in) members of the public or representatives from the development community attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and draft goals and strategies identified for the Urban Greening Plan in Clovis.

Following the presentation, participants independently visited four urban greening stations facilitated by staff from the City of Clovis and PlaceWorks. The interactive stations were developed to gain feedback on preliminary urban greening features and community concerns. These stations included:

- **GOALS AND STRATEGIES** presented the draft goals and strategies developed by the City as guidelines for the Urban Greening Plan. Participants were encouraged to read through the goals and provide feedback by writing directly on the list or highlighting components that they agreed or disagreed with.

The station also included an interactive board where participants used stickers to vote on the environmental issues that they considered most important to themselves or their community.

The final interactive board of the station presented urban greening strategies from other areas. Using stickers, participants voted on which features they wanted to see in their community.

- **CIRCULATION** included a board with a map of Northwest and the surrounding areas, including downtown Clovis and the roads up to the foothills. Participants used a green marker to show the areas where they currently walk or bike, both inside and outside of Northwest. On the same map, participants used an orange marker to mark the places that they would like to walk or think will be future connections through the neighborhood. Participants additionally used a black marker to indicate areas where it was difficult to walk or potential circulation issues.



This station additionally included a board intended to gauge preference for trail design. New residential developments in Clovis have emphasized new pedestrian routes and paseos. Furthermore, Northwest is currently an active center for bicycling and is located along the popular cycling route from Clovis to the Sierra foothills. As development occurs in Northwest, the role of cycling and space for pedestrian passages will need to be considered and new trails and will serve a vital role. This board presented three types of trails that could be incorporated into new development: an open-air trail traveling along an irrigation canal; an enclosed, concrete paseo with lawn and trees; and a semi-enclosed concrete paseo with increased groundcover, shrubs and openings for residences along the trail.

- **URBAN GREENING NEEDS ASSESSMENT** displayed a draft map of greening opportunities in Northwest, as well as separate board of greening precedents corresponding to the types of potential opportunities in the neighborhood. Participants were asked to mark the sites that they liked or disliked, as well as mark any sites that were not presented but should be considered for greening opportunities.

A second interactive feature at this station asked participants to brainstorm words that they considered to represent their neighborhood and write them inside a blank map of the community. Since implementing urban greening efforts requires community support and endorsement, each neighborhood within the Urban Greening Plan will have a unique character tailored to the community it represents. This free-form activity was intended to provide a way for Northwest residents to start to define their neighborhood in their own terms and provide City Staff with a better understanding of how to shape the plan to match the character of the community. Since Northwest has not yet been branded with a new development identity, this board also served as way to get inspiration for new themes.

- **PLANT PALETTE** encouraged participants to think about the style of plant features they wanted to include in their neighborhood, as well as the layout of their streets. The station included one board representing qualities of different tree types. The exercise did not present specific trees, but rather the general shape and look that the participants wanted to see in the area. Using stickers, participants voted on the qualities that they preferred.

The station also included a second board presenting different views of streets trees and asking participants to vote on their preferred look, including large trees versus small trees and consistent plantings versus diverse species.

The final board at this station presented different configurations of a conceptual four-lane street in the neighborhood, such as Shepherd Avenue or the future layout of Minnewawa Avenue. The new configurations presented opportunities for new plantings and bike lanes. Participants used stickers to vote for their preferred street layout.



In addition to completing the scripted exercises listed above, facilitators at each station also encouraged participants to write comments directly on the boards or recorded their feedback on the exercise. In some situations, participants' responses fell beyond the scope of the exercise; however, this input was recorded as a means of tailoring future workshops to residents' concerns.

Since Northwest is currently in the planning stages for future development, many residents were curious about growth and development plan, as well as the timeline for receiving City services, such as water and sewage. The City brought the most recent draft land use map of the area to discuss the proposed development with the residents.

## RESULTS FROM INTERACTIVE STATIONS

### Goals and Strategies

On the board outlining the City's draft goals and strategies, participants showed support for a number of the greening strategies. They highlighted the following strategies and made notes, presented in brackets below, to further expand on the concept:

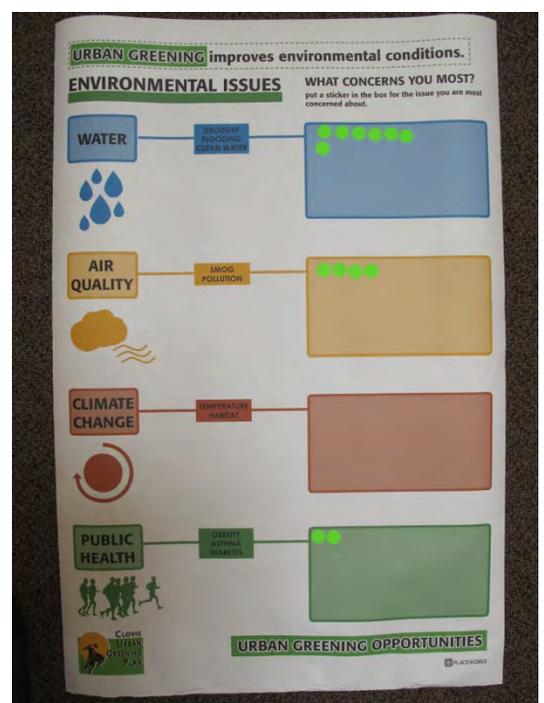
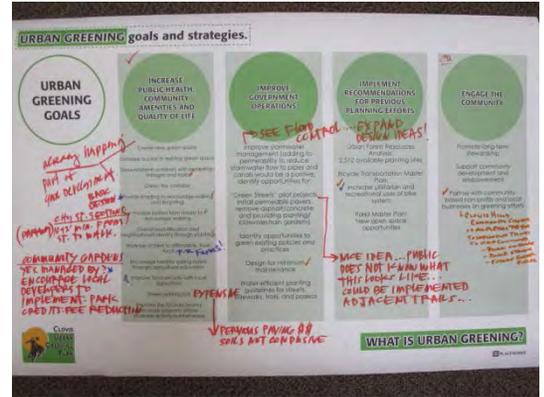
- Draw residents outdoors with pedestrian linkages and trails [Already happening. Part of good development.]
- Provide shading to encourage walking and bicycling [Basic design.]
- Overall beautification and neighborhood identity through planting
- Increase access to affordable fresh food [public relations for farms!]
- Improve stormwater management [See flood control...expand design ideas!]
- "Green Streets" pilot projects. Install permeable pavers, remove asphalt/concrete and provide planting/bioswales/rain gardens [Nice idea...public does not know what this look like...could be implemented adjacent to trails]
- Design for minimum maintenance
- Bicycle Transportation Master Plan: Increase utilitarian and recreational uses of bike system
- Partner with community-based non-profits and local businesses on greening efforts [Clovis Hills Community Church]
- Increase activity on and around affected corridors
- Pedestrian access from residential neighborhoods to everyday goods and services
- Improve air quality
- Promote alternative transit: biking, walking, public transit
- Offset impact of increasing impervious surfaces
- Provide water efficient plant palette for new development

Participants additionally added the following items:

- Community gardens – encourage local developers to implement [and offer] park credits or fee reductions
- Active sports

Participants noted some concerns with some of the goals including:

- High cost of green parking lots
- Limited soil capacity for using pervious paving, which is not very effective in this area



- Reducing vehicle miles traveled for residents is going to be difficult before more commercial development occurs in the north

At the environmental issues board, participants strongly voted that water was the issue that most concerned them, while air quality was the second highest concern. Participants indicated that they preferred “Parks and Open Space” as potential urban greening strategies, while all the other strategies received some smaller percentage of the votes. One participant also indicated the need for space for outdoor activities in Northwest.

## Circulation

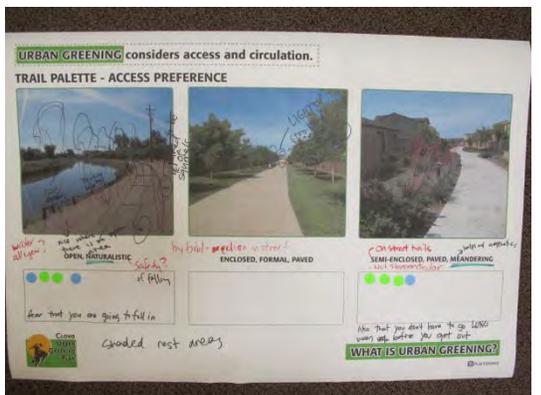
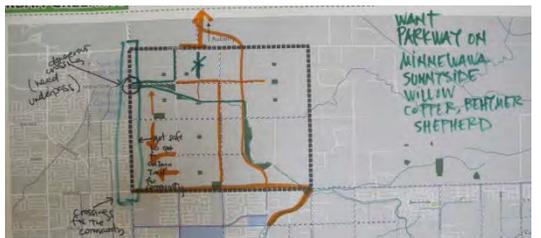
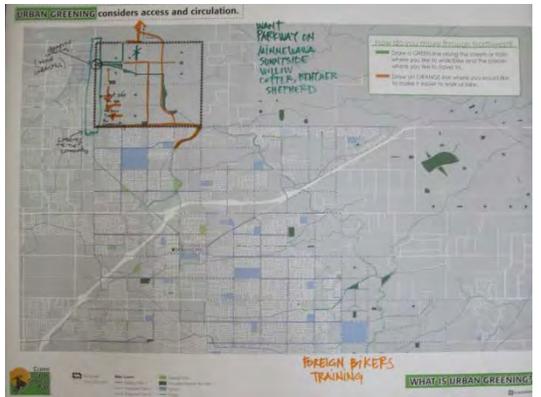
On the map, participants highlighted Willow Avenue as a dangerous crossing in its current state. The Old Town Trail runs along the west side of Willow Avenue and is separated from traffic. Many residents from the east side of Willow Avenue find it extremely difficult to cross the street to get to the trail. They emphasized that as development occurs in this area, there needs to be special crossings or underpasses for residents to connect to the trail. They assume that the Old Town Trail will continue to be an important, alternative transit link to downtown Clovis that needs to be accessible for Northwest residents.

Some participants used the green marker to indicate that they currently walk along the irrigation canal where the proposed trail will pass through the neighborhood. Others also indicated that they walk along E. Behymer around the Clovis Hills Community Church.

Participants noted Minnewawa Avenue as a major pedestrian and bicycle corridor as well as E. Behymer Avenue in orange as opportunities for future pedestrian connections. Numerous participants pointed out the need for a connection to Auberry Road, a popular route for cyclists. One participant noted that there are frequently international cyclists training in the area and as the neighborhood develops it will need to continue to serve as a cycling destination with easy access to popular bike rides. Participants indicated that they would like to see parkways installed along all of the major existing streets, including Minnewawa Avenue, Sunnyside Avenue, Willow Avenue, Copper Avenue, Behymer Avenue, and Shephard Avenue. Since these streets currently exist, or the right-of-way is generally known, planting along these streets could potentially begin before other streets are developed in Northwest and could become established as parkways before residents move to the area.

Some participants representing the development interest in Northwest presented the idea to consider internal pedestrian connectors in the early phases of development to connect residents to the new commercial district in the southwest of the neighborhood.

On the trail preferences board, participants voted equally for open, naturalistic style trails and semi-enclosed, paved, and meandering trails. Many participants emphasized that if the trail goes along an open canal there will need to be significant efforts to ensure that it is safe, including fencing or planted buffer between the pedestrian and the open water. One participant additionally pointed out that a canal trail would need to be paved because squirrels dig holes in the levees and make it unsuitable for biking. For both the open trail and the enclosed one, participants indicated that there should be lighting to ensure that it is usable during the day and evening and that there should be resting places



for people to stop along the way. In considering an enclosed or semi-enclosed trail, a participant indicated that there should be numerous places to get on or off the trail so that a user does not have to go a long way to exit.

## Urban Greening Needs Assessment

Utilizing the map of the urban greening needs assessment, participants indicated that they liked the proposed park located at the corner of Minnewawa and Shepherd Avenues and the greenway park along the irrigation canal, suggesting that it would be a good place for active sports. Participants did not like the proposed park at the end of the intersection of the canal and Willow Avenue and would prefer to see commercial development or multifamily homes there. One of the participants from Clovis Hill Community Church showed preference for a greening opportunity at the church and indicated that they would like to provide community open space. Participants indicated that realigning the connection to Auberry Road from Clovis Avenue could be a new greening opportunity.

Participants also used the urban greening needs assessment map to point out some of the existing landmarks in Northwest, including a historic house along Behymer Avenue and an existing allee of palm trees in the center of the neighborhood.

For the brainstorming exercise for words that represent Northwest, participants wrote some key notes about their neighborhood, as well as some historical information that might be helpful in developing an theme for future growth in Northwest:

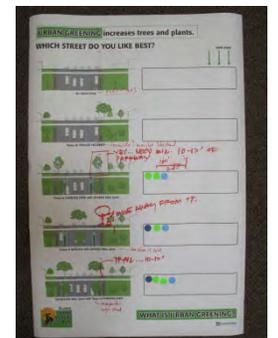
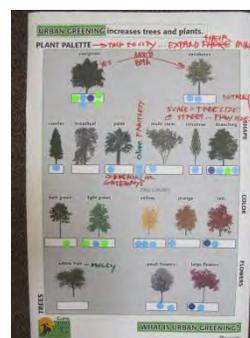
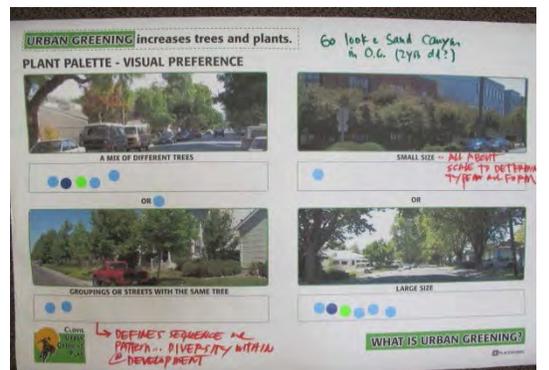
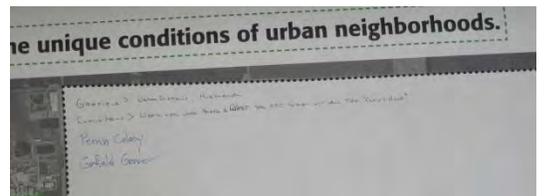
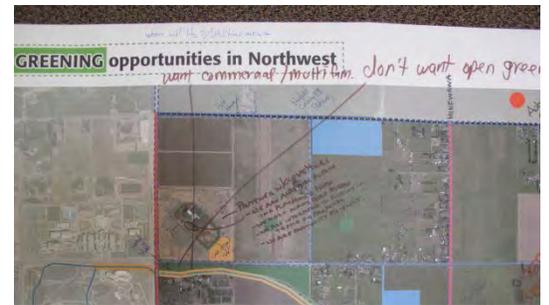
- Garfield Water District, Historical
- Garfield Grove
- Clovis Hills: When you look north and east you see what we call the "Clovis Hills"
- Perrin Colony

## Plant Palette

Most of the participants indicated a preference for larger tree on the streets in Northwest, with one participant emphasizing the need to consider the scale of the surrounding buildings to determine type and form. Participants also showed a preference for having a mix of different trees as compared to having the same type of tree along a corridor, although one participant noted that using the same tree can help to define a sequence or pattern, which might be consistent with Northwest's historic use as orchards.

In terms of tree style and form, participants showed the most support for evergreen trees, with one participant indicating the need for both. Participants preferred branching trees in a variety of colors. One person recommended a fruitless olive tree as a commercial or gateway tree and also indicated a concern for the mess associated with edible fruit trees.

Many participants expressed interest in a streetscape layout with separated bike lanes. Although some participants emphasized that it would only be feasible along larger streets. The streets with no trees or limited trees and no bike lanes did not receive any votes.



**B** URBAN GREENING MASTER PLAN  
Round 2 Workshop Summaries



# HELM RANCH ROUND 2 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY



*Tarpey Elementary School, Clovis, CA  
October 15, 2014 – 6:30pm-8:30pm*

## OVERVIEW

On Wednesday, October 15, 2014, staff from the City of Clovis and PlaceWorks facilitated a second community workshop aimed at re-introducing the City's Urban Greening Plan process, reviewing the outcomes of the previous workshop in May and getting feedback from participants on ideas for sample improvements and potential implementation of the Plan in Helm Ranch. Approximately 3 members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and evolution of the Urban Greening Plan in Clovis.

Following the presentation, participants were engaged in small discussion groups facilitated by staff from the City of Clovis and PlaceWorks. The groups discussed prioritization of types of projects and/or locations for projects and looking at sample project types to help articulate community needs.

## RESULTS FROM SMALL GROUP DISCUSSIONS

### **Priorities**

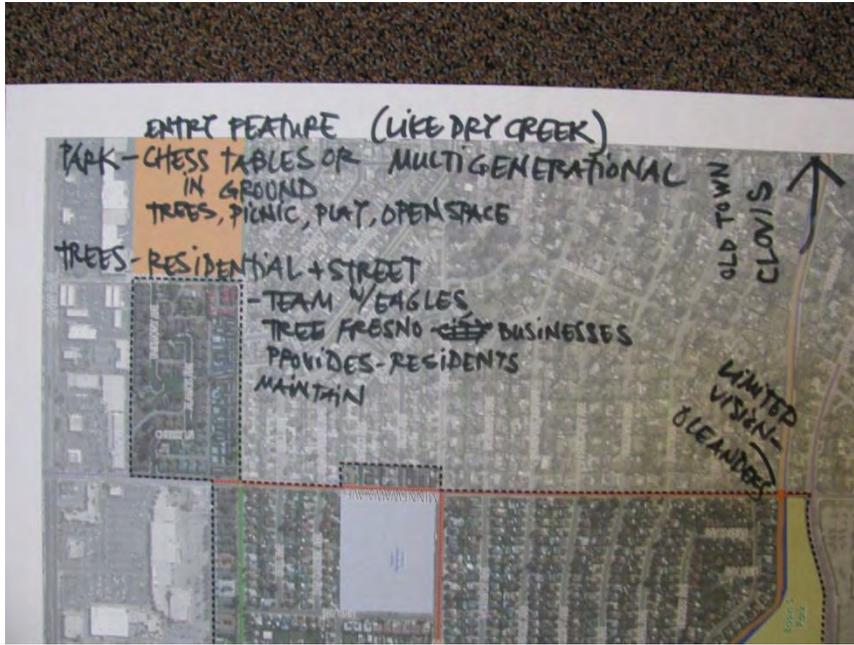
Community members participated in a discussion of possible projects, existing conditions, new developments and their vision for improvements. Maps were marked up and notes were written to capture the main ideas which included prioritizing the following:

- More trees but need to be limbed up for safety and vision
- Median trees along Willow
- Intersection improvements at Rolland Ave and Willow Ave more important than greening between Peach Ave/Villa Ave and Sanata Ana Ave/Rialto Ave
- Trail improvements (e) at drainage basin, level out w/better walking surface
- Intersection @ Peach/Ashlan is busy – needs traffic calming
- Golf course not used/Fresno side of street desirable for walking – work w/them?
- Priority area @ Gettysburg/Peach - use vacant lot to create space for kids to get out of street and kick ball around, keep clear site lines (limb up vegetation), green up the block – high priority
- Low water/low maintenance need plants



Concerns the community would like to see urban greening efforts also address include:

- Blight along Shaw Ave - empty buildings
- Trash/carts in alleys
- No code enforcement
- Lack of ownership with all the apartments
- Water use: pay attention to watering schedules and runoff
- Safety – walk in AM, don't feel safe at night
- San Gabriel Park doesn't feel safe





**URBAN GREENING OPPORTUNITIES**

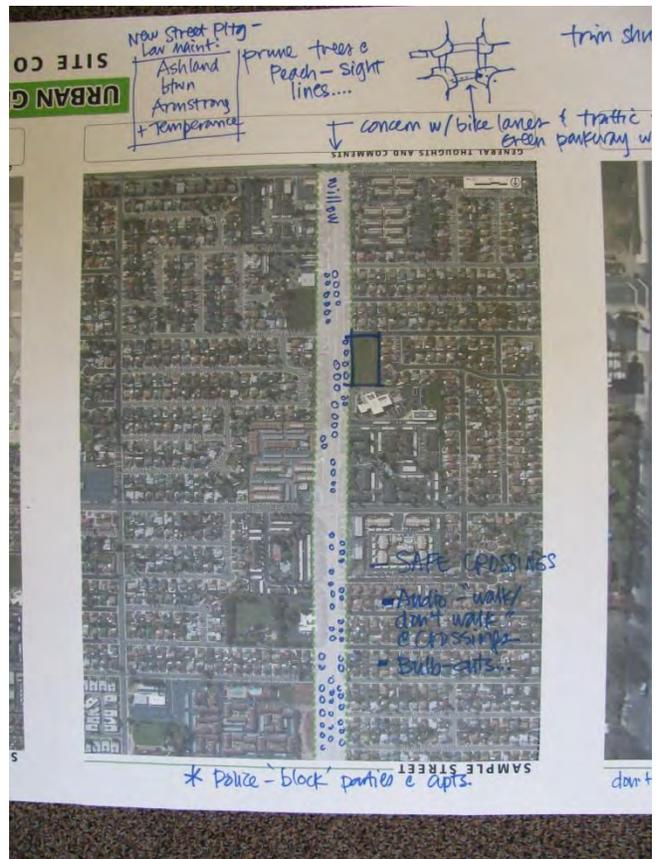
Legend:  
 - Existing Class I Multipurpose Trail  
 - Existing Class II Bike Lane  
 - Open Class  
 - Underground Cais  
 - Proposed Class I Multipurpose Trail  
 - Proposed Class II Bike Lane



## Design: Sample Streetscape

Comments were solicited as to components for streetscapes that would support the City's urban greening efforts. Willow Avenue was used as a sample street to illustrate community wants with stickers of different amenities and notes used to convey their desires. Street designs included the following:

- Explore Shaw – Santa Ana balance traffic and connectivity
- Green Shaw Ave: synchronize the lights, enforce a 35(?) mph speed limit
- Plant street trees along both sides of street corridor
- Landscape the median down the corridor
- Improve crosswalk specifically at intersections with Gettysburg Ave and Ashlan Ave
- Provide new low-maintenance street planting on Ashland between Armstrong and Temperance
- Prune trees around Peach Ave to improve sight lines
- Concern with bike lanes and traffic; a green parkway without losing lanes
- Create safe crossings with the audible “walk/don't walk” and bulbouts to reduce pedestrian crossing distances
- Increase police presence – ‘block’ parties at apartments



## Design: Sample Park Project

An undeveloped parcel along Willow Avenue was identified as potential park land. Priorities for amenities on this site include the following:

- Look at Dry Creek as a good example of what they would like to see
- Program the park to be multigenerational
- Plant species that will attract hummingbirds and butterflies
- Include a picnic shelter and bbq
- Install crosswalks on the perimeter streets for safe accessibility
- Plant street trees around the park perimeter and landscape the median on Willow Ave
- Install pedestrian lighting
- Provide basketball court
- Include playground structure and swings
- Police neighborhood event and opening



trim shrubs

lanes + traffic flow  
green parkway w/o losing lanes

GENERAL THOUGHTS AND COMMENTS



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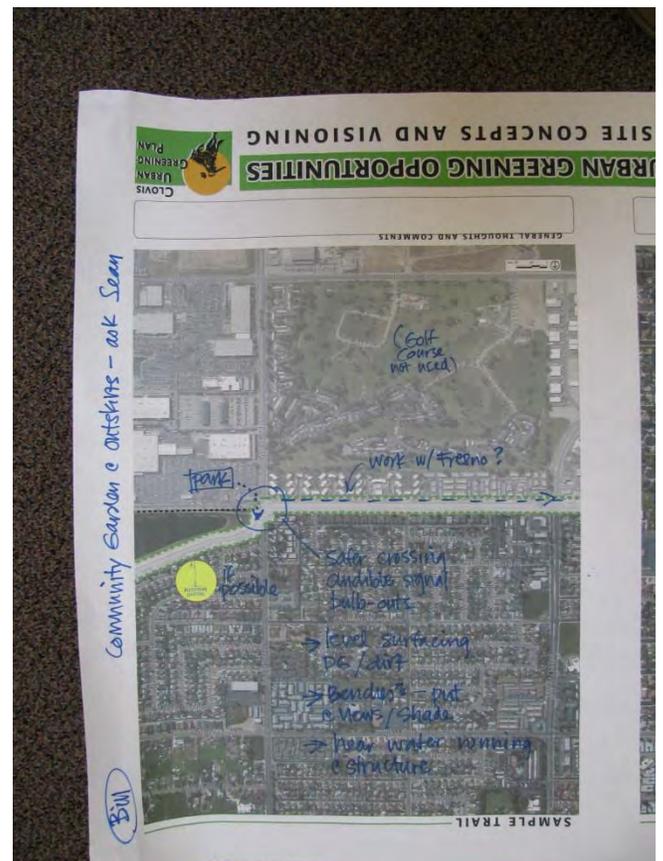
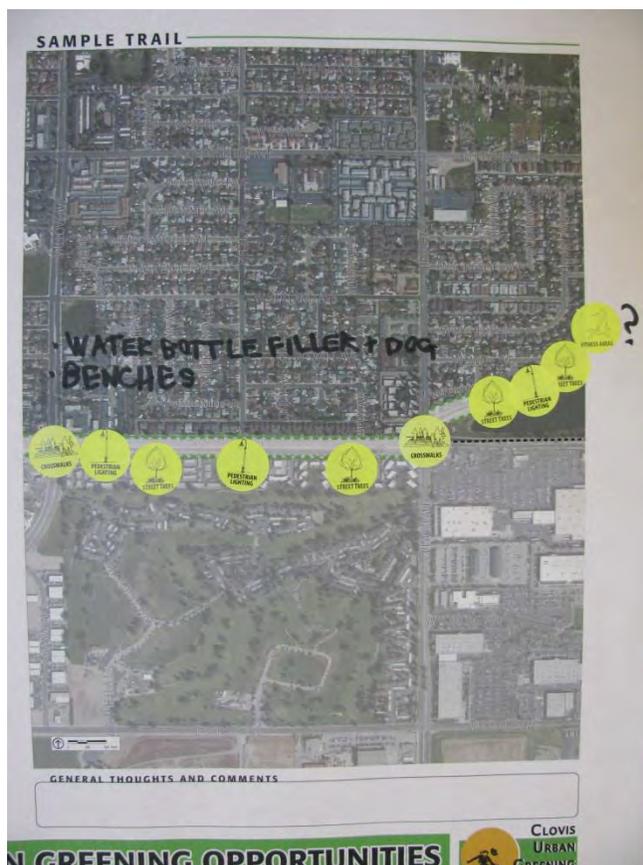
don't know n'hoods...

SAMPLE PARK

# Design: Sample Trail Project

A potential trail was located along a canal and the community recommended the following features:

- Water bottle filler and dog water fountain
- Benches
- Shade – trees or structure
- Crosswalks at Willow Ave and Peach Ave
- Trees and pedestrian lighting along the trail
- Fitness area
- Safer crossing at Peach Avenue with an audible signal and bulbouts to reduce the crossing distance for pedestrians
- Paved with level surfacing, such as decomposed granite or dirt
- Pedestrian lighting



# LOMA VISTA ROUND 2 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY



*Reagan Elementary School, Clovis, CA  
October 8, 2014 – 6:30pm-8:30pm*

## **OVERVIEW**

On Wednesday, October 8, 2014, staff from the City of Clovis and PlaceWorks facilitated a second community workshop aimed at re-introducing the City's Urban Greening Plan process, reviewing the outcomes of the previous workshop in May and getting feedback from participants on ideas for sample improvements and potential implementation of the Plan in Loma Vista. Approximately 8 members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and evolution of the Urban Greening Plan in Clovis.

Following the presentation, participants were engaged in small discussion groups facilitated by staff from the City of Clovis and PlaceWorks. The groups discussed prioritization of types of projects and/or locations for projects and looking at sample project types to help articulate community needs.

## **RESULTS FROM SMALL GROUP DISCUSSIONS**

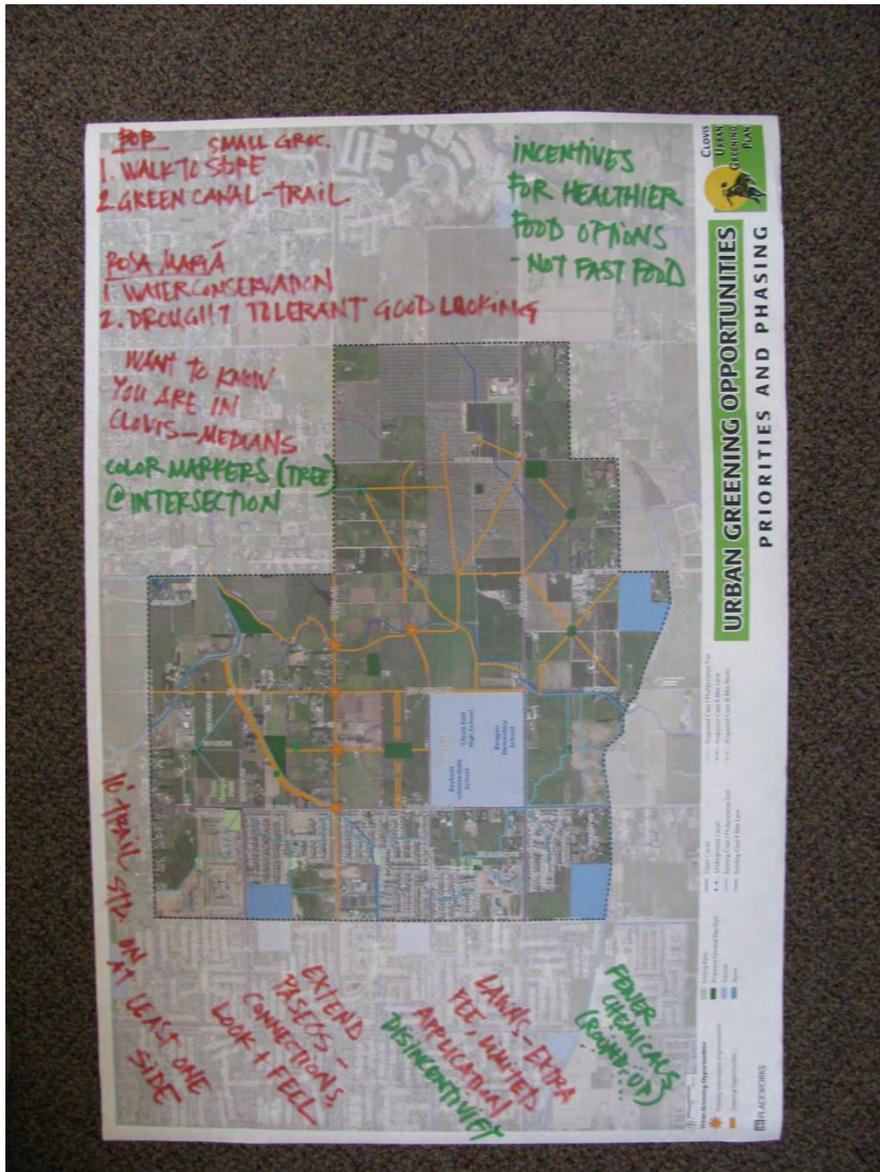
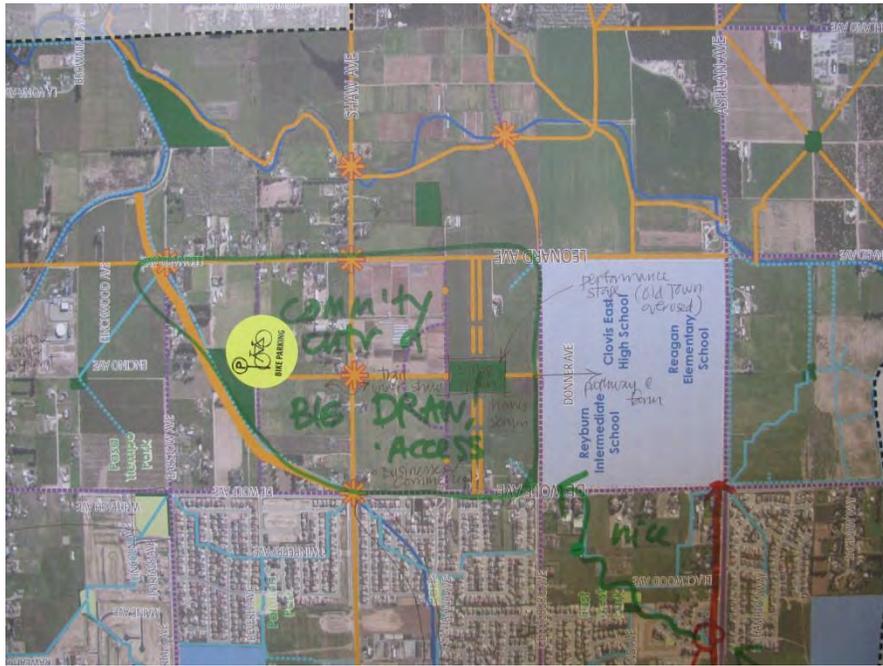
### **Priorities**

Community members participated in a discussion of possible projects, existing conditions, new developments and their vision for improvements. Maps were marked up and notes were written to capture the main ideas which included prioritizing the following:

- Continuing paseos to expand the network of trails and paths
- Adding new or improving existing plantings
- Increasing water conservation with drought tolerant plantings
- Deinsentivizing lawn
- Insentivizing healthier food options – not fast food
- Encouraging stores in walkable distances and locations from residences
- Providing trails along the canals
- Planting trees with seasonal colors at intersections
- Building a community center and village green with stage north of the Reagan Elementary/Clovis East campus
- Providing identification so you know you are now in Clovis



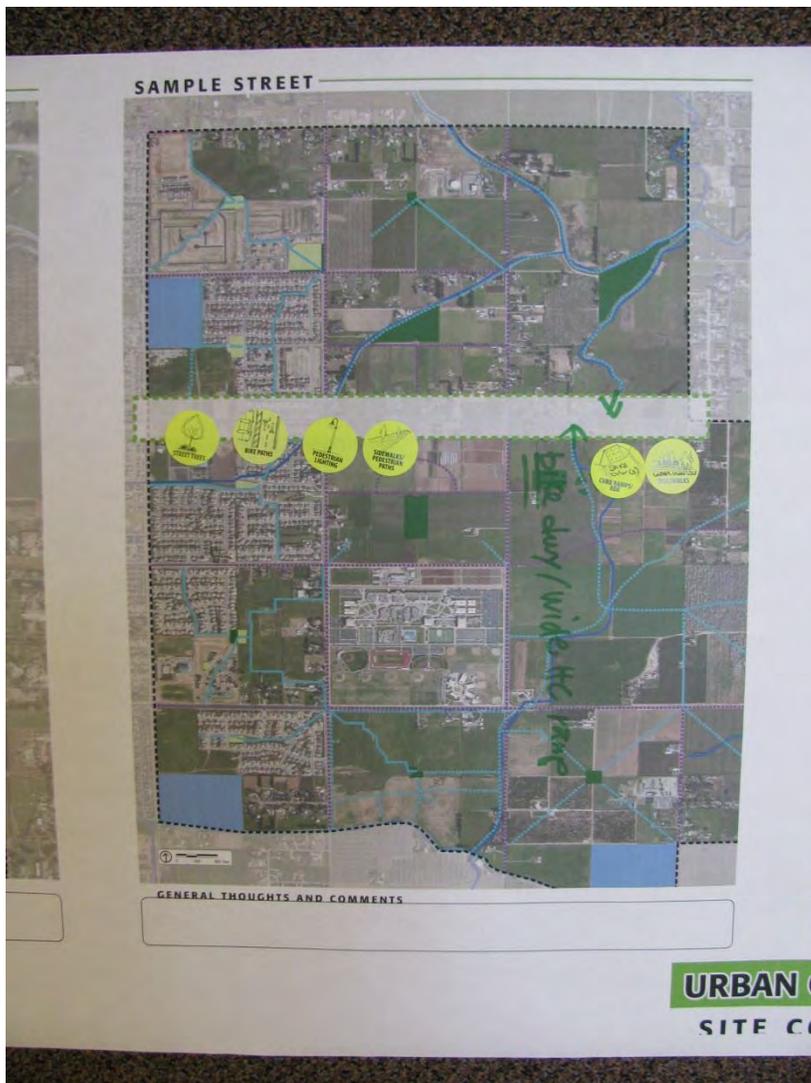




## Design: Sample Streetscape

Comments were solicited as to components for streetscapes that would support the City's urban greening efforts. Shaw Avenue was used as a sample street to illustrate community wants with stickers of different amenities and notes used to convey their desires. Street designs included the following:

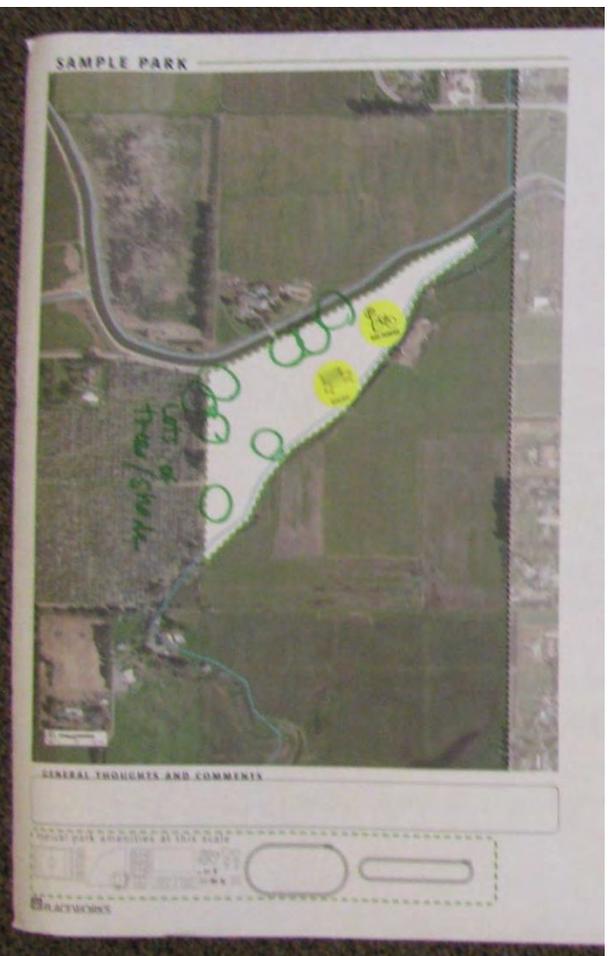
- Give bikes their own ramps/driveway-like to cross street (don't like bumps/HC ramps too small, esp. cross traffic)
- Street Trees
- Pedestrian lights
- Sidewalks/pedestrian paths
- Cross-walks



# Design: Sample Park Project

Land along a canal has been identified as potential park land. Priorities for amenities on this site include the following:

- Lots of trees/shade
- Bike Parking
- Benches
- Measured loop path
- Mix of active and passive recreation
- Potential lighting of fields



# Design: Sample Trail Project

A potential trail alignment was identified and the main discussion centered on wanting the following:

- Benches
- Barriers/signage
- Continuity with existing trails and paseos
- Wayfinding with directions and locations



# NORTHWEST ROUND 2 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY



*Clovis North High School, Clovis, CA  
October 9, 2014 – 6:30pm-8:30pm*

## OVERVIEW

On Thursday, October 9, 2014, staff from the City of Clovis and PlaceWorks facilitated a second community workshop aimed at re-introducing the City's Urban Greening Plan process, reviewing the outcomes of the previous workshop in May and getting feedback from participants on ideas for sample improvements and potential implementation of the Plan in Helm Ranch. One member of the public attended the meeting and was only able to stay for 15 minutes so we have a minute update of the process to date and overview, and then engaged in a dialogue about their ideas for the Northwest. City staff remained at the table and we had a group discussion looking at the area and came up with ideas based on what City staff had heard from the community over the years and what they envisioned for the area. Given the low turnout, the City emailed attendees from the Round 1 Community Workshop, provided a link to access the PowerPoint, and asked for them to forward to others and provide comments to the following three questions:

1. What are your priorities for urban greening in Northwest Clovis? Is it street improvements, trail connections, intersection improvements, new parks, or other ideas? Are there specific locations that are more important than others or specific types of improvements (parks, streets, trails) that are more important? Which improvements are most important to you?
2. What kind of amenities do you want to see in a new park, new streetscape, or a new trail? Trees, planted medians, improved crosswalks, separated trail from road, lighting, passive or active recreation, benches, fitness areas, paseos, community gardens, shade structures, bus shelters, playgrounds, natural open spaces, plazas, outdoor theater, vegetative buffers, drought tolerant plantings, public art, others?
3. What should the Northwest be identified as? The area has been called Northwest because it is geographically northwest of Old Town but should it have a different name? And, if so, what should it be called or be branded as? The City is interested in creating/identifying communities such as Harlan Ranch: A Clovis Community or Loma Vista: A Clovis Community. What should the Northwest be and what should represent it? Different suggestions for names include: Garfield District, Garfield Grove, Perrin Colony, and Clovis Hills; suggested graphic identification include some combination of foothills, agriculture, and the historic Garfield Elementary brick archway (corner of Shepherd and Minnewawa). What ideas do you have?



The following is a summary of all the comments received whether in person, by phone, or email.

## Priorities and Naming

Priorities for greening in Northwest include the following:

- Greenway or bikeway that connects the academic campuses with Old Town, perhaps along International and Minnewawa Avenues
- Separated bikeways at major intersections – consider undergrounding the crossings
- Bike trail network
- Complete, green streets that prevent speeding and have trees in medians and along the sidewalks
- Parks interconnected with wide bike lanes and walking/jogging trails
- Trees – plant more and try to get street trees in early so they are established by the time development comes
- Gateway Entry/Park @ old Garfield site – the brick archway is iconic and should be incorporated into some public facility
- Traffic calming on Willow near International
- Incorporation of surface water treatment plants and ground water recharge
- Very drought resistant landscaping

There was some discussion about what to name the area as Northwest refers to the geographic location. Some of the suggested names for the area include:

- Garfield
- Clovis Hills
- Perrin Colony
- Garfield Grove
- Garfield District
- Something related to the former Big Creek Train Depot or other historic association in the area

The brick gateway remnant at Shepherd and Minnewawa is frequently noted as an iconic structure in the area that could/should be associated with the planning area.

The community has indicated a strong preference for something that draws on the agricultural heritage of the area and something that helps them stand out as a unique Clovis community. A name for the area will be developed in the future by the City and/or in collaboration with developers as projects move forward.

## Design: Sample Streetscape

Comments were solicited as to components for streetscapes that would support the City's urban greening efforts. A sample street was used to illustrate community wants with stickers of different amenities and notes used to convey their desires. Street designs included the following:



- Bike lanes
- Median and pedestrian refuge islands
- Pedestrian lighting
- Street Trees
- Bus shelters
- Signage/banners
- Public Art
- Community kiosk

A dimensioned cross section of the street right-of-way was also drawn on the board, illustrating (from one property line to the other) an 8-foot tree planting strip, a 12-foot multi-use trail, an 8-foot tree planting strip, a 22-foot space for travel lanes, a 12-foot landscaped median, a 22-foot space for travel lanes, an 8-foot tree planting strip, a 5-foot sidewalk, and an 8-foot tree planting strip.

## Design: Sample Park Project

Land along the Enterprise Canal has been identified as potential park land. Priorities for amenities on this site include the following:

- Lots of trees for shade
- A natural walk with a bridge across the creek and a gateway (view statement) in the southern corner of the proposed GP park
- Passive recreation at the southern end with active recreation to the north
- Path lighting (noted by red paw prints on the map)
- Picnic facilities
- Benches
- Plutons (acorn grinding) – see City’s new staging area on Shepherd at Sunnyside
- Table Mt. interpretive opportunities – teach how to grow, cultivate, harvest, make things
- Sports fields and lights
- Concert venue – Shakespeare in Park
- Bike parking
- Uniform trail surface (AC)
- Bus shelter (alternative access)
- Public Art



## Design: Sample Trail Project

Land along the Enterprise Canal has been identified for trails. Community comments included the desire to separate trails from streets and natural open areas where possible. Priorities for amenities along the trail include the following:

- Benches
- Art
- Pedestrian lighting
- Street trees



# OLD TOWN ROUND 2 - COMMUNITY WORKSHOP AND OPEN HOUSE SUMMARY



*Weldon Elementary School, Clovis, CA  
October 16, 2014 – 6:30pm-8:30pm*

## **OVERVIEW**

On Thursday, October 16, 2014, staff from the City of Clovis and PlaceWorks facilitated a second community workshop aimed at re-introducing the City's Urban Greening Plan process, reviewing the outcomes of the previous workshop in May and getting feedback from participants on ideas for sample improvements and potential implementation of the Plan in Helm Ranch. Approximately 9 members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and evolution of the Urban Greening Plan in Clovis.



Following the presentation, participants were engaged in small discussion groups facilitated by staff from the City of Clovis and PlaceWorks. The groups discussed prioritization of types of projects and/or locations for projects and looking at sample project types to help articulate community needs.



## **RESULTS FROM SMALL GROUP DISCUSSIONS**

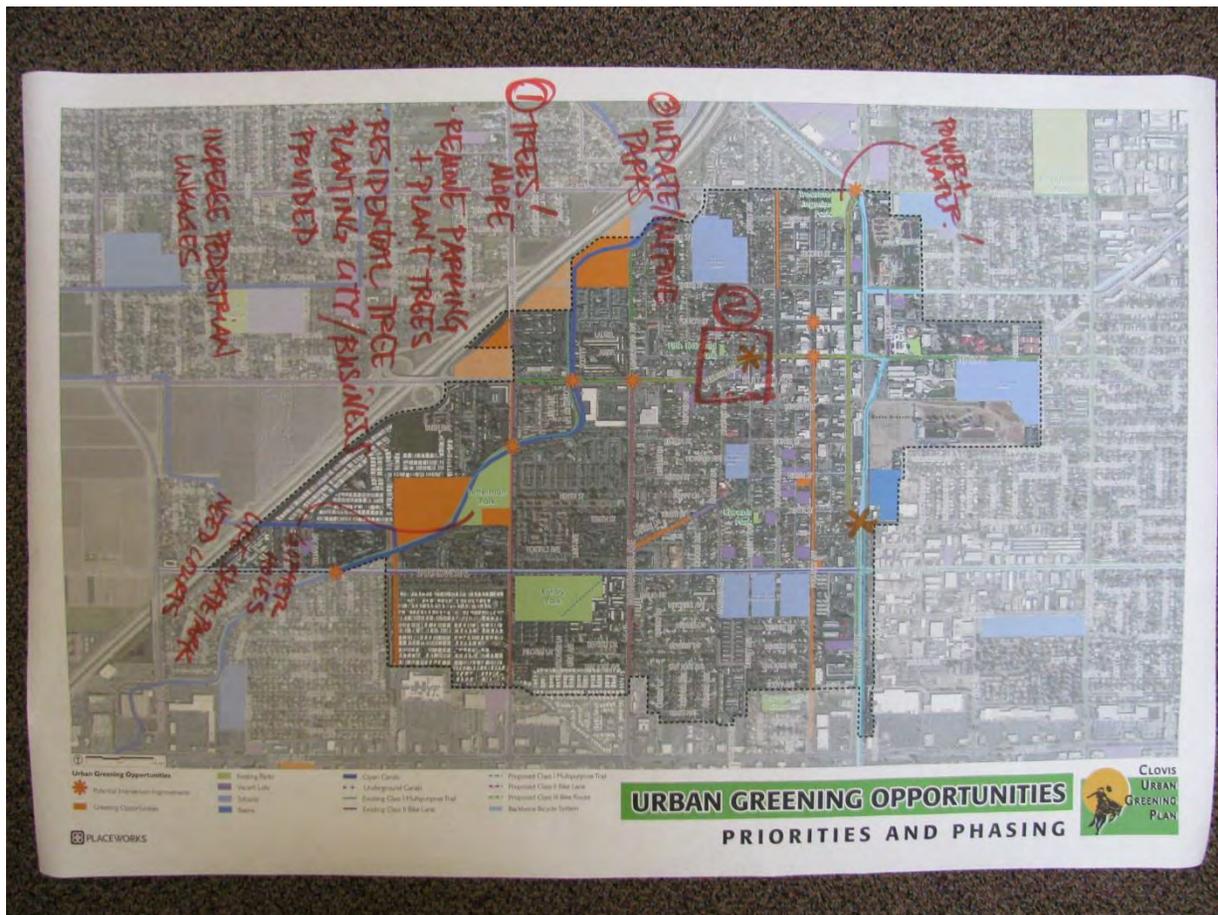
### **Priorities**

Community members participated in a discussion of possible projects, existing conditions, new developments and their vision for improvements. Maps were marked up and notes were written to capture the main ideas which included prioritizing the following:

- First priority: more trees
- Second priority: the intersection of Dewitt Ave and Bullard Ave
- Third priority: update and improve parks

Other priorities:

- Power and water (at Treasure Ingmire Park)
- Remove parking and plant trees
- Residential tree planting; City/business provided
- Increase pedestrian linkages
- Fill gopher holes, like skate park, need courts
- Intersection of Jefferson Ave and Clovis Ave



## Design: Sample Streetscape

Comments were solicited as to components for streetscapes that would support the City's urban greening efforts. Shaw Avenue was used as a sample street to illustrate community wants with stickers of different amenities and notes used to convey their desires. Street designs included the following:

- Four-way stops where Bullard Ave intersects with Dewitt Ave and Woodworth Ave (with crosswalk stickers)
- Benches maybe with bench sponsorship
- Shared streets with sidewalk plantings, not median
- Pedestrian lighting (at Seventh and Ninth Streets)
- Crosswalks (at Eighth and Tenth Streets, Dennis Drive, and Scott Avenue)
- Sidewalk/pedestrian paths along both sides of the corridor.

# 4-way stop SAMPLE STREET



GENERAL THOUGHTS AND COMMENTS

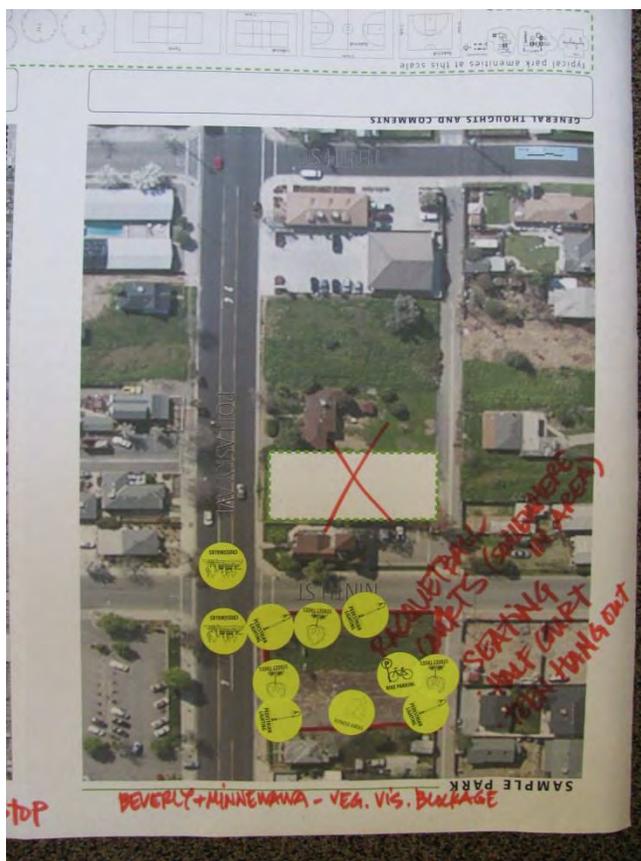
SHAW CROSSWALKS



## Design: Sample Park Project

The sample park was proposed to be at the southwest corner of Ninth Street and Pollasky Avenue, but the community decided to design the vacant lot on the northwest corner instead. Items included in the design were the following:

- Racquetball courts (somewhere in area)
- Seating
- Half court
- Teen hangout
- Crosswalks (on Pollasky Avenue for both sides of the intersection with Ninth Street)
- Pedestrian lighting
- Street trees around the perimeter of the park
- Fitness area and bike parking in the interior of the park.



## Design: Sample Trail Project

The community did not get to the trail design problem and focused on the street and park exercises.





URBAN GREENING MASTER PLAN

# Round 3 Workshop Summaries



# HELM RANCH ROUND 3 - COMMUNITY WORKSHOP SUMMARY

*Tarpey Elementary School, Clovis, CA  
May 12, 2015 – 6:30pm-8:30pm*



## **OVERVIEW**

On Tuesday, May 12, 2015, staff from the City of Clovis and PlaceWorks facilitated a third community workshop in Helm Ranch aimed at re-introducing the City's Urban Greening Master Plan process; reviewing the outcomes of the previous workshops in April and October 2014; and getting feedback from participants on draft strategies and implementation projects for Helm Ranch and the entire City, as outlined in the Draft Urban Greening Master Plan. Approximately 12 members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Master Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and a summary of the draft implementation strategies and actions laid out in the Draft Urban Greening Master Plan. The presentation noted that the Draft Urban Greening Master Plan is available on the City's website and will be updated to specifically address California's Executive Order B-29-15, which was issued April 1, 2015, the day after the draft plan was submitted to the City.

Following the presentation, participants were engaged in small discussion groups facilitated by staff from the City of Clovis and PlaceWorks. The discussion groups reviewed the draft short- (one to five years), mid- (six to ten years), and long-term (over ten years) implementation actions and provided comments to help articulate community needs. Implementation actions were pulled from the Draft Urban Greening Master Plan (dated March 31, 2015) and were organized by the seven urban greening goals identified in the plan.



## **RESULTS FROM SMALL GROUP DISCUSSIONS**

Community members discussed the draft implementation actions and offered/suggested changes and additional actions that should be considered. Discussions covered all seven goals (Educate the Community and Businesses, Draw People Outside, Utilize Green Infrastructure, Promote Alternative Transportation, Grow the Local Economy, Implement Recommendations from Previous Planning Efforts, and Maximize Opportunities for Partnerships on Greening Efforts). Notes were taken to capture the main ideas, which included the following:

- Provide more code enforcement
- Implement a water abuse reporting hotline residents could use to report code violations
- Implement a water saving hotline with tips on how to meet water conservation requirements
- Improve public safety (e.g. with improved sight lines, more patrols)
- Provide more open space



- Remove lawns in public rights of way but include water efficient plantings where possible
- Strive for groundwater balance – capture water, be efficient, recycle water
- Increase recreation (active or passive) at basin parks (new and existing)
- Acquire the vacant site at Willow and Holland; develop a park here
- Prioritize acquiring and developing gaps in trail network
- Brand bicycle wayfinding and install new signs to make trails, bicycle facilities, paths, routes, and lanes, and pedestrian paseos, more visible and more connected
- Increase use of recycled water
- Reduce waste
- Reduce undesirable uses and loitering to encourage positive outdoor activity
- Provide outdoor recreation space for children in Helm Ranch – currently not enough space(s) and kids play in street
- Look to improve pedestrian experience and address speeding on Willow, Peach, and Minnewawa
- Provide pedestrian lighting on streets and trails
- Provide more maintenance of street trees and plantings
- Make information on water conservation easy to find and access
- Create a turf removal incentive program
- Explore how to make swamp coolers more efficient and provide information to owners and renters

# Draft Urban Greening Master Plan Implementation Actions



## SHORT TERM ACTIONS:

- *Create a median mulch demonstration site to showcase landscape practices that improve soil health*
- *Require the use of compost in City projects*
- *Develop pilot projects to test new plant species and landscape installation practices (such as sheet mulching) with the dual goals of reducing future maintenance while increasing community aesthetics and green infrastructure*
- *Create demonstration soil preparation at the median on Shaw Avenue in Loma Vista*
- *Partner with developers to implement soil preservation/enhancement protocols following earthmoving, including tilling soil to a depth of 2-feet in planted areas, and applying compost*
- *Require and develop topsoil replacement, amendment, and proper soil preparation practices for all new development, including public rights-of-way, especially in Loma Vista and Northwest due to duripan soil issues*

## MID-TERM ACTIONS:

- *Create a median mulch demonstration site to showcase landscape practices that improve soil health*
- *Require the use of compost in all permitted projects*
- *Develop a heritage tree protection ordinance*
- *Consider incorporating or allowing plot-based community gardens or urban farming on public land*



### SHORT TERM ACTIONS:

- ***Increase urban forest plantings***
- ***Develop a Citywide tree canopy coverage goal of 25%***
- ***Add wayfinding to the intersection of Sierra Avenue and Clovis Avenue to direct trail users to trail and make drivers aware of busy trail intersection. Consider painting directional signage on pavement or using pavement markers (Old Town)***
- ***Install flashing crosswalks at intersections of Sierra Avenue and Clovis Avenue, Minnewawa and Bullard Avenue, and Bullard Avenue and Pollasky Avenue (Old Town)***

### MID-TERM ACTIONS:

- ***Develop parking lot, street, and sidewalk shade ordinance***
- ***Create a City-wide park and landscape district to provide dedicated source funding for maintenance throughout the City***
- ***Develop plans for and construct new Basin Parks at Basins 4D, 4E, 5B/5C, 5F, BC, BX, BW, DO, and DP***
- ***Create canal trail north from Letterman Park to Sierra Avenue, create pedestrian/bicycle crossings at canal intersections with Villa Avenue and Bullard Avenue***
- ***Construct Centennial Plaza (Old Town)***
- ***Create new community park at intersection of Willow Avenue and Holland Avenue (Helm Ranch)***

### LONG TERM ACTIONS:

- ***Create a Basin Park adjacent to HWY 168 at the end of 3rd Street (Old Town)***
- ***Create new pocket park at Gettysburg Avenue and Peach Avenue (Helm Ranch)***



### SHORT TERM ACTIONS:

- **Update City of Clovis Standard Drawings, October 1, 2012, to incorporate WELO requirements**
- **Update City of Clovis Approved Plant List with the recommendations from the Urban Greening Plan**
- **Update City of Clovis Design Guidelines to reflect the changes/ideas from the Urban Greening Plan including soil preparation**
- **Replace incandescent light bulbs with light emitting diode (LED) fixtures to provide better light quality on neighborhood streets, less light trespass into the night sky, lower electricity bills, eliminate toxic gases found in current lighting fixtures (thereby reducing landfill pollution), and reduce greenhouse gas emissions**
- **Develop specific plan for Willow Avenue as a pedestrian-friendly, green street (Helm Ranch)**
- **Develop specific plan for Pollasky Avenue south of Bullard Avenue to draw pedestrian activity from the northern part of the street south, to create new opportunities for commercial activity along this route or incorporate this into the Central Clovis Specific Plan (Old Town)**
- **Create a staggered planting plan to replace container trees along Bullard Avenue (Old Town)**

### MID-TERM ACTIONS:

- **Create a sustainable landscape best practices maintenance manual that outlines best practices to minimize waste, conserve water, and protect natural ecosystems; this could be built off of existing manuals such as the Model Bay-Friendly Landscaping Maintenance Specifications, which could be tailored to Clovis**
- **Consider the water tower at the southeastern edge of Letterman Park for a new water-efficiency demonstration garden (Old Town)**
- **Conduct traffic study of Willow Avenue, 5th Street, East Bullard Avenue, Gettysburg Avenue, Barstow Avenue, Minnewawa Avenue, and Shephard Avenue to evaluate opportunities for roadway reduction or reallocation to accommodate green street improvements (Old Town and Helm Ranch)**

### LONG TERM ACTIONS:

- **Explore/install hydroelectric generation systems when retrofitting or replacing existing City pipelines**
- **Create free shuttle from Clovis Community College Center to Old Town (Old Town)**



### SHORT TERM ACTIONS:

- *Create crosswalks across Ashlan Avenue, Gettysburg Avenue, and Shaw Avenue at Paseo and internal roadway intersections in Loma Vista*
- *Develop master plan for Enterprise Canal Trail and community park space adjacent to trail*
- *Prohibit developers from creating separation wall between housing complexes and key street corridors, such as Shephard Avenue, **Minnewawa Avenue**, and **Willow Avenue** to promote pedestrian activity along these corridor (**Old Town and Helm Ranch**)*
- *Incentivize developers to install landscape elements, including street trees prior to construction of residential and commercial properties*

### MID-TERM ACTIONS:

- *Install crosswalk improvements at the intersection of Peach Avenue and Ashlan Avenue, consider painting street to create wayfinding and alert drivers to pedestrians and cyclists (**Helm Ranch**)*
- *Replace and increase sidewalk width on Willow Avenue in Helm Ranch and improve the central median; consider a road diet and improved crosswalks (**Helm Ranch**)*
- *Develop master plan for regional park at center of Northwest along Enterprise Canal*
- *Install crosswalks at Willow Avenue intersections with Shephard Avenue, Perrin Avenue, Behymer Avenue, International Avenue, and Copper Avenue*

### LONG TERM ACTIONS:

- *Create levee trail along canal adjacent to Ashlan Avenue to create connection to the City of Fresno (**Helm Ranch**)*
- *Extend levee trail to the east from Basin S. Park (**Helm Ranch**)*



#### **MID-TERM ACTIONS:**

- *Work with partners to make OMRI-certified compost, such as that made by Kochergen Farms Composting with Clovis' green waste via Allied Waste's facilities in Fresno, available locally to the City. Residential and commercial growers could reduce maintenance needs, increase plant viability, restore soil health, and reduce water needs*
- *Establish municipal curb-side green waste program*

#### **LONG TERM ACTION:**

- *Provide compost to residents at no or reduced cost*



#### **SHORT TERM ACTION:**

- *Pursue grant funding or other monies to implement the Urban Greening Plan, focusing on built improvements and maintenance and referencing the Greening Analysis work*

#### **MID-TERM ACTION:**

- *Implement the proposed Class II bike lane on Willow and paint it for added visibility (Helm Ranch)*

#### **LONG TERM ACTION:**

- *Implement the proposed bike paths, lanes, and routes proposed in the Bicycle Transportation Master Plan*



### **SHORT TERM ACTIONS:**

- ***Look for opportunities to increase maintenance staffing***
- ***Actively create partnerships/training to address maintenance staffing shortfalls. Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts***

### **MID-TERM ACTIONS:**

- ***Expand the Citizen Forester Program, among others***
- ***Create an Urban Forester position and an Urban Forest Group charged with stewardship of the City's urban forest***

### **LONG TERM ACTIONS:**

- ***Create multiple-benefits agreement program between City of Clovis and Fresno Irrigation District to formalize use of levees as trails.***
- ***Establish best practices handbook for construction of trails on levees.***

# OLD TOWN ROUND 3 - COMMUNITY WORKSHOP SUMMARY

*Weldon Elementary School, Clovis, CA  
May 13, 2015 – 6:30pm-8:30pm*



## OVERVIEW

On Wednesday, May 13, 2015, staff from the City of Clovis and PlaceWorks facilitated a third community workshop in Old Town aimed at re-introducing the City's Urban Greening Master Plan process; reviewing the outcomes of the previous workshops in April and October 2014; and getting feedback from participants on draft strategies and implementation projects for Helm Ranch and the entire City, as outlined in the Draft Urban Greening Master Plan. Approximately 31 members of the public attended the meeting, which began with a brief overview introducing the Urban Greening Master Plan, including the Proposition 84 funding provided to develop the Plan, common features found in greening plans in other areas, and a summary of the draft implementation strategies and actions laid out in the Draft Urban Greening Master Plan.



Following the presentation, participants were engaged in small discussion groups facilitated by staff from the City of Clovis and PlaceWorks. The discussion groups reviewed the draft short- (one to five years), mid- (six to ten years), and long-term (over ten years) draft implementation actions and provided comment to help articulate community needs. Implementation actions were pulled from the Draft Urban Greening Master Plan (dated March 31, 2015) and were organized by the seven urban greening goals identified in the plan.



## RESULTS FROM SMALL GROUP DISCUSSIONS

Community members participated in a discussion reviewing the draft implementation actions and suggesting changes and additional actions that should be considered. Discussions covered all seven goals (Educate the Community and Businesses, Draw People Outside, Utilize Green Infrastructure, Promote Alternative Transportation, Grow the Local Economy, Implement Recommendations from Previous Planning Efforts, and Maximize Opportunities for Partnerships on Greening Efforts). Notes were taken to capture the main ideas, which included the following:

- Work with Fresno State as a partner to find ways to bring students to Old Town – advertise, provide areas for group studies, provide hangout spaces
- Improve wayfinding for pedestrians and bicyclists – more signs, lighted crosswalks, emergency “blue lights,” bike-activated crossings and/or bike lane activators (so bicyclists do not have to get off bike to press for signal)
- Provide more bike racks
- Provide a bike storage service



- Encourage provision of bike valets at events
- Create and implement a “get out and meet your neighbors” campaign
- Consider a produce swap between neighbors
- Reduce lawns and establish demonstration gardens
- Reduce pool filling usage – encourage use of pool covers to reduce evaporation
- Provide workshops or team with partners to offer workshops on water conservation measures, tools, tricks, ideas
- Institute deep tree watering – not surface watering
- Conduct events announcing trail connectivity
- Reduce lanes on Clovis Avenue and replace parking with open spaces/benches
- Support bike rental businesses
- Promote walking – team with County Public Health to launch a public education campaign
- Install “Welcome to Old Town” signs
- Save the street trees
- Support neighborhood retail, including grocery stores, to encourage walking
- Evaluate Woodworth Avenue for lane narrowing and installing a planted median
- Provide doggie bag stations along trails
- Provide free trees
- Incentivize tree planting
- Keep Clovis beautiful – do not forget about beautification and building/keeping positive pride for the neighborhood (water conservation does not have to mean zero-scape)
- Look at pavement updates to alleys – these are used as unofficial trails in Old Town
- Clarify process and requirements for, and/or make possible, residential gray water systems
- As possible, widen sidewalks on arterials near schools
- Add sidewalks where there are gaps in the existing sidewalk system, prioritizing school areas
- Implement successional street tree plantings so there is a continual tree canopy (there are lots of older trees in the neighborhood)
- Provide small gathering spaces for chess, meditation, resting, and hanging out
- Explore using Rodeo Grounds as an Old Town park and ride with a shuttle to other locations – fairs, farmers’ market, events
- Require better, or more, pedestrian and bicycle connectivity in new developments
- Provide traffic calming on Sierra Avenue – no posted speed currently
- Provide traffic calming at the Bullard Avenue/Fifth Street split – no traffic light or crosswalks

# Draft Urban Greening Master Plan Implementation Actions



## SHORT TERM ACTIONS:

- *Create a median mulch demonstration site to showcase landscape practices that improve soil health*
- *Require the use of compost in City projects*
- *Develop pilot projects to test new plant species and landscape installation practices (such as sheet mulching) with the dual goals of reducing future maintenance while increasing community aesthetics and green infrastructure*
- *Create demonstration soil preparation at the median on Shaw Avenue in Loma Vista*
- *Partner with developers to implement soil preservation/enhancement protocols following earthmoving, including tilling soil to a depth of 2-feet in planted areas, and applying compost*
- *Require and develop topsoil replacement, amendment, and proper soil preparation practices for all new development, including public rights-of-way, especially in Loma Vista and Northwest due to duripan soil issues*

## MID-TERM ACTIONS:

- *Create a median mulch demonstration site to showcase landscape practices that improve soil health*
- *Require the use of compost in all permitted projects*
- *Develop a heritage tree protection ordinance*
- *Consider incorporating or allowing plot-based community gardens or urban farming on public land*



### SHORT TERM ACTIONS:

- ***Increase urban forest plantings***
- ***Develop a Citywide tree canopy coverage goal of 25%***
- ***Add wayfinding to the intersection of Sierra Avenue and Clovis Avenue to direct trail users to trail and make drivers aware of busy trail intersection. Consider painting directional signage on pavement or using pavement markers (Old Town)***
- ***Install flashing crosswalks at intersections of Sierra Avenue and Clovis Avenue, Minnewawa and Bullard Avenue, and Bullard Avenue and Pollasky Avenue (Old Town)***

### MID-TERM ACTIONS:

- ***Develop parking lot, street, and sidewalk shade ordinance***
- ***Create a City-wide park and landscape district to provide dedicated source funding for maintenance throughout the City***
- ***Develop plans for and construct new Basin Parks at Basins 4D, 4E, 5B/5C, 5F, BC, BX, BW, DO, and DP***
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- ***Create new community park at intersection of Willow Avenue and Holland Avenue (Helm Ranch)***

### LONG TERM ACTIONS:

- ***Create a Basin Park adjacent to HWY 168 at the end of 3rd Street (Old Town)***
- ***Create new pocket park at Gettysburg Avenue and Peach Avenue (Helm Ranch)***



### SHORT TERM ACTIONS:

- **Update City of Clovis Standard Drawings, October 1, 2012, to incorporate WELO requirements**
- **Update City of Clovis Approved Plant List with the recommendations from the Urban Greening Plan**
- **Update City of Clovis Design Guidelines to reflect the changes/ideas from the Urban Greening Plan including soil preparation**
- **Replace incandescent light bulbs with light emitting diode (LED) fixtures to provide better light quality on neighborhood streets, less light trespass into the night sky, lower electricity bills, eliminate toxic gases found in current lighting fixtures (thereby reducing landfill pollution), and reduce greenhouse gas emissions**
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- **Create a staggered planting plan to replace container trees along Bullard Avenue (Old Town)**

### MID-TERM ACTIONS:

- **Create a sustainable landscape best practices maintenance manual that outlines best practices to minimize waste, conserve water, and protect natural ecosystems; this could be built off of existing manuals such as the Model Bay-Friendly Landscaping Maintenance Specifications, which could be tailored to Clovis**
- **Consider the water tower at the southeastern edge of Letterman Park for a new water-efficiency demonstration garden (Old Town)**
- **Conduct traffic study of Willow Avenue, 5th Street, East Bullard Avenue, Gettysburg Avenue, Barstow Avenue, Minnewawa Avenue, and Shephard Avenue to evaluate opportunities for roadway reduction or reallocation to accommodate green street improvements (Old Town and Helm Ranch)**

### LONG TERM ACTIONS:

- **Explore/install hydroelectric generation systems when retrofitting or replacing existing City pipelines**
- **Create free shuttle from Clovis Community College Center to Old Town (Old Town)**



### SHORT TERM ACTIONS:

- *Create crosswalks across Ashlan Avenue, Gettysburg Avenue, and Shaw Avenue at Paseo and internal roadway intersections in Loma Vista*
- *Develop master plan for Enterprise Canal Trail and community park space adjacent to trail*
- *Prohibit developers from creating separation wall between housing complexes and key street corridors, such as Shephard Avenue, **Minnewawa Avenue**, and **Willow Avenue** to promote pedestrian activity along these corridor (**Old Town and Helm Ranch**)*
- *Incentivize developers to install landscape elements, including street trees prior to construction of residential and commercial properties*

### MID-TERM ACTIONS:

- *Install crosswalk improvements at the intersection of Peach Avenue and Ashlan Avenue, consider painting street to create wayfinding and alert drivers to pedestrians and cyclists (**Helm Ranch**)*
- *Replace and increase sidewalk width on Willow Avenue in Helm Ranch and improve the central median; consider a road diet and improved crosswalks (**Helm Ranch**)*
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- *Install crosswalks at Willow Avenue intersections with Shephard Avenue, Perrin Avenue, Behymer Avenue, International Avenue, and Copper Avenue*

### LONG TERM ACTIONS:

- *Create levee trail along canal adjacent to Ashlan Avenue to create connection to the City of Fresno (**Helm Ranch**)*
- *Extend levee trail to the east from Basin S. Park (**Helm Ranch**)*



#### **MID-TERM ACTIONS:**

- *Work with partners to make OMRI-certified compost, such as that made by Kochergen Farms Composting with Clovis' green waste via Allied Waste's facilities in Fresno, available locally to the City. Residential and commercial growers could reduce maintenance needs, increase plant viability, restore soil health, and reduce water needs*
- *Establish municipal curb-side green waste program*

#### **LONG TERM ACTION:**

- *Provide compost to residents at no or reduced cost*



#### **SHORT TERM ACTION:**

- *Pursue grant funding or other monies to implement the Urban Greening Plan, focusing on built improvements and maintenance and referencing the Greening Analysis work*

#### **MID-TERM ACTION:**

- *Implement the proposed Class II bike lane on Willow and paint it for added visibility (Helm Ranch)*

#### **LONG TERM ACTION:**

- *Implement the proposed bike paths, lanes, and routes proposed in the Bicycle Transportation Master Plan*



### **SHORT TERM ACTIONS:**

- ***Look for opportunities to increase maintenance staffing***
- ***Actively create partnerships/training to address maintenance staffing shortfalls. Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts***

### **MID-TERM ACTIONS:**

- ***Expand the Citizen Forester Program, among others***
- ***Create an Urban Forester position and an Urban Forest Group charged with stewardship of the City's urban forest***

### **LONG TERM ACTIONS:**

- ***Create multiple-benefits agreement program between City of Clovis and Fresno Irrigation District to formalize use of levees as trails.***
- ***Establish best practices handbook for construction of trails on levees.***

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URBAN GREENING MASTER PLAN

# Green Space Assessment



*Revised July 25, 2014*

## GREEN SPACE ASSESSMENT

Urban “greening” can take many forms. Parks, trails, and open space provide a significant amount of the green space in urban areas; however features such as street plantings, public plazas, and stormwater retention basins can also have a significant impact on the overall environmental quality of a place. In assessing the overall green space, it is important to provide a range of opportunities that will encourage public participation with open space, increase healthy environmental function within a community, and provide for long-term sustainability and resilience.

The City of Clovis has a diverse and integrated green space system. The numerous public parks and trails, the Clovis Old Town Trail in particular, serve as important features within the everyday life of Clovis residents, providing a sense of attachment with open space amenities. However, the City is still not meeting the open space standard set forth in the General Plan for their current population size. In addition to open space, there are numerous greening opportunities for enriching the overall environmental quality of the City, such as integrated green street improvements, enhanced multi-benefit use facilities, and interactive green space amenities. Population is growing quickly in Clovis and the City is expanding. As it grows, it will be especially important to set aside land to meet the City’s open space standard, as well as integrate green standards into new projects.

This assessment evaluates the potential of various green features, including parks, trails, green streets, stormwater management, urban forestry, pedestrian and bicycle facilities, community gardens, and wildlife habitat.

### EXISTING CONDITIONS AND OPPORTUNITIES

The City of Clovis currently has a number of existing green assets, such as their well-developed trails and bikeway network, as well as a number of new opportunities to expand greening efforts throughout the City. This section expands on these assets and opportunities to define the focus of the greening plan.

#### EXISTING PARKS OPEN SPACE TRAILS

According to the draft 2010 Parks Master Plan, the City operates 56 public parks, totaling approximately 146 acres of publically accessible open space. The identified park types include pocket parks, neighborhood parks, area parks, community parks, regional parks, school parks, and basin parks. The City is in the process of updating their General Plan and has updated their inventory to reflect recent construction. Table 1 illustrates the number of each park type found in the City of Clovis as of May 2014.

TABLE 1 PARKS IN THE CITY OF CLOVIS

Classification	Number of Parks	Total Acres
Pocket Parks	8	1.58
Neighborhood Parks	44	35.77
Area Parks	13	53.59
Community Parks	3	46.83
Basin Parks (FMFCD Flood Control Basins)	3	21.13
<b>Total</b>	<b>71</b>	<b>158.89</b>

The City of Clovis’ “basin parks,” represent a unique multi-beneficial approach to open space. These parks are located on land surrounding reservoir basins and controlled by the Fresno Metropolitan Flood Control District. These facilities represent a progressive approach to open space development in which single facilities provide both green infrastructural and public recreational needs. As the City grows, it will need to continue to consider sites with multiple benefits for attaining greening goals.

The Master Plan additionally calls out potential Regional Park and School Parks within the City of Clovis. Regional Parks represent large-scale park facilities that could accommodate visitors from the larger region. Due to limited space, these types of spaces might be restricted to the edge of the existing City area. School parks represent an excellent opportunity to provide increased access to recreational facilities for the general public utilizing existing green facilities. Through structured use agreements with the Clovis Unified School District (CUSD), the City provides recreational access to people outside of school hours. The Master Plan suggests that the schools offer approximately 181 acres of open space that could be utilized for park functions and utilized this acreage in their analysis of park need for the City.

The City of Clovis’ 1993 General Plan set a goal of providing 4.9 acres of parkland per 1,000 residents. Based on a 2010 population of 96,868, the City of Clovis would need to have approximately 474 acres of open space. The City’s currently has 146 acres, representing approximately 1.5 acres of parkland per 1,000 residents. The Master Plan incorporated the estimated school sites with a combined size of 181 acres into the calculation of park need and found that the City provides approximately 3.4 acres of parkland per 1,000 residents. Although this is close to their target, the City still falls short of the goal by approximately 148 acres of parkland.

**EXISTING TRAILS**

There are approximately 14 miles of completed trails within the City of Clovis and this mileage increases fairly constantly. Trails provide space for Clovis residents to exercise and travel throughout the City, as well as creating a unique draw for tourists to the area. The Clovis Old Town Trail serves as a valuable central corridor

running from north to south through the City Center. Spur trails, proposed expansions and the completion of the beltway network will help to connect the trail system.

Bikeways and planted streets help to create a more hospitable pedestrian experience when moving within the City, particularly as a way to connect to the Clovis Old Town Trail from the east or west. Bike lanes on Teague, Nees, Alluvial, Sierra, Barstow, Gettysburg, and Ashlan Avenues provide valuable connection routes to intersect existing trails.

### **EXISTING URBAN FOREST**

According to the 2011 Urban Forest Resource Analysis, the City of Clovis publically manages 34,729 trees, of which 74-percent are in good condition. The report also indicated sites for approximately 2,769 more tree plantings. These numbers do not reflect the currently undeveloped areas of the City, nor do they reflect privately maintained trees.

Figures 1 and 2 provide a snapshot of the urban forest conditions in Old Town and Helm Ranch, respectively. These maps show the pattern of publicly planted and maintained street trees in these neighborhoods and where new trees could be planted.

### **OPPORTUNITIES**

Development of the draft Land Use Element for the update of the General Plan has identified several sites for future parks and open space opportunities. These sites include currently underutilized lands as well as existing multi-benefit sites, such as basins. Importantly, new parks must maintain their current level of service, and provide spaces for field sports, such as baseball, soccer, rugby, and football.

The draft Land Use Element also identifies future trail opportunities for the expansion of the trail network, and the City developed a Bicycle Master Plan for Clovis in 2011. In addition to implementing the recommendations for new open spaces and trails, the City could consider the following opportunities for increased urban greening.

### **GREEN STREETS**

Commonly streets in urban areas are wider than necessary and can be more efficiently designed to create spaces for pedestrians and planted areas. Creating center medians or vegetated buffers at the edge could help reduce traffic speeds while providing beneficial environmental services, such as stormwater retention and greenhouse gas reduction. Additionally, increased pedestrian and bicycle use can improve the overall health of the population and reduce dependence on fossil-fuel based transportation.

A City-wide street assessment could determine which streets in Clovis could be reduced in size to accommodate green street improvements.

## **BASIN WALKING PATHS AND DEMONSTRATION GARDENS**

Walking for exercise is the most popular recreation activity according to the California State Parks.<sup>1</sup> Increased opportunities for walking can increase a population's fitness and health. In addition to recreational park spaces around the basins, circuit trails with exercise nodes could provide a pleasant outdoor environment for residents to walk.

The basins' unique function also provides an opportunity to serve as a demonstration for water conservation. The basins serve as water storage and flood control, allowing visitors to create a connection with their water system. This makes these sites particularly well suited to publicly illustrate efficient water management in their own homes or to consider water usage in their day-to-day lives. Demonstrations could include drought-tolerant landscape examples or informational signage on water supply.

Walking paths or water conservation demonstration gardens can be incorporated into existing basin parks or designed as part of future basin park development, such as basins 4D, 4E, 5B/5C, 5F, BC, BX, BW, DO, DP, and S.

## **FRESNO IRRIGATION DISTRICT CANAL TRAILS**

Similarly to the basin parks, the Fresno Irrigation District (FID) channel network in the City of Clovis offers an opportunity for improved green infrastructure with channel restoration and trail renovation. There are a number of open channels that run through the City of Clovis. Several currently include trails along their banks, which serve as unique and effective off-street connections through the City. However, additional landscape and restoration benefits could significantly improve both the pedestrian experience along the canals and the hydrologic ecology. Through partnership, the City of Clovis could work cooperatively with FID to establish new trails on some channel banks and upgrade existing ones. Long term liability and maintenance concerns would need to be addressed and agreed upon by both entities.

## **STRUCTURED USE AGREEMENTS**

The 2010 Parks Master Plan identified approximately 181 acres of open space located on schools within the Clovis Unified School District (CUSD). By partnering with CUSD and formalizing an agreement to utilize this space, the City could establish a long-term guarantee for continued public access to these recreation facilities and open space and ensure the public's use of these spaces during non-school hours.

## **COMMUNITY GARDENS**

Allowing people to grow their own food not only provides new access to healthy food, it also provides new outlets for exercise and engagement in a community. Currently there are two community gardens serving residents of Clovis: Fresno Interdenominational Refugee Ministries (FIRM)'s Clovis Garden at 1726 Pollasky Avenue and Clovis Christian Church Garden at Locan Avenue and San Jose Avenue. Both of these gardens are managed by non-profit groups. Through partnership with other groups or managing a municipal program, more residents of Clovis could participate in a garden program.

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<sup>1</sup> California State Parks, 2005, *Parks and Recreation Trends in California*.

In areas where housing is denser, currently vacant or underutilized lots could be used for community gardening. Additionally, spaces within a public park could be set aside for this use. In areas where housing is planned or less dense, large pieces of land could be set aside for community gardening, a demonstration farm space, or other form of community-supported agriculture.

## **RODEO GROUNDS**

The Clovis Rodeo serves as a landmark event within the City every spring. The Rodeo and associated events bring in numerous tourists and provides a number of cultural activities to residents. Similarly to school sites, the rodeo site could serve as a municipal asset throughout the year. The City could reach out to the Rodeo for partnership efforts to provide greening infrastructure improvements, such as increased planting and stormwater control, and allow more regular access while maintaining the site's use during key rodeo events. Specific emphasis on the Rodeo's entry way could provide a landmark gateway for the facility and serve as a focal point for urban greening.

## **URBAN FOREST**

The 2012 Urban Forest Management Plan establishes a vision and mission statement that clarifies the need for a healthy, vibrant, and sustainable urban forest that is an integral part of the community's infrastructure. This plan articulated several recommendations including increasing urban forest plantings; developing both a parking lot shade ordinance and a heritage tree protection ordinance; creating an Urban Forester position and an Urban Forest Group charged with stewardship of the City's urban forest; creating a City-wide park and landscape district to provide dedicated source funding; and expanding the Citizen Forester Program, among others. Current staffing levels limit the City's ability to proactively maintain the existing urban forest or increase plantings; most effort is spent reacting to hazards. Implementing several of the recommendations outlined in the report could provide significant improvements to the City's urban greening efforts.

## **TRAIL NETWORK CONNECTIVITY AND WAYFINDING**

The City has made major commitments to creating a network of trails with new trails being built every year. As gaps in the network are closed and additional trail mileage added to the network, the importance of wayfinding becomes key. Currently there is no signage to indicate trail direction, length, or name making it difficult in some locations, particularly intersections, to know where the trail continues. Development of wayfinding signage would help encourage continued and expanded use of trails by providing information immediately to the user. The City is currently developing a trail marker system which will allow trail users to scan markers with their smart phones and get trail information. Continued development, installation, and maintenance of this information would greatly help with wayfinding efforts.

## **POLICY INITIATIVES**

In addition to site-specific opportunities, various City policies could be implemented to promote urban greening throughout the City.

## **CITY-WIDE PARK AND LANDSCAPE DISTRICT**

The City has various landscape maintenance districts associated with recent developments to fund the public open spaces in those districts. However, existing neighborhoods have a disparity as they are reliant on General Funds for landscape maintenance and therefore receive less attention and investment than newer developed areas. A City-wide Park and Landscape District would allow a systemic approach to the City's public open space, parks, trees, and trails that would ease the disparity between areas with special district funding and those dependent on General Fund fees, while providing a more consistent amount of funds for planning purposes.

## **EDUCATIONAL OPPORTUNITIES, DEMONSTRATION SITES AND INCENTIVE PROGRAMS**

Many cities and non-profits offer educational resources or incentive programs to residents as an effort to build momentum for greening efforts. Informational classes, such as water-efficient landscape design, tree maintenance, or bicycle repair, create an opportunity for citizens to take part in sustaining the City's ecological resources. Demonstration sites, such as examples of lawn alternatives or irrigation installation, allow residents to see first-hand opportunities what they could implement privately and can inspire them to make changes on their private property. Incentive programs, such as reduced cost for trees, low-water use plants, or alternative energy devices, could additionally motivate residents to make sustainable upgrades to their private property. These types of strategies decentralize greening efforts and potentially make it more feasible to have a large impact across the City. These types of programs are also great opportunities for partnership with local utilities, educational centers or non-profit groups. The City of Clovis could look to local resources, such as the Clovis Botanical Garden or Fresno State University for partnership for providing new educational opportunities or for demonstration sites.

## **ORGANIC WASTE COLLECTION AND COMPOSTING**

Many cities in California collect residential green waste for large-scale urban composting. The City of Clovis does not currently offer this service. This could significantly reduce residential organic waste going into landfills and could potentially provide a source of compost for local landscape projects. Adding compost to soil significantly improves its capacity to hold water and could be an important asset in water efficient landscape practices in the future.

## **SUSTAINABLE LANDSCAPE BEST-PRACTICES MAINTENANCE MANUAL**

Implementing a City-wide maintenance manual that outlines best practices to minimize waste, conserve water, and protect natural ecosystems. The manual could present recommendations for labor practices, equipment and tools, as well as specific implementation practices to preserve water and promote healthy plant growth. This manual could be built off best practices developed by other organizations, such the *Model Bay-Friendly Landscaping Maintenance Specifications*, which could be tailored to the Clovis area.

## **NEIGHBORHOOD ASSESSMENT**

The following summarizes specific greening opportunities for individual neighborhoods within the City of Clovis or in the City's sphere of influence.

## OLD TOWN

Old Town is fairly built-out with residential and commercial uses. In these conditions it can be difficult to find large spaces for new green spaces and attention must be focused on smaller interventions and multi-beneficial connections and green infrastructure. As shown in Figure 3, the following areas could be considered as part of the overall greening plan:

### **CANAL AND TRAIL RESTORATION**

There are two canals running through Old Town. In addition to creating a more formalized pedestrian trail, these linear corridors provide an excellent opportunity for channel restoration. A plan for increased planting and aesthetic improvements could improve both the trail experience and the ecological function of these sites.

There are key nodes where the trails pass busy streets, identified on the map in Figure 3. Currently there are no crosswalks or pedestrian amenities assuring safe passage at these intersections. These nodes serve as important opportunities for improving the pedestrian experience.

### **BASIN PARKS**

Clovis has a legacy of creating public parks around existing retention basins. There are three opportunities for new basin parks in Old Town. The basin near Letterman Park would provide an opportunity to expand the capacity of the existing park and also connects to the existing canal and trail. The basins close to the Sierra Freeway may be less desirable as open space due to their freeway proximity; however they provide unique open space opportunities for urban forestry along the basin edge.

Due to the use of basin parks to serve as water storage, these spaces will not be able to be utilized as parks at all times and cannot be densely planted. For this reason, they might best serve as nature preserves or aquatic habitat restoration areas. Existing basin parks in Clovis provide this function and provide users with an experience to interact with their local urban ecosystem.

### **LOW WATER USE DEMONSTRATION GARDENS**

As noted, Clovis successfully utilizes much of its water infrastructure with public space. These opportunities could be expanded by creating demonstration sites near these spaces to inform the public about low-water use landscape options and conservation methods, such as the garden installed at the Clovis Botanical Garden. There is a water tower at the southeastern edge of Letterman Park. Although this is not an accessible piece of water infrastructure, it could serve as the location of a new water-efficiency demonstration garden.

Additionally, the City could encourage private low-water use landscape conversion by sponsoring a program for demonstration front yards throughout the City building on the Central Valley Friendly Landscaping Program that the City currently supports. The City could reach out to non-profit groups to sponsor community work days to help residents transform their yards into low-water use gardens.

## **GREEN STREETS**

The major north-south connectors through Old Town are Villa Avenue and Minnewawa Avenue. Filling in the gaps for street trees and adding in green street features, such as raingardens, bulb outs, and stormwater plantings, might enhance the pedestrian experience along these routes.

Several of the streets in Old Town, particularly those south of 5<sup>th</sup> Street, are very wide. Street trees would make the streets feel narrower and more pedestrian friendly, as well as potentially reduce traffic speeds. These streets are identified on the map in Figure 3.

## **CENTENNIAL PLAZA**

The City has conceptual plans for Centennial Plaza. Construction of this public space could provide additional gathering and green space in Old Town.

## **DOWNTOWN**

The iconic Gateway to the Sierras marker could be expanded in meaning with the addition of more street trees and improvements to pedestrian and bicycle facilities. Existing intersection circles could be greened through the introduction of permeable pavers, where existing soil conditions allow, or plantings.

## **GREEN ALLEYS**

In Old Town, there are various alleyways that serve as back entrances for residential units. These alleys increase overall impervious surfaces in the neighborhood and increase runoff even though they have relatively low use. Converting these surfaces to more pervious materials or drivable green pavers could improve overall stormwater runoff in this part of the City.

## **VACANT LOT CONVERSIONS: POCKET PARKS OR COMMUNITY GARDENS**

Although there are relatively few underused spaces, there are a few vacant parcels in Old Town. These spaces could be acquired by the City for small pocket parks or community gardens. In particular the vacant lot on Pollasky Avenue south of Ninth Street currently has a large shade tree, making it an existing refuge on a warm day. This small lot could be transformed into a pocket park with exercise equipment or other amenities. This intervention could potentially activate this section of Pollasky Avenue, which currently has significantly less pedestrian activity than the highly active sections north of Bullard Avenue.

Fresno Interdenominational Refugee Ministries currently manages a community garden at the Memorial United Methodist Church at 1726 Pollasky Avenue. Partnership with a similar group might allow the City to cede management of the site to a non-profit group, reducing maintenance costs while providing public access.

## HELM RANCH

Helm Ranch neighborhood is also fairly built-out, however it does include some larger underutilized parcels for more traditional open space development. As shown in Figure 4, the following areas could be considered as part of the overall greening plan:

### **VACANT LOT CONVERSIONS: COMMUNITY PARKS**

There are some larger parcels in Helm Ranch that could serve as new community parks. Although they may not be able to accommodate larger sports complexes, they could accommodate smaller sports courts, gathering areas, fitness stations, or other play opportunities.

### **JOINT USE WITH SCHOOLS**

Tarpey Elementary School located on Gettysburg Avenue between Lind Avenue and Minnewawa Avenue has a large green space on the west side of the school. The City could reach out to the school to establish a joint use agreement to formalize and guarantee the current structured use allowing public use of the site when the school is not utilizing the facilities.

### **CHANNEL RESTORATION OR CHANNEL PARK**

Gould Canal runs east-west along the southern edge of Helm Ranch, with a basin park located at Minnewawa Avenue and Ashlan. There is an informal trail along the canal behind the park and basin; however connecting the trail to the east to connect to Old Town Trail could become an important pedestrian and bicycle corridor for Helm Ranch residents. Additionally, the canal continues to the west with an unimproved trail along the levee. This trail could be improved to become a separated pedestrian and bicycle route along Ashlan to the City of Fresno. Currently the intersection at Peach Avenue and Ashlan Avenue is particularly difficult to navigate if a person wants to continue along the canal trail. Pedestrian and bicycle improvements, such as special street markings, bicycle signals, and larger median pedestrian refuges, as well as wayfinding signage would improve the intersection. The unimproved canal trail west of Peach Avenue is bordered by oleander shrubs. Although they provide some shade, they could be replaced with larger trees to provide greater shade along this trail, making it a more hospitable travel route during the warmer parts of the year.

### **GREEN STREETS**

The major east-west connector streets, such as Gettysburg Avenue and Santa Ana Avenue could be improved with green street features to facilitate more pedestrian activity heading to and from the Old Town Trail. All of these streets were identified for proposed bike lanes. Other traffic calming devices, such as bulb outs, would make these streets more hospitable to future bicycle travel.

Additionally, Willow Avenue at the eastern edge of Old Helm Ranch is extremely wide and somewhat unfriendly to pedestrian activities, although it is used frequently by both cyclists and walkers. The sidewalk is narrow with inconsistent width along the length of the street through Helm Ranch. It could be expanded and made consistent along the length of the street. Additionally, the proposed Class II bike lane on Willow will formalize the use of the street for bicycle travel. A painted bike lane could increase the visibility of the lane and

potentially bring greater awareness of the cyclists traveling there. The central medians along Willow Avenue were recently improved to provide decorative signage for Helm Ranch, as well as new paving. These medians do not contain irrigation so planting would be difficult; however if water could be provided at installation, new water-efficient planting could be established in these medians, and provide opportunity for new plantings, as well as a greater sense of refuge for pedestrians crossing the streets.

## LOMA VISTA

Loma Vista is roughly 50-percent built out with varying levels of planned development for the remaining area; greening opportunities are limited by the timing and approval of development. In an effort to prepare for future development, the City could consider the greening opportunities listed below. Potential opportunity sites are identified in Figure 5.

### TEMPORARY USES OF PROPOSED GREEN SPACE

There are currently planned green spaces in Loma Vista. These future parks could be utilized temporarily for park use that does not require the construction of significant facilities, such as a tree bosque/orchard, community garden or BMX bike track.

### STREET TREE PLANTING

The major streets in Loma Vista have been designated. As a first stage towards developing the green streets in this neighborhood, street trees could be planted along these corridors. This would improve the overall look of the streets as the neighborhood develops. Each major street could be designated with a specific thematic tree, creating a wayfinding mechanism using the urban forest.

Shaw Avenue will be the central commercial corridor in Loma Vista, and serving as the “Village Center.” By creating a pleasant pedestrian environment along this street, the City could promote pedestrian uses and make it easier for nearby residents to walk or bike to everyday goods and services.

Furthermore, the City could designate tree canopy coverage for the neighborhood as part of the development strategy. Research conducted by American Forests recommends an overall average canopy coverage of 25-percent as appropriate for urban areas in temperate and arid climates, such as Clovis, based on recommended coverage for specific land uses of 35-percent for suburban residential, 18-percent for urban residential zones, and 9-percent for central business districts. These targets could be utilized in setting standards.

### PUBLIC ART

The street design for Loma Vista includes landscaped circular intersection nodes. These features could serve as centers for public art, allowing a space for expression within these landscape areas.

### STORMWATER TARGETS

The City is already requiring low-impact design strategies to be implemented in the new development at Loma Vista. New construction allows for new design standards and the new development could significantly offset its

stormwater impact. There are additional opportunities to reduce stormwater impacts, such as utilizing more pervious paving material for new trails, where existing soil conditions allow, and stormwater basins with engineered soil for percolation.

### **WATER CONSERVATION STANDARDS AND IRRIGATION TRAINING FOR CONTRACTORS**

The City could require more intensive water conservation design strategies be implemented in the new development at Loma Vista. The City utilizes the standards set forth in California's Water Efficient Landscape Ordinance (WELo) and could require following Central Valley Friendly landscaping principles or other water conservation standards.

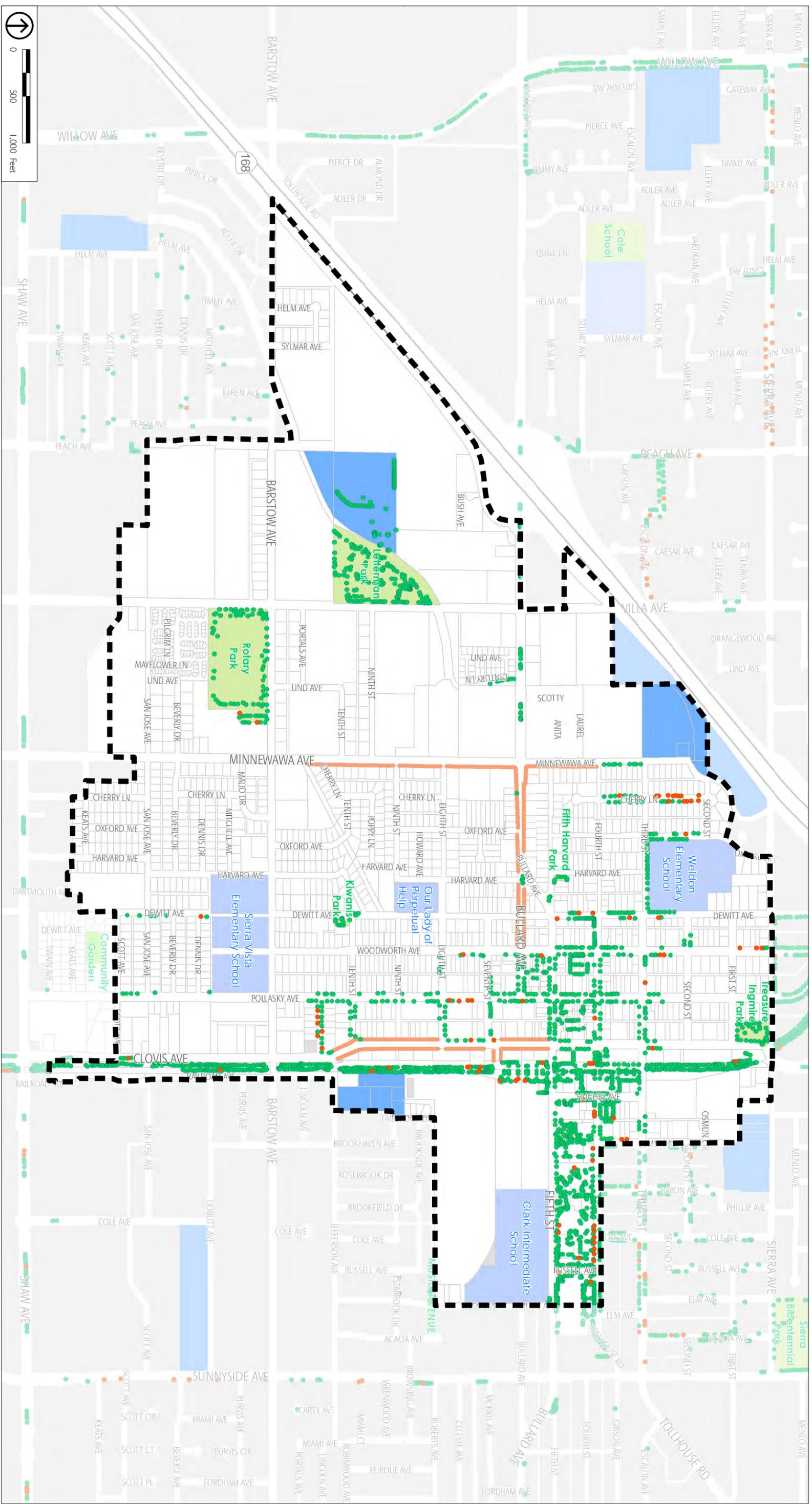
Additionally, the City could partner with irrigation companies to provide classes to contractors on effective and efficient strategies for installing new irrigation. This training could both ensure that the contractors are using the most water-efficient technologies, properly installing and calibrating the equipment in the most efficient ways, and preventing maintenance issues.

## **NORTHWEST**

Northwest has not yet experienced the changes development is bringing to Loma Vista and is still predominately comprised of rural residential and agricultural land uses. Unlike Loma Vista much of the planned development and design is not yet complete for this neighborhood. The City could require more stringent design standards to meet environmental goals, such as urban forestry targets, stormwater standards, and water-conservation features. A comprehensive low-water use/maintenance palette should be designed for the neighborhood. The palette could serve as a demonstration for other "Valley" communities, while honoring the foothills meets orchard/agriculture theme that currently defines the neighborhood.

Greening opportunities for Northwest can be found in Figure 6. Existing streets in Northwest are largely unimproved with few pedestrian amenities or street trees. The major roads connecting Northwest to the rest of the City could begin to transition to green streets. This would increase the likelihood of an active pedestrian presence in the neighborhood. Trail connectors are already planned to connect the education campuses at International and Willow Avenues through Northwest and connecting to Old Town. Establishing parkways on major arterials, extending Clovis Avenue north past Copper Avenue and further extending to Auberry Road, and integrating bike lanes/paths/routes into circulation patterns would all continue to build on the existing bike staging and riding that occurs.

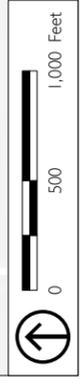
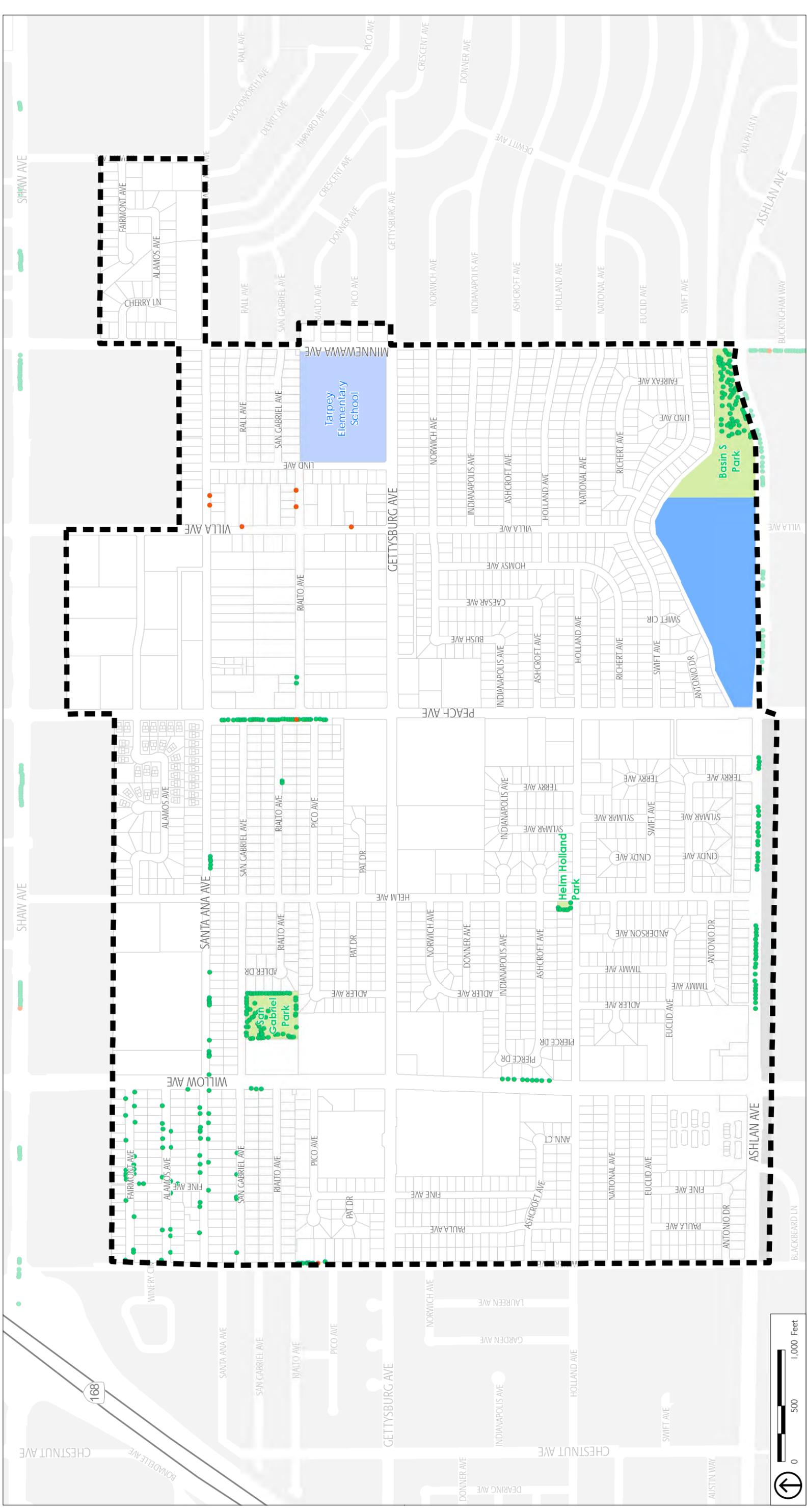




Source: City of Clovis, 2013; Fresno County, 2013; Davey Resource Group, Urban Forest Resource Analysis, 2011; PlaceWorks, 2014.

FIGURE 1: OLD TOWN  
URBAN FOREST CONDITIONS

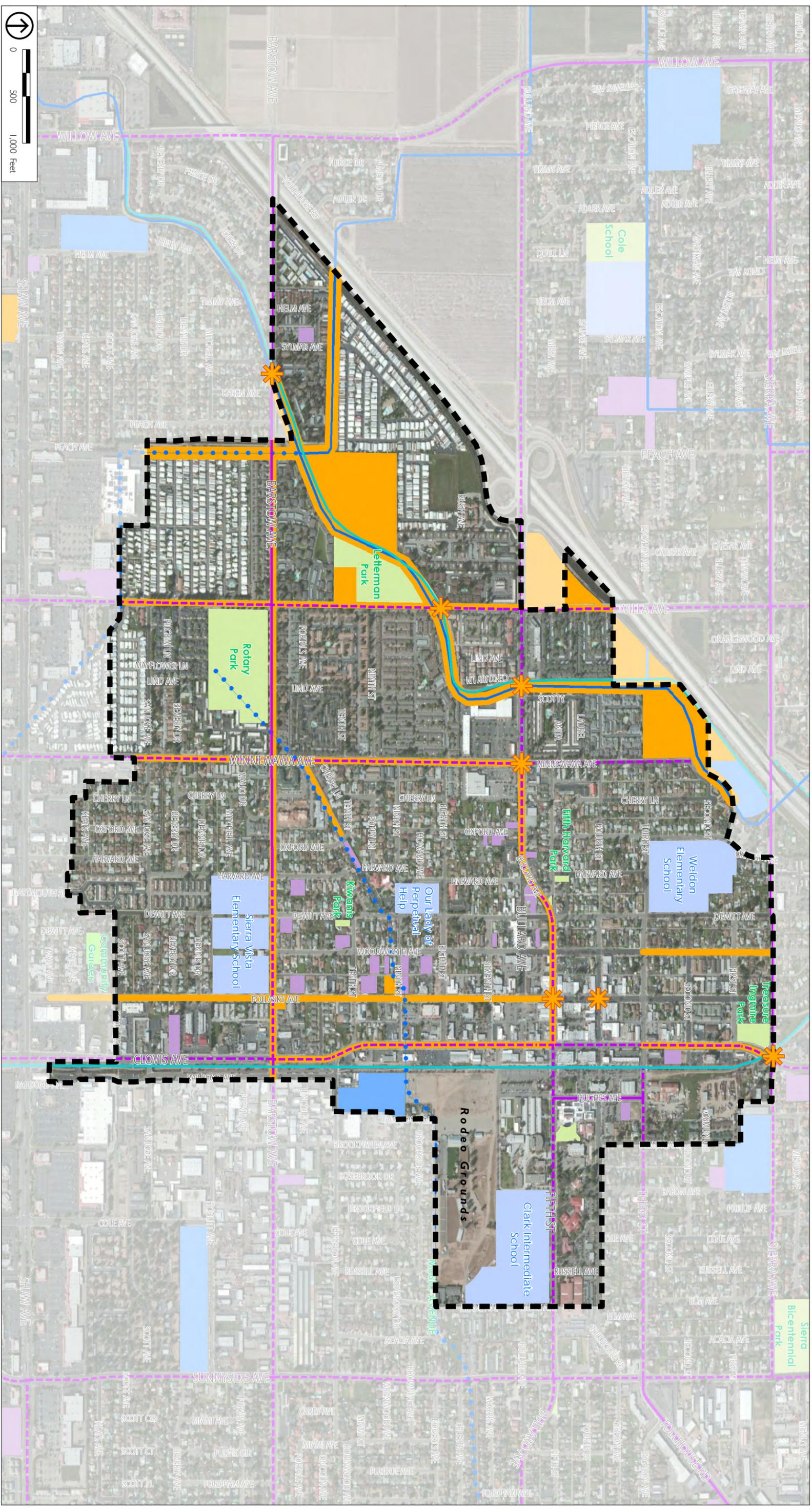
- Tree Conditions**
- New Tree Opportunities
  - Trees
  - High-Priority Urban Forestry Opportunities
- Existing Parks**
- Existing Parks
  - Community Garden
  - Proposed General Plan Park
- School**
- School
  - Basins



- Tree Conditions**
- Existing Parks
  - School
  - Basins
  - New Tree Opportunities
  - Trees

Source: City of Clovis, 2013; Fresno County, 2013; Davey Resource Group, Urban Forest Resource Analysis, 2011; PlaceWorks, 2014.

FIGURE 2: HELM RANCH  
URBAN FOREST CONDITION

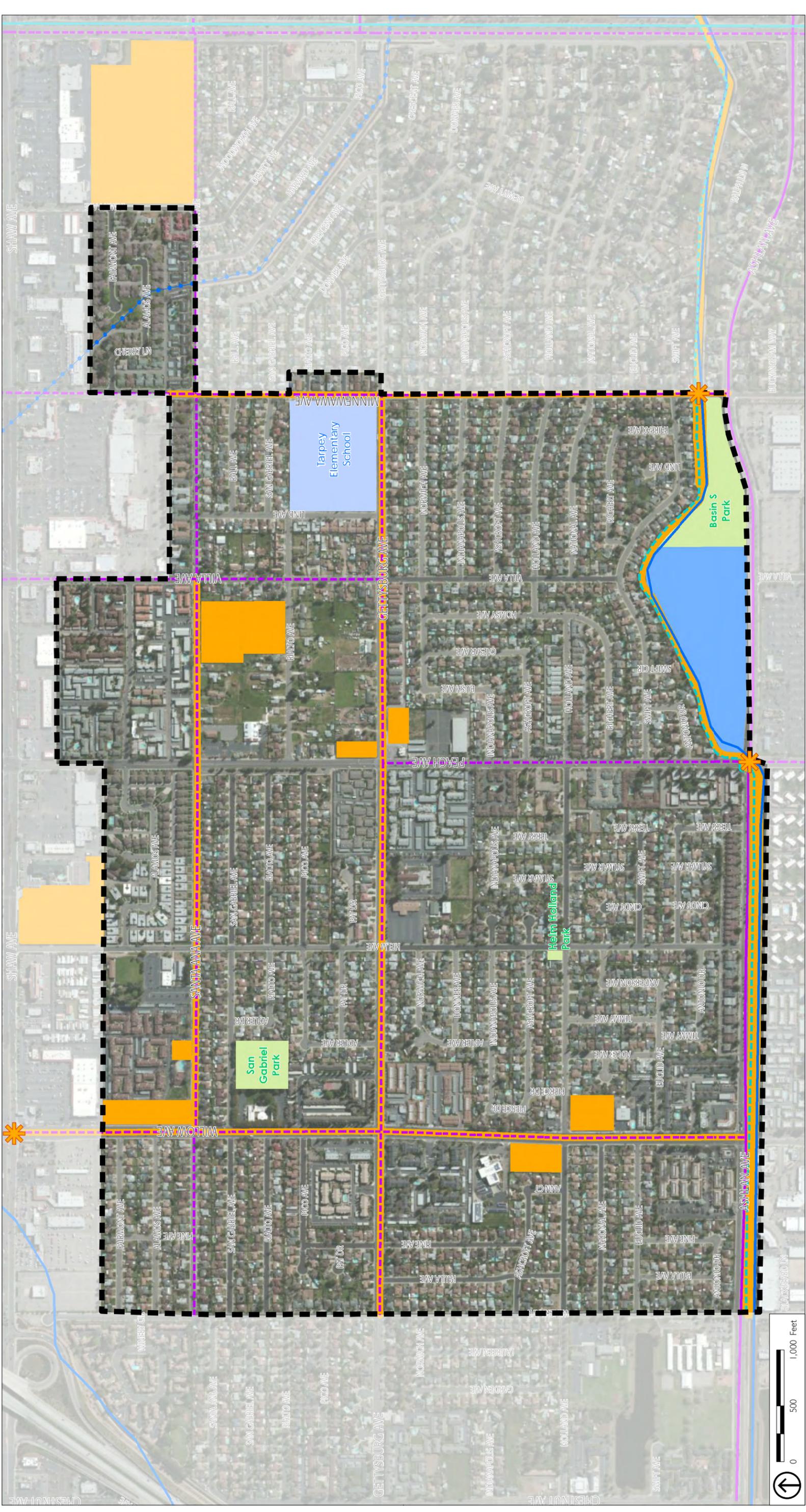


Source: City of Clovis, 2013; Fresno County, 2013; PlaceWorks, 2014.

**Urban Greening Opportunities**

- Potential Intersection Improvements
- Greening Opportunities
- Existing Class 1 Bike Lanes/Trails
- Proposed Class 1 Bike Lanes/Trails
- Existing Other Bike Lanes
- Proposed Other Bike Lanes
- Existing Parks
- Vacant Lots
- School
- Basins
- Open Canals
- Underground Canals

FIGURE 3: OLD TOWN GREENING OPPORTUNITY SITES



Source: City of Clovis, 2013; Fresno County, 2013; PlaceWorks, 2014.

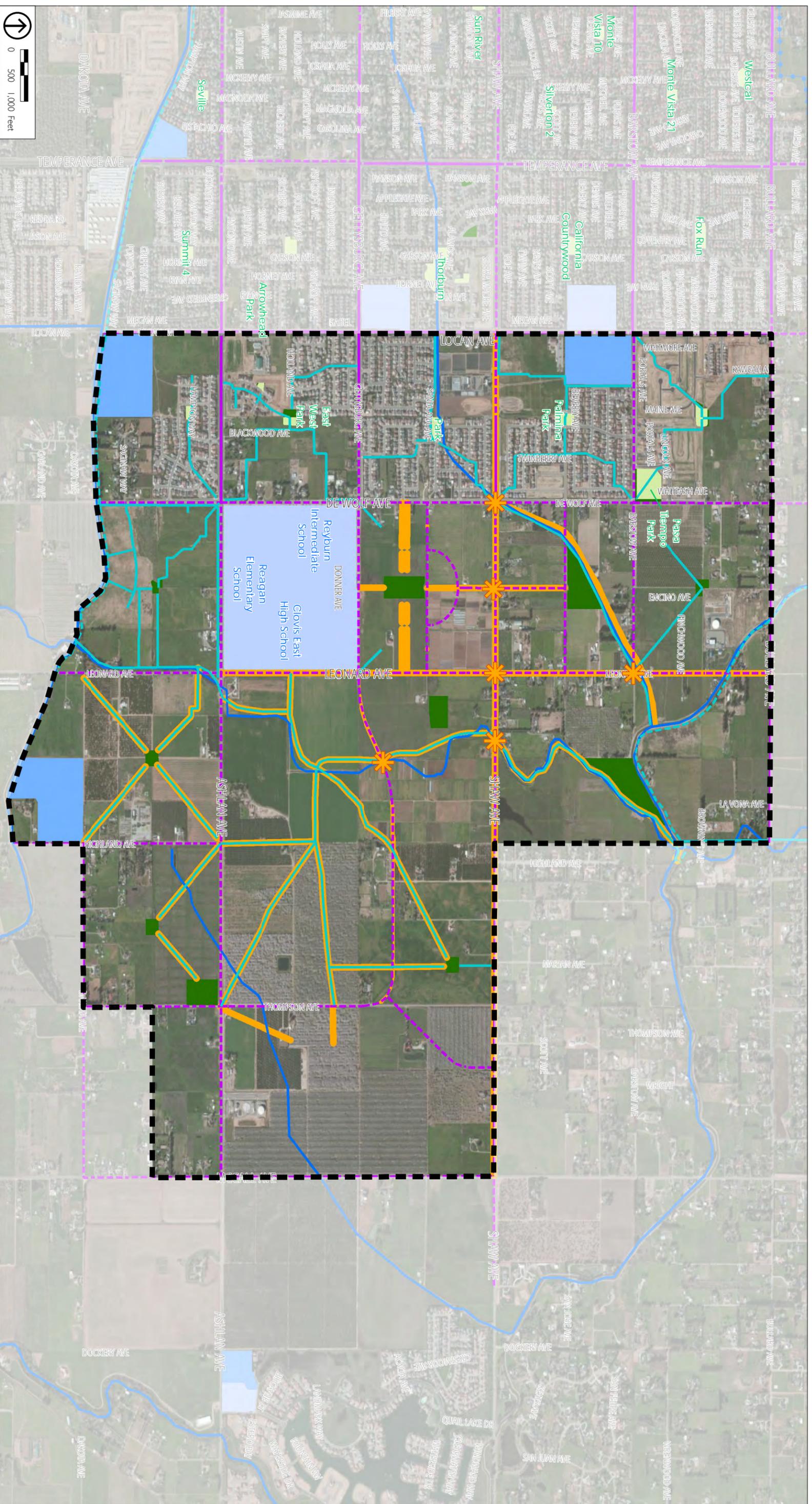
**Urban Greening Opportunities**  
**Potential Intersection Improvements**  
**Greening Opportunities**

Existing Class I  
Proposed Class I  
Existing Bike Lanes  
Proposed Bike Lanes

Existing Parks  
School

Basins  
Open Canals  
Underground Canals

**FIGURE 4: HELM RANCH  
GREENING OPPORTUNITY SITES**

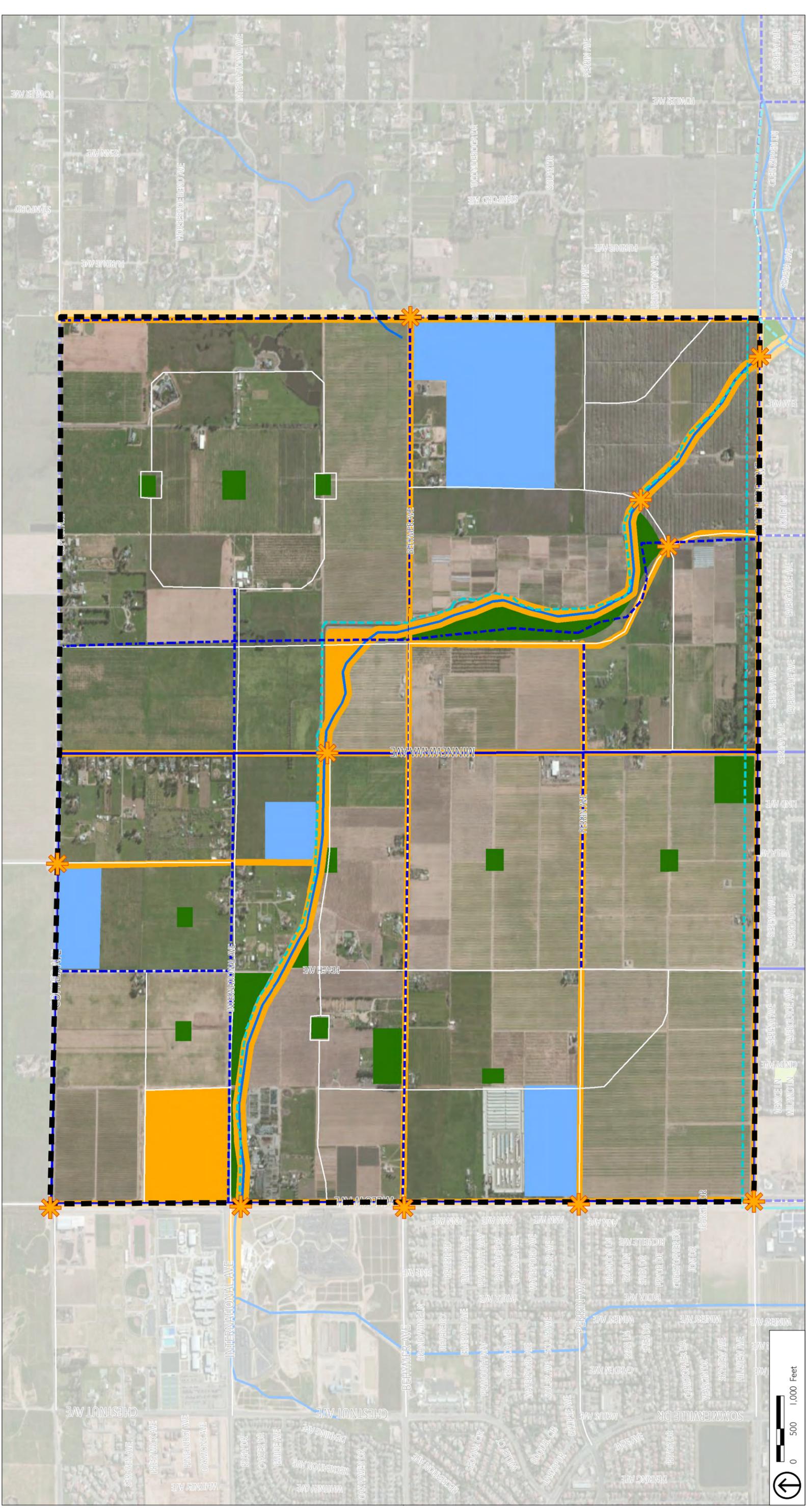


Source: City of Clovis, 2013; Fresno County, 2013; PlaceWorks, 2014.

**Urban Greening Opportunities**

- Existing Class I Bike Lanes/Trails
- Proposed Class I Bike Lanes/Trails
- Existing Other Bike Lanes
- Proposed Other Bike Lanes
- Greening Opportunities
- Existing Basins
- Proposed Basins
- Existing Parks
- Proposed General Plan Park
- Proposed School
- Open Canals
- Underground Canals

FIGURE 5: LOMA VISTA  
GREENING OPPORTUNITY SITES



Source: City of Clovis, 2013; Fresno County, 2013; PlaceWorks, 2014.

- Urban Greening Opportunities
- Potential Intersection Improvements
- Greening Opportunities
- Existing Class I Bike Lanes/Trails
- Proposed Class I Bike Lanes/Trails
- Existing Other Bike Lanes
- Proposed Other Bike Lanes
- Existing Parks
- Proposed General Plan Park
- Basins
- Open Canals
- Underground Canals

FIGURE 6: NORTHWEST

GREENING OPPORTUNITY SITES

URBAN GREENING MASTER PLAN

**E** Model Water Efficient Landscape  
Ordinance ~~September 10, 2009~~  
June 12, 2015 (Public Draft)



**Model Water Efficient Landscape Ordinance**  
**September 10, 2009**  
**June 12, 2015 (Public Draft)**

California Code of Regulations  
Title 23. Waters  
Division 2. Department of Water Resources  
Chapter 2.7. Model Water Efficient Landscape Ordinance

**§ 490. Purpose.**

(a) The State Legislature has found:

- (1) that the waters of the state are of limited supply and are subject to ever increasing demands;
- (2) that the continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;
- (3) that it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;
- (4) that landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; ~~and~~
- (5) that landscape design, installation, maintenance and management can and should be water efficient; and
- (6) that Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

(b) Consistent with these legislative findings, the purpose of this model ordinance is to:

- (1) promote the values and benefits of landscaping practices that integrate and transcend the conservation and efficient use of water; landscapes while recognizing the need to invest water and other resources as efficiently as possible;
- (2) establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects by using a whole system watershed approach in landscapes of any size and scale that requires cross-sector collaboration to achieve the many benefits possible;
- (3) establish provisions for water management practices and water waste prevention for existing landscapes;
- (4) use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount;
- (5) promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;
- (6) encourage local agencies and water purveyors to use economic incentives that promote the efficient use of water, such as implementing a tiered-rate structure; and
- (7) encourage local agencies to designate the necessary authority that implements and enforces the provisions of the Model Water Efficient Landscape Ordinance or its local landscape ordinance.

(c) Regenerative landscape systems that are planned, designed, installed, managed and maintained with the watershed based approach can improve California's environmental conditions and achieve sustainability goals. Consistent with the legislative findings and purpose of the Ordinance, achievable goals include:

- (1) Increasing carbon storage, water retention and productive plant growth by improving soils through reducing compaction, incorporating organic matter and minimizing cut and fill grading.
- (2) Minimizing energy use by reducing irrigation water requirements, reducing reliance on petroleum based fertilizers and pesticides, and planting long lived climate appropriate shade trees in urban areas.

- (3) Conserving water by capturing and reusing rainwater and graywater wherever possible and selecting climate appropriate plants that need minimal supplemental water.
- (4) Protecting air and water quality by reducing power equipment use and landfill trips, selecting locally sourced materials, and using mulch and efficient irrigation equipment to prevent erosion.
- (5) Protecting existing habitat and creating new habitat by choosing local native plants wherever possible and including climate appropriate non-native plants when necessary, and avoiding pesticides and invasive plants.

Note: Authority cited: Section 65593, Government Code. Reference: Sections 65591, 65593, 65596, Government Code.

**§ 490.1 Applicability**

(a) After ~~January 1, 2010~~ November 1, 2015, this ordinance shall apply to all of the following landscape projects:

- (1) new construction projects with a landscape area greater than 500 square feet requiring a building or landscape permit, plan check or design review;
- (2) rehabilitated landscape projects with an aggregated landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
- ~~(1) new construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or design review;~~
- ~~(2) new construction and rehabilitated landscapes which are developer installed in single family and multi family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;~~
- ~~(3) new construction landscapes which are homeowner provided and/or homeowner hired in single family and multi family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or design review;~~
- (3) ~~(4)~~ existing landscapes limited to Sections 493, 493.1 and 493.2; and
- (4) ~~(5)~~ cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 492.4, 492.11 and 492.12; and existing cemeteries are limited to Sections 493, 493.1 and 493.2.

(b) This ordinance does not apply to:

- (1) registered local, state or federal historical sites;
- (2) ecological restoration projects that do not require a permanent irrigation system;
- (3) mined-land reclamation projects that do not require a permanent irrigation system; or
- (4) existing plant collections, as part of botanical gardens and arboretums open to the public.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 491. Definitions.**

The terms used in this ordinance have the meaning set forth below:

- (a) “applied water” means the portion of water supplied by the irrigation system to the landscape.
- (b) “automatic irrigation controller” means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.
- (c) “backflow prevention device” means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.
- (d) “Certificate of Completion” means the document required under Section 492.9.

(e) “certified irrigation designer” means a person certified to design irrigation systems by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency’s WaterSense irrigation designer certification program and Irrigation Association’s Certified Irrigation Designer program.

(f) “certified landscape irrigation auditor” means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency’s WaterSense irrigation auditor certification program and Irrigation Association’s Certified Landscape Irrigation Auditor program.

(g) “check valve” or “anti-drain valve” means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

(h) “common interest developments” means community apartment projects, condominium projects, planned developments, and stock cooperatives per Civil Code Section 1351.

(i) “conversion factor (0.62)” means the number that converts acre-inches per acre per year to gallons per square foot per year.

(j) “drip irrigation” means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

(k) “ecological restoration project” means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(l) “effective precipitation” or “usable rainfall” (Eppt) means the portion of total precipitation which becomes available for plant growth.

(m) “emitter” means a drip irrigation emission device that delivers water slowly from the system to the soil.

(n) “established landscape” means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

(o) “establishment period of the plants” means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.

(p) “Estimated Total Water Use” (ETWU) means the total water used for the landscape as described in Section 492.4.

(q) “ET adjustment factor” (ETAF) means a factor of 0.75 for residential areas and 0.4 for non-residential areas, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 for residential areas and 0.37 for other areas is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.7485 for residential and 0.92 for non-residential areas. Therefore, the ETAF adjustment factor for residential and non-residential is  $(0.75)/(0.425/0.857)$  and  $(0.4)/(0.37/0.92)$ , respectively. The ETAF for a new and existing Special Landscape Areas shall not exceed 1.0. The ETAF for existing non-rehabilitated landscapes is 0.8.

(r) “evapotranspiration rate” means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

(s) “flow rate” means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

(t) “friable” means a soil condition that is easily crumbled or loosely compacted down to a minimum depth per planting material requirements, whereby the root structure of newly planted material will be allowed to spread unimpeded.

(u) “graywater” means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. “Graywater”

includes, but is not limited to, wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers. Pursuant to Health and Safety Code Section 17922.12.

(v) ~~(t)~~ “hardscapes” means any durable material (pervious and non-pervious).

(w) ~~(u)~~ “homeowner-provided landscaping” means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.

(x) ~~(v)~~ “hydrozone” means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

(y) ~~(w)~~ “infiltration rate” means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

(z) ~~(x)~~ “invasive plant species” means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. “Noxious weeds” means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

(aa) ~~(y)~~ “irrigation audit” means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule. The audit must be conducted in a manner consistent with the Irrigation Association’s Landscape Irrigation Auditor Certification program.

(bb) ~~(z)~~ “irrigation efficiency” (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.8574 for residential areas and 0.92 for non-residential areas, averaged on a site-wide basis. Greater irrigation efficiency can be expected from well designed and maintained systems.

(cc) ~~(aa)~~ “irrigation survey” means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.

(dd) ~~(bb)~~ “irrigation water use analysis” means a review of water use data based on meter readings and billing data.

(ee) ~~(cc)~~ “landscape architect” means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.

(ff) ~~(dd)~~ “landscape area” means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

(gg) ~~(ee)~~ “landscape contractor” means a person licensed by the state of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

(hh) “landscape designer” means a person permitted by the Business and Profession Code to prepare plans, drawings, and specifications for the selection, placement, or use of plants for single family dwellings. They may prepare drawings for the conceptual design and placement of tangible objects and landscape features. A landscape designer may not prepare construction documents, details, or specifications for tangible landscape objects or landscape features or prepare grading and drainage plans for the alteration of sites.

- (ii) ~~(ff)~~ “Landscape Documentation Package” means the documents required under Section 492.3.
- (jj) ~~(gg)~~ “landscape project” means total area of landscape in a project as defined in “landscape area” for the purposes of this ordinance, meeting requirements under Section 490.1.
- (kk) ~~(hh)~~ “lateral line” means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.
- (ll) ~~(ii)~~ “local agency” means a city or county, including a charter city or charter county, that is responsible for adopting and implementing the ordinance. The local agency is also responsible for the enforcement of this ordinance, including but not limited to, approval of a permit and plan check or design review of a project.
- (mm) ~~(jj)~~ “local water purveyor” means any entity, including a public agency, city, county, or private water company that provides retail water service.
- (nn) ~~(kk)~~ “low volume irrigation” means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.
- (oo) ~~(H)~~ “main line” means the pressurized pipeline that delivers water from the water source to the valve or outlet.
- (pp) “master valve” is an electric valve installed at the supply point which controls water flow into the main piping system. When this valve is closed water will not be supplied to the irrigation system. A master valve will greatly reduce any water loss due to a leaky station valve.
- (qq) ~~(mm)~~ “Maximum Applied Water Allowance” (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 492.4. It is based upon the area’s reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.
- (rr) “median” is an area between opposing lanes of traffic that may be unplanted or planted with trees, shrubs, perennials, and ornamental grasses.
- (ss) ~~(nn)~~ “microclimate” means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.
- (tt) “microspray” means a microirrigation emission device with one or more orifices to convert irrigation water pressure to water discharge with a flow rate not to exceed 30 gallons per hour (113.5 litres per hour) at the largest area of coverage available for the nozzle series when operated at 30 psi (206.8kPa). Microsprays are inclusive of “microbubblers”, “microspinners” and “microspray jets.” (From ASABE/ICC 802-2014 Landscape Irrigation and Emitter Standard.)
- (uu) ~~(oo)~~ “mined-land reclamation projects” means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
- (vv) ~~(pp)~~ “mulch” means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.
- (ww) ~~(qq)~~ “new construction” means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.
- (xx) ~~(rr)~~ “operating pressure” means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
- (yy) ~~(ss)~~ “overhead sprinkler irrigation systems” means systems that deliver water through the air (e.g., spray heads and rotors).

(zz) (tt) “overspray” means the irrigation water which is delivered beyond the target area.

(aaa) “parkway” means the area between a sidewalk and the curb or traffic lane. It may be planted or unplanted, and with or without pedestrian egress.

(bbb) (uu) “permit” means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.

(ccc) (vv) “pervious” means any surface or material that allows the passage of water through the material and into the underlying soil.

(ddd) (ww) “plant factor” or “plant water use factor” is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication “Water Use Classification of Landscape Species”. Plant factors may also be obtained from horticultural researchers from academic institutions or nursery industry professional associations as approved by the California Department of Water Resources (DWR).

(eee) (xx) “precipitation rate” means the rate of application of water measured in inches per hour.

(fff) (yy) “project applicant” means the individual or entity submitting a Landscape Documentation Package required under Section 492.3 to request a permit, plan check, or design review from the local agency. A project applicant may be the property owner or his or her designee.

(ggg) (zz) “rain sensor” or “rain sensing shutoff device” means a component which automatically suspends an irrigation event when it rains.

(hhh) (aa) “record drawing” or “as-builts” means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

(iii) (bbb) “recreational area” means areas, excluding private single family residential areas, dedicated to active play recreation or public assembly such as parks, sports fields, picnic grounds, amphitheaters and or golf courses tees, fairways and greens.

(jii) (eee) “recycled water”, “reclaimed water”, or “treated sewage effluent water” means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

(kkk) (ddd) “reference evapotranspiration” or “ETo” means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Appendix A Section 495.1, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.

(lll) (eee) “rehabilitated landscape” means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Section 490.1, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

(mmm) (fff) “runoff” means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

(nnn) (ggg) “soil moisture sensing device” or “soil moisture sensor” means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

(ooo) (hhh) “soil texture” means the classification of soil based on its percentage of sand, silt, and clay.

(ppp) (iii) “Special Landscape Area” (SLA) means an area of the landscape dedicated solely to edible plants, recreational areas, areas irrigated with recycled water, and water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

~~(qqq)~~ ~~(jjj)~~ “sprinkler head” means a device which delivers water through a nozzle.

~~(rrr)~~ ~~(kkk)~~ “static water pressure” means the pipeline or municipal water supply pressure when water is not flowing.

~~(sss)~~ ~~(lll)~~ “station” means an area served by one valve or by a set of valves that operate simultaneously.

~~(ttt)~~ ~~(mmm)~~ “swing joint” means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

~~(uuu)~~ ~~(nnn)~~ “turf” means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

~~(vvv)~~ ~~(ooo)~~ “valve” means a device used to control the flow of water in the irrigation system.

~~(www)~~ “water budget” is a reasonable estimate of the amount of irrigation water required for a specific landscape. Basic water budget calculations require measured areas of each irrigated hydrozone and reference evapotranspiration for the area to be landscaped.

~~(xxx)~~ ~~(ppp)~~ “water conserving plant species” means a plant species identified as having a low plant factor.

~~(yyy)~~ ~~(qqq)~~ “water feature” means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

~~(zzz)~~ ~~(rrr)~~ “watering window” means the time of day irrigation is allowed.

~~(aaaa)~~ ~~(sss)~~ “WUCOLS” means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, and the Department of Water Resources and the Bureau of Reclamation, 2000 2014.

Note: Authority Cited: Section 65595, Government Code. Reference: Sections 65592, 65596, Government Code.

## **§ 492. Provisions for New Construction or Rehabilitated Landscapes.**

(a) A local agency may designate another agency, such as a water purveyor, to implement some or all of the requirements contained in this ordinance. Local agencies may collaborate with water purveyors to define each entity’s specific responsibilities relating to this ordinance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

### **§ 492.1 Compliance with Landscape Documentation Package.**

(a) Prior to construction, the local agency shall:

- (1) provide the project applicant with the ordinance and procedures for permits, plan checks, or design reviews;
- (2) review the Landscape Documentation Package submitted by the project applicant;
- (3) approve or deny the Landscape Documentation Package;
- (4) issue a permit or approve the plan check or design review for the project applicant; and
- (5) upon approval of the Landscape Documentation Package, submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.

(b) Prior to construction, the project applicant shall:

- (1) submit a Landscape Documentation Package to the local agency.

(c) Upon approval of the Landscape Documentation Package by the local agency, the project applicant shall:

- (1) receive a permit or approval of the plan check or design review and record the date of the permit in the Certificate of Completion;
- (2) submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee; and
- (3) submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.2 Penalties.**

(a) A local agency may establish and administer penalties to the project applicant for non-compliance with the ordinance to the extent permitted by law.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.3 Elements of the Landscape Documentation Package.**

(a) The Landscape Documentation Package shall include the following six (6) elements:

- (1) project information;
  - (A) date
  - (B) project applicant
  - (C) project address (if available, parcel and/or lot number(s))
  - (D) total landscape area (square feet)
  - (E) project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)
  - (F) water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
  - (G) checklist of all documents in Landscape Documentation Package
  - (H) project contacts to include contact information for the project applicant and property owner
  - (I) applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package".
- (2) Water Efficient Landscape Worksheet;
  - (A) hydrozone information table
  - (B) water budget calculations
    1. Maximum Applied Water Allowance (MAWA)
    2. Estimated Total Water Use (ETWU)
- (3) soil management report;
- (4) landscape design plan;
- (5) irrigation design plan; and
- (6) grading design plan.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.4 Water Efficient Landscape Worksheet.**

(a) A project applicant shall complete the Water Efficient Landscape Worksheet which contains two sections (see sample worksheet in Appendix B):

- (1) a hydrozone information table (see Appendix B, Section A) for the landscape project; and
- (2) a water budget calculation (see Appendix B, Section B) for the landscape project. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, a project

applicant shall use the ETo values from the Reference Evapotranspiration Table in Appendix A. For geographic areas not covered in Appendix A, use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.

(b) Water budget calculations shall adhere to the following requirements:

(1) The plant factor used shall be from WUCOLS. Plant factors may also be obtained from horticultural researchers with academic institutions or nursery industry professional associations as approved by the California Department of Water Resources (DWR). The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.

(2) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

(3) All Special Landscape Areas shall be identified and their water use calculated as described below.

(4) ETAF for Special Landscape Areas shall not exceed 1.0.

(c) Maximum Applied Water Allowance

The Maximum Applied Water Allowance shall be calculated using the equation:

Residential Areas:  $MAWA = (ET_o) (0.62) [(0.57 \times LA) + (0.53 \times SLA)]$

Non-Residential:  $MAWA = (ET_o) (0.62) [(0.4 \times LA) + (0.6 \times SLA)]$

The example calculations below are hypothetical to demonstrate proper use of the equations and do not represent an existing and/or planned landscape project. The ETo values used in these calculations are from the Reference Evapotranspiration Table in Appendix A, for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

(1) Example MAWA calculation for a residential landscape project: a hypothetical landscape project in Fresno, CA with an irrigated landscape area of 50,000 square feet without any Special Landscape Area (SLA= 0, no edible plants, recreational areas, or use of recycled water). To calculate MAWA, the annual reference evapotranspiration value for Fresno is 51.1 inches as listed in the Reference Evapotranspiration Table in Appendix A.

$MAWA = (ET_o) (0.62) [(0.57 \times LA) + (0.53 \times SLA)]$

MAWA = Maximum Applied Water Allowance (gallons per year)

ET<sub>o</sub> = Reference Evapotranspiration (inches per year)

0.62 = Conversion Factor (to gallons per year)

0.57 = ET Adjustment Factor (ETAF)

LA = Landscape Area including SLA (square feet)

0.53 = Additional Water Allowance for SLA

SLA = Special Landscape Area (square feet)

$MAWA = (51.1 \text{ inches}) (0.62) [(0.57 \times 50,000 \text{ square feet}) + (0.53 \times 0)]$

$= 1,108,870 \text{ } 792,050$  gallons per year

To convert from gallons per year to hundred-cubic-feet per year:

$= 1,108,870 \text{ } 792,050 / 748 = 1,482,059$  hundred-cubic-feet per year

(100 cubic feet = 748 gallons)

(2) In this next hypothetical example, the residential landscape project in Fresno, CA has the same ETo value of 51.1 inches and a total landscape area of 50,000 square feet. Within the 50,000 square foot project, there is now a 2,000 square foot area planted with edible plants. This 2,000 square foot area is considered to be a Special Landscape Area.

$$\begin{aligned}
 \text{MAWA} &= (\text{ET}_o) (0.62) [(0.57 \times \text{LA}) + (0.53 \times \text{SLA})] \\
 \text{MAWA} &= (51.1 \text{ inches}) (0.62) [(0.57 \times 50,000 \text{ square feet}) + (0.53 \times 2,000 \text{ square feet})] \\
 &= 31.68 \times [235,000 + 1,0600] \text{ gallons per year} \\
 &= 31.68 \times 3526,0600 \text{ gallons per year} \\
 &= 1,127,808823,680 \text{ gallons per year or } 1,101,508 \text{ hundred-cubic-feet per year}
 \end{aligned}$$

(d) Estimated Total Water Use.

The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$\text{ETWU} = (\text{ET}_o)(0.62) \left( \frac{\text{PF} \times \text{HA}}{\text{IE}} + \text{SLA} \right)$$

Where:

- ETWU = Estimated Total Water Use per year (gallons)
- ET<sub>o</sub> = Reference Evapotranspiration (inches)
- PF = Plant Factor from WUCOLS (see Section 491)
- HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
- SLA = Special Landscape Area (square feet)
- 0.62 = Conversion Factor (to gallons per year)
- IE = Irrigation Efficiency (minimum 0.8574 for residential areas and 0.92 for non-residential areas)

(1) Example ETWU calculation: landscape area is 50,000 square feet; plant water use type, plant factor, and hydrozone area are shown in the table below. The ET<sub>o</sub> value is 51.1 inches per year. There are no Special Landscape Areas (recreational area, area permanently and solely dedicated to edible plants, and area irrigated with recycled water) in this example.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	17,000	5,6800
2	High	0.7	102,000	147,000
3	Medium	0.5	156,000	78,5000
4	Low	0.3	147,000	42,1200
5	Low	0.2	180,000	23,0600
			Sum	24,70017,500

\*Plant Factor from WUCOLS

$$\begin{aligned}
 \text{ETWU} &= (51.1)(0.62) \left( \frac{17,500}{0.85} + 0 \right) \\
 &= 1,102,116 \text{ } 652,276 \text{ gallons per year}
 \end{aligned}$$

Compare ETWU with MAWA: For this example MAWA = (51.1) (0.62) [(0.57 x 50,000) + (0.53 x 0)] = 1,108,870 792,050 gallons per year. The ETWU (1,102,116 652,276 gallons per year) is less than MAWA (1,108,870 792,050 gallons per year). In this example, the water budget complies with the MAWA.

(2) Example ETWU calculation: total landscape area is 50,000 square feet, 2,000 square feet of which is planted with edible plants. The edible plant area is considered a Special Landscape Area

(SLA). The reference evapotranspiration value is 51.1 inches per year. The plant type, plant factor, and hydrozone area are shown in the table below.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)*	Hydrozone Area (HA) (square feet)	PF x HA (square feet)
1	High	0.8	<u>17,000</u>	<u>85,600</u>
2	High	0.7	<u>19,000</u>	<u>6,3700</u>
3	Medium	0.5	<u>145,000</u>	<u>7,0500</u>
4	Low	0.3	<u>147,000</u>	<u>4,2400</u>
5	Low	0.2	<u>180,000</u>	<u>32,600</u>
			Sum	<u>1623,3500</u>
6	SLA	1.0	2,000	2,000

\*Plant Factor from WUCOLS

$$ETWU = (51.1)(0.62) \left( \frac{16,300}{0.85} + 2,000 \right)$$

$$= (31.68) (33,099 \underline{19,176} + 2,000)$$

$$= 1,111,936 \underline{670,898} \text{ gallons per year}$$

Compare ETWU with MAWA. For this example:

$$MAWA = (51.1) (0.62) [(0.57 \times 50,000) + (0.53 \times 2,000)]$$

$$= 31.68 \times [235,000 + \underline{1,0600}]$$

$$= 31.68 \times \underline{35,60026,000}$$

$$= 1,127,808 \underline{823,680} \text{ gallons per year}$$

The ETWU (1,111,936670,898 gallons per year) is less than MAWA (1,127,808823,680 gallons per year). For this example, the water budget complies with the MAWA.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### § 492.5 Soil Management Report.

(a) In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:

- (1) Submit soil samples to a laboratory for analysis and recommendations.
  - (A) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
  - (B) The soil analysis may include:
    1. soil texture;
    2. infiltration rate determined by laboratory test or soil texture infiltration rate table;
    3. pH;
    4. total soluble salts;
    5. sodium;
    6. percent organic matter; and
    7. recommendations.
- (2) The project applicant, or his/her designee, shall comply with one of the following:
  - (A) If significant mass grading is not planned, the soil analysis report shall be submitted to the local agency as part of the Landscape Documentation Package; or

- (B) If significant mass grading is planned, the soil analysis report shall be submitted to the local agency as part of the Certificate of Completion.
- (3) The soil analysis report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
- (4) The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to the local agency with Certificate of Completion.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

### § 492.6 Landscape Design Plan.

(a) For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

#### (1) Plant Material

(A) Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance. To encourage the efficient use of water, the following is highly recommended:

1. protection and preservation of native species and natural vegetation;
2. selection of water-conserving plant and turf species, especially local native plants;
3. selection of plants based on local climate suitability, disease and pest resistance;
4. selection of trees based on applicable local tree ordinances or tree shading guidelines, and size at maturity as appropriate for the planting area; and
5. selection of plants from local and regional landscape program plant lists.

(B) Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 492.7(a)(2)(D).

(C) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended:

1. use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
2. recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; and
3. consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

(D) Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).

(E) Turf is prohibited in street medians.

(F) Turf is prohibited in parkways less than 10 feet wide, unless the parkway is adjacent to a parking strip and used to enter and exit vehicles. Any turf in parkways must be irrigated by sub-surface irrigation or by other technology that creates no overspray or runoff.

(G) ~~(E)~~ A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per

Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

(H) ~~(F)~~ The use of invasive and/or noxious plant species is strongly discouraged.

(I) ~~(G)~~ The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

(2) Water Features

(A) Recirculating water systems shall be used for water features.

(B) Where available, recycled water shall be used as a source for decorative water features.

(C) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

(D) Pool and spa covers are highly recommended.

(E) Recreational water features (swimming pools, splash pads or similar) must recirculate water.

(3) Soil Preparation, Mulch and Amendments

(A) Prior to the planting of any materials, compacted soils shall be transformed to a friable condition.

(B) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 492.5).

(C) For landscape installations, compost at a rate of a minimum of four cubic yards per 1,000 square feet of permeable area (unless contra-indicated by soil test) shall be incorporated to a depth of six inches into the soil. Soils with greater than 25% organic matter in the top 6 inches of soil are exempt from adding compost.

(D) ~~(A)~~ A minimum ~~two~~ three inch (23" ) layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.

(E) ~~(B)~~ Stabilizing mulching products shall be used on slopes.

(F) ~~(C)~~ The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

(G) Organic mulch materials should take precedence over inorganic materials in instances where it is suitable, ecologically possible, and the material does not pose a fire hazard. Composted organic material, in particular that which includes post-consumer material, should be considered over more compacted products such as bark, wood chips, etc.

~~(D) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected (see Section 492.5).~~

(b) The landscape design plan, at a minimum, shall:

(1) delineate and label each hydrozone by number, letter, or other method;

(2) identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;

(3) identify recreational areas;

(4) identify areas permanently and solely dedicated to edible plants;

(5) identify areas irrigated with recycled water;

(6) identify type of mulch and application depth;

(7) identify soil amendments, type, and quantity;

(8) identify type and surface area of water features;

(9) identify hardscapes (pervious and non-pervious);

(10) identify location, installation details, and 24-hour retention or infiltration capacity of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to: are provide in Section 492.16.

(A) infiltration beds, swales, and basins that allow water to collect and soak into the ground;

(B) constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and

(C) pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

(11) identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, eisterns, etc.) as discussed in Section 492.16 and their 24-hour retention or infiltration capacity;

(12) identify any applicable graywater discharge piping, system components and area(s) of distribution;

(13) ~~(12)~~ contain the following statement: “I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan”; and

(14) ~~(13)~~ bear the signature of a licensed landscape architect, licensed landscape contractor, landscape designer or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code and Section 1351, Civil Code.

### § 492.7 Irrigation Design Plan.

(a) This section applies to landscaped areas requiring permanent irrigation, not areas that require temporary irrigation solely for the plant establishment period. For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers’ recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

#### (1) System

(A) ~~Dedicated landscape water meters are highly recommended on landscape areas smaller than 5,000 square feet to facilitate water management shall be required for all non-residential irrigated landscapes of 1,000 sq. ft. but not more than 5,000sq.ft. (the level at which Water Code 535 applies) and residential irrigated landscapes of 5,000 sq. ft. or greater. A landscape water meter may be either:~~

1. a customer service meter dedicated to landscape use provided by the local water purveyor; or

2. a privately owned meter or submeter.

(B) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data and non-volatile memory shall be required for irrigation scheduling in all irrigation systems.

(C) The installation of a pressure regulator is required ~~The irrigation systems shall be designed~~ to ensure that the dynamic pressure at each emission device is within the manufacturer’s recommended pressure range for optimal performance.

1. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators,

booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

2. Static water pressure, dynamic or operating pressure and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

(D) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions. Irrigation should be avoided during windy or freezing weather or during rain.

(E) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

(F) Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the applicable local agency code (i.e., public health) for additional backflow prevention requirements.

(G) ~~High~~ Flow sensors that detect ~~and report~~ high flow conditions created by system damage or malfunction are ~~recommended~~ required.

(H) Master valves are required on all projects.

(I) ~~(H)~~ The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

(J) ~~(H)~~ Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

(K) ~~(J)~~ The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

(L) ~~(K)~~ The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 492.4 regarding the Maximum Applied Water Allowance.

(M) The irrigation system must be designed and installed in such a manner that a precipitation rate of 1.0 inches per hour is not exceeded in any portion of the landscape.

(N) ~~(L)~~ It is highly recommended that the project applicant or local agency inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.

(O) ~~(M)~~ In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

(P) ~~(N)~~ Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

(Q) ~~(O)~~ Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.

(R) ~~(P)~~ Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to hardscapes or in high traffic areas of turfgrass.

(S) ~~(Q)~~ Check valves or anti-drain valves are required for all irrigation systems.

(T) ~~(R)~~ Narrow or irregularly shaped Areas of, including turf, less than ~~teneight~~ (108) feet in width in any direction shall be irrigated with subsurface irrigation or ~~low volume irrigation system other technology that produces no runoff or overspray.~~

(U) ~~(S)~~ Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may

include drip, drip line, or other low flow non-spray technology. The setback area may be planted or unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

1. the landscape area is adjacent to permeable surfacing and no runoff occurs; or
2. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
3. the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in Section 492.7 (a)(1)(~~I~~H). Prevention of overspray and runoff must be confirmed during the irrigation audit.

(V) Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

## (2) Hydrozone

(A) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

(B) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

(C) Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf to facilitate the appropriate irrigation of trees.

(D) Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:

1. plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
2. the plant factor of the higher water using plant is used for calculations.

(E) Individual hydrozones that mix high and low water use plants shall not be permitted.

(F) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table (see Appendix B Section A). This table can also assist with the irrigation audit and programming the controller.

## (b) The irrigation design plan, at a minimum, shall contain:

- (1) location and size of separate water meters for landscape;
- (2) location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
- (3) static water pressure at the point of connection to the public water supply;
- (4) flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
- (5) recycled water irrigation systems as specified in Section 492.14;
- (6) the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and
- (7) the signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

### **§ 492.8 Grading Design Plan.**

(a) For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for other local agency permits satisfies this requirement.

(1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

- (A) height of graded slopes;
- (B) drainage patterns;
- (C) pad elevations;
- (D) finish grade; and
- (E) stormwater retention improvements, if applicable.

(2) To prevent excessive erosion and runoff, it is highly recommended that project applicants:

- (A) grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
- (B) avoid disruption of natural drainage patterns and undisturbed soil; and
- (C) avoid soil compaction in landscape areas.

(3) The grading design plan shall contain the following statement: “I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the grading design plan” and shall bear the signature of a licensed professional as authorized by law.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

### **§ 492.9 Certificate of Completion.**

(a) The Certificate of Completion (see Appendix C for a sample certificate) shall include the following six (6) elements:

(1) project information sheet that contains:

- (A) date;
- (B) project name;
- (C) project applicant name, telephone, and mailing address;
- (D) project address and location; and
- (E) property owner name, telephone, and mailing address;

(2) certification by either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package;

(A) where there have been significant changes made in the field during construction, these “as-built” or record drawings shall be included with the certification;

(3) irrigation scheduling parameters used to set the controller (see Section 492.10);

(4) landscape and irrigation maintenance schedule (see Section 492.11);

(5) irrigation audit report (see Section 492.12); and

(6) soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations (see Section 492.5).

(b) The project applicant shall:

(1) submit the signed Certificate of Completion to the local agency for review;

(2) ensure that copies of the approved Certificate of Completion are submitted to the local water purveyor and property owner or his or her designee.

(c) The local agency shall:

(1) receive the signed Certificate of Completion from the project applicant;

(2) approve or deny the Certificate of Completion. If the Certificate of Completion is denied, the local agency shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.10 Irrigation Scheduling.**

(a) For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

- (1) Irrigation scheduling shall be regulated by automatic irrigation controllers.
- (2) Overhead irrigation shall be scheduled between 8:00 p.m. and 10:00 a.m. unless weather conditions prevent it. If allowable hours of irrigation differ from the local water purveyor, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
- (3) For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.
- (4) Parameters used to set the automatic controller shall be developed and submitted for each of the following:
  - (A) the plant establishment period;
  - (B) the established landscape; and
  - (C) temporarily irrigated areas.
- (5) Each irrigation schedule shall consider for each station all of the following that apply:
  - (A) irrigation interval (days between irrigation);
  - (B) irrigation run times (hours or minutes per irrigation event to avoid runoff);
  - (C) number of cycle starts required for each irrigation event to avoid runoff;
  - (D) amount of applied water scheduled to be applied on a monthly basis;
  - (E) application rate setting;
  - (F) root depth setting;
  - (G) plant type setting;
  - (H) soil type;
  - (I) slope factor setting;
  - (J) shade factor setting; and
  - (K) irrigation uniformity or efficiency setting.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.11 Landscape and Irrigation Maintenance Schedule.**

- (a) Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.
- (b) A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

(c) Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.

(d) A project applicant is encouraged to implement sustainable Best Practices ~~or environmentally-friendly practices~~ for overall all landscape maintenance activities.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 492.12 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.**

(a) All landscape irrigation audits shall be conducted by a local agency irrigation auditor or a third party certified landscape irrigation auditor that is not the designer or installer of the landscape.

(b) For new construction and rehabilitated landscape projects installed after January 1, 2010, as described in Section 490.1:

(1) the project applicant shall submit an irrigation audit report with the Certificate of Completion to the local agency that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule;

(2) the local agency shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 492.13 Irrigation Efficiency.**

(a) For the purpose of determining Maximum Applied Water Allowance, average irrigation efficiency is assumed to be 0.8571 for residential areas and 0.92 for non-residential areas. Irrigation systems shall be designed, maintained, and managed to meet or exceed a site-wide ~~average~~ landscape irrigation efficiency of 0.8571 for residential areas and 0.92 for non-residential areas.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 492.14 Recycled Water.**

(a) The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in Section 492.14(b).

(b) Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the local water purveyor stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.

(c) All recycled water irrigation systems shall be designed and operated in accordance with all applicable local and State laws.

(d) Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 492.15 Graywater Systems.**

(a) Graywater systems promote the efficient use of water and are encouraged to assist in on-site landscape irrigation. All graywater systems shall conform to the California Plumbing Code (Title 24, Part 5, Chapter 16) and any applicable local ordinance standards.

### **§ 492.165 Stormwater Management and Rainwater Retention.**

(a) Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site rainwater retention and infiltration are encouraged.

(b) Project applicants shall refer to the local agency or Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.

(c) All planted landscape areas are required to have friable soil to maximize water retention and infiltration. Refer to § 492.6(a)(3).

(d) It is recommended that project also incorporate any of the following elements to improve on-site stormwater retention:

- Grade impervious surfaces, such as driveways, during construction to drain to vegetated areas.
- Minimize the area of impervious surfaces such as paved areas, roof and concrete driveways.
- Incorporate pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.
- Direct runoff from paved surfaces and roof areas into planting beds or landscaped areas to maximize site water retention.
- Incorporate rain gardens, cisterns, and other rain harvesting or catchment.
- Incorporate infiltration beds, swales, basins and drywells to retain stormwater and increase percolation into the soil.
- Consider constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants.

~~(e) Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.~~

(e) It is strongly recommended that retention and infiltration capacity sufficient to prevent runoff from roof surfaces and the landscape area from either the one inch, 24-hour rain event or the 85<sup>th</sup> percentile, 24-hour rain event, and such additional capacity, if any, as may be required by any applicable local or regional regulation, be provided.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

### **§ 492.176 Public Education.**

(a) Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the community.

(1) A local agency or water supplier/purveyor shall provide information to owners of permitted renovations and new single-family residential homes regarding the design, installation, management, and maintenance of water efficient landscapes based on a water budget.

(b) Model Homes. All model homes ~~shall be landscaped and that are landscaped shall~~ use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.

(1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme. Signage shall include information about the site water use as designed per the local ordinance; specify who designed and installed the water efficient landscape; and demonstrate low water use approaches to landscaping such as using native plants, graywater systems, and rainwater catchment systems.

(2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes. Information available shall include detailed specifications on how to hire trained and licensed landscape architects, contractors, designers and maintenance workers and the benefits of using such professionals.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 492.187 Environmental Review.**

(a) The local agency must comply with the California Environmental Quality Act (CEQA), as appropriate.

Note: Authority cited: Section 21082, Public Resources Code. Reference: Sections 21080, 21082, Public Resources Code.

#### **§ 493. Provisions for Existing Landscapes.**

(a) A local agency may designate another agency, such as a water purveyor, to implement some or all of the requirements contained in this ordinance. Local agencies may collaborate with water purveyors to define each entity's specific responsibilities relating to this ordinance.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 493.1 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.**

(a) This section, 493.1, shall apply to all existing landscapes that were installed before ~~January 1, 2010~~ November 1, 2015 and are over one acre in size.

(1) For all landscapes in 493.1(a) that have a water meter, the local agency shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as:  $MWA = (0.8) (ET_o)(LA)(0.62)$ .

(2) For all landscapes in 493.1(a), that do not have a meter, the local agency shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

(b) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

#### **§ 493.2 Water Waste Prevention.**

(a) Local agencies shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff from leaving the target landscape due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally.

(b) Restrictions regarding overspray and runoff may be modified if:

(1) the landscape area is adjacent to permeable surfacing and no runoff occurs; or

(2) the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping.

Note: Authority cited: Section 65594, Government Code. Reference: Section 65596, Government Code.

#### **§ 494. Effective Precipitation.**

(a) A local agency may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:

MAWA = (ETo - Eppt) (0.62) [(0.57 x LA) + (0.53 x SLA)] for residential areas.

MAWA = (ETo - Eppt) (0.62) [(0.4 x LA) + (0.6 x SLA)] for non-residential areas.

Note: Authority Cited: Section 65595, Government Code. Reference: Section 65596, Government Code.

**§ 495. Reporting.**

(a) Local agencies responsible for administering the ordinance shall report on implementation and enforcement by December 31, 2015. Subsequently, reporting will be due by January 31<sup>st</sup> of each year.

Reports should be submitted as follows.

(b) Local agencies are to address the following:

- (1) Define the reporting period. For the initial reporting, local agencies are encouraged to report as far back as records for implementation of their ordinances allow. At a minimum, the reporting period shall commence on November 1, 2015. The end of the reporting period shall be no sooner than December 15, 2015. In subsequent years, reporting will be for the calendar year.
- (2) State if using a locally modified Water Efficient Landscape Ordinance (WELO) or the MWELo. If using a locally modified WELO, how is it different than MWELo, and are there any exemptions specified?
- (3) State the entity responsible for implementing the ordinance.
- (4) State number and types of projects subject to the ordinance during the specified reporting period.
- (5) State the total area (in square feet or acres) subject to the ordinance over the reporting period, if available.
- (6) Provide the number of new housing starts, new commercial projects, and landscape retrofits during the reporting period.
- (7) Describe the procedure for review of projects subject to the ordinance.
- (8) Describe actions taken to verify compliance. Is a plan check performed; if so, by what entity? Is a site inspection performed; if so, by what entity? Is a post-installation audit required; if so, by whom?
- (9) Describe enforcement measures.
- (10) Explain challenges to implementing and enforcing the ordinance.
- (11) Describe educational and other needs to properly apply the ordinance.

**Appendices.**

**Appendix A. Reference Evapotranspiration (ET<sub>o</sub>) Table.**

<b>County and City</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Annual ET<sub>o</sub></b>
<b>ALAMEDA</b>													
Fremont	1.5	1.9	3.4	4.7	5.4	6.3	6.7	6.0	4.5	3.4	1.8	1.5	47.0
Livermore	1.2	1.5	2.9	4.4	5.9	6.6	7.4	6.4	5.3	3.2	1.5	0.9	47.2
Oakland	1.5	1.5	2.8	3.9	5.1	5.3	6.0	5.5	4.8	3.1	1.4	0.9	41.8
Oakland Foothills	1.1	1.4	2.7	3.7	5.1	6.4	5.8	4.9	3.6	2.6	1.4	1.0	39.6
Pleasanton	0.8	1.5	2.9	4.4	5.6	6.7	7.4	6.4	4.7	3.3	1.5	1.0	46.2
Union City	1.4	1.8	3.1	4.2	5.4	5.9	6.4	5.7	4.4	3.1	1.5	1.2	44.2
<b>ALPINE</b>													
Markleeville	0.7	0.9	2.0	3.5	5.0	6.1	7.3	6.4	4.4	2.6	1.2	0.5	40.6
<b>AMADOR</b>													
Jackson	1.2	1.5	2.8	4.4	6.0	7.2	7.9	7.2	5.3	3.2	1.4	0.9	48.9
Shanandoah Valley	1.0	1.7	2.9	4.4	5.6	6.8	7.9	7.1	5.2	3.6	1.7	1.0	48.8
<b>BUTTE</b>													
Chico	1.2	1.8	2.9	4.7	6.1	7.4	8.5	7.3	5.4	3.7	1.7	1.0	51.7
Durham	1.1	1.8	3.2	5.0	6.5	7.4	7.8	6.9	5.3	3.6	1.7	1.0	51.1
Gridley	1.2	1.8	3.0	4.7	6.1	7.7	8.5	7.1	5.4	3.7	1.7	1.0	51.9
Oroville	1.2	1.7	2.8	4.7	6.1	7.6	8.5	7.3	5.3	3.7	1.7	1.0	51.5
<b>CALAVERAS</b>													
San Andreas	1.2	1.5	2.8	4.4	6.0	7.3	7.9	7.0	5.3	3.2	1.4	0.7	48.8
<b>COLUSA</b>													
Colusa	1.0	1.7	3.4	5.0	6.4	7.6	8.3	7.2	5.4	3.8	1.8	1.1	52.8
Williams	1.2	1.7	2.9	4.5	6.1	7.2	8.5	7.3	5.3	3.4	1.6	1.0	50.8
<b>CONTRA COSTA</b>													
<del>Benicia</del>	<del>1.3</del>	<del>1.4</del>	<del>2.7</del>	<del>3.8</del>	<del>4.9</del>	<del>5.0</del>	<del>6.4</del>	<del>5.5</del>	<del>4.4</del>	<del>2.9</del>	<del>1.2</del>	<del>0.7</del>	<del>40.3</del>
Brentwood	1.0	1.5	2.9	4.5	6.1	7.1	7.9	6.7	5.2	3.2	1.4	0.7	48.3
Concord	1.1	1.4	2.4	4.0	5.5	5.9	7.0	6.0	4.8	3.2	1.3	0.7	43.4
Courtland	0.9	1.5	2.9	4.4	6.1	6.9	7.9	6.7	5.3	3.2	1.4	0.7	48.0
Martinez	1.2	1.4	2.4	3.9	5.3	5.6	6.7	5.6	4.7	3.1	1.2	0.7	41.8
Moraga	1.2	1.5	3.4	4.2	5.5	6.1	6.7	5.9	4.6	3.2	1.6	1.0	44.9
Pittsburg	1.0	1.5	2.8	4.1	5.6	6.4	7.4	6.4	5.0	3.2	1.3	0.7	45.4
Walnut Creek	0.8	1.5	2.9	4.4	5.6	6.7	7.4	6.4	4.7	3.3	1.5	1.0	46.2
<b>DEL NORTE</b>													
Crescent City	0.5	0.9	2.0	3.0	3.7	3.5	4.3	3.7	3.0	2.0	0.9	0.5	27.7
<b>EL DORADO</b>													
Camino	0.9	1.7	2.5	3.9	5.9	7.2	7.8	6.8	5.1	3.1	1.5	0.9	47.3
<b>FRESNO</b>													
Clovis	1.0	1.5	3.2	4.8	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.4
Coalinga	1.2	1.7	3.1	4.6	6.2	7.2	8.5	7.3	5.3	3.4	1.6	0.7	50.9
Firebaugh	1.0	1.8	3.7	5.7	7.3	8.1	8.2	7.2	5.5	3.9	2.0	1.1	55.4
FivePoints	1.3	2.0	4.0	6.1	7.7	8.5	8.7	8.0	6.2	4.5	2.4	1.2	60.4
Fresno	0.9	1.7	3.3	4.8	6.7	7.8	8.4	7.1	5.2	3.2	1.4	0.6	51.1
Fresno State	0.9	1.6	3.2	5.2	7.0	8.0	8.7	7.6	5.4	3.6	1.7	0.9	53.7
Friant	1.2	1.5	3.1	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
Kerman	0.9	1.5	3.2	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.2
Kingsburg	1.0	1.5	3.4	4.8	6.6	7.7	8.4	7.2	5.3	3.4	1.4	0.7	51.6
Mendota	1.5	2.5	4.6	6.2	7.9	8.6	8.8	7.5	5.9	4.5	2.4	1.5	61.7
Orange Cove	1.2	1.9	3.5	4.7	7.4	8.5	8.9	7.9	5.9	3.7	1.8	1.2	56.7

## Appendix A. Reference Evapotranspiration (ET<sub>o</sub>) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ET <sub>o</sub>
Panoche	1.1	2.0	4.0	5.6	7.8	8.5	8.3	7.3	5.6	3.9	1.8	1.2	57.2
Parlier	1.0	1.9	3.6	5.2	6.8	7.6	8.1	7.0	5.1	3.4	1.7	0.9	52.0
Reedley	1.1	1.5	3.2	4.7	6.4	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.3
Westlands	0.9	1.7	3.8	6.3	8.0	8.6	8.6	7.8	5.9	4.3	2.1	1.1	58.8
<b>GLENN</b>													
Orland	1.1	1.8	3.4	5.0	6.4	7.5	7.9	6.7	5.3	3.9	1.8	1.4	52.1
Willows	1.2	1.7	2.9	4.7	6.1	7.2	8.5	7.3	5.3	3.6	1.7	1.0	51.3
<b>HUMBOLDT</b>													
Eureka	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
Ferndale	0.5	1.1	2.0	3.0	3.7	3.7	3.7	3.7	3.0	2.0	0.9	0.5	27.5
Garberville	0.6	1.2	2.2	3.1	4.5	5.0	5.5	4.9	3.8	2.4	1.0	0.7	34.9
Hoopa	0.5	1.1	2.1	3.0	4.4	5.4	6.1	5.1	3.8	2.4	0.9	0.7	35.6
<b>IMPERIAL</b>													
Brawley	2.8	3.8	5.9	8.0	10.4	11.5	11.7	10.0	8.4	6.2	3.5	2.1	84.2
Calipatria/Mulberry	2.4	3.2	5.1	6.8	8.6	9.2	9.2	8.6	7.0	5.2	3.1	2.3	70.7
El Centro	2.7	3.5	5.6	7.9	10.1	11.1	11.6	9.5	8.3	6.1	3.3	2.0	81.7
Holtville	2.8	3.8	5.9	7.9	10.4	11.6	12.0	10.0	8.6	6.2	3.5	2.1	84.7
Meloland	2.5	3.2	5.5	7.5	8.9	9.2	9.0	8.5	6.8	5.3	3.1	2.2	71.6
Palo Verde II	2.5	3.3	5.7	6.9	8.5	8.9	8.6	7.9	6.2	4.5	2.9	2.3	68.2
Seeley	2.7	3.5	5.9	7.7	9.7	10.1	9.3	8.3	6.9	5.5	3.4	2.2	75.4
Westmoreland	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Yuma	2.5	3.4	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.6
<b>INYO</b>													
Bishop	1.7	2.7	4.8	6.7	8.2	10.9	7.4	9.6	7.4	4.8	2.5	1.6	68.3
Death Valley Jct	2.2	3.3	5.4	7.7	9.8	11.1	11.4	10.1	8.3	5.4	2.9	1.7	79.1
Independence	1.7	2.7	3.4	6.6	8.5	9.5	9.8	8.5	7.1	3.9	2.0	1.5	65.2
Lower Haiwee Res.	1.8	2.7	4.4	7.1	8.5	9.5	9.8	8.5	7.1	4.2	2.6	1.5	67.6
Oasis	2.7	2.8	5.9	8.0	10.4	11.7	11.6	10.0	8.4	6.2	3.4	2.1	83.1
<b>KERN</b>													
Arvin	1.2	1.8	3.5	4.7	6.6	7.4	8.1	7.3	5.3	3.4	1.7	1.0	51.9
Bakersfield	1.0	1.8	3.5	4.7	6.6	7.7	8.5	7.3	5.3	3.5	1.6	0.9	52.4
Bakersfield/Bonanza	1.2	2.2	3.7	5.7	7.4	8.2	8.7	7.8	5.7	4.0	2.1	1.2	57.9
Bakersfield/Greenlee	1.2	2.2	3.7	5.7	7.4	8.2	8.7	7.8	5.7	4.0	2.1	1.2	57.9
Belridge	1.4	2.2	4.1	5.5	7.7	8.5	8.6	7.8	6.0	3.8	2.0	1.5	59.2
Blackwells Corner	1.4	2.1	3.8	5.4	7.0	7.8	8.5	7.7	5.8	3.9	1.9	1.2	56.6
Buttonwillow	1.0	1.8	3.2	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.5	0.9	52.0
China Lake	2.1	3.2	5.3	7.7	9.2	10.0	11.0	9.8	7.3	4.9	2.7	1.7	74.8
Delano	0.9	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.4	3.4	1.4	0.7	52.0
Famoso	1.3	1.9	3.5	4.8	6.7	7.6	8.0	7.3	5.5	3.5	1.7	1.3	53.1
Grapevine	1.3	1.8	3.1	4.4	5.6	6.8	7.6	6.8	5.9	3.4	1.9	1.0	49.5
Inyokern	2.0	3.1	4.9	7.3	8.5	9.7	11.0	9.4	7.1	5.1	2.6	1.7	72.4
Isabella Dam	1.2	1.4	2.8	4.4	5.8	7.3	7.9	7.0	5.0	3.2	1.7	0.9	48.4
Lamont	1.3	2.4	4.4	4.6	6.5	7.0	8.8	7.6	5.7	3.7	1.6	0.8	54.4
Lost Hills	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
McFarland/Kern	1.2	2.1	3.7	5.6	7.3	8.0	8.3	7.4	5.6	4.1	2.0	1.2	56.5
Shafter	1.0	1.7	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.5	0.9	52.1
Taft	1.3	1.8	3.1	4.3	6.2	7.3	8.5	7.3	5.4	3.4	1.7	1.0	51.2
Tehachapi	1.4	1.8	3.2	5.0	6.1	7.7	7.9	7.3	5.9	3.4	2.1	1.2	52.9

**Appendix A. Reference Evapotranspiration (ET<sub>o</sub>) Table.**

<b>County and City</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Annual ET<sub>o</sub></b>
<b>KINGS</b>													
Caruthers	1.6	2.5	4.0	5.7	7.8	8.7	9.3	8.4	6.3	4.4	2.4	1.6	62.7
Corcoran	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Hanford	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.2	5.4	3.4	1.4	0.7	51.5
Kettleman	1.1	2.0	4.0	6.0	7.5	8.5	9.1	8.2	6.1	4.5	2.2	1.1	60.2
Lemoore	0.9	1.5	3.4	5.0	6.6	7.7	8.3	7.3	5.4	3.4	1.4	0.7	51.7
Stratford	0.9	1.9	3.9	6.1	7.8	8.6	8.8	7.7	5.9	4.1	2.1	1.0	58.7
<b>LAKE</b>													
Lakeport	1.1	1.3	2.6	3.5	5.1	6.0	7.3	6.1	4.7	2.9	1.2	0.9	42.8
Lower Lake	1.2	1.4	2.7	4.5	5.3	6.3	7.4	6.4	5.0	3.1	1.3	0.9	45.4
<b>LASSEN</b>													
Buntingville	1.0	1.7	3.5	4.9	6.2	7.3	8.4	7.5	5.4	3.4	1.5	0.9	51.8
Ravendale	0.6	1.1	2.3	4.1	5.6	6.7	7.9	7.3	4.7	2.8	1.2	0.5	44.9
Susanville	0.7	1.0	2.2	4.1	5.6	6.5	7.8	7.0	4.6	2.8	1.2	0.5	44.0
<b>LOS ANGELES</b>													
Burbank	2.1	2.8	3.7	4.7	5.1	6.0	6.6	6.7	5.4	4.0	2.6	2.0	51.7
Claremont	2.0	2.3	3.4	4.6	5.0	6.0	7.0	7.0	5.3	4.0	2.7	2.1	51.3
El Dorado	1.7	2.2	3.6	4.8	5.1	5.7	5.9	5.9	4.4	3.2	2.2	1.7	46.3
Glendale	2.0	2.2	3.3	3.8	4.7	4.8	5.7	5.6	4.3	3.3	2.2	1.8	43.7
Glendora	2.0	2.5	3.6	4.9	5.4	6.1	7.3	6.8	5.7	4.2	2.6	2.0	53.1
Gorman	1.6	2.2	3.4	4.6	5.5	7.4	7.7	7.1	5.9	3.6	2.4	1.1	52.4
Hollywood Hills	2.1	2.2	3.8	5.4	6.0	6.5	6.7	6.4	5.2	3.7	2.8	2.1	52.8
Lancaster	2.1	3.0	4.6	5.9	8.5	9.7	11.0	9.8	7.3	4.6	2.8	1.7	71.1
Long Beach	1.8	2.1	3.3	3.9	4.5	4.3	5.3	4.7	3.7	2.8	1.8	1.5	39.7
Los Angeles	2.2	2.7	3.7	4.7	5.5	5.8	6.2	5.9	5.0	3.9	2.6	1.9	50.1
Monrovia	2.2	2.3	3.8	4.3	5.5	5.9	6.9	6.4	5.1	3.2	2.5	2.0	50.2
Palmdale	2.0	2.6	4.6	6.2	7.3	8.9	9.8	9.0	6.5	4.7	2.7	2.1	66.2
Pasadena	2.1	2.7	3.7	4.7	5.1	6.0	7.1	6.7	5.6	4.2	2.6	2.0	52.3
Pearblossom	1.7	2.4	3.7	4.7	7.3	7.7	9.9	7.9	6.4	4.0	2.6	1.6	59.9
Pomona	1.7	2.0	3.4	4.5	5.0	5.8	6.5	6.4	4.7	3.5	2.3	1.7	47.5
Redondo Beach	2.2	2.4	3.3	3.8	4.5	4.7	5.4	4.8	4.4	2.8	2.4	2.0	42.6
San Fernando	2.0	2.7	3.5	4.6	5.5	5.9	7.3	6.7	5.3	3.9	2.6	2.0	52.0
Santa Clarita	2.8	2.8	4.1	5.6	6.0	6.8	7.6	7.8	5.8	5.2	3.7	3.2	61.5
Santa Monica	1.8	2.1	3.3	4.5	4.7	5.0	5.4	5.4	3.9	3.4	2.4	2.2	44.2
<b>MADERA</b>													
Chowchilla	1.0	1.4	3.2	4.7	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.4
Madera	0.9	1.4	3.2	4.8	6.6	7.8	8.5	7.3	5.3	3.4	1.4	0.7	51.5
Raymond	1.2	1.5	3.0	4.6	6.1	7.6	8.4	7.3	5.2	3.4	1.4	0.7	50.5
<b>MARIN</b>													
Black Point	1.1	1.7	3.0	4.2	5.2	6.2	6.6	5.8	4.3	2.8	1.3	0.9	43.0
Novato	1.3	1.5	2.4	3.5	4.4	6.0	5.9	5.4	4.4	2.8	1.4	0.7	39.8
Point San Pedro	1.1	1.7	3.0	4.2	5.2	6.2	6.6	5.8	4.3	2.8	1.3	0.9	43.0
San Rafael	1.2	1.3	2.4	3.3	4.0	4.8	4.8	4.9	4.3	2.7	1.3	0.7	35.8
<b>MARIPOSA</b>													
Coulterville	1.1	1.5	2.8	4.4	5.9	7.3	8.1	7.0	5.3	3.4	1.4	0.7	48.8
Mariposa	1.1	1.5	2.8	4.4	5.9	7.4	8.2	7.1	5.0	3.4	1.4	0.7	49.0
Yosemite Village	0.7	1.0	2.3	3.7	5.1	6.5	7.1	6.1	4.4	2.9	1.1	0.6	41.4
<b>MENDOCINO</b>													

## Appendix A. Reference Evapotranspiration (ET<sub>o</sub>) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ET <sub>o</sub>
Fort Bragg	0.9	1.3	2.2	3.0	3.7	3.5	3.7	3.7	3.0	2.3	1.2	0.7	29.0
Hopland	1.1	1.3	2.6	3.4	5.0	5.9	6.5	5.7	4.5	2.8	1.3	0.7	40.9
Point Arena	1.0	1.3	2.3	3.0	3.7	3.9	3.7	3.7	3.0	2.3	1.2	0.7	29.6
Sanel Valley	1.0	1.6	3.0	4.6	6.0	7.0	8.0	7.0	5.2	3.4	1.4	0.9	49.1
Ukiah	1.0	1.3	2.6	3.3	5.0	5.8	6.7	5.9	4.5	2.8	1.3	0.7	40.9
<b>MERCED</b>													
Kesterson	0.9	1.7	3.4	5.5	7.3	8.2	8.6	7.4	5.5	3.8	1.8	0.9	55.1
Los Banos	1.0	1.5	3.2	4.7	6.1	7.4	8.2	7.0	5.3	3.4	1.4	0.7	50.0
Merced	1.0	1.5	3.2	4.7	6.6	7.9	8.5	7.2	5.3	3.4	1.4	0.7	51.5
<b>MODOC</b>													
Modoc/Alturas	0.9	1.4	2.8	3.7	5.1	6.2	7.5	6.6	4.6	2.8	1.2	0.7	43.2
<b>MONO</b>													
Bridgeport	0.7	0.9	2.2	3.8	5.5	6.6	7.4	6.7	4.7	2.7	1.2	0.5	43.0
<b>MONTEREY</b>													
Arroyo Seco	1.5	2.0	3.7	5.4	6.3	7.3	7.2	6.7	5.0	3.9	2.0	1.6	52.6
Castroville	1.4	1.7	3.0	4.2	4.6	4.8	4.0	3.8	3.0	2.6	1.6	1.4	36.2
Gonzales	1.3	1.7	3.4	4.7	5.4	6.3	6.3	5.9	4.4	3.4	1.9	1.3	45.7
Greenfield	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
King City	1.7	2.0	3.4	4.4	4.4	5.6	6.1	6.7	6.5	5.2	2.2	1.3	49.6
King City-Oasis Rd.	1.4	1.9	3.6	5.3	6.5	7.3	7.4	6.8	5.1	4.0	2.0	1.5	52.7
Long Valley	1.5	1.9	3.2	4.1	5.8	6.5	7.3	6.7	5.3	3.6	2.0	1.2	49.1
Monterey	1.7	1.8	2.7	3.5	4.0	4.1	4.3	4.2	3.5	2.8	1.9	1.5	36.0
Pajaro	1.8	2.2	3.7	4.8	5.3	5.7	5.6	5.3	4.3	3.4	2.4	1.8	46.1
Salinas	1.6	1.9	2.7	3.8	4.8	4.7	5.0	4.5	4.0	2.9	1.9	1.3	39.1
Salinas North	1.2	1.5	2.9	4.1	4.6	5.2	4.5	4.3	3.2	2.8	1.5	1.2	36.9
San Ardo	1.0	1.7	3.1	4.5	5.9	7.2	8.1	7.1	5.1	3.1	1.5	1.0	49.0
San Juan	1.8	2.1	3.4	4.6	5.3	5.7	5.5	4.9	3.8	3.2	2.2	1.9	44.2
Soledad	1.7	2.0	3.4	4.4	5.5	5.4	6.5	6.2	5.2	3.7	2.2	1.5	47.7
<b>NAPA</b>													
Angwin	1.8	1.9	3.2	4.7	5.8	7.3	8.1	7.1	5.5	4.5	2.9	2.1	54.9
Carneros	0.8	1.5	3.1	4.6	5.5	6.6	6.9	6.2	4.7	3.5	1.4	1.0	45.8
Oakville	1.0	1.5	2.9	4.7	5.8	6.9	7.2	6.4	4.9	3.5	1.6	1.2	47.7
St Helena	1.2	1.5	2.8	3.9	5.1	6.1	7.0	6.2	4.8	3.1	1.4	0.9	44.1
Yountville	1.3	1.7	2.8	3.9	5.1	6.0	7.1	6.1	4.8	3.1	1.5	0.9	44.3
<b>NEVADA</b>													
Grass Valley	1.1	1.5	2.6	4.0	5.7	7.1	7.9	7.1	5.3	3.2	1.5	0.9	48.0
Nevada City	1.1	1.5	2.6	3.9	5.8	6.9	7.9	7.0	5.3	3.2	1.4	0.9	47.4
<b>ORANGE</b>													
Irvine	2.2	2.5	3.7	4.7	5.2	5.9	6.3	6.2	4.6	3.7	2.6	2.3	49.6
Laguna Beach	2.2	2.7	3.4	3.8	4.6	4.6	4.9	4.9	4.4	3.4	2.4	2.0	43.2
Santa Ana	2.2	2.7	3.7	4.5	4.6	5.4	6.2	6.1	4.7	3.7	2.5	2.0	48.2
<b>PLACER</b>													
Auburn	1.2	1.7	2.8	4.4	6.1	7.4	8.3	7.3	5.4	3.4	1.6	1.0	50.6
Blue Canyon	0.7	1.1	2.1	3.4	4.8	6.0	7.2	6.1	4.6	2.9	0.9	0.6	40.5
Colfax	1.1	1.5	2.6	4.0	5.8	7.1	7.9	7.0	5.3	3.2	1.4	0.9	47.9
Roseville	1.1	1.7	3.1	4.7	6.2	7.7	8.5	7.3	5.6	3.7	1.7	1.0	52.2
Soda Springs	0.7	0.7	1.8	3.0	4.3	5.3	6.2	5.5	4.1	2.5	0.7	0.7	35.4
Tahoe City	0.7	0.7	1.7	3.0	4.3	5.4	6.1	5.6	4.1	2.4	0.8	0.6	35.5

## Appendix A. Reference Evapotranspiration (ET<sub>o</sub>) Table.

County and City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ET <sub>o</sub>
Truckee	0.7	0.7	1.7	3.2	4.4	5.4	6.4	5.7	4.1	2.4	0.8	0.6	36.2
<b>PLUMAS</b>													
Portola	0.7	0.9	1.9	3.5	4.9	5.9	7.3	5.9	4.3	2.7	0.9	0.5	39.4
Quincy	0.7	0.9	2.2	3.5	4.9	5.9	7.3	5.9	4.4	2.8	1.2	0.5	40.2
<b>RIVERSIDE</b>													
Beaumont	2.0	2.3	3.4	4.4	6.1	7.1	7.6	7.9	6.0	3.9	2.6	1.7	55.0
Blythe	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Cathedral City	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Coachella	2.9	4.4	6.2	8.4	10.5	11.9	12.3	10.1	8.9	6.2	3.8	2.4	88.1
Desert Center	2.9	4.1	6.4	8.5	11.0	12.1	12.2	11.1	9.0	6.4	3.9	2.6	90.0
Elsinore	2.1	2.8	3.9	4.4	5.9	7.1	7.6	7.0	5.8	3.9	2.6	1.9	55.0
Indio	<b>3.1</b>	3.6	6.5	8.3	10.5	11.0	10.8	9.7	8.3	5.9	3.7	2.7	83.9
<b>RIVERSIDE</b>													
La Quinta	2.4	2.8	5.2	6.5	8.3	8.7	8.5	7.9	6.5	4.5	2.7	2.2	66.2
Mecca	2.6	3.3	5.7	7.2	8.6	9.0	8.8	8.2	6.8	5.0	3.2	2.4	70.8
Oasis	2.9	3.3	5.3	6.1	8.5	8.9	8.7	7.9	6.9	4.8	2.9	2.3	68.4
Palm Desert	2.5	3.4	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.6
Palm Springs	2.0	2.9	4.9	7.2	8.3	8.5	11.6	8.3	7.2	5.9	2.7	1.7	71.1
Rancho California	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
Rancho Mirage	2.4	3.3	5.3	6.9	8.7	9.6	9.6	8.7	6.9	5.0	3.0	2.2	71.4
Ripley	2.7	3.3	5.6	7.2	8.7	8.7	8.4	7.6	6.2	4.6	2.8	2.2	67.8
Salton Sea North	2.5	3.3	5.5	7.2	8.8	9.3	9.2	8.5	6.8	5.2	3.1	2.3	71.7
Temecula East II	2.3	2.4	4.1	4.9	6.4	7.0	7.8	7.4	5.7	4.1	2.6	2.2	56.7
Thermal	2.4	3.3	5.5	7.6	9.1	9.6	9.3	8.6	7.1	5.2	3.1	2.1	72.8
Riverside UC	2.5	2.9	4.2	5.3	5.9	6.6	7.2	6.9	5.4	4.1	2.9	2.6	56.4
Winchester	2.3	2.4	4.1	4.9	6.4	6.9	7.7	7.5	6.0	3.9	2.6	2.1	56.8
<b>SACRAMENTO</b>													
Fair Oaks	1.0	1.6	3.4	4.1	6.5	7.5	8.1	7.1	5.2	3.4	1.5	1.0	50.5
Sacramento	1.0	1.8	3.2	4.7	6.4	7.7	8.4	7.2	5.4	3.7	1.7	0.9	51.9
Twitchell Island	1.2	1.8	3.9	5.3	7.4	8.8	9.1	7.8	5.9	3.8	1.7	1.2	57.9
<b>SAN BENITO</b>													
Hollister	1.5	1.8	3.1	4.3	5.5	5.7	6.4	5.9	5.0	3.5	1.7	1.1	45.1
San Benito	1.2	1.6	3.1	4.6	5.6	6.4	6.9	6.5	4.8	3.7	1.7	1.2	47.2
San Juan Valley	1.4	1.8	3.4	4.5	6.0	6.7	7.1	6.4	5.0	3.5	1.8	1.4	49.1
<b>SAN BERNARDINO</b>													
Baker	2.7	3.9	6.1	8.3	10.4	11.8	12.2	11.0	8.9	6.1	3.3	2.1	86.6
Barstow NE	2.2	2.9	5.3	6.9	9.0	10.1	9.9	8.9	6.8	4.8	2.7	2.1	71.7
Big Bear Lake	1.8	2.6	4.6	6.0	7.0	7.6	8.1	7.4	5.4	4.1	2.4	1.8	58.6
Chino	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0	54.6
Crestline	1.5	1.9	3.3	4.4	5.5	6.6	7.8	7.1	5.4	3.5	2.2	1.6	50.8
Lake Arrowhead	1.8	2.6	4.6	6.0	7.0	7.6	8.1	7.4	5.4	4.1	2.4	1.8	58.6
Lucerne Valley	2.2	2.9	5.1	6.5	9.1	11.0	11.4	9.9	7.4	5.0	3.0	1.8	75.3
Needles	3.2	4.2	6.6	8.9	11.0	12.4	12.8	11.0	8.9	6.6	4.0	2.7	92.1
Newberry Springs	2.1	2.9	5.3	8.4	9.8	10.9	11.1	9.9	7.6	5.2	3.1	2.0	78.2
San Bernardino	2.0	2.7	3.8	4.6	5.7	6.9	7.9	7.4	5.9	4.2	2.6	2.0	55.6
Twentynine Palms	2.6	3.6	5.9	7.9	10.1	11.2	11.2	10.3	8.6	5.9	3.4	2.2	82.9
Victorville	2.0	2.6	4.6	6.2	7.3	8.9	9.8	9.0	6.5	4.7	2.7	2.1	66.2

<b>SAN DIEGO</b>													
Chula Vista	2.2	2.7	3.4	3.8	4.9	4.7	5.5	4.9	4.5	3.4	2.4	2.0	44.2
Escondido SPV	2.4	2.6	3.9	4.7	5.9	6.5	7.1	6.7	5.3	3.9	2.8	2.3	54.2
Miramar	2.3	2.5	3.7	4.1	5.1	5.4	6.1	5.8	4.5	3.3	2.4	2.1	47.1
Oceanside	2.2	2.7	3.4	3.7	4.9	4.6	4.6	5.1	4.1	3.3	2.4	2.0	42.9
Otay Lake	2.3	2.7	3.9	4.6	5.6	5.9	6.2	6.1	4.8	3.7	2.6	2.2	50.4
Pine Valley	1.5	2.4	3.8	5.1	6.0	7.0	7.8	7.3	6.0	4.0	2.2	1.7	54.8
Ramona	2.1	2.1	3.4	4.6	5.2	6.3	6.7	6.8	5.3	4.1	2.8	2.1	51.6
San Diego	2.1	2.4	3.4	4.6	5.1	5.3	5.7	5.6	4.3	3.6	2.4	2.0	46.5
Santee	2.1	2.7	3.7	4.5	5.5	6.1	6.6	6.2	5.4	3.8	2.6	2.0	51.1
Torrey Pines	2.2	2.3	3.4	3.9	4.0	4.1	4.6	4.7	3.8	2.8	2.0	2.0	39.8
Warner Springs	1.6	2.7	3.7	4.7	5.7	7.6	8.3	7.7	6.3	4.0	2.5	1.3	56.0
<b>SAN FRANCISCO</b>													
San Francisco	1.5	1.3	2.4	3.0	3.7	4.6	4.9	4.8	4.1	2.8	1.3	0.7	35.1
<b>SAN JOAQUIN</b>													
Farmington	1.5	1.5	2.9	4.7	6.2	7.6	8.1	6.8	5.3	3.3	1.4	0.7	50.0
<b>SAN JOAQUIN</b>													
Lodi West	1.0	1.6	3.3	4.3	6.3	6.9	7.3	6.4	4.5	3.0	1.4	0.8	46.7
Manteca	0.9	1.7	3.4	5.0	6.5	7.5	8.0	7.1	5.2	3.3	1.6	0.9	51.2
Stockton	0.8	1.5	2.9	4.7	6.2	7.4	8.1	6.8	5.3	3.2	1.4	0.6	49.1
Tracy	1.0	1.5	2.9	4.5	6.1	7.3	7.9	6.7	5.3	3.2	1.3	0.7	48.5
<b>SAN LUIS OBISPO</b>													
Arroyo Grande	2.0	2.2	3.2	3.8	4.3	4.7	4.3	4.6	3.8	3.2	2.4	1.7	40.0
Atascadero	1.2	1.5	2.8	3.9	4.5	6.0	6.7	6.2	5.0	3.2	1.7	1.0	43.7
Morro Bay	2.0	2.2	3.1	3.5	4.3	4.5	4.6	4.6	3.8	3.5	2.1	1.7	39.9
Nipomo	2.2	2.5	3.8	5.1	5.7	6.2	6.4	6.1	4.9	4.1	2.9	2.3	52.1
Paso Robles	1.6	2.0	3.2	4.3	5.5	6.3	7.3	6.7	5.1	3.7	2.1	1.4	49.0
San Luis Obispo	2.0	2.2	3.2	4.1	4.9	5.3	4.6	5.5	4.4	3.5	2.4	1.7	43.8
San Miguel	1.6	2.0	3.2	4.3	5.0	6.4	7.4	6.8	5.1	3.7	2.1	1.4	49.0
San Simeon	2.0	2.0	2.9	3.5	4.2	4.4	4.6	4.3	3.5	3.1	2.0	1.7	38.1
<b>SAN MATEO</b>													
Hal Moon Bay	1.5	1.7	2.4	3.0	3.9	4.3	4.3	4.2	3.5	2.8	1.3	1.0	33.7
Redwood City	1.5	1.8	2.9	3.8	5.2	5.3	6.2	5.6	4.8	3.1	1.7	1.0	42.8
Woodside	1.8	2.2	3.4	4.8	5.6	6.3	6.5	6.2	4.8	3.7	2.4	1.8	49.5
<b>SANTA BARBARA</b>													
Betteravia	2.1	2.6	4.0	5.2	6.0	5.9	5.8	5.4	4.1	3.3	2.7	2.1	49.1
Carpenteria	2.0	2.4	3.2	3.9	4.8	5.2	5.5	5.7	4.5	3.4	2.4	2.0	44.9
Cuyama	2.1	2.4	3.8	5.4	6.9	7.9	8.5	7.7	5.9	4.5	2.6	2.0	59.7
Goleta	2.1	2.5	3.9	5.1	5.7	5.7	5.4	5.4	4.2	3.2	2.8	2.2	48.1
Goleta Foothills	2.3	2.6	3.7	5.4	5.3	5.6	5.5	5.7	4.5	3.9	2.8	2.3	49.6
Guadalupe	2.0	2.2	3.2	3.7	4.9	4.6	4.5	4.6	4.1	3.3	2.4	1.7	41.1
Lompoc	2.0	2.2	3.2	3.7	4.8	4.6	4.9	4.8	3.9	3.2	2.4	1.7	41.1
Los Alamos	1.8	2.0	3.2	4.1	4.9	5.3	5.7	5.5	4.4	3.7	2.4	1.6	44.6
Santa Barbara	2.0	2.5	3.2	3.8	4.6	5.1	5.5	4.5	3.4	2.4	1.8	1.8	40.6
Santa Maria	1.8	2.3	3.7	5.1	5.7	5.8	5.6	5.3	4.2	3.5	2.4	1.9	47.4
Santa Ynez	1.7	2.2	3.5	5.0	5.8	6.2	6.4	6.0	4.5	3.6	2.2	1.7	48.7
Sisquoc	2.1	2.5	3.8	4.1	6.1	6.3	6.4	5.8	4.7	3.4	2.3	1.8	49.2
Solvang	2.0	2.0	3.3	4.3	5.0	5.6	6.1	5.6	4.4	3.7	2.2	1.6	45.6

<b>SANTA CLARA</b>													
Gilroy	1.3	1.8	3.1	4.1	5.3	5.6	6.1	5.5	4.7	3.4	1.7	1.1	43.6
Los Gatos	1.5	1.8	2.8	3.9	5.0	5.6	6.2	5.5	4.7	3.2	1.7	1.1	42.9
Morgan Hill	1.5	1.8	3.4	4.2	6.3	7.0	7.1	6.0	5.1	3.7	1.9	1.4	49.5
Palo Alto	1.5	1.8	2.8	3.8	5.2	5.3	6.2	5.6	5.0	3.2	1.7	1.0	43.0
San Jose	1.5	1.8	3.1	4.1	5.5	5.8	6.5	5.9	5.2	3.3	1.8	1.0	45.3
<b>SANTA CRUZ</b>													
De Laveaga	1.4	1.9	3.3	4.7	4.9	5.3	5.0	4.8	3.6	3.0	1.6	1.3	40.8
Green Valley Rd	1.2	1.8	3.2	4.5	4.6	5.4	5.2	5.0	3.7	3.1	1.6	1.3	40.6
Santa Cruz	1.5	1.8	2.6	3.5	4.3	4.4	4.8	4.4	3.8	2.8	1.7	1.2	36.6
Watsonville	1.5	1.8	2.7	3.7	4.6	4.5	4.9	4.2	4.0	2.9	1.8	1.2	37.7
Webb	1.8	2.2	3.7	4.8	5.3	5.7	5.6	5.3	4.3	3.4	2.4	1.8	46.2
<b>SHASTA</b>													
Burney	0.7	1.0	2.1	3.5	4.9	5.9	7.4	6.4	4.4	2.9	0.9	0.6	40.9
Fall River Mills	0.6	1.0	2.1	3.7	5.0	6.1	7.8	6.7	4.6	2.8	0.9	0.5	41.8
Glenburn	0.6	1.0	2.1	3.7	5.0	6.3	7.8	6.7	4.7	2.8	0.9	0.6	42.1
McArthur	0.7	1.4	2.9	4.2	5.6	6.9	8.2	7.2	5.0	3.0	1.1	0.6	46.8
Redding	1.2	1.4	2.6	4.1	5.6	7.1	8.5	7.3	5.3	3.2	1.4	0.9	48.8
<b>SIERRA</b>													
Downieville	0.7	1.0	2.3	3.5	5.0	6.0	7.4	6.2	4.7	2.8	0.9	0.6	41.3
Sierraville	0.7	1.1	2.2	3.2	4.5	5.9	7.3	6.4	4.3	2.6	0.9	0.5	39.6
<b>SISKIYOU</b>													
Happy Camp	0.5	0.9	2.0	3.0	4.3	5.2	6.1	5.3	4.1	2.4	0.9	0.5	35.1
MacDoel	1.0	1.7	3.1	4.5	5.9	7.2	8.1	7.1	5.1	3.1	1.5	1.0	49.0
Mt Shasta	0.5	0.9	2.0	3.0	4.5	5.3	6.7	5.7	4.0	2.2	0.7	0.5	36.0
Tule lake FS	0.7	1.3	2.7	4.0	5.4	6.3	7.1	6.4	4.7	2.8	1.0	0.6	42.9
Weed	0.5	0.9	2.0	2.5	4.5	5.3	6.7	5.5	3.7	2.0	0.9	0.5	34.9
Yreka	0.6	0.9	2.1	3.0	4.9	5.8	7.3	6.5	4.3	2.5	0.9	0.5	39.2
<b>SOLANO</b>													
<u>Benicia</u>	<u>1.3</u>	<u>1.4</u>	<u>2.7</u>	<u>3.8</u>	<u>4.9</u>	<u>5.0</u>	<u>6.4</u>	<u>5.5</u>	<u>4.4</u>	<u>2.9</u>	<u>1.2</u>	<u>0.7</u>	<u>40.3</u>
Dixon	0.7	1.4	3.2	5.2	6.3	7.6	8.2	7.2	5.5	4.3	1.6	1.1	52.1
Fairfield	1.1	1.7	2.8	4.0	5.5	6.1	7.8	6.0	4.8	3.1	1.4	0.9	45.2
Hastings Tract	1.6	2.2	3.7	5.1	6.8	7.8	8.7	7.8	5.7	4.0	2.1	1.6	57.1
Putah Creek	1.0	1.6	3.2	4.9	6.1	7.3	7.9	7.0	5.3	3.8	1.8	1.2	51.0
Rio Vista	0.9	1.7	2.8	4.4	5.9	6.7	7.9	6.5	5.1	3.2	1.3	0.7	47.0
Suisun Valley	0.6	1.3	3.0	4.7	5.8	7.0	7.7	6.8	5.3	3.8	1.4	0.9	48.3
Winters	0.9	1.7	3.3	5.0	6.4	7.5	7.9	7.0	5.2	3.5	1.6	1.0	51.0
<b>SONOMA</b>													
Bennett Valley	1.1	1.7	3.2	4.1	5.5	6.5	6.6	5.7	4.5	3.1	1.5	0.9	44.4
Cloverdale	1.1	1.4	2.6	3.4	5.0	5.9	6.2	5.6	4.5	2.8	1.4	0.7	40.7
Fort Ross	1.2	1.4	2.2	3.0	3.7	4.5	4.2	4.3	3.4	2.4	1.2	0.5	31.9
Healdsburg	1.2	1.5	2.4	3.5	5.0	5.9	6.1	5.6	4.5	2.8	1.4	0.7	40.8
Lincoln	1.2	1.7	2.8	4.7	6.1	7.4	8.4	7.3	5.4	3.7	1.9	1.2	51.9
Petaluma	1.2	1.5	2.8	3.7	4.6	5.6	4.6	5.7	4.5	2.9	1.4	0.9	39.6
Santa Rosa	1.2	1.7	2.8	3.7	5.0	6.0	6.1	5.9	4.5	2.9	1.5	0.7	42.0
Valley of the Moon	1.0	1.6	3.0	4.5	5.6	6.6	7.1	6.3	4.7	3.3	1.5	1.0	46.1
Windsor	0.9	1.6	3.0	4.5	5.5	6.5	6.5	5.9	4.4	3.2	1.4	1.0	44.2
<b>STANISLAUS</b>													
Denair	1.0	1.9	3.6	4.7	7.0	7.9	8.0	6.1	5.3	3.4	1.5	1.0	51.4
La Grange	1.2	1.5	3.1	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
Modesto	0.9	1.4	3.2	4.7	6.4	7.7	8.1	6.8	5.0	3.4	1.4	0.7	49.7

Newman	1.0	1.5	3.2	4.6	6.2	7.4	8.1	6.7	5.0	3.4	1.4	0.7	49.3
Oakdale	1.2	1.5	3.2	4.7	6.2	7.7	8.1	7.1	5.1	3.4	1.4	0.7	50.3
Patterson	1.3	2.1	4.2	5.4	7.9	8.6	8.2	6.6	5.8	4.0	1.9	1.3	57.3
Turlock	0.9	1.5	3.2	4.7	6.5	7.7	8.2	7.0	5.1	3.4	1.4	0.7	50.2
<b>SUTTER</b>													
Nicolaus	0.9	1.6	3.2	4.9	6.3	7.5	8.0	6.9	5.2	3.4	1.5	0.9	50.2
Yuba City	1.3	2.1	2.8	4.4	5.7	7.2	7.1	6.1	4.7	3.2	1.2	0.9	46.7
<b>TEHAMA</b>													
Corning	1.2	1.8	2.9	4.5	6.1	7.3	8.1	7.2	5.3	3.7	1.7	1.1	50.7
Gerber	1.0	1.8	3.5	5.0	6.6	7.9	8.7	7.4	5.8	4.1	1.8	1.1	54.7
Gerber Dryland	0.9	1.6	3.2	4.7	6.7	8.4	9.0	7.9	6.0	4.2	2.0	1.0	55.5
Red Bluff	1.2	1.8	2.9	4.4	5.9	7.4	8.5	7.3	5.4	3.5	1.7	1.0	51.1
<b>TRINITY</b>													
Hay Fork	0.5	1.1	2.3	3.5	4.9	5.9	7.0	6.0	4.5	2.8	0.9	0.7	40.1
Weaverville	0.6	1.1	2.2	3.3	4.9	5.9	7.3	6.0	4.4	2.7	0.9	0.7	40.0
<b>TULARE</b>													
Alpaugh	0.9	1.7	3.4	4.8	6.6	7.7	8.2	7.3	5.4	3.4	1.4	0.7	51.6
Badger	1.0	1.3	2.7	4.1	6.0	7.3	7.7	7.0	4.8	3.3	1.4	0.7	47.3
Delano	1.1	1.9	4.0	4.9	7.2	7.9	8.1	7.3	5.4	3.2	1.5	1.2	53.6
Dinuba	1.1	1.5	3.2	4.7	6.2	7.7	8.5	7.3	5.3	3.4	1.4	0.7	51.2
Lindcove	0.9	1.6	3.0	4.8	6.5	7.6	8.1	7.2	5.2	3.4	1.6	0.9	50.6
Porterville	1.2	1.8	3.4	4.7	6.6	7.7	8.5	7.3	5.3	3.4	1.4	0.7	52.1
Visalia	0.9	1.7	3.3	5.1	6.8	7.7	7.9	6.9	4.9	3.2	1.5	0.8	50.7
<b>TUOLUMNE</b>													
Groveland	1.1	1.5	2.8	4.1	5.7	7.2	7.9	6.6	5.1	3.3	1.4	0.7	47.5
Sonora	1.1	1.5	2.8	4.1	5.8	7.2	7.9	6.7	5.1	3.2	1.4	0.7	47.6
<b>VENTURA</b>													
Camarillo	2.2	2.5	3.7	4.3	5.0	5.2	5.9	5.4	4.2	3.0	2.5	2.1	46.1
Oxnard	2.2	2.5	3.2	3.7	4.4	4.6	5.4	4.8	4.0	3.3	2.4	2.0	42.3
Piru	2.8	2.8	4.1	5.6	6.0	6.8	7.6	7.8	5.8	5.2	3.7	3.2	61.5
Port Hueneme	2.0	2.3	3.3	4.6	4.9	4.9	4.9	5.0	3.7	3.2	2.5	2.2	43.5
Thousand Oaks	2.2	2.6	3.4	4.5	5.4	5.9	6.7	6.4	5.4	3.9	2.6	2.0	51.0
Ventura	2.2	2.6	3.2	3.8	4.6	4.7	5.5	4.9	4.1	3.4	2.5	2.0	43.5
<b>YOLO</b>													
Bryte	0.9	1.7	3.3	5.0	6.4	7.5	7.9	7.0	5.2	3.5	1.6	1.0	51.0
Davis	1.0	1.9	3.3	5.0	6.4	7.6	8.2	7.1	5.4	4.0	1.8	1.0	52.5
Esparto	1.0	1.7	3.4	5.5	6.9	8.1	8.5	7.5	5.8	4.2	2.0	1.2	55.8
Winters	1.7	1.7	2.9	4.4	5.8	7.1	7.9	6.7	5.3	3.3	1.6	1.0	49.4
Woodland	1.0	1.8	3.2	4.7	6.1	7.7	8.2	7.2	5.4	3.7	1.7	1.0	51.6
Zamora	1.1	1.9	3.5	5.2	6.4	7.4	7.8	7.0	5.5	4.0	1.9	1.2	52.8
<b>YUBA</b>													
Browns Valley	1.0	1.7	3.1	4.7	6.1	7.5	8.5	7.6	5.7	4.1	2.0	1.1	52.9
Brownsville	1.1	1.4	2.6	4.0	5.7	6.8	7.9	6.8	5.3	3.4	1.5	0.9	47.4

\* The values in this table were derived from:

- 1) California Irrigation Management Information System (CIMIS);
- 2) Reference EvapoTranspiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept of Water Resources 1999; and
- 3) Reference Evapotranspiration for California, University of California, Department of Agriculture and Natural Resources (1987) Bulletin 1922,
- 4) Determining Daily Reference Evapotranspiration, Cooperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426

**Appendix B – Sample Water Efficient Landscape Worksheet.**

**WATER EFFICIENT LANDSCAPE WORKSHEET**

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package.  
Please complete all sections (A and B) of the worksheet.

**SECTION A. HYDROZONE INFORMATION TABLE**

Please complete the hydrozone table(s) for each hydrozone. Use as many tables as necessary to provide the square footage of landscape area per hydrozone.

Hydrozone*	Zone or Valve	Irrigation Method**	Area (Sq. Ft.)	% of Landscape Area
<b>Total</b>				<b>100%</b>

**\* Hydrozone**  
*HW = High Water Use Plants*  
*MW = Moderate Water Use Plants*  
*LW = Low Water Use Plants*

**\*\*Irrigation Method**  
*MS = Micro-spray*  
*S = Spray*  
*R = Rotor*  
*B= Bubbler*  
*D= Drip*  
*O = Other*

## SECTION B. WATER BUDGET CALCULATIONS

### Section B1. Maximum Applied Water Allowance (MAWA)

The project's Maximum Applied Water Allowance shall be calculated using these equations:

$$\text{MAWA} = (\text{ETo}) (0.62) [(0.57 \times \text{LA}) + (0.53 \times \text{SLA})] \text{ for residential areas}$$

$$\text{MAWA} = (\text{ETo}) (0.62) [(0.4 \times \text{LA}) + (0.6 \times \text{SLA})] \text{ for non-residential areas}$$

where:

MAWA = Maximum Applied Water Allowance (gallons per year)

ETo = Reference Evapotranspiration from Appendix A (inches per year)

0.5, 0.47 = ET Adjustment Factor (ETAF) for residential and non-residential areas, respectively

LA = Landscaped Area includes Special Landscape Area (square feet)

0.62 = Conversion factor (to gallons per square foot per year)

SLA = Portion of the landscape area identified as Special Landscape Area (square feet)

0.30.5, 0.6 = the additional ET Adjustment Factors for Special Landscape Area in residential and non-residential areas, respectively (1.0-0.5=0.5), (1.0-0.4=0.6)(1.0-0.7=0.3)

**Maximum Applied Water Allowance = \_\_\_\_\_ gallons per year**

Show calculations.

### Effective Precipitation (Eppt)

If considering Effective Precipitation, use 25% of annual precipitation. Use the following equation to calculate Maximum Applied Water Allowance:

$$\text{MAWA} = (\text{ETo} - \text{Eppt}) (0.62) [(0.57 \times \text{LA}) + (0.53 \times \text{SLA})] \text{ for residential areas}$$

$$\text{MAWA} = (\text{ETo} - \text{Eppt}) (0.62) [(0.4 \times \text{LA}) + (0.6 \times \text{SLA})] \text{ for non-residential areas}$$

**Maximum Applied Water Allowance = \_\_\_\_\_ gallons per year**

Show calculations.

**Section B2. Estimated Total Water Use (ETWU)**

The project's Estimated Total Water Use is calculated using the following formula:

$$ETWU = (ET_o)(0.62) \left( \frac{PF \times HA}{IE} + SLA \right)$$

where:

- ETWU = Estimated total water use per year (gallons per year)
- ET<sub>o</sub> = Reference Evapotranspiration (inches per year)
- PF = Plant Factor from WUCOLS (see Definitions)
- HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
- SLA = Special Landscape Area (square feet)
- 0.62 = Conversion Factor (to gallons per square foot)
- IE = Irrigation Efficiency (minimum 0.8574 for residential areas and 0.92 for non-residential areas, averaged site-wide)

**Hydrozone Table for Calculating ETWU**

Please complete the hydrozone table(s). Use as many tables as necessary.

Hydrozone	Plant Water Use Type(s)	Plant Factor (PF)	Area (HA) (square feet)	PF x HA (square feet)
			Sum	
	SLA			

**Estimated Total Water Use = \_\_\_\_\_ gallons**

Show calculations.

**Appendix C – Sample Certificate of Completion.**

**CERTIFICATE OF COMPLETION**

This certificate is filled out by the project applicant upon completion of the landscape project.

**PART 1. PROJECT INFORMATION SHEET**

Date		
Project Name		
Name of Project Applicant	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

**Project Address and Location:**

Street Address		Parcel, tract or lot number, if available.
City		Latitude/Longitude (optional)
State	Zip Code	

**Property Owner or his/her designee:**

Name	Telephone No.	
	Fax No.	
Title	Email Address	
Company	Street Address	
City	State	Zip Code

**Property Owner**

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

\_\_\_\_\_

Property Owner Signature Date

**Please answer the questions below:**

1. Date the Landscape Documentation Package was submitted to the local agency \_\_\_\_\_
2. Date the Landscape Documentation Package was approved by the local agency \_\_\_\_\_
3. Date that a copy of the Water Efficient Landscape Worksheet (including the Water Budget Calculation) was submitted to the local water purveyor \_\_\_\_\_

**PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE**

"I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the ordinance and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package."

Signature*	Date	
Name (print)	Telephone No.	
	Fax No.	
Title	Email Address	
License No. or Certification No.		
Company	Street Address	
City	State	Zip Code

\*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor.

**PART 3. IRRIGATION SCHEDULING**

Attach parameters for setting the irrigation schedule on controller per ordinance Section 492.10.

**PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE**

Attach schedule of Landscape and Irrigation Maintenance per ordinance Section 492.11.

**PART 5. LANDSCAPE IRRIGATION AUDIT REPORT**

Attach Landscape Irrigation Audit Report per ordinance Section 492.12.

**PART 6. SOIL MANAGEMENT REPORT**

Attach soil analysis report, if not previously submitted with the Landscape Documentation Package per ordinance Section 492.65.

Attach documentation verifying implementation of recommendations from soil analysis report per ordinance Section 492.65.

F

URBAN GREENING MASTER PLAN

# Model Bay-Friendly Landscaping Maintenance Specifications



# **MODEL BAY-FRIENDLY LANDSCAPE MAINTENANCE SPECIFICATIONS**





# Model Bay-Friendly Landscaping Maintenance Specifications

## Table of Contents

	<u>Page</u>
<b>Section 1: General Information</b>	
1.1 Project goals	1
1.2 General scope of work	1
1.3 Site description	1
1.4 Limits of work	1
1.5 Supplemental Documents	1
1.6 Supplemental Resources	2
<b>Section 2: General Requirements</b>	
2.1 Contractor requirements	2
2.2. Compliance with laws, ordinances and policies	2
2.3 Work requirements	3
<b>Section 3: Landscape Standards and Maintenance Requirements</b>	
3.1 Overview	7
3.2 Site Analysis	7
3.3 Soil & Nutrition Management	8
3.4 Water Management	10
3.5 Integrated Pest Management (IPM)	12
3.6 Plant Growth Control	16
3.7 Waste Management	17
3.8 Landscape repair/refurbishment	17
<b>Section 4: Landscape Specifications for Plant Types and Landscape Zones</b>	
4.1 Turf	18
4.2 Ground Cover	19
4.3 Annual Color	21
4.4 Shrubs	22
4.5 Trees	23
4.6 Open Space & Meadows	25
4.7 Bioswales and bioretention areas	25
4.8 Planter Boxes for Stormwater Management	26
4.9 Hardscape	27
<b>Section 5: Definitions</b>	28

# Model Bay-Friendly Landscaping Maintenance Specifications

## Section 1: General Information

### 1.1. Project goals

Bay-Friendly Landscape Maintenance practices shall be employed to minimize waste, protect air and water quality, conserve energy and water, and protect natural ecosystems (refer to Bay-Friendly Landscape Guidelines, [www.BayFriendly.org](http://www.BayFriendly.org)).

### 1.2. General scope of work

This work shall include all supervision, labor, materials, equipment, tools, supplies and services to maintain in a superior condition all landscape areas, irrigation and drainage systems and other related work. All work shall be performed in a workmanlike manner, using quality equipment, Bay-Friendly methods and materials.

### 1.3. Site description

- A. Work to be done is located at \_\_\_\_\_ and identified on the enclosed maps and plans. This area is owned or supervised by \_\_\_\_\_, hereafter referred to as Agency, with \_\_\_\_\_ acting as agent, hereafter referred to as Agency Representative.
- B. Landscape inventory
  - Turf \_\_\_\_\_ ft<sup>2</sup>
  - Ground cover \_\_\_\_\_ ft<sup>2</sup>
  - Annual color \_\_\_\_\_ ft<sup>2</sup>
  - Shrubs \_\_\_\_\_ ft<sup>2</sup>
  - Trees \_\_\_\_\_ ft<sup>2</sup>
  - Hard surfaces/sidewalks \_\_\_\_\_ ft<sup>2</sup>
  - Parking areas \_\_\_\_\_ ft<sup>2</sup>

### 1.4. Limits of work: Specified work does not include:

- A. Installation or replacement of plants, except for those damaged or allowed to decline or die by the Contractor;
- B. Repair and/or modification of the irrigation system, except for those specified in section 3.4 Water Management.

### 1.5. Supplemental Documents

- A. Site maps
  - 1. A site map will be provided and shared between the Agency and the Contractor. The map shall identify general plant palette, landscape features, building and parking footprints, streets and addresses.
  - 2. An irrigation plan identifying locations of meters, valves, controllers, and types of irrigation equipment specified for the site will be provided.
  - 3. A planting plan or list of all existing plants will be provided for use by the Contractor in developing pest management programs and irrigation schedules.
- B. Initial soil analysis
 

Results of soil analyses from samples collected at the project area shall be provided to Contractor, if available.
- C. Water budget calculations (MAWA)
 

Calculations of Maximum Allowable Water Allowances for the project area will be provided to the Contractor, if available.

**1.6. Supplemental Resources**

- A. StopWaste.Org [www.BayFriendly.org](http://www.BayFriendly.org)
  - 1. Bay-Friendly Landscape Guidelines
  - 2. A Landscaper's Guide to Grasscycling
  - 3. A Landscaper's Guide to Mulch
- B. *A Guide to Estimating Irrigation of Water Needs of Landscape Plantings*, California Dept of Water Resources, <http://cdec.water.ca.gov>
- C. *Irrigation water audits*, Irrigation Association, [www.irrigation.org](http://www.irrigation.org), and the Irrigation Technology Research Center, [www.itrc.org](http://www.itrc.org).
- D. *California Irrigation Management Information System*, [www.cimis.water.ca.gov](http://www.cimis.water.ca.gov), Waste management and recycling, [www.ciwmb.ca.gov](http://www.ciwmb.ca.gov).
- E. *The Weed Worker's Handbook, A Guide to Techniques for Removing Bay Area Invasive Plants*, The Watershed Council (510) 231-5655 and the California , Invasive Plant Council (510) 843-3902
- F. *Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide*, 2<sup>nd</sup> ed., UC Publication 3359, <http://www.ipm.ucdavis.edu>
- G. *A Field Guide to Compost Use*, The Composting Council, 114 South Pitt Street, Alexandria, Virginia 22314, (703) 739-2401, <http://www.compostingcouncil.org/index.cfm>

## Section 2: General Requirements

### 2.1. Contractor requirements

#### A. Qualifications

1. Contractor must have a valid California C-27 contractor's license authorized by the State of California.
2. Contractor must have assigned to the project at least one employee possessing a California State Chemical Applicator's License for the control of weeds, plant diseases and other pests.
3. Contractor must have assigned to the project at least one employee who has successfully completed the Pollution Prevention Training & Certification Program For Surface Cleaners issued by the Bay Area StormWater Management Agencies Association (BASMAA).
4. It is preferred that the Contractor have assigned to the project at least one employee who is a Certified Irrigation Contractor (Irrigation Association).
5. It is preferred that the Contractor have assigned to the project at least one employee who is a Certified Arborist or Certified Tree Worker (International Society of Arboriculture).
6. It is preferred that the Contractor have assigned to the project at least one employee who has experience or training in Integrated Pest Management (IPM) techniques.
7. It is preferred that the Contractor have assigned to the project at least one employee who has experience or training in Bay-Friendly Landscaping practices.

#### B. Insurance

Contractor shall maintain insurance required in the bid documents throughout the contract period.

### 2.2. Compliance with laws, ordinances and policies

All services rendered shall be provided in accordance with all ordinances, resolutions, statutes, rules, laws and regulations of the Agency, and any Federal, State, or local governmental agency having jurisdiction in effect at the time service is provided

- A. Contractor must adhere to the Agency's Landscape Water Conservation Ordinance No. \_\_\_\_\_. A copy may be obtained at \_\_\_\_\_.
- B. Contractor must adhere to the Agency's Integrated Pest Management and Pesticide Use Policy. A copy may be obtained at \_\_\_\_\_.
- C. Contractor must adhere to the Agency's Tree Preservation and Protection Ordinance No. \_\_\_\_\_. A copy may be obtained at \_\_\_\_\_.
- D. Contractor must adhere to the Agency's Stormwater Pollution Prevention Plan (SWPPP) for the site and any Stormwater Management and Erosion Control policy. A copy may be obtained at \_\_\_\_\_.
- E. Contractor must adhere to the Agency's Environmental Purchasing Policy. A copy may be obtained at \_\_\_\_\_.

### 2.3. Work requirements

#### A. Work schedule

1. Contractor is to provide Agency with a weekly work schedule describing the work to be performed in the Project Area.
2. The Contractor shall conduct all operations during the hours of 7:00 a.m. to 5:00 p.m. Monday through Friday, unless otherwise approved by the Agency. Contractor may not work on any Federal, State, or local holidays.
3. Any non-emergency work that may be deemed hazardous or disruptive (i.e., chemical spraying, tree pruning, etc.) shall be scheduled at least two (2) weeks in advance with the Agency's representative. For emergency work, Contractor must obtain written approval from Agency's representative prior to commencing work.
4. Agency reserves the right to change schedules for special events, conflicts with adjacent property owners/tenants within five (5) working days advance notice.

#### B. Protection of existing property

1. Contractor must protect all existing plant materials, site improvements, structures, facilities, utilities, and natural areas from damage, both above and below ground. Any damages shall be reported immediately to the Agency's representative. Any damages caused by Contractor shall be corrected and/or paid for by the Contractor at no cost to the Agency.
2. Contractor shall protect property from accidental chemical, fuel, oil or other contaminate spills.
3. Contractor shall not wash or blow soil, chemicals, litter, mulch, soil amendments or other materials into storm drains.

#### C. Safety

Contractor must at all times exercise necessary precautions to provide for the protection of the public and employees.

##### 1. Traffic Lane Closure

Landscape maintenance services conducted in the roadway center medians must be performed in a safe manner. The contractor is required to perform traffic diverting lane closures prior to beginning any trimming operations in the center median. Litter pickup does not require a lane closure.

All lane closure activities must comply with [put in your preferred reference here such as the Federal Highway Manual on Uniform Traffic Control Devices (MUTCD) <http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/supplement.htm>], and follow notification requirements of the Police and Fire Departments.

##### 2. Chemical Applications

**Note:** Bay-Friendly Landscaping emphasizes Integrated Pest Management (IPM) practices to control pests and diseases in the landscape. IPM uses cultural, mechanical, physical, and biological control methods before using pesticides. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.

Contractor shall apply all chemicals in a safe manner and according to label instructions and Agency, State and Federal requirements. A California Chemical Applicators license is required by the contractor for chemical applications. The Contractor shall mix and apply chemicals to protect against accidental spills and drift to non-target areas, and to insure safety of the applicator. Any spilled chemicals, as well as contaminated soil, water, and/or landscape materials must be removed from the Project and disposed of in accordance with the Agency requirements. The Contractor shall maintain applicator's licenses and records of applications as required by the State.

A Chemical Work Report shall be completed for each chemical application. The Contractor is responsible for submitting chemical usage reports to the County Agricultural Department. Copies are to be sent to the Agency's representative as part of the Contractor's monthly report.

#### D. Contractor's Personnel and Supervision

1. Contractor shall provide a list including all Contractor's and subcontractor's employees assigned to work site and include work schedule and assignment. Contractor must update list within 3 business days of any change. All Contractor's employees assigned to the Project must demonstrate they are United States citizens or have a legal right to work in the United States.
2. The Contractor shall assign a qualified trained supervisor to oversee work performed at the work site and to act as the Contractor's liaison with the Agency representative. This supervisor must inspect the Project daily (Monday through Friday) except holidays and provide direction to the Contractor's workers and/or subcontractors. This supervisor shall speak, write, read and understand English and be capable of writing schedules, monthly reports noting any deficiency that needs correcting and major projects for the coming month. This supervisor shall have at least three (3) years of landscape maintenance supervision experience.
3. All Contractor's personnel shall adhere to basic public works standards for working attire including; uniform shirts with Contractor's name or logo clearly visible at all times when working at all locations, proper shoes and other equipment required by State Safety Regulations. Shirts are to be maintained in a neat and presentable condition.

4. All Contractor vehicles are to have a readable sign with Contractor's name or logo and telephone number. Trucks are to be kept in a clean and presentable condition.

#### E. Subcontracting

A portion of the work covered by these specifications may be subcontracted with prior approval of the Agency. Contractor shall supervise subcontractor and guarantee work quality. Subcontractors and their qualifications must be submitted to the Agency thirty (30) days before working at the site. All subcontractors assigned to the Project must demonstrate they are United States citizens or have a legal right to work in the United States. It is preferred that subcontractors have training in Bay-Friendly Landscaping or other experience in sustainable landscape practices.

#### F. Supplies and Equipment

##### 1. Fuel conservation and low emission equipment

The Contractor will implement strategies in work operations to reduce fossil fuel consumption and emissions, such as:

- a. Use hand-powered equipment when possible.
- b. Minimize use of gas-powered blowers, especially on planting beds.
- c. Select smallest, most fuel efficient equipment to accomplish task.
- d. Consider vehicles that operate on natural gas or biodiesel.
- e. Maintain equipment properly and keep it well tuned.
- f. Emphasize employee carpooling to Project.

##### 2. Use local products and suppliers

The Contractor shall use local products and suppliers (produced within 150 miles from the project site) to the extent possible to minimize fuel consumption and emissions.

##### 3. Use recycled and salvaged materials

The Contractor shall use salvaged and recycled-content products where possible. Materials for reuse may be found by contacting the CalMax website at [www.ciwmb.ca.gov](http://www.ciwmb.ca.gov) or at [www.stopwaste.org](http://www.stopwaste.org).

##### 4. Equipment refueling and repair

The Contractor shall refuel and repair equipment in a safe manner to protect against accidental spills. Limit refueling to specific areas on a site. Measures shall be taken to prevent, control, and clean-up spills. Clean-ups should be immediate, automatic and routine and performed by a trained staff member or a licensed cleaning company. Contact the local emergency response team agencies to report all spills.

#### G. Reporting and inspecting

1. The Contractor shall submit a written report each month stating all contract work completed. The report shall show the work completed during each week contract work was accomplished, and shall be submitted with and cover the same work as the Contractor's billing statement for the previous month's work. The report shall include documentation of stormwater and irrigation inspections, IPM monitoring, soil and pest management treatments and other chemical applications.
2. Unusual horticultural problems such as pests, disease and damages that are beyond the scope of the Contractor's responsibility shall be brought to the attention of the Agency representative immediately.
3. The Agency, through a designated representative, shall make periodic inspections to insure that complete and continuous maintenance is fulfilled. In addition, the Agency may obtain the services of an approved horticultural specialist to inspect plantings and make recommendations for improvements in the maintenance program.

#### H. Work Performance

1. Contractor is responsible for (a) having thoroughly investigated and considered the scope of services to be performed, (b) carefully considering how the services should be performed, and (c) fully understanding the facilities, difficulties, and restrictions attending to the performance of the services required. Contractor is responsible to investigate the area and be fully acquainted with the conditions.

2. Should the Contractor discover any latent or unforeseeable conditions, which will materially affect the performance of services, Contractor shall immediately inform the Agency of such fact and shall not proceed except at Contractor's risk until written instructions are received from the Agency.
3. Plants, irrigation systems, etc., damaged by traffic accidents or vandalism, shall be reported immediately to the Agency.

I. Extra Work

1. New and unforeseen work will be classed as extra work when determined by the Agency that such work is not covered by these specifications. Upon notification that extra work will be required, the Contractor shall submit an itemized, written cost proposal for such work to the Agency. The Agency shall retain the right to reject such cost proposal and perform the extra work with Agency forces or other contractors. Should the proposal be acceptable to the Agency, the Contractor shall be advised in writing, and upon receipt of such written notification, shall begin the work within five (5) working days or as agreed to between the Contractor and the Agency.
2. The Contractor shall do such extra work in accordance with the agreement for extra work and with the provisions of these specifications and shall furnish all labor, materials and equipment. Payment for extra work performed shall be as agreed to by the Contractor and the City and as bid. Compensation for material will not exceed Contractor cost plus 10%. Contractor must provide invoice copies to be compensated for material.

J. Emergency Work

1. Contractor shall supply office, pager and home phone numbers of employee responsible for emergencies. Said employee shall be fluent in English.
2. Agency will provide Contractor with emergency numbers for Agency's representatives and emergency personnel. Said employee shall be fluent in English.

## Section 3: Landscape Standards and Maintenance Requirements

### 3.1 Overview

#### A. Bay-Friendly Landscape Principles and Objectives

Contractor shall maintain the specified landscape in an integrated approach, consistent with the principles set forth in the Bay-Friendly Landscape Guidelines, [www.BayFriendly.org](http://www.BayFriendly.org). The seven Bay-Friendly principles are:

1. Landscape locally – The Project landscape is part of a larger natural ecosystem of the San Francisco Bay Area. The materials and methods used to maintain the Project can support the health, diversity and sustainability of the Bay.
2. Landscape for less to the landfill – Reducing waste starts with not generating plant debris in the first place by fertilizing, irrigating and pruning judiciously, grasscycling, mulching and composting plant debris. Using recycled content, salvaged, durable or local materials conserves resources and reduces the amount of energy consumed by the landscape.
3. Nurture the soil – Create a healthy soil that supports a healthy landscape by protecting the soil from compaction and erosion, replenishing organic matter and mulching, using slow-release and organic fertilizers and minimizing use of chemicals that harm beneficial soil organisms.
4. Conserve water – Use California’s water supply efficiently by reducing irrigation requirements, irrigating according to plant need, maximizing irrigation system performance, increasing the water holding capacity of the soil and using recycled water.
5. Conserve energy – Conventional landscapes are fossil fuel consumptive. Nationally it is estimated that lawn mowers consume 400 million gallons of gas. Look for opportunities to conserve fuel and energy by choosing and maintaining materials and equipment for fuel conservation.
6. Protect water and air quality –Reduce runoff, reduce contaminants in runoff through an integrated pest management (IPM) program, and increase the soil’s ability to remove pollutants from runoff through steps such as mulching bare soil. Reduce air pollution by reducing fossil fuel consumption, recycling plant debris on –site and planting trees to remove CO<sub>2</sub> and absorb air pollutants.,
7. Protect and maintain wildlife habitat – The Project may provide food, water, shelter and nesting sites for birds, butterflies, beneficial insects and animals that contribute to the ecological diversity of the Bay. Methods to protect them include minimizing application of chemicals by implementing an integrated pest management (IPM) program, and conserving flowers, berries, fruits, seed heads, low branch cover, and natural vegetation in open space areas.

#### B. Applicable standards and Best Management Practices (BMP’s).

Contractor shall adhere to applicable professional standards as defined by a professional organization including:

1. American National Standard for Tree Care Operations - ANSI A300, Parts 1 and 2
2. International Society of Arboriculture BMP for Tree and Shrub Fertilization, and BMP for Tree Pruning.
3. Irrigation Association BMPs
4. Bay-Friendly Landscape Guidelines

### 3.2 Site Analysis

- A. Contractor shall characterize the Project’s microclimate(s) and range in exposures as a precursor for developing the water management program.
- B. Contractor shall identify plants species present in the Project landscape
  1. Contractor will determine key plant species present
  2. Contractor will determine plant water use classification for each plant species present as a precursor for developing the water management program. Plant water use classifications may be found in “A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California” (Univ. of Calif. Cooperative Extension, 2000).
  3. Contractor will identify any plants in the Project landscape that are protected from removal or damage by ordinance, and adhere to all protection requirements.

### C. Soil tests

1. Contractor shall collect and submit soil samples to an accredited and approved testing laboratory, annually for 3 years during the transition to a Bay-Friendly landscape and then when planning a renovation and when experiencing ongoing problems. At a minimum one soil sample shall be collected from turf and one from shrub/ground cover areas that are representative of site conditions. Sample collection procedures shall adhere to recommendations of the soil testing laboratory. Contractor shall request that the laboratory make recommendations based on an 'organic' approach to soil and landscape management. Submit soil lab report and any proposed soil amendments and cost adjustments to Agency Representative for written approval. After review and written approval by the Owner, amend the soils according to said laboratory's recommendations. The approved soils laboratory recommendations shall be considered a part of this specification. Analyses to be performed include:
  - pH, electrical conductivity, nitrate, ammonium, phosphorus, potassium, calcium, saturation percent, sodium, chloride, sodium adsorption ratio, boron, % sand-silt-clay, lime, % organic
2. Contractor shall determine infiltration rate and drainage characteristics within the Project. This information shall be considered when scheduling irrigation.

### D. Topography and potential for runoff

Contractor shall assess topography within the Project and evaluate potential for runoff. This information shall be considered when scheduling irrigation and determining need for erosion control measures.

## 3.3 Soil & Nutrition Management

### A. Goals

A healthy, biologically diverse soil is required to sustain a healthy landscape. A basic concept of Bay-Friendly Landscaping is to cultivate a functional, living soil foodweb which shall then provide nutrient elements as needed to sustain healthy and attractive plants while avoiding excessive growth that might attract pests and/ or need to be removed through pruning, edging or mowing. Landscape maintenance activities shall be implemented to nurture biological activity, provide organic material, and protect soil from damage. Bay and riparian water quality and soil and aquatic habitat shall be protected by controlling soil erosion.

### B. Contractor shall protect soil from compaction by:

1. Cultivating soil when it is moderately moist; wet and dry soils shall not be cultivated.
2. Scheduling maintenance operations that require driving equipment over the soil (e.g. mowing turf) when the soil is dry.
3. Confining traffic to paved areas.
4. When temporary access is needed over non-paved areas, distribute the load over the soil with 6" thick coarse organic mulch or reusable planks.

### C. Contractor shall protect the soil from erosion by:

1. Maintaining vegetative cover over the soil to the extent possible.
2. Placing compost berms, blanket, socks or tubes along slopes to slow water.
3. Maintaining a minimum of 2" mulch [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance]cover over bare soil.
4. Minimizing use of blowers in planting beds and on turf.
5. Using coarse mulch on slopes to avoid washing of mulch into storms drains.
6. Create leaf repositories in planting beds as appropriate.

### D. Soil and plant tissue analysis

1. Contractor shall submit soil samples for testing as described in Section 3.2 – Site Analysis. The types and quantities of fertilizer and/or soil amendments to be applied shall be determined from the results of the soil analysis and shall be based on an 'organic' approach to soil management.
2. Where plant micronutrient deficiencies are suspected, plant tissue analyses are recommended to determine need for fertilizer application.

### E. Incorporate organic soil amendments

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover.
  - a. Planting beds for annuals and ground covers: Incorporate 2-4" of compost into the top 6-12" of soil
  - b. Turf: Incorporate 1-2" (3 1/3 – 6 2/3 cubic yards) compost into the top 5-7" of soil
2. Compost shall be a well decomposed, stable, weed free organic matter source. The product shall be certified through the US Composting Council's (USCC) Seal of Testing Assurance Program (STA) Program (a compost testing and information disclosure program). It shall be derived from agricultural and/or food waste and/or yard trimmings. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the feedstock (the original materials from which it was derived).

Before delivery of the compost, the supplier will submit proof of STA certification and a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's CAP and using the approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

- a. Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
  - b. Organic Matter Content: 50% - 60% by dry wt. preferred, 35-70% acceptable
  - c. Carbon and Nitrogen Ratio: C:N < 25:1 plus at least one measure of stability and at least one measure of toxicity.
  - d. Maturity/Stability: shall have a dark brown color and a soil-like odor. In addition any one of the following is required to indicate stability
    - 1) Oxygen Test < 1.3 O<sub>2</sub> / unit TS / hr
    - 2) Specific oxy. Test < 1.5 O<sub>2</sub> / unit BVS / hr
    - 3) Respiration test < 8 C / unit VS / day
    - 4) Dewar test < 20 Temp. rise (°C)
    - 5) Solvita® > 5 Index value
  - e. Toxicity: any one of the following measures is sufficient to indicate non-toxicity.
    - 1) NH<sub>4</sub><sup>-</sup> : NO<sub>3</sub>-N < 3
    - 2) Ammonium < 500 ppm, dry basis
    - 3) Seed Germination > 80 % of control
    - 4) Plant Trials > 80% of control
    - 5) Solvita® > 5 Index value
  - f. Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
    - 1) Total Nitrogen content 0.9% or above preferred.
    - 2) Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm
  - g. Salinity: Must be reported; may vary but < 4.0 mmhos/cm preferred. Soil should also be tested: <2.5 mmhos/cm is preferred for soil/compost blend but may vary with plant species.
  - h. pH: pH shall be between 6.5 and 8. May vary with plant species.
  - i. Particle size: 95% passing a 1/2" screen.
  - j. Bulk density: shall be between 500 and 1100 dry lbs/cubic yard
  - k. Moisture Content shall be between 35% - 55% of dry solids.
  - l. Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 0.1 % by weight or volume.
  - m. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.
  - n. Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.
    - 1) Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.
3. The delivery tags indicating the quantity delivered to the job site shall be submitted by contractor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or heat (120F) upon delivery or rewetting will not be accepted.

#### F. Maintain organic mulch

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over soil surface that is not covered by vegetation. Mulch shall be applied so that it is below grade (curb, edging, etc.) by half an inch. Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded green waste, wood chips from pruning operations, or chipped landscape prunings. When available, use materials generated on-site. Shredded redwood bark mulch ("Gorilla hair") shall be avoided. Non porous material (e.g. plastic weed barriers) shall not be placed under the mulch.
2. Sheet mulching shall be employed where possible.

#### G. Retain natural leaf litter and clippings

1. To conserve nutrients on-site and protect the soil surface, Contractor shall retain natural leaf drop under trees or in shrub beds. Select only tree and shrub beds that will not allow leaf litter or mulch to wash out into storm drains. Where leaf litter detracts from landscape appearance due to large leaf size, it is preferable that leaves be chopped and returned to landscape beds. Remove diseased leaves that would provide inoculums for plant infection.
2. Contractor shall practice grasscycling (discussed further in Section 4.1 *Turf Management*)

#### H. Fertilizers and other soil amendments

1. Bay-Friendly Landscaping relies on organic fertilizers and soil amendments from natural sources that release elements slowly, which shall be preferred.
2. Additional amendments and fertilizers that are approved for use by the Organics Materials Research Institute (OMRI) for use in crop production are approved for use in landscape. See [www.omri.org](http://www.omri.org). Contractor must supply fertilizer and soil amendment labels including the guaranteed analysis identifying components of the material and the percent nutrient content. Contractor is required to apply the appropriate amount of fertilizer to supply the specified quantity of nutrient as determined by soil analysis and/or plant tissue analysis.
3. Contractor shall apply and manage fertilizers and amendments to prevent pollution of surface and ground water and to avoid creating a nitrogen draft in the soil or toxicity to plants.
4. Application frequency  
Fertilizers shall be applied on a prescription base only. Application frequency shall be determined by plant need and assessed through soil and/or tissue analyses. For bidding purposes the following maximum annual number of applications are provided.
 

a. Trees, shrubs, woody ground covers:	One time per year
b. Herbaceous ground covers, perennials	Two times per year
c. Annuals and turf:	Four times per year
5. Restricted materials. Fertilizers that are not approved or are restricted for use in crop production by OMRI shall be applied only after review and written approval by the Agency Representative.

### 3.4 Water Management

#### A. Water conservation goals

Landscapes shall be irrigated to maintain plant appearance and health, and managed to conserve water and avoid overspray and water damage to Agency's hardscape and property.

#### B. Irrigation system assessment

1. Irrigation application rates and distribution uniformity are best assessed through an irrigation audit. Contractor is encouraged to perform an irrigation audit bi-annually (refer to [www.itrc.org](http://www.itrc.org)) or to schedule an audit with the water district that is the service provider to that property.
2. If a water audit is not performed, the Contractor shall inventory of the irrigation system at the start of the job. For each hydrozone determine the irrigation type and nozzle size, spacing and gallonage (from manufacturer's literature).

#### C. Irrigation scheduling – water budget method

The water budget approach to irrigation scheduling shall be used to match plant need with water application and avoid over-irrigation and overspray.

1. Irrigation intervals and frequency shall be suitable for weather conditions, soil infiltration rates, and plant species' rooting depth and water requirements within each hydrozone. Calculation methods are described in *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California*, available from the Dept. of Water Resources, Sacramento, CA.
2. Irrigation frequency shall be based on ET (evapotranspiration) data (available through CIMIS). Irrigation shall be applied at approximately 60% allowable depletion (AD) for turf and annuals, 70% for non-drought tolerant and 90% for drought tolerant plantings.
3. Irrigation duration within each hydrozone shall be based on the soil infiltration rate, species water requirement and rooting depth within the hydrozone, and the application rate and distribution uniformity of the irrigation system within that zone. Enough water shall be applied at each irrigation cycle to wet through the depth of root zone. Where runoff occurs, the application time shall be divided into shorter time intervals and repeated as needed.
4. Irrigation frequency for each hydrozone shall be adjusted a minimum of every four weeks to reflect ET expected in the next month.
5. For sites with controllers that monitor ET and adjust schedules automatically, the Contractor shall program the controller according to manufacturer specifications, and monitor to ensure that frequency is appropriate.
6. Whenever possible, landscape irrigation shall be scheduled between 2:00 a.m. and 10:00 a.m. to avoid irrigating during times of high wind or high temperature.

#### D. Irrigation monitoring

1. Contractor shall monitor soil moisture within plant root zones using a soil probe or shovel and adjust irrigation schedules accordingly if a soil moisture sensor is not signaling the irrigation controller.
2. Contractor shall observe irrigation system in operation to identify and correct water runoff or standing water problems as noted in the Section below *3.4.F Maintenance and Repair*.
3. Contractor shall determine irrigation run time demand monthly by recording water meter reading before and after irrigation (if site has a separate irrigation meter). This data should be reconciled with run times and flow rates to determine if there is unusual consumption which may indicate stuck valves or leaks.

#### E. Irrigation with recycled water

For landscapes irrigated with recycled water and containing salt-sensitive plants, the Contractor should increase irrigation frequency and duration to allow for elevated salts in the water and reduce salt accumulation in the root zone.

1. As a general guideline it is recommended that irrigation frequency adjusted to 50% allowable depletion (AD) for turf and annuals, 60% for non-drought tolerant plantings and 80% for drought tolerant plantings.
2. Once a month during the summer, irrigation duration should be increased by 20% to leach salts below plant root zones.

#### F. Irrigation system maintenance and repair

1. Contractor shall maintain the irrigation system for optimum performance, as per manufacturers specifications, by inspecting the entire system on an ongoing basis. This includes cleaning and adjusting all sprinkler and bubbler heads, drip emitters and valves for proper coverage.
2. Contractor shall inspect the irrigation system in operation to ensure proper function according to the following schedule:
 

April – October	Weekly
November – March	Monthly (when system operating)
3. All malfunctioning equipment shall be repaired prior to the next scheduled irrigation.
4. All irrigation replacement parts shall be of the same manufacturer, type, and application rates as existing, or approved equals or upgrades.
5. Irrigation system pressure shall be checked and adjusted at least monthly during season of operation.
6. Twice a year, at a minimum, the Contractor shall:
  - a. Ensure all flush valve/cap locations are visible.

- b. Ensure valve boxes are visible and can be opened.
  - c. Inspect valves, filters, and pressure regulators for damage or leaks. Check wire splices.
  - d. Clean valve boxes of dirt and debris.
  - e. Flush filters. A hose can be attached to the flush cap to keep water out of the valve box.
  - f. Inspect and clean filters. Replace damaged or torn filters.
  - g. Flush laterals.
  - h. Make sure plants have adequate numbers of drip emitters for their size.
  - i. Test backflow preventers.
7. Sprinkler heads shall be modified as needed to avoid overspray.
  8. Where possible and appropriate, recommend to Agency where sprinklers could be converted to drip or bubblers.
  9. Contractor shall maintain and submit monthly documentation of irrigation checks and as built plans of any changes or adjustments to the system. See Section 2.3.G.1. *Reporting and Inspecting*.

### 3.5 Integrated Pest Management (IPM)

#### A. Goals

An integrated pest management program shall be implemented to:

1. maintain healthy, attractive plants, maximize resistance to pests and out-compete weeds;
2. monitor for presence of pests and to evaluate pest impact to plant health and appearance, and nuisance to the public;
3. provide control treatments that have minimal negative effects on all but the pest and that protect air and water quality.

Contractor shall assume pesticides are potentially hazardous to human and environmental health. Preference shall be given to reasonably available nonpesticide alternatives when considering the use of pesticides on Agency property.

#### B. Insects and diseases

##### 1. Key plant:key pests

Contractor shall identify primary plant species and cultivars in the landscape (key plants) and the pests that commonly cause significant harm to plant health or appearance (key pests).

##### 2. Monitoring

Contractor shall monitor landscape areas to identify presence of beneficial insects and pests, determine populations, life stage, and degree of damage to plants. Key plants:key pests will be monitored closely during normal periods of pest activity. This information will be the basis on which pest control methods are initiated. Records of monitoring activity shall be kept.

##### 3. Controls

Bay-Friendly Landscaping seeks to control pests without harming non-target organisms, or negatively affecting air and water quality and public health. It relies on IPM which uses a range of cultural, mechanical, physical, and biological control methods before using pesticides. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied. Pesticides are not applied on a prescheduled basis.

a. Cultural/Mechanical/physical methods. A number of maintenance practices or modifications of them can make the environment unfavorable for pest reproduction, movement, or survival. Often simply modifying an existing maintenance practice, such as timing of pruning or fertilization, can produce positive results. Other mechanical or physical practices may specifically combat plant pests or increase host resistance. Key treatments include:

- 1) Fostering a healthy soil, judicious fertilization only when needed, and managing irrigation appropriately.
- 2) Pruning to remove infected or infested branches and shoots. Time pruning to avoid periods of insect infestation. For example prune pines and eucalyptus in the winter (December-February) when bark beetles and borers are inactive.

- 3) Removing fallen twigs, leaves, and fruit that contains disease inoculum.
- 4) Mulching soil surface to reduce weeds and to reduce splashing and the drops of mud that would protect spores deposited on plant surfaces.
- 5) Trapping insects using sticky surfaces (also used for monitoring). Mechanical traps can be used to control rodents.
- 6) Bringing to attention of Agency plants that are disease or insect prone and suggesting resistant plant replacements or those better suited to the site and microclimate

b. Biological methods

Biological controls are pesticides of natural origin that have limited or no adverse effects on the environment or beneficial organisms. Determining the effective biological control and proper timing of application are critical to success in pest control.

The Contractor shall consider the following biological control methods when cultural/mechanical/physical methods are not adequate to lower pest populations to the target level.

- 1) *Bacillus thuringiensis* (Bt)
- 2) Parasitic nematodes
- 3) Pheromone traps
- 4) Beneficial insect release and conservation

c. Pesticides

The term pesticide applies to insecticides, fungicides and other substances used to control pests. Antimicrobial agents are not included in this definition of pesticides.

1) Least toxic pesticides

When cultural, mechanical, physical and biological controls have provided inadequate pest control, the Contractor may select and apply an appropriate least-toxic pesticide as a last resort. Least-toxic pesticides have a high LD-50, low residual, and narrow range of toxicity. Application must be timed to the appropriate life stage of the pest.

Examples are:

- a. insecticidal soaps,
- b. horticultural oils,
- c. herbicidal soaps,
- d. neem,
- e. Pyriproxyfen insect growth regulator (e.g. Distance IGR)

2) Restricted chemicals

Organophosphate-containing pesticides have been found to persist in the environment and cause water quality impairment of some creeks, streams, and arroyos in Alameda County. They are restricted from use. Examples include:

- a. diazinon, trade names Spectracide®, Knox-out® and
- b. chlorpyrifos, trade names Dursban®, Pageant®)
- c. malathion and carbaryl (trade name Sevin®)

Water quality agencies recommend against using pyrethroids and pyrethrins containing piperonyl butoxide (PBO). These chemicals are restricted from use.

Pyrethrins are toxic to birds, fish, and beneficial insects, should be used only as a last resort, and carefully applied to avoid runoff and contact with non-target plants.

Contractor shall not apply any Toxicity Category I or II Pesticide Product, any pesticide containing a chemical identified by the State of California as a chemical known to the State to cause cancer or reproductive toxicity pursuant to the California Safe Drinking Water and Toxic Enforcement Act of 1986, and any pesticide classified as a human carcinogen, probable human carcinogen or possible human carcinogen by the United

States Environmental Protection Agency, Office of Prevention, Pesticides and Toxic Substances.

- 3) All chemical applications shall be performed by a licensed, trained technician. Contractor must be a licensed Pest Control Operator as required by the State of California, registered in Alameda Co., and strictly adhere to all laws.

#### 4. Notice of pesticide use

- a. Signs shall be posted at least three days before application of the pesticide product and remain posted at least four days after application of the pesticide.
  - 1) Signs shall be posted (i) at every entry point where the pesticide is applied if the pesticide is applied in an enclosed area, and (ii) in highly visible locations around the perimeter of the area where the pesticide is applied if the pesticide is applied in an open area.
  - 2) Signs shall be of a standardized design that are easily recognizable to the public and workers.
  - 3) Signs shall contain the name and active ingredient of the pesticide product, the target pest, the date of pesticide use, the signal word indicating the toxicity category of the pesticide product, the date for re-entry to the area treated, and the name and contact number for the City department responsible for the application.
- b. Contractor shall not be required to post signs in right-of-way locations that the general public does not use for recreational purposes. However, Contractor shall notify Agency in writing three days prior to pesticide applications in the right-of-way areas.
- c. Contractor may obtain authorization from the Agency to apply a pesticide without providing a three-day advance notification in the event of a public health emergency or to comply with worker safety requirements. Signs shall be posted for at least four days after application of the pesticide, as described in the Section above, 3.5.B.4.a., *Notice of Pesticide Use*

#### 5. Recordkeeping and reporting

- a. Contractor shall maintain records of all pest management activities. Each record shall include the following information:
  - 1) target pest;
  - 2) type and quantity of pesticide used;
  - 3) site of the pesticide application;
  - 4) date the pesticide was used;
  - 5) name of the pesticide applicator;
  - 6) application equipment used;
  - 7) prevention and other non-chemical methods of control used.
- b. Contractor shall submit the pest management record to Agency on a monthly basis.

#### C. Weed management

1. Landscapes shall be maintained in a healthy and attractive manner using Bay-Friendly methods.
2. Identify key weeds
 

Contractor will identify key weeds present and design weed manage program to target those species.
3. Invasive plants
 

Invasive plant species may have been included in the plantings inadvertently. Seedlings and/or suckers from those plants shall be removed by the Contractor. Refer to [www.bayfriendly.org](http://www.bayfriendly.org) or [www.cal-ipc.org](http://www.cal-ipc.org) for a list of invasive species. Remove all invasive plants not planted intentionally as noted in the Section below, 3.5.C.4, *Controls*. When invasive plants are an intended part of the landscape please notify Agency and propose a replacement option.
4. Controls
  - a. Cultural/Mechanical/physical methods will be used as the first choice in weed management.
    - 1) Monitor planting areas frequently to identify and eradicate weeds early in the growth stage prior to their setting seed.

- 2) Cut or pull weeds using hand operated equipment where possible.
  - 3) Mow large areas to reduce weed growth, and eliminate species that are not tolerant of mowing. Mowing is especially effective when done prior to seed set. Mowing also reduces fire hazard in open spaces.
  - 4) Goats may be used to manage weed growth, where appropriate. Goats must be well managed and plants fenced to avoid damage to non-target plants.
  - 5) Mulches shall be maintained at all times over soil surface that is not covered by vegetation. (see also Section 3.3 E, *Incorporate Organic Soil Amedments*)
  - 6) Sheet mulching, a layered system of non-plastic weed barrier overlain by mulch, shall be employed where possible.
  - 7) Propane-fueled flammers may be used in winter and spring with required permits and approval by the Fire Marshall to kill early-season, non-grass weeds by heating the cells until they burst. The weed quickly wilts and dies.
- b. Least toxic herbicides may be employed by Contractor as a last resort. Examples are:
- 1) Fatty acid potassium salts (herbicidal soaps e.g. Safer's Superfast Weed and Grass Killer® Dr. Bronner's Peppermint Anti-Bacterial Soap)<sup>1</sup>
  - 2) Acetic and citric acids (e.g. Nature's Glory Weed and Grass Killer RTU®)
  - 3) Clove, citrus, mint and thyme oil (e.g. Matran II®, Xpress®)
  - 4) Corn gluten
  - 5) Low-toxic, low-residual herbicide [e.g. glyphosate (Round-up®), glufosinate-ammonium (Finale®), pelargoic acid (Scythe®)]
- c. Restricted herbicides that may not be used because they have been identified as ground water contaminants are (trade names in parentheses):
- 1) Atrazine (Aatrex)
  - 2) Simazine (Princep)
  - 3) Bromacil (Hyvar, Krovar)
  - 4) Prometon (Pramitol)
  - 5) Bentazon (Basagran)
  - 6) Norflurazon (Solicam, Predict, Zorial)
- d. Restricted herbicides that may not be used because they have been identified as a compost contaminant are:
- 1) Picloram
  - 2) Clopyralid
- D. Vertebrate pests
1. Identify key pests that significantly affect plant health and appearance. Accurate identification is critical to appropriate control. Common vertebrate pests are:
    - a. Rodents including rats, mice, voles, moles, gophers
    - b. Deer
    - c. Rabbits
  2. Controls
    - a. Mechanical/physical/cultural methods shall be implemented as a first course of action. Preferred treatments include:
      - 1) Exclusion – Protect plants from damage by grazing animals with fences or cages.
      - 2) Habitat modification – Reduce cover at the periphery of the project as needed to solve problem.
      - 3) Application of repellents that are suitable for use in public areas.
      - 4) Traps may be used where mechanical/physical/cultural methods have been insufficient to control moles, voles, gophers, rats and mice.

<sup>1</sup> Trade names are used only as examples and are not intended as an endorsement.

- 5) Encouragement of predators – owl boxes
- b. Least toxic rodenticides

### 3.6 Plant Growth Control

#### A. Goals

The goals of plant growth control are to maintain healthy, attractive plants within the planting space allotted with minimal removal and disposal of vegetative growth.

#### B. Pruning

##### 1. Selective pruning

Plants shall be pruned selectively to remove individual stems or branches that extend beyond the natural conformation of the plant to a lateral branch or at the point of attachment.

Woody groundcovers shall be selectively pruned to control growth towards pavements rather than edged.

##### 2. Hedging and shearing

- a. Existing hedges that have been maintained by shearing in the past and that do not have adequate space to grow to mature plant size can continue to be maintained by shearing.

Suggest to Agency alternative plantings to these existing hedges that can be maintained in their natural shape for future renovations

- b. For hedges that have not yet been maintained by shearing: shearing of plants into formal shapes shall be avoided as this destroys the natural form of the plant and generates excessive waste.

- 1) Plants having adequate space for development shall instead be selectively pruned on an as needed basis.

- 2) Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations. Contractor will notify Agency where hedges could be replaced with size-appropriate plants to eliminate requirement for shearing.

##### 3. Tree Pruning

Tree pruning shall be performed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning. See Section 3.5.C., *Pruning*, for additional requirements.

#### C. Fire management/defensible space

For projects that adjoin open space areas, manage growth of grasses shrubs and trees to minimize fire risk. Contractor shall maintain vegetation clearances as required by the Alameda County Fire Marshall. Where recommended clearances would negatively affect plant health or environmental quality, Contractor will contact the Fire Marshall for a field inspection and recommendation. See also Section 4.5.B. *Fire Management*.

- D. Irrigation and fertilization programs shall be designed to avoid excessive plant growth that would require additional pruning or mowing to manage.

### 3.7 Waste Management

#### A. Goals

Bay Friendly landscapes are maintained to minimize producing waste and to use as much of the plant debris generated on-site as is possible and to recycle plant debris and discarded materials to the maximum extent feasible at appropriate recycling centers to avoid adding it to landfill.

#### B. Retain natural leaf litter

To conserve nutrients on-site and protect the soil surface, Contractor shall retain natural leaf drop and other organic materials in shrub beds. Select sites where leaves will not enter the storm drain. Where leaf litter detracts from landscape appearance due to large leaf size, it is preferable that leaves be chopped and returned to landscape beds. Remove diseased leaves that would provide inoculum for plant infection.

**C. Grasscycle**

Contractor will leave grass clippings on the lawns after mowing, from at least April through October,. Sports turf may be excluded 'in season' when clippings will interfere with play.

**D. Debris removal and clean-up**

Contractor shall keep all landscaped areas, walkways, building entries and exits free from trash and debris. Debris clean up with brooms and rakes is preferred to blowers.

**E. Producing mulch from site generated untreated and unpainted wood and plant debris**

Contractor is encouraged to chip all vegetative materials and wood and use on site as mulch.

**F. Producing compost from site generated plant debris**

Where appropriate space is available, Contractor is encouraged to compost site-generated green waste and reuse on site. Site must be approved by agency, have a water hook-up nearby, be in an area that discourages interaction with public and be regularly monitored. Contractor should have knowledge of compost basics such as: C:N ratio, proper moisture content, and proper aeration.

**G. Recycle waste**

Contractor shall separate all plant debris that cannot be reused on site and other discarded materials that are readily recyclable and transport to appropriate recycling facilities.

If lawn clippings, shrub and tree trimmings, or prunings must be removed from site, they must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

**3.8. Landscape repair/refurbishment**

When landscapes are repaired and/or refurbished, the Contractor will employ Bay-Friendly landscape guidelines to enhance the sustainability of the landscape, reduce waste and protect watersheds. Refer to the Bay-Friendly landscape guidelines at [www.BayFriendly.org](http://www.BayFriendly.org).

**A. Replace high input plants with species better suited to location and use. Species should be selected that are:**

1. appropriate size at maturity for planting site
2. native to region and/or drought tolerant
3. resistant to significant pests
4. non-invasive
5. increase diversity of the plant palette.

**B. Reduce amount of area occupied by high water use plantings where possible (e.g. replace turf with drought-tolerant ground cover). Suggest alternative plantings to Agency for decorative turf especially turf areas less than 8 feet wide.****C. Reuse materials removed from the landscape that are in good condition.****D. When buying new materials, select recycled content materials where possible.****E. When irrigation systems are replaced or upgraded, install high efficiency systems.**

## Section 4: Landscape Specifications for Plant Types and Landscape Zones

### 4.1 Turf

#### A. Standards for Health and Appearance

Turf shall be maintained to sustain an attractive appearance, and good health with deep roots uniform green color, and uniform density with no bare spots,

#### B. Protect Environmental Resources

Turf shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

#### C. Mowing and Edging

1. Turf shall be mowed and edged at regular intervals to maintain a neat appearance and healthy growth.
2. Grasscycling shall be employed for all turf areas (see A Bay-Friendly Landscaping Guide to Grasscycling, available at [www.BayFriendly.org](http://www.BayFriendly.org)). Grasscycling requires an integrated management system of irrigation, mowing height, and mowing frequency. Key components are:
  - a. Mow often, at least once a week during the growing season.
  - b. Mow when the turf is dry; at least on the day following irrigation.
  - c. Maintain equipment to keep blades sharp and balanced; usually sharpen once a week. Keep area under the mower deck clean. Mulching mowers are more effective, but not required for grasscycling.
  - d. Leave clippings on the turf. A second pass over clumps or windrows may be necessary if clippings are long. Clipping may not be left on turf in clumps or windrows.
  - e. Seasonal rains may require temporarily halting of grasscycling because of excessive moisture. The clippings must be picked up and used as a mulch or transported to a plant debris recycling facility. Do not use grass clippings as a mulch if an herbicide has been applied to the turf.
2. Turf will be mowed at a height appropriate for the species of turf:
 

a. Tall fescue	2-3"
b. Bluegrass, ryegrass, red fescue	1.5-2.5"
c. Dichondra, bermudagrass	0.5-1.0"
3. Turf will be cut with appropriately sized equipment which will give a neat appearance without rutting, sliding over or scalping the turf.
4. Mowing patterns will be changed weekly or however often necessary to avoid rutting.
5. Turf areas adjacent to pavements shall be edged on a vertical plane every other mowing.
6. A stringtrimmer or shears shall be used to trim around valve boxes, headerboards, etc. in the turf, on a regular basis to maintain a neat appearance.
7. Turf shall be maintained away from the base of features in the turf at the following distances:
 

a. Trees	24"
b. Signs and similar features	4"
c. Buildings and other structures	4"
8. Clippings will be removed from paved surfaces the day of the mowing and edging.
9. Contractor shall take care to avoid damaging plants, equipment, signs, buildings, vehicles, etc. during turf maintenance operations. Any trees which have more than 50% of the circumference of the trunk tissue removed or damaged by string trimmers or mowers shall be considered destroyed and shall be replaced at the Contractor's expense with like species and size.

#### D. Leaf Litter

1. Mulch leaf litter with mowers as needed throughout the fall and winter months. Large concentrations of leaves may require pickup. Rakes are preferred for leaf litter removal over blowers.
2. Leaf litter will not be allowed to accumulate to the point that it will damage or kill turf.

3. Leaf litter that is removed from turf will be either chopped and used on-site, or transported to a plant debris recycling facility.

E. Aerating and De-thatching

1. Aerate turf in traffic areas once a year. Aerate turf in low use areas every two years. Use equipment with hollow tines that removes a soil core. Topdress with ¼ inch fine compost. Overseed to fill in thin spots and to crowd out weeds.
2. Dethatch turf when thatch accumulates to a one-half inch thickness by cutting with a vertical mower. Thatch shall be raked and either composted for use elsewhere, or transported to a greenwaste recycling facility.
3. Aeration and dethatching activities should be scheduled to coincide with active growth period of the turf species, avoid hot weather conditions, and avoid peak time of crabgrass and other weed seed germination.

F. Water Management

1. Turf shall be irrigated to provide adequate water to maintain an attractive, green, healthy turf, and moderate growth rate during its growing season, without stimulating excessive growth rates.
2. The water budget approach to irrigation scheduling shall be used to match turf need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)
3. Irrigation frequency under normal conditions should not exceed three times per week.

G. Soil and Nutrition Management

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments*.
2. Fertilization shall be managed to provide moderate, not excessive, turf growth, and to avoid polluting surface and ground waters. Grasscycling reduces the fertilization requirement of turfgrass by 15-20%.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. For bidding purposes plan to apply approximately 3.5-4.5 lbs. of actual nitrogen to cool season grasses per year in four applications. Include the available nitrogen from grasscycling and applying compost as a topdressing in the calculations of actual nitrogen.
4. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of turf (see also Section 3.3 *Soil and Nutrition Management* ).

H. Pest Management (see also Section 3.4, *Integrated Pest Management*)

1. Contractor is responsible for monitoring turf to identify and assess pest problems, and for taking action to control pests that affect turf health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

## 4.2 Ground Cover

A. Standards for Health and Appearance

Ground covers shall be maintained to sustain an attractive, healthy, normal color for the species, and uniform density with no bare spots. Ground covers shall be kept free of trash and debris.

B. Protect Environmental Resources

Ground cover shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

#### C. Edging and Mowing

1. Ground covers shall be trimmed on a regular basis to maintain pavements and other features clear of vegetation.
2. The edge of woody ground covers (e.g. rosemary, cotoneaster) shall be maintained by pruning individual branches or stems to interior lateral branches a minimum of 6" and maximum of 12" from the edge of pavement.
3. The edge of herbaceous ground covers (e.g. hypericum) may be maintained using turf edging equipment.
4. When ground covers become excessively woody or develop thatch in excess of 4", the Contractor shall prune the planting severely to rejuvenate it. For most woody ground covers, prune to approximately 6-8" height. Herbaceous ground covers may be mowed at an appropriate height, generally 4-6". This treatment shall only be applied in the late winter/early spring when ET is low and regrowth will occur quickly.

#### 5. Handling of plant debris

Contractor is encouraged to chip all vegetative materials use on site as mulch and/or compost and use as soil amendment.

If ground cover prunings must be removed from site, they must be kept free of other types of inorganic debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

#### D. Mulching

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas that is not covered by ground cover. Mulch shall be applied so that it is below grade (curb, edging, etc.) by half an inch. Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris wood chips from pruning operations. When available, utilize chipped plant prunings generated on-site.

#### E. Water Management

1. Ground cover shall be irrigated to provide adequate water to maintain an attractive, green, healthy plants, and moderate growth rate during its growing season.
2. The water budget approach to irrigation scheduling shall be used to match ground cover need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)

#### F. Soil and Nutrition management (see also Section 3.3, *Soil & Nutrition Management*)

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments*.
2. Fertilization shall be managed to provide moderate, not excessive, growth, and avoid polluting surface and ground waters.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. For bidding purposes plan to apply 1-2 lbs. of actual nitrogen to ground cover areas in two applications annually.
4. Contractor shall select fertilizers that are released over a period of time, predominately are organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of the ground cover.

#### G. Pest management

1. Contractor is responsible for monitoring ground cover to identify, assess pest problems and taking action to control pests that affect ground cover health and appearance when pest populations or damage exceed established thresholds.

2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor shall not apply restricted chemicals that may harm water resources.

#### 4.3 Annual Color

##### A. Standards for Health and Appearance

Annual color beds shall be maintained to sustain an attractive, healthy, plants and uniform density with no bare spots. Annual beds shall be kept free of weeds, trash and debris. Weeds shall be controlled using methods consistent with Section 3.5, *Integrated Pest Management*.

##### B. Protect Environmental Resources

Annual color beds shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

##### C. Contractor shall suggest to Agency where annual color beds could be converted to perennial beds that provide color over several seasons and minimize waste.

##### D. Annual color shall be planted only in designated beds or pots and hydrozoned. Provide two installations per year: one in the early spring, and one in the late fall. Select species appropriate for the exposure and microsite conditions. Avoid species requiring excessive irrigation and fertilization to sustain.

##### E. Mulching

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas that is not covered by ground cover. Mulch shall be applied so that it is below grade (curb, edging, etc.) by half an inch. Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris wood chips from pruning operations. When available, utilize chipped plant prunings generated on-site.

##### F. Contractor shall prune annual plants monthly or more to remove spent flowers before seed is formed.

##### G. Water Management

1. Annual color shall be irrigated to provide adequate water to maintain an attractive, green, healthy plants and moderate growth rate during the growing season.
2. The water budget approach to irrigation scheduling shall be used to match plant need with water application and avoid over-irrigation (see Section 3.5)
3. Maximum irrigation frequency under normal conditions should not exceed two times per week.

##### H. Soil and Nutrition Management

1. Contractor shall incorporate composted organic amendments into soil prior to planting annuals or replanting damaged turf or ground cover as per Sections 3.3.D, *Soil and Plant Tissue Analysis* and 3.3.E., *Incorporate Organic Soil Amendments*.
2. Fertilization shall be managed to provide moderate, not excessive, growth, and to avoid polluting surface and ground waters.
3. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies.
4. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of annual color (see also Section 3.4).

##### I. Pest Management (see also Section 3.6)

1. Contractor is responsible for monitoring annual color to identify and assess pest problems, and for taking action to control pests that affect turf health and appearance.
2. Contractor shall employ integrated pest management procedures (see also Section 3.6).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

#### J. Handling of plant debris

Contractor is encouraged to use all vegetative materials as a feedstock for compost.

If plant debris must be removed from site, it must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

### 4.4 Shrubs

#### A. Standards for Health and Appearance

Shrubs shall be maintained to sustain an attractive and healthy plant that is characteristic for the species.

#### B. Protect Environmental Resources

Shrubs shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

#### C. Pruning

##### 1. Selective pruning

- a. Shrubs shall be pruned selectively only as necessary to enhance their natural shape.
- b. Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations

##### 2. Hedging and shearing

- a. Existing hedges that have been maintained by shearing in the past and that do not have adequate space to grow to mature plant size can continue to be maintained by shearing. Suggest to Agency alternative plantings to these existing hedges that can be maintained in their natural shape for future renovations
- b. For hedges that have not yet been maintained by shearing: shearing of plants into formal shapes shall be avoided as this destroys the natural form of the plant and generates excessive waste.
  - 3) Plants having adequate space for development shall instead be selectively pruned on an as needed basis.
  - 4) Where plant size must be controlled because of inadequate space for the plant, prune to reduce size by cutting individual branches or stems to interior lateral branches at appropriate locations. Contractor will notify Agency where hedges could be replaced with size-appropriate plants to eliminate requirement for shearing.

3. Trimmings generated by pruning shall either be chipped and used as mulch on the site, or transported to a plant debris recycling facility.

#### D. Mulching

1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas surrounding shrubs. Mulch shall be applied so that it is below grade (curb, edging, etc.) by half an inch. Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch

materials shall be chipped or shredded composed green waste, wood chips from pruning operations, or chipped landscape prunings generated on-site.

2. Sheet mulching shall be employed at installation, where possible.

#### E. Water Management

1. Shrubs shall be irrigated to provide adequate water to maintain an attractive, healthy plants, and moderate growth rate during their growing season.
2. The water budget approach to irrigation scheduling shall be used to match shrub need with water application and avoid over-irrigation (see Section 3.4 *Water Management*)

#### F. Soil and Nutrition Management (see also Section 3.3, *Soil & Nutrition Management*)

1. Fertilization shall be managed to provide moderate, not excessive, growth, to and avoid polluting surface and ground waters.
2. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. Additional fertilization of mature shrubs maintained with mulch may not be necessary.
3. Contractor shall select fertilizers that are released over a period of time, predominantly are organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide primary nutrient needs of the ground cover.

#### G. Pest Management

1. Contractor is responsible for monitoring shrubs to identify, assess pest problems and taking action to control pests that affect shrub health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor shall not apply restricted chemicals that may harm water resources.

### 4.5 Trees

#### A. Standards for Health and Appearance

Trees shall be maintained to sustain an attractive, healthy and structurally stable plant that is characteristic for the species.

#### B. Protect Environmental Resources

Trees shall be maintained using materials and methods that protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

#### C. Pruning

1. All tree pruning shall be performed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning. Arborist must have a State of Calif. Contractors License for Tree Service (C61-D49).
2. All pruning shall be in accordance with the Best Management Practices for Pruning (International Society of Arboriculture, 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).
3. Young trees shall receive annual pruning for up to five years after planting by personnel trained in pruning to develop tree structure. The purpose of the pruning is to direct the tree into the appropriate form for the species and the site and to develop a strong branch structure. Trees with codominant trunks and multiple branch attachments shall be pruned to correct those defects over a period of several years.
4. Trees shall be pruned in the following manner:

- a. Clear the crown of diseased, crossing, weak and dead branches. Trees shall not be routinely thinned.
  - b. Provide 14' vertical clearance over roads, 8' over walkways;
  - c. Reduce end weight on heavy, horizontal branches
  - d. Create a strong central trunk with lateral branches spaced vertically and horizontally.
  - e. Interior branches shall not be stripped out.
  - f. No more than 20% of live foliage shall be removed within the trees.
  - g. Trees shall not be climbed with spurs.
  - h. Branch removal or reduction cuts (thinning cuts) are to be employed rather than heading cuts. Trees shall not be topped or headed back.
  - i. No green palm fronds shall be removed above a horizontal line drawn across the base of the crown.
5. Schedule pruning to avoid time of bud break, flowering and leaf drop on live branches, and to avoid peak periods of insect and disease activity for pests to which the tree species is susceptible.
  6. Pruning operations shall be conducted in a manner that does not damage surrounding and understory plants and structures.
- D. Staking
1. Tree stakes, ties and guys shall be checked regularly to ensure trees are not being damaged. Adjust ties and stake as necessary to prevent girdling and wounding.
  2. Tree stakes shall be removed within two years of planting. For trees unable to stand alone after two years, Contractor will shorten the stakes and lower the ties to 3-4' height. If after the third year the tree will not stand without a stake, Contractor will inspect to determine cause of instability, and make recommendations to Agency for corrective action.
  3. If new ties are needed to secure tree to stake, use ties composed of recycled materials. The tie must be broad, have a smooth surface where it contacts the trunk, and provide some elasticity. Wire covered with hose, tubing or other materials, and covered electrical wire are not acceptable materials.
- E. Mulching
1. Contractor shall maintain a minimum of 2" [substitute 'minimum of 3" 'if required by the Agency's water conservation ordinance] of coarse organic mulch at all times over bare soil areas surrounding trees taking care not to place mulch against trunks. Mulch shall be applied so that it is below grade (curb, edging, etc.) by half an inch. Some additional grading preparation and grading of areas adjacent to sidewalks or edging, etc. may be required to keep the finish grade of the mulch at an appropriate level. Mulch materials shall be chipped or shredded plant debris and/or wood chips from pruning operations. When available, utilize chipped landscape prunings generated on-site.
  2. Sheet mulching shall be employed at installation, where possible.
- F. Water Management
1. Trees shall be irrigated to encourage deep root growth and to provide adequate water to maintain an attractive, healthy plants, and a moderate growth rate during their growing season.
  2. The water budget approach to irrigation scheduling shall be used to match shrub need with water application and avoid over-irrigation (see Section 3.4, *Water Management*)
- G. Soil and Nutrition Management (see also Section 3.3, *Soil & Nutrition Management*)
1. Fertilization shall be managed to provide moderate, not excessive, growth, and to avoid polluting surface and ground waters.
  2. Fertilizer applications are to be made on a prescription basis only when soil and/or plant tissue analyses identify specific deficiencies. Additional fertilization of mature trees may not be necessary.
  3. Contractor shall select fertilizers that are released over a period of time, are predominantly organic and derived from natural sources, are produced locally, and will not pollute surface and ground water when properly used to provide the primary nutrient needs of the tree.
- H. Pest management

1. Contractor is responsible for monitoring trees to identify, assess pest problems and taking action to control pests that affect tree health and appearance when pest populations or damage exceed established thresholds.
2. Contractor shall employ integrated pest management procedures (see also Section 3.5, *Integrated Pest Management*).
3. Contractor shall select pest controls to provide adequate pest control without harming non-target organisms, or negatively affect air and water quality and public health. Pest management shall rely first on cultural, mechanical, physical, and biological control methods. Chemical controls may be applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control will be applied. Pesticides may not be applied on a prescheduled basis.
4. Contractor may not apply restricted chemicals that may harm water resources.

#### 4.6 Open Space & Meadows

##### A. Standards for Health and Appearance

Open space area shall be maintained to sustain an attractive, healthy plant community that is capable of supporting wildlife.

##### B. Fire Management

1. Contractor shall maintain vegetation clearances and manage fuel loads as required by the Alameda County Fire Marshall. Where recommended clearances would negatively affect plant health, Contractor will contact the Fire Marshall for a field inspection and recommendation.
2. Herbaceous growth shall be managed to minimize fire hazard by mowing on a frequency to meet Alameda County Fire Marshall requirements.
3. Goats may be used to manage growth, where appropriate. Plants that need protection must be fenced and goats well-managed to prevent damage to non-target plants.

##### C. Soil and Nutrition Management

1. Contractor shall protect soil from compaction by:
  - a. Scheduling maintenance operations that require driving equipment over the soil (e.g. mowing, pruning) when the soil is dry.
  - b. Confining traffic to paved areas.
  - c. When temporary access is needed over non-paved areas, distribute the load over the soil with 6" thick coarse organic mulch or wood planks.
2. In planted areas, Contractor shall maintain a minimum of 3" of coarse organic mulch at all times over soil surface that is not covered by vegetation. Mulch materials shall be chipped or shredded plant debris, wood chips from pruning operations. When available, utilize chipped landscape prunings generated on-site.
3. Sheet mulching shall be employed where possible.

##### D. Protect soil from erosion

Contractor shall protect the soil from erosion by:

1. Maintaining vegetative cover over the soil to the extent possible.
2. Placing compost berms, blanket, socks or tubes along slopes to slow water.
3. Maintaining mulch cover over bare soil.

##### E. Invasive species

Invasive plant species shall be eradicated from open space areas to the extent possible using methods described in Section 3.5.C., *Weed Management*. Refer to [www.cal-ipc.org](http://www.cal-ipc.org) for a list of invasive species.

#### 4.7 Bioswales and bioretention areas

##### A. Standards for Health and Appearance and Function

Bioswales and bioretention areas remove pollutants from the stormwater by filtering runoff slowly through an active layer of soil. They shall be maintained to ensure that flow is not obstructed, erosion

is prevented and they continue to be effective without causing flooding or harboring vectors and in accordance with the site's Stormwater Control Plan's Operation and Maintenance Plan, if available.

B. Protect Environmental Resources

Bioswales depend on soils that are biologically active and held together by plant roots. They shall be maintained using materials and methods that support this biological activity, protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Monitoring and inspection

1. Inspect inlets for channels and exposure of soils and report to the Agency if evidence of erosion is found. Examine rock or other material and report to the Agency if it requires replacement.
2. Inspect inlets and slopes for instability, erosion or obstructions. Report indications of problems to Agency.
3. Observe soil at the bottom of the swale for uniform infiltration. Confirm that irrigation is adequate but not excessive. Report water that does not drain within 48 hours of a storm.
4. Confirm that check dams and flow spreaders are in place and level. Report problems to Agency.

D. Sediment control

1. Clear minor obstructions and inspect for accumulation of sediment. Contractor shall remove accumulated sediment in bioswales by hand and around catch basins and culverts as necessary to maintain adequate flow.

E. Vegetation management

Examine vegetation to ensure that it is healthy, adequately but not overwatered, and dense enough to provide filtering. Remove debris. Prune large trees and shrubs as per previous Sections 4.4, *Shrubs* and 4.5 *Trees*. Weeds and invasive plant species shall be controlled as described in 3.5.C. *Weed Management*. Refer to [www.cal-ipc.org](http://www.cal-ipc.org) for list of invasive species

F. Mowing

Grassy swales shall be mowed as needed to maintain adequate water flow. For bidding purposes assume 4 mowings per year. Remove no more than 1/3 of the length of the leaf blade. Clippings should be collected and either used elsewhere on-site or transported to a plant debris recycling facility.

G. Mosquito Abatement

Areas of seasonal water collection that do not drain within 48 hours shall either be filled with gravel/cobble or treated monthly with Bt (See Section 3.5.B.3, *Controls*)

#### 4.8 Planter Boxes for Stormwater Management

A. Standards for Health and Appearance and Function

Planter boxes capture runoff from downspouts, plaza or paved areas. The runoff briefly floods the box and then percolates through an active layer of soil. They shall be maintained to continue to be effective, attractive and healthy.

B. Protect Environmental Resources

Planter boxes depend on soils that are biologically active. They shall be maintained using materials and methods that support this biological activity, protect environmental quality and human health, conserve water and energy, minimize waste, and reuse and recycle materials to the extent possible.

C. Monitoring and inspection

1. Examine downspouts or inlets from paving. Remove debris and separate organic matter for recycling. Check splash blocks or rocks. Report damaged pipes, downspouts, blocks or rocks that need replenishing.
2. Examine overflow pipe to make sure it can safely convey excess flows to a storm drain. Repair disconnected pipe or report damage to Agency.
3. Check underdrain piping to make sure it is intact and unobstructed. Report evidence of damage or malfunction to the Agency.
4. Check planter box for holes, cracks, rot or failure. Make minor repairs and report more significant damage to Agency.

D. Vegetation management

Examine vegetation to ensure that it is healthy, adequately but not overwatered, and dense enough to provide filtering. Remove debris. Prune large trees and shrubs as per previous sections on growth and waste management. Weeds and invasive plant species shall be controlled as described in Section 3.5.C., *Weed Management*. Refer to [www.cal-ipc.org](http://www.cal-ipc.org) for list of invasive species

#### E. Soil and Nutrition Management

1. Check that the soil is at the appropriate depth to allow a reservoir of water above the soil surface and to function as a stormwater filter. Confirm that water is draining through soil within 3-4 hours after a storm event. Alleviate compaction or replace soil as needed, with soil that includes compost at a rate of 1 part compost to 3 parts soil.
2. Remove accumulations of sediment, litter or plant debris. Separate organic matter and handle as section on waste management. If plant debris must be removed from site, it must be kept free of other types of debris and transported to a local composting facility or transfer station that offers a separate processing (and often discounts) of plant debris for composting.

### 4.9 Hardscape

#### A. Debris removal and clean-up

Contractor shall keep all hardscape areas, walkways, building entries and exits free from trash and debris.

#### B. Surface cleaning

Contractor will clean hard surfaces as needed to remove accumulation of sediment, dirt, or other materials that distracts from the visual impact of the area or creates a safety hazard. Cleaning methods must be consistent with the Bay Area Stormwater Management Agencies Association. (BASMAA) criteria (listed below in Section 4.9.E., *BASMAA Certification*).

#### C. Root interference

Potential root damage to hardscapes shall be reported to Agency. Corrective action will be determined and directed as an extra service.

#### D. Pervious paving

Contractor shall clean the surface of pervious paving to remove fine debris and dirt as needed to maintain permeability (approximately four times per year). Pavement may be cleaned with street sweepers equipped with vacuums, water, and brushes, followed by high-pressure hosing of surface. If necessary, replace displaced aggregate fill with clean gravel. Cleaning methods must be consistent with the Bay Area Stormwater Management Agencies Association. (BASMAA) criteria (listed below in section 4.9.E., *BASMAA Certification*).

#### E. BASMAA Certification

Pollution Prevention Training & Certification Program For Surface Cleaners issued by the Bay Area StormWater Management Agencies Association (BASMAA) is required to perform surface cleaning work. BASMAA certification number: \_\_\_\_\_. <http://www.basmaa.org/recognition/> All work should conform to BASMAA standards. BASMAA standards encourage the use of dry cleaning methods over wet such as the use of absorbing materials for oils and sweeping. It discourages the use of any soaps or solvents. It encourages directing wash water into the landscape or collection of waste water for disposal into a sanitary sewer instead of a storm drain. See their website for a thorough list of criteria.

## Section 5: Definitions

**Antimicrobial agent** – Any substance or mixture of substances intended for inhibiting the growth of or destroying any bacteria, fungi pathogenic to human and other animals, or viruses declared to be pests under Section 12754.5 of the California Food and Agricultural Code, except slime control agents. Antimicrobial agents include, but are not limited to, disinfectants, sanitizers, bacteriostats, sterilizers, fungicides and fungistats.

**Biodiesel** – A fuel produced through a process in which organically-derived oils such as soybean or vegetable oil are combined with alcohol.

**Bioswale** - Channel constructed to improve the water quality of runoff, usually while also conveying it, through filtering by vegetation and other mechanisms that capture and hold water pollutants.

**Blanket** – Mat of organic, biodegradable materials such as coir fibers, straw or curled wood fiber, on or between photodegradable polypropylene or degradable natural fiber netting. The blanket is placed on the soil surface to protect from surface erosion.

**Compost Berm** – An erosion control device composed of linear mounds of compost placed along a slope to slow water movement and retain sediment.

**Evapotranspiration (ET)** – The combined loss of water from a given area, and during a specified period of time, by evaporation from the soil surface and by transpiration from plants.

**Grasscycling** – A turf management technique in which turf is mown frequently and clippings are left on the turf to return nutrients to the soil, thereby reducing fertilizer requirements by as much as 50%.

**Hardscape** – The hard-surface components of the landscape such as sidewalks, pavements, non-living features.

**Hydrozone** – A portion of a landscaped area having plants with similar water needs that are served by one irrigation valve or set of valves with the same schedule.

**I.S.A.** – International Society of Arboriculture, [www.isa-arbor.com](http://www.isa-arbor.com)

**Integrated Pest Management** – A holistic approach to managing insects, plant disease, weeds and other pests so that their populations do not exceed a tolerable level by fostering an environment favorable for plants and other beneficial organisms and unfavorable for pests. If pest problems arise a variety of control techniques are considered, with least toxic pesticides being applied as a last resort.

**Pesticide** – As defined in Section 12753 of the California food and Agricultural Code, a pesticide includes any of the following: (a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever. Antimicrobial agents are excluded from the definition of pesticide.

“Toxicity Category I Pesticide Product” means any pesticide product that meets United States Environmental Protection Agency criteria for Toxicity Category I under Section 156.10 of Part 156 of Title 40 of the Code of Federal Regulations.

“Toxicity Category II Pesticide Product” means any pesticide product that meets United States Environmental Protection Agency criteria for Toxicity Category II under Section 156.10 of Part 156 of Title 40 of the Code of Federal Regulations.

**Sheet Mulching** - A layered system of non-plastic weed barrier (e.g. recycled cardboard, newspaper) overlain by mulch that is used for soil improvement and weed control

**Sock** – Sleeve filled with mulch, straw, or other organic, biodegradable material to create long tube placed along a slope to slow water movement and retain sediment.

**Tube** – See sock.

**Wattle** – See sock.



URBAN GREENING MASTER PLAN

# Section 013521 Bay-Friendly Landscaping Requirements



## SECTION 013521 BAY-FRIENDLY LANDSCAPING REQUIRMENTS (4-16-13 Version)

THIS IS A SAMPLE SPECIFICATION FOR INFORMATIONAL PURPOSES ONLY. NOTHING CONTAINED HEREIN IS INTENDED TO CONSTITUTE LEGAL ADVICE. STOPWASTE.ORG MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED REGARDING THE SUITABILITY OR ACCURACY OF THE INFORMATION CONTAINED HEREIN.

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: General requirements to comply with and obtain Bay-Friendly Rated Landscape status. The landscape and site development in this project is to achieve a Bay-Friendly Rated Landscape status by, incorporating the required practices and achieving the minimum score on the Bay-Friendly Scorecard for Commercial and Civic Landscapes. Bay-Friendly credits as identified on the attached scorecard for this project have bearing on the Contractor's scope of work.
- B. Bay-Friendly Landscaping (BFL) is a holistic approach to the design, construction and maintenance of the landscape in order to support the integrity of one of California's most magnificent ecosystems, the San Francisco Bay watershed. The BFL Program is based upon seven inter-relating principles, including:
  - 1. Landscaping Locally
  - 2. Landscape for Less to the Landfill
  - 3. Nurture the soil
  - 4. Conserve Water
  - 5. Conserve Energy
  - 6. Protect Water & Air Quality
  - 7. Create Wildlife Habitat
- C. Related Sections:
  - 1. [include all specification sections that detail BFL practices for this project]

## 1.2 REFERENCES

- A. Bay-Friendly Scorecard for Commercial and Civic Landscapes for this project (attached to the end of this specification section)
- B. Bay-Friendly Rating Manual for Civic and Commercial Landscapes: serves as a guide in describing the requirements and verification procedures for each practice in the scorecard.
- C. Bay-Friendly Maintenance Specifications: serves as a reference document to provide language as needed to improve the environmental standards of ongoing landscape maintenance contracts.

- D. Bay-Friendly Landscape Guidelines: fully describes the seven Bay-Friendly principles, offering 55 practices in sustainable landscape design, construction, and maintenance.
- E. Additional Bay-Friendly resources found at [www.BayFriendly.org](http://www.BayFriendly.org)

### 1.3 DOCUMENTATION

- A. BFL documentation is required to verify compliance with the BFL scorecard and must be submitted in addition to project submittals. If a submitted item is identical to that submitted to comply with other project requirements submit duplicate copies in a separate BFL submittal. (On the submittal list below, the numbers such as "C.7.a.i" references the numbering of practices on the BFL Scorecard for Civic and Commercial Landscapes.) Submit the following: [ delete submittals that are not applicable and add additional contractor submittal requirements per the scorecard and Rating Manual, such as signed Accountability Forms. Confirm accountability forms needed with BFL Rater ]
  - 1. A.3.a. Submit photos of trees identified for removal being chipped for use as mulch onsite.
  - 2. A.5.a. Submit accountability form signed by Contractor confirming site boundaries were walked and identified prior to construction.
  - 3. C.1.a. Submit soils analysis report and accompanying recommendations from the accredited soil laboratory.
  - 4. C.3.a. Submit accountability form signed by Contractor confirming fencing has been installed per the requirements of this credit.
  - 5. C.4.a.i Submit accountability form signed by Contractor confirming soil has been ripped to a depth of 8”.
  - 6. C.4.a.ii Submit accountability form signed by Contractor confirming soil has been ripped to a depth of 12”.
  - 7. C.5.a. Submit accountability form signed by Contractor confirming fertilizers prohibited by OMRI are not utilized on the project.
  - 8. C.6.a. Submit tags or receipts for mulch and sheetmulching materials indicating the amount purchased/delivered and/or submit photos of removed trees being chipped for use as mulch on site.
  - 9. C.7.a i and ii- Submit Soil analysis and/or tags or receipts for compost indicating the amount of compost delivered/ purchased.
  - 10. C.7.a.iii- Submit tags or receipts showing compost is purchased from a processor that participates in US Composting Council's Standard Testing Assurance Program.
  - 11. C.8.a- Submit tags or receipts for sheet mulch cardboard.
  - 12. C.8.b Submit accountability form signed by Contractor confirming synthetic preemergents have been prohibited.
  - 13. C.9.a Submit tags or receipts of purchased compost, and/or compost socks indicating amounts.
  - 14. D.1.b- Submit accountability form confirming 25% recycled aggregate was utilized.
  - 15. D.1.c- Submit tags or receipts showing flyash or slag percentage in concrete mix.
  - 16. D.1.d Submit tags or receipts showing quantity, supplier and feedstock of compost and/or mulch.
  - 17. D.2.a,b,c- Submit Pre Construction Debris Recovery Plan in the planning stages of construction and submit Post Construction Debris Recovery Plan and documentation of results (i.e. hauler facility gate tags, builders waste tabulation supplied by local waste authority) and diversion rate from the C&D facility.
  - 18. D.5.a- Submit accountability form signed by contractor indicating solar powered pumps have been installed for water features.

## Section 013521 Bay-Friendly Landscaping Requirements

18. D.2.c. Submit accountability form signed by contractor indicating unused materials have been donated.
19. D.6.a. Submit accountability form signed by contractor confirming stone and non-concrete hardscape materials are produced within 500 miles of the site.
20. D.7.a. Submit accountability form signed by contractor indicating IPM was used during construction.
21. D.8.a. Submit accountability form signed by contractor indicating OPM was used during construction.
22. E.4.a. Submit accountability form signed by contractor indicating no turf has been installed in areas less than 8' wide unless irrigated with subsurface or low volume irrigation.
23. E.5.a. Submit accountability form signed by contractor confirming plants have been installed according to hydrozones.
24. F.2.a. Submit accountability form signed by contractor verifying weather based controller is installed per criteria of this credit. F.2.b. Submit accountability form signed by contractor confirming no spray heads are specified in areas less than 8' wide.
25. F.2.c.i and ii. Submit accountability form signed by contractor confirming drip or bubblers are installed per criteria of this credit.
26. F.2.d. Submit accountability form signed by contractor confirming precipitation rates and OD meet criteria of this credit.

#### 1.4 SUBSTITUTIONS

- A. Notify Owner and Landscape Architect when Contractor wishes to substitute materials, equipment or products that may affect BFL certification.
- B. Contractor shall provide sufficient technical data and supporting information to verify that the proposed substitution is in compliance with the applicable Bay-Friendly credit(s) and practice(s), as described in the BFL Rating Manual for Civic and Commercial Landscapes
- C. Refer to the general provisions of the contract regarding substitution requirements and procedures.

#### PART 2 - PRODUCTS

- 2.1 Refer to the plans and specs.

#### PART 3 - EXECUTION- not used

END OF SECTION 013591

[Attach BFL Scorecard for Commercial and Civic Landscapes for this project]

