



---

# MATHNEY TRACT CLIMATE ADAPTATION PLAN

---

2020



[DATE]

COUNTY OF TULARE  
5961 S. Mooney Boulevard  
Visalia, CA 93277-9394  
(559) 624-7000

---

# Matheny Tract Climate Adaptation Plan

---

# Matheny Tract Climate Adaptation Plan

---

## TABLE OF CONTENTS

### Chapter 1 Executive Summary

Background .....	1-1
Introduction .....	1-2
Community Setting .....	1-2
Assessment of Existing Transportation, Storm Water, Energy, Pedestrian and Urban Greening	
Infrastructure .....	1-7
Water Supply .....	1-7
Sewer System .....	1-8
Storm Water Drainage .....	1-9
Road Conditions .....	1-12
Street Lights .....	1-13
Sidewalks .....	1-15
State Route 99 .....	1-20
AMTRAK .....	1-20
Mefford Field Airport .....	1-20
Aircraft Noise .....	1-20
Union Pacific Railroad .....	1-20
Energy: Natural Gas/Electricity .....	1-21
Solid Waste .....	1-21
Internet Access .....	1-21
Public Services .....	1-21
Sheriff .....	1-21
Fire .....	1-21
Parks .....	1-22
Schools .....	1-22
Library .....	1-24
Circulation and Traffic .....	1-24
Traffic .....	1-24
Existing Circulation .....	1-24
Patterns of Blocks and Streets .....	1-24
Urban Greening .....	1-27
Complete Streets .....	1-27

### Chapter 2 Study Methodology

Scope and Scale .....	2-1
Vulnerability and Consequences and Risk Assessment .....	2-1
Vulnerability and Consequences and Risk Assessment Findings .....	2-1
Develop Climate Adaptation Plan Framework .....	2-1

---

# Matheny Tract Climate Adaptation Plan

---

Implementation and Monitoring and Funding Opportunities .....	2-1
Climate Change Adaptation .....	2-1
Water Supply .....	2-2
Flooding .....	2-2
Agriculture and Forest .....	2-3

## Chapter 3 Setting

Statewide Climate Change Projections .....	3-1
Statewide Greenhouse Gas Emissions Strategy .....	3-1
Executive Order S-3-05 .....	3-1
Assembly Bill (AB) 32 .....	3-1
2008 Scoping Plan .....	3-2
Senate Bill (SB) 32 .....	3-3
2017 Scoping Plan .....	3-4
Impacts to California .....	3-5
Water Supply .....	3-5
Surface Water Quality .....	3-6
Amount of Precipitation .....	3-6
Changes in Runoff and Flooding .....	3-7
Wildland Fire Hazards .....	3-7
Negative Impacts to Agriculture and Forestry .....	3-8
Sea Level Rise .....	3-9
Negative Impacts to Public Health .....	3-9
Negative Impacts to Wildlife .....	3-9
Tulare County Climate Change Projections .....	3-10
Climate Change Implications for Tulare County include the following Considerations: .....	3-10
Increased Flooding .....	3-10
Water Supplies .....	3-10
Agriculture .....	3-10
Public Health .....	3-10
Community Assets .....	3-11
Project Overview .....	3-11
Summary of Initial Event .....	3-11
Findings from Follow-up Discussion .....	3-12
Measures needed to be Taken to Adapt to Climate Change .....	3-12
The Future Nature of the Community Requires Further Discussion .....	3-13
The Role of Collaborating Organizations Must be Expanded .....	3-13
Overall Takeaways and Recommendations from this Process .....	3-13
Relevant Local Planning Initiatives .....	3-14
Climate Action Plan .....	3-14
2030 General Plan Update Principles .....	3-15

---

# Matheny Tract Climate Adaptation Plan

---

Local Hazard Mitigation Plan .....	3-16
Tulare County’s General Plan Safety Element .....	3-17
Assembly Bill 2140 (AB 2140) .....	3-17
Relevant State and Regional Planning Initiatives .....	3-18
Tulare County’s Blueprint Vision .....	3-18
Community Survey and Results .....	3-18

## Chapter 4 Climate Change Exposures

CalEnviroScreen Introduction and Methodology .....	4-1
Pollution Burden .....	4-3
Ozone .....	4-4
PM 2.5 .....	4-5
Diesel PM .....	4-6
Drinking Water .....	4-7
Pesticides .....	4-8
Toxic Releases .....	4-9
Traffic Density .....	4-10
Cleanup Sites .....	4-11
Groundwater .....	4-12
Hazardous Waste .....	4-13
Solid Waste .....	4-14
Population Characteristics .....	4-15
Asthma .....	4-16
Cardiovascular Disease .....	4-17
Low Birth Weight .....	4-18
Education .....	4-19
Housing Burden .....	4-20
Linguistic Isolation .....	4-21
Poverty .....	4-22
Unemployment .....	4-23
Health and Data Analysis of Survey Data .....	4-24

## Chapter 5 Asset Profiles

Emergency Response Services and Public Facilities .....	5-1
Public Health .....	5-1
Housing and Schools .....	5-2
Water Supply .....	5-2
Wastewater Management .....	5-2
Stormwater Management .....	5-2

---

# Matheny Tract Climate Adaptation Plan

---

Transportation Infrastructure.....	5-3
Flood Management .....	5-4
Energy Infrastructure.....	5-4
Solid Waste/Hazardous Materials Management .....	5-5
Parks, Natural Areas, EcoSystems .....	5-5
Commercial and Industrial Assets.....	5-5

## Chapter 6 Climate Change Vulnerability, Risk Assessment, and Adaptation Framework and Strategies

Phases of the Adaptation Planning Process.....	6-1
Phase 1, Explore, Define, and Initiate.....	6-1
Phase 2, Assess Vulnerability .....	6-1
Phase 3, Define Adaptation Framework and Strategies .....	6-1
Phase 4, Implement, Monitor, Evaluate, and Adjust: .....	6-1
Vulnerability .....	6-1
Summary of Methodology .....	6-1
Maximum and Minimum Temperatures .....	6-3
Number of Extreme Heat Days.....	6-4
Timing of Extreme Heat Days .....	6-5
Frequency of Heat Waves .....	6-5
Maximum Duration of Heat Waves .....	6-6
Number of Warm Nights .....	6-6
Frequency of Warm Night Heat Waves.....	6-6
Maximum Duration of Warm Night Heat Waves .....	6-7
Extreme Precipitation Events .....	6-8
Wildfire.....	6-8
Snow Water Equivalence .....	6-9
Consequences.....	6-10
Risk Assessment .....	6-10
Potential Economic Impacts .....	6-10
Potential Public Health Impacts.....	6-11
Adaptation Framework and Strategies .....	6-11

## Chapter 7 Policy Plan

Identification of Policies .....	7-1
General Plan Policies Having Greenhouse Gas Emission Reductions.....	7-2
Land Use and Transportation Strategies .....	7-2

---

# Matheny Tract Climate Adaptation Plan

---

Transit and Pedestrian Oriented and Traditional Neighborhood Design Summary (AQ-3.1–PFS-8.3)	7-5
Pedestrian and Bicycle Infrastructure Summary	7-7
Transit Infrastructure and Support Policies and Measures Summary	7-8
Transportation Management Programs Summary	7-10
Building Energy Efficiency	7-11
Building Energy Efficiency Measures Summary	7-11
Water Conservation Energy Savings	7-12
Water Conservation Measures Summary	7-12
Solid Waste Reduction and Recycling	7-13
Solid Waste Reduction and Recycling Measures Summary	7-13
Agricultural Programs and Initiatives	7-13
Agricultural Measures Summary	7-13

## Chapter 8 Implementation, Monitoring and Funding Opportunities

Identification Projects and or Programs	8-1
Wastewater Treatment/Gravity Collection System Plan	8-1
Stormwater Drainage System Plan	8-5
Transportation Infrastructure Plan	8-7
Sidewalks	8-7
Cost for New Street Lights	8-11
Housing Energy Conservation and Weatherization Programs	8-13
Green Technology	8-14
Urban Greening Program	8-15
Urban Greening Guidelines	8-15
Benefits	8-15
Current and Historical Funding	8-16
Identification of Funding Sources for Plan Implementation	8-17
Long Term Implementation Considerations	8-18
Programmatic	8-18

## Chapter 9 Sources

---

# Matheny Tract Climate Adaptation Plan

---

## FIGURES

Figure 1-1 Vicinity Map .....	1-4
Figure 1-2 Matheny Tract Aerial.....	1-5
Figure 1-3 Tulare Irrigation District Map .....	1-11
Figure 1-4 Matheny Tract Transportation and Infrastructure Plan .....	1-12
Figure 1-5 Existing Street Lights, Utility Poles and Fire Hydrants (Northwest Area) .....	1-13
Figure 1-6 Existing Street Lights, Utility Pole s and Fire Hydrants (Northeast Area) .....	1-14
Figure 1-7 Existing Street Lights, Utility Poles and Fire Hydrants of Matheny Tract (Southwest Area) .	1-15
Figure 1-8 Existing Curbs and Sidewalks of Matheny Tract (Northwest Area) .....	1-16
Figure 1-9 Existing Curbs and Sidewalks of Matheny Tract (Northeast Area).....	1-17
Figure 1-10 Existing Curbs and Sidewalks of Matheny Tract (Southwest Area).....	1-18
Figure 1-11 TCaT Route 20 Southbound.....	1-19
Figure 1-12 Emergency Services - City of Tulare.....	1-23
Figure 1-13 Traffic Modeling 2019 Matheny Tract.....	1-25
Figure 1-14 Traffic Model 2035 Matheny Tract.....	1-26
Figure 4-1 CalEnviroScreen 3.0 Results (June 2018 Update).....	4-2
Figure 4-2 Pollution Burden .....	4-3
Figure 4-3 Ozone.....	4-4
Figure 4-4 PM 2.5 .....	4-5
Figure 4-5 Diesel PM .....	4-6
Figure 4-6 Drinking Water.....	4-7
Figure 4-7 Pesticides .....	4-8
Figure 4-8 Toxic Releases.....	4-9
Figure 4-9 Traffic Density .....	4-10
Figure 4-10 Clean-Up Sites .....	4-11
Figure 4-11 Groundwater .....	4-12
Figure 4-12 Hazardous Waste.....	4-13
Figure 4-13 Solid Waste .....	4-14
Figure 4-14 Population Characteristics .....	4-15
Figure 4-15 Asthma .....	4-16
Figure 4-16 Cardiovascular Disease .....	4-17
Figure 4-17 Low Birth Weight.....	4-18
Figure 4-18 Education .....	4-19
Figure 4-19 Housing Burden .....	4-20
Figure 4-20 Linguistic Isolation.....	4-21
Figure 4-21 Poverty .....	4-22
Figure 4-22 Unemployment.....	4-26
Figure 8-1 Sewer System Network Preliminary Layout.....	8-3
Figure 8-2 North Matheny Storm Water Survey Map .....	8-5
Figure 8-3 Prioritized Locations for Roadway (Curb, Gutter & Sidewalk) .....	8-9
Figure 8-4 Matheny Tract Sidewalks and Safe Routes to Bus Stop Improvement Project.....	8-11
Figure 8-5 Matheny Tract Sidewalks and Safe Routes to Bus Stop Improvement Project.....	8-12
Figure 8-6 Proposed Bike Facilities .....	8-13

---



# Matheny Tract Climate Adaptation Plan

---

## TABLES

Table 6-1 Climate Change Projections for Matheny Tract.....	6-2
Table 6-2 Maximum Temperatures .....	6-3
Table 6-3 Maximum Temperatures .....	6-3
Table 6-4 Minimum Temperature .....	6-4
Table 6-5 Minimum Temperature .....	6-4
Table 6-6 Heat Days.....	6-4
Table 6-7 Heat Days.....	6-4
Table 6-8 Timing of Heat Days .....	6-5
Table 6-9 Timing of Heat Days .....	6-5
Table 6-10 Frequency of Heat Waves.....	6-5
Table 6-11 Frequency of Heat Waves.....	6-5
Table 6-12 Duration of Heat Waves .....	6-6
Table 6-13 Duration of Heat Waves .....	6-6
Table 6-14 Number of Warm Nights.....	6-6
Table 6-15 Number of Warm Nights.....	6-6
Table 6-16 Frequency Heat Waves .....	6-7
Table 6-17 Frequency Heat Waves .....	6-7
Table 6-18 Duration Heat Waves.....	6-7
Table 6-19 Duration Heat Waves.....	6-7
Table 6-20 Precipitation .....	6-8
Table 6-21 Precipitation .....	6-8
Table 6-22 Wildfire .....	6-8
Table 6-23 Wildfire .....	6-8
Table 6-24 Snow Water .....	6-9
Table 6-25 Snow Water .....	6-9
Table 6-26 Potential Climate Change Impacts for the Matheny Tract Population .....	6-10
Table 7-1 Sustainability and Greenhouse Gas Emissions.....	7-1
Table 8-1 Collection System Design Criteria.....	8-1
Table 8-2 Project Cost Estimate.....	8-2
Table 8-3 Engineer’s Opinion of Probable Construction Cost.....	8-4
Table 8-4.....	8-6
Table 8-5.....	8-7
Table 8-6 Transportation and Infrastructure Funding Matrix.....	8-17
Table 8-7 Agriculture Sector.....	8-18
Table 8-8 Biodiversity and Habitat (BH) Sector.....	8-20
Table 8-9 Emergency Management Sector .....	8-21
Table 8-10 Energy (EN) Sector .....	8-22
Table 8-11 Forest (FOR) Sector.....	8-24
Table 8-12 Land Use and Community Development (LUCD) Sector.....	8-25
Table 8-13 Parks and Recreation.....	8-26
Table 8-14 Public Health (PH) Sector.....	8-27
Table 8-15 Transportation (TRANS) Sector.....	8-29

---

# Matheny Tract Climate Adaptation Plan

---

Table 8-16 Water (W) Sector .....	8-29
-----------------------------------	------

# Matheny Tract Climate Adaptation Plan

---

## Chapter 1 Executive Summary

### Background

Passed by California voters in 2006, Proposition 84 appropriated funding for a variety of activities designed to protect the State's natural resources, including the Sustainable Communities Planning Grants and Incentives Program (SCPGI). The Strategic Growth Council (SGC) approved three sets of awards for SCPGI, including \$16 million at its June 3, 2014 meeting. In July 2018, the SGC approved the use of reimbursed Proposition 84 funds to support Transformative Climate Communities (TCC) Round II Planning Grants.

Updates to the TCC Round II Program Guidelines were approved by the SGC on July 31, 2018. The TCC Program released a Notice of Funding Availability (NOFA) on August 15, 2018, that called for planning grant applications to be submitted by October 30, 2018. The NOFA indicated that \$800,000 would be available for up to four (4) communities to receive planning grant awards. After the final deliberation, the scores from each of the reviewers were averaged to determine the final score for the application. Staff recommended that the top four scoring applications be approved by the Council for funding. The recommended applicants to receive funding for TCC Round II are South Los Angeles, Tulare County, McFarland, and Bakersfield.

The purpose of the TCC Planning Grant program is to assist communities in developing compelling and feasible proposals for a TCC Implementation Grant. In addition to using the funds to plan for the transformative components of the Implementation Grant application, communities are required to explain how activities are consistent with the State's Planning Priorities, identified in Section 65041.1 of the Government Code. Planning priorities focus on promoting infill development and equity by rehabilitating, maintaining and improving existing infrastructure; protecting, preserving and enhancing environmental and agricultural lands and natural and recreational resources, and encouraging location and resource efficient new development.

Tulare County proposes to develop a community-level climate adaptation plan for the rural community in the Matheny Tract. The plan will identify priorities and recommend community-specific solutions to climate adaptation, in collaboration with county agencies and community-based organizations. The following discussion provides a summary of the proposed TCC Plan for the Matheny Tract:

The County of Tulare County was awarded \$200,000 in funding to develop a community-level climate adaptation plan for the rural community of Matheny Tract, an area identified as 85-90% disadvantaged per CalEnviroScreen 3.0. Matheny Tract is an unincorporated community of about 188 acres with approximately 300 homes near the southwest border of the City of Tulare. The plan is intended to improve outcomes for the Project Area's most vulnerable residents by providing residents with the opportunity to identify priorities and recommend community-specific solutions to climate adaptation, and will be developed in collaboration with county agencies, community-based organizations, and community groups. Through a series of workshops and grassroots outreach, this plan will include multiple, coordinated greenhouse gas emission reduction projects that provide local economic, environmental, and health benefits; and a list of policies and funding sources to support climate adaptation county-wide will also be developed. The proposal will address the Planning Area's specific infrastructure, transportation, and adjacent land use challenges.

# Matheny Tract Climate Adaptation Plan

---

## Introduction

The Matheny Climate Adaptation Plan (Adaptation Plan) examines a broad spectrum of the community's climate change vulnerabilities and prioritizes potential adaptation responses based on the greatest risks, needs, and synergies with related planning efforts. The Adaptation Plan is meant to guide adaptation planning by identifying important infrastructure and community assets that are vulnerable to climate change impacts, assessing the risk that climate change poses to those assets, and recommending response actions that the County should integrate into its planning efforts to mitigate that risk. The overall goal is to establish a stronger framework for gathering data, making decisions, and prioritizing actions that will improve the community's resilience to climate change over time.

## Community Setting

Matheny Tract is located adjacent to the city of Tulare (**see Figure 1-1**) generally located south of Avenue 216 (Paige Avenue), east of Road 96 (Pratt Street) and west of I Drive and State Route (SR) 99.

Matheny Tract is located just west of industrial land uses and a Union Pacific Railroad (formerly Southern Pacific Transportation Company) line running through Tulare County. Physically, the Community of Matheny Tract (**see Figure 1-2**) is physically divided into a north and south area by agricultural land uses that separate approximately 256 households in North Matheny from 80 households in South Matheny Tract. The Matheny Tract Community is predominantly surrounded by agricultural land.

Along the eastern boundary, running parallel to South I Drive is an irrigation ditch, above ground power lines and the Union Pacific Railroad (formerly Southern Pacific Transportation Company) tracks. Also visible to the east is the city of Tulare corporation yard. Above ground power lines run parallel to Pratt Road that acts as the western boundary. The City of Tulare's Wastewater Treatment and Reclamation facility is located about ¾ miles northwest of Matheny Tract. In addition, an industrial area is located immediately northeast of the Community.

There is a canal within Tulare Irrigation District (TID) service area that bisects North and South Matheny Tract. The Oakland Colony Ditch runs in a north south direction through North Matheny Tract along the Canal Street corridor and extends in an east-west direction between North and South Matheny Tract. There are two (2) east-west crossings of the Oakland Colony Ditch - one along Wade Avenue and the other along Addie Avenue - in North Matheny Tract.

Matheny Tract is an aging unincorporated Tulare County subdivision. As indicated above, there are two parts to Matheny Tract, the southern and smaller portion laid out as Tulare County Tract 53 in 1946 and the northern portion laid out as Tract 104 in 1947 by E.S. Matheny and Grace L. Matheny with a population of approximately 1,043 and 280 households. Matheny Tract is also designated as a disadvantaged community, which is, a census designated place that has household median incomes that are less than 80% of the statewide household median income.

# Matheny Tract Climate Adaptation Plan

---

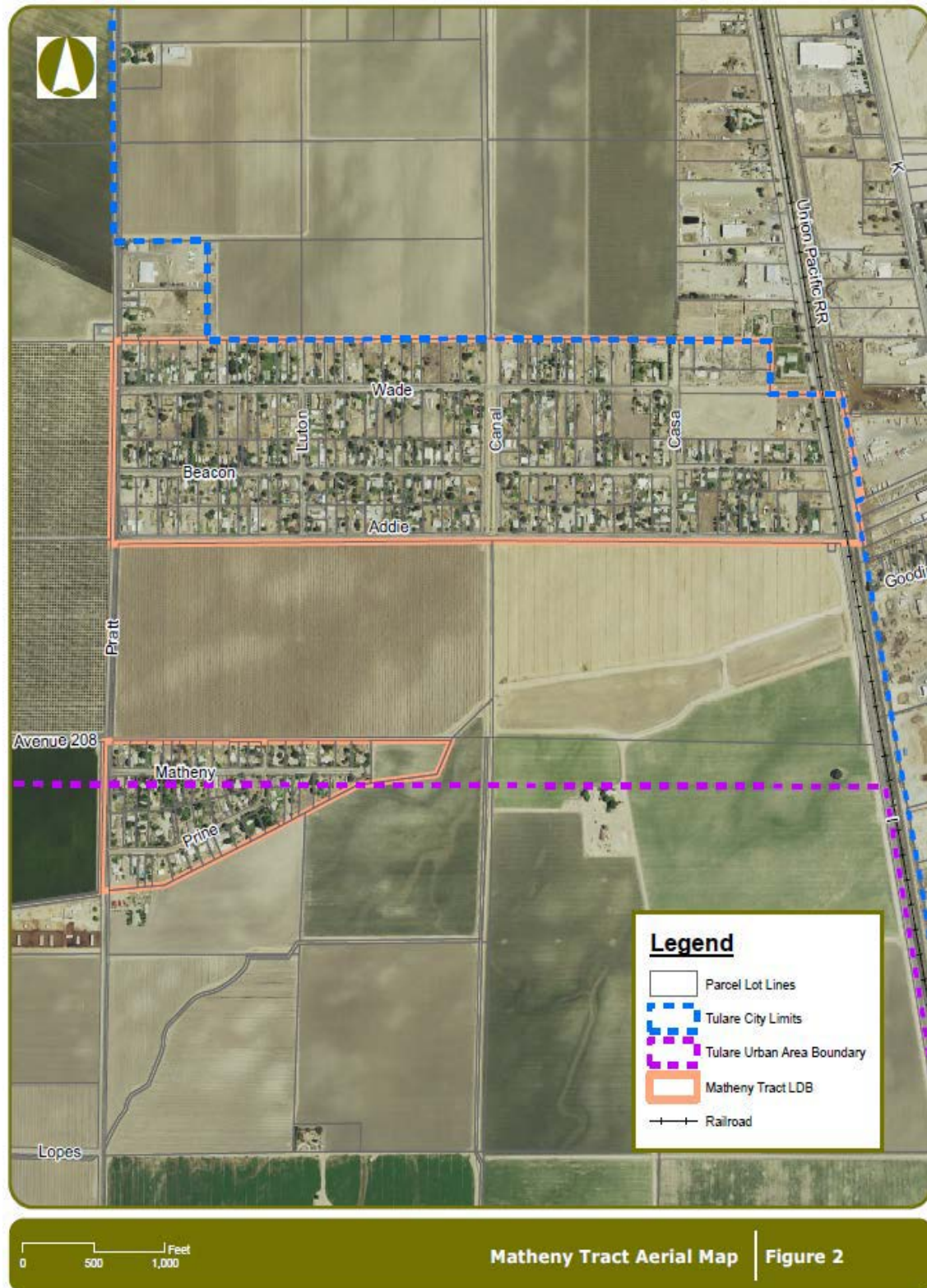
The Tulare County community of Matheny Tract is comprised of two groupings of dwellings located south of the City of Tulare just east of Pratt Road and adjacent to the city of Tulare. Matheny Tract is in Section 22, 23, & 27, Township 20 South, Range 24 East, MDB&M, and can be found within the Page, United States Geological Survey 7.5 Minute topographic quadrangle. Matheny Tract is located at an elevation of 269 feet above sea level, National Geodetic Vertical Datum. The coordinates of Matheny Tract are Latitude: 36.172179 and Longitude: -119.351606.





# Matheny Tract Climate Adaptation Plan

Figure 1-2 Matheny Tract Aerial



# Matheny Tract Climate Adaptation Plan

---

The Matheny Tract Legacy Development Boundary (LDB) area consists of 187.8 acres (**see Figure 1-2**). The Land Uses within the LDB are described as follows. Agricultural activities, including orchards and pasture, currently occupy 1.54 percent of the 187.8 acres. Urban development, including urbanized uses such as residential and commercial development occupy 80.77 percent of the 187.8 acres. The remaining 17.5 percent are lands dedicated for rights-of-way.

City of Tulare's Sphere of Influence (SOI) is located adjacent to the Tulare city limits and outside the city's 2035 Urban Development Boundary. Many residents have lived in Matheny Tract for many years; a 2012 survey found that 51% had lived there longer than ten years.

Thirty-four percent had lived in Matheny Tract for more than 20-years. Most children attend Palo Verde School, which is not part of the Tulare City School District, and many of their parents attended Palo Verde as well.

The American Community Survey (ACS) estimates that Matheny Tract's total population in 2014 was 1,098 residents with 305 households. The age breakdown is as follows: 38.8% of the population in Matheny Tract is between the ages 0 to 19, 36.3% are between 20 to 44 years of age, 18.1% are between 45 to 59 years of age, and 11.9% are over 60-years of age. The male and female population makes up 49.2% and 50.8%, respectively. In Matheny Tract, residents of Hispanic or Latino background make up 63.4% of the population. Additionally, of the population that identified as Not Hispanic, 33.8% identified themselves as White and 2% identified themselves as Black or African American.

According to the California Department of Finance, the 2011-2015 American Community Survey indicated that the unemployment rate for Matheny Tract was about 9.1% while the rate for Tulare County was 7.2%. The unemployment rate for the State of California was 6.2%. Keeping in mind that the 9.1% includes only the employable labor force (that is, not every person of the population) results in about 67 unemployed persons of Matheny Tract's person labor force of 390.

In 2015, Matheny Tract's median household income was \$30,565 whereas the State of California's median household income was \$61,818. Therefore, based upon Matheny Tract's median household income of \$30,565 (which is about 49% of the State of California's median household income), it is considered a severely disadvantaged community.

The condition of housing is typically categorized as sound, deteriorated, or dilapidated. A sound housing unit (house) is one that is in good-to-excellent condition requiring no structural or other improvements. Deteriorated housing means a housing unit may need some level of maintenance/repair to improve the condition of the housing. Deterioration is classified as minor, moderate, or substantial. Dilapidated means a unit is not considered suitable for living. There may be structural, electrical, plumbing or other conditions that could endanger the well-being and safety of persons living in dilapidated housing. Housing condition is an indicator of a person's ability to afford maintenance/repair of the house they live in. Without income to pay for maintenance/repair, it is likely that a house, as it ages, will continue to deteriorate over time.

According to the 2015 Tulare County Housing Element, a sampling of housing conditions in Matheny Tract indicated that approximately 14% of the housing units were sound. Approximately 55% of Matheny Tract's housing units were deteriorated and 32% were dilapidated.



# Matheny Tract Climate Adaptation Plan

---

## Assessment of Existing Transportation, Storm Water, Energy, Pedestrian and Urban Greening Infrastructure

Infrastructure is defined as the basic physical and organizational structures needed for the operation of a society or enterprise or the services and facilities. In regards to Matheny Tract, this TCC Plan is intended to address deficiencies and the need for improvements to the wastewater system improvements, (for example wastewater distribution piping), curbs, gutters, streets, sidewalks, etc.). The prioritized concerns of the Community identified in the 2017 Legacy Plan included:

1. Water Supply
2. Sewer System
3. Storm Water Drainage
4. Road Improvements
5. Street Lights
6. Sidewalks
7. Solid Waste
8. Community Safety
9. Community Park
10. Fresh food availability/Market

The prioritized concerns of the Community identified in the 2019 Fall Survey include:

1. Street lights
2. Bike lanes/ Street Improvements/Sidewalks
3. Transit Projects
4. Home Improvements (Energy Efficiency)
5. Storm Water Drainage
6. Air/Water Quality
7. Housing Safe and Sanitary
8. Public Health
9. Infrastructure
10. Solar to reduce energy costs

### Water Supply

In 2016, the State Water Board exercised its power and directed the city of Tulare to accept Matheny Tract as water customers. Water supply for Matheny Tract is provided by City of Tulare's Water Division. As per the city of Tulare's MSR update, August 2013 The Water Division is responsible for providing water that is of safe and sanitary quality for the citizens of Tulare and an adequate water supply for fire protection. Tulare's water supply source consists of a 30 domestic wells that are scattered throughout the city, extracting water from the city's underground aquifer. Newer wells drilled by the city over the past thirty-five years are gravel packed and have been drilled to approximately 700 feet. The older wells, and wells purchased by the city are generally around 350 feet deep. The city has one elevated water storage tank with a capacity of 150,000 gallons, and several hydro-pneumatic pressure tanks that are used for storage.

# Matheny Tract Climate Adaptation Plan

---

The Water Division operates under the direction of the Board of Public Utilities. The quality of water is maintained through monitoring and proper maintenance of the system. State regulations require the city test the entire system, from wells to service connections, and that data is then reported to the State.

## Sewer System

There is no community wide sewer system in Matheny Tract. The community depends on individual on-site septic tank systems for wastewater disposal. In wet years, the combination of a perched water table and tight soils creates problems for effective leaching of septic tank effluent. SGC survey results indicate that the Matheny Tract residents are in favor of creating a community wide sewer system. No public sewer facilities are available in Matheny Tract. Each landowner relies on septic systems for wastewater.

The wastewater flow from Matheny Tract is estimated to be approximately 87,500 gpd on average; however, a community system should be designed to handle 130,000 gpd of flow to account for high flows in the summer months as reflected in the water use records.

Alternatives to address the failing on-site wastewater treatment systems included the following:

1. On-Site Systems with a Septic Maintenance District: provides replacement of the existing on-site septic systems with systems that denitrify wastewater before discharging it, and would provide for continuation of proper maintenance of the systems by creating a Septic Maintenance District.
2. Gravity Collection System, Consolidation with the City of Tulare: provides construction of a wastewater collection system throughout the community with a main connection to the City of Tulare wastewater collection system and ultimate delivery to the City of Tulare Wastewater Treatment Plant (WWTP). This alternative assumes that the City of Tulare will ultimately own and operate the Matheny Tract collection system and main connection to the City of Tulare.
3. Gravity Collection System with Community Wastewater Treatment Facility: provides for construction of a wastewater collection system similar to the one shown in Alternative 2; however, it would also provide for construction of a small independent Wastewater Treatment Facility (WWTF) within or near the Matheny Tract. This alternative would also require creation of an agency to manage and operate the community WWTP and collection system.
4. No Project: maintains the community in its current condition with no improvement to the existing septic systems. All operations and maintenance responsibility would remain with the individual property owners.

In summary, based on an engineering and cost effectiveness analysis, the selected alternative for the community of Matheny Tract would be Alternative 2 to construct a gravity collection system within the community and a lift station and force main to the City of Tulare sewer trunk line. This recommendation is contingent upon the City of Tulare agreeing to consolidation and accepting the sanitary sewer flows.

The City of Tulare and the County of Tulare are in the process of identifying/discussing specifics to allow connection to the City of Tulare's Wastewater Treatment System. Preliminary County and City discussion regarding alternative routes appear to be in general agreement pending future evaluation studies including CEQA. Discussion regarding 42 inch vs. 27 inch pipes were evaluated. The County

# Matheny Tract Climate Adaptation Plan

---

is the lead agency with the City to providing “Will Serve” letter. The estimated rate is \$53.00 a month for sewer service. The two-year project time frame is estimated to start in 2021. Estimated sewer water pipe separation is 10 feet.

The Selected Alternative 2 would require the County of Tulare to initiate execution of a Memorandum of Understanding or similar agreement/will-serve mechanism with the City of Tulare, to coordinate with the City to implement consolidation with the city sewer system by providing sanitary sewer service to the community of Matheny Tract.

## Storm Water Drainage

A storm drainage system is designed to drain excess rain and groundwater from roads, sidewalks, etc. to some point where it is discharged into a channel, ponding basin, or piped system. The system itself typically consists of pipes connecting inlets and is facilitated by curbs and gutters, manholes, and sumps. The operation of the system consists of runoff being collected in the inlets and transported by pipes to a discharge location. Manholes provide access to storm drain pipes for inspection and cleanout. A sump is a shallow, artificial pond designed to infiltrate storm water through permeable soils into the groundwater aquifer. It does not typically discharge to a detention basin.

Storm drainage systems should be designed so they have adequate capacity to accommodate runoff that enters the system for the design frequency and should also be designed considering future development.

An inadequate roadway drainage system could result in the following:

- Water overflowing the curb and entering adjacent property leading to damage.
- Accelerated roadway deterioration and public safety concerns may occur due to excessive water accumulation on roadways.
- Over saturation of the roadway structural section due to immersion will lead to pavement deterioration.

Matheny Tract currently has a limited storm water system, which is served by Tulare Irrigation District (TID). The purpose of TID is to obtain and deliver surface water supplies for the purpose of agricultural irrigation in the District and for groundwater recharge efforts within the basin underlying the District. The District must also operate and maintain 330 miles of canal and approximately 30-miles of pipeline along with 1,110 acres of groundwater recharge/regulation basins.

In Matheny Tract (northern portion), the Oakland Colony Ditch bisects the Community running in a north/south direction between Ruth Street and Canal Street. **Figure 1-3** identifies Matheny Tract, the Oakland Colony ditch, a groundwater recharge basin, TID service area and the City of Tulare limits.

According to TID, the Oakland Colony Ditch is used primarily for irrigation and flood control purposes. An existing pump station is located the northeast corner of Addie Avenue/Canal Street that pumps surface water into the ditch.

Excessive runoff from the Oakland Colony Ditch is directed to a groundwater recharge basin located south of North Matheny Tract. An additional basin is located to the east of the current basin for large flood events.

## Matheny Tract Climate Adaptation Plan

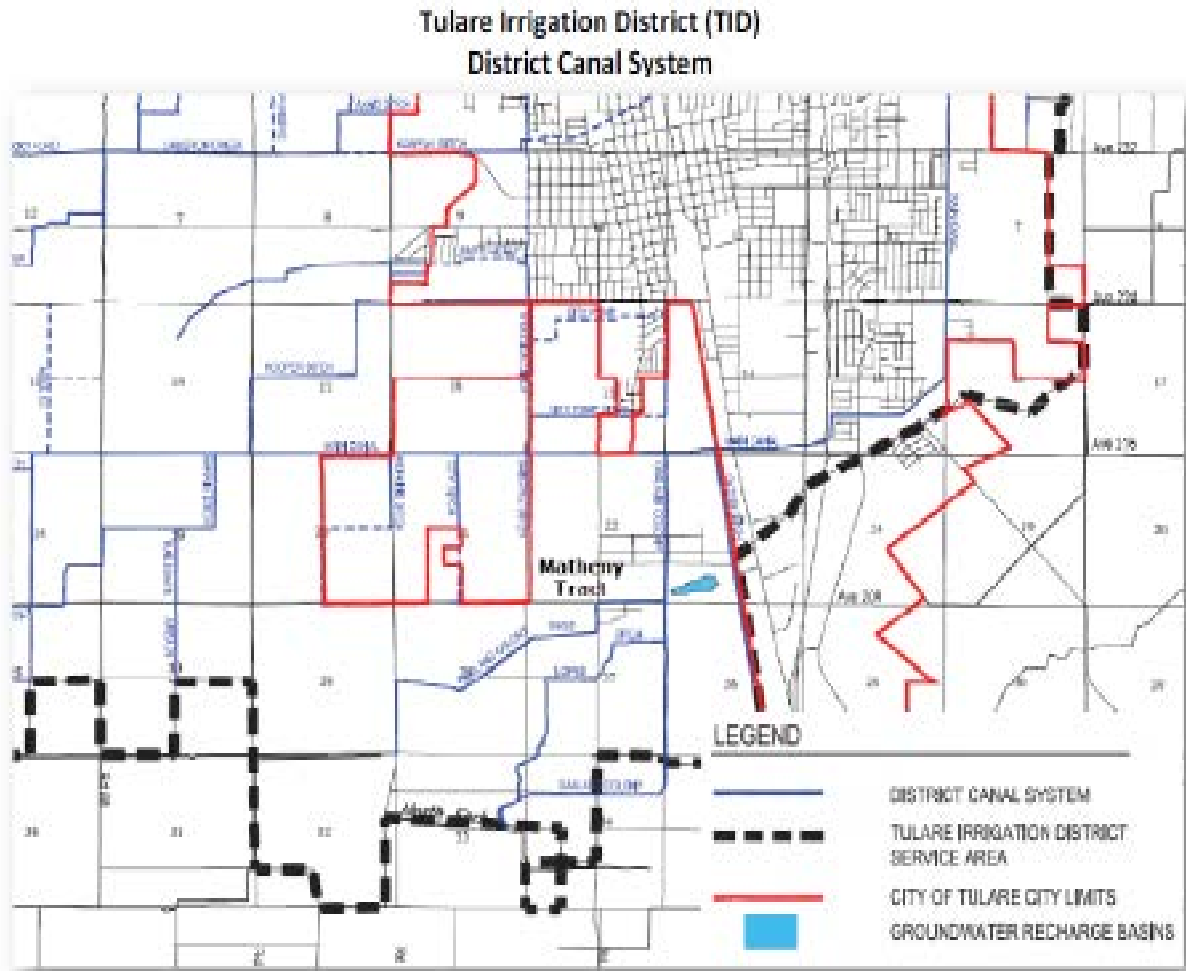
---

Tulare County has completed initial base mapping for Matheny Tract. Files obtained from RMA include surveying data with benchmark locations and top of curb or pavement elevations in north Matheny Tract. In addition, existing concrete pipes and directional flow arrows are mapped as shown in **Figure 1-3**.

It was also indicated by TID that trash accumulation in and around Oakland Colony Ditch in the Matheny Tract Community is a serious concern. Any future efforts to underground the ditch with a grate to exclude trash and other debris would be a maintenance issue to prevent obstruction of water flow. Additional costs would have to be offset with a maintenance agreement between the property owners and the beneficiaries of such improvements to safety and aesthetics, if desired.

# Matheny Tract Climate Adaptation Plan

Figure 1-3 Tulare Irrigation District Map



# Matheny Tract Climate Adaptation Plan

## Road Conditions

Tulare County also has road classifications that are used to determine how the road is constructed, i.e., typical cross section (median, travel lanes, curb, gutter, sidewalk, shoulder, etc.), pavement structure, design speeds, grades, super elevation, sight distance, horizontal alignments, intersections, etc. Tulare County has four (4) road classifications as summarized below:

**Figure 1-4 Matheny Tract Transportation and Infrastructure Plan**



Based upon field reviews, the roads in Matheny Tract are generally in poor to fair condition, lack continuous curbs, gutters and sidewalks, are poorly lit at night, lack crosswalks, are susceptible to flooding i.e., lack drainage and provide limited opportunity for walking and bicycling beyond the vehicle travel surface.

There are several roadways in Matheny Tract that are in need of repair. Over time, roadway pavement can become damaged or begin to fail due to fatigue, aging, or surface abrasion. The binding agent within road pavement becomes rigid and less flexible as time passes and the surface of the pavement may start losing aggregates. If timely maintenance does not occur, potholes will start to occur within the road.



# Matheny Tract Climate Adaptation Plan

## Street Lights

Street lights are typically located at the edge of roadways on top of utility poles. They are illuminated at night and improve the visibility and safety of the roadway and sidewalk by increasing motorist visibility and improving nighttime pedestrian security. They can also reduce nighttime pedestrian crashes by increasing the awareness of drivers relative to pedestrians.

The County typically provides street lighting at major road intersections in the communities but does not provide mid-block lighting as is typical within cities. Matheny Tract has street lighting at 10 locations. Overhead utility poles are prevalent in Matheny Tract. These utility poles provide electricity and telephone service to residences and businesses in Matheny Tract and are located within the County rights-of-way. **Figures 1-5 through 1-10** display Existing Utilities Poles, Fire Hydrants and Street Lights in three sub-areas in Matheny Tract (Northwest Area, Northeast Area and Southwest Area).

**Figure 1-5 Existing Street Lights, Utility Poles and Fire Hydrants (Northwest Area)**



# Matheny Tract Climate Adaptation Plan

Figure 1-6 Existing Street Lights, Utility Pole s and Fire Hydrants (Northeast Area)





# Matheny Tract Climate Adaptation Plan

**Figure 1-7 Existing Street Lights, Utility Poles and Fire Hydrants of Matheny Tract (Southwest Area)**



## Sidewalks

Sidewalks are typically separated from a roadway by a curb and accommodate pedestrian travel. They improve mobility for those with disabilities and are also an important part of walking routes to schools. They provide the space for pedestrians to travel within the public rights-of-way while being separated from vehicles and bicycles.

The 2010 California Building Code identifies a clear width minimum of 48 inches for sidewalks. This clear width minimum is the walkway width that is completely free of obstacles and not necessarily the sidewalk width. However, the 48-inch minimum does not provide sufficient passing space or space for two-way travel. Therefore, the guidelines state that for sidewalks less than five (5) feet in clear width, passing lanes (wide enough for wheelchairs) shall be provided at 200-foot intervals. However, the clear width may be reduced to three (3) feet if the enforcing agency determines that compliance with the four (4) foot clear sidewalk width would create an unreasonable hardship due to rights-of-way restrictions, natural barriers, or other existing conditions. The presence of curbs, gutters and sidewalks (CG&S) varies significantly between the communities in Tulare County. Some street segments within the Matheny Tract have curbs and fewer segments have sidewalks; however, several segments have no curbs, gutters or sidewalks. **Figures 1-8, 1-9, and 1-10** display existing curbs and

## Matheny Tract Climate Adaptation Plan

sidewalks in (3) three sub-areas in Matheny Tract (Northwest Area, Northeast Area and Southwest Area). As indicated in the Figures, many gaps and non-contiguous sections for both curbs and sidewalks exist.

Matheny Tract currently consists of existing sidewalks within the Community; however, many of these existing sidewalks are fragmented or are in relatively poor condition and need to be replaced entirely because they have deteriorated past the point where spot repairs are feasible or cost effective. The photograph to the left shows an existing street with driveways and a partial sidewalk. Many of the existing non-contiguous sidewalks are proposed to be replaced entirely in order to have uniformity and to be in compliance with current County Standards. The Americans with Disabilities Act (ADA) of 1990 included design requirements for persons with disabilities in the public rights-of-way. Curb ramps are an important part of making sidewalks and street crossings accessible to people with disabilities (especially those who use wheelchairs). An ADA compliant curb ramp is a short ramp cutting through or built-up to a curb. It consists of the ramp itself, which is sloped to allow wheelchair access from the street to the sidewalk and flared sides that bring the curb to the level of the street.

Curb ramps are most typically found at intersections, but can also be located near on-street parking, transit stations and stops, and midblock crossings. Title II regulations require curb ramps at existing and new facilities.

The County of Tulare completed a survey of ADA compliant ramps within the communities in August 2012. According to the survey, there are no ADA compliant curb ramps located within Matheny Tract.

**Figure 1-8 Existing Curbs and Sidewalks of Matheny Tract (Northwest Area)**



# Matheny Tract Climate Adaptation Plan

Figure 1-9 Existing Curbs and Sidewalks of Matheny Tract (Northeast Area)





# Matheny Tract Climate Adaptation Plan

**Figure 1-10 Existing Curbs and Sidewalks of Matheny Tract (Southwest Area)**



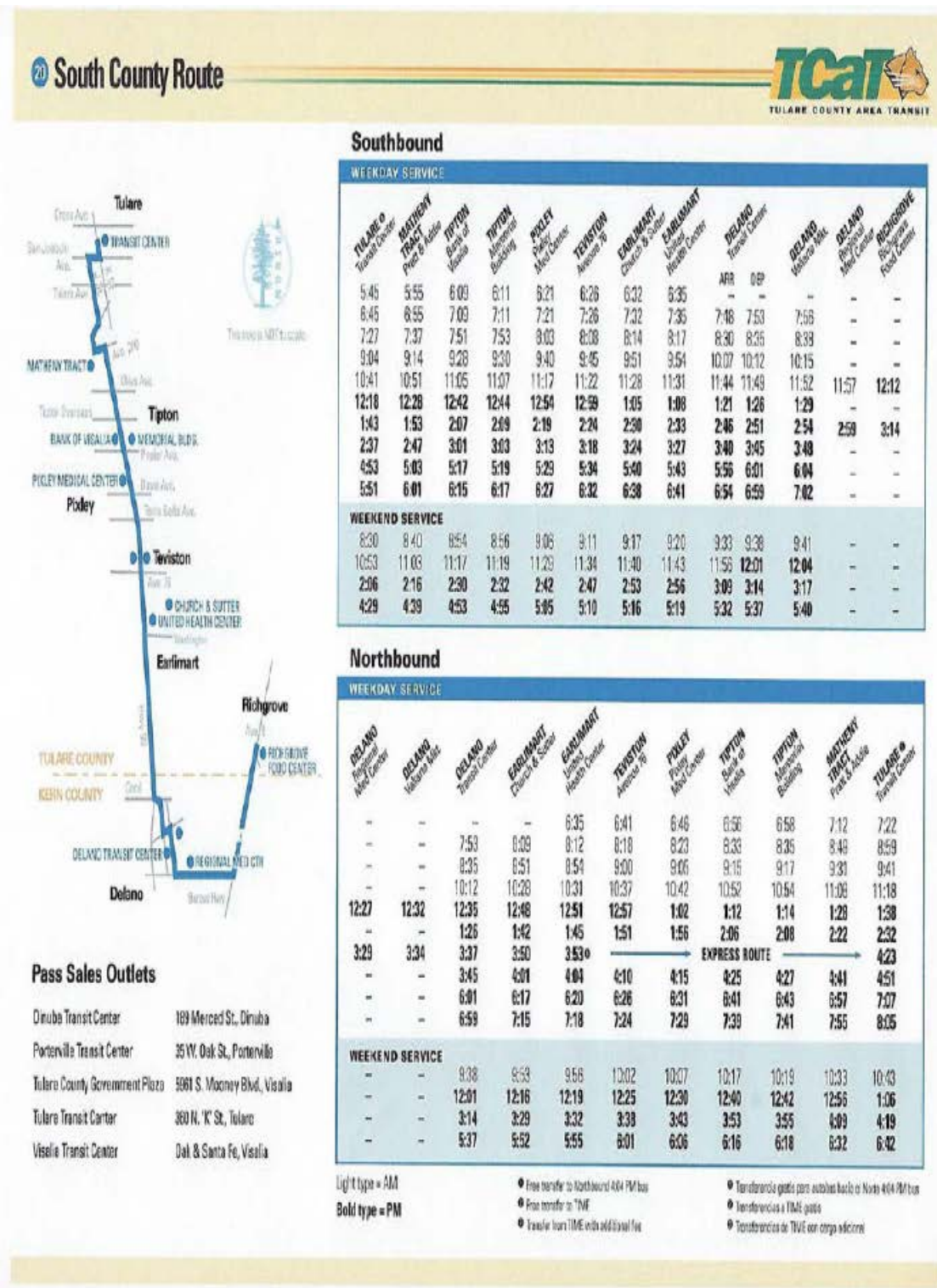
The Tulare County Transit Agency (TCaT) operates fixed-route services that link communities with each other and with Visalia and Tulare's urban transit systems. Matheny Tract is connected via TCaT Route 20 Southbound to Tulare (see **Figure 1-11**) and its transit center. TCaT also connects Delano (Kern County) in the south. Route 20 has ten northbound and southbound buses serving Matheny Tract on weekdays and four buses in each direction on Saturdays and Sundays. Stops are currently located at Pratt and Addie. In Tulare, transfers can be made to connect to Visalia (see TCaT website at: <http://www.tularecounty.ca.gov/rma/index.cfm/public-works/tulare-county-area-transit-tcat/>).

TCaT vehicles are wheelchair accessible and all full size buses include bike racks. As such, public transit is likely to remain a limited option due to fiscal constraints and the high cost of providing services to a community of less than one thousand residents. The low level of auto congestion in Matheny Tract, now and as forecasted into the future, suggests that driving will continue to be more convenient in rural communities than the use of transit for those with access to a private car.

Beginning in August 2017, TCaT Bus Stops for Southbound Route 20 at Matheny Tract have been realigned so that Passengers getting on or off will not be required to cross Pratt Street or Addie Avenue.

# Matheny Tract Climate Adaptation Plan

Figure 1-11 TCaT Route 20 Southbound



# Matheny Tract Climate Adaptation Plan

---

## State Route 99

State Route (SR) 99 is the major highway between cities within the Central Valley and is the primary route between the City of Fresno to the north and the City of Bakersfield to the south. Matheny Tract is located approximately two (2) miles west of SR 99.

## AMTRAK

The Hanford AMTRAK station, located approximately 25 miles to the northwest in Kings County, is the closest station to Matheny Tract providing passenger rail service. The San Joaquin Joint Powers Authority (SJJPA) is comprised of ten agencies (including TCAG) currently oversees the operation of seven (7) daily trains serving this station. Service is provided to points north including San Francisco and Sacramento and to points south including Bakersfield and the Los Angeles basin (via connecting Amtrak Thruway bus service).

## Mefford Field Airport

Currently, the airport is primarily used for general aviation operations, including local and itinerant services. Other Airport activities include airtaxi services and government operations.

## Aircraft Noise

The most common public complaint regarding airports is the noise generated by aircraft operations. Most individuals can tolerate low levels of aircraft noise, but as the overall noise level rises and begins to interfere with conversation, sleep, business and other activities, the frequency of complaints increases. Complaints can also result from a single event in which the perception is held that an aircraft is too low or too noisy. Eventually, excess noise levels become detrimental to the public health, safety and welfare and, therefore, contrary to the public interest. Matheny Tract is located outside of the 55 dB CNEL noise contour of the Tulare Municipal Airport (Mefford Field).

## Union Pacific Railroad

Matheny Tract is bound on the east side by the Union Pacific Railroad (formerly Southern Pacific Transportation Company) line running through Tulare County. According to the Trainmaster's office in Fresno, there are more than 20 freight train operations per day in the Tulare County Area. Passenger trains presently do not operate on Union Pacific tracks in Tulare County, 23 Train speeds on the mainline are generally 45-65 mph and train movements may occur at any time during the night or day.

According to the Wyle methodology, the type and frequency of rail operation results in noise exposures of 65 and 60 dB Ldn at approximately 335 and 660 feet, respectively, from the center of the tracks for present operations, and at approximately 440 and 800 feet, respectively, from the center of the tracks for estimated future operations. There are areas in the east side of the Matheny Tract LDB that are located within 335 feet of the Union Pacific Railroad line. Noise levels are higher at grade crossings due to the warning horn. The Paige Avenue (Avenue 216) and Avenue 200 grade crossings are over one (1) mile from the Community of Matheny Tract.

The Union Pacific Railroad tracks are elevated approximately ten (10) feet above natural ground surface; these tracks serve as a physical boundary between the commercial and industrial areas located in the City of Tulare to the east and the Matheny Tract.

# Matheny Tract Climate Adaptation Plan

---

## Energy: Natural Gas/Electricity

Southern California Edison (SCE) is the main provider of electrical power in Tulare County, which maintains an extensive network of high-voltage and low-voltage electrical lines, substations, natural gas mains, and related facilities. In addition to power produced by its plants, SCE purchases power from other producers for use within its service area.

On a region wide basis, electrical demand has increased while the available power supply has remained fairly constant. As a result, during peak demand periods, the reserve capacity of the overall system has dropped at times to under 3%. In response, SCE has planned for more stringent measures as reserve capacity diminishes. These measures include voluntary cutbacks, cutbacks for major users with whom PG&E has arrangements, and rolling blackouts. The Southern California Gas Company provides gas service to Matheny Tract.

## Solid Waste

Solid waste disposal services for Matheny Tract is provided by Waste Management, a private company. Solid waste generated in Matheny Tract can be disposed of at Visalia Landfill, located at 8614 Avenue 328.

## Internet Access

Most families in Matheny Tract do not have internet access at their homes. Any available internet service is unreliable and expensive. Residents are told by internet providers that there is not a tower in their area and that is why internet service is either unreliable or very expensive compared to what it costs in nearby cities. This is a major problem to residents, without access to the internet; they are unable to do very basic things such as online job hunting, applying for resources, and providing homework help to their kids. Internet access ranked as a high priority improvement need in Matheny Tract.

## Public Services

### Sheriff

Police protection services are provided in Matheny Tract by the Tulare County Sheriff's Department main Sheriff Office located at 2404 W. Burrell Avenue, in Visalia, approximately 20 miles northeast of Matheny Tract.

### Fire

Tulare County and all of the incorporated cities have a mutual-aid agreement for fire protection services. The proximity of the nearest City or County fire station varies significantly between the unincorporated communities. There are three City fire stations and one County fire station in the Tulare area. County Fire Station 25 is within Tulare City limits. County Fire Station 25, located at Foster Drive/Turner Drive, is the closest station to Matheny Tract (two miles) and is shown in Figure 33-6. Eleven fire hydrants are found within Matheny Tract. These fire hydrants are located within the County rights-of-way. Emergency Services are located in the City of Tulare (**see Figure 1-12**).

# Matheny Tract Climate Adaptation Plan

---

## Parks

There are no County owned/operated public parks in Matheny Tract. In the community of Matheny Tract there is no safe open green space for children to play and adults to be physically active. The nearest park is located approximately two (2) miles away in the City of Tulare.

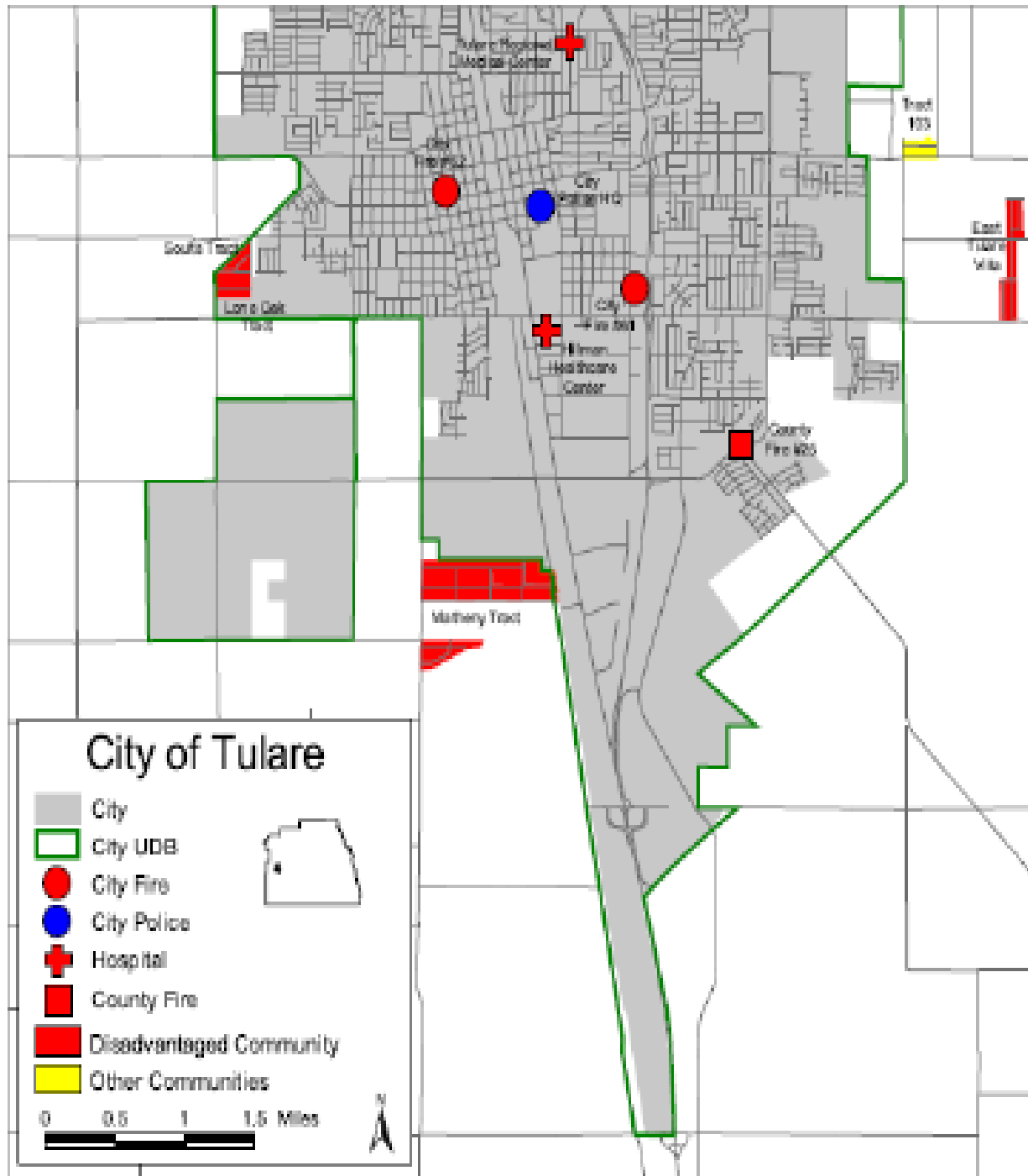
## Schools

Schools are an especially important component of a community. The quality of residential development is often measured by whether schools exist in close proximity to the neighborhood. As a result, schools are often a gravitational factor in attracting residential development to certain areas of a community. Most children attend Palo Verde Union School District (not part of the Tulare City School District). The District provides Preschool - 8th grade education. High School students attend high school in the City of Tulare, approximately two (2) miles away.



# Matheny Tract Climate Adaptation Plan

Figure 1-12 Emergency Services - City of Tulare



# Matheny Tract Climate Adaptation Plan

---

## Library

The Tulare County Public Library System is comprised of interdependent branches, grouped by services, geography and usage patterns to provide efficient and economical services to the residents of the county. At present, there are 14 regional libraries and one main branch. The Visalia Branch Library is located in the City of Visalia approximately 20-miles to the northeast. The Tulare Public Library is located approximately five (5) miles northeast in the City of Tulare.

## Circulation and Traffic

Existing roadways must have the capacity to expand as traffic counts increase, and new roads must be planned so that one part of the community can be connected to another. The purpose of the highway, streets and roads section is to identify the existing regional circulation system and determine both feasible short-term and long-range improvements. Tulare County's planned circulation system consists of an extensive network of regional streets and roads, local streets and State Highways. The system is designed to provide an adequate Level of Service (LOS) that satisfies the transportation needs of County residents. However, Tulare County has experienced a large increase in population and is beginning to outgrow portions of the circulation system. The need for major improvements to the State Highways, streets and roads network is an important issue.

The existing State Highway system was completed in the 1950's and 60's. The average design life of a State Highway is approximately 20 years and many Tulare County's highways were constructed 50 years ago. The Agricultural and commercial industry continue to utilize the circulation system to get products to market. With industry intensification and other development, many facilities are beginning to show structural fatigue (e.g., surface cracks, potholes, and broken pavement).

## Traffic

Tulare County is linked to Fresno County and Kern County principally by State Route 99. This route provides the only continuous north-south route through the County and is heavily used for regional travel. The entire length of State Route 99 in Tulare County and State Route 198 through Visalia and freeways provide for the ability to carry large traffic volumes at high speeds for long distances. Access points are fully controlled. Freeways connect points within the County and link the County to other parts of the State.

## Existing Circulation

Matheny Tract is a small agricultural community located adjacent to Pratt Street (Road 90). The internal traffic circulation system for the Matheny Tract Legacy Plan is comprised of Matheny Avenue, Wade Avenue, Beacon Avenue, Addie Avenue, Pratt Street, Lutton Street, Canal Street, Casa Street, and Prine Drive.

## Patterns of Blocks and Streets

The prominent grid pattern of County roads provides efficient and direct collector routes that provide ease of travel from place to place. TCAG traffic model outputs are displayed below for 2019 and 2035.





# Matheny Tract Climate Adaptation Plan

---

## Urban Greening

Urban greening refers to public landscaping and urban forestry projects that create mutually beneficial relationships between urban residents and their environments. The presence of green spaces can enhance the health and wellbeing of people living and working in these urban areas. Green spaces also indirectly impact our health by improving air quality and limiting the impact of heatwaves by reducing urban temperatures. Urban greening is currently limited to residential landscaping in Matheny Tract.

## Complete Streets

The California Complete Streets Act (AB 1358) of 2008 was signed into law on September 30, 2008. Beginning January 1, 2011, AB 1358 requires circulation elements to address the transportation system from a multimodal perspective. The bill states that streets, roads, and highways must meet the needs of all users in a manner suitable to the rural, suburban, or urban context of the general plan. The Complete Street roadway typically includes sidewalks and sidewalk amenities, transit shelters and facilities whenever there is a route along the corridor, and provisions for bicycle facilities.

# Matheny Tract Climate Adaptation Plan

---

# Matheny Tract Climate Adaptation Plan

---

## Chapter 2 Study Methodology

### Scope and Scale

The Matheny Tract Climate Action Plan conducts a climate change vulnerability and risk assessment that considers a broad range of climate change exposures, including higher temperatures, and extreme precipitation events. It is well-suited to consider climate change impacts beyond flooding, and is consistent with state guidance for adaptation planning, including the California Climate Adaptation Planning Guide<sup>2</sup> (CCAPG), which recommends a sequence of nine steps in developing strategies to address climate change impacts:

- Assess exposure to climate change impacts;
- Assess community sensitivity to the exposure; (3) assess potential impacts; (4) evaluate existing community capacity to adapt to anticipated impacts; (5) evaluate risk and onset, meaning the certainty of the projections and speed at which they may occur; (6) set priorities for adaptation needs; (7) identify strategies; (8) evaluate and set priorities for strategies; and (9) establish phasing and implementation.

### Vulnerability and Consequences and Risk Assessment

Conduct an assessment of vulnerability and consequences for categories of assets and critical individual assets in the project area.

### Vulnerability and Consequences and Risk Assessment Findings

Synthesize the assessment information into vulnerability and consequence findings. Share these findings with the stakeholder working group and engage them in identify the key planning issues for the project.

### Develop Climate Adaptation Plan Framework

After reviewing the project resilience goals with the stakeholder working group, develop adaptation responses for the vulnerabilities and key planning issues that lay a clear and transparent path towards implementation.

### Implementation and Monitoring and Funding Opportunities

Identify resources to assist with implementation; conduct feasibility studies as needed for specific actions; communicate project outcomes to stakeholders, including boards, commissions, committees and other decision-making bodies. Integrate adaptation responses into governance, capital investment and management.

### Climate Change Adaptation

There are adaptation strategies Tulare County can use that would minimize impacts from climate change to the County. These strategies are incorporated in a variety of policies within the 2030 Tulare County General Plan. The policies will help the County adapt to impacts from climate change.

# Matheny Tract Climate Adaptation Plan

---

## Water Supply

Water conservation policies in the Tulare County General Plan will help to conserve water for future uses. These water conservation policies are summarized in Section 5.1.3, Water Conservation Energy Savings, of this CAP and include the following:

- WR-1.5 Expand Use of Reclaimed Wastewater
- WR-1.6 Expand Use of Reclaimed Water
- WR-3.5 Use of Native and Drought Tolerant Landscaping
- ERM-1.7 Planting of Native Vegetation

AB 1881 (2006) required the State Department of Water Resources to update the Model Water Efficient Landscape Ordinance and required all cities and counties to adopt and implement a water efficient landscape ordinance by January 1, 2010. The ordinance is intended to reduce water consumption for landscape watering and so will help Tulare County adapt to potential lower water availability. The County enforces water conservation requirements of the CalGreen Building Code and the Model Water Efficient Landscape Ordinance. During the recent drought, the County adopted the Ordinance Establishing the Staged Water Conservation Program at All County-Operated Water Systems in County Service Area No. 1 on May 17, 2016, which was designed to meet the Governor's Executive Order B-29-15 that requires a 25 percent reduction in potable urban water use compared with a 2013 baseline (Tulare County 2016b).

## Flooding

The General Plan policies that would help to prevent flooding include the following:

- FGMP-8.3 Development in the Floodplain
- HS-1.4 Building and Codes
- HS-1.5 Hazard Awareness and Public Education
- HS-1.11 Site Investigations
- HS-5.1 Development Compliance with Federal, State, and Local Regulations
- HS-5.2 Development in Floodplain Zones
- HS-5.3 Participation in Federal Flood Insurance Program
- HS-5.4 Multi-Purpose Flood Control Measures
- HS-5.5 Development in Dam and Seiche Inundation Zones
- HS-5.6 Impacts to Downstream Properties
- HS-5.7 Mapping of Flood Hazard Areas
- HS-5.8 Road Location
- HS-5.9 Floodplain Development Restrictions
- HS-5.10 Flood Control Design
- HS-5.11 Natural Design
- PFS-4.1 Stormwater Management Plans
- PFS-4.3 Development Requirements
- PFS-4.6 Agency Coordination



# Matheny Tract Climate Adaptation Plan

---

## Agriculture and Forest

There are several adaptation strategies for the agricultural sector (KRH 2008). These include crop switching, breeding, and improved management practices. As chill hours decline, varieties of fruits and nuts that require less chill time could increase survival rates. Better monitoring of pests, weeds, and diseases could lead to improved control and reduced damages. More efficient water use could reduce farmers' exposure to drought.

Methods to provide greater heat tolerance for cows include introducing shade, showering, and cool drinking water, changing feeding schedules, and adjusting livestock diets. The effectiveness of these methods, however, may decrease at higher temperatures. Additionally, breeding for more heat-resistant livestock may be a longer-term strategy; historically, heat resistance has been sacrificed for greater milk production. Other livestock such as poultry and sheep are also impacted by excessive heat.

Agricultural and forestland preservation and conservation would allow greater room for adaptation. Smart growth policies and urban growth boundaries would help to reduce encroachment onto agricultural and forestlands.

The General Plan policies that would help the County adapt to impacts from climate change on agriculture include the following, as described in Section 5.1, Tulare County General Plan Policies and Measures:

- AQ-3.2 Infill near Employment
- LU-1.4 Compact Development
- LU-1.8 Encourage Infill Development
- LU-3.3 High Density Residential Locations
- LU-2.1 Agricultural Lands
- AG-1.8 Agriculture within Urban Boundaries
- ERM-5.15 Open Space Preservation
- LU IM 3 Encourage Smart Growth Incentives

# Matheny Tract Climate Adaptation Plan

---

# Matheny Tract Climate Adaptation Plan

---

## Chapter 3 Setting

### Statewide Climate Change Projections

California leads the nation in adopting broad reaching legislation and implementing comprehensive regulations to reduce greenhouse gas emissions. This leadership role is expected to continue in the coming years in order to reach the challenging mid-term and long-term reduction targets set by the State.

### Statewide Greenhouse Gas Emissions Strategy

#### Executive Order S-3-05.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following reduction targets for greenhouse gas emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. The State achieved the 2010 target is expected to achieve the 2020 target.

#### Assembly Bill (AB) 32

The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006 (2006 Stats. Ch. 488 and Health & Safety Code § 38500, et seq.). This landmark legislation was California's first comprehensive bill to require the reduction of greenhouse gas emissions. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. CARB is the primary State agency charged with developing plans to meet AB 32 targets, developing emission inventories, and regulating certain sources of greenhouse gases that cause global warming. The California Energy Commission (CEC), the California Department of Water Resources (CDWR), and CalRecycle also have significant roles in implementing AB 32.

AB 32 states the problem as follows:

- Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the State from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

# Matheny Tract Climate Adaptation Plan

---

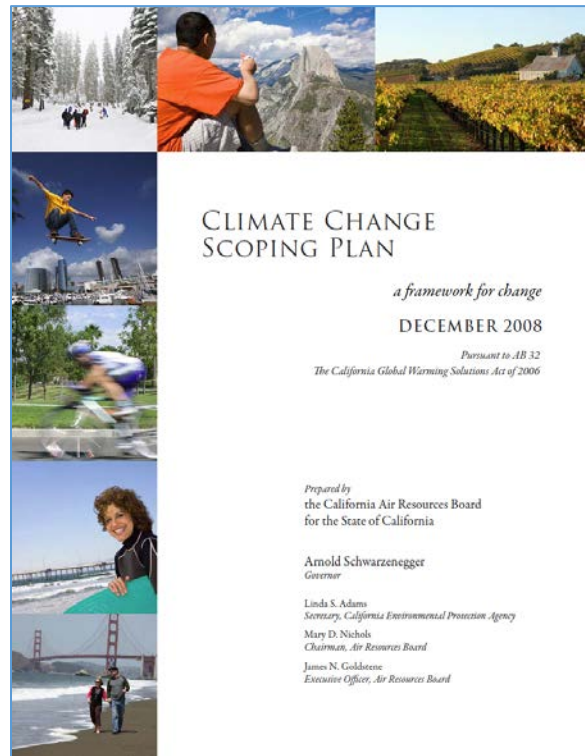
CARB approved the 1990 greenhouse gas emissions level of 427 MMTCO<sub>2</sub>e on December 6, 2007 (CARB 2007). The First Update to 2014 Scoping Plan Update revised the 1990 inventory to 431 MMTCO<sub>2</sub>e, therefore, emissions generated in California in 2020 are required to be equal to or less than 431 MMTCO<sub>2</sub>e.

## 2008 Scoping Plan

CARB approved the Climate Change Scoping Plan in December 2008. The Plan proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health.

The 2008 Scoping Plan identifies recommended measures for multiple greenhouse gas emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 greenhouse gas target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards. (The CEC completed 2013 and 2016 updates to Title 24 Building Energy Efficiency and CalGreen and is currently working on the 2019 update);
- Achieving a Statewide renewables energy mix of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system (The CAP and Trade program is in place and recent auctions have been successful);
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets (SB 375) (Regional targets have been adopted by CARB).
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (All in place); and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation (Considered infeasible at this time).



An important feature of the Scoping Plan is that it differentiates between “capped” and “uncapped” strategies. Capped strategies are subject to the proposed cap-and-trade program, which comprise 85

# Matheny Tract Climate Adaptation Plan

---

percent of the State's GHG emissions. The Scoping Plan states that the inclusion of these emissions within the cap-and-trade program will help ensure that the year 2020-emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure.

Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional greenhouse gas emission reductions. Examples of uncapped strategies are high global warming potential measures, sustainable forests, oil and gas extraction and transmission, and landfill methane capture. The CARB reports that the State is on track to meet or exceed the 2020 target.

The First Update to the Climate Change Scoping Plan adopted in May 2014 provided revised inventory projections to reflect slower growth in emissions during the recession and lower future year projections. The State's 2020 BAU inventory was reduced from 596 MMTCO<sub>2</sub>e to 545 MMTCO<sub>2</sub>e (CARB 2014). The GHG reduction level for the State to reach 1990 emission levels by 2020 was lowered to 21.7 percent from BAU in 2020. The 2014 Scoping Plan Update also confirmed that the State is on track to achieve the 2020 target and to maintain and continue reductions beyond 2020 as required by AB 32 (CARB 2014).

The 2014 Scoping Plan Update incorporated a list of key recommended actions for the agriculture sector, including the following: In 2014, convene an interagency workgroup that includes the California Department of Food and Agriculture, CARB, CEC, the California Public Utilities Commission (CPUC), and other appropriate state and local agencies and agriculture stakeholders to:

- Establish agriculture sector GHG emission reduction planning targets for the mid-term time frame and 2050.
- Expand existing calculators and tools to develop a California-specific agricultural GHG tool for agriculture facility operators to use to estimate GHG emissions and sequestration potential from all on-farm sources. The tool would include a suite of agricultural GHG emission reduction and carbon sequestration practices and would allow users to run different scenarios to determine the best approach for achieving on-farm reductions.
- Make recommendations on strategies to reduce GHG emissions associated with the energy needed to deliver water used in agriculture based on the evaluation of existing reporting requirements and data.
- Conduct research that identifies and quantifies the GHG emission reduction benefits of highly efficient farming practices and provide incentives for farmers and ranchers to employ those practices.

## Senate Bill (SB) 32

SB 32 is follow-up legislation to address the 2030 target previously contained in Executive Order B-30-15. SB 32 continues the State's leadership in reducing GHG emissions. The Governor signed SB 32 on September 8, 2016. SB 32 gives CARB the statutory responsibility needed to pursue this goal. SB 32 states that "In 2050 adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state [air resources] board shall ensure that statewide greenhouse gas emissions are reduced to at least 40

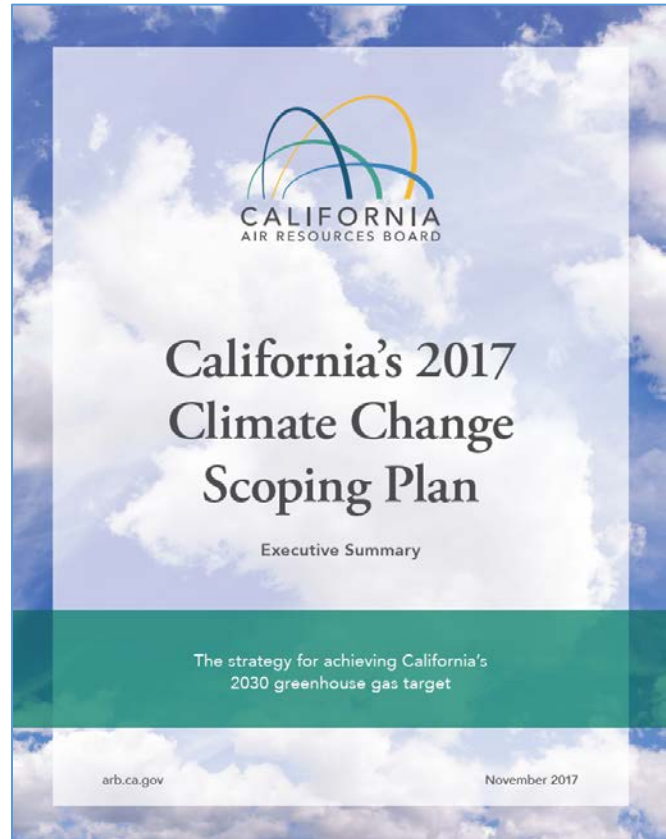
## Matheny Tract Climate Adaptation Plan

---

percent below 1990 levels by December 31, 2030.” The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets were adopted on December 14, 2017.

### 2017 Scoping Plan

Unlike the 2008 Scoping Plan, which provided emission reduction estimates for each strategy, the 2017 Scoping Plan assigns a range of reductions to each measure to account for the uncertainty in effectiveness of the regulations ultimately adopted to implement the measures. The 2017 Scoping Plan indicates that potential shortfalls from the strategies, if any, would be made up through the CAP and Trade Program (CARB 2017a). The Governor signed AB 398 on July 25, 2017 to extend the Cap-and-Trade Program to 2030. The legislation includes provisions to ensure that offsets used by sources are limited to 4 percent of their compliance obligation from 2021 through 2025 and 6 percent from 2026 through 2030. AB 398 also prevents Air Districts from adopting or implementing emission reduction rules on stationary sources that are also subject to the Cap-and-Trade Program (CAR 2017).



Future climate change conditions have the potential to affect a number of different resources. From a Statewide perspective, climate change could affect California's environmental resources through potential, though uncertain, changes related to future air temperatures and precipitation and resulting impacts on water temperatures, reservoir operations, sea levels, and stream runoff. Such changes could threaten California's economy, public health, and environment.

Executive Order S-13-08 indicates that climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources. Pursuant to the requirements in the order, in December 2009, the California Natural Resources Agency released its 2009 California Climate Adaptation Strategy (CNRA 2009). The Strategy is the first Statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States. Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.



# Matheny Tract Climate Adaptation Plan

---

## Impacts to California

The following is a summary of current scientific literature related to the effects of climate change in California. Much of the information contained below is from the 2009 California Climate Change Adaptation Strategy report (CNRA 2009) and Our Changing Climate 2012 (CEC 2012).

Taken collectively, the indicators help portray the interrelationships between climate and other physical and biological elements of the environment.

1. Average temperatures have increased by about 1.8 degrees Fahrenheit in California over the past century. Increases in minimum and maximum temperatures were 2.2°F and 1.3°F, respectively.
2. Over the past 120 years, California has become increasingly dry. The most recent drought from 2012 to 2016 was the most extreme since instrumental records began.
3. With increasing temperatures, the energy needed to cool buildings during warm weather—measured by “cooling degree days”—has increased.
4. Extreme heat days and especially nights have become more frequent since 1950. Heat waves have been highly variable each year, but nighttime heat waves have shown a marked increase since the mid-1970s.
5. Glaciers in the Sierra Nevada have decreased in area dramatically. By 2014, several of the largest glaciers were on average about half their size at the beginning of the twentieth century.
6. The amount of water stored in the state’s snowpack has been highly variable from year to year, dropping to a record low in 2015, about 5 percent of the historical average. Snowmelt runoff during April through July has declined over the past century.
7. The area burned by wildfires across the state is increasing in tandem with rising temperatures. Large wildfires account for much of the acreage burned each year.
8. Over the past 80 years, California’s forests have been changing in response to decreasing water availability, driven by warmer temperatures. Small trees and oaks have increased, while pines have decreased.
9. Sea levels along the California coast have risen overall, except at one location where uplift of the land surface has occurred due to the movement of the Earth’s plates.

## Water Supply

Section VII of the 2009 California Climate Adaptation Strategy report prepared by the California Natural Resource Agency (CNRA) provides a detailed discussion regarding potential impacts to California’s water supply from climate change. Climate change is expected to impact California’s water supply through a diminishing Sierra snowpack. The predicted change in rain and snowfall patterns over the 21<sup>st</sup> century varies by climate scenarios and models; however, most models suggest a 12 to 35 percent overall decrease in precipitation, with more precipitation occurring as rain rather than snow (CNRA 2009). This could lead to water shortages, as communities in California depend on runoff from established snowpack to provide water during the drier months. This problem is exacerbated by higher temperatures, which increase evaporation and snowmelt.

It is expected that increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control instead of using the water for supply conservation, as is the standard practice. This change in water management could lead, in turn, to more frequent water shortages during periods of high-water

# Matheny Tract Climate Adaptation Plan

---

demand. Many regional studies have shown that only small changes in inflows into reservoirs could result in large changes in the reliability of water yields from those reservoirs (CNRA 2009).

A report prepared by the California Department of Water Resources in response to Executive Order S-3-05 represents the most current complete analysis of changes to State Water Project and Central Valley Project operations that would be likely to occur as a result of climate change. Contained in the report is an analysis of the potential impacts of climate change on State Water Project and Central Valley Project operations and deliveries and on Delta water quality and water levels. Results discussed in the report include projections from 2035 through 2064 under four potential climate change scenarios compared with a baseline scenario that does not assume climate change effects.

Four potential climate change scenarios were included, based upon modeling output from two separate global climate models. Three (3) of these scenarios included decreased average annual precipitation, while one included increased average annual precipitation. Results from the investigation are considered preliminary, incorporate several assumptions regarding the effects of climate change on California water resources, and reflect a limited number of climate change scenarios. Results from the four modeled scenarios indicated effects to State Water Project and Central Valley Project operations. Because of projections of shifts in seasonal and annual average runoff, the amount of water delivered by the State Water Project and Central Valley Project was reduced considerably. The wetter scenario exhibited increased winter season runoff and decreased April-July runoff, but it resulted in a 3-percent average annual increase in Central Valley Project South of Delta deliveries (CDWR 2006).

Most global climate models project that anthropogenic (human caused) climate change will be a continuous and fairly gradual process through the end of this century. California is expected to be able to adapt to the water supply challenges posed by climate change, even at warmer and dryer projections. Sudden and unexpected changes, however, could leave water managers unprepared, which, in extreme situations could have significant implications for California's water supplies (CDWR 2006).

## Surface Water Quality

Water quality is affected by several variables, including runoff volume and timing, the physical characteristics of the watershed and water temperature. A combination of changes to these factors could affect several natural processes that serve to eliminate pollutants in water bodies. For example, an overall decrease in stream flows could concentrate pollutants and prevent contaminants from flushing from point sources.

## Amount of Precipitation

Most precipitation events in California occur during the October through April rainy season with most of California's precipitation, in terms of amount of water, falling during November through March. An investigation completed by the Department of Water Resources indicated a statistically significant increasing trend in total precipitation in northern and central California since the late 1960s. A single investigation by Bardini and others showed a trend of potentially decreasing annual precipitation in California; however, this result is probably related to the specific subset of data that the Bardini study relied upon, wherein extremes at the beginning or end of time series data can substantially impact the



# Matheny Tract Climate Adaptation Plan

---

identified trend. An investigation of rainfall during November through March from 1930 through 1997 indicated significant increases in California rainfall (CDWR 2006).

There is also evidence that the amount of precipitation that occurs on an annual basis is becoming more variable, that is, periods of both high and low rainfall are becoming more common. Specifically, a study performed by the Department of Water Resources indicates that present-day variability in annual precipitation is about 75 percent greater than that of the early 20th century (CDWR 2006).

## Changes in Runoff and Flooding

Annual runoff is measured during the annual water year (October 1 through September 30) and includes river flows derived from precipitation events, snowmelt, and river base flow. Peak runoff is typically measured for individual storm events. Like annual runoff, peak runoff results from precipitation events, snowmelt, and river



Kaweah River Canyon

base flow. Precipitation across California appears to have increased over the past century, and individual water years have become more variable in terms of the amount of precipitation that occurs. It follows, then, that similar variable trends would be seen for runoff (CNRA 2009).

In relation to snowpack, winter storms provide snow to higher elevations that have historically melted from April through July. This process effectively stores water in California's snowpack until the spring snowmelt, when the water flows downstream and into major rivers and reservoirs, providing a significant portion of the water supply for the dry summer and autumn periods. April through July runoff in both the Sacramento and San Joaquin rivers shows a decreasing trend over the last century, indicating that in both watersheds, an increasing percentage of runoff is occurring earlier in the year, when many reservoirs are managed primarily for flood control and not for water supply (CDWR 2006).

Large annual variations in winter rainfall and runoff, which are normal in California, create uncertainty surrounding potential changes in flooding as a result of climate change. Independent climate modeling efforts are predicting that trends towards more variable river flows and more frequent flooding events will continue into the future, as a result of climate change (REIR 2010).

## Wildland Fire Hazards

Warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt contribute to the increase in wildfires. Low- to moderate-intensity fires can be beneficial to ecosystems; however, there are no benefits from high-intensity fires (CNRA 2009).

Results of fire modeling conducted for the California Energy Commission found that within California, increases in fire risk in Northern California ranged from 15 to 90 percent, increasing with temperature. In Southern California, the change in fire risks ranged from a decrease of 29 percent to

# Matheny Tract Climate Adaptation Plan

---

an increase of 28 percent. Temperature increases and lower precipitation in northern California and southern Oregon produced larger fire-risk increases in the western slopes and foothills of the Sierra Nevada and in the Coast and Cascade ranges of northern California and southern Oregon, where forests and woodlands provide a ready source of fuel (CEC 2006).

## Negative Impacts to Agriculture and Forestry

Impacts to agricultural and forest resources from wildfires, pests, increased temperatures, water reductions, and flooding may be caused by climate change. Development on productive farmland or forestry reduces land available for adaptation. There could be reductions in the quality and quantity of certain agricultural products such as grapes, fruit, nuts, and milk.

Some temperature warming may be beneficial for agriculture and forestry, but at a certain level, these benefits will deteriorate basic plant functioning. Earlier flowering can be a problem if plants become desynchronized with life cycles of pollinators. A reduction in chill hours can be a problem for fruits and nuts. Warmer temperatures increase the growth rate of pests, weeds, and pathogens. Increased temperatures may reduce the range of forests (KRH 2008).



Extreme events such as heat waves and floods pose significant challenges to this sector, including early flowering, reduced effectiveness of pollination, and decreased ability for photosynthesis, decreased yield, and demise of plants requiring long periods of growth. Higher temperatures can reduce cow milk production. A lower temperature-warming scenario shows a 7- to 10-percent reduction in dairy production and 11 to 22 percent reduction for the highest warming scenario (KRH 2008).

Climate change poses a serious threat to agriculture for the State of California and Tulare County. Temperature increases observed statewide and globally have been partially masked in the past few decades by cooling from irrigation. However, the aerial extent of irrigation is expected to stabilize, thus unable to mask further increases. Thus, temperature increases and other climatic changes pose serious threats to the leading economic sector of the county, including:

- Higher temperatures, including extreme temperatures, can negatively affect crop growth during various stages of their development, as well as cattle and poultry health and reproduction; Higher temperatures, especially in the main harvesting months, are also dangerous to agricultural workers;
- Reduced water availability as a result of (a) the projected decrease in snowpack as more precipitation falls as rain than as snow and (b) higher temperatures leading to higher evaporation from reservoirs and soils resulting in reduced reservoir storage and generally drier conditions; any decrease in total precipitation as projected by the latest climate change projections for the state would only exacerbate these declines in water supplies;
- More intense downpours can lead to fruit, vegetable and flower damage and more soil erosion;
- Water demand by plants and animals (for drinking and cooling) will increase as temperatures increase;
- Reduced number of chill hours (with relevant temperature thresholds varying by fruit crop); Less-well understood effects of changing climate on crop pollination;

# Matheny Tract Climate Adaptation Plan

---



- Lower productivity of rangelands for cattle;
- Increased risk of pest infestations and spread of invasive plant species. CEC 2012).

One of the potential benefits of a warmer climate is that cold extremes and late winter and spring frosts which can pose serious threats to sensitive crops will continue to become less frequent (**see Figure 32**). Many crops also respond positively to elevated carbon dioxide under lower levels of warming, but

this beneficial effect on growth and yields is limited quickly by higher levels of warming and water or other nutrient shortage (CEC 2012).

## Sea Level Rise

A rise in sea levels could result in the displacement of coastal businesses and residences. During the past century, sea levels along California's coast have risen about 7 inches. If heat-trapping emissions continue unabated and temperatures rise into the higher warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century (Moser et al. 2009). Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

## Negative Impacts to Public Health

Climate change could cause an increase in infections, disease, asthma, and other health-related problems (CCCC 2006). Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.

If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range.

## Negative Impacts to Wildlife

Increased global temperatures and resource depletion exacerbated by climate change are causing disruptions in animal migration and plant pollination. As temperatures rise, species are moving north in California or to higher elevations. This change in migration disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change on different timeframes. With vegetation, reduction in soil moisture will result in early die-back of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but because of the inability of wildlife to adapt to new climates, the potential for severe species loss is highly probable (CNRA 2009).

# Matheny Tract Climate Adaptation Plan

---

## Tulare County Climate Change Projections

### Climate Change Implications for Tulare County include the following Considerations:

#### **Increased Flooding**

Increasing snowmelt from rising temperatures coupled with increasing precipitation in the form of rain and less falling as snow in the mountains could result in greater flows in mountain streams and rivers. Additionally, increasing variability in storm events could affect flood control measures such as levees and reservoirs (CDWR 2006).

Tulare County contains a number of rivers and waterways. The Kern River flows north to south through the Sierra Nevada Mountains in eastern Tulare County. The headwaters for the Kaweah and Tule Rivers are located in the Sierra Nevada Mountains. These rivers flow west into the Tulare Lake Basin. A number of mountain streams flow into the Kaweah and Tule rivers and their respective reservoirs, Lake Kaweah and Lake Success. Lake Kaweah and Lake Success both serve as flood control structures. The Kaweah and Tule rivers, their tributaries, and Lake Kaweah and Lake Success could be subject to increased frequency or severity of flooding from upstream areas as a result of increased snowmelt and runoff. A number of communities are located near these water bodies, including Three Rivers, Woodlake, Lemon Cove, Springville, and Porterville, and could be exposed to increase flooding associated with the effects of climate change (REIR 2010).

#### **Water Supplies**

Tulare County receives some of its water supplies from the State Water Project and Central Valley Project. Surface water supplies in Tulare County from the State Water Project and Central Valley Project could potentially be reduced as a result of climate change effects (CDWR 2006).

Few scientific studies have been performed on the effects of climate change on specific groundwater basins, groundwater quality, or groundwater recharge characteristics. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Reductions in spring runoff and higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water (CNRA 2009). Groundwater serves as a major source of water supply in Tulare County, which could result in serious implications for water supply in the County.

#### **Agriculture**

Agriculture is important to Tulare County. Climate change may cause negative effects to agriculture. Some crop yields may increase with warming, while others may decrease. Compared with 2005 levels, the following yield changes in 2030 are estimated for Tulare County: almond yield increase by 5 percent; grape yield decrease by 5 percent; berry yield decrease by 5 percent; and cherry yield decrease by more than 15 percent (CNRA 2009). No values were provided in the report for citrus. Changes in precipitation can result in drought, which can have serious impacts on agriculture in the County.

#### **Public Health**

The elderly and young, and those vulnerable populations that do not have the resources to deal with the costs and adapt to the changes that are expected to impact the community will need assistance. More days with higher temperatures could increase heat related illnesses, especially in the elderly that



# Matheny Tract Climate Adaptation Plan

---

may not be able to afford to run their air conditioning system. Increased temperatures may also result in higher ozone concentrations with more violations of the health-based standard. Some vectors such as mosquitoes may expand their range to new areas resulting in increased vector-related illnesses. Warming may also cause increases in allergens. Social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on the County (CNRA 2009).

## Community Assets

The summary and key findings from the Matheny Tract Community Asset Mapping Project that was undertaken in between November 2019 and February 2020 is discussed below.

### Project Overview

This project, planned and executed in collaboration with the Tulare County Resource Management Agency and the Leadership Counsel for Justice and Accountability, was designed to map existing community assets in Matheny Tract as well as identify areas for improvement and renewed investment in the community. The results of this project were meant to provide context and community-based priorities for the upcoming Transformative Climate Communities-funded Matheny Tract Climate Adaptation Plan, as well as a discussion point for continued conversations with the community about what they would like to see in terms of continued investment and improvement in the future.

### Summary of Initial Event

Our initial community event took place between 11:00 am and 3:00 pm on January 20<sup>th</sup> (Martin Luther King Day), and was planned to consist of two discrete portions: a community walkthrough in the morning, and a facilitated “world café” discussion in the afternoon. The event was designed this way to maximize participation as well as gather the greatest amount of community input possible.

This event did not go as initially expected. Despite a great amount of community outreach that was conducted, there was no turnout from community members for the morning community walkthrough. This meant that we could not gather community input for existing assets in Matheny Tract in the manner we desired. In order to make productive use of staff time, as well as still gather data on what could potentially be existing community assets as a discussion point, staff and the co-facilitators of the event decided to split into three groups and walk through the community itself. Meticulous notes were taken by all, noting assets such as trees that provided shade, fire hydrants that provided fire extinguishment capabilities, sidewalks, and houses that provided character to the community. This information was incorporated into the text below of the climate adaptation plan upon further discussion with the community at the February Matheny Tract Committee meeting.

As for the afternoon portion, 16 people attended the meeting, including the facilitators/coordinators of the event. Community members that attended, with one exception, were members of the Matheny Tract Committee, with whom staff had discussed the project extensively in the months leading up to the event dates. In light of this smaller turnout, staff had one large discussion rather than several smaller ones.

Staff opened the discussion with the question of what existing community assets Matheny Tract has. One of the first reactions we received, from an elder of the church that we were using as meeting

# Matheny Tract Climate Adaptation Plan

---

space, was that there are no assets in Matheny Tract. He then went on to discuss the decades of divestment and neglect that Matheny Tract has experienced from the State of California, the County of Tulare, as well as the City of Tulare particularly in regards to the fight for a hookup to the City of Tulare's sewer system. He further spoke of the community having "lost hope" as a result of not only neglect from governmental authorities but also being "burned" or otherwise mistreated by previously CBOs and nonprofit entities that have engaged in the area. Additionally, he noted the glacial pace of progress on areas that governmental authorities and NGOs were engaging on (such as the sewer hookup). These comments were backed up by Reina Palma (the MTC committee chair), who also shared her own experiences.

This initial opening resulted in a powerful discussion regarding how Matheny Tract can best move forward in terms of investment and improvement, as well as getting the community to genuinely engage in these efforts and restore the hope that has been "lost" over the decades. The discussion then focused on solutions, and ways that the community can move beyond the distrust and neglect perceived by the Matheny Tract community at this point.

This discussion resulted in much needed context for the upcoming Climate Adaptation Plan for Matheny Tract in the form of first-hand accounts from community members about the state and history of the community. While staff did not fulfill our initial goals of gathering community-generated data regarding existing assets in the community (owing to the lack of turnout and general consensus that there were no existing assets, as well as framing and facilitation of the discussion that was somewhat unclear to residents), staff provided a starting point for continued discussion and generated findings that will hopefully be of use to the community as well as our project partners.

## Findings from Follow-up Discussion

In order to supplement our findings from the initial community event, an additional discussion was held at the February 20<sup>th</sup> meeting of the Matheny Tract Committee. This was designed to further engage residents in a discussion around what parts of the community they wished to protect, and what characteristics of the community they wanted to keep the same in the face of climate change.

This discussion had a number of key topics and themes that emerged. Several broad takeaways from the discussion are noted and expanded on below.

## Measures needed to be Taken to Adapt to Climate Change

One topic in this area was long-term adaptation towards increasing extreme heat. Members of the community expressed strong desire to take measures to do so. Specific measures discussed included increasing tree canopy, in addition to repair and retrofitting of existing homes to install new air conditioning systems or solar panels.

A similar topic that emerged was adaptation to increased flooding, which will also occur in Matheny Tract. Specific attention was paid to increased hazards such as mosquitoes and house damages, as well as potential increased bacteria from septic tanks that result from the community's current lack of a functioning sewer system. It was noted that the potential for increased flooding makes it all the more important that the community be hooked up to the City of Tulare's system, the process for which is currently underway.

# Matheny Tract Climate Adaptation Plan

---

## The Future Nature of the Community Requires Further Discussion

Another major topic that emerged was the nature of the community. One resident in particular asked the question “What kind of community do we want to be?” and noted that that question had to be answered before proceeding with any adaptation effort. This discussion went in several directions. One resident brought up wanting more selection in stores in the community, and in particular a big chain store such as Walmart. Other residents were opposed to this idea, as they believed that adding large industry to the community such as that would irreparably damage the community’s character and drain money from the community itself.

Similarly, a resident brought up the fact that a nearby recently established chemical plant was emitting toxins into the air, and noted that two family members of his had recently been diagnosed with cancer. Another resident noted that her allergies were getting worse due to this chemical plant as well. Though the issue of industry in the community was somewhat contentious, there was a consensus that any industry that did enter the community should contribute to it, and not cause it further harm.

The other major theme that emerged in this regarding was the development of more housing within the community and the effect that would have on the community’s character. Again, this issue was split. Some wanted it to maintain its current sparsely developed character, and others wanted to build more housing. A similar issue that emerged was the lack of a central meeting space for the community, and the need to create one so that the community can gather somewhere that is not a church or a house loaned by a community member for this purpose.

Finally, the question of community solar was brought up, potentially as a means of enhancing community-level energy resilience as well as sustainability. Some community members brought up the idea of retrofitting homes to house solar panels, and others mentioned potentially contributing to a larger utility-scale project. It was concluded that this was an area of further exploration, and solar energy generation will definitely be included in the final strategies list for the climate adaptation plan for Matheny Tract in some substantive form.

## The Role of Collaborating Organizations Must be Expanded

The last portion of the discussion was the question of how local public agencies (as well as CBOs such as Self-Help Enterprises and Leadership Counsel for Justice and Accountability) could be of better use to the community. The main consensus was that there has to be more community involvement, and that folks want to hear from those that are not participating. It was voiced by several that many in the community do not care enough, and that they have too much pride as well as fear to collaborate effectively at present. It was noted that the county has tried repeatedly to step up outreach efforts in order to more effectively engage the community, with hitherto limited success. It was agreed that this was an ongoing issue, and that it needed further work from all parties.

## Overall Takeaways and Recommendations from this Process

This two month long process of identifying community assets and areas for investment and improvement within the community yielded many findings that ought to be considered in the process of putting together the climate adaptation plan for Matheny Tract as well as future community discussion and planning processes down the road. From these detailed findings (discussed above), we can extract three key takeaways and recommendations from the process that ought be considered in

# Matheny Tract Climate Adaptation Plan

---

the TCC planning process going forward, as well as future community-level discussions and planning processes in Matheny Tract going forward.

- While community awareness of the problems they face is strong, the majority of residents hesitate turning out to community events when action steps on issues seem far away or intangible, as has often been the case. The history of institutional divestment and neglect the community has faced also contributes to this state of affairs, as we learned from the initial event. Acknowledgement of this history is a must for continued engagement, and overcoming this history should be at the forefront of any discussion about community development and investment.
- There are community assets and characteristics that the community wants to protect in the face of climate change, as well as things they would like to change and improve upon. These assets are noted from our walkthrough notes (attached) as well as the above discussion summaries. These, in combination with the priorities survey that was distributed at the beginning of the TCC grant cycle, ought to also be at the forefront of the planning processes going forward.
- Areas of investment and improvement vastly outnumber existing assets in the minds of community members. This is something that emerged in both discussions, and should be kept in mind as the planning process for Matheny Tract proceeds.

It is our hope that these three items, and the detailed findings behind them enumerated in this report, are of use to the community, the Tulare County RMA, LJCA, HHSA, and the numerous other partners that are working to improve life for the Matheny Tract Community going forward. It is with this goal in mind that we respectfully submit this summary report and recommendations from our process of identifying community assets and areas for investment and improvement within Matheny Tract.

## Relevant Local Planning Initiatives

### Climate Action Plan

The County of Tulare (County) adopted the Tulare County Climate Action Plan (CAP) in August 2012. The CAP includes provisions for an update when the State of California Air Resources Board (CARB) adopts a Scoping Plan Update that provides post-2020 targets for the State and an updated strategy for achieving a 2030 target. Governor Brown signed Senate Bill (SB) 32 on September 8, 2016 which contains the new 2030 target. The CARB 2017 Scoping Plan Update for the Senate Bill (SB) 32 2030 targets was adopted by the CARB on December 14, 2017 which provided new emission inventories and a comprehensive strategy for achieving the 2030 target (CARB 2017a). With the adoption of the 2017 Scoping Plan, the County proceeded with the 2018 CAP Update that is provided in this document.

The 2018 CAP Update was adopted in December 2018 and incorporates new baseline and future year inventories to reflect the latest information and updates the County's strategy to address the SB 32 2030 target. The 2030 target requires the State to reduce emissions by 40 percent below 1990 levels from the 2017 Scoping Plan and County data. The CAP identifies the County's fair share of reductions required to maintain consistency with the State target.

The Executive Summary provides an overview of the Tulare County CAP. It includes brief discussions of the various CAP components to allow the reader to quickly understand the most important aspects of the CAP, including:



# Matheny Tract Climate Adaptation Plan

---

- The purpose of the CAP.
- The relationship to other State and regional regulatory and planning efforts.
- Using the CAP for CEQA compliance.
- Tulare County's greenhouse gas inventory.
- Emission reduction targets to demonstrate consistency with AB 32 and the CARB Scoping Plan.
- The Climate Action Plan strategy for achieving emission reduction targets.
- The plan for tracking and monitoring progress in implementing the CAP.

The CAP serves as a guiding document for County of Tulare (County) actions to reduce greenhouse gas emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update. The General Plan provides the supporting framework for development in the County to produce fewer greenhouse gas emissions during Plan buildout. The CAP builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets consistent with California legislation. The terms Climate Action Plan and Greenhouse Gas Reduction Plan are often used interchangeably. The County has chosen to use Climate Action Plan abbreviated as CAP for this document.

- The CAP follows a series of guiding principles to ensure that it is consistent with the County's values, objectives, and economy.
- The CAP will focus on strategies that meet multiple County objectives and enhance the quality of life and well-being of Tulare County residents.
- CAP strategies that provide an economic return will receive a higher priority than strategies that increase costs for the County, or for businesses and residents.
- The CAP will not duplicate strategies and programs that are better handled by other agencies.
- The CAP will recognize that federal, state, and SJVAPCD requirements set for local government regarding greenhouse gas reductions and climate change are evolving, so strategies and targets must be adaptable to changing conditions.
- CAP implementation and monitoring will use existing data collection and reporting systems to the maximum extent possible.

## 2030 General Plan Update Principles

Fortunately, many of the County's most important objectives such as farmland protection, preserving open space and natural environments, and improving air quality are consistent with many of the actions needed to reduce greenhouse gases from new development. The Planning Framework Element of the 2030 General Plan Update includes the following principles:

- Principle 1: Provide opportunities for small unincorporated communities to grow or improve quality of life.
- Principle 2: Promote reinvestment in existing communities and hamlets in a way that enhances the quality of life in these locations.
- Principle 3: Protect the County's important agricultural resources and scenic natural lands from urban encroachment.
- Principle 4: Strictly limit rural residential development potential in important agricultural areas outside of communities, hamlets, and cities (i.e., avoid rural residential sprawl).

# Matheny Tract Climate Adaptation Plan

---

- Principle 5: Allow existing, outdated agricultural facilities in rural areas to be used for new businesses (including nonagricultural uses) if they provide employment.
- Principle 6: Enhance planning coordination and cooperation with the agencies and organizations with land management responsibilities in and adjacent to Tulare County.

## Local Hazard Mitigation Plan

Tulare County (County) has adopted the 2017 Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) to assess the natural, technological, and human-caused risks to County communities, to reduce the potential impact of the hazards by creating mitigation strategies. The 2017 MJLHMP represents the County's commitment to create a safer, more resilient community by taking actions to reduce risk and by committing resources to lessen the effects of hazards on the people and property of the County.

This plan complies with The Federal Disaster Mitigation Act (DMA 2000), Federal Register 44 CFR Parts 201 and 206, which modified the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) by adding a new section, 322 - Mitigation Planning. This law, as of November 1, 2004, requires local governments to develop and submit hazard mitigation plans as a condition of receiving Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) and other mitigation project grants. The County; the Cities of Dinuba, Exeter, Farmersville, Lindsay, Portersville, Tulare, Visalia, and Woodlake; the Tule River Tribe; and Special District staffs have coordinated preparation of the MJLHMP in cooperation with stakeholders, partner agencies and members of the public.

This introduction to the MJLHMP provides a brief description of hazard mitigation planning, local mitigation plan requirements, and an outline of the 2017 MJLHMP. There is also an overview of FEMA programs and grants related to hazard mitigation.

The DMA 2000 provides the legal basis for the FEMA mitigation planning requirements for local, State, and Indian Tribal governments as a condition of mitigation grant assistance. The DMA 2000 mitigation planning provisions, along with other sections of the Act, provide a significant opportunity to reduce disaster losses across the nation. The language in DMA 2000, taken as a whole, emphasizes the importance of strong State, Tribal, and local planning processes, and comprehensive mitigation program management at the State level. FEMA strongly believes that with hazard mitigation planning, as with most similar efforts, the actual process of planning is as important as the resultant plan. Therefore, we consider the plan as the written record, or documentation, of the planning process or development of a product (such as goals, or hazard identification).

The development, approval, and implementation of this MJLHMP can dramatically reduce future risk and loss by evaluating risk and identifying mitigation actions. The MJLHMP will also assist the County in qualifying for several types of funding offered by FEMA including Pre-Disaster Mitigation (PDM) funds (funding for projects that are implemented before a disaster occurs) and HMGP (post-disaster funds for hazard reduction projects). In addition, the MJLHMP improves the County's access to other types of Federal disaster assistance, including funds for permanent repairs. This increased eligibility for grant programs affords the County an opportunity to prepare for the future and work with neighbors to protect the local community.

# Matheny Tract Climate Adaptation Plan

---

The County's MJLHMP has been developed to provide a living document that meets the requirements of DMA 2000 that will reduce risks posed by hazards in order to protect the community. Regular updates the MJLHMP are required to comply with the guidance of DMA 2000. The current MJLHMP was completed in 2011 and has not been updated. Completion of this updated MJLHMP and approval by FEMA will support efforts to reduce hazards to County communities, and to apply for HMGP funding. Both pre- and post-disaster hazard mitigation grants are available. Post-disaster funding, which can be used to enhance the resiliency of facilities, is governed by Section 406 of the Stafford Act, 42 U.S.C. 5172. The Stafford Act provides FEMA with the authority to fund cost-effective mitigation measures under the Public Assistance program in conjunction with the repair of disaster-damaged public facilities.

As the costs of damage from natural disasters continue to increase, governmental and local agencies, as well as the general public, have come to realize the importance of identifying effective ways to reduce vulnerability and losses. The MJLHMP assists entities and jurisdictions in reducing impacts from hazards by recognizing vulnerability in relation to risk, identifying resources, creating an orderly data collection process and developing strategies for risk reduction, while helping to guide and coordinate mitigation activities. The resources and information within the MJLHMP:

- Establish a basis for coordination and collaboration among agencies and the public
- Assist in the integration of mitigation goals and objectives with other County and community plans
- Identify existing mitigation projects and prioritize future projects
- Assist in meeting the requirements of Federal mitigation programs
- Lay the foundation for future MJLHMP updates and MJLHMP maintenance

In addition, the MJLHMP is designed to ensure the long-term values of the community are not compromised in the course of preparing for, responding to or recovering from, natural and manmade hazards.

## Tulare County's General Plan Safety Element

### Assembly Bill 2140 (AB 2140)

The California Disaster Assistance Act limits the State share for any eligible project to no more than 75% of total State-eligible costs, except that the State share shall be up to 100% of total State-eligible costs connected with certain events. AB 2140 prohibits the State share for any eligible project from exceeding 75% of total State-eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan in accordance with DMA 2000 as part of the safety element of its general plan, in which case the State may exceed the State share of 75% for total state eligible costs.

In addition, the California Government Code, Sections 8685.9 and 65302.6, authorizes the State to provide for a State share of local costs that exceeds 75% of total state eligible costs where the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan in accordance with DMA as part of the safety element of its general plan adopted pursuant to subdivision (g) of Section 65302.

# Matheny Tract Climate Adaptation Plan

---

## Relevant State and Regional Planning Initiatives

### Tulare County's Blueprint Vision

The Tulare County Association of Governments (TCAG) participated in the San Joaquin Valley Blueprint project that developed a vision for development in the San Joaquin Valley to year 2050. TCAG then developed a Regional Blueprint Vision for Tulare County. The vision statement is as follows:

- To preserve and enhance the Tulare County region's unique features—it's vibrant and culturally diverse communities, its rivers, farmland, mountains, recreational opportunities, natural areas, and national parks. To promote sustainability through a well-trained and educated workforce, and a healthy and diverse economy. To ensure that the urban and rural areas of the County are thriving and residents can enjoy a well-planned, well-designed, and maintained land use structure and transportation system that offers a variety of housing choices, mixed uses, and numerous ways to get from place to place (TCAG 2009).

## Community Survey and Results

The Transformative Climate Communities (TCC) survey was distributed to the community through door-to-door outreach, distribution at the local Elementary school, and focus groups during the TCC - community meetings. The survey contained questions regarding what environmental challenges such as air quality and high temperatures impact their daily lives and quality of life. The survey also included questions that allowed residents to choose, which projects they would like to see most in their community. Some of the most popular projects that the survey showed includes:

- Safety and infrastructure projects including street lights (68.4%)
- Access to solar energy either via community solar or solar panels for homes (63.2%)
- Transit projects such as more bus routes, bus shelters, and electric vehicle-sharing programs (54.4%)
- Home-assistance programs that do target improvements for safety and sanitation purposes (52.6%) and home energy efficiency programs through weatherization and electrification programs (47.4%).

This was followed by a strong need for community green spaces such as parks, street drainage due to street flooding, and air monitoring systems.

#### ■ Community Survey Results (60 Surveys Collected) \*

##### Community Priorities

- Street lights
- Bike lanes/ Street Improvements/Sidewalks
- Transit Projects
- Home Improvements (Energy Efficiency)
- Stormwater Drainage
- Air/Water Quality
- Housing Safe and Sanitary
- Public Health

## Matheny Tract Climate Adaptation Plan

---

- Infrastructure
- Solar to reduce energy costs

\* Public comment: Concerns regarding odor from groundwater recharge basins south of the community.

# Matheny Tract Climate Adaptation Plan

Transformative Climate Communities - Matheny Tract Needs Assessment Strengths Opportunities and Weaknesses.

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>● Community collaboration with government and CBOs.</li> <li>● Palo Verde Elementary</li> <li>● Access to potable water via connection to the City of Tulare’s water system. <ul style="list-style-type: none"> <li>○ Possible future connection to sewer service.</li> </ul> </li> <li>● There are 3 churches in Matheny Tract that may be used for meeting spaces and community events.</li> <li>● Cost of living is low relative to bigger towns and cities.</li> </ul>	<p style="text-align: center;"><b>Opportunities</b></p> <ol style="list-style-type: none"> <li>1. Existing TCAT service that can be improved with more frequent routes.</li> <li>2. Electrification projects through TCC funds can offset the burden of high energy and gas bills.</li> <li>3. Vacant lots available for desired projects such as parks, community centers, community solar site or green spaces.</li> </ol>
<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>● Lack of: <ul style="list-style-type: none"> <li>○ Sidewalks</li> <li>○ Street lights with adequate illumination</li> <li>○ Street drainage</li> </ul> </li> <li>● Poor street/road conditions such as potholes, unpaved roads, and cracks.</li> <li>● Active transportation opportunities are lacking. <ul style="list-style-type: none"> <li>○ Can be repaired with bike lanes, sidewalks, pathways.</li> </ul> </li> <li>● Transportation and financial barriers in accessing healthy food. Local gas station serves overpriced snacks and no fresh food.</li> <li>● Growing homeless population on the edges of the community have led to security and safety concerns among residents. Other residents have also voiced the need for local and state governments to offer assistance to the growing population.</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>● Proximity to agricultural and industrial sites leads to increased resident exposure to pesticides/dust, pollutants (PM 2.5, NOx) from nearby freeway and diesel trucks. <ul style="list-style-type: none"> <li>○ <b>Related:</b> Poor air quality impacting resident health.</li> </ul> </li> <li>● Impaired homes with weatherization needs and improvements lead to high and unaffordable energy bills for many residents.</li> <li>● Extreme temperatures during the summertime strains resident budgets due to high energy bills and also to sizable resident population without AC (swamp coolers).</li> </ul>



# Matheny Tract Climate Adaptation Plan

---

## Chapter 4 Climate Change Exposures

### CalEnviroScreen Introduction and Methodology

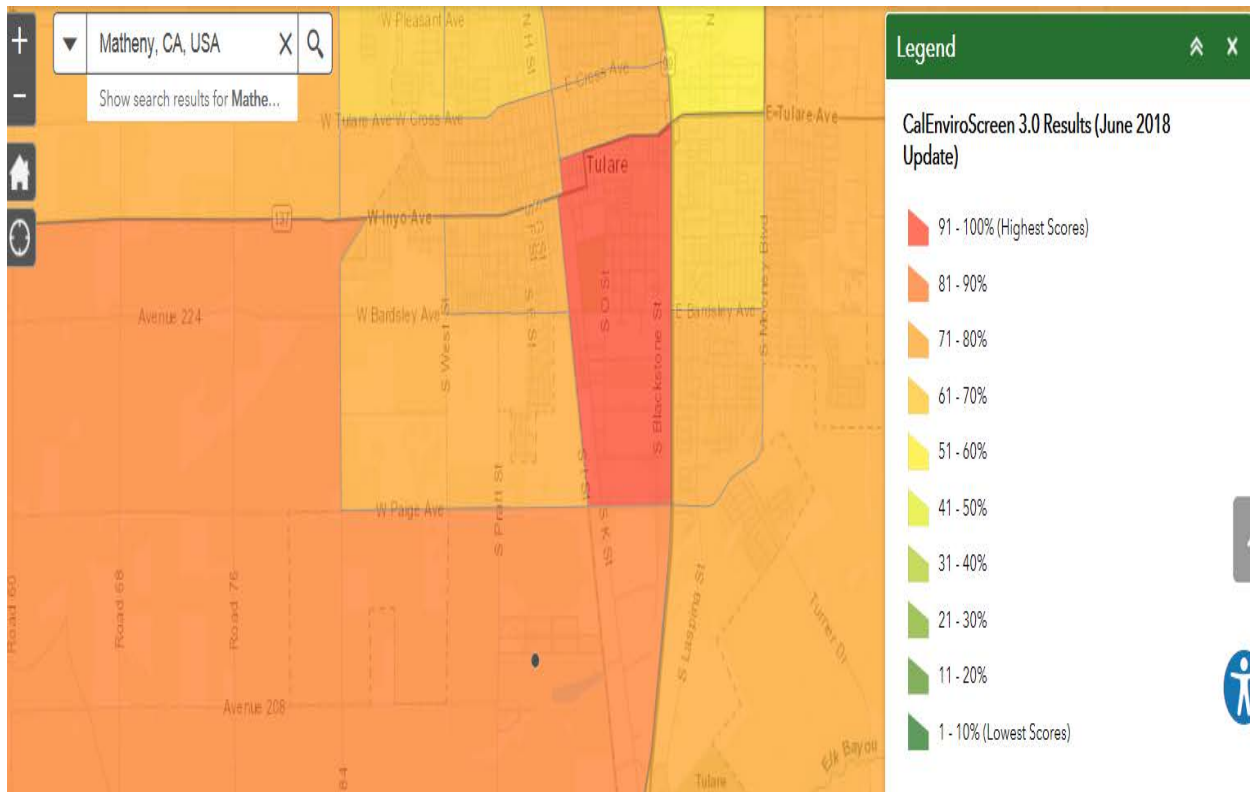
CalEnviroScreen uses a science-based method for evaluating multiple pollution sources in a community while accounting for a community's vulnerability to pollution's adverse effects. CalEnviroScreen identifies communities most burdened by pollution from multiple sources and most vulnerable to its effects, taking into account the socioeconomic and health status of people living in those communities. In doing so, CalEnviroScreen continues to:

Produce a relative, rather than absolute, measure of pollution's impacts and vulnerabilities in California communities.

- Provide a consistent assessment and methodology with prior versions of the tool that has been expanded and updated with additional information.
- Evaluate multiple pollution sources, and stressors that measure a community's vulnerability to pollution.
- Provide a broad picture of the burdens and vulnerabilities that communities confront from environmental pollutants.
- Rely on the use of indicators that are measured or estimated and affect the resulting impact score.
- Analyze the data and present results at the census tract scale.
- The model is made up of multiple components cited in the above definition as contributors to cumulative impacts. The model includes two components representing Pollution Burden – Exposures and Environmental Effects – and two components representing Population Characteristics – Sensitive Populations (e.g., in terms of health status and age) and Socioeconomic Factors.
- Uses a suite of statewide indicators to characterize both Pollution Burden and Population Characteristics.
- Uses a limited set of indicators in order to keep the model simple.
- Uses percentiles to assign scores for each of the indicators in a given geographic area. The percentile represents a relative score for the indicators.
- Uses a scoring system in which the percentiles are averaged for the set of indicators in each of the four components (Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors).
- Combines the component scores to produce a CalEnviroScreen score for a given place relative to other places in the state. Characteristics, the scores are combined to calculate the overall CalEnviroScreen Score.

# Matheny Tract Climate Adaptation Plan

**Figure 4-1 CalEnviroScreen 3.0 Results (June 2018 Update)**



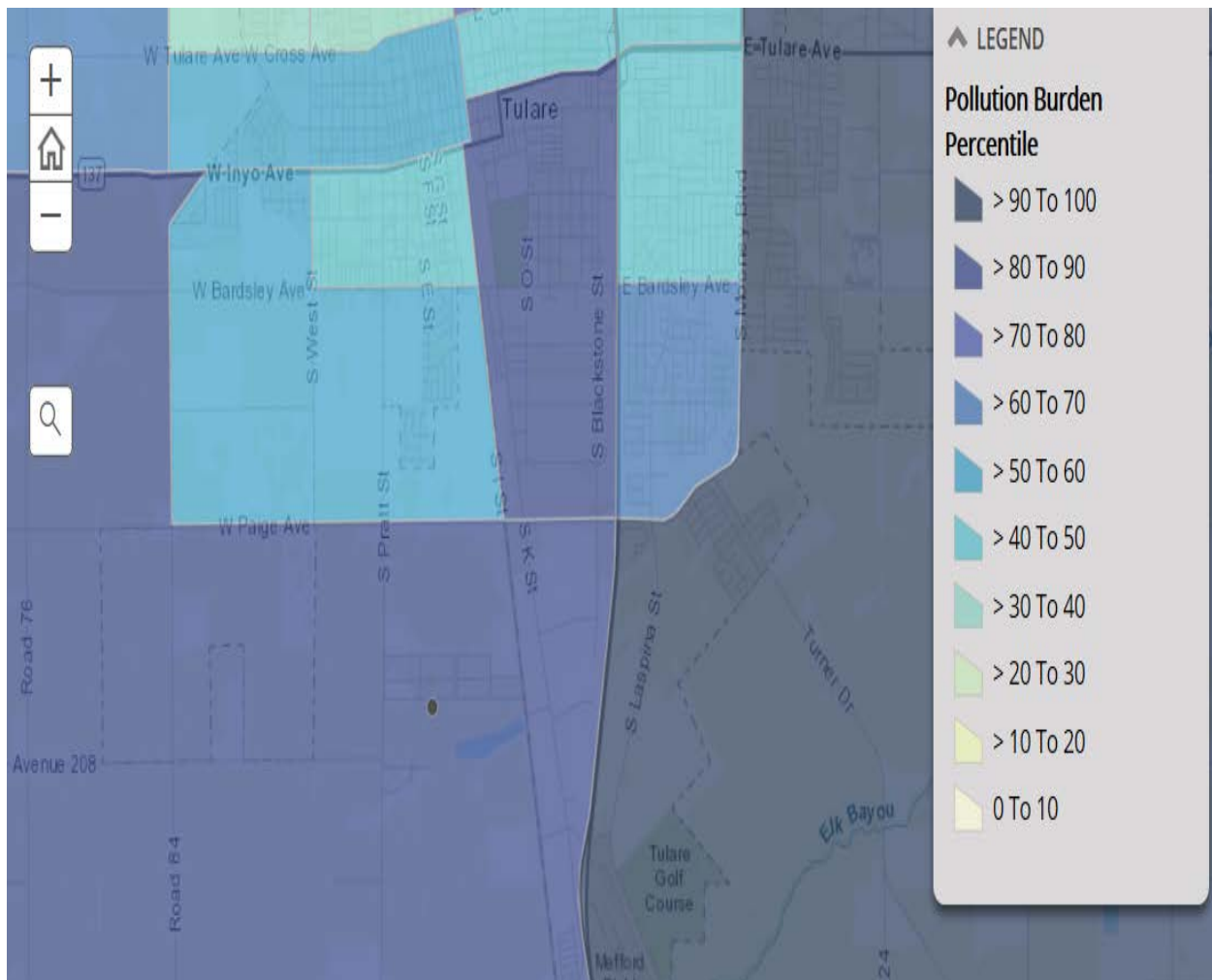
The overall CalEnviroScreen score is calculated by multiplying the Pollution Burden and Population Characteristics scores. After multiplying Pollution Burden and Population Characteristic scores to produce an overall CES score for each census tract, all census tracts are then ordered from highest to lowest, and are then assigned a percentile rank. The percentile ranking for each census tract demonstrates the tract's degree of burdens relative to the rest of the state's census tracts. Since each group has a maximum score of 10, the maximum CalEnviroScreen Score is 100. The CalEnviroScreen cumulative score for the Matheny Tract is 85-90%.

# Matheny Tract Climate Adaptation Plan

## Pollution Burden

Pollution burden represents the potential exposures to pollutants and the adverse environmental conditions caused by pollution. It includes measurements of potential pollution exposures such as air quality, drinking water contamination, pesticide use, toxins from facilities, and traffic density. It also includes measurements of several environmental effects including cleanup sites, impaired bodies of water, groundwater threats, and hazardous and solid waste facilities. The Pollution Burden Score is a good overall measure of pollution concentration in an area that includes both air and water components. The CalEnviroScreen pollution burden score for the Matheny Tract is 85%.

**Figure 4-2 Pollution Burden**

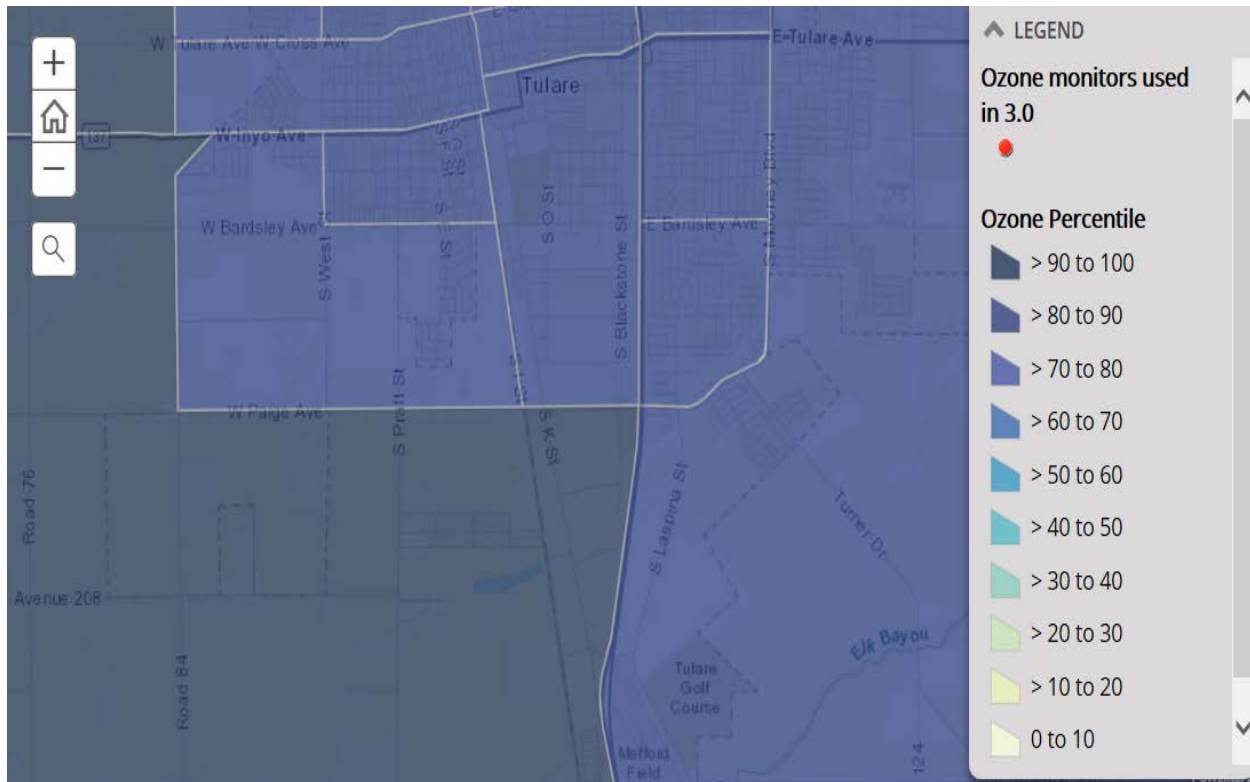


# Matheny Tract Climate Adaptation Plan

## Ozone

Ozone is the main ingredient of smog. At ground level, ozone is formed when pollutants chemically react in the presence of sunlight. The main sources of ozone are trucks, cars, planes, trains, factories, farms, construction, and dry cleaners. Ozone can irritate the lungs, cause inflammation, and make chronic illnesses worse, even at low levels of exposure. Children and the elderly are sensitive to the effects of ozone. Ozone levels are highest in the afternoon and on hot days. People who spend a lot of time outdoors may also be affected by ozone. The indicator is the mean of summer months (May - October) of the daily maximum 8-hour ozone concentration (ppm). This measurement is used to represent short-term ozone health impacts. The data is from 2012 to 2014. This census tract has a summed concentration of 0.062 parts per million (ppm). The ozone percentile for this census tract is 91, meaning the summed concentration is higher than 91% of the census tracts in California. Ozone concentrations in California range between 0.026 - 0.068 ppm.

Figure 4-3 Ozone

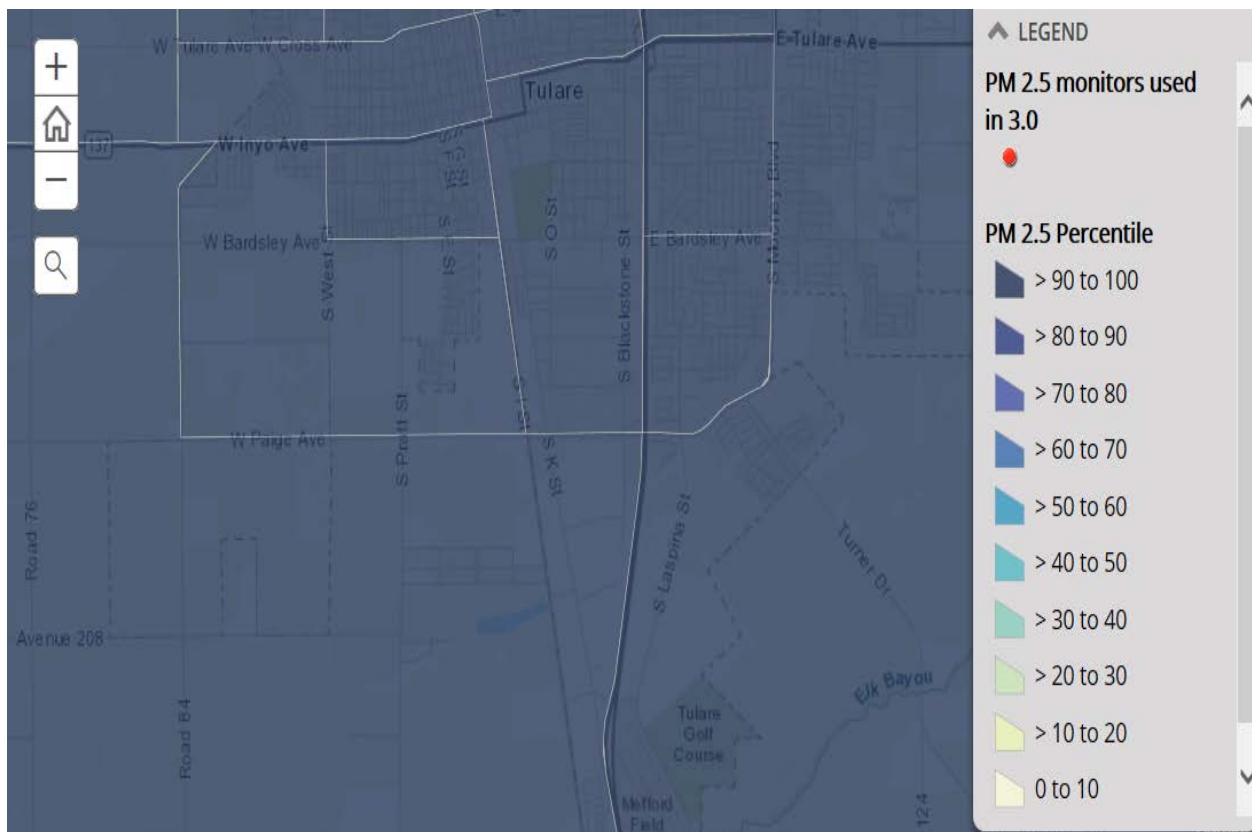


# Matheny Tract Climate Adaptation Plan

## PM 2.5

Particulate matter or PM 2.5 is very small airborne particle pollution (less than 2.5 micrometers), which is less than the thickness of a human hair. PM 2.5 is a mixture of particles that can include organic chemicals, dust, soot and metals. These particles can come from cars and trucks, factories, wood burning, and other activities. They can travel deep into the lungs and cause various health problems including heart and lung disease because they are so small. Children, the elderly, and people suffering from heart or lung disease, asthma, or chronic illness are most sensitive to the effects of PM 2.5 exposure. The indicator represents the average concentration of fine particulate matter, or PM 2.5, in the air. The data is from 2012 to 2014. This census tract has a concentration of 17.080 micrograms per meter cubed (17.080  $\mu\text{g}/\text{m}^3$ ). The PM 2.5 percentile for this census tract is 99, meaning it is higher than 99% of the census tracts in California.

**Figure 4-4 PM 2.5**

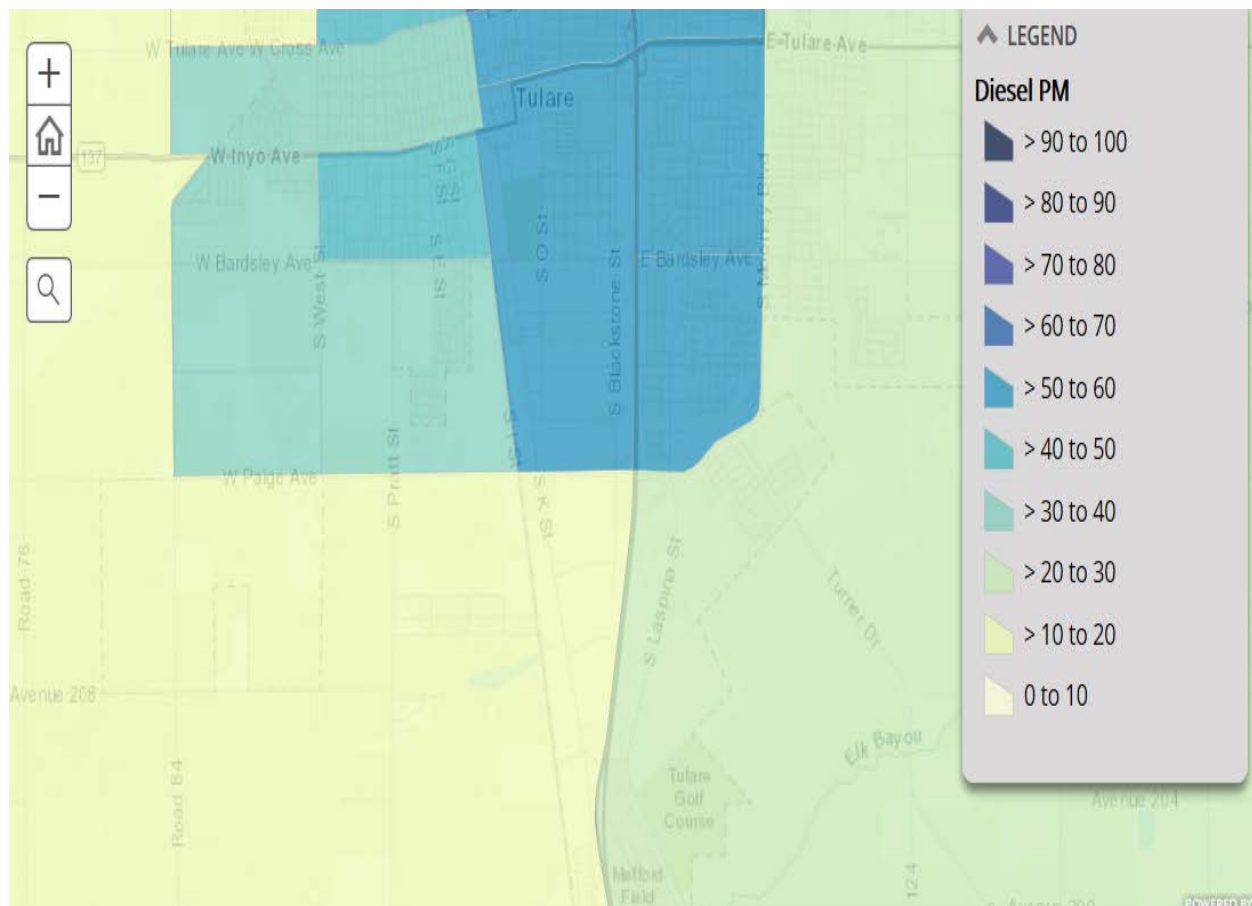


# Matheny Tract Climate Adaptation Plan

## Diesel PM

Exhaust from trucks, buses, trains, ships and other equipment with diesel engines contains a mixture of gases and solid particles. These solid particles are known as diesel particulate matter (diesel PM). Diesel PM contains hundreds of different chemicals any of these are harmful to health. The highest levels of diesel PM are near ports, rail yards and freeways. The particles in diesel PM can reach deep into the lung, where they can contribute to health problems including eye, throat and nose irritation, heart and lung disease, and lung cancer. Children and the elderly are most sensitive to the effects of diesel PM. This indicator represents how much diesel particulate matter (PM) is emitted into the air within and nearby the populated parts of the census tracts. The data is from 2012. Sources of diesel PM within and nearby the populated parts of this census tract emit 5.26 kilograms per day. The diesel PM percentile for this census tract is 14, meaning it is higher than 14% of the census tracts in California. Diesel emissions in California range between 0 - 254 kilograms per day.

**Figure 4-5 Diesel PM**



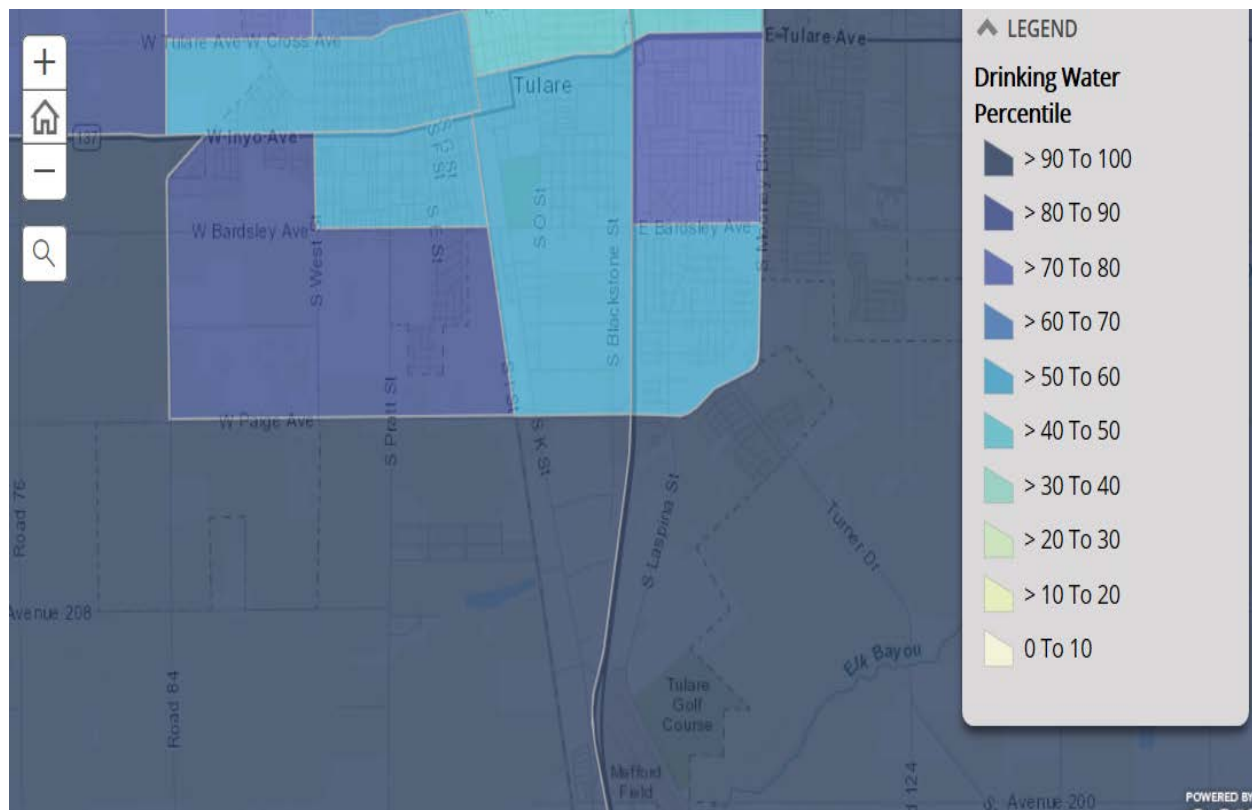


# Matheny Tract Climate Adaptation Plan

## Drinking Water

Most drinking water in California meets health standards. However, drinking water sometimes becomes contaminated with chemicals or bacteria above the standards. Both natural and human sources can contaminate drinking water. Natural sources include rocks, soil, wildlife and fires. Human sources include factories, sewage, and runoff from farms. One common contaminant, arsenic, occurs naturally in some rocks and soil and is often found in groundwater in California. It can cause cancer. Nitrate from fertilizer or manure can leach into groundwater and contaminate wells. Nitrate can cause a blood disorder in infants called blue baby syndrome. This indicator is an index for a select number of contaminants found in drinking water. Average concentrations of contaminants and average violations are ranked by census tract and assigned percentiles. The data is from 2005 to 2013, the most recent complete compliance cycle. The drinking water contaminant score for this census tract is 881.67, which is the sum of the contaminant and violation percentiles. The drinking water contaminant percentile is 94, meaning it is higher than 94% of the census tracts in California.

**Figure 4-6 Drinking Water**

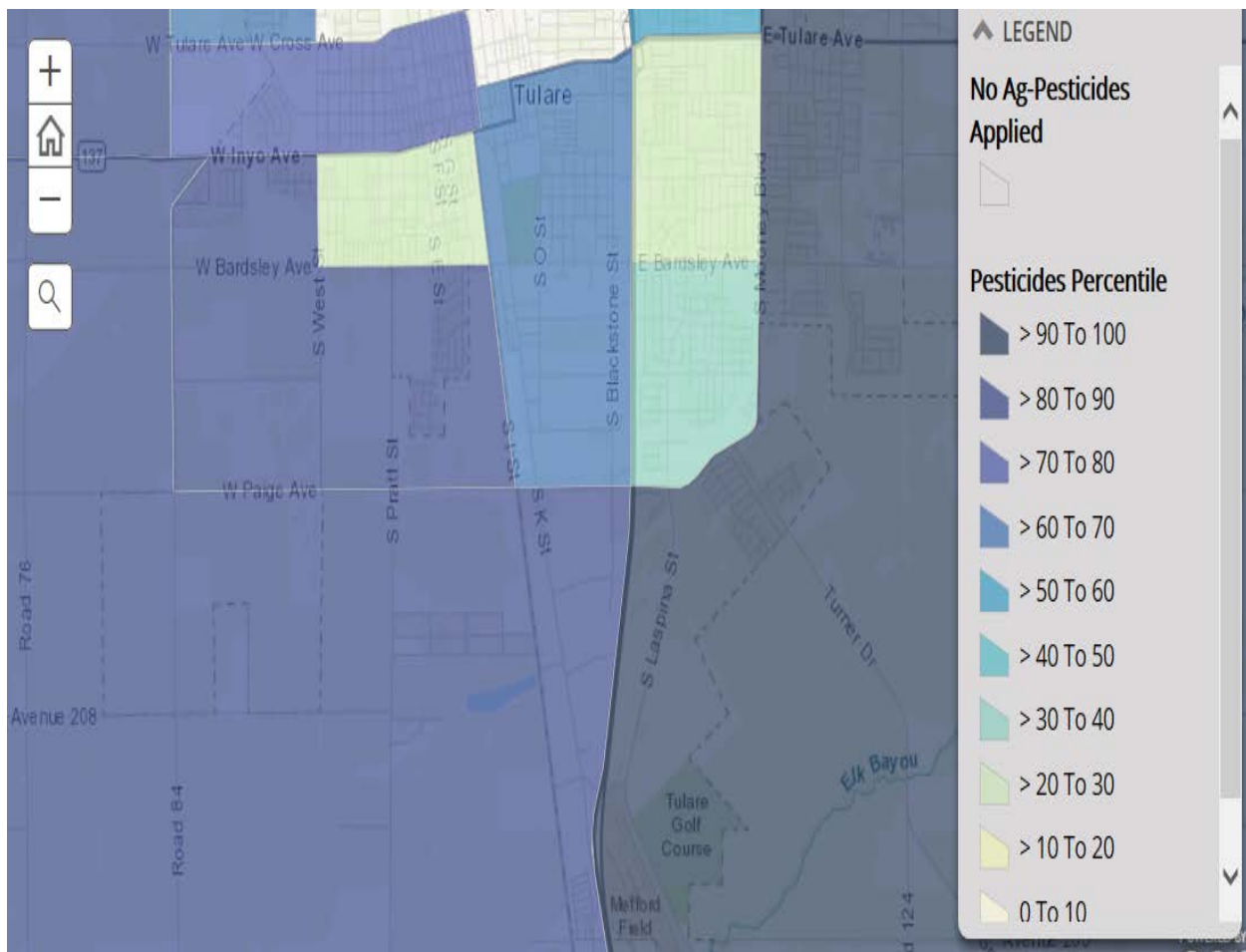


# Matheny Tract Climate Adaptation Plan

## Pesticides

Pesticides are chemicals used to control insects, weeds and plant diseases. Over 1,000 pesticides are registered for use in California. They are applied to fields by air, by farm machinery, or by workers on the ground. Farmworker families and other people who live near fields can be exposed to pesticides, both outdoors and inside homes. Exposure to high levels of some pesticides can cause illness right away or conditions such as birth defects or cancer later in life. This indicator represents the reported use of 70 hazardous and volatile pesticides in 2012-2014. Only pesticides used on agricultural commodities are included in the indicator. The data is averaged over the census tract area, and some application may be adjacent to (instead of within) the census tract. This census tract has an estimated 202.565 pounds of active ingredients used per square mile. The percentile for this census tract is 80, meaning it is higher than 80% of the census tracts in California.

**Figure 4-7 Pesticides**

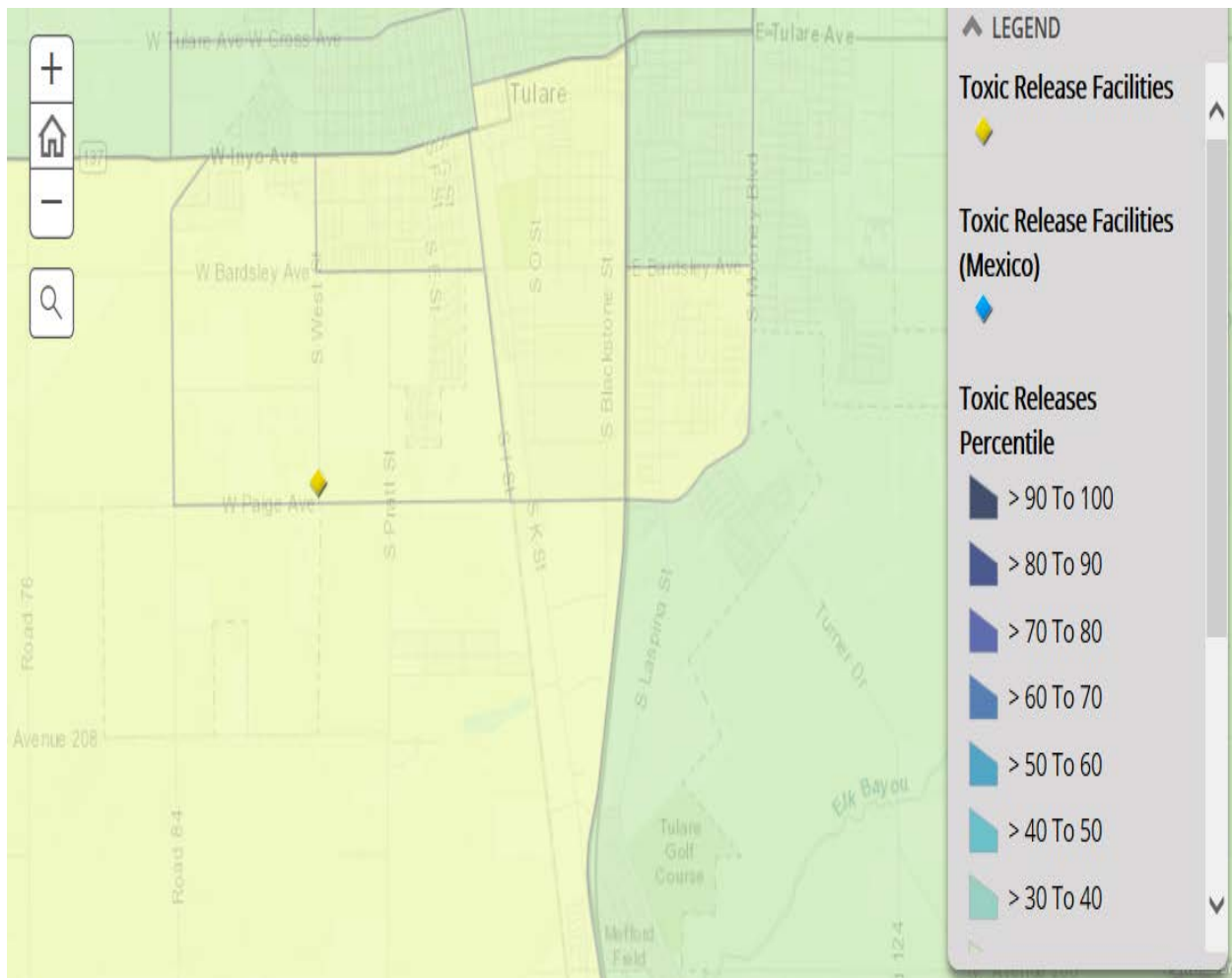


# Matheny Tract Climate Adaptation Plan

## Toxic Releases

Facilities that make or use toxic chemicals can release these chemicals into the air. These chemicals are sometimes detected in the air of communities nearby. People living near the indicator represents modeled air concentration of chemical releases from large facility emissions in and nearby the census tract. This indicator takes the air concentration and toxicity of the chemical to determine the toxic release score. The data is from 2010. The score for this census tract is 43.59. The toxic release percentile for this census tract is 17.76, meaning it is higher than 17.76% of the census tracts in California. Facilities may breathe contaminated air regularly or if contaminants are released during an accident.

**Figure 4-8 Toxic Releases**

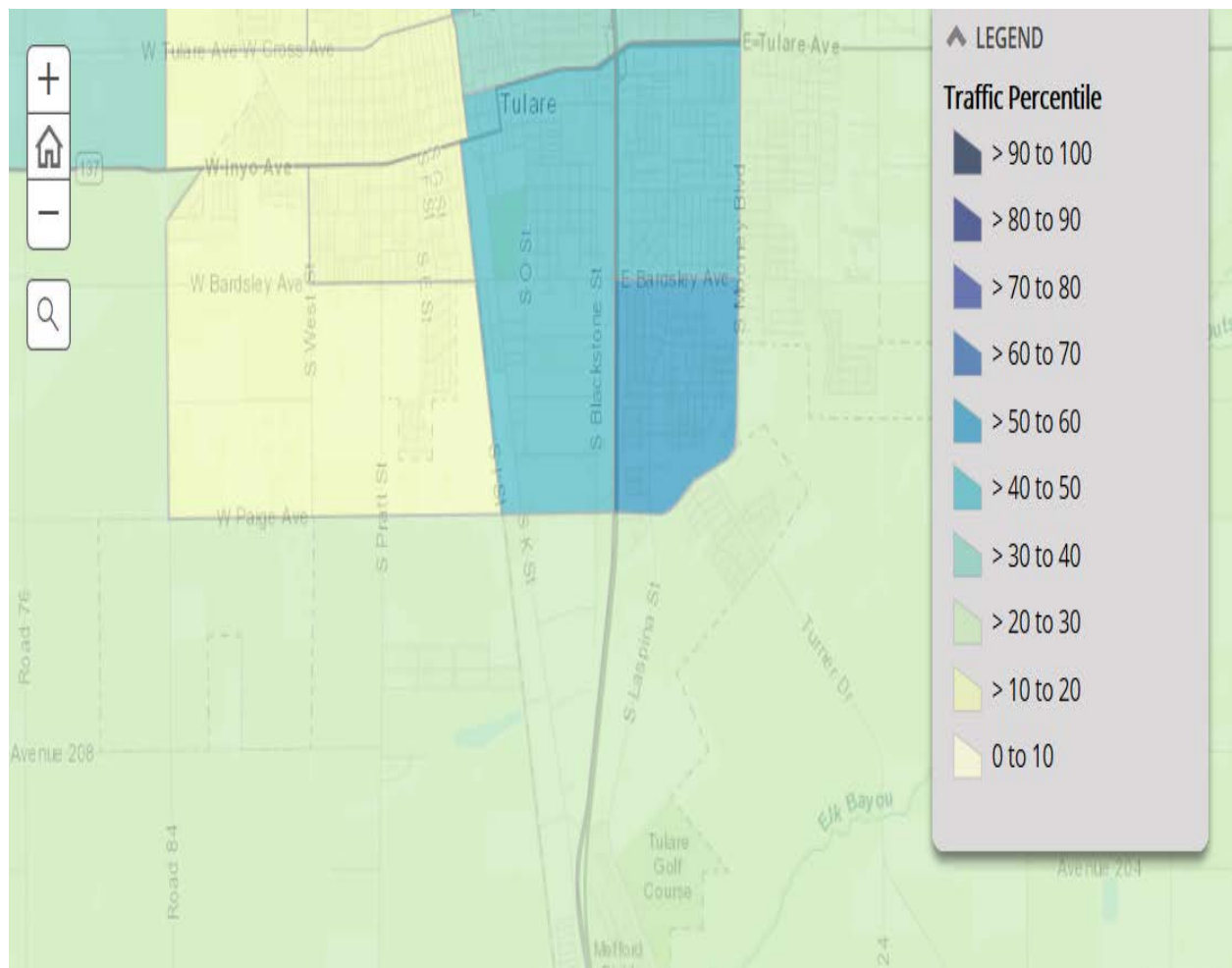


# Matheny Tract Climate Adaptation Plan

## Traffic Density

California has the biggest network of freeways in the country. Its cities are known for heavy traffic. Traffic density is a measure of the number of vehicles on the roads in an area. While California has strict vehicle-emissions standards, exhaust from cars and trucks is the main source of air pollution in much of the state. Major roads and highways can bring air pollutants and noise into nearby neighborhoods. Children who live or go to schools near busy roads have higher rates of asthma than children in areas farther from roads. The traffic density indicator represents the average traffic volumes per amount of roadways. It is calculated by dividing the traffic volumes by the total road length within and 150 meters around the census tract. The data is from 2013. This census tract has a traffic density of 390.07. The traffic density percentile for this census tract is 20, meaning it is higher than 20% of the census tracts in California.

**Figure 4-9 Traffic Density**

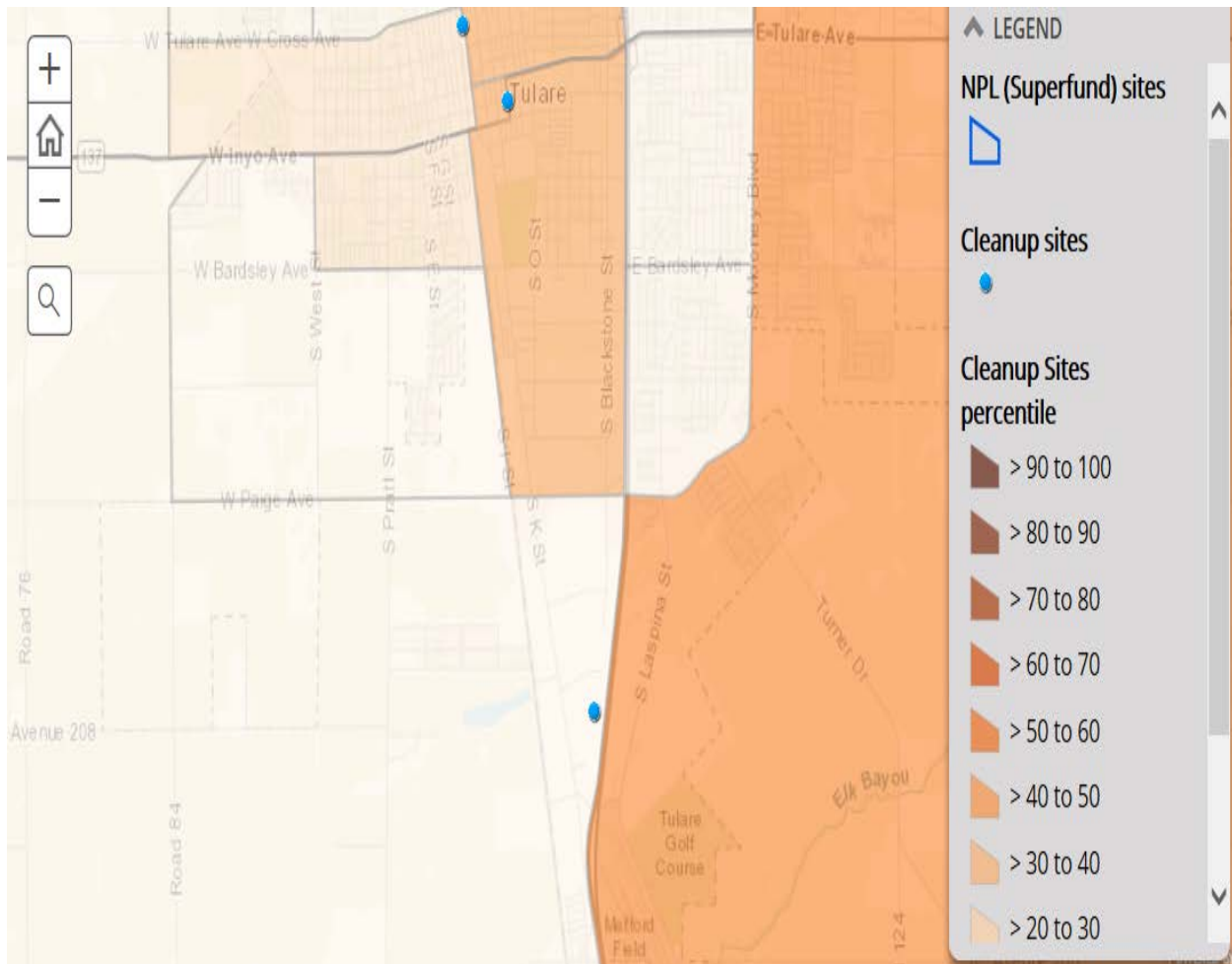


# Matheny Tract Climate Adaptation Plan

## Cleanup Sites

Cleanup sites are places that are contaminated with hazardous chemicals and require clean up by the property owners or government. Chemicals at cleanup sites can move through the air or groundwater. People living near these sites have a greater potential to be exposed to chemicals from the sites than people living further away. Some studies have shown that neighborhoods with cleanup sites are generally poorer and have more people of color than other neighborhoods. The land may take many years or decades to clean up, reducing possible benefits to the community. This indicator is calculated by considering the number of cleanup sites including Superfund sites on the National Priorities List (NPL), the weight of each site, and the distance to the census tract. This tract either contains or is within a kilometer of 1 Cleanup site(s). The cleanups percentile for this census tract is 0, meaning the number and type of cleanup sites is higher than 0% of the census tracts in California.

**Figure 4-10 Clean-Up Sites**

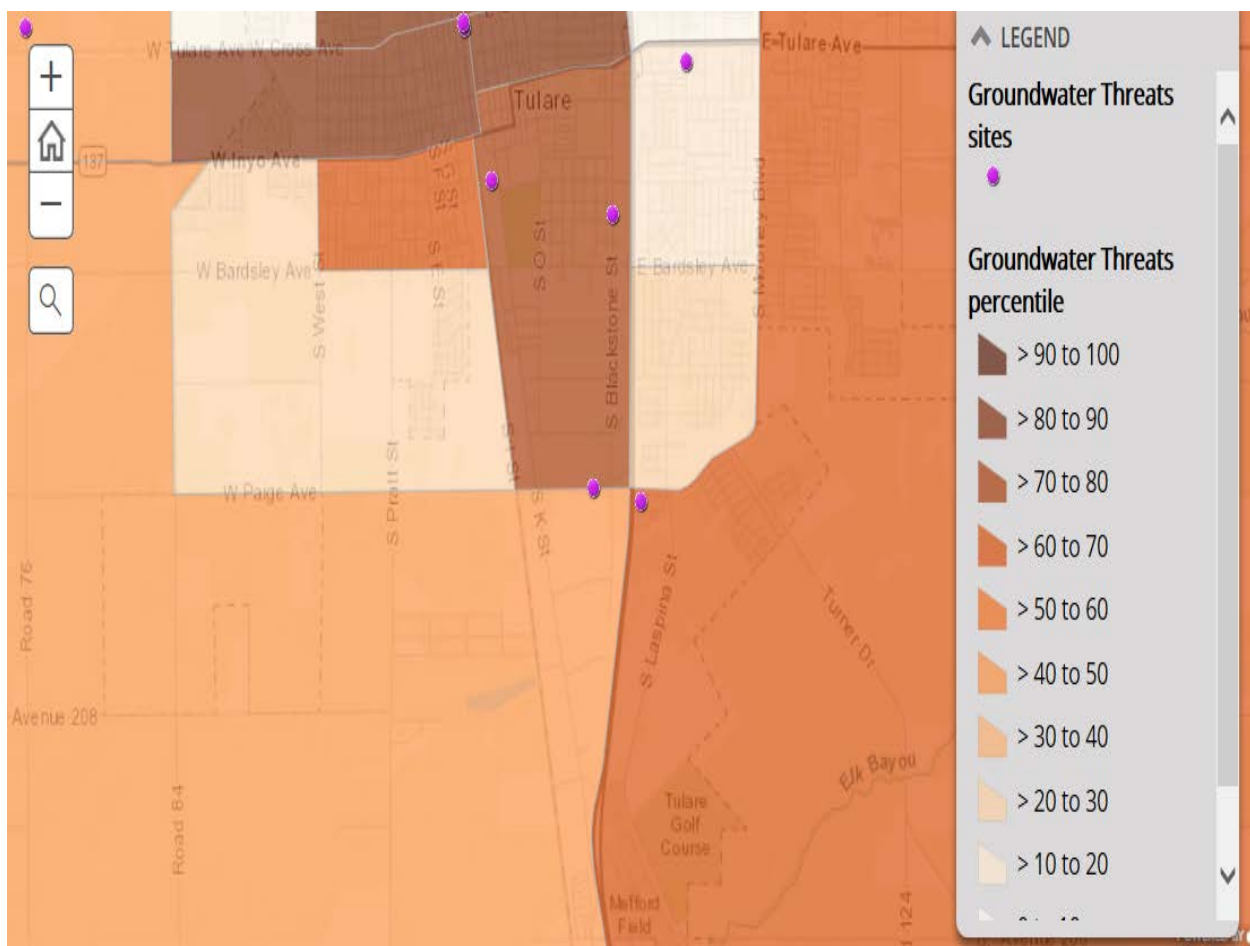


# Matheny Tract Climate Adaptation Plan

## Groundwater

Hazardous chemicals are often stored in containers on land or in underground storage tanks. Leaks from tanks can contaminate soil and groundwater. Common soil and groundwater pollutants include gasoline and diesel fuels at gas stations, as well as solvents, heavy metals and pesticides. Leaking tanks can affect drinking water and expose people to contaminated soil and air. The land and groundwater may take many years or decades to clean up. This indicator is calculated by considering the number of groundwater cleanup sites, the weight of each site, and the distance to the census tract. This tract either contains or is within a kilometer of 4 Groundwater Cleanup site(s). The cleanups percentile for this census tract is 47, meaning the number and type of groundwater threats is higher than 47% of the census tracts in California.

**Figure 4-11 Groundwater**



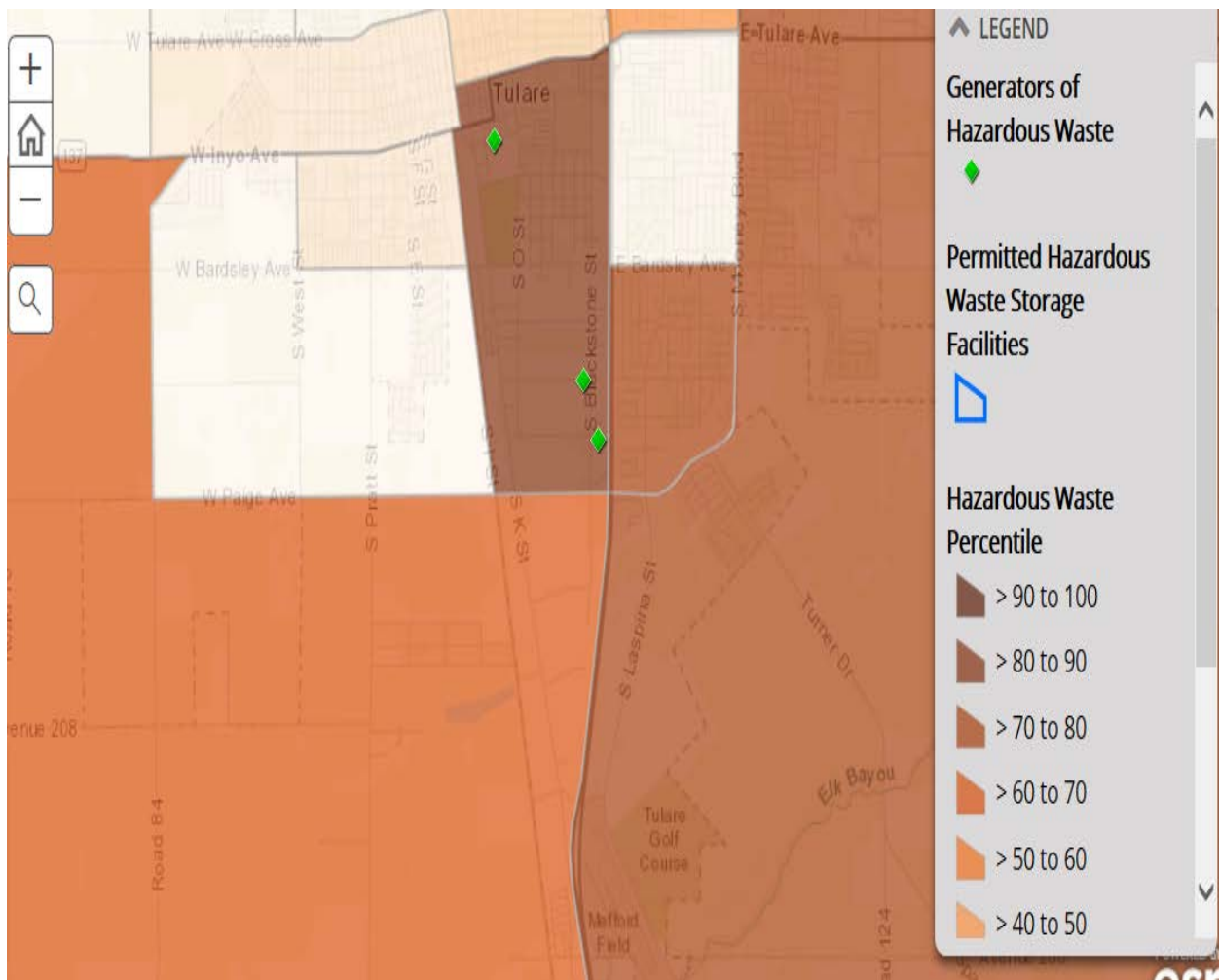


# Matheny Tract Climate Adaptation Plan

## Hazardous Waste

Hazardous waste contains chemicals that may be harmful to health. Only certain facilities are allowed to treat, store or dispose of this type of waste. Hazardous waste can range from used automotive oil to highly toxic waste materials produced by factories and businesses. Hazardous waste is transported from businesses that generate waste to permitted facilities for recycling, treatment, storage or disposal. Studies have found that hazardous waste facilities are often located near poor neighborhoods and communities of color. This indicator is calculated by considering the number of permitted Treatment, Storage and Disposal Facilities (TSDFs) or generators of hazardous waste, the weight of each generator or site, and the distance to the census tract. This tract either contains or is nearby 2 hazardous waste generators and TSDFs. The hazardous waste percentile for this census tract is 67, meaning the number and type of hazardous waste generators and sites is higher than 67% of the census tracts in California.

**Figure 4-12 Hazardous Waste**



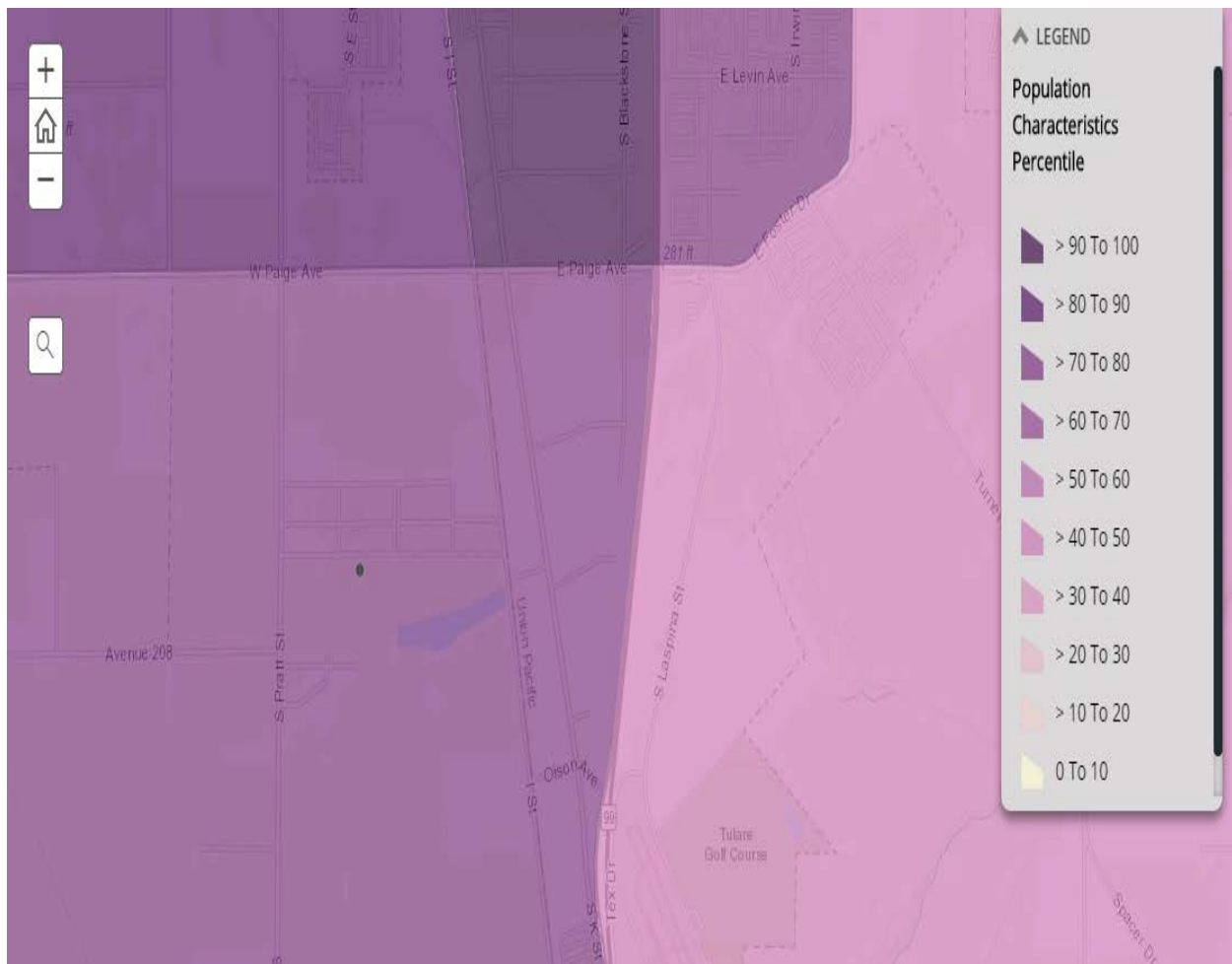


# Matheny Tract Climate Adaptation Plan

## Population Characteristics

This map shows the combined Population Characteristics scores, which is made up of indicators from the Sensitive Populations and Socioeconomic Factors components of the CalEnviroScreen model. Population Characteristics represent biological traits, health status, or community characteristics that can result in increased vulnerability to pollution. The following numbers represent the percentile score for that component or indicator. A higher percentile indicates a higher relative burden. Population Characteristics Percentile: 75, Asthma: 79, Low Birth Weight: 38, Cardiovascular Disease: 78, Education: 85, Linguistic Isolation: 88, Poverty: 90, Unemployment: 67, Housing Burden: 9.

**Figure 4-14 Population Characteristics**

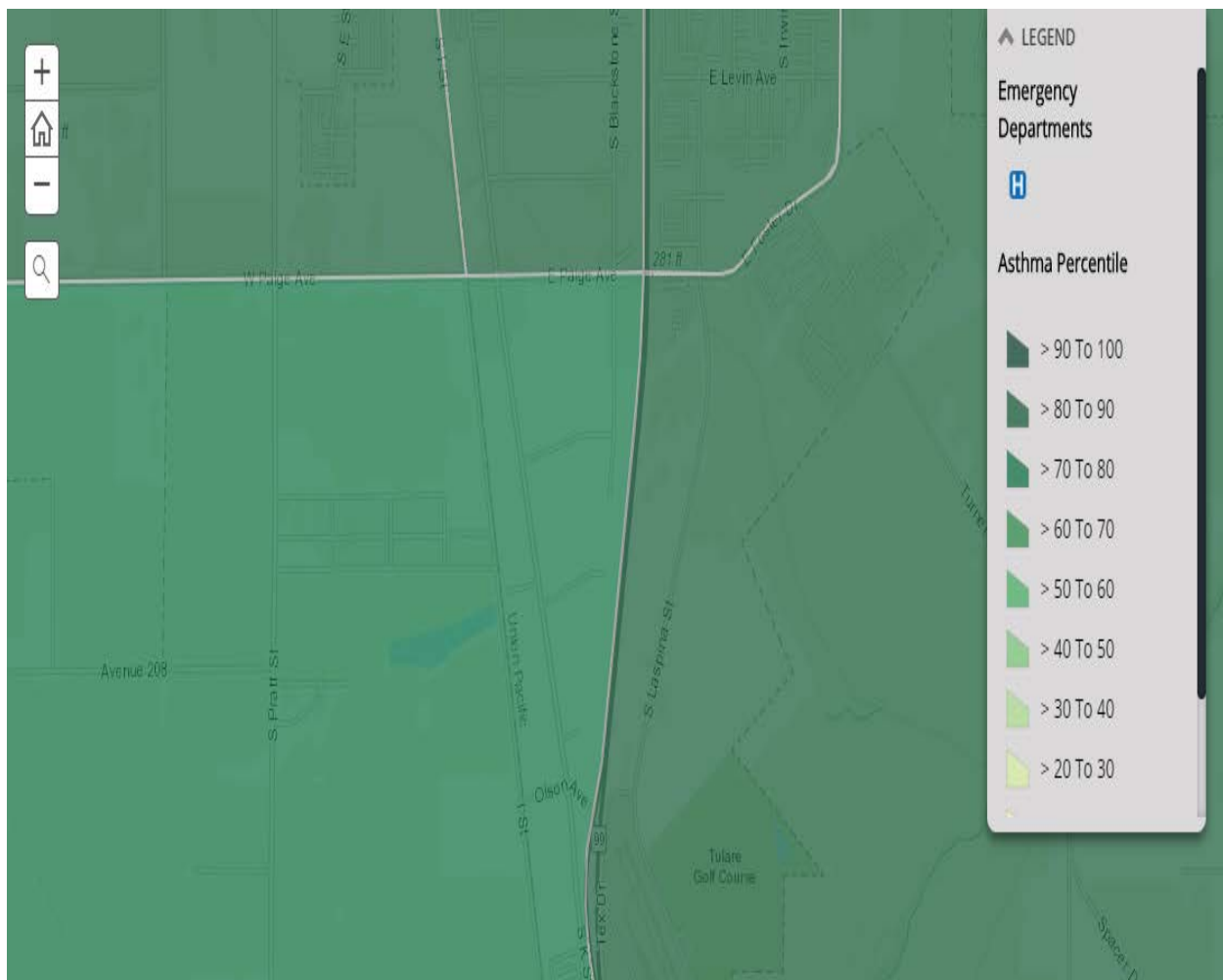


# Matheny Tract Climate Adaptation Plan

## Asthma

Asthma is a disease that affects the lungs and makes it hard to breathe. Symptoms include breathlessness, wheezing, coughing, and chest tightness. The causes of asthma are unknown but both genetic and environmental factors can be involved. Five million Californians have been diagnosed with asthma at some point in their lives. People with asthma can be especially susceptible to pneumonia, flu and other illnesses. Outdoor air pollution can trigger asthma attacks. This indicator represents an asthma rate. It measures the number of emergency department visits for asthma per 10,000 people over the years 2011 to 2013. 70.29 people per 10,000 people in this census tract visited the emergency department for asthma. The asthma percentile for this census tract is 78.86, meaning the asthma rate is higher than 78.86% of the census tracts in California.

**Figure 4-15 Asthma**

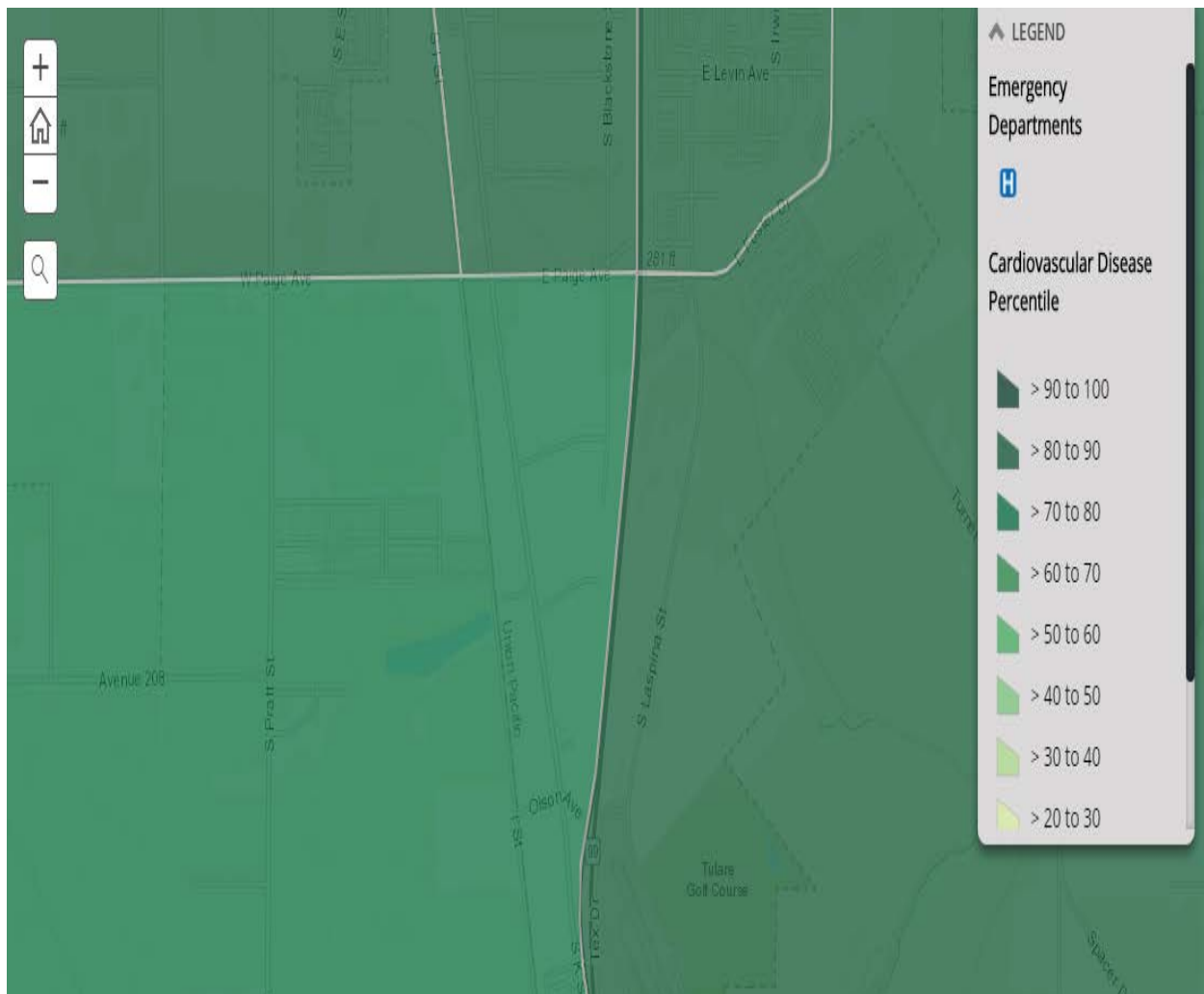


# Matheny Tract Climate Adaptation Plan

## Cardiovascular Disease

Cardiovascular disease refers to conditions that involve blocked or narrowed blood vessels of the heart. A heart attack is the most common result of cardiovascular disease. Many people survive and return to normal life after a heart attack, but quality of life may be reduced. There are many risk factors for developing cardiovascular disease including diet, lack of exercise, smoking and exposure to air pollution. Exposure to outdoor air pollution following a heart attack has been shown to increase the risk of death. In addition to people with a past heart attack, the effects of air pollution may also be greater in the elderly and people with other preexisting health conditions. This indicator represents the rate of heart attacks. It measures the number of emergency department visits for acute myocardial infarction (or heart attack) per 10,000 people over the years 2011 to 2013. 10.42 people per 10,000 in this census tract visited the emergency department for a heart attack. The Cardiovascular Disease percentile for this census tract is 78, meaning it is higher than 78% of the census tracts in California.

**Figure 4-16 Cardiovascular Disease**

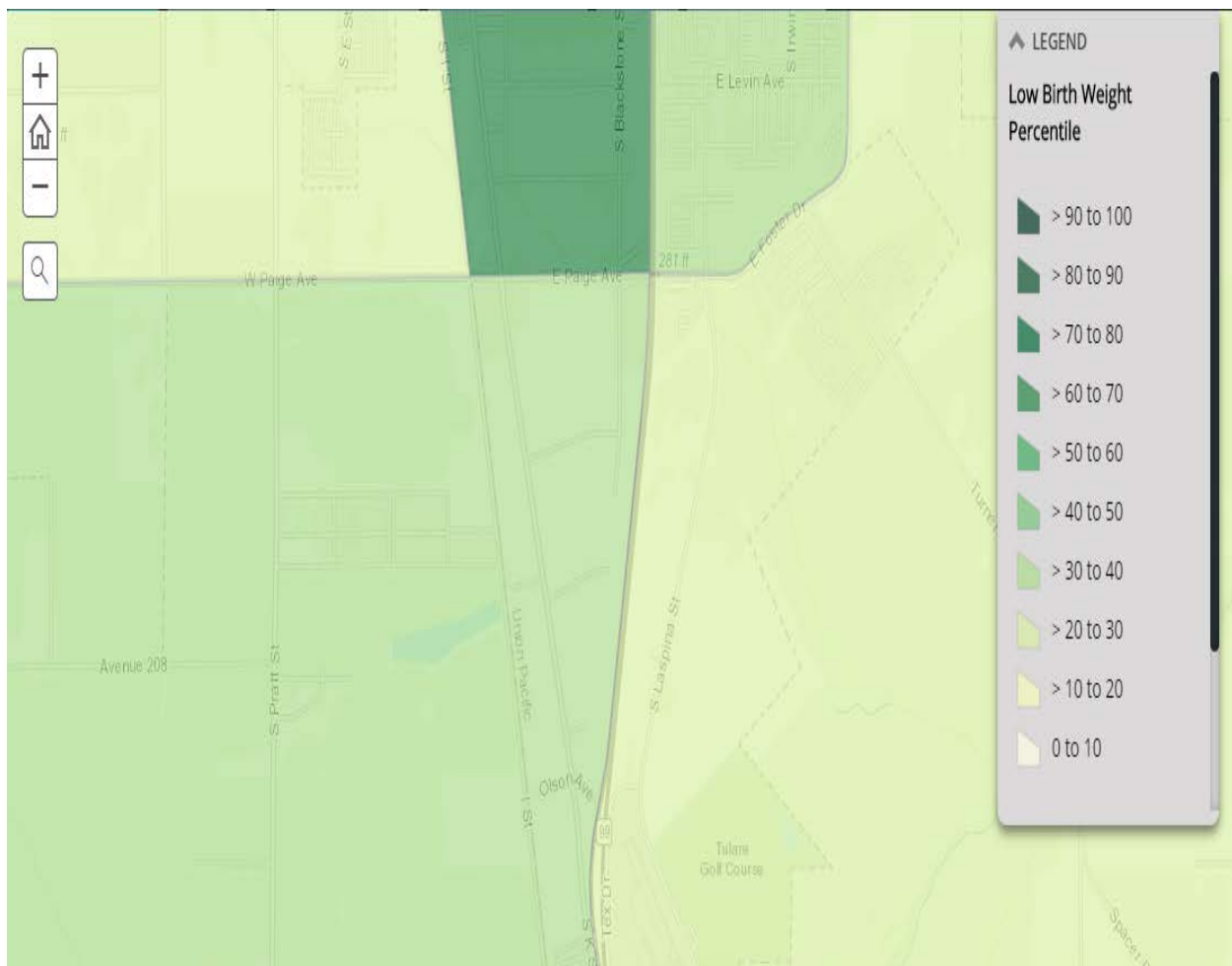


# Matheny Tract Climate Adaptation Plan

## Low Birth Weight

Babies who weigh less than about five and a half pounds (or 2500 grams) at birth are considered low birth weight. Poor nutrition, lack of prenatal care, stress and smoking by the mother are known to increase the risk of having a low birth weight baby. Studies suggest that pollution could also be a factor. Low birth-weight babies may face a greater risk of developing asthma or other chronic diseases later in life. They are also more likely to die as infants than babies who are not born low weight. This indicator represents the percent of low birth weight babies in the census tract. It measures the percentage of babies born weighing less than 2500 grams (about 5.5 pounds) out of the total number of live births over the years 2006 to 2012. 4.48 percent of births in this census tract were low birth weight. The low birth weight percentile for this census tract is 38, meaning the percent low birth weight is higher than 38% of the census tracts in California.

**Figure 4-17 Low Birth Weight**



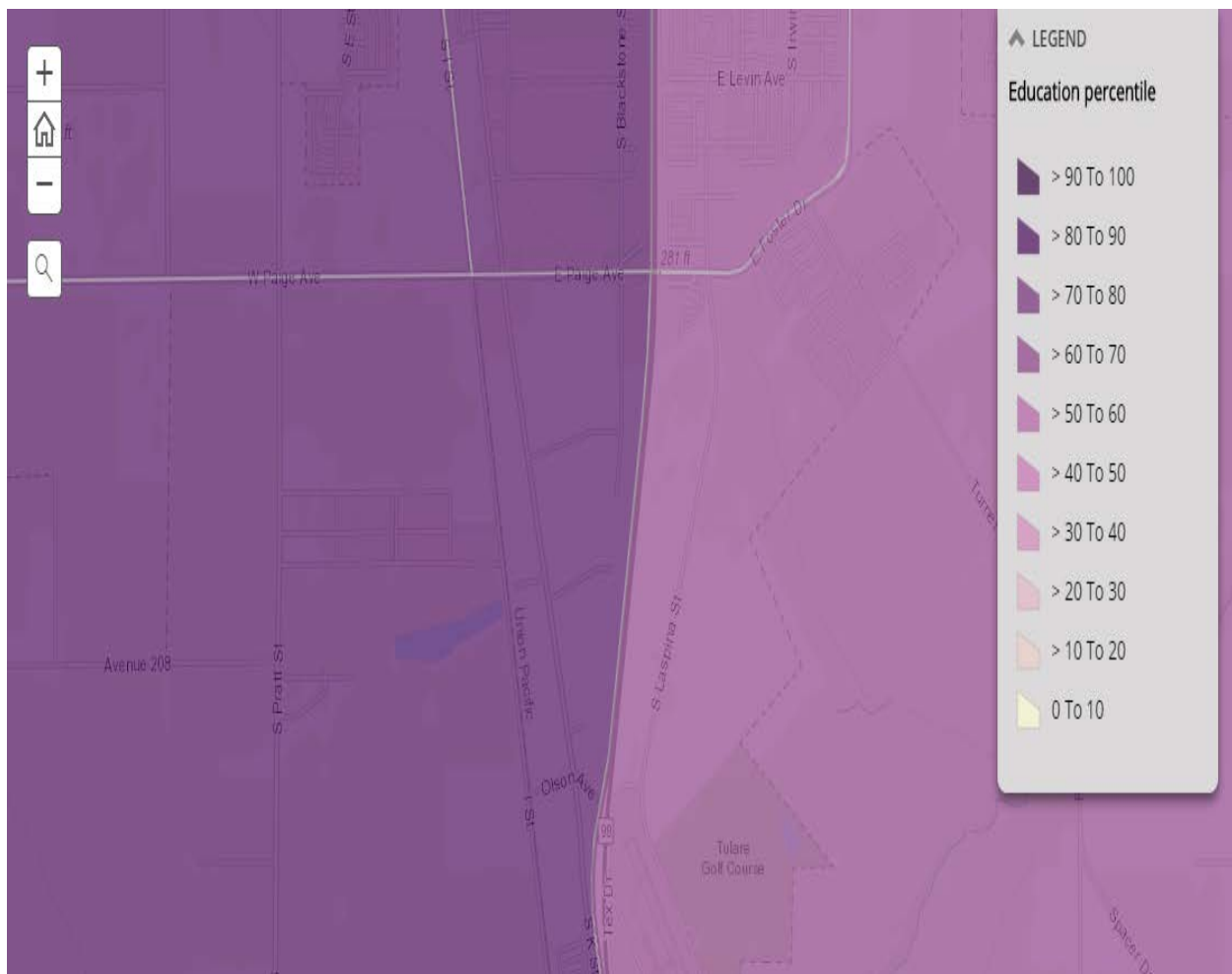


# Matheny Tract Climate Adaptation Plan

## Education

Educational attainment is the highest level of education a person has completed. People with more education usually earn more than people with less education. California has a high percentage of people without high school degrees compared to the rest of the United States, which makes education important to consider. Many studies have found that the health effects of air pollution are worse among people with low educational attainment. The low education indicator measures the percentage of adults over 25 in the census tract with less than a high school education. The data is from 2011 to 2015. 38 percent of adults in this census tract have less than a high school education. The percentile for this census tract is 85, meaning the percent of adults without a high school education is higher than 85% of the census tracts in California.

**Figure 4-18 Education**

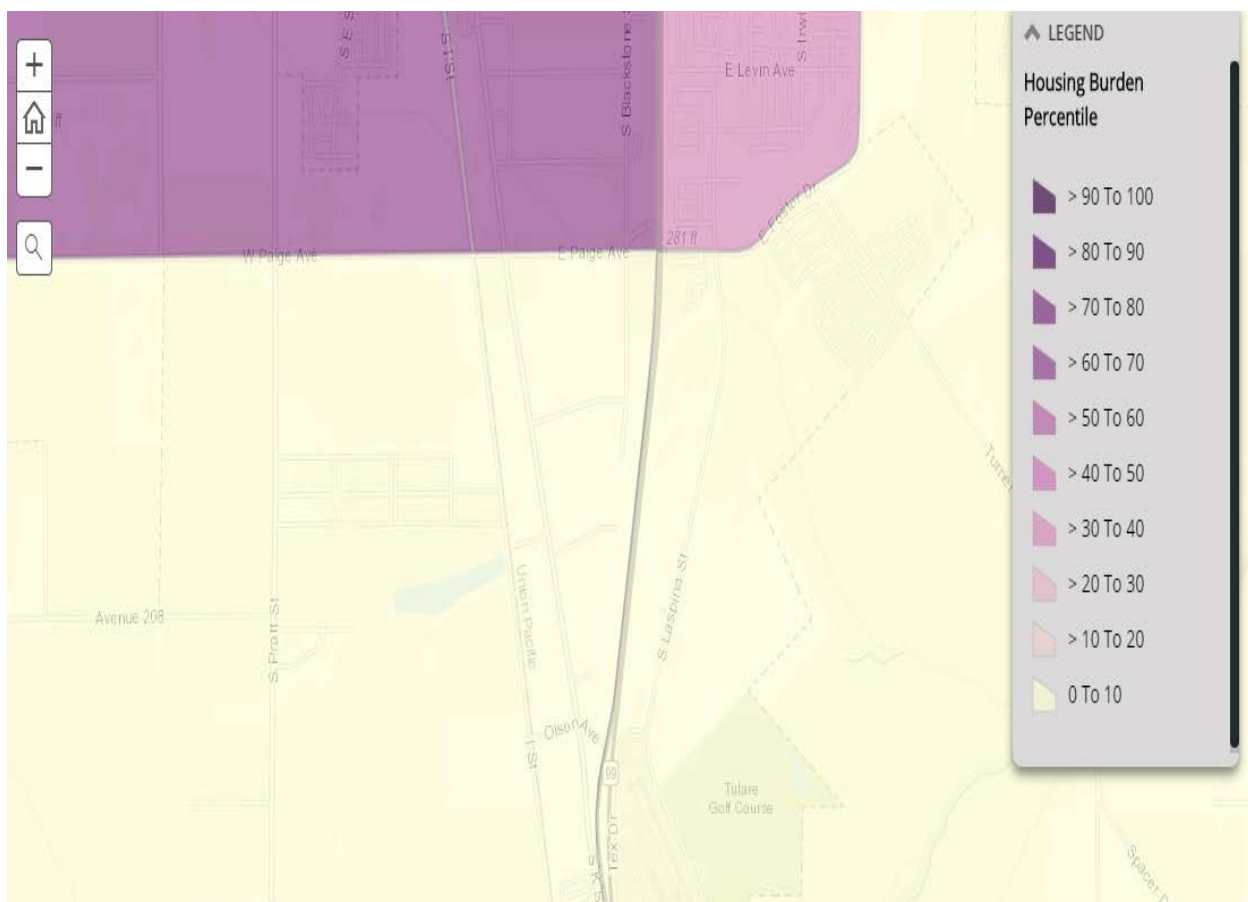


# Matheny Tract Climate Adaptation Plan

## Housing Burden

Housing burdened low income households are households that are both low income and highly burdened by housing costs. California has very high housing costs relative to much of the country, which can make it hard for many to afford housing. Households with lower incomes may spend a larger proportion of their income on housing and may suffer from housing-induced poverty. Housing affordability is an important determinant of health and well-being. Low-income households with high housing costs may suffer adverse health impacts. The housing burden indicator measures the percent of households in a census tract that are both low income (making less than 80% of their counties' median family income) and severely burdened by housing costs (paying greater than 50% of their income to housing costs). The data are from 2009 - 2013. 9 percent of people in this census tract are housing burdened low income households. The percentile for this tract is 9, meaning the percent housing burdened is higher than 9% of the rest of the state. There are about 925 housing units in this tract. About 495 of them are considered low income. Of these low income households, about 83 are considered housing burdened.

**Figure 4-19 Housing Burden**



# Matheny Tract Climate Adaptation Plan

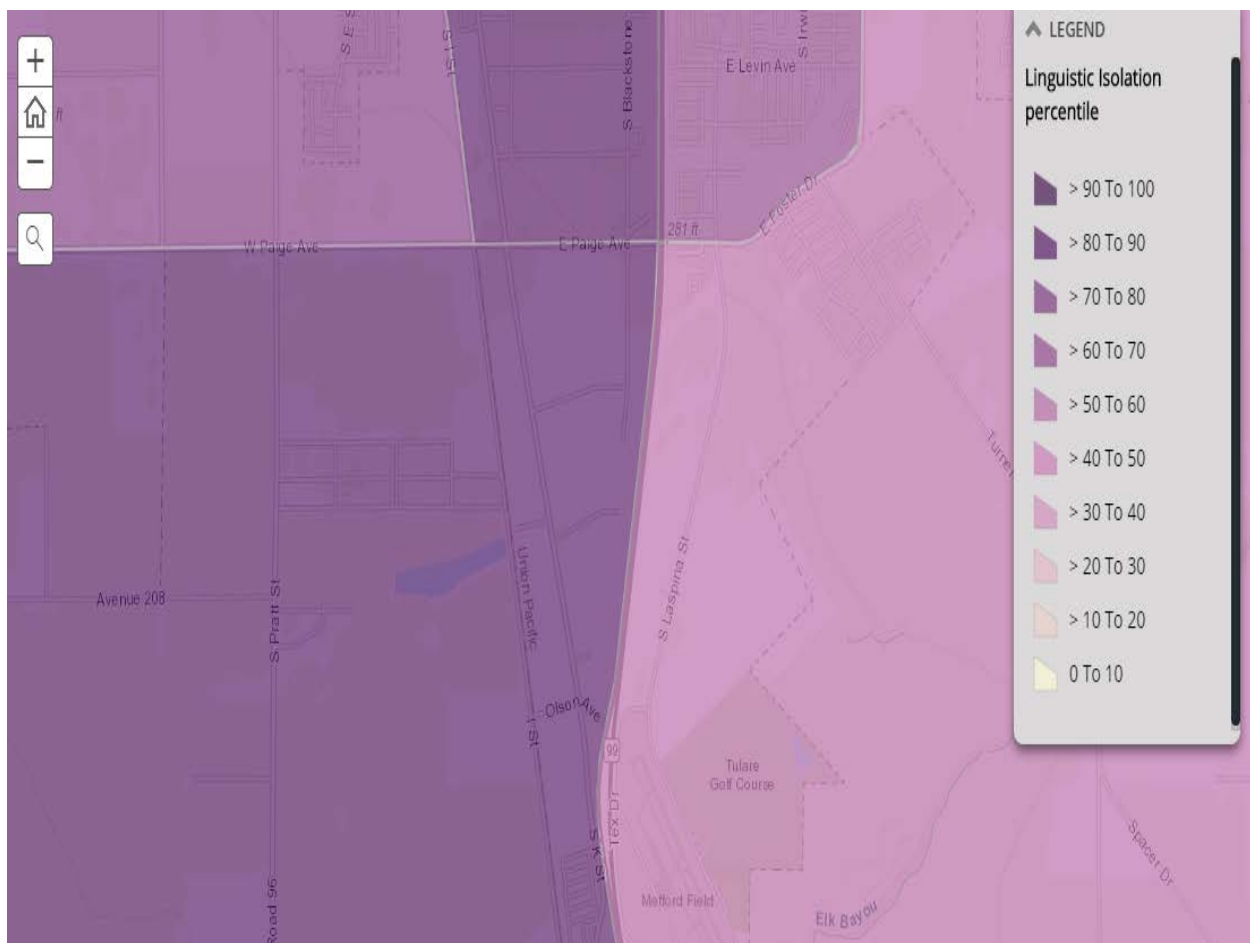
## Linguistic Isolation

Linguistic isolation is a term used by the U.S. Census Bureau for limited English-speaking households. More than 40 percent of Californians speak a language other than English at home. About half of those do not speak English well or at all. Adults who are not able to speak English well often have trouble talking to the people who provide social services and medical care. Linguistically isolated households may also not hear or understand important information when there is an emergency like an accidental chemical release or spill. The linguistic isolation indicator measures the percentage of households in the census tract where no one over 14 speaks English well. The data is from 2011 to 2015. 23 percent of households in this census tract do not speak English well. The percentile for this census tract is 88, meaning the percent of linguistically isolated households is higher than 88% of the census tracts in California. Approximately 1,049 people in this census tract do not speak English well.

The top three languages spoken besides English are:

- Spanish (~977 people)
- Portuguese (~24 people)
- Hmong (~19 people)

**Figure 4-20 Linguistic Isolation**

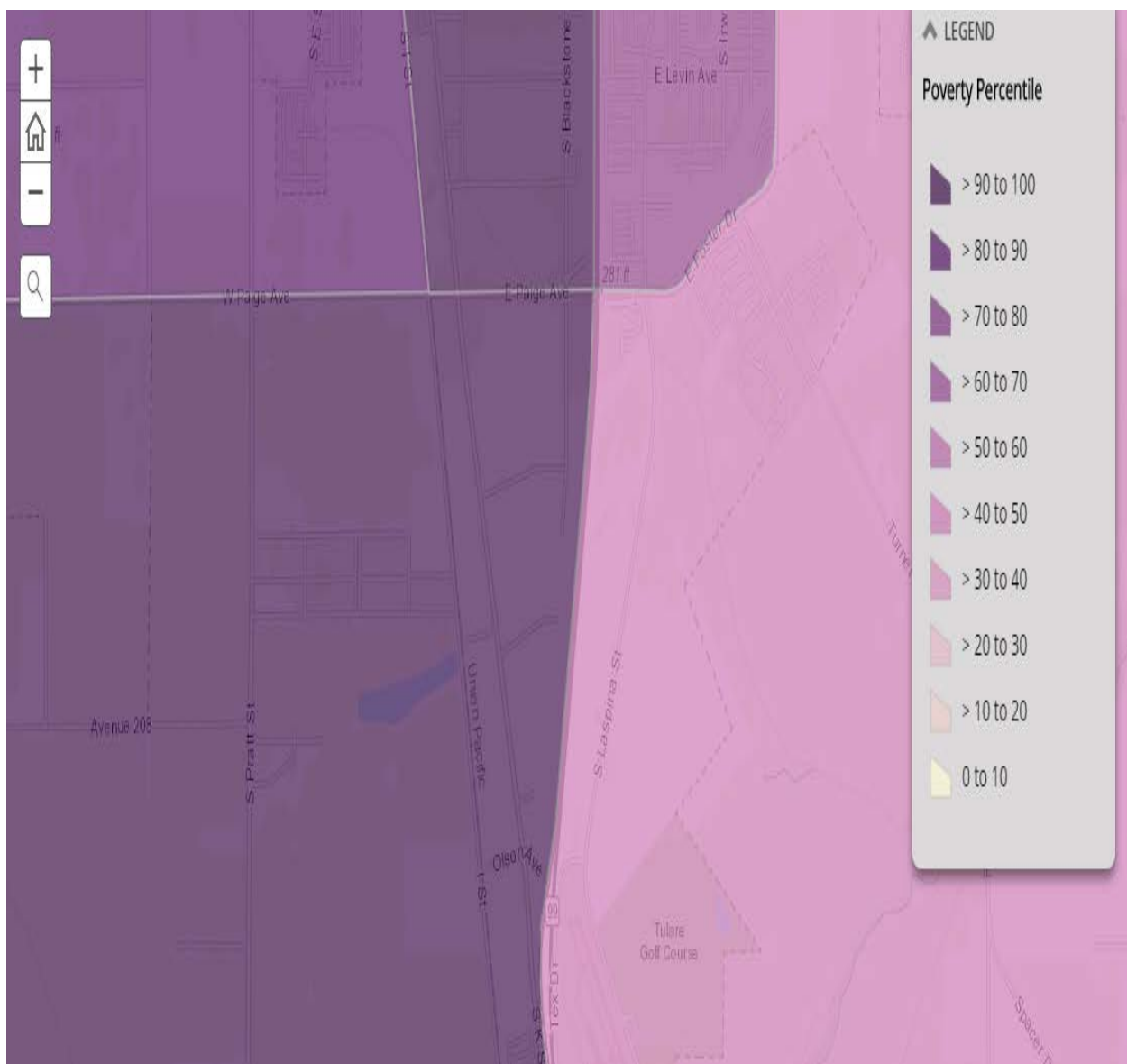


# Matheny Tract Climate Adaptation Plan

## Poverty

The U.S. Census Bureau determines the federal poverty level each year. The poverty level is based on the size of the household and the age of family members. If a person or family's total income before taxes is less than the poverty level, the person or family are considered in poverty. Many studies have found that people living in poverty are more likely than others to become ill from pollution. The poverty indicator measures the percentage of people in the census tract living below twice the federal poverty level. Twice the poverty level is used due to the high cost of living in California. The data is from 2011 to 2015. 67 percent of people in this census tract are living below twice the federal poverty level. The percentile for this census tract is 90, meaning the percent of people living below twice the poverty level is higher than 90% of the census tracts in California.

**Figure 4-21 Poverty**

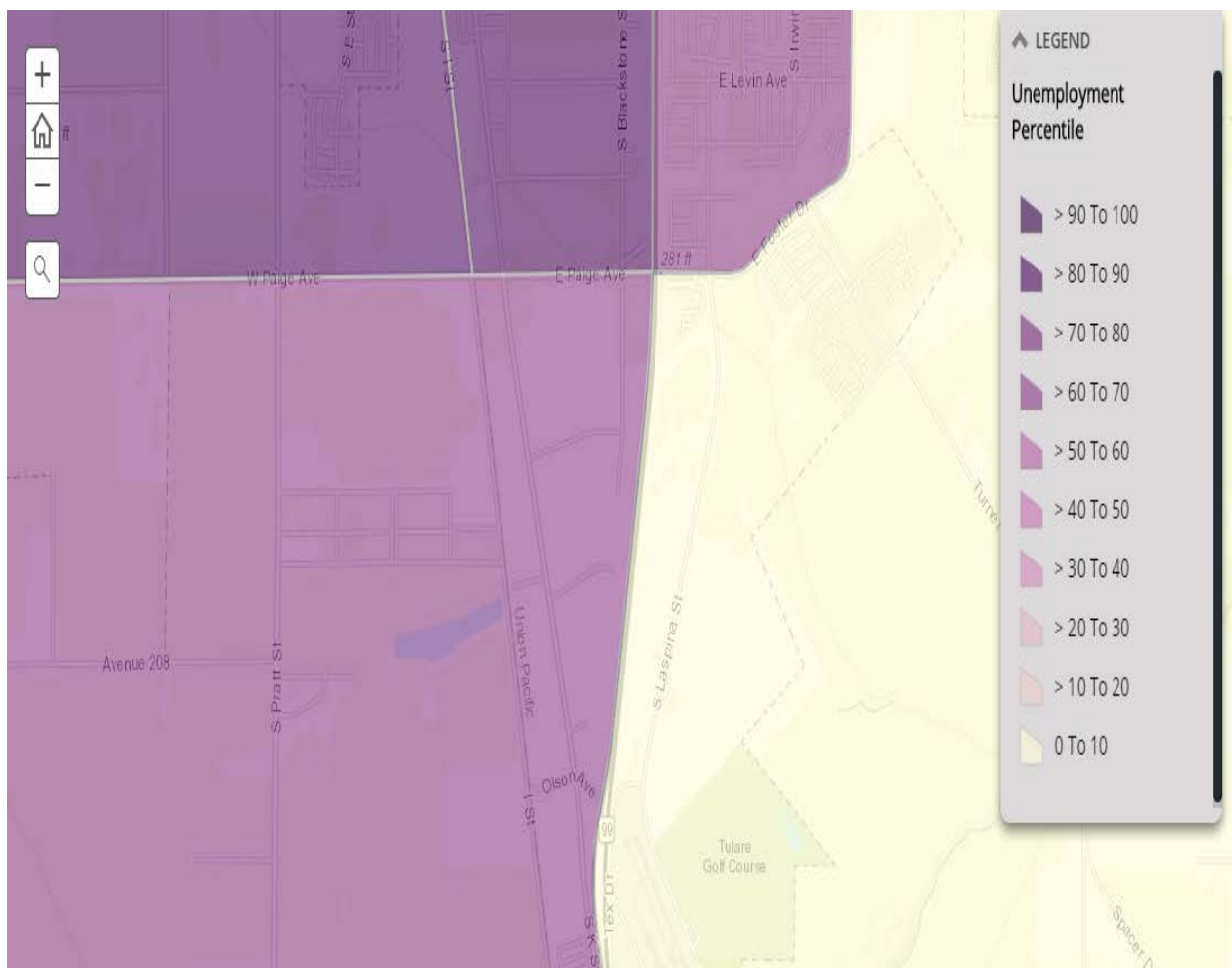


# Matheny Tract Climate Adaptation Plan

## Unemployment

The U.S. Census Bureau counts people who are over 16 years old, out of work and able to work but not working as unemployed. This does not include students, active duty military, retired people or people who have stopped looking for work. Stress from long-term unemployment can lead to chronic illnesses, such as heart disease, and can shorten a person's life. The unemployment indicator measures the percentage of people over 16 in the census tract who are unemployed and eligible for the workforce. The indicator excludes retirees, students, homemakers, institutionalized persons except prisoners, those not looking for work, and military personnel on active duty. The data is from 2011 to 2015. Twelve percent of adults in the census tract are unemployed. The percentile for this census tract is 67, meaning the percent of unemployed people is higher than 67% of the census tracts in California.

**Figure 4-22 Unemployment**



# Matheny Tract Climate Adaptation Plan

---

## Health and Data Analysis of Survey Data



# Matheny Tract Climate Adaptation Plan

---

## Chapter 5 Asset Profiles

### Emergency Response Services and Public Facilities

Police protection services are provided in Matheny Tract by the Tulare County Sheriff's Department main Sheriff Office located at 2404 W. Burrel Avenue, in Visalia, approximately 20 miles northeast of Matheny Tract. Tulare County and all of the incorporated cities have a mutual-aid agreement for fire protection services. The proximity of the nearest City or County fire station varies significantly between the unincorporated communities. There are three City fire stations and one County fire station in the Tulare area. The closest County Fire Station (Fire Station 25) is approximately two (2) miles from Matheny Tract and located within Tulare City limits at Foster Drive/Turner Drive (**see Figure 1-12**). Eleven (11) fire hydrants are found and located within the County rights-of-way. Additional Emergency Services are located in the City of Tulare.

### Public Health

The Tulare County HHS Public Health Branch protects and promotes the health status of Tulare County residents through the development and implementation of public health and primary care programs that use best-practice interventions.

The Public Health Branch comprises the following four divisions:

- Health Services
- Public Health
- Environmental Health
- Health Administration

Public Health Services include:

- Health assessments and case management
- Primary, specialty, and preventive health care
- Public Health laboratory services
- Criminal Justice health services
- Women, Infant, and Children (WIC) Program
- Prenatal and perinatal wellness
- Nutrition Education and Obesity Prevention Program (NEOP)
- Immunizations
- Chronic disease prevention and self-management
- California Children's Services (CCS)
- Child Health and Disability Prevention Program (CHDP)
- Lead Poisoning Prevention
- Infectious disease control
- Emergency response planning and preparedness
- Regulation of production and shipping of milk for Tulare and Kings Counties
- Environmental health services
- Environmental water quality testing

# Matheny Tract Climate Adaptation Plan

---

The Hillman Healthcare Center located at 1062 S. K Street in Tulare is located approximately three (3) miles north of the Matheny Tract.

## Housing and Schools

According to the 2015 Tulare County Housing Element, a sampling of housing conditions in Matheny Tract indicated that approximately 14% of the housing units were sound. Approximately 55% of Matheny Tract's housing units were deteriorated and 32% were dilapidated. Most children attend Palo Verde School, which is not part of the Tulare City School District, and many of their parents attended Palo Verde as well. The District provides Preschool through 8th grade education. High School students attend high school in the City of Tulare, approximately two (2) miles away.

## Water Supply

In 2016, the State Water Board exercised its power and directed the city of Tulare to accept Matheny Tract as water customers. Water supply for Matheny Tract is provided by City of Tulare's Water Division. As per the city of Tulare's MSR update, August 2013 the Water Division is responsible for providing water that is of safe and sanitary quality for the citizens of Tulare and an adequate water supply for fire protection. Tulare's water supply source consists of 30 domestic wells that are scattered throughout the city, extracting water from the city's underground aquifer. Newer wells drilled by the city over the past thirty-five years are gravel packed and have been drilled to approximately 700 feet. The older wells, and wells purchased by the city are generally around 350 feet deep. The city has one elevated water storage tank with a capacity of 150,000 gallons, and several hydro-pneumatic pressure tanks that are used for storage.

## Wastewater Management

There is no community wide sewer system in Matheny Tract. The community depends on individual on-site septic tank systems for wastewater disposal. In wet years, the combination of a perched water table and tight soils creates problems for effective leaching of septic tank effluent. SGC survey results indicate that the Matheny Tract residents are in favor of creating a community wide sewer system. No public sewer facilities are available in Matheny Tract. Each landowner relies on septic systems for wastewater.

The City of Tulare and the County of Tulare are in the process of identifying/discussing specifics to allow connection to the City of Tulare's Wastewater Treatment System. Preliminary County and City discussion regarding alternative routes appear to be in general agreement pending future evaluation studies including CEQA. Discussion regarding 42 inches vs. 27 inches pipes were evaluated. The County is the lead agency with the City to providing 'Will Serve' letter. The estimated rate is \$53.00 a month for sewer service. The two-year project time frame is estimated to start in 2021. Estimated sewer water pipe separation is 10 feet.

## Stormwater Management

Matheny Tract currently has a limited storm water system, which is served by Tulare Irrigation District (TID). The purpose of TID is to obtain and deliver surface water supplies for the purpose of agricultural irrigation in the District and for groundwater recharge efforts within the basin underlying the District. The District must also operate and maintain 330 miles of canal and approximately 30 miles of pipeline along with 1,110 acres of groundwater recharge/regulation basins.

# Matheny Tract Climate Adaptation Plan

---

In Matheny Tract (northern portion), the Oakland Colony Ditch bisects the Community running in a north- south direction between Ruth Street and Canal Street. **Figure 1-3** identifies Matheny Tract, the Oakland Colony ditch, a groundwater recharge basin, TID service area and the City of Tulare limits.

According to TID, the Oakland Colony Ditch is used primarily for irrigation and flood control purposes. An existing pump station is located the northeast corner of Addie Avenue/Canal Street that pumps surface water into the ditch.

Excessive runoff from the Oakland Colony Ditch is directed to a groundwater recharge basin located south of North Matheny Tract. An additional basin is located to the east of the current basin for large flood events.

Tulare County has completed initial base mapping for Matheny Tract. Files obtained from RMA include surveying data with benchmark locations and top of curb or pavement elevations in north Matheny Tract.

## Transportation Infrastructure

Based upon field reviews, the roads in Matheny Tract are generally in poor to fair condition, lack continuous curbs, gutters and sidewalks, are poorly lit at night, lack crosswalks, are susceptible to flooding i.e., lack drainage and provide limited opportunity for walking and bicycling beyond the vehicle travel surface.

There are several roadways in Matheny Tract that are in need of repair. Over time, roadway pavement can become damaged or begin to fail due to fatigue, aging, or surface abrasion. The binding agent within road pavement becomes rigid and less flexible as time passes and the surface of the pavement may start losing aggregates. If timely maintenance does not occur, potholes will start to occur within the road.

The Tulare County Transit Agency (TCaT) operates fixed-route services that link communities with each other and with Visalia and Tulare's urban transit systems. Matheny Tract is connected via TCAT Route 20 Southbound to Tulare (**see Figure 1-11**) and its transit center. TCaT also connects Delano (Kern County) in the south. Route 20 has ten northbound and southbound buses serving Matheny Tract on weekdays and four buses in each direction on Saturdays and Sundays. Stops are currently located at Pratt and Addie. In Tulare, transfers can be made to connect to Visalia (see TCAT website at: <http://www.tularecounty.ca.gov/rma/index.cfm/public-works/tulare-county-area-transit-tcat/>).

State Route (SR) 99 is the major highway between cities within the Central Valley and is the primary route between the City of Fresno to the north and the City of Bakersfield to the south. Matheny Tract is located approximately two (2) miles west of SR 99.

The Hanford AMTRAK station, located approximately 25 miles to the northwest in Kings County, is the closest station to Matheny Tract providing passenger rail service. The San Joaquin Joint Powers Authority (SJJPAA) is comprised of ten agencies (including TCAG) currently oversees the operation of seven daily trains serving this station. Service is provided to points north including San Francisco and Sacramento and to points south including Bakersfield and the Los Angeles basin (via connecting Amtrak Thruway bus service).

## Matheny Tract Climate Adaptation Plan

---

Currently, the Mefford Field airport is primarily used for general aviation operations, including local and itinerant services. Other Airport activities include airtaxi services and government operations.

Matheny Tract is bound on the east side by the Union Pacific Railroad (formerly Southern Pacific Transportation Company) line running through Tulare County. According to the Trainmaster's office in Fresno, there are more than 20 freight train operations per day in the Tulare County Area. Passenger trains presently do not operate on Union Pacific tracks in Tulare County. Train speeds on the mainline are generally 45-65 mph and train movements may occur at any time during the night or day.

### Flood Management

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Community-Panel Number 06107C1275E. Matheny Tract is located within Flood Zone X – areas of 0.2% annual chance flood; area of 1% annual chance flood with average depths of less than 1 square mile; and areas protected by levees from 1% annual chance flood. Structures located in a shaded X zone are recommended to be elevated one foot above natural ground. Elevation Certificates not required unless property owner wishes to use them for insurance rating purposes; for example, a preferred risk policy.

The County of Tulare has taken steps to be a part of the National Flood Insurance Program (NFIP), which means the County of Tulare agreed to manage flood hazard areas by actively adopting minimum regulatory standards as set forth by Federal Emergency Management Agency (FEMA). The National Flood Insurance Program (NFIP) is administered by the (FEMA) to offer flood insurance to properties located in special flood hazard areas (SFHAs). Information about the NFIP, is available at the following website: [www.fema.gov](http://www.fema.gov). As part of the county's participation in the NFIP, individuals are eligible to obtain flood insurance. Further flood information is available on Tulare County Resource Management Agency website at: <http://tularecounty.ca.gov/rma/index.cfm/publicworks/flood-hazard-information/flood-control-information/>. On June 16, 2009, Tulare County adopted the new Digital Flood Insurance Rate Maps (DFIRMs). Information is available to determine if a property is located in a SFHA by using the following FEMA Map Service Center link as follows: <https://msc.fema.gov/portal>.

### Energy Infrastructure

Southern California Edison (SCE) is the main provider of electrical power in Tulare County, which maintains an extensive network of high-voltage and low-voltage electrical lines, substations, natural gas mains, and related facilities. In addition to power produced by its plants, SCE purchases power from other producers for use within its service area.

On a region wide basis, electrical demand has increased while the available power supply has remained fairly constant. As a result, during peak demand periods, the reserve capacity of the overall system has dropped at times to under three (3) percent. In response, SCE has planned for more stringent measures as reserve capacity diminishes. These measures include voluntary cutbacks, cutbacks for major users with whom PG&E has arrangements, and rolling blackouts. The Southern California Gas Company provides gas service to Matheny Tract.

# Matheny Tract Climate Adaptation Plan

---

Matheny Tract has street lighting at 10 (ten) locations. Overhead utility poles are prevalent in Matheny Tract. These utility poles provide electricity and telephone service to residences and businesses in Matheny Tract and are located within the County rights-of-way.

## Solid Waste/Hazardous Materials Management

Solid waste disposal services for Matheny Tract is provided by Waste Management, a private company. Solid waste generated in Matheny Tract can be disposed of at Visalia Landfill, located at 8614 Avenue 328 in Visalia, California.

## Parks, Natural Areas, EcoSystems

There are no County owned/operated public parks in Matheny Tract. In the community of Matheny Tract there is no safe open green space for children to play and adults to be physically active. The nearest park is located approximately two (2) miles away in the City of Tulare.

## Commercial and Industrial Assets

The Matheny Tract Legacy Development Boundary (LDB) area consists of 187.8 acres. The Land Uses within the HDB are described as follows. Agricultural activities, including orchards and pasture, currently occupy 1.54% of the 187.8 acres. Urban development, including urbanized uses such as residential and commercial development occupy 80.77% of the 187.8 acres. The remaining 17.5% are lands dedicated for Rights-of-way. Existing commercial areas in the Matheny Tract total 2.5 acres.

## Chapter 6 Climate Change Vulnerability, Risk Assessment, and Adaptation Framework and Strategies

### Phases of the Adaptation Planning Process

#### Phase 1, Explore, Define, and Initiate

This phase includes scoping the process and project, such as identifying the potential climate change effects and important physical, social, and natural assets in the community. It also identifies the key stakeholders in the local government and throughout the community.

#### Phase 2, Assess Vulnerability

This phase includes analysis of potential impacts and adaptive capacity to determine the vulnerability for populations, natural resources, and community assets. The vulnerability assessment identifies how climate change could affect the community.

#### Phase 3, Define Adaptation Framework and Strategies

This phase focuses on creating an adaptation framework and developing adaptation strategies based on the results of the vulnerability assessment. The adaptation strategies are the community's response to the vulnerability assessment that is, how the community will address the potential for harm identified in the vulnerability assessment, given the community's resources, goals, values, needs, and regional context.

#### Phase 4, Implement, Monitor, Evaluate, and Adjust:

In this phase, the adaptation framework is implemented, consistently monitored and evaluated, and adjusted based on continual learning, feedback, or triggers.

### Vulnerability

#### Summary of Methodology

This assessment was conducted using Cal-Adapt, a free resource provided by the State of California to assess community-level vulnerability to specific climate change effects and extrapolate potential community-level impacts. The four primary effects examined in this analysis are extreme heat, extreme precipitation, increased wildfire, and decreased water availability<sup>1</sup>.

From these four impacts, ten impact factors are incorporated in this analysis:

- Maximum Temperature
- Minimum Temperature
- Extreme Heat Days
- Frequency of Heat Waves
- Maximum Duration of Heat Waves

---

<sup>1</sup> Cal-Adapt does not provide localized flood projections per se, and there was not a readily available proxy measure. Therefore, it was unfortunately omitted from this report.



## Matheny Tract Climate Adaptation Plan

- Number of Warm Nights
- Frequency of Warm Night Heat Waves
- Maximum Duration of Warm Night Heat Waves
- Number of Extreme Precipitation Events
- Annual average Area Burned (Hectares)
- Snow Water Equivalence (Inches)

Each of these impact factors is presented in the below summary table and narrative report with two distinct scenarios<sup>2</sup>:

- RCP4.5: emissions peak around 2040 and then decline
- RCP8.5: emissions continue to rise strongly through 2050 and plateau around the year 2100.

For each of these scenarios the average of the four recommended climate models for the state of California is presented. In addition to the average of all four recommended models, the results of two (2) of these models (HADGEMS2 and CNRM2) are attached (**see Appendix TBD**), as are all of the datasets used to generate these results.

**Table 6-1 Climate Change Projections for Matheny Tract**

Summary of Climate Change Projections/Anticipated Effects	
Variable	Effect
Maximum Temperature (degrees Fahrenheit)	RCP4.5: Peak at 83 degrees by 2050. RCP8.5: Peak at 90 degrees by 2100
Minimum Temperature (degrees Fahrenheit)	RCP4.5: Peak at 56 degrees by 2074. RCP8.5: Peak at 62 degrees in 2098
Number of Extreme Heat Days (defined as any day above 104.2 degrees Fahrenheit)	RCP4.5: Peak at 58 in 2074 RCP8.5: Peak at 105 in 2098
Timing of Extreme Heat Days	Both scenarios: Becoming more consistent in the summer months, extending to later in the year
Number of Heat Waves (defined as 4 or more days above 104.2 degrees Fahrenheit)	RCP4.5: Peak at 11 in 2088 RCP8.5: Peak at 21 in 2098
Maximum Duration (number of days) of Heat Waves	RCP4.5: Peak at 18 in 2074 RCP8.5: Peak at 76 in 2096
Number of Warm Nights (defined as any night above 70.3 degrees Fahrenheit)	RCP4.5: Peak at 67 in 2074 RCP8.5: Peak at 130 in 2098
Frequency of Warm Night Heat Waves (defined as 4 nights above the extreme heat threshold of 70.3 degrees)	RCP4.5: Peak at 15 in 2074 RCP8.5: Peak at 30 in 2098

<sup>2</sup> RCP=Representative Concentration Pathways-possible scenarios for greenhouse gas concentration, number is based on amount of “radiative forcing” (difference between energy radiated towards the sun and energy radiated back down to earth)

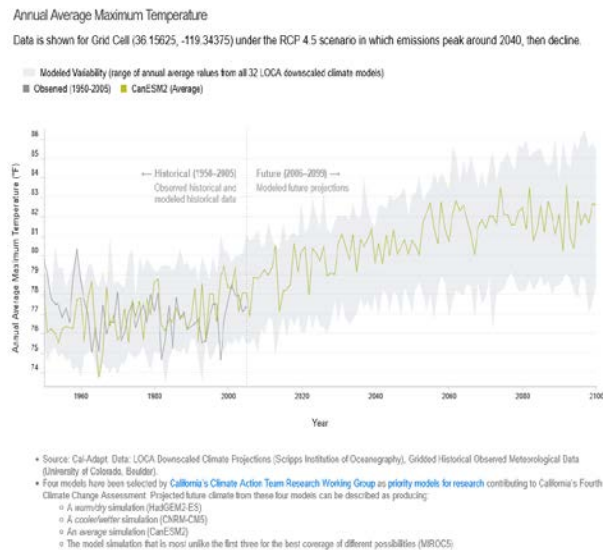
# Matheny Tract Climate Adaptation Plan

Summary of Climate Change Projections/Anticipated Effects	
Maximum Duration (number of days) of Warm Nights	RCP4.5: Peak at 42 in 2061 RCP8.5: Peak at 100 in 2098
Number of Extreme Precipitation Events (defined as any 2-day rainfall total above .64 inches)	RCP4.5: Peak at 32 in 2022 RCP8.5: Peak at 31 in 2068
Regional projections: Annual Average Area Burned (Hectares)	RCP4.5: Peak at 19864 in 2017 RCP8.5: Peak at 20396 in 2015
Regional projections: Snow Water Equivalence (Inches)	RCP4.5: Lowers to .00368 in 2054 RCP8.5: Lowers to .0000000106 in 2043

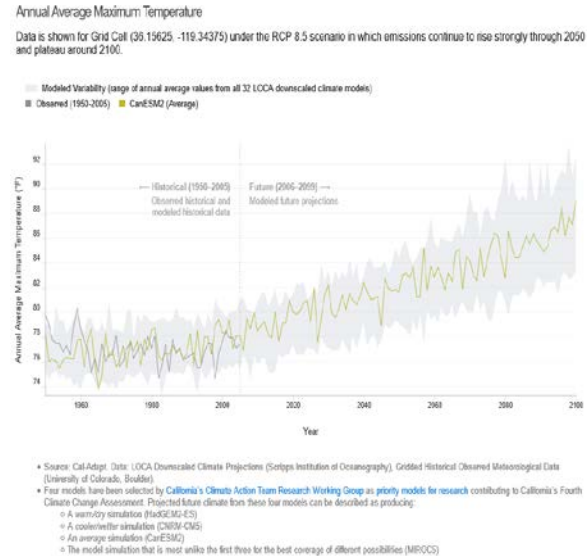
## Maximum and Minimum Temperatures

The annual average maximum temperatures in Matheny Tract are projected to increase under both scenarios. For an RCP4.5 scenario it is projected to increase to 83 degrees by 2050, and under an RCP8.5 scenario is projected to peak at 90 degrees in 2100 (see **Table 6-2** and **6-3**).

**Table 6-2 Maximum Temperatures**



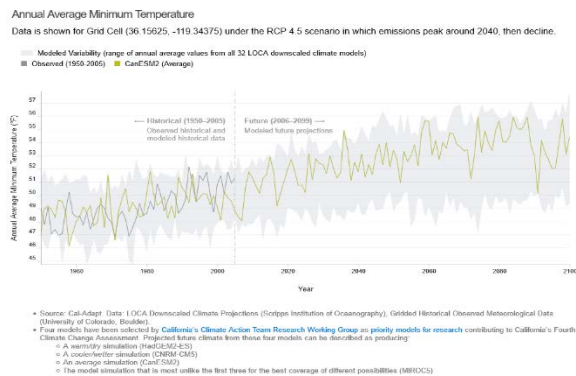
**Table 6-3 Maximum Temperatures**



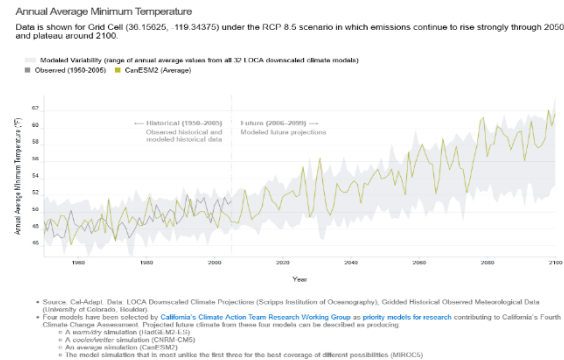
# Matheny Tract Climate Adaptation Plan

Correspondingly, the minimum temperature in Matheny Tract is also projected to increase correspondingly. Under an RCP4.5 scenario it is projected to peak at approximately 56 degrees in 2074, and under an RCP8.5 scenario will peak at approximately 62 degrees in 2098 (see Tables 6-4 and 6-5).

**Table 6-4 Minimum Temperature**



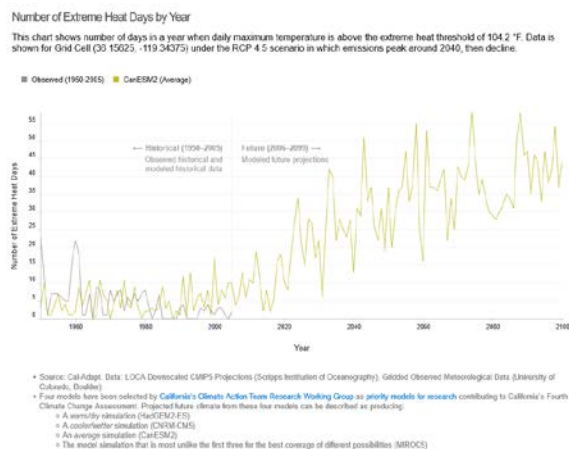
**Table 6-5 Minimum Temperature**



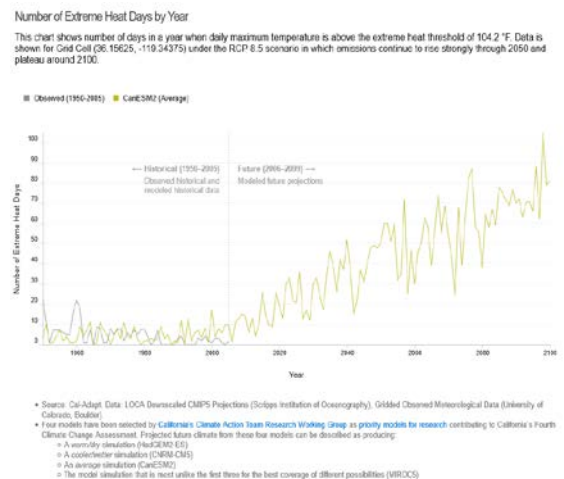
## Number of Extreme Heat Days

One of the most pronounced impacts of climate change in Matheny Tract will be increased extreme heat. This can be measured in a few different ways. The first of which is the number of extreme heat days, which will increase under both scenarios. Under an RCP4.5 scenario the number of extreme heat days in Matheny Tract will peak at 58 in 2074, and will peak at 105 in 2098 under an RCP8.5 scenario (see Tables 6-6 and 6-7).

**Table 6-6 Heat Days**



**Table 6-7 Heat Days**

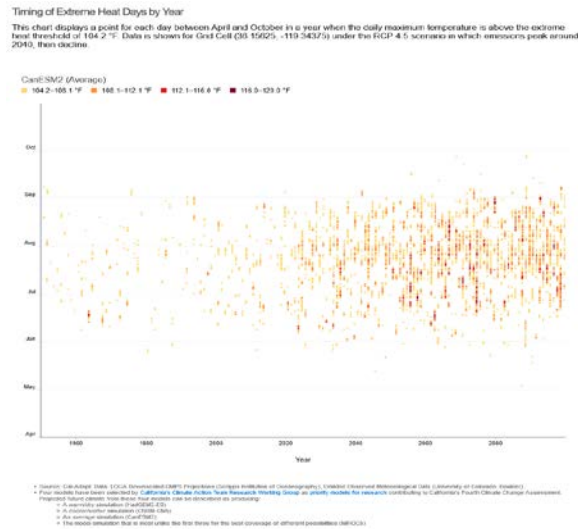


# Matheny Tract Climate Adaptation Plan

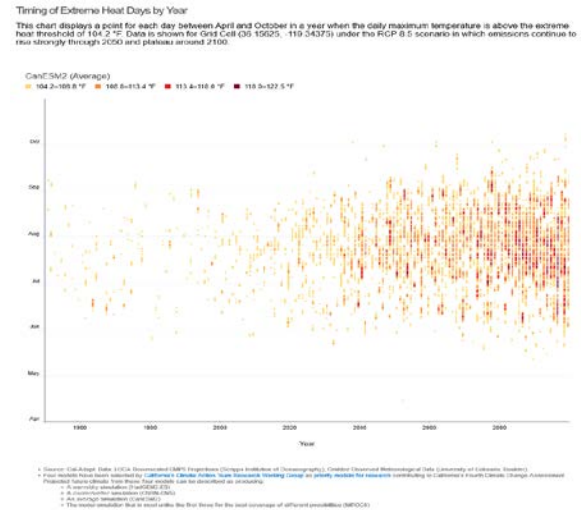
## Timing of Extreme Heat Days

The timing of extreme heat days is also projected to change considerably under both scenarios. These events are anticipated to increase in the summer months, and the normal period for extreme heat days is expected to extend into September and October, particularly under an RCP8.5 scenario (**Tables 6-8 and 6-9**).

**Table 6-8 Timing of Heat Days**



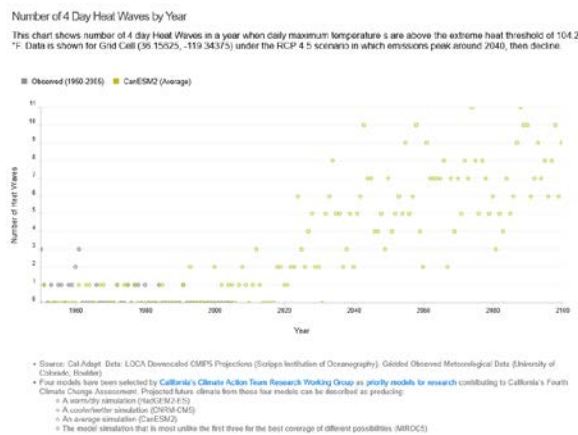
**Table 6-9 Timing of Heat Days**



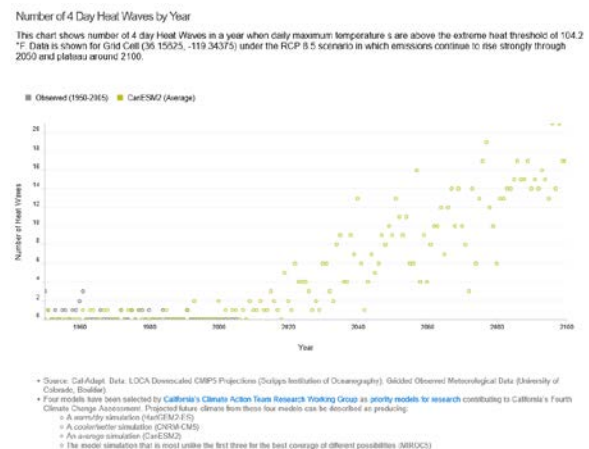
## Frequency of Heat Waves

The frequency of heat waves is also projected to increase under either scenario, with the number of extreme heat events (defined as four days in a row with temperatures being above 104.2) projected to peak at 11 in 2088 under an RCP45 scenario, and peaking at 21 in 2098 under an RCP8.5 scenario (see **Tables 6-10 and 6-11**).

**Table 6-10 Frequency of Heat Waves**



**Table 6-11 Frequency of Heat Waves**



# Matheny Tract Climate Adaptation Plan

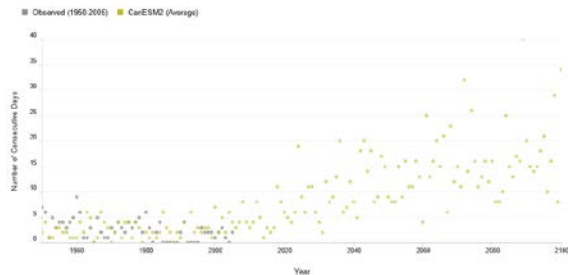
## Maximum Duration of Heat Waves

Similarly, the maximum duration of these heat waves is projected to increase under both scenarios, with the number of successive extreme heat days peaking at 18 in 2074 under an RCP4.5 scenario, and peaking at 76 days in 2096 under an RCP8.5 scenario (see **Tables 6-12 and 6-13**).

**Table 6-12 Duration of Heat Waves**

### Longest Stretch of Consecutive Extreme Heat Days by Year

This chart shows the longest stretch of consecutive days when daily maximum temperatures are above the extreme heat threshold of 104.2 °F. Data is shown for Grid Cell (36.15625, -119.34375) under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

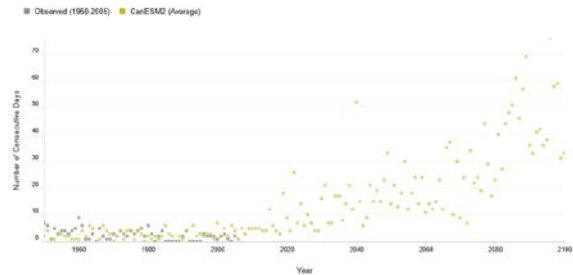


- Source: Cal Adapt Data: LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography); Gridded Observed Meteorological Data (University of Colorado, Boulder).
- Four models have been selected by **California's Climate Action Team Research Working Group as priority models for research** contributing to California's Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:
  - A wetter simulation (HadGEM2-ES)
  - A coarser weather simulation (CNRM-CM5)
  - An average simulation (CanESM2)
  - The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5)

**Table 6-13 Duration of Heat Waves**

### Longest Stretch of Consecutive Extreme Heat Days by Year

This chart shows the longest stretch of consecutive days when daily maximum temperatures are above the extreme heat threshold of 104.2 °F. Data is shown for Grid Cell (36.15625, -119.34375) under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.



- Source: Cal Adapt Data: LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography); Gridded Observed Meteorological Data (University of Colorado, Boulder).
- Four models have been selected by **California's Climate Action Team Research Working Group as priority models for research** contributing to California's Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:
  - A wetter simulation (HadGEM2-ES)
  - A coarser weather simulation (CNRM-CM5)
  - An average simulation (CanESM2)
  - The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5)

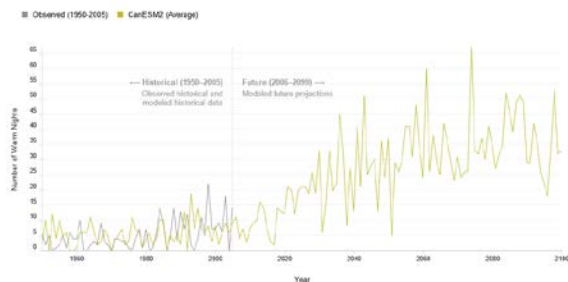
## Number of Warm Nights

The number of warm nights (defined as any night over the extreme heat threshold of 70.3 degrees Fahrenheit) is also expected to increase under both scenarios, with the number of warm nights in a year peaking at 67 in 2074 under an RCP4.5 scenario, and peaking at 130 in 2098 under an RCP8.5 scenario (see **Tables 6-14 and 6-15**).

**Table 6-14 Number of Warm Nights**

### Number of Warm Nights by Year

This chart shows number of nights in a year when daily minimum temperature is above the extreme heat threshold of 70.3 °F. Data is shown for Grid Cell (36.15625, -119.34375) under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

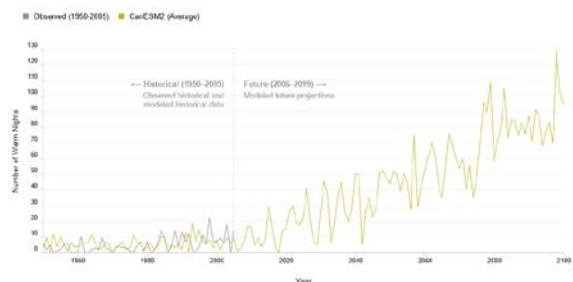


- Source: Cal Adapt Data: LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography); Gridded Observed Meteorological Data (University of Colorado, Boulder).
- Four models have been selected by **California's Climate Action Team Research Working Group as priority models for research** contributing to California's Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:
  - A wetter simulation (HadGEM2-ES)
  - A coarser weather simulation (CNRM-CM5)
  - An average simulation (CanESM2)
  - The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5)

**Table 6-15 Number of Warm Nights**

### Number of Warm Nights by Year

This chart shows number of nights in a year when daily minimum temperature is above the extreme heat threshold of 70.3 °F. Data is shown for Grid Cell (36.15625, -119.34375) under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.



- Source: Cal Adapt Data: LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography); Gridded Observed Meteorological Data (University of Colorado, Boulder).
- Four models have been selected by **California's Climate Action Team Research Working Group as priority models for research** contributing to California's Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:
  - A wetter simulation (HadGEM2-ES)
  - A coarser weather simulation (CNRM-CM5)
  - An average simulation (CanESM2)
  - The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5)

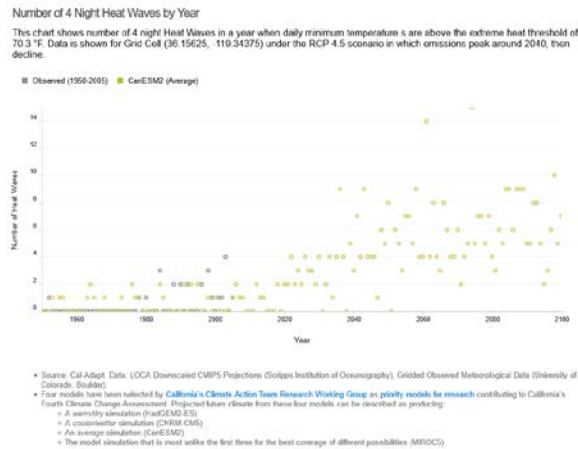


# Matheny Tract Climate Adaptation Plan

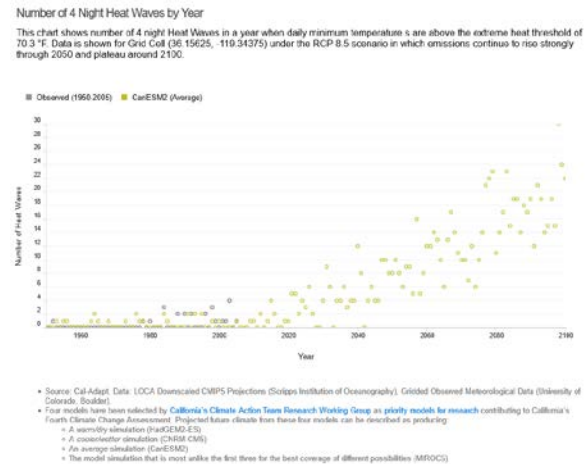
## Frequency of Warm Night Heat Waves

The frequency of warm night heat waves (defined as 4 nights above the extreme heat threshold of 70.3 degrees Fahrenheit) is also projected to increase under both scenarios, with the frequency of warm night heat waves reaching 15 in 2074 under an RCP4.5 scenario, and reaching 30 in 2098 under and RCP8.5 scenario (see Tables 6-16 and 6-17).

**Table 6-16 Frequency Heat Waves**



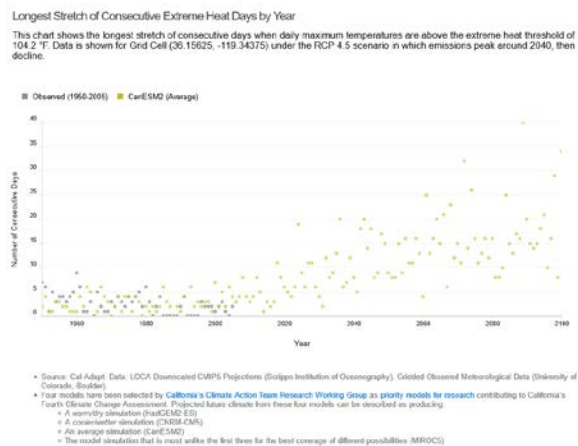
**Table 6-17 Frequency Heat Waves**



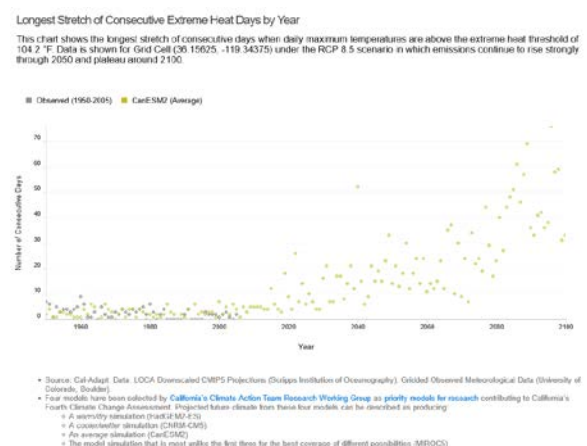
## Maximum Duration of Warm Night Heat Waves

The maximum duration of warm night heat waves is also projected to increase as well under both scenarios, with the maximum duration of warm nights reaching 42 in 2061 under an RCP4.5 scenario, and reaching 100 in 2098 under and RCP8.5 scenario (see Tables 6-18 and 6-19).

**Table 6-18 Duration Heat Waves**



**Table 6-19 Duration Heat Waves**



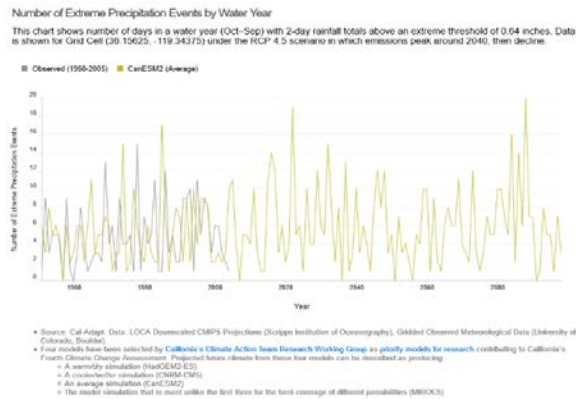


# Matheny Tract Climate Adaptation Plan

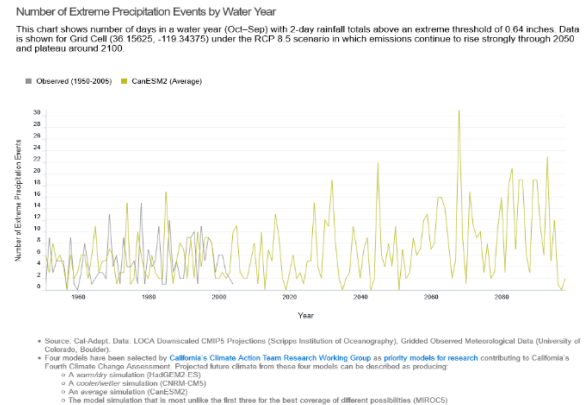
## Extreme Precipitation Events

Extreme Precipitation Events<sup>3</sup> are also expected to increase in Matheny Tract under both scenarios. This is projected to increase in both scenarios, with a peak of 32 extreme precipitation events in 2022 under an RCP4.5 scenario, and peaking at 31 extreme precipitation events in 2068 under an RCP8.5 scenario (see Tables 6-20 and 6-21).

**Table 6-20 Precipitation**



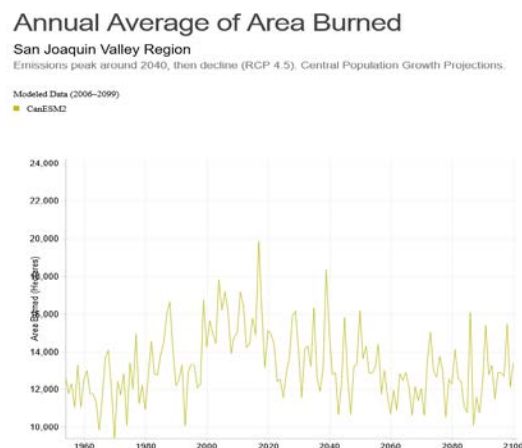
**Table 6-21 Precipitation**



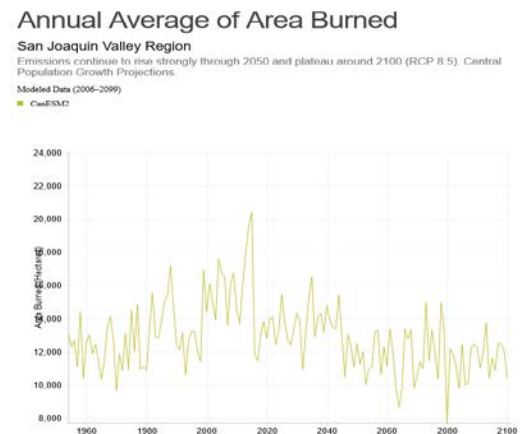
## Wildfire

The San Joaquin valley region as a whole is projected to experience an increase in wildfire, particularly in the eastern elevated regions. This is projected to result in an increase in the total annual area burned under both scenarios, with this peaking at 19864 hectares in 2017 under an RCP4.5 scenario, and peaking at 20396 hectares under an RCP8.5 scenario (see Tables 6-22 and 6-23).

**Table 6-22 Wildfire**



**Table 6-23 Wildfire**



<sup>3</sup> The frequency and timing of extreme precipitation events are available in the datasets attached to this report but owing to ongoing technical difficulties with Cal-Adapt could not be represented in a graphical format.

# Matheny Tract Climate Adaptation Plan

## Snow Water Equivalence

The San Joaquin Valley region is also expected to have much less snowpack, particularly in the eastern elevated regions. This will result in less available water for Matheny Tract. Snow Water Equivalence (the measure of snowpack that will become available water) is projected to lower under both scenarios, with it lowering to .00368 in 2054 under an RCP4.5 scenario, and lowering to 0.00000000106298190171852 by 2043 under an RCP8.5 scenario. (see **Tables 6-24 and 6-25**).

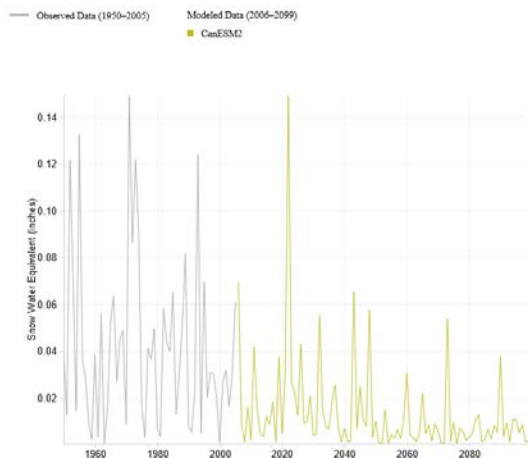
**Table 6-24 Snow Water**

**Table 6-25 Snow Water**

### Snow Water Equivalence

San Joaquin Valley Region

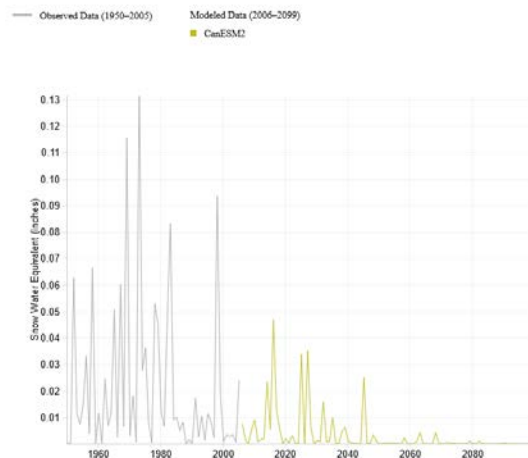
Emissions peak around 2040, then decline (RCP 4.5)



### Snow Water Equivalence

San Joaquin Valley Region

Emissions continue to rise strongly through 2050 and plateau around 2100 (RCP 8.5)



# Matheny Tract Climate Adaptation Plan

## Consequences

**Table 6-26 Potential Climate Change Impacts for the Matheny Tract Population**

<b>Summary of Climate Change Impacts to Matheny Tract Population<sup>4</sup></b>	
<b>Effect</b>	<b>Impact</b>
Increased Extreme Heat Days	Increased strain on farmworkers without ample shelter. Increased mortality from heatstroke, dehydration, and other heat-related illnesses.
Increased Warm Nights	Long-term potential negative health impacts resulting from the body not being unable to rest and recover adequately.
Increased Extreme Precipitation Events	Extreme precipitation events can lead to flooding. This in turn can lead to physical asset damage in the community as well as deaths among residents. Additionally, the current lack of a sewer system means that any additional flooding poses a potential biohazard threat owing to the aging septic systems currently located throughout the community.
Increased Wildfire	Increased wildfire smoke has potential long-term negative health impacts, particularly for those in at-risk groups (such as those with asthma, COPD, or other lung disease as well as the very young and elderly).
Decreased Snowpack	Potential for decreased long-term water availability for the region. Could result in decreased groundwater for the community, and wells drying up long-term.
ALL	Potential for disruption to agricultural economy, resultant job losses and loss of economic productivity.

Matheny Tract, like the rest of Tulare County, is a Mediterranean climate, with little rainfall overall and hot temperatures in the summertime. This makes Matheny Tract potentially vulnerable to increased extreme heat and decreased snowpack. Increased extreme precipitation and increased wildfire in the region are also of concern, as more extreme precipitation events can potentially result in more flooding in the area, and increased wildfire can potentially cause negative economic and public health effects (as can all the other impacts analyzed in this report).

## Risk Assessment

### Potential Economic Impacts

Tulare County is predominantly an agricultural economy. Many of these climate effects have the potential to severely disrupt the livelihoods of the Matheny Tract community, as many are farmworkers or otherwise work in the agricultural industry. General agriculture patterns are likely to shift due to changing weather patterns, extreme heat, and extended drought. This likely means that business activities would shift as well. In turn, this could mean potential long-term job losses, a loss

---

<sup>4</sup> Maizlish N, English D, Chan J, Dervin K, English P. Climate Change and Health Profile Report: Tulare County. Sacramento, CA: Office of Health Equity, California Department of Public Health; 2017.

# Matheny Tract Climate Adaptation Plan

---

of capital from Tulare County (and Matheny Tract by extension), and other negative resultant negative economic impacts. This could lead to a loss of income for the community, resulting in potential negative economic impacts to the community.

## Potential Public Health Impacts

Additionally, public health impacts to the Matheny Tract community are likely to be of concern. This is of concern due the fact that Matheny Tract has many older residents who are more at risk for health problems and less able to endure issues like poor air quality and extreme heat<sup>5</sup>. Similar problems will be posed for the very young, who are also more vulnerable to these impacts.

Farmworkers and others who work outdoors will also be potentially impacted by these effects. Many such workers work long days in the sun and need ample water or shelter to begin with. This could potentially result in increased heatstroke, dehydration, and possible death among this population. As it is important to develop adequate measures to protect their health and safety.

More extreme precipitation events can lead to increased potential flooding throughout the community, particularly as Matheny Tract itself is close to a 100-year flood zone. Increased flooding makes the community potentially vulnerable to resultant damage to physical assets (such as houses) as well as resultant potential impacts among affected residents (particularly the elderly and very young who may not be able to leave their homes by themselves in the event of such an event). Additionally, owing to the current lack of a sewer system, in the near term more extreme precipitation and increased flooding could pose a potential biohazard threat given the amount of aging septic systems currently located throughout the community.<sup>6</sup>

Finally, increased wildfire can lead to potential negative impacts on the economy as well as public health. Wildfire smoke can potentially exacerbate chronic health problems (such as asthma and COPD), or in some cases even cause them in the first place. Like the others, these impacts will be most pronounced in the elderly and the very young. In addition to these public health impacts, increased wildfire could potentially result in negative economic impacts for Tulare County as a whole, which could extend to the Matheny Tract population. Increased states of emergency generally could result in businesses closing (including agricultural businesses), which in turn could have negative economic and monetary effects for the Matheny Tract population.

## Adaptation Framework and Strategies

---

<sup>5</sup> Matheny Tract Legacy Plan, 2017

<sup>6</sup> Matheny Tract is expected to have a sewer hookup by 2025

# Matheny Tract Climate Adaptation Plan

## Chapter 7 Policy Plan

### Identification of Policies

The Tulare County General Plan 2030 Update fulfills many sustainability and greenhouse gas reduction objectives at the program level. Individual projects that will implement the General Plan will comply with these policies resulting in long-term benefits to air quality and greenhouse gas reductions that will help Tulare County achieve the CAP reduction targets. The Policy Plan lists the policies from the various General Plan elements that promote more efficient development and reduce travel and energy consumption.

### General Plan Policies Having Greenhouse Gas Emission Reductions

**Table 7-1 Sustainability and Greenhouse Gas Emissions**

Sustainability and Greenhouse Gas Emission	
PF-1.1 Maintain Urban Edges	ERM-1.2 Development in Environmentally Sensitive Areas
PF-1.2 Location of Urban Development	ERM-1.3 Encourage Cluster Development
PF-1.3 Land Uses in UDBs/HDBs	ERM-1.4 Protect Riparian Management Plans and Mining Reclamation Plans
PF-1.4 Available Infrastructure	ERM-1.6 Management of Wetlands
AG-1.7 Conservation Easements	ERM-1.7 Planting of Native Vegetation
AG-1.8 Agriculture Within Urban Boundaries	ERM-1.8 Open Space Buffers
AG-1.11 Agricultural Buffers	ERM-1.14 Mitigation and Conservation Banking Program
AG-1.14 Right to Farm Noticing	ERM-4.1 Energy Conservation and Efficiency Measures
AG-2.11 Energy Production	ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation
AG-2.6 Biotechnology and Biofuels	ERM-4.3 Local and State Programs
AQ-1.6 Purchase of Low Emission/Alternative Fuel Vehicles,	ERM-4.4 Promote Energy Conservation Awareness
AQ-1.7 Support Statewide Global Warming Solutions,	ERM-4.6 Renewable Energy
AQ-1.8 Greenhouse Gas Emissions Reduction Plan	ERM-4.7 Reduce Energy Use in County Facilities
AQ-1.9 Off-Site Measures to Reduce Greenhouse Gas Emissions	ERM-4.8 Energy Efficiency Standards
AQ-1.10 Alternative Fuel Vehicle Infrastructure	ERM-5.1 Parks as Community Focal Points
AQ-2.1 Transportation Demand Management Programs,	ERM-5.6 Location and Size Criteria for Parks
AQ-2.3 Transportation and Air Quality	ERM-5.15 Open Space Preservation
AQ-2.4 Transportation Management Associations,	HS-1.4 Building and Codes
AQ-2.5 Ridesharing,	Chapter 11: Water Resources
AQ-3.1 Location of Support Services	TC-2.1 Rail Service
AQ-3.2 Infill Near Employment	TC-2.4 High Speed Rail (HSR)
AQ-3.3 Street Design	TC-2.7 Rail Facilities and Existing Development
AQ-3.5 Alternative Energy Design	TC-4.4 Nodal Land Use Patterns that Support Public Transit
AQ-3.6 Mixed Use Development	TC-5.1 Bicycle/Pedestrian Trail System

# Matheny Tract Climate Adaptation Plan

Sustainability and Greenhouse Gas Emission	
LU-1.1 Smart Growth and Healthy Communities	TC-5.2 Consider Non-Motorized Modes in Planning and Development
LU-1.2 Innovative Development	TC-5.3 Provisions for Bicycle Use
LU-1.3 Prevent Incompatible Uses	TC-5.4 Design Standards for Bicycle Routes
LU-1.4 Compact Development	TC-5.5 Facilities
LU-1.8 Encourage Infill Development	TC-5.6 Regional Bicycle Plan
LU-2.1 Agricultural Lands	TC-5.7 Designated Bike Paths
LU-3.2 Cluster Development	TC-5.8 Multi-Use Trails
LU-3.3 High-Density Residential Locations	PFS-1.3 Impact Mitigation
LU-4.1 Neighborhood Commercial Uses	PFS-1.15 Efficient Expansion
LU-7.1 Distinctive Neighborhoods	PFS-2.1 Water Supply
LU-7.2 Integrate Natural Features	PFS-2.2 Adequate Systems
LU-7.3 Friendly Streets	PFS-3.3 New Development Requirements
LU-7.15 Energy Conservation	PFS-5.3 Solid Waste Reduction
ED-2.3 New Industries	PFS-5.4 County Usage of Recycled Materials and Products
ED-2.8 Jobs/Housing Ratio	PFS-5.5 Private Use of Recycled Products
ED-5.9 Bikeways	PFS-8.3 Location of School Sites
ED-6.1 Revitalization of Community Centers	PFS-8.5 Government Facilities and Services
ED-6.2 Comprehensive Redevelopment Plan	Part II, Chapter 1: Rural Valley Lands Plan
ED-6.3 Entertainment Venues	WR-1.5 Expand Use of Reclaimed Wastewater
ED-6.4 Culturally Diverse Business	WR-1.6 Expand Use of Reclaimed Water
ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas	WR-3.5 Use of Native and Drought Tolerant Landscaping
ED-6.7 Existing Commercial Centers	TC-5.6 Regional Bicycle Plan
SL-3.1 Community Centers and Neighborhoods	TC-5.7 Designated Bike Paths
ERM-1.1 Protection of Rare and Endangered Species	TC-5.8 Multi-Use Trails
Source: Tulare County General Plan 2030 Update	

## Land Use and Transportation Strategies

The County's authority over land use provides its most important contribution to efforts to reduce greenhouse gas emissions related to new development. In addition, as new development is constructed consistent with the General Plan and the Blueprint, even existing development will see benefits from infill and better transportation options.

- **PF-1.1 Maintain Urban Edges.** The County shall strive to maintain distinct urban edges for all unincorporated communities within the valley region, while creating a transition between urban uses and agriculture and open space.
- **PF-1.2 Location of Urban Development.** The County shall ensure that urban development only takes place in the following areas:
  - Within incorporated cities and Urban Development Boundaries (UDBs);
  - Within the UDBs of adjacent cities in other counties, unincorporated communities, planned community areas, and HDBs of hamlets;
  - Within foothill development corridors as determined by procedures set forth in Foothill Growth Management Plan;
  - Within areas set aside for urban use in the Mountain Framework Plan and the mountain sub-area plans; and



## Matheny Tract Climate Adaptation Plan

---

- Within other areas suited for non-agricultural development, as determined by the procedures set forth in the Rural Valley Lands Plan.
- **PF-1.3 Land Uses in Urban Development Boundaries (UDBs)/Hamlet Development Boundaries (HDBs).** The County shall encourage those types of urban land uses that benefit from urban services to develop within UDBs, urban area boundaries, and HDBs. Permanent uses which do not benefit from urban services shall be discouraged within these areas. This shall not apply to agricultural or agricultural support uses, provided that such accessory uses are time-limited through special use permit.
- **AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions.** The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.
- **AQ-3.2 Infill near Employment.** The County shall identify opportunities for infill development projects near employment areas within all unincorporated communities to reduce vehicle trips.
- **LU-1.4 Compact Development.** The County shall actively support the development of compact mixed-use projects that reduce travel distances.
- **LU-1.8 Encourage Infill Development.** The County shall encourage and provide incentives for infill development to occur in communities, and hamlets within or adjacent to existing development in order to maximize the use of land within existing urban areas, minimize the conversion of existing agricultural land, and minimize environmental concerns associated with new development.
- **LU-3.2 Cluster Development.** The County shall encourage proposed residential development to be clustered onto portions of the site that are more suitable to accommodating the development, and shall require access either directly onto a public road or via a privately maintained road designed to meet County road standards.
- **LU-3.3 High-Density Residential Locations.** The County shall encourage high-density residential development (greater than 14 dwelling units per gross acre) to locate along collector roadways and transit routes, and near public facilities (e.g., schools, parks), shopping, recreation, and entertainment.
- **ERM-1.3 Encourage Cluster Development.** When reviewing development proposals, the County shall encourage cluster development in areas with moderate to high potential for sensitive habitat.
- **PFS-1.15 Efficient Expansion.** The County shall provide incentives for infill projects where an efficient expansion of the infrastructure delivery system is fully funded.
- **LU-2.1 Agricultural Lands.** The County shall maintain agriculturally designated areas for agriculture use and by directing urban development away from valuable agricultural lands to cities, unincorporated communities, and hamlets where public facilities and infrastructure are available.
- **AG-1.8 Agriculture within Urban Boundaries.** The County shall not approve applications for preserves or regular Williamson Act contracts on lands located within a UDB unless it is demonstrated that the restriction of such land will not detrimentally affect the growth of the community involved for the succeeding 10 years, or that the property in question has special public values for open space, conservation, etc., or that the contract is consistent with the publicly

## Matheny Tract Climate Adaptation Plan

---

desirable future use and control of the land in question. If proposed within a UDB of an incorporated city, the County shall give written notice to the affected city pursuant Government Code §51233.

- **AG-1.11 Agricultural Buffers.** The County shall examine the feasibility of employing agricultural buffers between agricultural and non-agricultural uses, and along the edges of UDBs, HDBs considering factors including the type of operation and chemicals used for spraying, building orientation, planting of trees for screening, location of existing and future rights-of-way (roads, railroads, canals, powerlines, etc.), and unique site conditions.
- **ERM-1.8 Open Space Buffers.** The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state.
- **ERM-5.15 Open Space Preservation.** The County shall preserve natural open space resources through the concentration of development in existing communities, use of cluster development techniques, maintaining large lot sizes in agricultural areas, avoiding conversion of lands currently used for agricultural production, limiting development in areas constrained by natural hazards, and encouraging agricultural and ranching interests to maintain natural habitat in open space areas where the terrain or soil is not conducive to agricultural production.
- **LU IM 3.** During preparation of the Zoning Ordinance and Land Development Regulations, the County shall consider appropriate incentives to encourage smart growth implementation, including but not limited to such factors as infill, densification, transportation alternatives, provision of public amenities, and commercial standards.
- **LU IM 4.** During the review of all discretionary permit applications, the County shall ensure that smart growth and other urban design principles set forth in this Land Use Element are incorporated as conditions of project approval, as appropriate.
- **LU IM 7.** The County shall develop a set of criteria to determine whether proposed projects are infill developments and develop a set of incentive programs for infill projects located within UDBs.
- **LU IM 8.** The County shall develop and maintain a Geographic Information System based database of infill sites and encourage new development to occur on the identified sites.
- **LU IM 9.** The County shall create a program to consolidate infill sites when permits are sought for development and shall require access to public roads be present prior to development.
- **LU IM 10.** The County shall require identification of infill sites in all new community plan updates, hamlet plans and redevelopment project area plans as they are prepared over time.
- **LU IM 19.** The County shall prepare a cluster development ordinance, defining the process, incentives and standards. The means of consultation and contents will be developed later, after further research.
- **LU IM 24.** The County shall review LEED and LEED-ND certification requirements and develop an implementation program.

# Matheny Tract Climate Adaptation Plan

---

## Transit and Pedestrian Oriented and Traditional Neighborhood Design Summary (AQ-3.1–PFS-8.3)

- Locate high-density development close to commercial and service destinations that are within walking distance.
- Provide direct pedestrian connections between uses to minimize walking distances.
- Locate transit stops and infrastructure near to high-density development to maximize the number of people within walking distance.
- Provide transit infrastructure such as benches and shelters at locations that maximize accessibility.
- Construct narrow streets to slow traffic and allow room for pedestrian infrastructure.
- Traffic calming measures such as roundabouts, and pedestrian bulb outs to improve flow and enhance pedestrian safety.
- Use a grid street system to provide direct routes to many destinations.
- Require tree-lined streets with drought tolerant trees to shade pedestrian routes.
- Storefronts near the street to create an interesting pedestrian orientation.
- Provide parking lots in the back or in public lots to minimize separation of compatible uses.
- Allow second story residential mixed use in downtown commercial areas and large mixed-use projects to create a more active pedestrian environment after normal business hours.

- **AQ-3.1 Location of Support Services.** The County shall encourage the location of ancillary employee services (including, but not limited to, child care, restaurants, banking facilities, convenience markets) near major employment centers for the purpose of reducing midday vehicle trips.
- **AQ-3.2 Infill near Employment.** The County shall identify opportunities for infill development projects near employment areas within all unincorporated communities to reduce vehicle trips.
- **AQ-3.3 Street Design.** The County shall promote street design that provides an environment which encourages transit use, biking, and pedestrian movements.
- **AQ-3.6 Mixed Use Development.** The County shall encourage the mixing of land uses that generate high trip volumes, especially when such uses can be mixed with support services and where they can be served by public transportation.
- **LU-1.1 Smart Growth and Healthy Communities.** The County shall promote the principles of smart growth and healthy communities UDBs and HDBs, including:
  - Creating walkable neighborhoods,
  - Providing a mix of residential densities,
  - Creating a strong sense of place
  - Mixing land uses,
  - Directing growth toward existing communities,
  - Building compactly,
  - Discouraging sprawl,
  - Encouraging infill,

# Matheny Tract Climate Adaptation Plan

---

- Preserving open space,
- Creating a range of housing opportunities and choices,
- Utilizing planned community zoning to provide for the orderly pre-planning and long-term development of large tracks of land which may contain a variety of land uses, but are under unified ownership or development control, and
- Encouraging connectivity between new and existing development
- **LU-1.2 Innovative Development.** The County shall promote flexibility and innovation through the use of planned unit developments, development agreements, specific plans, mixed-use projects, and other innovative development and planning techniques.
- **LU-3.2 Cluster Development.** The County shall encourage proposed residential development to be clustered onto portions of the site that are more suitable to accommodating the development, and shall require access either directly onto a public road or via a privately maintained road designed to meet County road standards.
- **LU-4.1 Neighborhood Commercial Uses.** The County shall encourage the development of small neighborhood convenience and grocery facilities to meet the everyday shopping and personal needs of immediately surrounding residential land uses in communities and hamlets.
- **LU-7.1 Distinctive Neighborhoods.** The County shall encourage development of diverse and distinctive neighborhoods that build on the patterns of the natural landscape and are responsive in their location and context and to the lifecycle needs of the residents.
- **LU-7.3 Friendly Streets.** The County shall encourage new streets within UDBs to be designed and constructed to not only accommodate traffic, but also serve as comfortable pedestrian and cyclist environments. These should include, but not be limited to:
  - Street tree planting adjacent to curbs and between the street and sidewalk to provide a buffer between pedestrians and automobiles, where appropriate,
  - Minimize curb cuts along streets,
  - Sidewalks on both sides of streets, where feasible,
  - Bike lanes and walking paths, where feasible on collectors and arterials, and
  - Traffic calming devices such as roundabouts, bulb-outs at intersections, traffic tables, etc.
- **ED-6.1 Revitalization of Community Centers.** The County, through public and private collaboration, shall strive to strengthen the core areas of communities to serve as the center for public, financial, entertainment, and commercial activities.
- **ED-6.3 Entertainment Venues.** The County shall encourage the establishment of community and regional entertainment venues within community core areas.
- **ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas.** The County shall work with communities and transit providers to develop intermodal hubs that focus on both local and regional bus service.
- **ED-6.7 Existing Commercial Centers.** The County shall help protect the viability of community retail centers by promoting a business mix that responds to changing economic conditions and provides needed services to surrounding neighborhoods.

## Matheny Tract Climate Adaptation Plan

---

- **SL-3.1 Community Centers and Neighborhoods.** The County shall support investments in unincorporated communities and hamlets to improve the image, quality of urban infrastructure, amenities, and visual character by:
  - Encouraging restoration of existing historic buildings and developing new buildings that reflect the local culture and climate,
  - Creating or enhancing overall community design frameworks with a hierarchy of connected block and street patterns, open spaces, town centers, neighborhoods, and civic facilities,
  - Reducing the need for sound-walls and gated neighborhoods by having residential and nonresidential uses interface along streets and open spaces (not adjoining property lines) and locating residential uses on local-serving streets,
  - Planning residential development as interconnected neighborhoods with definable social and physical centers that incorporate parks, schools and commercial services,
  - Enhancing the comfort and scenic experience of transit riders, cyclists, and pedestrians, and
  - Developing open spaces, streets and pedestrian facilities that include landscaping and streetscaping that improve the image of the community and make it a more comfortable pedestrian environment.
- **ERM-5.1 Parks as Community Focal Points.** The County shall strengthen the role of County parks as community focal points by providing community center/recreation buildings to new and existing parks, where feasible.
- **TC-4.4 Nodal Land Use Patterns that Support Public Transit.** The County shall encourage land uses that generate higher ridership including; high density residential, employment centers, schools, personal services, administrative and professional offices, and social/recreational centers, to be clustered within a convenient walking distance of one another.
- **PFS-8.3 Location of School Sites.** The County shall work with school districts and land developers to locate school sites consistent with current and future land uses. The County shall also encourage siting new schools near the residential areas that they serve and with access to safe pedestrian paths to school.

### Pedestrian and Bicycle Infrastructure Summary

- |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Provide sidewalks and pedestrian paths that connect uses that would attract walkers.</li><li>• Provide safe, well-connected bicycle paths and lanes that encourage bicycle travel.</li><li>• Secure bicycle parking for employment sites to increase convenience for cyclists.</li><li>• Bike racks for commercial development to provide security for bikes during shopping trips.</li></ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- **ED-5.9 Bikeways.** The County shall support the enhancement of the County's recreational bikeways and promote the bikeway network a component of the County's tourism program.
  - **TC-5.1 Bicycle/Pedestrian Trail System.** The County shall coordinate with TCAG and other agencies to develop a Countywide integrated multi-purpose trail system that provides a linked network with access to recreational, cultural, and employment facilities, as well as offering a recreational experience apart from that available at neighborhood and community parks.

## Matheny Tract Climate Adaptation Plan

---

- **TC-5.2 Consider Non-Motorized Modes in Planning and Development.** The County shall consider incorporating facilities for non-motorized users, such as bike routes, sidewalks, and trails when constructing or improving transportation facilities and when reviewing new development proposals. For developments with 50 or more dwelling units or non-residential projects with an equivalent travel demand, the feasibility of such facilities shall be evaluated.
- **TC-5.3 Provisions for Bicycle Use.** The County shall work with TCAG to encourage local government agencies and businesses to consider including bicycle access and provide safe bicycle parking facilities at office buildings, schools, shopping centers, and parks.
- **TC-5.4 Design Standards for Bicycle Routes.** The County shall utilize the design standards adopted by Caltrans and as required by the Streets and Highway Code for the development, maintenance, and improvement of bicycle routes.
- **TC-5.5 Facilities.** The County shall require the inclusion of bicycle support facilities, such as bike racks, for new major commercial or employment locations.
- **TC-5.6 Regional Bicycle Plan.** The County shall identify Countywide recreational and commuter bicycle routes and update the Tulare County Regional Bicycle Plan as appropriate.
- **TC-5.7 Designated Bike Paths.** The County shall support the creation and development of designated bike paths adjacent to or separate from commute corridors.
- **TC-5.8 Multi-Use Trails.** The County shall encourage the development of multi-use corridors (such as hiking, equestrian, and mountain biking) in open space areas, along power line transmission corridors, utility easements, rivers, creeks, abandoned railways, and irrigation canals.
- **TC-5.9 Existing Facilities.** The County shall support the maintenance of existing bicycle and pedestrian facilities.

### Transit Infrastructure and Support Policies and Measures Summary

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Provide a wide variety public transportation options that reduce vehicle trips and miles traveled such as transit and rail service.</li><li>• Coordinate transit service provided by various transit agencies in the County to make service as convenient as possible for potential riders.</li><li>• Provide quality transit and rail facilities and equipment that will provide system users with reasonable travel times and comfort.</li><li>• Support a variety of rail options including existing Amtrak services and potential high-speed rail that will provide competitive travel times and costs compared to flying and driving.</li><li>• Preserve rail corridors for future use as light rail or trail corridors.</li></ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- **TC-4.1 Transportation Programs.** The County shall support the continued coordination of transportation programs provided by social service agencies, particularly those serving elderly and/or handicapped.
  - **TC-4.2 Determine Transit Needs.** The County will continue to work with TCAG, cities, and communities in the County to evaluate and respond to public transportation needs.



## Matheny Tract Climate Adaptation Plan

---

- **TC-4.3 Support Tulare County Area Transit.** The County shall request the support of TCAG for development of transit services outlined in the County's Transit Development Plan. Efforts to expand Tulare County Area Transit should be directed toward:
  - Encouraging new and improving existing transportation services for the elderly and disabled,
  - Providing intercommunity services between unincorporated communities and cities.
- **TC 4.5 Transit Coordination.** The County shall encourage regional coordination to facilitate improved connectivity between County and city operated transit systems and other transportation modes.
- **TC-2.1 Rail Service.** The County shall support improvements to freight and expanding passenger rail service throughout the County.
- **TC 2.2 Rail Improvements.** The County shall work with cities to support improvement, development, and expansion of passenger rail service in Tulare County.
- **TC-2.3 Amtrak Service.** The County shall encourage Amtrak to add passenger service to the Union Pacific corridor in the County.
- **TC-2.4 High Speed Rail.** The County shall coordinate with TCAG and the California High Speed Rail Authority in efforts to locate the HSR corridor with a passenger stop and maintenance facility in Tulare County.
- **TC-2.5 Railroad Corridor Preservation.** The County shall work with other agencies to plan railroad corridors to facilitate the preservation of important railroad rights-of-way for future rail expansion or other appropriate transportation facilities.
- **TC-2.6 Rail Abandonment.** The County shall coordinate with the Public Utilities Commission and TCAG to evaluate possible impacts of rail line abandonment proposals and consider alternatives uses for abandoned facilities, such as light rail, bike trails, utility corridors, or transit facilities.
- **AQ-2.3 Transportation and Air Quality.** When developing the regional transportation system, the County shall work with TCAG to comprehensively study methods of transportation, which may contribute to a reduction in air pollution in Tulare County. Some possible alternatives that should be studied are:
  - Commuter trains (Light Rail, Amtrak, or High-Speed Rail) connecting with Sacramento, Los Angeles, and San Francisco, with attractive services scheduled up and down the Valley,
  - Public transportation such as buses and light rail, to serve between communities of the Valley, publicly subsidized if feasible,
  - Intermodal public transit such as buses provided with bicycle racks, bicycle parking at bus stations, bus service to train stations and airports, and park and ride facilities, and
  - Community transportation systems supportive of alternative transportation modes, such as cycling or walking trails, with particular attention to high-density areas.
- **ED IM 3.** The County shall commit staff resources to engage in regional transportation initiatives, such as the Regional Blueprint and San Joaquin Partnership that encourage regional planning and economic development.

# Matheny Tract Climate Adaptation Plan

---

## Transportation Management Programs Summary

- Transportation Demand Management programs encourage employees to use alternative modes of transportation for commute trips through incentives and information exchange regarding available options.
- Transportation Management Associations provide transportation services and expertise to multiple employers that may be too small individually to provide effective services.
- Ridesharing and matching programs help increase carpool participation by identifying and coordinating potential participants.

- **AQ-2.1 Transportation Demand Management Programs.** The County shall coordinate and provide support for County Transportation Demand Management programs with other public and private agencies, including programs developed by the TCAG and the SJVAPCD [New Policy].
- **AQ-2.4 Transportation Management Associations.** The County shall encourage commercial, retail, and residential developments to participate in or create Transportation Management Associations that can assist in the reduction of pollutants through provisions to support carpooling, alternative transportation, etc.
- **AQ-2.5 Ridesharing.** The County shall continue to encourage ridesharing programs such as employer-based rideshare programs.
- **AQ IM 10.** The County shall continue to evaluate and implement flextime programs (non-traditional work hour programs) for County employees to limit County staff commuting during peak hours.
- **AQ IM 17.** The County may inspect County facilities to evaluate energy use, the effectiveness of water conservation measures, production of GHGs, use of recycled and renewable products and indoor air quality to develop recommendations for performance improvement or mitigation. The County shall update the audit periodically and review progress towards implementation of its recommendations.

# Matheny Tract Climate Adaptation Plan

---

## Building Energy Efficiency

Energy consumption from buildings through electricity and natural gas usage is one of the largest sources of greenhouse gases. Policies that encourage the installation of the most energy efficient technologies can substantially reduce energy use and related emissions.

### Building Energy Efficiency Measures Summary

- New buildings to provide energy conserving features such as increased insulation in walls and roofs, cool light-colored roofs, high efficiency window.
  - Use high efficiency heating, ventilation, and cooling equipment in buildings.
  - Use passive solar designs and day-lighting to reduce heating and lighting demands.
  - Landscaping the shades buildings or parking lots to reduce ambient temperatures around buildings.
  - Provide solar ready roofs that provide adequate area to install photovoltaic panels and avoid shading of panels with roof structures and landscaping.
  - Install solar water heating systems.
  - Promote retrofits of older less efficient buildings with energy conserving devices.
- 
- **AQ-3.5 Alternative Energy Design.** The County shall encourage all new development, including rehabilitation, renovation, and redevelopment, to incorporate energy conservation and green building practices to maximum extent feasible. Such practices include, but are not limited to: building orientation and shading, landscaping, and the use of active and passive solar heating and water systems.
  - **LU-7.15 Energy Conservation.** The County shall encourage the use of solar power and energy conservation building techniques in all new development.
  - **ERM-4.1 Energy Conservation and Efficiency Measures.** The County shall encourage the use of solar energy, solar hot water panels, and other energy conservation and efficiency features in new construction and renovation of existing structures in accordance with State law.
  - **ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation.** The County shall promote the planting and maintenance of shade trees along streets and within parking areas of new urban development to reduce radiation heating.
  - **ERM-4.3 Local and State Programs.** The County shall participate, to the extent feasible, in local and State programs that strive to reduce the consumption of natural or man-made energy sources.
  - **ERM-4.4 Promote Energy Conservation Awareness.** The County should coordinate with local utility providers to provide public education on energy conservation programs.
  - **HS-1.4 Building and Codes.** Except as otherwise allowed by State law, the County shall ensure that all new buildings intended for human habitation are designed in compliance with the latest edition of the California Building Code, California Fire Code, and other adopted standards based on risk (e.g., seismic hazards, flooding), type of occupancy, and location (e.g., floodplain, fault).

# Matheny Tract Climate Adaptation Plan

---

- **ERM-4.6 Renewable Energy.** The County shall support efforts, when appropriately sited, for the development and use of alternative energy resources, including renewable energy such as wind and solar, biofuels and co-generation.
- **ERM-4.7 Reduce Energy Use in County Facilities.** Continue to integrate energy efficiency and conservation into all County functions.
- **ERM-4.8 Energy Efficiency Standards.** The County shall encourage renovations and new development to incorporate energy efficiency and conservation measures that exceed State Title 24 standards. When feasible, the County shall offer incentives for use of energy reduction measures such as expedited permit processing, reduced fees, and technical assistance.

## Water Conservation Energy Savings

Water conservation saves energy required to pump and treat water for use and reduces energy required for wastewater treatment. Specific measures to conserve water include:

### Water Conservation Measures Summary

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Expand groundwater recharge to capture runoff and water available during wet years.</li><li>• Use reclaimed water from tertiary plants for irrigation in appropriate locations.</li><li>• Use native and drought tolerant landscaping.</li><li>• Require the installation of low-flow fixtures.</li><li>• Smart irrigation technologies that apply water based on plant requirements and that direct water flow only where needed.</li></ul> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
- **WR-1.5 Expand Use of Reclaimed Wastewater.** To augment groundwater supplies and to conserve potable water for domestic purposes, the County shall seek opportunities to expand groundwater recharge efforts.
  - **WR-1.6 Expand Use of Reclaimed Water.** The County shall encourage the use of tertiary treated wastewater and household gray water for irrigation of agricultural lands, recreation and open space areas, and large landscaped areas as a means of reducing demand for groundwater resources.
  - **WR-3.5 Use of Native and Drought Tolerant Landscaping.** The County shall encourage the use of low water consuming, drought-tolerant and native landscaping and emphasize the importance of utilizing water conserving techniques, such as night watering, mulching, and drip irrigation.
  - **ERM-1.7 Planting of Native Vegetation.** The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.

# Matheny Tract Climate Adaptation Plan

---

## Solid Waste Reduction and Recycling

Recycled materials typically require a fraction of the energy to produce compared to those using virgin materials. Programs to avoid use of excessive packaging reduce energy used in production and eliminate the transfer of material to a landfill. Landfills produce methane gas from the decomposition of the organic matter in the waste stream. Programs to encourage composting and use of the biomass for energy production provide renewable energy and reduce greenhouse gas emissions.

## Solid Waste Reduction and Recycling Measures Summary

- Encourage the use of recycled materials in its own operations and purchases.
  - Provide sites and publicity for recycling events.
  - Work with recycling contractors on innovative programs to encourage residents and businesses to take advantage of recycling services.
- **PFS-5.3 Solid Waste Reduction.** The County shall provide notification to proposed development within one-mile of a solid waste facility of the existence of the solid waste facility and any proposed changes to the facility.
  - **PFS-5.4 County Usage of Recycled Materials and Products.** The County shall encourage all industries and government agencies in the County to use recycled materials and products where economically feasible.
  - **PFS-5.5 Private Use of Recycled Products.** The County shall work with recycling contractors to encourage businesses to use recycled products and encourage consumers to purchase recycled products.

## Agricultural Programs and Initiatives

Agriculture offers opportunities for projects that generate greenhouse gas credits related to biofuels and other alternative energy sources and that may provide additional income to farming operations.

## Agricultural Measures Summary

- Encourage energy production and alternative energy projects with assistance in identifying appropriate sites and with the permit process.
  - Build on its advanced agricultural technology base to provide conditions supportive for developing a strong biotech and biofuels industry.
- **AG-2.11 Energy Production.** The County shall encourage and support the development of new agricultural related industries featuring alternative energy (e.g., ethanol), utilization of agricultural waste, and solar or wind farms.
  - **AG-2.6 Biotechnology and Biofuels.** The County shall encourage the location of industrial and research-oriented businesses specializing in biotechnologies and biofuels that can enhance agricultural productivity, enhance food processing activities in the County, provide for new agriculturally related products and markets, or otherwise enhance the agricultural sector in the County.

# Matheny Tract Climate Adaptation Plan

---



# Matheny Tract Climate Adaptation Plan

## Chapter 8 Implementation, Monitoring and Funding Opportunities

### Identification Projects and or Programs

The following projects and programs are recommended for consideration:

1. Wastewater Treatment/Gravity Collection System Plan
2. Stormwater Drainage System Plan
3. Transportation Infrastructure Plan
4. Housing Energy Conservation and Weatherization programs
5. Urban Greening Program

### Wastewater Treatment/Gravity Collection System Plan

A gravity collection system and consolidation with the City of Tulare, is the preferred alternative. This alternative includes construction of a wastewater collection system within the Matheny Tract, at least one lift station located near Pratt Street, and a combination of 8-, 10- and 12-inch PVC sewer mains with manholes spaced at 350 feet. The design criteria for the project were defined previously and are summarized in the following **Tables (8-1 through 8-3 and Figure 8-1)**. The system will be designed to utilize PVC pipe, which will have a useful life of more than 50 years if properly maintained. The lift station(s) will have useful lives of 20-50 years, depending on which components are considered. The pumps and other mechanical components will require replacement long before the piping and lift station structures, although maintenance to surface coatings will be periodically needed.

**Table 8-1 Collection System Design Criteria**

Table 8-1: Collection System Design Criteria			
Parameter	Units	Peaking Factor	Design Value
Average Dry-Weather Flow	gpd	-	130,000
Peak Daily Flow	gpd	1.6	208,000
Peak Hourly Flow	gpd gph	2.1 <sup>14</sup>	273,000 11,375
Minimum Separation (from existing Water main)	feet		10
Minimum Cover	feet		4
Manhole Spacing, maximum	feet		350
Lift Station Depth, maximum	feet		25
Gravity Sewer Velocity	feet per second (fps)		Minimum: 2 Maximum: 10
Force Main Velocity,	fps		Minimum: 2 Maximum: 10
Gravity Sewer Slope, minimum [1]	ft/ft		8-inch main: 0.0033 10-inch main: 0.0024 12-inch main: 0.0019
Notes: [1] Identified minimum sewer slopes are specified in the City of Tulare Standards and Specifications			

## Matheny Tract Climate Adaptation Plan

---

**Table 8-2 Project Cost Estimate**

Table 8-2: Project Cost Estimate	
Item Description	Subtotal
Wastewater Collection System	\$5,539,001
Connection to City of Tulare	\$2,010,275
Contingency	\$1,509,855
Engineering	\$754,928
<b>Total Project Costs</b>	<b>\$9,814,059</b>
Annual Operations & Maintenance Costs	\$150,192
Cost per Month per Connection [1]	\$42
Present Worth Cost	\$2,234,478
<b>Total Project Costs + Present Worth Costs</b>	<b>\$12,048,537</b>
Notes:	
[1] The cost per month is the City's current sewer rate and does not include any loan repayment component.	



# Matheny Tract Climate Adaptation Plan

**Table 8-3 Engineer's Opinion of Probable Construction Cost**

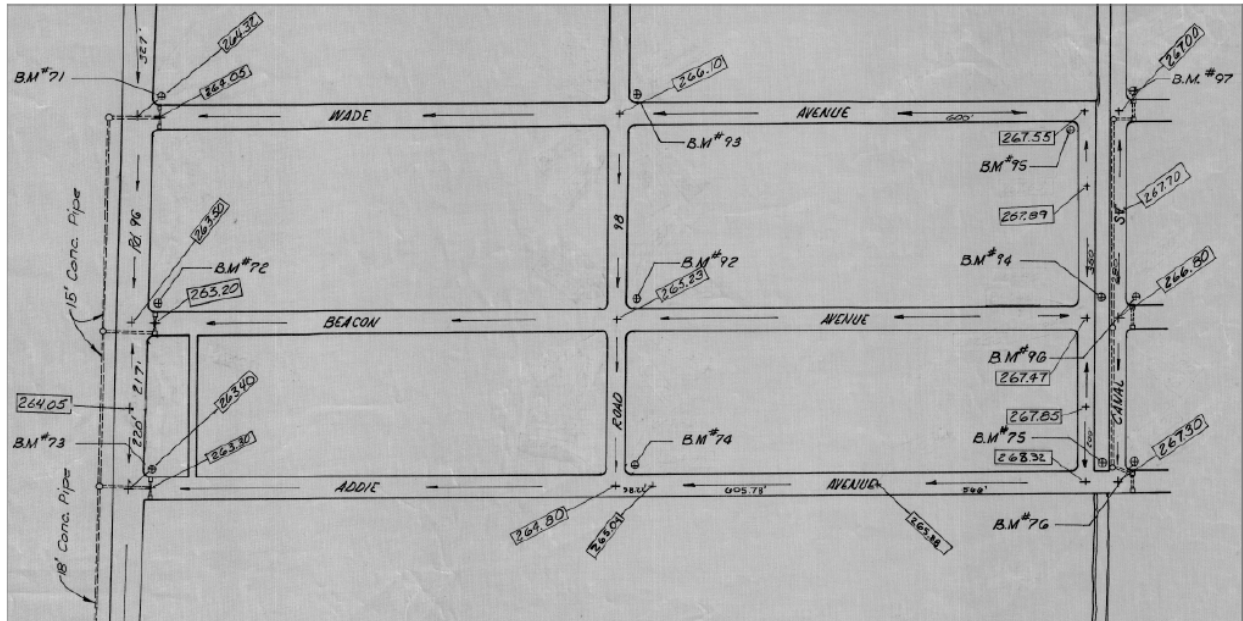
<b>ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST</b> <b>PRELIMINARY</b>  <b>MATHENY TRACT WASTEWATER STUDY</b> <b>ALTERNATIVE NO. 2</b> <b>WASTEWATER COLLECTION SYSTEM AND</b> <b>CONSOLIDATION WITH CITY OF TULARE</b>  2/4/2016				
ITEM NO.	QTY	BID ITEM DESCRIPTION	UNIT PRICE	SUBTOTAL
<b>Collection System</b>				
1	1	Mobilization, Demobilization, Bonds and Insurance	\$160,000 / LS	\$160,000
2	1	Traffic Control	\$60,000 / LS	\$60,000
3	1	Fugitive Dust Control	\$10,000 / LS	\$10,000
4	1	Worker Protection	\$21,500 / LS	\$21,500
5	1	Prepare and Implement SWPPP	\$26,500 / LS	\$26,500
6	22,000	8-Inch PVC Sewer Main	\$53 / LF	\$1,166,000
7	1,010	10-Inch PVC Sewer Main	\$64 / LF	\$64,640
8	270	Bore & Jack 8" Carrier Pipe w/16" Casing	\$690 / LF	\$186,300
9	1	Lift Station	\$400,000 / EA	\$400,000
10	292	4" Sewer Service	\$4,200 / EA	\$1,226,400
11	6	6" Sewer Service	\$5,300 / EA	\$31,800
12	298	Abandon Existing Septic Systems	\$4,250 / LF	\$1,266,500
13	1	Permitting	\$15,000 / LS	\$15,000
14	23,010	Temporary Trench Resurfacing (Mains)	\$6.50 / LF	\$149,565
15	23,010	Permanent Trench Resurfacing (Mains)	\$32 / LF	\$736,320
16	298	Temporary Trench Resurfacing (Services)	\$31 / EA	\$9,238
17	298	Permanent Trench Resurfacing (Services)	\$31 / EA	\$9,238
		<b>Subtotal Collection System</b>		<b>\$5,538,001</b>
<b>Connection to City of Tulare System</b>				
18	2,810	12-Inch PVC Sewer Main	\$85 / LF	\$238,850
19	120	Bore & Jack 12" Carrier Pipe w/24" Casing	\$700 / LF	\$84,000
20	298	Capacity & Connection Fees	\$5,300 / LF	\$1,579,400
21	1	Permitting	\$2,650 / LS	\$2,650
22	2,810	Temporary Trench Resurfacing (Mains)	\$6.50 / LF	\$18,265
23	2,810	Permanent Trench Resurfacing (Mains)	\$31 / LF	\$87,110
		<b>Subtotal Connection to City of Tulare</b>		<b>\$2,010,275</b>
		<b>Subtotal</b>		<b>\$7,548,276</b>
		Contingency - 20%		\$1,509,855
		Engineering & Construction Observation - 10%		\$754,928
		<b>Total Project Cost</b>		<b>\$9,814,059</b>
		Present Worth of O&M Costs (\$150,200 per year for 20 years at 3% interest)		\$2,234,478
<b>TOTAL PROJECT COST + PRESENT WORTH COSTS</b>				<b>\$12,048,537</b>

# Matheny Tract Climate Adaptation Plan

## Stormwater Drainage System Plan

Tulare County has completed initial base mapping for Matheny Tract. Relevant information includes surveying data with benchmark locations and top of curb or pavement elevations in north Matheny Tract. In addition, existing concrete pipes and directional flow arrows are mapped as shown in **Figure 8-3**.

**Figure 8-2 North Matheny Storm Water Survey Map**



## Matheny Tract Climate Adaptation Plan

The backbone of the storm drain system is used to estimate costs for curb, gutter and sidewalk improvements. When possible, surface water would flow into the existing canal and ponding basin. However, due to the elevation of Matheny Tract, which generally descends from the northeast to the southwest, surface water will have to be pumped at places of lower elevation. A preliminary opinion of probable cost estimates that are included below.

**Table 8-4**

Backbone Infrastructure (Master Drainage)					
Item No.	Description	Unit	Qty	Unit Price	Item Price
1	Land Purchase	AC	3	35000	\$105,000
2	Basin Excavation	CY			
3	Fencing	LF			
4	Outlet Structure	EA			
5	Misc. Basin Items	LS			
6	30" Reinforced Concrete Pipe (Trunk) - Shed B	LF		\$80.00	
7	24" Reinforced Concrete Pipe (Trunk) - Shed A	LF		\$60.00	
8	Misc. Drainage Collection	LS			
Total (Items 1-8)					

Cost per Ft Calculation (All Inclusive)				
Item No.	Description	Unit	Qty	Unit Price
	HMA thickness	IN	3	
	AB thickness	IN	6	
	Existing Road thickness	IN	9	
	Width	FT	36	
1	Roadway Excavation	CY	1.000	\$15.00
2	Hot Mix Asphalt	TON	0.720	\$100.00
3	Class 2 Aggregate Base	CY	0.667	\$50.000
4	Curb & Gutter	LF		\$20.00
5	Sidewalk	LF		\$30.00
6	15" RCP Storm Drain	LF		\$80.00
7	Signing/Striping	LS		\$10,000.00
8	Curb Ramps	EA		\$2,000.00
9	Mobilization	%		10.0%
10	Traffic Control	%		5.0%
11	Design Engineering	%		10.0%
12	Right of Way/Utilities	LS		
13	Environmental Clearance	%		5.0%
14	Misc. Roadway Items	%		20.0%
15 (Items 1-6)	*With Storm Drain	LF		\$380.33
16 (Items 1-5)	*Without Storm Drain	LF		\$220.33
17 (Items 1-3)	Roadway	LF		\$120.33
18 (Items 4-5)	*Curb, Gutter & Sidewalk	LF		\$100.00
19 (Item 6)	*Drainage	LF		\$160.00

**Notes:**

1) Proposed Improvements & Existing Conditions includes the cost of new roadway, curb & gutter, and curb ramps. Additionally, it only includes the cost of storm drain along specified segments and excludes the cost of sidewalk where it currently exists.

2) ATP Grant includes the cost of new curb & gutter and curb ramps along the specified sections. Additionally, it only includes the cost of storm drain and roadway along the proposed storm drain segments (\*\*) and excludes the cost of sidewalk where it currently exists.

3) Base Construction Cost includes the cost of materials per foot (Items 15-19) plus the cost for curb ramps (Item 8).

4) Misc. Construction Cost includes the cost for mobilization (Item 9), traffic control (Item 10), and misc. roadway items (Item 14).

5) Env/Eng Cost includes the cost for design engineering (Item 11) and Environmental clearance (Item 13).

6) Segment Costs do not include lump sum cost for Signing/Striping and Right of Way/Utilities.

\* Cost assumes improvements on both sides of segment.

\*\* Segments with Proposed Storm Drain

\*\*\* ATP segments (include segments with proposed storm drain)



# Matheny Tract Climate Adaptation Plan

Table 8-5

Priority A Improvements																
					With Storm Drain				Proposed Improvements & Existing Conditions				Without Storm Drain			
Segment	From - To	Length (FT)	No. Curb Ramps	Existing Sidewalk (FT)	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost
Adde	***Pratt - S. Lutan	1310	2		\$902,236.67	\$175,782.83	\$75,335.50	\$1,053,355.00	\$902,236.67	\$175,782.83	\$75,335.50	\$1,053,355.00	\$293,636.67	\$102,422.83	\$43,865.50	\$438,965.00
	***S. Lutan - S. Canal	1320	2		\$906,040.00	\$177,114.00	\$75,906.00	\$1,059,060.00	\$294,840.00	\$103,194.00	\$44,226.00	\$442,260.00	\$294,840.00	\$103,194.00	\$44,226.00	\$442,260.00
	***S. Canal - S. Casa	1280	2		\$490,626.67	\$171,789.33	\$73,624.00	\$736,240.00	\$490,626.67	\$171,789.33	\$73,624.00	\$736,240.00	\$296,026.67	\$100,109.33	\$42,964.00	\$439,040.00
	***S. Casa - I Drive (County Rd 112)	1230	2		\$471,810.00	\$165,133.50	\$70,771.50	\$707,715.00	\$275,910.00	\$96,253.50	\$41,251.50	\$412,515.00	\$265,910.00	\$96,253.50	\$41,251.50	\$412,515.00
				Adde Total*	\$1,970,913.33	\$689,819.67	\$295,637.00	\$2,956,370.00	\$1,562,913.33	\$547,019.67	\$234,437.00	\$2,344,370.00	\$1,148,913.33	\$401,979.67	\$172,277.00	\$1,722,770.00
Pratt	***W. Wade - W. Beacon	550	2		\$213,183.33	\$74,614.17	\$31,977.50	\$319,775.00	\$125,183.33	\$43,814.17	\$18,777.50	\$187,775.00	\$125,183.33	\$43,814.17	\$18,777.50	\$187,775.00
	***W. Beacon - W. Adde	445	2		\$173,248.33	\$60,636.92	\$25,987.25	\$259,872.50	\$102,048.33	\$35,716.92	\$15,307.25	\$153,072.50	\$102,048.33	\$35,716.92	\$15,307.25	\$153,072.50
	***W. Adde - W. Matheny	1520	2		\$682,106.67	\$203,727.33	\$87,316.00	\$973,160.00	\$338,906.67	\$118,617.33	\$50,636.00	\$508,960.00	\$338,906.67	\$118,617.33	\$50,636.00	\$508,960.00
	***W. Matheny - Pine Dr	515	2		\$199,871.67	\$69,955.08	\$29,980.75	\$299,807.50	\$117,471.67	\$41,115.08	\$17,620.75	\$176,207.50	\$117,471.67	\$41,115.08	\$17,620.75	\$176,207.50
				Pratt Total*	\$1,168,410.00	\$408,943.50	\$175,261.50	\$1,752,615.00	\$683,610.00	\$239,263.50	\$102,541.50	\$1,025,415.00	\$683,610.00	\$239,263.50	\$102,541.50	\$1,025,415.00
				Priority A Total*	\$3,139,323.33	\$1,098,763.17	\$470,898.50	\$4,708,985.00	\$2,246,523.33	\$786,283.17	\$336,978.50	\$3,369,786.00	\$2,246,523.33	\$786,283.17	\$336,978.50	\$3,369,786.00

\*\* Segments with Proposed Storm Drain

\*\*\* ATP segments (include segments with proposed storm drain)

Priority B Improvements																
Segment	From - To	Length (FT)	No. Curb Ramps	Existing Sidewalk (FT)	With Storm Drain				Proposed Improvements & Existing Conditions				Without Storm Drain			
					Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost
Beacon	***Pratt - Lutan	1305	2	140	\$600,335.00	\$175,117.25	\$75,050.25	\$750,502.50	\$287,335.00	\$100,587.25	\$43,100.25	\$431,022.50	\$291,535.00	\$102,037.25	\$43,730.25	\$437,302.50
	***Lutan - Canal	1315	2	442	\$604,138.33	\$176,448.42	\$75,620.75	\$756,207.50	\$280,478.33	\$98,167.42	\$42,071.75	\$420,717.50	\$293,738.33	\$102,808.42	\$44,060.75	\$440,607.50
	***Canal - Casa	1275	4	50	\$492,926.00	\$172,523.75	\$73,938.75	\$739,387.50	\$287,426.00	\$100,586.75	\$43,113.75	\$431,137.50	\$288,926.00	\$101,123.75	\$43,338.75	\$433,387.50
					Beacon Total*	\$1,497,399.33	\$524,089.42	\$224,609.75	\$2,246,097.50	\$855,239.33	\$299,333.42	\$128,285.75	\$1,282,857.50	\$874,198.33	\$305,969.42	\$131,128.75
Lutan	***Wade - Beacon	550			\$209,183.33	\$73,214.17	\$31,377.50	\$313,775.00	\$209,183.33	\$73,214.17	\$31,377.50	\$313,775.00	\$121,183.33	\$42,414.17	\$18,177.50	\$181,775.00
	***Beacon - Adde	440			\$167,346.67	\$58,571.33	\$25,102.00	\$251,020.00	\$167,346.67	\$58,571.33	\$25,102.00	\$251,020.00	\$96,946.67	\$33,931.33	\$14,542.00	\$145,420.00
				Lutan Total*	\$376,530.00	\$131,785.50	\$56,479.50	\$564,795.00	\$376,530.00	\$131,785.50	\$56,479.50	\$564,795.00	\$218,130.00	\$76,345.50	\$32,719.00	\$327,195.00
S. Canal	***Wade - Beacon	555			\$211,085.00	\$73,879.75	\$31,662.75	\$316,627.50	\$122,285.00	\$42,789.75	\$18,342.75	\$183,427.50	\$122,285.00	\$42,789.75	\$18,342.75	\$183,427.50
	***Beacon - Adde	430			\$163,543.33	\$57,240.17	\$24,631.50	\$245,315.00	\$84,743.33	\$33,160.17	\$14,211.50	\$142,115.00	\$84,743.33	\$33,160.17	\$14,211.50	\$142,115.00
				S. Canal Total*	\$374,628.33	\$131,119.92	\$56,194.25	\$561,942.50	\$217,028.33	\$75,959.92	\$32,554.25	\$325,542.50	\$217,028.33	\$75,959.92	\$32,554.25	\$325,542.50
Canal	***Beacon - Adde	420			\$159,740.00	\$55,909.00	\$23,961.00	\$239,610.00	\$159,740.00	\$55,909.00	\$23,961.00	\$239,610.00	\$138,810.00	\$42,540.00	\$17,389.00	\$138,810.00
	***Adde - Casa	455			\$173,851.67	\$60,568.08	\$25,957.75	\$259,577.50	\$173,851.67	\$60,568.08	\$25,957.75	\$259,577.50	\$100,251.67	\$35,088.08	\$15,037.75	\$150,377.50
				Canal Total*	\$333,591.67	\$116,477.08	\$49,918.75	\$499,987.50	\$333,591.67	\$116,477.08	\$49,918.75	\$499,987.50	\$239,061.67	\$77,636.16	\$32,425.50	\$326,723.33
Matheny	***Pratt - Pine	1075	2		\$412,859.33	\$144,500.42	\$61,528.75	\$619,287.50	\$240,859.33	\$84,300.42	\$36,128.75	\$361,287.50	\$240,859.33	\$84,300.42	\$36,128.75	\$361,287.50
	***Pine - End	625			\$237,709.33	\$83,197.92	\$35,656.25	\$356,562.50	\$137,709.33	\$48,197.92	\$20,656.25	\$206,562.50	\$137,709.33	\$48,197.92	\$20,656.25	\$206,562.50
				Matheny Total*	\$650,568.67	\$227,698.33	\$97,185.00	\$975,050.00	\$378,568.67	\$132,498.33	\$56,785.00	\$567,850.00	\$378,568.67	\$132,498.33	\$56,785.00	\$567,850.00
Pine	***Pratt - Matheny	1320			\$605,843.33	\$177,045.17	\$75,076.50	\$758,765.00	\$263,043.33	\$102,965.17	\$43,956.50	\$439,965.00	\$263,043.33	\$102,965.17	\$43,956.50	\$439,965.00
				Priority B Total*	\$3,737,768.33	\$1,308,215.42	\$560,468.75	\$5,608,837.50	\$2,386,998.33	\$856,099.42	\$367,899.75	\$3,678,997.50	\$2,375,748.33	\$856,099.42	\$367,899.75	\$3,678,997.50

\*\* Segments with Proposed Storm Drain

\*\*\* ATP segments (include segments with proposed storm drain)

Priority C Improvements																
Segment	From - To	Length (FT)	No. Curb Ramps	Existing Sidewalk (FT)	With Storm Drain				Proposed Improvements & Existing Conditions				Without Storm Drain			
					Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost	Base Construction Cost	Misc. Construction Cost	Env/Bng Cost	Total Segment Cost
Wade	***Pratt - Lutan	1285	2		\$492,728.33	\$172,454.92	\$73,909.25	\$739,092.50	\$287,128.33	\$100,494.92	\$43,069.25	\$430,692.50	\$287,128.33	\$100,494.92	\$43,069.25	\$430,692.50
	***Lutan - Canal	1320	2		\$906,040.00	\$177,114.00	\$75,906.00	\$1,059,060.00	\$294,840.00	\$103,194.00	\$44,226.00	\$442,260.00	\$294,840.00	\$103,194.00	\$44,226.00	\$442,260.00
	***Canal - Casa	1280	1	140	\$492,630.00	\$172,420.50	\$73,894.50	\$739,945.00	\$282,030.00	\$98,710.50	\$42,304.50	\$423,045.00	\$286,230.00	\$100,180.50	\$42,934.50	\$429,345.00
				Wade Total*	\$1,491,398.33	\$521,989.42	\$223,709.75	\$2,237,097.50	\$863,998.33	\$302,399.42	\$128,599.75	\$1,294,597.50	\$868,198.33	\$303,869.42	\$130,228.75	\$1,302,287.50
Beacon	***Casa - I Drive	1180	2		\$445,186.67	\$155,815.33	\$66,778.50	\$667,780.00	\$259,586.67	\$90,855.33	\$38,938.00	\$389,380.00	\$259,586.67	\$90,855.33	\$38,938.00	\$389,380.00
Canal	***Wade - Beacon	550		385	\$209,183.33	\$73,214.17	\$31,377.50	\$313,775.00	\$209,183.33	\$73,214.17	\$31,377.50	\$313,775.00	\$121,183.33	\$42,414.17	\$18,177.50	\$181,775.00
	***Beacon - Casa	520			\$197,773.33	\$66,220.67	\$29,666.00	\$296,660.00	\$197,773.33	\$66,220.67	\$29,666.00	\$296,660.00	\$114,673.33	\$40,100.67	\$17,186.00	\$171,860.00
I Drive	***Beacon - Adde	480			\$162,560.00	\$53,886.00	\$27,384.00	\$273,840.00	\$105,760.00	\$37,016.00	\$15,864.00	\$158,640.00	\$105,760.00	\$37,016.00	\$15,864.00	\$158,640.00
				Priority C Total*	\$2,826,101.67	\$984,136.68	\$378,016.25	\$3,788,162.60	\$1,638,761.67	\$588,018.00	\$230,862.75	\$2,449,642.42	\$1,489,011.67	\$514,256.68	\$220,886.25	\$2,224,162.60

\*\* Segments with Proposed Storm Drain

\*\*\* ATP segments (include segments with proposed storm drain)

## Transportation Infrastructure Plan

### Sidewalks

Making improvements to sidewalks has been identified by Matheny residents as one of the highest priorities. Public workshops have responded to this strong desire for improved sidewalks by appropriating significant funding the past several years for sidewalk improvements as indicated by a self-imposed transportation tax for countywide transportation improvements (Measure R). In addition, the 2012 General Plan adopted by the Tulare County Board of Supervisors contains the following goals and policies related to sidewalk improvements:

- PF-2.7 Improvement Standards in Communities
- LU-7.3 Friendly Streets
- HS-9.1 Healthy Communities
- HS-9.2 Walkable Communities

# Matheny Tract Climate Adaptation Plan

---

- TC-5.5 Consider Non-Motorized Modes in Planning and Development

This document has been prepared to address public concerns as well as these goals and policies contained in the Tulare County General Plan. There are three primary sidewalk issues within Matheny Tract that are addressed in this Plan. They are:

1. Existing sidewalks that are in poor condition that need to be replaced;
2. Locations where new sidewalks need to be constructed because no sidewalks currently exist; and,
3. Maintenance.

Due to the large number of locations where no sidewalks currently exist, it will take a sustained effort over many years and a significant amount of funding to address all of the sidewalk needs within the Community.

During the Public Workshops, Community input was given to determine how to prioritize the locations to build new sidewalks and is specific to Matheny Tract. The criteria for determining the locations to construct new sidewalks where none currently exist in Matheny Tract are as follows:

- **Priority A:** Locations along major collectors (Pratt Street and Addie Avenue) with a higher number of pedestrians.
- **Priority B:** Locations along a collector or local roadway adjacent/near:
  1. A school/transit bus stop;
  2. More dense residential center(s); and,
  3. Commercial center with a higher number of pedestrians.
- **Priority C:** All other locations (i.e., residential areas). Based on this priority system, **Figure 8-3** shows the residential density within Matheny Tract and identifies prioritized locations for roadway (curb, gutter & sidewalk) within the Community. Based on this priority system, **Figure 8-3** identifies prioritized locations for roadway (curb, gutter & sidewalk) within the Community. **Figure 8-3** represent the level of priority for curb, gutter and sidewalk projects in Matheny Tract.



## Matheny Tract Climate Adaptation Plan

---

The costs for constructing new sidewalks within Matheny Tract will vary greatly depending on the specific location. Most of the areas that do not have sidewalks also do not have curb & gutter. Installing curb & gutter and adequate drainage facilities is necessary before sidewalks can be installed and the cost for this infrastructure will be much higher than the actual cost of the sidewalk. In addition, some locations will require considerable grading for the new sidewalks to be constructed, which will greatly increase the overall cost.

For purposes of this report, the following assumptions were used to estimate the costs for new sidewalks (5-foot wide):

- Cost per Linear Foot of New Sidewalk Only: \$30/linear foot.
- Cost for Curb & Gutter/Drainage/Grading per Linear Foot of New Sidewalk: \$20/linear foot (depends on drainage requirements) - Use average of \$80/linear foot for purposes of this report.
- Total Cost per Linear Foot of New Sidewalk and Curb & Gutter: \$50/linear ft.

Based on this unit cost, the total estimated cost to construct sidewalks along both sides of all existing streets where a sidewalk does not currently exist is approximately \$3,700,000.

Based upon the Active Transportation Program (ATP) Goals identified below, Tulare County submitted an application on May 21, 2014, for approximately \$4,800,120 for FY 2014/15 through Caltrans. This grant was not successful; however, Tulare County will continue to submit in future ATP funding cycles.

**Figure 8-4** includes the construction of approximately 39,650 linear feet of 5-foot wide concrete sidewalk with curb and gutter along both sides of the following street segments in Matheny Tract:

- Wade Avenue between Pratt Street (Road 96) and Casa Street (0.74 mi.);
- Beacon Avenue between Pratt Street and I Drive (0.95 mi.);
- Addie Avenue between Pratt Street and I Drive (0.97 mi.);
- Pratt Street between Addie Avenue and Wade Avenue (0.18 mi.);
- Luton Street between Addie Avenue and Wade Avenue (0.18 mi.);
- S. Canal Street between Addie Avenue and Wade Avenue (0.18 mi.);
- Canal Street between Addie Avenue and Wade Avenue (0.18 mi.); and, Casa Street between Addie Avenue and Wade Avenue (0.18 mi.).

New storm drains and roadway reconstruction is proposed along the following street segments in Matheny Tract:

- Addie Avenue between Pratt Street and Luton Street (0.25 mi.);
- Addie Avenue between Canal Street and Casa Street (0.24 mi.);
- Luton Street between Addie Avenue and Wade Avenue (0.18 mi.); and,
- Casa Street between Addie Avenue and Wade Avenue (0.18 mi.).

# Matheny Tract Climate Adaptation Plan

**Figure 8-4 Matheny Tract Sidewalks and Safe Routes to Bus Stop Improvement Project**



In addition, 12 new drainage inlets (DI) are proposed at various locations along these street segments. ADA standard ramps shall be placed at all intersections that include new sidewalks.

## Cost for new street lights

The costs for installation of 18 new street lights is a result of environmental mitigation required as a result of a Community Benefits Agreement between Matheny Tract Committee and Colony Energy - Tulare, LLC, drafted October 4, 2012. In summary, the following was agreed upon between the two parties involved in discussions regarding mitigation measures of the proposed development:

- Developer shall arrange for installation of, or provide funding to the County of Tulare for installation of, 4 street lights in South Matheny Tract and provide funding or reimbursement to the County of Tulare for operation of such street lights for a 10-year period; and,
- Developer shall also provide funding or reimbursement to the County of Tulare for operation of 14 street lights in North Matheny Tract for a 10-year period.



# Matheny Tract Climate Adaptation Plan

Figure 8-5 Matheny Tract Sidewalks and Safe Routes to Bus Stop Improvement Project

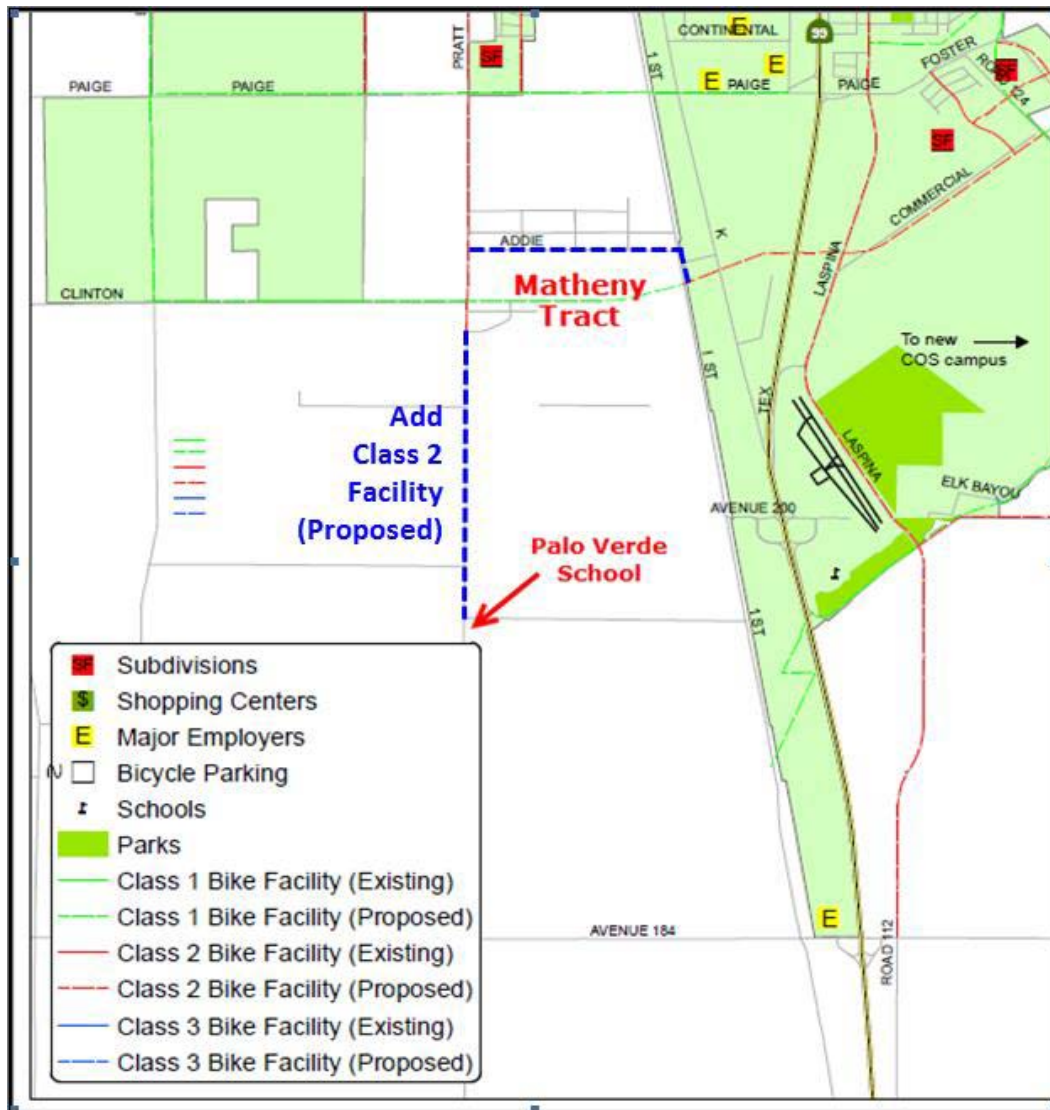


In addition, residents were asked to identify key locations within Matheny Tract where they desired installation of new street lights within Matheny Tract. These locations were refined to include locations at intersections, at the end of cul-de-sacs, at curved roads and along corridors with no existing streets lights. Based upon recent street light installation costs, which include hooking up to power, it is estimated that these streetlights will cost approximately \$15,000 each or \$270,000 for 18 street lights. **Figure 8-5** identifies existing and proposed street lights that were selected by the residents and should be used by the agency or group that installs the street lights. This figure represents a high priority project in Matheny Tract. **Figure 8-5** below identifies proposed bike facilities.



# Matheny Tract Climate Adaptation Plan

Figure 8-6 Proposed Bike Facilities



## Housing Energy Conservation and Weatherization Programs

Consideration of CDBG Housing Rehabilitation or similar mechanisms to improve the condition of housing and quality of life in the unincorporated areas of the County by expanding and preserving the supply of healthy, safe, sanitary and code compliant housing; and maintaining the stability of neighborhoods. Green Building Standards should be considered in an effort to meet these goals. Additional smart growth principles could include California Green Builder, LEED for Homes or other best management practices.

# Matheny Tract Climate Adaptation Plan

---

## Green Technology

Promoting energy efficiency and use of resource-efficient and healthy materials beyond code requirements as feasible and appropriate, and incorporating products with reduced impact on global resources such as forests and the ozone layer.

1. Site and structural improvements.
  - a. Minimum 15% fly ash or slag concrete for foundation and other applications.
  - b. Minimum 25% recycled-content structural steel.
  - c. Engineered lumber for beams and headers.
  - d. Engineered lumber for Wood I-Joists or web trusses for floors and ceilings.
  - e. Energy Star rated cool roof that are durable and non-combustible.
  - f. Integrated solar roof.
  - g. Insulation – blown-in cellulose minimum 75% recycled content.
  - h. Oriented Strand Board (OSB) for floor, wall and roof sheathing.
  - i. Seal sole plates.
  - j. Seal top plate and exterior penetrations at plumbing, electrical and other penetrations.
  - k. Insulated or solid core doors with weather stripping.
  - l. Install and flash windows in compliance with window installation protocols.
2. Improvements to increase the efficient use of energy in structures.
  - a. Installation of Energy Star® ceiling fans in living areas and all bedrooms.
  - b. Installation of a whole house fan with insulated louvers.
  - c. Installation of Energy Star® appliances.
  - d. Increase wall and attic insulation.
  - e. Conversion/modification/replacement of heating and cooling equipment, including the use of solar energy equipment.
  - f. Install Compact energy efficient Bulbs or compact lamps.
3. Improvements to increase the efficient use of water.
  - a. Low-flow toilets or High Efficiency Toilets.
  - b. Waterless Urinals.
  - c. Water saving faucets, shower heads and flow restrictors.
  - d. Grey water systems.
  - e. Gas storage water heater with an Energy Factor (EF) of 0.62 or greater and a capacity of at least 30 gallons for one- and two-bedroom units and 40 gallons for three-bedroom units or larger.
4. Improvements to indoor environments.
  - a. Use 0 or low VOC paint and stains.
  - b. Use formaldehyde-free or fully sealed materials for cabinets and counters.
  - c. Renewable/Recycled/Certified flooring. Carpet shall comply with U.S. Department of Housing and Urban Development/Federal Housing Administration UM 44C, or alternatively, cork, bamboo, linoleum, or hardwood floors shall be provided in all other floor areas.

# Matheny Tract Climate Adaptation Plan

---

## Urban Greening Program

Consideration of projects that will reduce greenhouse gases and create a more sustainable and healthy community including the following benefits:

- Sequester and store carbon by planting trees.
- Reduce building energy use by strategically planting trees to shade buildings.
- Reduce commute vehicle miles traveled by constructing bicycle paths, bicycle lanes or pedestrian facilities that provide safe routes for travel between residences, workplaces, commercial centers, and schools.

## Urban Greening Guidelines

- 60 percent to projects located within and benefitting disadvantaged communities (top 25% in CalEnviroScreen 3.0).
- 10 percent to projects located within and benefitting AB 1550 low-income communities (at or below 80 percent of the statewide median income).
- 5 percent to projects located within and benefitting AB 1550 low-income communities that are within a half mile of a disadvantaged community.
- Establishment, enhancement, and expansion of neighborhood parks and community spaces.
- Greening of public lands and structures, including schoolyards, and which may include incorporation of riparian habitat for water capture and provide for other public and wildlife benefits.
- Green streets and alleyways.
- Non-motorized urban trails that provide safe routes for travel between residences, workplaces, commercial centers, and schools.
- Urban heat island mitigation and energy conservation efforts.

Additional points will be given to projects that meet two of the following:

1. Provides park or recreational benefits to a critically underserved community or disadvantaged community.
2. Proposed by a critically underserved community or disadvantaged community.
3. Develops partnerships with local community organizations and businesses in order to strengthen outreach to disadvantaged communities, provides access to quality jobs for residents of disadvantaged communities, or provides access to workforce education and training.
4. Uses interagency cooperation and integration.
5. Uses existing public lands and facilitates the use of public resources and investments, including schools.

## Benefits

More bikeable and walkable environments:

- Improving health and well-being
- Raising property values

## Matheny Tract Climate Adaptation Plan

---

- Neighborhood pride
- Provide spaces for children to play
- Recreational opportunities

### Current and Historical Funding

Eligibility: cities, counties, non-profits, special districts, joint powers authority can all apply. Other requirements: project has to meet GHG reductions; must serve a disadvantaged or low-income community (75% of funds).

- 2020 - Round 4: \$30 million available. Application opens in March 2020, deadline to submit is usually 30-60 days after deadline.
- 2019 - \$19 million for 11 infrastructure projects.
- 2017 - \$76 million for 36 infrastructure projects.

# Matheny Tract Climate Adaptation Plan

## Identification of Funding Sources for Plan Implementation

The Transportation and Infrastructure Funding Matrix, shown in **Table 8-6**, provides a list of transportation and infrastructure projects that have been identified as a result of this Plan. Based upon input gathered at previous Community Workshops and analysis of existing and proposed conditions, **Table 8-6** identifies major projects recommended for implementation in Matheny Tract such as curb, gutter and sidewalk installation, roadway rehabilitation, drainage improvements and development of a storm water facilities. Additional projects are underground pipes, drainage inlets, ponding basin, installation of 18 street lights, and other projects such as bus stops/amenities (benches, shelters, trash receptacles, etc.), landscaping/dust control and bike lanes.

**Table 8-6** Transportation and Infrastructure Funding Matrix

							FHWA-FTA				Caltrans			Local		Other							
Priority	Improvement	Cost Estimate	Community Preferred Alternative	Recommended Alternative	5-5 Year Cost	6-10 Year Cost	11-20 Year Cost	CMAQ	TE	SETS	TAP	Section 307/311	SR25	ATP <sup>1</sup>	BLA	State/Cas Tax	Measure R (Roads)	Measure R (Bike/Ped.)	Seismic Mitigation	CRRMS Grants	CDMG Grants	Misc. Grants	USDA Loan Assessments
A	Adelle Ave, Front Dr																						
	—Roadway	\$1,474,685	*	*	\$467,495	\$865,752	\$201,438	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*
	—Curb, Gutter & Sidewalk	\$1,273,500	*	*	\$496,250	\$253,600	\$60,450					*	*	*	*	*	*	*	*	*	*	*	*
B	—Drainage	\$1,960,800	*	*	\$621,600	\$1,291,360	\$267,840					*		*	*	*	*	*	*	*	*	*	*
	Beacon Ave, Lutton St, S. Canal St																						
	Canal St, Casa St, Matheny Ave, Friar Dr																						
C	—Roadway	\$1,764,388	*	*	\$260,823	\$1,303,852	\$200,713	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*
	—Curb, Gutter & Sidewalk	\$1,496,250	*	*	\$1,007,310	\$389,152	\$47,788					*	*	*	*	*	*	*	*	*	*	*	*
	—Drainage	\$2,346,000	*	*	\$346,800	\$1,396,360	\$299,840					*		*	*	*	*	*	*	*	*	*	*
D	Wade Ave, Beacon Ave, Canal St																						
	Casa St, I Dr																						
	—Roadway	\$1,192,203	*	*	\$49,860	\$678,674	\$219,664	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*
E	—Curb, Gutter & Sidewalk	\$1,011,750	*	*	\$920,625	\$72,400	\$18,225					*	*	*	*	*	*	*	*	*	*	*	*
	—Drainage	\$1,585,200	*	*	\$124,800	\$1,146,320	\$262,080					*		*	*	*	*	*	*	*	*	*	*
	Street Lights at 18 Locations <sup>2</sup>	\$270,000	*	*	\$270,000														*				
Other	Bus Stop Benches/Amenities <sup>3</sup>	\$30,000	*	*	\$10,000	\$10,000	\$10,000					*					*	*	*	*	*	*	*
	Landscaping/Dust Control <sup>4</sup>	\$250,000	*	*	\$40,333	\$80,333	\$40,333	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*
	Bike Lanes <sup>5</sup>	\$750,000	*	*	\$250,000	\$250,000	\$250,000					*	*	*	*	*	*	*	*	*	*	*	*

<sup>1</sup> ATP Grant Application for \$4.8 million submitted on May 21, 2014 (1-6 Year Case Priority A, B & C).

<sup>2</sup> Cost estimates based upon similar projects; average \$10,000 per street light.

<sup>3</sup> Cost estimates based upon similar projects; average \$1,667 per bench.

<sup>1</sup> ATP Grant Application for \$4.8 million submitted on May 21, 2014 (5-5 Year Cycle Priority A, B & C).

<sup>2</sup> Cost estimates based upon similar projects; assumes \$15,000 per street light.

<sup>3</sup> Cost estimates based upon similar projects; not detailed.

# Matheny Tract Climate Adaptation Plan

## Long Term Implementation Considerations

It is common to categorize strategies to respond to different options for implementation. The Regional Resilience Toolkit 10 provides examples of strategy categories or types that have been incorporated into the example strategies contained below. These categories include operational; programmatic; plans, regulations, and policy development; capital improvement/infrastructure projects; education, outreach, and coordination; and evaluation.

### Programmatic

Strategies to expand or create new programs, activities, and initiatives.

- **Plans, regulations, and policy development.** Strategies to develop or revise policies, plans, regulations, and guidelines.
- **Capital improvement/infrastructure projects.** Strategies designed to address physical and functional deficiencies and needs in the built and natural environment.
- **Education/outreach/coordination.** Strategies related to initiating or expanding partnerships and relationships, communicating and sharing information, and expanding awareness.
- **Evaluation.** Strategies to improve feedback, input, and data and information or conduct further or new analyses.

**Table 8-7 Agriculture Sector**

## APPENDIX C: EXAMPLES OF LOCAL ADAPTATION STRATEGIES BY SECTOR

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Agriculture Sector</b>							
Extreme Heat, drought, flooding	<b>Strategy AG-1: Encourage the breeding of livestock animals and adoption of crops that are better adapted to warmer temperatures and greater precipitation variability.</b> This is a broad, high-level strategy responding to concerns that warmer temperatures and more precipitation extremes will decrease the productivity or quality of agricultural products for plants and animals that are susceptible to these changes. In many cases, projected future conditions may better suit particular varieties of plants or livestock animals. If not, ongoing research efforts may be successful in producing such examples. Local governments do not (and should not seek to) control what varieties of plant or livestock animal are grown or raised, nor do they conduct research on new crop or livestock varieties. However, communities can work with farming and ranching groups to encourage adoption of these varieties, and in some cases may be able to support research efforts at local institutions.	Every community will face different specific needs for this strategy, depending on the types of crops and livestock in the local agricultural industry and the changes in climate conditions that are projected for the area. Some crops and livestock have readily available varieties that are suitable for future conditions and meet market requirements, while more research may be needed for other crops and livestock to produce a viable future-adapted variety. If a viable strain is available but adoption is slow, consider pilot incentive programs to encourage this.	Education, Outreach, Coordination Programmatic Evaluation	Water	Cities and counties	General Fund State Water Efficiency & Enhancement Program grant Climate Adaptation and Resiliency Program grant FEMA hazard mitigation grant Other grant funding	<a href="#">Adaptation Resources for Agriculture Southwest Regional Climate Hub</a> <a href="#">Santa Clara Valley Agricultural Plan</a>
All climate hazards	<b>Strategy AG-2: Revise land use plans to accommodate changes in types of agricultural activities, and to allow for shifts in agriculturally viable areas.</b> As the climate changes, crops and livestock currently raised in an area may no longer be viable, and newly viable crops and livestock may require different land uses (for example, orchards converting to row crops). Agricultural operations may also consider accessory uses, including agritourism and direct retail activities, to help keep their businesses successful. Communities should revise and revise as needed their land use plans, including General Plan land use elements, zoning codes, and development standards, to ensure that they are not creating unintended barriers to continued viability of agricultural areas as climate conditions change. In communities with a range of topographic and climate conditions, these changes may include allowing certain types of agricultural activities in areas that were previously unsuitable.	As with any land use decision, communities should consider changes to the standards that govern where and how agricultural operations occur as part of addressing overall community well-being and quality of life. Keep in mind that changes to agricultural locations and types of operations may create conflicts with other land uses, including natural ecosystems which may also be stressed by climate change. Strategies such as agricultural buffers and wind rows can help minimize potential incompatibilities. Local governments may need to remove some barriers on agricultural operations while simultaneously enacting additional regulations. If a community has a right to farm ordinance or a land conservation program, be aware of any changes that may need to be made to accommodate shifts in agricultural activities. Multiple jurisdictions working together can take a regional approach to help maintain agricultural viability across political boundaries.	Plans, Regulations, and Policy Development	Land Use and Community Development Water	Cities and counties Council for Association of Governments	General Fund SB 1 Grant Climate Adaptation and Resiliency Program grant State Water Efficiency & Enhancement Program grant Other grant funding	<a href="#">Adaptation Resources for Agriculture Santa Clara Valley Agricultural Plan</a>



# Matheny Tract Climate Adaptation Plan

CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy AG-3: Change soil management and planting and growing techniques to improve soil and plant health.</b> Farmers rely on specific techniques to ensure that their soil and crops remain healthy and productive. These may include specific planting schedules, use of soil additives, growing plants to a particular height or shape, combining multiple plants in the same growing area, and many others. Farmers may make several adjustments to these strategies in response to climate change. For example, altered crop rotation and soil cover management can help maintain soil moisture levels, protecting against drought, and changes to the types of additives used in soils may provide additional nutrients to plants that can protect them against climate stress. Decisions about the types of changes made to these activities should be left to individual farmers, and local governments should not impose requirements for specific growing activities. However, in coordination with agricultural operations and research institutions, local governments can provide important education and outreach opportunities, and may be able to incentivize pilot programs.	Changes to soil management and planting and growing techniques should largely fall within the existing framework of agricultural regulations established by state and local governments. However, be aware of potential conflicts. For example, farmers may wish to erect shade structures in fields that could exceed height requirements for row crops, or it may be necessary to alter aerial crop-spraying schedules. In consultation with farming groups, identify what changes to these techniques farmers intend to make, and review local regulations to make sure there are no unnecessary barriers to these changes. In cases where changes to these techniques may expose workers or community members to new or increased levels of potentially harmful materials, ensure that local governments and agricultural operations take all needed steps to minimize the risk, remembering that protection of community (including ecological) health, safety, and welfare is paramount.	Education, Outreach, Coordination Programmatic Evaluation Plans, Regulations, and Policy Development	Biodiversity and Habitat Water	Cities and counties	General Fund Climate Adaptation and Resiliency Program grant Healthy Soils Program grant FEMA hazard mitigation grant State Water Efficiency & Enhancement Program grant Other grant funding	<a href="#">California Healthy Soils</a>
Extreme heat	<b>Strategy AG-4: Plant trees or construct shade structures for livestock.</b> Extreme heat can be very harmful for livestock animals, leading to significant illness or death. These conditions may also decrease the quantity or quality of products from livestock, such as milk from dairy cattle or eggs from laying hens. Providing shade for livestock can provide protection against harm from extreme heat, as temperatures in the shade may feel 10 to 15 degrees Fahrenheit cooler than in the sun. Ranchers can plant trees or tall shrubs to provide shade, which may provide fruit or other crops as a side benefit. Ranchers may also erect shade structures, which they can use as a trellis for crop plants or as a mount for solar panels, providing energy to the ranch. Positioning water troughs under shade structures can also reduce evaporation, decreasing overall water use.	Local governments should encourage farmers to plant shade trees that are drought tolerant. Ideally, farmers would also plant native trees that provide habitat to beneficial insects and other animals. While landscaping and tree ordinances often do not apply to agricultural lands, if these regulations are applicable, ensure that there are allowable trees that meet the needs of ranchers. Communities may need to amend the zoning code or development standards to allow shade structures, including elevated ground-mounted solar arrays, on pastures or other ranch lands. If agricultural areas about other land uses, local governments may require farmers to screen the view of the shade structure. If the community encourages farmers to install solar panels as a shade structure, ensure that these efforts are coordinated with any existing community-wide renewable energy and energy efficiency strategies. Communities may want to use incentive programs to encourage adoption of shade trees or shade structures.	Education, Outreach, Coordination Evaluation Plans, Regulations, and Policy Development	Biodiversity and Habitat Water	Cities and counties	General Fund Climate Adaptation and Resiliency Program grant Healthy Soils Program grant FEMA hazard mitigation grant State Water Efficiency & Enhancement Program grant Other grant funding	<a href="#">Adaptation Resources for Agriculture</a> <a href="#">Southwest Regional Climate Hub</a> <a href="#">Santa Clara Valley Agricultural Plan</a>

CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Extreme heat, air quality, pests and diseases	<b>Strategy AG-5: Ensure that all agricultural workers have adequate protection from extreme conditions, and that healthy and safe working conditions are maintained.</b> Agricultural work is vital, but often physically demanding, and can lead to chronic health impacts. The socially vulnerable nature of many agricultural workers may be a barrier to receiving the safe and just working conditions that they deserve. Through educational efforts, as well as enforcement of labor laws in coordination with state and federal agencies, communities can make sure that agricultural workers have the resources and supplies they need to be safe and to remain healthy while at work. This can include access to appropriate protective gear (such as N95 masks during days of poor air quality), sufficient water and rest breaks during high heat conditions, access to safe and comfortable shelter, and ensuring that workers suffering from heat-related illnesses receive prompt and appropriate medical care.	Community-based organizations are vital partners to implementation of this strategy, as agricultural areas often have organizations that work directly with agricultural workers on issues of health and equity. Communities should work with these organizations to purchase and distribute supplies, and to listen to complaints that agricultural workers may have about their working conditions. Be aware that some agricultural workers, especially undocumented workers, may be reluctant to interact with government staff. Simultaneously, communities should work with agricultural groups to ensure that owners and managers fully understand their own responsibilities to maintain a safe and healthy working environment, especially as climate conditions change. Communities should not hesitate to coordinate with state and federal labor agencies about potential health or safety violations.	Education, Outreach, Coordination Programmatic	Climate Justice Public Health	Cities and counties Community-based organizations State and federal agencies	General Fund Transformative Climate Communities grant Other grant funding	<a href="#">Adaptation Resources for Agriculture</a> <a href="#">Southwest Regional Climate Hub</a> <a href="#">Santa Clara Valley Agricultural Plan</a>
All climate hazards	<b>Strategy AG-6: Provide sufficient habitat for native pollinators and beneficial species in and adjacent to agricultural areas.</b> Agricultural lands, especially buffers and other areas left in a more natural state, are directly beneficial to agricultural operations. These natural areas act as habitat to pollinator species as well as animals that prey on agricultural pests and disease vectors. Providing this habitat helps ensure healthy crops and livestock, especially in the face of increased climate stressors, and for crops such as almonds and melons that are heavily reliant on managed pollinators (which themselves may face greater stress from climate change). Natural lands can also provide other ecosystem benefits, including increased carbon sequestration, groundwater recharge, and flood protection and water filtering.	Local governments can encourage or incentivize habitat for these species, require natural buffers as part of land use standards. In cases where agricultural buffers are required, habitat for native species can meet this need. Agricultural operators do not necessarily need to dedicate part of their own land as buffers, as it could be set aside as part of a development adjacent to an agricultural land (this has the added benefit of not taking land out of agricultural development). Neighboring property owners and managers should take care not to expose native habitat buffer areas to herbicides, insecticides, or other compounds that may be harmful to native species. Local governments can integrate proper care and maintenance of these habitats into a community-wide integrated pest management strategy.	Education, Outreach, Coordination Plans, Regulations, and Policy Development	Biodiversity and Habitat	Cities and counties	General Fund Healthy Soils Program grant State Water Efficiency & Enhancement program grant Other grant funding	<a href="#">Adaptation Resources for Agriculture</a> <a href="#">Southwest Regional Climate Hub</a> <a href="#">Santa Clara Valley Agricultural Plan</a>

# Matheny Tract Climate Adaptation Plan

**Table 8-8 Biodiversity and Habitat (BH) Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Biodiversity and Habitat Sector</b>							
All climate hazards	<b>Strategy BH-1: Improve interagency cooperation on ecological conservation efforts.</b> Ecological communities very often cross jurisdictional boundaries, and many protected natural areas are under state or federal jurisdiction. Protecting and improving habitat resiliency for the parts of an ecosystem only within one community will likely not achieve the hoped-for degree of adaptation benefits. Instead, communities should coordinate with each other, with appropriate state and federal agencies, and with other relevant stakeholders on biodiversity and habitat protection to develop and implement a comprehensive resilience strategy. These efforts should take advantage of the resources and opportunities available to each stakeholder, including regulatory authority, access to funding sources, and staff time and institutional knowledge.	Depending on the agencies involved, building cooperation and developing a comprehensive adaptation approach for ecological conservation can vary widely in the level of complexity. Any existing agreements or memoranda of understanding (MOUs) between agencies can be a good place to start. When deciding which agencies should be involved, consider those that own or regulate both current and future suitable land for local biological communities, as well as agencies that have regulatory authority over wildlife (such as the California Department of Fish and Wildlife, or the US Fish and Wildlife Service) even if they do not have land use control in the area.	Education, Outreach, Coordination	Forests Ocean and Coast Land Use and Community Development Water Parks and Recreation	Cities and Counties Council or Association of Governments State and federal agencies Community-based organizations	General Fund Habitat Conservation Fund grant Department of Fish and Wildlife grants Department of Water Resources grant Wildlife Conservation Board grant ESA Nontraditional Section 6 grant National Fish and Wildlife Foundation grants Other grant programs	<a href="#">Integrated Regional Conservation and Development (ICARD) program and RePlan System</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy BH-3: Restore degraded ecosystems to enhance the natural adaptive capacity of biological communities.</b> Healthy ecosystems are better able to resist the pressures of climate change and other stressors than damaged ones. Even if an ecosystem type is generally resilient to climate change, it may face higher-than-expected harm if it has been damaged. Restoring these degraded ecosystems back to their natural state helps to better prepare them for climate change. Such ecosystems often have higher biodiversity, improving overall ecosystem health and reducing the odds that invasive or other non-native species will replace them. Restoring degraded ecosystems also allows them to support other biodiversity and habitat-related adaptation efforts, or to provide additional ecosystem services that benefit surrounding communities	Ensure that degraded ecosystems are restored to a "climate-smart" condition that allows for a healthy and functioning biological community both now and in the future, rather than a "business as usual" ecosystem that may have been appropriate in past years but is not adapted to expected future conditions. The species and specific breeds or strains of organisms re-introduced to degraded areas should be appropriate for the current ecosystem and demonstrate a moderate or high level of climate change resilience, to the extent possible. Communities should also practice climate-smart restoration should also be practiced in non-organic restoration activities, such as corrections to the area's hydrology. Conduct regular monitoring of the site once the primary restoration is complete, especially as climate stressors appear or become greater, and adjust future restoration and management practices as needed.	Plans, Regulations, and Policy Development Programmatic Evaluation	Forests Ocean and Coast Land Use and Community Development Water Parks and Recreation Agriculture	Cities and Counties Council or Association of Governments State and federal agencies	General Fund Habitat Conservation Fund grant Department of Fish and Wildlife grants Department of Water Resources grant Wildlife Conservation Board grant ESA Nontraditional Section 6 grant National Fish and Wildlife Foundation grants Other grant programs	<a href="#">Integrated Regional Conservation and Development (ICARD) program and RePlan System</a>

# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy BH-4: Educate community members about the climate risks to habitats and biodiversity, and the need to safeguard these natural systems.</b> Protecting nature is an important value for many Californians, but it is still helpful to reinforce the importance of natural systems, particularly as climate change stressors require a greater allocation of government resources toward conservation activities. In partnership with community-based organizations and landowners, jurisdictions should educate community members of all ages about why it is necessary to safeguard species and natural resources in their area. These educational and outreach efforts can often be integrated into existing programs, which can make them easier to implement.	Consider what types of education programs could be most effective in the community. This can include interpretive signage and in-person educational events at natural sites, online resources and information on social media, outreach to community groups and stakeholders, volunteer opportunities, more intensive efforts such as after-school and summer camp programs, and any other strategies that may be relevant. Multiple forms of outreach could likely be helpful. Ensure that educational programs are widely accessible to the community, including persons with different income levels and access to resources, who speak different languages, and who have differing levels of ability. Ensure that educational efforts reflect the most recent and best available science, which may require revisions to outreach approaches as scientific understanding evolves. Communities should also ensure that educational efforts are universally accessible, including to people with access and functional needs.	Education, Outreach, Coordination Programmatic	Public Health Parks and Recreation	Cities and counties Community-based organizations	General Fund EPA Environmental Education grants Other grant programs	
All climate hazards	<b>Strategy BH-5: Promote diverse economic opportunities that are responsive to changes in available natural resources.</b> The economies of communities often rely at least in part on local natural ecosystems as a source of economically important resources, a site for cultural and recreational activities, and as a scenic benefit, among others. Damage to these ecosystems may lead to economic harm for the community, causing a host of indirect effects. Communities should expand their economic activities to use resources that are less vulnerable to climate change, and resources that may shift into the area as ecosystems migrate. This economic diversification can also help to buffer the community against other types of economic hardships.	Economic development plan or program that can serve as an overarching implementation mechanism for this strategy. In some cases, adapting to future ecosystem conditions may be a relatively easy process for businesses, requiring little government involvement other than education and outreach. In other cases, communities may need to extensively alter their land use plans and zoning codes to allow for new types of activities, or activities in new locations. If changes to the natural environment are likely to lead to economic opportunities requiring different job skills than those currently held by community members, jurisdictions and their economic partners should enact appropriate job training programs and other workforce development efforts. Such programs should emphasize empowering and retraining economically disadvantaged persons and those whose jobs face the greatest risk from climate change.	Education, Outreach, Coordination Programmatic Evaluation Plans, Regulations, and Policy Development	Land Use and Community Development Parks and Recreation Forests Ocean and Coast	Cities and counties Community-based organizations	General Fund Workforce development grants Other grant programs	

**Table 8-9 Emergency Management Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Emergency Management Sector</b>							
All climate hazards	<b>Strategy EM-1: Revise emergency management plans, programs, and activities to account for changing hazard profiles and their consequences.</b> Changes to the frequency and severity of climate-related hazards may cause existing emergency management efforts to be less effective. A community's existing resources may not be enough to adequately prepare for and respond to more frequent and intense disasters, or existing emergency plans may not adequately account for new hazard regimes. To ensure the continued effectiveness of emergency management efforts, these efforts should be developed to account for anticipated future climate conditions and associated hazard regimes, as well as addressing current needs.	Climate-smart emergency management activities will likely require an increased commitment of staff time and expertise, materials and equipment, and other resources. Multi-jurisdictional emergency management efforts can allow for communities to effectively share resources but ensure that there is also a sufficient supply if all participating communities are simultaneously affected by a major disaster. Be mindful that future projections of climate conditions are likely to change based on future levels of greenhouse gas emissions and as scientific understanding evolves. Use the most recent best science to inform emergency management efforts whenever plans, programs, and activities are updated.	Plans, Regulations, and Policy Development Evaluation Operational Education, Outreach, Coordination	Transportation Energy	Cities and Counties		<a href="#">Safeguarding California: 2018 Update</a>
All climate hazards	<b>Strategy EM-2: Integrate findings of climate vulnerability into all phases of emergency planning.</b> Emergency planning, including mitigation, preparedness, response, and recovery efforts, should be tailored to match the specific needs of the community. These efforts should incorporate the findings of the vulnerability assessment and be responsive to any unique challenges in the community identified through the assessment. This should include addressing the needs of populations who may be less able to effectively prepare for or respond to emergency events, ensuring that critical facilities and services are protected and kept operational during disasters, and conducting recovery operations to improve resiliency relative to pre-disaster levels.	Numerous plans, operating procedures, programs, and other efforts cover the full spectrum of emergency management activities, and these activities may be managed by different agencies. It is important to coordinate efforts across activities and agencies to ensure that the results of the vulnerability assessment are being appropriately integrated. In particular, ensure that vital life-saving emergency management efforts such as evacuations, shelters, emergency medical response, and temporary housing are responsive to any unique needs of the community. Climate-smart emergency planning efforts should be reflected in implementation activities, including training for both professional emergency responders and community volunteers.	Evaluation Plans, Regulations, and Policy Development Operational	Public Health Energy Transportation Land Use and Community Development	Cities and counties State and federal agencies		

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy EM-3: Develop a notification system for natural hazards that is responsive to community needs.</b> Emergency notification systems are a critical type of communication, letting people know of potential, impending, and ongoing disaster events. Community members can find out how they can prepare for a future event, what they can do and where they should go to be safe, and how they can make recovery easier. These vital pieces of information should be communicated clearly and effectively in a way that reaches as many community members as possible (and ideally, all of them).	Emergency notification information should be distributed as widely as possible. Television, radio, email, telephones, text messaging, and social media should all be used as appropriate. For mitigation and preparedness notifications, there is often enough time to conduct in-person awareness and educational efforts. Notifications can also be made at existing meetings and gatherings, such as religious services, school board or PTA meetings, and other well-attended events. Ensure that notifications are made in all commonly spoken languages in the community. Consider the needs of community members who may have functional needs, such as vision or hearing-related disabilities, and ensure that there are means for them to receive important information. It may be helpful to partner with existing community-based organizations to help distribute notifications about emergency issues, particularly in places where some community members may be more insular or where there may be lower levels of trust for government agencies.	Programmatic Capital Improvements & Infrastructure Projects Education, Outreach, Coordination	Public Health	Cities and Counties Tribal State and federal agencies		<a href="#">Safeguarding California: 2018 Update</a>



# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy EM-4: Assess the potential for climate refugees as a sending or receiving community and develop short- and long-term strategies for shelter/housing and services.</b> As demonstrated by recent wildfires in California and hurricanes in the Gulf Coast, there is a potential for significant movement of people in response to climate-related disasters. This may be short-term, evacuation-associated displacement while response operations occur or longer-term displacement due to catastrophic loss of structures and infrastructure and the supporting economy. Such displacement activities have profound impacts on the evacuating community, but also on the community receiving a large influx of people. Communities should develop scenarios for the rapid and significant change in population and the associated social, cultural, environmental, and economic effects.	These planning efforts should consider both the needs of the community to evacuate elsewhere (a sending community), as well as the possibility of the community to accept people evacuating from elsewhere (a receiving community). Bear in mind that such displacements may be short-term, long-term, or in some cases permanent. Communities may not have the need or the resources to conduct detailed studies of their ability to act as sending and receiving sites, but it is worth exploring at a general level at the very least. When examining potential for a sending community, consider issues such as how to maintain necessary levels of community services while residents are elsewhere, how to rebuild quickly and effectively so as to bring residents back, and if wholesale reconstruction of the community offers unique chances to improve any aspects of the community's health, safety, well-being, or overall quality of life. When looking at potential to act as a receiving community, consider issues such as how to house incoming persons in a manner that is safe and affordable, where their property can be stored, and what increases in community services may be needed to meet the greater demand. In both cases, work to ensure that displaced people can receive news and information from both the sending and receiving communities.	Evaluation Plans, Regulations, and Policy Development Programmatic	Land Use and Community Development	Cities and Counties Tribal State and federal agencies Community-based organizations		<a href="#">Butte County Recovery</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy EM-5: Ensure that emergency management activities are being conducted equitably.</b> Emergency management activities should be responsive to the needs of all community members, but these needs vary widely. Differences in ability, language, income and economic means, access to lifelines, living situation, and many other factors all influence how community members can mitigate and prepare for disaster events, and respond and recover to them. Inclusive emergency management efforts recognize these differences and provide the tools, information, engagement, and other resources to ensure that the health, safety, and well-being of all community members is equitably addressed.	Communities should convey information about emergency management activities to a wide audience, which means communicating in many different formats, and in multiple languages as appropriate. Different forms of educational efforts could be needed. To address differences in adaptive capacity, some community members may need financial assistance, or help with labor or equipment. Recognize that people who do not own their home may be more limited in their emergency management capacity, even if they are not disadvantaged in other respects. As discussed elsewhere in this guide, differing levels of vulnerability are often a function of systemic issues that may not be apparent to people who are not part of disadvantaged communities. If the staff conducting the emergency management planning are not reflective of the makeup of the community, it may be helpful to have an advisory group of community members who can more knowledgeably speak to equity issues, and to conduct regular outreach with and to seek feedback from members of the community who face equity issues.	Plans, Regulations, and Policy Development Education, Outreach, Coordination	Public Health	Cities and Counties state and federal agencies		<a href="#">USDH Guide to Equitable, Community-Driven Climate Preparedness Planning</a>

**Table 8-10 Energy (EN) Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Energy Sector</b>							
Avalanches, coastal flooding, drought, flooding, forestry pests and diseases, landslides, sea level rise, severe weather, wildfire	<b>Strategy EN-1: Harden energy infrastructure systems against damage from climate-related effects and expand redundancy in the energy network.</b> California's energy infrastructure is a complex system of refineries, power plants, utility lines, storage facilities, substations, and many other pieces of infrastructure, not to mention the roads, rails, and retail outlets used to distribute some energy resources. All these factors render the system vulnerable to several different types of climate-related effects. Damage to any component of these networks can cause a loss of energy supplies, and can also create additional hazard events, such as a downed power line that sparks a wildfire. Communities and other organizations that manage the energy network can construct or retrofit these infrastructure components so that they are less likely to be damaged by and so that they can quickly recover from a climate-related event. Additionally, communities and other organizations can ensure that there are redundant energy systems (e.g., backup generators, multiple transmission lines feeding a given area), which can help prevent a complete loss of service. Local governments may also consider moving toward a more decentralized electric supply system that relies on microgrids and distributed generation (e.g., local renewable energy generation), reducing the need for long-range transmission systems that may run through densely forested areas and cause wildfires, or may be impacted during utility public safety power shutoffs. See Strategy EN-5 for more examples of this.	In most cases, local communities have very limited control over the energy networks. With the exception of communities that have their own publicly-owned utilities (not including community choice aggregator programs), private companies control much of the electricity and natural gas infrastructure. Private companies also control the refining and distribution systems that supply fuels such as gasoline, diesel, and propane. Because of this, coordination with external agencies is critical to hardening the energy network. Electricity and natural gas systems are heavily regulated by state agencies, who should also be involved in such efforts as feasible. Local governments should evaluate if local permitting procedures or development standards create barriers to hardened or redundant energy systems and identify ways to reduce these barriers in a way that maintains public health and safety and is compatible with the community character. In some instances, hardening energy systems may mean retreating from highly exposed areas and rebuilding in a less susceptible location.	Capital Improvement & Infrastructure Projects	Emergency Management Land Use and Community Development Public Health Water	Utility providers Cities and Counties		SDG&E and SCE weather network, Fire Potential Index (FPI) and Santa Ana Wildfire Threat Index (SAWTI) monitoring, and wildfire watch camera network concentrated in HFRAs, vegetation management programs <a href="#">CAAA Dale et al. report on wildfire impacts to the California electricity grid</a> <a href="#">CAAA Bragui et al. report on Natural Gas assets in San Diego</a> <a href="#">Coastal Commission Guidance 2018</a> <a href="#">Consolidated Edison Co. of New York Post Sandy Enhancement Plan</a> <a href="#">Preparedness at Greenwich Hospital CAAA Bragui et al. report on SDG&amp;E electricity asset risk and adaptation to coastal flooding</a>

# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy EN-2: Transition to climate-smart sources of energy.</b> Climate change is likely to influence the capacity of different energy sources. Hydroelectric facilities in particular are likely to be harmed by more frequent and severe drought events, reducing the amount of electricity available to California from these sources. Some industrial facilities and associated infrastructure that are key nodes in the state's energy network, including refineries and seaports, may be harmed by climate change and are vulnerable to disruptions, particularly since alternatives may be limited. Centralized power generation facilities (both renewable and fossil fuel) rely on long-range transmission infrastructure which could be increasingly susceptible to impacts from climate effects. Additionally, policies to reduce greenhouse gas emissions may also affect sources of energy from fossil fuels. Communities can transition their sources of energy to those that are less likely to be affected by climate change, especially energy sources that are renewable and decentralized and do not rely on long-range transmission from centralized generation sources [see EN-5 for more information].	If the community has control over its electricity sources (as a public electrical utility or a community choice aggregator), consider transitioning away from fossil fuels and hydroelectric sources in favor of local or regionally-based renewable sources. Explore opportunities to increase adoption of electric vehicles, which are less dependent on potentially vulnerable industrial facilities. Increasing public electric vehicle charging stations, as well as providing educational opportunities and incentives, can help with this. Communities also have the option to reduce their dependence on natural gas by encouraging or requiring new construction not to use natural gas, or by encouraging or requiring a transition away from natural gas as part of any significant retrofit activities. When transition to a new source of energy, of any type, ensure that the new sources are also resilient in the long-term to climate change, avoiding the need for multiple adaptation efforts. New energy sources should be cost-competitive with the sources they are replacing. Communities should also ensure that the new sources of energy will not create new environmental justice issues or exacerbate existing ones.	Capital Improvement & Infrastructure Projects Plans, Regulations, and Policy Development	Water Ocean and Coasts	Cities and Counties Councils/ Associations of Government Utility Providers		

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Extreme Heat	<b>Strategy EN-3: Minimize stress on the electrical grid.</b> During very high heat events, electrical equipment can operate less effectively and be more prone to failure. At the same time, power demand often rises during extreme heat due to the increased use of air conditioners and other cooling equipment. The combination of these factors places stress on the electrical grid and increases the risk of a power loss, even though there may be little or no physical damage. Communities can work to decrease their electricity use during extreme heat events, reducing the stress placed on the electrical grid. These actions may involve educational efforts and changes to building codes related to equipment and infrastructure, or some combination of the two. As a side benefit, these efforts also decrease electrical bills and reduce greenhouse gas emissions associated with energy use.	There are several strategies at a community's disposal to reduce energy use during extreme heat events. Demand response programs alert energy users at times when grid stress is likely to be high and provide financial incentives to users who sufficiently reduce their use. Weatherization programs help insulate buildings against very high or very low temperatures, decreasing the need for cooling (or space heating). Energy efficiency programs can replace inefficient air conditioners with more efficient models, allowing for the same level of cooling while using less energy. On-site renewable energy and storage systems allow buildings to power their air conditioning systems with electricity generated or stored on the property, rather than pulling from the grid. Numerous funding sources are available to help communities implement these programs, or communities can partner directly with local utilities. Communities should make sure that this effort (as with all other adaptation planning efforts) is conducted equitably, as different populations face different levels of vulnerability to extreme heat events and have varying levels of adaptive capacity to these events.	Programmatic Plans, Regulations, and Policy Development Capital Improvement & Infrastructure Projects	Emergency Management Land Use and Community Development Public Health	Utility providers Cities and Counties		

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Drought, extreme heat, flooding, landslides, severe weather, wildfire	<b>Strategy EN-4: Maintain hydroelectric generating capacity as feasible.</b> Hydroelectric power plants are an important source of electricity for California, in addition to other benefits that dams can provide (water storage, recreation, and flood control, among others). However, as drought conditions become more frequent and intense, and as warmer temperatures cause faster snowmelt and greater evaporation, the overall capacity of hydroelectric facilities is threatened. Communities have the opportunity to maintain generating capacity, or to work with agencies that manage these facilities to do so.	Agencies that operate hydroelectric facilities should take improved hydrometeorological forecasting into account, and ensure that planning procedures for wet, normal, and dry years (including multiple dry years) reflect the new precipitation patterns that are expected in the watershed. Consider solutions such as covering reservoirs, particularly smaller ones, to reduce water loss from evaporation. If conditions change to the point where the hydroelectric facility is no longer able to function as a normal run-of-river installation, consider converting it to a pumped storage facility that can be used to store excess electricity on demand. Some hydroelectric operators may consider increasing dam capacity, especially to improve generating potential during very wet years, but be mindful of environmental barriers and other challenges that such projects are likely to face. Additionally, in the long term, recognize that some hydroelectric facilities may no longer make sense to continue operating, and should be deconstructed to allow river restoration.	Capital Improvement & Infrastructure Projects Education, Outreach, Coordination	Water	Utility providers Cities and Counties		<a href="#">International Hydropower Association</a> , <a href="#">Hydropower Sector Climate Resilience Guidance</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy EN-5: Decentralize energy supplies and energy storage capacity to improve energy independence.</b> Some of the vulnerability in California's energy network is due to the fact that most energy supplies are produced at centralized large-scale facilities such as refineries and power plants and distributed across large distances. Disruptions at these centralized facilities or along the main paths for transporting energy resources can create shortages and service disruptions over large regions. Decentralizing energy generation and storage systems helps to reduce the potential for energy supplies to be disrupted by distant events. Energy is the energy source that is most suitable for decentralization, as natural gas and petroleum-derived fuels require industrial facilities, and so electrification of the built environment and transportation systems can help spur energy independence. Local governments can also seek to decentralize by creating municipal energy utilities and/or forming electric co-ops between rural jurisdictions for more local control over infrastructure and energy supply.	Decentralizing the energy system, predominantly the electrical grid, allows community members to generate electricity and store it as needed at their properties or in their neighborhoods, reducing their dependence on the statewide electrical grid. Rooftop solar photovoltaic panels are often the most suitable form of decentralized energy generation, and battery storage systems are increasingly available for individual buildings. However, people living in rental units or those with limited financial means may need financial assistance or special programs to be able to install these technologies. Consider creating microgrids, which allows for a single building or group of buildings to share distributed energy generation and storage resources. Under state law, new small residential buildings are already required to install solar panels. Communities have the authority to require some or all additional types of buildings to install distributed energy, either when they are constructed or at times of significant renovations, but such actions require adopting a reach code that is subject to state review. Helping to transition building and transportation energy sources to electricity can make decentralizing the energy network easier.	Capital Improvement & Infrastructure Projects Operational	Emergency Management Land Use and Community Development Public Health	Cities and Counties		<a href="#">Enhancing Energy Efficiency in the State's Limited School District CA4A Moezzi et al. report on energy efficiency research CA4A Burillo et al. report on LA County electricity and risk to extreme heat CA4A Taha et al. report on urban heat islands</a>

# Matheny Tract Climate Adaptation Plan

**Table 8-11 Forest (FOR) Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Forests Sector</b>							
Pests and Diseases, Wildfire	<b>Strategy FOR-1: Develop a local forest management taskforce to manage fuel loads, thinning, brush removal, and prescribed burns.</b> A forest management taskforce is a group of forestry and fire management professionals, local government stakeholders, private businesses, local community members, and non-profits that collaborate to effectively manage wildfire fuel loads. The taskforce can work together to conduct thinning, brush removal, and prescribed burns, while also working with community members to reduce fuel loads on private properties and in developed areas. This could expand capacity to restore forest health on private and public lands, which includes active management to reduce fire risk, including removal and disposal of diseased trees and other fuels. Local governments can also use this taskforce to work with public and private partners to identify appropriate locations for mills, biomass facilities, or other facilities that support the reuse of trees for other uses, including composting and renewable energy.	An important factor to consider when managing fuel loads in forests is the indirect impacts on the residents and businesses in the community. Prescribed burns can cause smoke and poor air quality conditions, and logging trucks can cause congestion on small mountain roadways. It is also important to coordinate with contractors and biomass facilities, to integrate biomass facilities into the fuel management process. Local governments can work with these facilities to process woody materials from tree mortalities to expedite removal. To minimize the impacts of transporting cleared woody material, including the GHG emissions from trucks, consider locating facilities that can use or process this material near forested areas, as environmental conditions and other constraints allow.	Operational Programmatic Education, Outreach, Coordination	Energy Biodiversity and Habitat	Cities and Counties Fire Departments CAL FIRE	CAL FIRE Fuel Reduction Project Grants CAL FIRE Forest Health Grants FEMA Hazard Mitigation Grant	<a href="#">Placer County Sustainability Plan (2019)</a> <a href="#">Safeguarding California: 2018 Update</a> <a href="#">California Forest Management Taskforce</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Wildfire	<b>Strategy FOR-2: Provide information to homeowners about statutory vegetation management requirements and promote fuel breaks to slow fire spread in forested and WUI areas.</b> California law requires landowners in areas with flammable groundcover (e.g., forest, brush, grasslands) to maintain defensible space around buildings that can help slow or prevent the spread of wildfire. Local communities and fire protection agencies should strengthen standards as needed to provide adequate protection in response to changing fire regimes. Standards should include hardening of structures with fire-resistant or fire-proof building materials, for both new construction and retrofits to existing buildings. While these standards can reduce wildfire risk, not all landowners may be aware of them and may not take appropriate action. Local jurisdictions should encourage landowners in forested areas and the WUI to establish fuel breaks that can slow the spread of fire, in addition to maintaining fire safe landscaping around structures. Local communities can work with fire protection agencies to provide information to landowners about creating defensible space and fuel breaks.	Homeowners may be unaware that the State has vegetation management requirements for homes throughout. Local governments should provide flyers to all homeowners within their jurisdictions that are reflective of the languages spoken in their communities. It is also important for jurisdictions and their strategic partners to provide educational opportunities for homeowners to learn about vegetation management on their properties. In the case of rental properties, especially those owned by remote landlords, communities may need to conduct additional outreach to engage with landlords and ensure they comply with vegetation management requirements and best practices. Some property owners may require assistance from others to conduct vegetation management activities, including those who may be considered vulnerable populations. Incentive programs that subsidize vegetation clearing may be helpful in these cases.	Education, Outreach, Coordination Plans, Regulations, and Policy Development	Land Use and Community Development Emergency Management	Cities and Counties CAL FIRE Fire Departments	Forest Improvement Program FEMA Hazard Mitigation Grant	<a href="#">WRCOG Adaptation Strategy (2019)</a> <a href="#">CAL FIRE: Fire and Fuel Treatment OPP: Fire Hazard Planning General Plan Technical Advice Series</a>
Wildfire, Pests and Diseases	<b>Strategy FOR-3: Establish partnerships to apply prescribed burns in priority areas and manage forests at an ecologically meaningful scale.</b> Local governments can establish local partnerships with CAL FIRE, the U.S. Forest Service, tribal governments, and local fire departments to identify priority areas and conduct prescribed burns as applicable. Priority areas could include overgrown forests and forest understories and floor that are littered with debris. Priority areas could occur on federal, state, tribal, local, or privately-owned lands, and therefore it is essential to create partnerships to implement prescribed burns on a large scale. It is essential to include tribal partners where applicable, as in many cases they have previously conducted prescribed burns on lands throughout the state.	One factor to consider is the air quality impacts of prescribed burns. Local and regional air quality could decline due to smoke conditions created by these burns. Communities should also closely monitor weather conditions, as hot, dry, and windy conditions could cause the prescribed burn to launch into an uncontrollable wildfire.	Education, Outreach, Coordination Programmatic	Biodiversity and Habitat	Cities and Counties CAL FIRE Fire Departments	CAL FIRE Fuel Reduction Project Grants USDA Forest Service CAL FIRE Forest Health Grants	<a href="#">Safeguarding California: 2018 Update</a> <a href="#">Sous Creek, Colorado</a> <a href="#">USDA Forest Service South Bench Prescribed Burn</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Wildfire, Pests and Diseases	<b>Strategy FOR-4: Provide private landowners with incentives for forest protection through easements and working forests that can return revenue from timber harvesting to cover taxes and other expenses of maintaining forest lands, thereby preventing land fragmentation and conversion to non-forest land uses.</b> To prevent the fragmentation or conversion of forested land, local governments can provide private property owners with incentives to prevent an economic loss. These incentives can include timber harvesting, which can also help reduce fuel loads on private properties and prevent uncontrollable wildfires. Local governments and private property owners can partner with local land conservancies or the Wildlife Conservation Board to place land in forest protection easements.	Local governments should consider the economic viability of timber harvesting on lands before proceeding with an easement. Properties should have a certain quantity and quality of trees to support timber harvesting that can cover taxes and other expenses on the land. Properties protected by timber easements should also be located near mills that can process the wood products to the extent possible, to avoid significant construction of new infrastructure.	Programmatic Education, Outreach, Coordination	Land Use and Community Development Biodiversity and Habitat	Cities and Counties Land Trusts or Conservancies	State and Private Forestry Grants	<a href="#">Wildlife Conservation Board's Land Acquisition Program</a> <a href="#">California Forest Legacy Program</a>
Extreme Heat, Flooding	<b>Strategy FOR-5: Establish policies and management plans to develop urban forests and incentivize the use of best practices for long-term maintenance and preservation of urban trees.</b> Urban forests can not only increase natural habitat within urban areas, but also lower surface temperatures and provide pervious surfaces that reduce flooding. Local government should develop new or update older policies and plans to increase and manage urban forests within their communities. These policies can be integrated into updated general plan elements, zoning codes, or stand-alone documents with enforceable measures. These measures should include priority areas for new urban tree programs, preservation policies for existing urban forests, and long-term maintenance strategies to ensure the health of the urban forest ecosystem.	When establishing policies for urban forestry programs, local governments should not only ensure that budget is available to plant trees and install watering systems, but also provide budget for staffing and equipment for the maintenance of the urban forests. Local governments can provide educational programs to teach community members to care for the trees in their neighborhoods, which can provide public support during the implementation phase of an urban forestry plan. Urban forestry plans and policies should also consider areas that may have a low quantity or quality of trees or tree canopy as priorities for implementation.	Plans, Regulations, and Policy Development Education, Outreach, Coordination	Land Use and Community Development Biodiversity and Habitat	Cities and Counties	Urban and Community Forestry Grant Program California Natural Resources Agency Urban Greening Grant Program	<a href="#">Safeguarding California: 2018 Update</a> <a href="#">City of Los Angeles: First Step</a> <a href="#">City and County of San Francisco: Urban Forest Plan</a>



# Matheny Tract Climate Adaptation Plan

**Table 8-12 Land Use and Community Development (LUCD) Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Land Use and Community Development Sector</b>							
All climate hazards	<b>Strategy LUCD-1: Integrate climate change adaptation considerations into general plan safety elements, local hazard mitigation plans, emergency operations plans, and other public safety documents.</b> This strategy is a long-term goal of all adaptation planning efforts. Almost all communities maintain plans to help prepare community members and municipal staff for disasters and other hazards, and to guide staff response once a disaster occurs. These plans can include General Plan Safety Elements, Local Hazard Mitigation Plans, and Emergency Operations Plans, among others. Climate change-related hazards and other climate change effects can pose threats to human health and property and should be included in public safety and planning documents. Communities throughout California should strive to ensure that their public safety documents address emergencies that may be created or otherwise affected by climate change, including discussion on how the effects may vary in the future due to a changing climate.	Per state requirements, jurisdictions must update these plans regularly to include the most recent and should include the most relevant climate change projections. Community and staff understanding, and support of climate adaptation strategies, is critical for integration into safety documents and implementation of the strategies. Therefore, updating public safety documents should coincide with comprehensive outreach and education programs for the community. Local governments should also consider updating zoning and development codes for consistency with public safety documents.	Plans, Regulations, and Policy Development	Emergency Management Public Health	Cities and Counties	FEMA Hazard Mitigation Grant CA 58 1 Grant	<a href="#">City of Foster City, Local Hazard Mitigation Plan &amp; Safety Element (2016)</a> <a href="#">Mammoth Lakes Safety Element (2019)</a> <a href="#">Riverside County Multi-Jurisdictional LHMP (2018)</a> <a href="#">California Government Code Section 65302(g)</a> <a href="#">WRCOG Adaptation Strategy</a> <a href="#">State of California General Plan Guidelines (2017)</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Wildfire, Landslide, Extreme Heat, Air Quality, Drought, Flooding, severe Weather, Sea Level Rise	<b>Strategy LUCD-2: Increase the resiliency of existing residential and commercial development through structural strengthening, fire safe landscaping, and energy efficiency upgrades.</b> Many existing developments are located near or on lands that are within hazard prone areas and can be damaged or destroyed by wildfires, landslides, flooding, and coastal flooding. Older building may also not be energy efficient, and homeowners and business owners may have to increase the use of air conditioning systems during extreme heat or poor air quality days. Damage to buildings and increasing energy use can cause financial burdens and limit the recovery options for building owners. To alleviate recovery costs and prepare existing development for potential hazards and other negative effects of climate change, local governments can identify funding opportunities, including grant assistance or PACE programs, to increase the resiliency of existing residential and commercial development. Homeowners and business owners can use these funds to make structural strengthening and energy upgrades, as well as adhere to fire safe landscaping standards developed by Cal FIRE. However, these upgrades and changes can often be too expensive for economically disadvantaged populations. Local governments can pursue grant funding such as the Transformative Climate Communities Program through Strategic Growth Council and identify regional PACE programs that can support business and residents in strengthening and upgrading their homes and buildings.	This strategy includes creating funding to make buildings more resilient. However, local governments should also put resilient building requirements in their General Plan policy documents, the zoning code, and local building codes. Co-benefits of these retrofits and upgrades include reducing greenhouse gas emissions and reducing the potential spread of wildfires.	Programmatic	Energy	Cities and Counties	Grant funding PACE programs Community Development Block Grant	<a href="#">Resource Legacy Fund: Paying for Climate Adaptation in California</a> <a href="#">California Climate Grant</a> <a href="#">PACE in California</a> <a href="#">State of California General Plan Guidelines (2017)</a> <a href="#">Fire Hazard Planning General Plan Technical Advice Series (2015)</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy LUCD-3: Collaborate with local and regional partners to support business resiliency through preparedness education, trainings, and resources.</b> Climate change-induced hazards and other climate change-related effects can severely damage both urban and rural local. For example, communities in mountainous areas often face a threat from wildfires that destroy mountain communities, droughts and agricultural pests can harm agricultural communities, or coastal flooding can harm commercial centers near the water. These types of effects, along with many others, can all directly or indirectly impact local economies. Working with local business and regional employment centers to support business resiliency can produce a more resilient local economy. Actions under this strategy could include increasing access to business related emergency preparedness and mitigation resources, supporting the business community in increasing their resiliency and ability to reopen after disaster through FEMA and other financial assistance, and expanding the availability of business resiliency trainings, data backup plans, and other resources specific to business owners.	The loss of residents and visitors during or after a disaster has direct economic effects on these communities. As communities lose homes and essential infrastructure due to disasters, residents may choose or be forced to leave the community, hampering economic recovery. Keeping businesses and employers open can help keep these residents in the community in the long-term. Ensure that business resiliency is integrated into any community or regional economic development plans and initiatives, and that local business groups are key stakeholders in any implementation efforts.	Education, Outreach, Coordination Programmatic	Emergency Management	Cities and Counties		<a href="#">Mammoth Lakes Safety Element (2019)</a> <a href="#">Capital Region Business Resiliency Initiative</a> <a href="#">Moreno Valley Business Emergency Resiliency Training Program</a>
Drought, Extreme Heat, Flooding	<b>Strategy LUCD-4: Encourage and incentivize the use of pervious and landscaped surfaces in new and existing development.</b> The use of pervious and landscaped surfaces in existing and new development can help neighborhoods reduce the urban heat island effect, catch stormwater where it falls to reduce flooding and help groundwater recharge, and lower overall water use on a property. Many new developments are required to have a specific percentage of pervious or landscaped surfaces. Encouraging existing developments in urban areas to use these materials can increase the resilience of the community.	Although landscaping can improve groundwater recharge and reduce the urban heat island effect, it is also essential to incorporate wildfire mitigation landscape standards into this adaptation strategy. Adding these standards can reduce the risk of wildfire spreading between properties in some cases, depending on the specific landscaping approach.	Programmatic	Public Health Biodiversity and Habitat	Cities and Counties	Utility Companies Grants	<a href="#">Safeguarding California: 2018 Update</a> <a href="#">Mammoth Lakes Safety Element (2019)</a> <a href="#">San Luis Obispo County Cash for Grass Program</a> <a href="#">SoCal Water Smart Residential Rebates</a>

# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All climate hazards	<b>Strategy LUCD-5: Collaborate with local, regional, state, and federal partners to develop a community-wide outreach program to educate a diverse community on how to prepare and recovery from climate change effects.</b> Implementation of climate adaptation strategies requires the community to understand the climate effects in their area. Local governments can work with Cal FIRE, community-based organizations, FEMA, and other partners to create an educational program that can help community members act. This program is also an opportunity for community members to brainstorm strategies unique to their community and neighborhoods.	Education and outreach programs should consider their audience and the timing and location of the events. Local governments should work with community-based organizations to identify location and timing to reach specific populations such as seniors, school age children, and linguistically isolated persons. Educational programs should be in multiple languages, at different locations, and during varying times in the day to reflect the unique demographics and needs within each community.	Education, Outreach, Coordination	Emergency Management Public Health	Cities and Counties Cal OES FEMA Community-Based Organizations		<a href="#">Safeguarding California: 2018 Update</a> <a href="#">Marin County - Resilient Neighborhoods</a> <a href="#">California Air Resources Board</a>
Wildfire, Landslide, Flooding, Sea Level Rise, Extreme Heat	<b>Strategy LUCD-6: Identify and establish climate hazard overlay zones.</b> Local governments can use Geographic Information Systems (GIS) to identify where climate change-related effects are most likely to occur now and, in the future, and then overlay the at-risk areas with existing parcels, infrastructure, and building information. Communities can determine expected extent of sea level rise and where flooding, wildfires, and landslides are most likely to occur. Jurisdictions can then put specific development and infrastructure regulations in place to ensure that neighborhoods can prevent and are prepared for climate hazards and other effects. Each community can tailor hazard overlay zones to meet their needs.	When hazard overlay zones are established, local governments should also consider superimposing maps of vulnerable populations to identify hot spots of vulnerability in wildfire, flooding, sea level rise, landslide, and extreme heat areas. These areas may need funding assistance to upgrade facilities and properties to comply with risk reduction measures in the hazard overlay zone. Communities can also use these overlay zones to identify essential infrastructure such as hospitals, schools, and power plants that are at risk of damage from climate hazards and other effects.	Evaluation Plans, Regulations, and Policy Development	Emergency Management Public Health Transportation Energy	Cities and Counties Council or Association of Governments	\$B 1 Grant General Fund	<a href="#">Cal FIRE: Fire and Resource Assessment Program</a> County of San Luis Obispo: Geologic Study Area <a href="#">FEMA: National Flood Hazard Layer</a> <a href="#">Coastal Adaptation Policy Brief</a> <a href="#">APFN: Mapping Resilience Report</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Wildfire	<b>Strategy LUCD-7: Develop a fire risk assessment for all new development within fire hazard severity zones or the wildland-urban interface (WUI).</b> Fire risk assessments can help identify the potential for fires to occur within and surrounding a new or existing development. These assessments can assign numerical values to metrics such as fire history, FRAP fire threat, response time, proximity to the WUI, fuel reduction efforts, community collaboration, and unique local criteria. Based on the fire risk assessment, local governments can understand if new development is prepared for or even considers wildfire threats within the area. Jurisdictions can place additional requirements on projects that do not meet specific thresholds based on a community's fire risk assessment.	The fire risk assessment can be integrated into existing plans or development review processes. Communities can apply this assessment at different scales to accommodate small developments or large subdivision projects. Jurisdictions can also use fire risk assessments for event permits and other special use permits that may be located within wildfire hazard areas.	Plans, Regulations, and Policy Development Evaluation	Emergency Management Forests	Cities and Counties Council or Association of Governments	FEMA Hazard Mitigation Grant \$B 1 Grant General Fund	<a href="#">Permit Sonoma - Fire Risk Assessment</a>

**Table 8-13 Parks and Recreation**

Pests and diseases, flooding, landslide, wildfire, severe storms	<b>Strategy PR-2: Collaborate with local and regional partners to provide robust trail and park maintenance to prevent and respond to damage from climate change effects.</b> Fallen trees, flood waters, wildfires, landslides, and severe storms, among other effects, can all damage trails and parks. To prevent long-term closures of park and trail facilities, local governments and collaborate with regional park districts and California State Parks to maintain park and trail facilities. Park management agencies can harden and stabilize park buildings and trails to prevent future damage.	Local agencies should consider funding and land ownership when providing robust trail and park maintenance. Preventative activities to make parks and trails more resilient can often receive grant funding, whereas recovery efforts more likely will derive from emergency funds. However, preventative measures can help avoid damage to facilities that would cost more money to fix.	Education, Outreach, Coordination Programmatic	Forests	Local and Regional Parks and Recreation Departments CA State Parks	California Department of Parks and Recreation California Natural Resources Agency	<a href="#">Safeguarding California: 2018 Update</a> <a href="#">Park Planner's Toolbox</a>
All hazards	<b>Strategy PR-3: Maximize opportunities for the public to participate in and inform the parks and recreation adaptation planning process.</b> When park districts, State Parks, or other park management agencies update park plans to add adaptation elements, public participation should be maximized. This could include several different outreach strategies, including public workshops, surveying persons using park facilities, and talking to stakeholders from nearby communities about the parks and recreation planning process.	Outreach should include both residents of the area and visitors to the area, as these populations are both key stakeholders for parks and recreation. Any type of public participation should be in multiple languages and culturally appropriate to the demographics that these programs would be serving.	Education, Outreach, Coordination	Land Use and Community Development	Cities and Counties Local and Regional Parks and Recreation Departments CA State Parks	California Department of Parks and Recreation California Natural Resources Agency	<a href="#">Safeguarding California: 2018 Update</a>

# Matheny Tract Climate Adaptation Plan

CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Extreme heat, flooding	<b>Strategy PH-4: Identify park-poor communities and ensure that new urban parks and trail systems are within walking distance to underserved populations and are connected to high-density infill, homes, and offices.</b> Many neighborhoods with urban areas may not have access to parks and trail systems that can promote healthy living and active transportation. Local governments can work with community members and community-based organizations to identify these areas and designate land to build parks and recreational areas. These can include connections to larger trail networks, or pocket-parks in the center of urban areas. It is important to involve communities' members from the onset of urban park planning to receive feedback and find consensus on what is best for the community.	When building parks in park-poor communities, it is essential to ensure that communities have ownership of their neighborhood parks. This can be achieved through integrating local cultural assets such as stories, public art, cultural activities, artists, and traditions into park design.	Programmatic	Land Use and Community Development Public Health	Cities and Counties Local and Regional Parks and Recreation Departments	Urban Greening Grant Program Urban and Community Forestry Program Grants AB 31 – Park Poor Communities Program	<a href="#">Safequaring California 2018 Update</a> <a href="#">City of Los Angeles 50 Parks Initiative</a>
Drought, extreme heat	<b>Strategy PH-5: Coordinate with owners of winter recreation areas and water recreation areas to support additional recreational activities that are less dependent on snowpack and water levels.</b> Changing snowpack conditions and precipitation patterns may force snow and water recreation sites to support alternative recreational opportunities. Local governments should coordinate with the owners of these sites to ensure that they can remain economically viable and help sustain the local economy and workforce. Alternative forms of recreation could include biking and hiking trails on skiing mountains during the summer season, or ropes courses and other alternative recreational activities at water recreation sites.	Ski resorts often make their own snow in winters that do not provide enough natural snow to sustain skiing. Local government should encourage ski resort owners to estimate future energy demand for snow-making activities and to install renewable energy generation and energy storage systems to accommodate this demand.	Education, Outreach, Coordination Operational	Water Land Use and Community Development	Cities and Counties	Prop 68 – State of California Parks and Water Bond 2018	<a href="#">Placer County Sustainability Plan (2019)</a>
Extreme heat	<b>Strategy PH-6: Install refillable water stations at parks, trailheads, community centers, and sport courts/fields with available water supplies to encourage proper hydration and protection against heat-related illnesses.</b> Extreme heat events may not deter people from hiking, biking, and participating in other outdoor recreational activities. However, local governments should make sure that parks and recreational areas have adequate water supply and water refill stations. This can reduce heat stress, heat stroke, and dehydration during periods of extreme heat.	When installing water refill stations, local governments should provide education signage in multiple languages to enable visitors to understand how to prevent heat related illnesses. Local governments can also consider providing free insect repellent at outdoor recreation facilities. This can help prevent vector-borne illnesses from mosquitoes and ticks from spreading.	Capital Improvements & Infrastructure Projects Education, Outreach, Coordination	Public Health	Cities and Counties	California Department of Parks and Recreation California Natural Resources Agency	<a href="#">Placer County Sustainability Plan (2019)</a>

**Table 8-14 Public Health (PH) Sector**

CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Public Health Sector</b>							
Air quality, extreme heat, wildfire, flooding, sea level rise	<b>Strategy PH-1: Establish resilience hub locations in neighborhoods throughout the community.</b> Resiliency hubs consist of well-used, existing community-serving facilities that are upgraded to provide local communities with shelter and electricity during extreme heat events, poor air quality, and disasters. These hubs should have other essential resources such as food, ice and refrigeration, charging stations, basic medical supplies, and other emergency supplies. They should have their own renewable energy and energy storage systems that should be able to operate up to 72 hours if a power outage occurs. Resiliency hubs should also act as education centers, where community members can go to learn about climate-related hazards and other effects, how to prepare and respond to them, and enhance community connections to increase adaptive capacity. Local and regional General Plan Safety Elements, Local Hazard Mitigation Plans, and Emergency Operations Plans should integrate site planning and establishment of resiliency hubs, and their importance to emergency preparation and response.	When establishing resilience hubs, local governments should focus on existing community facilities that can be upgraded, instead of new facilities that are unfamiliar to the community. These facilities should be located outside of hazard-prone areas. Jurisdictions should consider ease of access to the site, as those with limited mobility or without access to transportation may be unable to travel to a resilience hub during a disaster. Local governments can work with community-based organizations and neighborhood leaders to identify resilience hub locations and establish neighborhood outreach programs to disseminate information to older adults and linguistically isolated populations. <sup>48</sup>	Capital Improvement & Infrastructure Projects Programmatic Education, Outreach, Coordination	Emergency Management Land Use and Community Development Climate Justice	Cities and Counties Council and Association of Governments	Transformative Climate Communities Grant	WRCOG Adaptation Strategy (2019) <a href="#">USPN: Guide to Equitable, Community-Driven Climate Preparedness Planning</a> <a href="#">Tuolumne County Community Resilience Centers</a>
All hazards	<b>Strategy PH-2: Integrate climate change and health equity into traditional public health programs and core functions.</b> Traditional public health programs primarily focus on treating individuals who are sick based on their symptoms. Integrating climate change and health equity into this traditional public health system can allow doctors to understand underlying conditions that create illnesses and whether climate change effects could exacerbate those illnesses. Public health officials could use hazard data, such as areas vulnerable to extreme heat or poor air quality, to reach vulnerable populations that may not otherwise have access to healthcare services.	When integrating climate change and health equity into public health programs, local governments should consider where the most vulnerable populations are located and if there are existing community centers or resilience hubs to focus resources. Part of health equity incorporation will be to provide care and educational programs in languages that match the demographics of the local community. This should encourage community members to participate in public health programs.	Operational Education, Outreach, Coordination	Land Use and Community Development Emergency Management Climate Justice	Cities and Counties Council and Association of Governments		<a href="#">APEN: Mapping Resilience</a> <a href="#">Climate Change, Health, and Equity: Guide for Local Health Departments</a> <a href="#">Making Equity Real in Climate, Adaptation, and Community Resilience Policies and Programs: A Guidebook</a>

# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Extreme Heat, Air Quality, Flooding	<b>Strategy PH-3: Collaborate with community-based organizations to develop or expand urban greening and urban agriculture programs.</b> Community-based organizations have direct ties to the communities they are from or work in, and therefore are optimal partners to identify areas for urban greening and urban agriculture, and then develop and implement these programs. Urban greening can include adding trees, parks, green infrastructure, and other green elements to a neighborhood. This program can help reduce temperatures on the ground by providing shade, clean the air to improve air quality, and provide natural drainage areas that prevent flooding. Urban agriculture includes community gardens or small farms within urban areas of a community. This program can replace paved areas and reduce the urban heat island effect, while also providing additional food and educational opportunities for the community.	The first factor to consider is where urban greening and urban agriculture is most needed, which is typically in areas with few trees, parks, or healthy food options. Local governments should also consider gentrification and displacement that could occur because of these programs. To prevent this, local governments can protect affordable rentals and the ability of residents to remain in their homes, while also hiring local youth or young adults to install green infrastructure or other plants as part of workforce development jobs program. This effort could also include on-site capture of rainwater on private properties.	Programmatic Education, Outreach, Coordination	Land Use and Community Development	Cities and Counties CBOs	Transformative Climate Communities Grant General Fund	<a href="#">City of San Francisco Green Trees Program</a> <a href="#">City of Santa Monica Rain Barrel and Cistern Rebate Program</a> <a href="#">City of Seattle's Housing Affordability and Livability</a> <a href="#">USDN: Guide to Equitable, Community-Driven Climate Preparedness Planning</a>
All hazards	<b>Strategy PH-4: Develop a climate preparedness outreach program focused on vulnerable populations that provide information on staying healthy and safe during hazardous events.</b> Community members, especially those within a vulnerable population group, may be unaware of the climate-related effects that may be harmful to their community, or how to stay safe during hazardous events. Vulnerable populations may be the least prepared for the impacts of climate effects. Local governments can develop climate preparedness outreach programs to work with community members to increase resiliency to hazardous events. Programming can include educational events, workshops for school aged children, and providing emergency kits to community members. Jurisdictions should prioritize resources for vulnerable populations, provide them in multiple languages, and design them to communicate effectively with all groups to reduce health inequities in communities. <sup>44</sup>	Local governments should consider the populations they are trying to reach in these outreach programs, and the effects most likely to impact those communities. Some communities may be at high risk of flooding, while others could be in the high wildfire hazard severity zones. It can be difficult for jurisdictions to reach some populations, especially those that are isolated, with these outreach efforts. Local governments can work with established neighborhood outreach programs or collaborate with community-based organizations to improve trust and communication to reach as many people as possible.	Education, Outreach, Coordination Programmatic	Emergency Management	Cities and Counties		<a href="#">USDN: Guide to Equitable, Community-Driven Climate Preparedness Planning</a> <a href="#">Oakland Community Climate Action Guide</a> <a href="#">City of Seattle Equity &amp; Environment Initiative</a>

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Air Quality, Extreme Heat, Wildfire, Human Health Hazards	<b>Strategy PH-5: Expand employer and worker training in industries with outdoor work, including assurance or adequate water, shade, rest breaks, protection from poor air quality, training of heat impacts, and vector borne diseases.</b> Health effects from climate change can be more severe for individuals who work outdoors, such as construction workers, landscapers and grounds crews, and agricultural workers. Extreme heat and poor air quality are the primary health effects for these workers, although increased exposure to potential disease vectors such as ticks and mosquitoes can also pose a hazard. The local and regional governments can provide guidance to employers and workers, as well as work with the private sector and community-based organizations, to ensure that outdoor employees are aware of the harm posed by these climate-related effects and how to reduce them.	Many workers in these industries may be difficult to reach and outdoor workers may be fearful of engaging with the government. However, local governments can work with community-based organizations and worker rights advocates to determine the best method to outdoor workers. Information can include protections from climate-related effects, but also information about worker protect laws. Outreach should also be culturally relevant and be in multiple languages that are representative of the outdoor worker population.	Programmatic Education, Outreach, Coordination	Emergency Management Agriculture	Cities and Counties		<a href="#">USDN: Guide to Equitable, Community-Driven Climate Preparedness Planning</a> <a href="#">Fair Work Center</a>
All hazards	<b>Strategy PH-6: Coordinate with local homeless services to ensure that emergency shelters are available during extreme heat events, poor air quality, severe weather events, and other highly hazardous conditions.</b> Ensure that the local homeless population is made aware of these resources. Local communities should coordinate with agencies and organizations that provide homeless services to provide shelter during hazardous conditions. These emergency shelters should provide information about hazardous events and basic supplies such as insect repellent and hygiene provisions that can increase the adaptive capacity of individuals experiencing homelessness. Outreach and support efforts to homeless individuals is essential to disseminate information on how to stay safe during hazardous conditions and where the nearest emergency shelters are located.	This is a two-pronged adaptation measure that involves both coordination with homeless services and outreach to local homeless individuals or populations. Some communities have existing homeless shelters that can be used during emergencies, and others would have to develop new emergency shelters that can accommodate the homeless population. These locations may not be familiar to homeless individuals, and therefore it is essential to go to the homeless community, homeless shelters, and local soup kitchens to disseminate this information.	Education, Outreach, Coordination	Emergency Management	Cities and Counties Local homeless services organizations (Continuum of Care, homeless partnerships, etc.)	Homeless Assistance Grants Emergency Solutions Grants (ESG) Program	<a href="#">Placer County Sustainability Plan, (2019)</a> <a href="#">WRCOG Adaptation Strategy (2019)</a>



# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
All hazards	<b>Strategy PH-7: Work with local medical providers and hospitals to ensure that medical facilities are prepared to meet any increased demand because of hazardous events.</b> Hazardous events, such as wildfires, floods, poor air quality, and extreme heat, can increase illnesses such as heat stroke, asthma, and cardiovascular diseases. This can increase the demand for medical services at hospitals and local medical providers. This demand can create an unexpected overflow of patients and can strain hospitals and clinics in a community. Local governments can work with the regional public health systems, hospitals, clinics, and private practices to prepare for an influx of patients during hazardous events. This could be stocking up on specific medical supplies for local emergencies or working with emergency management agencies to have medical professionals and supplies at emergency shelter locations.	Local governments can work with medical providers to identify specific health impacts that may occur due to different climate change effects. Medical providers are trained to understand the illnesses of patients, but they may not understand health hazards that are created or worsened by climate change. This adaptation strategy can help community members be treated effectively and efficiently to recover from climate-related effects.	Operational Education, Outreach, Coordination	Emergency Management	Cities and Counties Public Health Departments		<a href="#">Placer County Sustainability Plan (2019)</a> <a href="#">Health Care Climate Council</a> <a href="#">Preparing Public Health Officials for Climate Change: A Decision Support Tool</a>
Human Health Hazards	<b>Strategy PH-8: Identify and remedy poor drainage areas to reduce disease risk from stagnant water.</b> Expand outreach programs to educate communities about potential increases in vector-borne diseases from stagnant water. Stagnant water provides a breeding ground for mosquitoes, which in turn can increase the risk of mosquito-borne pathogens such as West Nile virus. Stagnant water can develop in areas of poor drainage following flood events, creating a health risk in the vicinity. Communities can identify poorly drained areas and complete infrastructure improvements so that they drain properly. If infrastructure improvements are not feasible, communities can categorize these locations as needing mosquito-control efforts following a flood event. Communities can collaborate with local mosquito abatement districts to expand public education programs regarding preventative actions against vector-borne diseases that have the potential to occur in the future.	Local governments can work with local flood control districts and mosquito abatement districts to both identify poor drainage areas, implement abatement measures, and conduct community outreach. Outreach should focus on the most vulnerable populations and be presented in a culturally relevant manner in languages that are representative of the local demographic.	Capital Improvement & Infrastructure Projects Education, Outreach, Coordination Programmatic	Land Use and Community Development Water Biodiversity and Habitat	Cities and Counties Mosquito Abatement Districts Flood Control Districts		WRCOG Adaptation Strategy (2019) <a href="#">Pacific Southwest Center of Excellence in Vector-Borne Diseases California Department of Public Health Mosquito and Vector Control Association of California</a>

**Table 8-15 Transportation (TRANS) Sector**

Air quality, Extreme heat	<b>Strategy TRANS-4: Collaborate with public works departments and regional transit providers to increase shading and heat-mitigating materials on pedestrian walkways and transit stops.</b> Adequate shade on sidewalks and transit stops is essential for community members who walk or use public transit to get to their destinations. To increase the comfort of pedestrians and bicyclists on hot days, local governments can work with local jurisdictions to install pavement with high albedo, which absorbs less heat and contributes less to the urban heat island effect. Heat-reflective pavement can be applied either by replacing existing surfaces or by coating surfaces with a highly reflective coating. Local governments can also encourage tree planting programs along walkways to provide shade, particularly in communities that have little shade. This could help reduce heat and improve local air quality, as well as incentivize outdoor activity.	Local governments should prioritize areas that have few trees or lack shade covers when implementing heat-mitigation projects. When increasing shade at transit stops and walking or biking paths, local governments should also consider installing green infrastructure, which can both increase shade and prevent flooding in low-lying areas.	Programmatic Education, Outreach, Coordination	Public Health	Cities and Counties Transportation Agencies		WRCOG Adaptation Strategy (2019)
---------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------	---------------	------------------------------------------------	--	----------------------------------

**Table 8-16 Water (W) Sector**

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
<b>Water Sector</b>							
Flooding, drought	<b>Strategy W-1: Reduce flood and drought risk through integrated watershed management.</b> This is a high level, integrated approach to balancing water availability (both surface and groundwater), demand, and an ecosystem's minimum water needs to ensure a balanced consideration of economic, social, and ecosystem welfare. Healthy watersheds where development is planned to minimize impact and use and water sources are carefully managed to assure long-term, sustainable supply are more resilient to both variable, intense rainfall and drought. A healthy watershed maintains wetland areas as flood mitigation and maintains undeveloped natural areas, promoting soil health to blunt flood impacts and to assure greater resilience to drought.	Each city should assess its context in a watershed and, if needed, engage in a collaborative relationship with other entities in the local watershed. This should include collaboration with various departments in a community from planning, to natural resources, to water providers, and more. Conservation measures should be pursued to preserve wetlands, particularly upstream of a community, and manage undeveloped areas. Planning should work to assure that floodplains remain intact and have safety margins that expect expanded flood extents. Cities can collaborate with water providers to encourage increased water efficiency (e.g. graywater systems, reduced outdoor use, low flow fixtures) and to diversify water sources.	Operational Programmatic	Biodiversity Land Use and Community Development	Cities and counties (planning, hazards, & natural resource departments) Water providers	General Fund DWR Integrated Regional Water Management Grant Programs	<a href="#">DWR "Integrated Regional Water Management"</a> <a href="#">The Water Institute "Focus on Integrated Watershed Management"</a>
Flooding, drought	<b>Strategy W-2: Reduce local flooding through implementation of low impact development.</b> This strategy is specific to the stormwater system in a community. The approach through installation of bioretention elements in parking lots and on the street margin. It can be implemented through landscape codes, green street standards, and a site standard. The approach seeks to mitigate the local flooding resulting from the effects of climate change and impervious surfaces on runoff events. These strategies also increase groundwater recharge and moderate increased streamflow in the receiving waterways.	This requires cities to assess the underlying soils, geology, and water table to assure infiltration is possible. Strategies should be developed appropriate for the local conditions. It is best to combine these approaches with road paving schedules and implementation of road diet approaches as the reduction of lane frees space for bioretention along the road margin in combination with other amenities such as sidewalks, bike lanes, and bus stops.	Plans, Regulations, and Policy Development Capital Improvement/Infrastructure Project	Land Use and Community Development	Cities and counties (utility dept.)	General fund Capital improvement fund	Central Coast Low Impact Development Initiative (CCLDI). "Municipal Codes" from <a href="https://www.centralcoastlidi.org/">https://www.centralcoastlidi.org/</a> .

# Matheny Tract Climate Adaptation Plan

TABLE C.1 EXAMPLES OF LOCAL CLIMATE ADAPTATION STRATEGIES BY SECTOR							
CLIMATE HAZARDS	ADAPTATION STRATEGY	FACTORS TO CONSIDER	CATEGORY	SECTOR OVERLAP	RESPONSIBLE AGENCIES	FUNDING	EXAMPLES & SOURCES
Drought	<b>Strategy W-3: Increase water efficiency and conservation.</b> Cities, on their own or through collaboration with water providers, encourage increased water conservation and efficiency (e.g. graywater systems, reduced outdoor use, low flow fixtures). This is a key strategy to facing increasing frequency of drought conditions as it allows existing water supplies to stretch a further. Such efforts can be implemented through a variety of tools from turf replacement programs to building codes.	As assessment primary water uses in a community can help narrow and focus the measure chosen such as communities with high levels of outdoor use can pursue strategies to limit the amount used and type of water used (e.g. gray or recycled). This can be promoted through adjustments to a tiered fee system, outreach, turf replacement programs, or building requirements for low-flow fixtures. The fee-based options require careful assessment of impacts on lower income community members.	Plans, Regulations, and Policy Development Education/Outreach/Coordination	Land Use and Community Development	Cities and counties	General fund DWR Water Use Efficiency Grants	DWR. "Water Use & Efficiency" from <a href="https://water.ca.gov/Programs/Water-Use-And-Efficiency">https://water.ca.gov/Programs/Water-Use-And-Efficiency</a>
Flooding, drought	<b>Strategy W-4: Upgrade water and wastewater systems to accommodate projected changes in water quality and availability.</b> Under future conditions, existing water and wastewater systems may not be able to meet community demand. For example, wells and intake systems may be too shallow to effectively pull enough water supplies from groundwater aquifers and surface water bodies, higher levels of water contaminants may exceed the capacity of water treatment systems, and water storage tanks may not be able to hold enough water to meet demand if there is a supply interruption. This can be a particular challenge for smaller systems. Making retrofits to these pieces of infrastructure in advance of future conditions can help communities be better prepared and ensure that there are fewer disruptions to water and wastewater services.	When upgrading existing water and wastewater systems, it is critical to identify the specific needs of the systems under future conditions, and what upgrades are required to ensure these needs are met. As with any engineering project, retrofits should be designed to err on the side of caution in case future conditions are more extreme than projected, without overengineering retrofits to the point of wastefulness. Retrofits are also a prime opportunity to consider other upgrades not directly related to water availability and quality, but which provide other adaptation benefits, such as energy efficiency and renewable energy.	Capital Improvement/Infrastructure Project	Public Health	Water and wastewater service providers	General fund Capital improvement fund Water and wastewater infrastructure improvement grants	



## Chapter 9 Sources

# Matheny Tract Climate Adaptation Plan

---