A Compilation and Analysis of Local Climate Action Plan Measures

Prepared for the City of Galt

By

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Background

This document compiles climate action plan (CAP) strategies from small and rural California cities. Strategies highlighted in this document may be used by staff at the City of Galt to create a climate action plan. This report was prepared in response to Galt being awarded the California Energy Commission's Local Government Challenge grant to develop a CAP. The report is accompanied by a spreadsheet, the CAP Scorecard, which lays out each climate strategy in detail.

This document was prepared by two CivicSpark Climate Fellows at the Sacramento Metropolitan Air Quality Management District. CivicSpark is an AmeriCorps program that helps local government agencies build capacity to address climate change.

Introduction

Cities were chosen for analysis based on their similarities with the City of Galt. With the exception of the City of Goleta, all are rural jurisdictions located in the Central Valley, and most have a small population. Furthermore, these cities have relatively new climate action plans, allowing comparison of more recent trends across municipalities. Selected cities are listed in Table 1 in descending order by population size.

Table 1 - Cities from which CAP Measures were selected

City	Population (2016)	Year CAP Adopted	Consultant
Lancaster	160,106	Draft 2016	Michael Baker Int'l
Lodi	64,641	2014	AECOM
Atascadero	59,068	2014	Rincon Consultants
Oroville	30,850	2015	ICF Int'l
Woodland	30,330	2017	AECOM
Goleta	19,033	2014	ICF Int'l

Additional information about each city is included in the "City Overview" tab of the accompanying spreadsheet. The Scorecard has separated out key CAP policies by sector into tabs and includes the following information for each policy: policy number (corresponding to each city's CAP document), emissions reduction potential (for 2020, 2030/35, and 2050, where applicable), implementation timeframe, cost to city, private cost, and responsible department. Co-benefits for each strategy theme are also listed. If applicable, additional policy-specific co-benefits are listed in the Notes column.

As noted, the implementation timeline of each measure was standardized as follows: *short-term* policies are easily implemented in 1 to 3 years, *mid-term* policies require more planning and can be implemented in 3 to 5 years, and *long-term* policies require strategic planning and will be implemented post-2020. In some cases, a policy considered short term by the City for purposes of implementation will continue to generate GHG reductions across a longer timeframe, well past 2020. For example, Lancaster's policy 4.8.1c seeks to develop a local green building program that would incentivize developers to include green features in construction. This policy was categorized by Lancaster staff as short term to implement, however it will deliver long-term benefits over the life of each installed feature.

AB 32, SB 32, and Target Emissions

All cities set greenhouse gas (GHG) emissions reduction goals in accordance with California state goals outlined in AB 32 (2006), which aims to reach 1990 emissions levels by 2020. The cities of Lancaster, Lodi, and Goleta also set emissions targets for 2030, consistent with SB 32 (2016), which established a state goal of reducing GHG emissions 40 percent below 1990 levels by 2030. The City of Woodland recently updated their general plan to a planning horizon of 2035 and their climate action plan therefore includes an emissions reduction target through this date. In the attached CAP scorecard, all emissions are quantified using metric tons of CO_2 equivalent per year ($MTCO_2e$), unless otherwise noted. Table 2 highlights each municipality's 2020 and 2030/35 emissions reduction targets.

Table 2 - Local GHG Emissions Reduction Targets for the Years 2020 and 2030/35

City	Baseline Year	Baseline Emissions	2020 Emissions Target	2020 Percent Reduction	2030/35 Emissions Targets	2030/35 Percent Reduction
Lancaster	2010	885,210	752,430	15%	451,460	49%
Lodi	2008	486,628	413,634	15%	306,576	37%
Atascadero	2005	141,428	120,214	15%	-	-
Oroville	2010	163,288	145,000	11%	-	-
Woodland	2005	566,389	481,431	15%	270,743	*
Goleta	2007	325,532	290,374	11%	213,000**	37%

All values measured in metric tons of CO2 equivalent ($MTCO_2e$) per year unless otherwise noted.

*Instead of calculating a percentage reduction, Woodland will aim for a per capita target of 2.25 MTC02e per year in the service area.
**Preliminary target. At the time of adoption, the CAP includes no legislative mandate for 2030.

Sector Overview

Policies from each climate action plan were divided into the following sectors: energy, built environment, transportation, land use, green space, water, waste, and adaptation. Within each sector, policies were grouped into strategy themes based on key concepts, such as renewable energy or water conservation.

Policies were selected for analysis if they were scalable and/or replicable in other jurisdictions. Policies that were more specific and highly developed were selected over more broad strategies. A range of policies with a corresponding range of greenhouse gas reduction impacts from modest to ambitious were included. Many policies have impacts across sectors. For example, land use strategies may have transportation benefits and vice versa, and most strategies carry additional adaptation benefits. Table 3 highlights each municipality's 2020 greenhouse gas reduction goals broken down by sector.

Table 3 - 2020 GHG Reduction Goals by Sector (community only - *does not include state reductions or municipal measures*)

City	Energy	Built Environment	Transportation	Land Use	Green Space	Water	Waste	Total
Lancaster	44,755	1,050	4,960	-	-	1,310	6,830	58,905
Lodi	11,747^	4,639	18,967	9,129	-	-	-	44,482
Atascadero	3,098	-	22,525		1,781	22	924	28,350
Oroville	3,756	-	1,418		2	1,646	1,983	8,805
Woodland	26,000	-	18,000		2,300	11,900		58,200
Goleta	26,126*	3,219**	22,279		-	597	806	53,027

All values measured in metric tons of CO2 equivalent (MTCO2e) per year unless otherwise noted.

^Incorporates Energy Efficiency Retrofits and Renewable Energy Generation portions of Energy Efficiency section of Lodi's CAP.
*Renewable Energy section of Goleta's CAP.
**Building Energy Efficiency section of Goleta's CAP.

The following sections present a discussion of each sector and its associated strategy themes. For each sector, an overview chart illustrates the inclusion or exclusion of select policies by each city. Policies that are included both in a city's CAP and in our analysis are highlighted in dark blue. Policies included in the CAP but not in our analysis are highlighted in light blue. Policies absent from the CAP and therefore also our analysis are highlighted in white. These charts provide a high-level overview of how cities focused their policy efforts.

Sector Legend

Included in CAP and Scorecard	Included in CAP, not included in Scorecard	Not included in CAP or Scorecard

Finally, this report highlights innovative policies for each sector, exploring relevant background information for each policy and additional co-benefits.

Energy

The burning of coal, natural gas, and oil for electricity and heat is the largest single source of global greenhouse gas emissions.[1] In California, SB 350 (2015) requires utilities to supply 50 percent of their electricity from renewable energy sources by 2050, but local governments can play an important role in reducing demand through energy-efficient building codes, incentives, and ordinances. Local governments can also encourage distributed generation in the community by removing barriers and streamlining processes. As such, policies addressing energy efficiency and renewable energy are integral components of a climate action plan. Not only will these policies enable California households to reduce energy costs, they will help create an estimated 1.5 million jobs.[2] Renewable energy generation boosts energy independence and decreases reliance on fossil fuels, while energy-efficient buildings can help improve residents' health and comfort.

All municipalities' CAPs contained policies to improve energy efficiency. Goleta will conserve energy with programs for retrofitting houses and appliances. Woodland seeks to provide access to data about consumption to drive behavior change. Oroville has robust housing retrofit policies, while Atascadero focuses on policies that will streamline rooftop solar installations. Lodi will make renewable energy easier to permit, while Lancaster's innovative policies encourage the development of battery storage as a backup to local renewable energy.

[1] U.S. Environmental Protection Agency. *Global Greenhouse Gas Emissions Data.* 2017. Retrieved from: https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

[2] Based on household energy savings of $56 billion from 1972-2006. Roland-Holst, David. *Energy Efficiency, Innovation, and Job Creation in California.* 2008. Department of Agricultural and Resource Economics, UC Berkeley. Retrieved from: https://escholarship.org/uc/item/7qz3b977

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Increase renewable energy						
Replace public lighting fixtures with energy-efficient lighting						
Manage building energy use through retrofits and commissioning						
Offer and support residential weatherization programs						
Conduct energy efficiency education campaigns						
Offer rebates and incentives for energy efficiency upgrades						
Revise permitting and zoning codes to incentivize clean energy						

Innovative Policy: Lancaster Battery Storage (4.2.1c and 4.2.1d)

With 350 days of sunshine each year, Lancaster has been widely recognized for its efforts to become a net zero energy city. In 2010, Mayor Rex Parris visited China's BYD, one of the world's largest manufacturers of electric vehicles, including buses, and battery storage technology, an effort which culminated in BYD constructing an electric vehicle production facility in Lancaster in 2013.[3] The city's solar financing program has helped the school district, business parks, churches, and five city facilities switch to solar energy, which is estimated to save about $6 million over 15 years.[4]

In 2013, the City Council adopted a requirement that every new home have solar installed, beginning in January 2014. At the time of adoption, the mandate was the first of its kind nationwide, and aims to encourage solar development across all homes. Residential homes on lots of 7,000 square feet or more are required to install solar PV of 1 to 1.5 kW, while rural residential homes must have at least 1.5 kW of solar installed. Developers are allowed to aggregate solar systems across all homes in a division, and can also meet the requirement off-site from another solar development within the city. Since then, the city

[3] BYD. Press Release: *BYD Breaks Ground on Phase II Expansion of Vehicle Manufacturing Facility in Lancaster, California*. 2016. Retrieved from: http://www.cityoflancasterca.org/Home/Components/News/News/7548/20

[4] City of Lancaster. *Alternative Energy*. 2017. Retrieved from: http://www.cityoflancasterca.org/about-us/sustainability/alternative-energy

has issued roughly 240 permits for new homes that must have solar.[5] As of 2016, Lancaster and BYD are working on a 500 MW battery storage system, more than double the US's total installed capacity through 2016, which will enable the city to build energy resilience and reduce the use of fossil fuels.[6]

Given this history, it comes as no surprise that the City of Lancaster's Climate Action Plan contains many solar and battery storage goals. The CAP requires that all City facilities and public buildings with solar also be fitted with battery storage by 2020. The CAP also aims to install battery storage on *all buildings* in the city by 2030. Lancaster will also implement 'reach codes', which exceed current Title 24 Building Energy Efficiency Standards, to mandate all new commercial development install solar and battery storage options.

Built Environment

Decisions on how and where cities build impact transportation, energy consumption, and ultimately quality of life.[7] Buildings, both residential and commercial, account for 38 percent of CO_2 emissions in the U.S., with most of the emissions resulting from electricity and natural gas usage for heating, cooling, powering home appliances, and lighting.[8]

Adopting green infrastructure measures such as cool roofs and permeable pavements can yield greenhouse gas reductions and improve air quality, while building resilience to extreme heat. Incorporating solar into building design can offset increased need for electricity, while innovative landscaping and construction practices can help cities reduce stormwater runoff, improving water quality and decreasing flood risk.

Woodland has several policies encouraging energy-efficient and "green" building development, while all cities except Lodi encourage or require development to exceed Title 24 standards. Cities are serious about increasing solar energy generation, with Oroville and Goleta requiring new development include solar.

[5] Mulkern, Anne. *Conservative Desert Town on the Cusp of Emerging Solar Trend.* 2016. E&E News. 2016. Retrieved from: https://www.eenews.net/stories/1060044419

[6] Shahan, Zachary. CleanTechnica. *Huge BYD Storage Project In Lancaster, BYD's EV Master Plan, Tesla's EV Master Plan*. 2016. Retrieved from: https://cleantechnica.com/2016/01/06/huge-byd-storage-project-in-lancaster-byds-ev-master-plan-teslas-ev-master-plan-cleantech-talk-16/

[7] Younger et al. *The Built Environment, Climate Change, and Health.* 2008. Retrieved from: http://www.ajpmonline.org/article/S0749-3797(08)00682-X/pdf

[8] U.S. Green Building Council. *Buildings and Climate Change.* 2015. Retrieved from: http://www.eesi.org/files/climate.pdf

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Construct energy efficient or net-zero housing units						
Build “green” buildings						
Encourage solar energy production in new development						
Exceed CA Building Code standards						

Innovative Policies: Exceeding the Title 24 California Building Standards Code (Oroville BE-1) and Exploring Energy Efficiency Retrofit Programs (Oroville BE-2 and BE-3; Goleta BEE-2)[9]

Title 24 establishes mandatory standards for construction in California and includes the Building Energy Efficiency Standards (California Energy Code) and the California Green Building Standard Code (CALGreen). Cities often establish CAP strategies that adopt energy standards which are more stringent than the Building Energy Efficiency Standards, or adopt voluntary CALGreen measures, even as future updates of Title 24 will tighten the mandatory requirements.

For CALGreen, voluntary measures outlined in Tier I are designed to exceed Title 24 standards by 15%. One voluntary measure in this category is the installation of cool roofs.[10] By reflecting more sunlight and thus absorbing less heat, cool roofs are approximately 50 to 60 degrees Fahrenheit cooler than traditional roofing materials during the peak summer season.[11] They help reduce energy costs and peak electricity demand. Los Angeles passed the first local ordinance requiring all new and retrofitted residential buildings to have cool roofs that meet minimum solar reflectivity standards.[12]

Not only can GHG emissions from the built environment be reduced by developing new energy-efficient buildings, retrofitting existing residential and commercial buildings can also make a significant impact. The majority of housing in California was built before 1980 and consumes more electricity and natural gas relative to newer efficient buildings.[13] Consequently, energy usage increases with age of the home.

[9] CAP Policies for Oroville BE-2 and BE-3 and Goleta BEE-2 can be found in the CAP Scorecard under the “Energy” sector.

[10] California Housing and Community Development. *Tier 1 Residential Measures*. 2016. Retrieved from: http://www.hcd.ca.gov/building-standards/calgreen/docs/HCDSHL605B.pdf

[11] U.S. Environmental Protection Agency. *Reducing Urban Heat Islands: Compendium of Strategies Draft*. 2008. Retrieved from: https://www.epa.gov/heat-islands/heat-island-compendium.

[12] Los Angeles Department of Water & Power. Retrieved from: https://www.ladbs.org/docs/default-source/publications/ordinances/cool-roof-fact-sheet-and-faq.pdf?sfvrsn=10

[13] Bardham et al. *Energy Efficiency Retrofits for U.S. Housing: Removing the Bottlenecks.* 2014. Retrieved from: https://doi.org/10.1016/j.regsciurbeco.2013.09.001

Homes built after 2000 use 40% less energy than homes built before 1950, and these existing buildings continue to be a major source of emissions.[14]

Oroville combines both of these approaches. The City of Oroville's CAP plans to adopt a Green Building Ordinance to require new residential and non-residential developments to reduce energy usage by 15% compared to Title 24 requirements current at time of construction. The city will also develop education and outreach materials to support this ordinance. Oroville estimates that this policy will have a payback period of 6 to 13 years and will result in savings between $10 and $220 dollars per metric ton reduced.[15] The city plans to implement a low-income weatherization program for single-family and multi-family homes. Oroville plans to identify funding mechanisms for residential and commercial retrofits, including federal tax credits, local rebates, and Property Assessed Clean Energy financing. In addition, Oroville plans to provide funding to non-low income homeowners to cover 25% of the costs of whole house retrofits. Oroville will also conduct targeted education and outreach campaigns for residents and businesses to highlight the need for building retrofits, and its associated benefits, such as lowered utility bills, improved building comfort and occupant safety, and in some cases, increased property value.

Goleta has also identified measures to increase the energy efficiency of existing buildings through a voluntary energy retrofit program. Examples of measures include installing programmable thermostats, sealing ducts and air leaks, insulating attics, and replacing incandescent bulbs with compact fluorescent bulbs or LEDs.

Transportation

Transportation is California's leading source of GHG emissions, accounting for 39% of statewide emissions.[16] Lowering emissions associated with transportation can be achieved by reducing vehicle miles traveled, shifting modes of transportation (promoting active transportation and public transit), increasing vehicle occupancy (promoting carpools/vanpools), and reducing the GHG intensity of transportation fuels (through electric vehicles and other alternative fuels).[17] These strategies can directly improve air quality, reducing the risk of respiratory diseases and illnesses, while strategies supporting active transportation can reduce obesity, heart disease, and other chronic illnesses.

Most cities did an excellent job of addressing employee commutes in their climate action plan policies. Strategies range from creating a rideshare program to encouraging telecommuting. Most cities also focused on improving alternate modes of transportation such as biking and public transit. Woodland's bike strategies are particularly all-encompassing while Lancaster focuses in similar detail on developing high-quality public transit.

[14] California Department of Housing and Community Development. Public Draft- *Statewide Housing Assessment 2025, California's Housing Future: Challenges and Opportunities.* 2017. Retrieved from: http://www.hcd.ca.gov/policy-research/plans-reports/docs/California%27s-Housing-Future-Full-Public-Draft.pdf

[15] City of Oroville Climate Action Plan. 2015. Retrieved from: http://www.cityoforoville.org/home/showdocument?id=12191

[16] California Air Resources Board. *California Greenhouse Gas Emissions Inventory*. 2017. Retrieved from: https://www.arb.ca.gov/cc/inventory/data/data.htm

[17] *Advancing the Science of Climate Change: America's Climate Choices*. Washington, D.C. National Academies Press. 2010. Retrieved from: https://www.nap.edu/read/12782/chapter/17

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Increase bicycle parking and storage						
Construct bicycle paths and lanes						
Conduct bicycle education campaigns						
Build walkability						
Improve access to public transit						
Implement strategies to reduce employee commute miles						
Conduct VMT reduction campaigns						
Promote electric and alternative-fuel vehicles						
Incentivize electric equipment						

Innovative Policy: Increasing Bicycle Infrastructure and Education in Woodland (T/LU-1 and T/LU-5)

Active transportation networks greatly improve public health by providing long-term benefits such as reduced risk of diseases related to obesity and sedentary lifestyles. A study analyzing the health care costs and benefits of the City of Portland's bicycle infrastructure found that by 2040, city investments between $138 to $605 million dollars will translate to health care cost savings of $388 to $594 million and fuel savings of $143 to $218 million.[18]

Bicycling is also good for the local economy. The Iowa Bicycle Coalition found that commuter and recreational bicycling in Iowa generated more than $400 million in economic activity in 2011.[19] Investing in bicycle infrastructure is often a cost-effective way to create local jobs and increase economic spending, especially when compared to road projects. A report by the Alliance for Biking & Walking found that bicycling and walking projects can create 11-14 jobs per $1 million spent, creating nearly twice as many

[18] Gotschi, Thomas. *Costs and Benefits of Bicycling Investments in Portland, Oregon.* Journal of Physical Activity and Health, Volume 8 (2011). Retrieved from: http://www.healthyweld2020.com/assets/7311d20DD1b9CCdc74c8.pdf

[19] Flusche, Darren. *Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure.* Advocacy Advance. 2012. Retrieved from: http://bikeleague.org/sites/default/files/Bicycling_and_the_Economy-Econ_Impact_Studies_web.pdf

jobs compared to the same investment in highway projects. Additionally, active transportation investments can yield cost-savings through reduced traffic congestion.[20]

Increasing bike ridership is more successful if complementary policies are adopted concurrently, such as land use policies like increasing density bundled with bicycle education programs.[21] The City of Woodland is doing just this, by building new bicycle infrastructure and connecting existing bike paths to increase ridership while also adopting policies for community education and outreach efforts. Woodland plans to host bicycle repair and safety clinics and provide free or low-cost helmets and renovated bicycles to low-income residents. Woodland also works closely with The Bike Campaign, a local non-profit that encourages people to ride their bikes. In 2015, the city was recognized for their efforts as a bronze-level Bicycle Friendly Community by the League of American Bicyclists.[22]

Land Use

Land use policies that embrace smart growth strategies make it easier for people to walk, bike, or use public transit, and thus reduce vehicle miles traveled (VMT).[23] Examples of smart growth strategies include policies that support high-density, mixed-use, and transit-oriented development. These strategies support state legislation SB 375, which requires metropolitan planning organizations to create strategies that incorporate both transportation and land use policies.[24] Policies that promote sustainable land use not only reduce GHG emissions, but also create communities that can more easily adapt to the effects of climate change. These policy shifts may be supported through regulations, development incentives, and building code revisions, among others.

The EPA has compiled resources on smart growth strategies specifically for small and rural communities to highlight policies that present opportunities to achieve internal growth and development goals while maintaining town identity.[25] Additionally, Smart Growth America has designed three toolkits specifically for leaders in rural areas to create and implement smart growth policies.[26] The Community Facilities Location Toolkit helps communities plan for new facilities such as hospitals or post offices. The Well-Placed Affordable Housing Toolkit looks at how communities can create centrally located housing infrastructure

[20] Alliance for Biking & Walking. *Bicycling and Walking in the United States 2012 Benchmarking Report.* 2012. Retrieved from: http://peoplepoweredmovement.org/site/images/uploads/2012%20Benchmarking%20Report%20%20-%20Final%20Draft%20-%20WEB.pdf

[21] Pucher et. al. *Infrastructure, Programs, and Policies to Increase Bicycling: An International Review.* Preventative Medicine, 50 (2011). Retrieved from: https://nacto.org/wp-content/uploads/2011/03/Infrastructure-Programs-and-Policies-to-Increase-Bicycling-An-International-Review.pdf

[22] The Bike League. *Bicycle Friendly Community Awards and Honorable Mentions.* 2015. Retrieved from: http://bikeleague.org/sites/default/files/BFC_Awards_and_HMs_Fall_2015.pdf

[23] Smart Growth Network. *This is Smart Growth*. 2014. Retrieved from: https://www.epa.gov/sites/production/files/2014-04/documents/this-is-smart-growth.pdf

[24] California Environmental Protection Agency Air Resources Board. *Sustainable Communities.* 2017. Retrieved from: https://www.arb.ca.gov/cc/sb375/sb375.htm

[25] U.S. Environmental Protection Agency. *Smart Growth in Small Towns and Rural Communities.* 2017. Retrieved from: https://www.epa.gov/smartgrowth/smart-growth-small-towns-and-rural-communities

[26] Each toolkit may be accessed respectively at:
https://smartgrowthamerica.org/resources/community-facility-location-policy-toolkit/
https://smartgrowthamerica.org/resources/providing-well-placed-affordable-housing-rural-communities-toolkit/
https://smartgrowthamerica.org/resources/fiscal-impact-analysis-policies-rural-communities-toolkit/

utilizing existing resources. The Fiscal Impact Analysis Toolkit looks at how local government can better understand the long-term financial implications of decisions regarding new development.

Lancaster effectively supports infill development, and consequently increases density, by offering expedited plan review and same-day inspections, while Woodland has comprehensive policies on mixed use development and density. Policies, such as Woodland's "10-Minute Neighborhood" standard and Oroville's plan to support a fair jobs-housing balance, can help cities attract businesses and halt retail leakage, all while reducing GHG emissions. Oroville also provides in-depth guidance on design standards to support complete streets and other smart growth principles.

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Increase density	■		■	■		■
Support mixed-use development			■	■	■	■
Employ smart roadway design and complete streets	■		■			■
Promote transit-oriented development	■		■	■		
Manage parking demand		■	■		■	
Plan vibrant communities			■	■	■	■

Innovative Policy: Woodland Urban Limit Line (UF-5 + T/LU-2)

An urban limit line (ULL), also known as an urban growth boundary, is a designated boundary or line typically enforced through zoning requirements to prevent development outside of it.[27] The City of Woodland established an ULL by voter approval in 2006.[28] The ULL encompasses all land that would be considered for urban development, also known as the Planning Area.[29] The reason for adoption was

[27] Pendall, Rolf, & Martin, Jonathan. The Brooking Institution Center on Urban and Metropolitan Policy. *Holding the Line: Urban Containment in the United States.* 2002. Retrieved from: https://www.brookings.edu/wp-content/uploads/2016/06/pendallfultoncontainment.pdf

[28] City of Woodland, Community Development Department. *Notice of Availability of the Final Environmental Impact Report for the Draft 2035 General Plan and Draft 2035 Climate Action Plan for the City of Woodland*. 2017. Retrieved from http://www.cityofwoodland.org/civicax/filebank/blobdload.aspx?blobid=17606

[29] Carvahlo, Elisa. *Draft City of Woodland Municipal Service Review and Sphere of Influence Study.* 2010. Retrieved from: http://www.yolocounty.org/home/showdocument?id=14684

twofold: to protect rural agricultural land and prevent sprawl. Currently, the ULL used in the general plan through 2035 is identical to the ULL boundaries established in 2006.[30]

Complementary to the ULL are policies that increase residential development densities. Increasing density can reduce VMT, promote active transportation and thereby improve public health, reduce commute times, and potentially provide better access to jobs.[31] Protecting rural agricultural land can help support carbon sequestration and reduce GHG emissions while also providing climate adaptation benefits such as flood protection and food security.

Green Space

Urban forests greatly enhance not only aesthetic value but also economic value in neighborhoods. In recent years, ecosystem services accounting has been increasingly used to quantify the economic value that natural spaces provide. The City of Corvallis, Oregon, for example, found their 440,000 publicly maintained trees saved 1,083 MWh per year by reducing building demand for cooling. The trees also reduced stormwater treatment and processing by 410,000 cubic meters per year and reduced harmful air pollutants such as nitrogen dioxide.[32]

All cities analyzed, with the exception of Lancaster, strive to increase and maintain the urban forest canopy. Some locations, such as Lodi and Oroville, will adopt require tree planting for new development through ordinances or code. Woodland names many educational outreach tactics, such as creating a Woodland Tree Guide, to improve the quantity and quality of its green space.

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Conserve open space	■		■		■	
Support community gardens	■		■			■
Plant urban trees		■	■	■	■	■
Provide tree education		■	■			
Require or encourage trees in development		■	■			■

[30] City of Woodland. *Woodland Area General Plan Urban Development Policy*. 2002. Retrieved from: http://www.cityofwoodland.org/civicax/filebank/blobdload.aspx?blobid=5638

[31] Miller, Ganson. *Mitigation Vehicle-Miles Traveled (VMT) In Rural Development.* 2015. Retrieved from: https://www.opr.ca.gov/docs/Mitigating_Vehicle-Miles_Traveled_(VMT)_in_Rural_Development.pdf

[32] Phillips, Don. *Assessment of Ecosystem Services Provided by Urban Trees: Public Lands Within the Urban Growth Boundary of Corvallis, Oregon.* ND. Retrieved from: https://www.itreetools.org/resources/reports/Corvallis_Urban_Tree_Assessment_Tech_Report.pdf

Innovative Policies: Urban Forests in Oroville (TR-2.1) & Woodland (UF-3)

Oroville passed the Oak Tree Loss Mitigation Ordinance in April 2017 to protect native oak trees during construction and grading, minimize their removal, require a replacement if removal is required, and monitor the maintenance of replacements. The measure sets criteria for obtaining a tree removal permit, such as conducting a tree survey and preparing an oak tree preservation plan. If a tree removal permit is granted, the applicant must mitigate its loss through one or a combination of measures, such as on-site replacement, in-lieu fees, and off-site replacement, with replacements taking place within 90 days. Monitoring must be conducted on replacement-site trees. Furthermore, the City will place all in-lieu fees in an Oak Tree Maintenance Fund for the planting of new trees and maintenance of existing trees. The City is also able to fine persons who destroy an oak tree in violation of this ordinance, for an amount equal to the value of up to three times the number trees destroyed. These fines will also be placed in the Oak Tree Maintenance Fund.[33]

Woodland is taking steps to protect and enhance its urban forest. A 2010 study estimated that for every dollar spent on Woodland's public trees, the community would receive $1.50 in benefits through energy savings, air quality improvements, and aesthetics, among other benefits. At the time of study in 2010, the City maintained 13,140 trees, a large percentage of which were newly planted. These trees accounted for Woodland's overall tree canopy cover, some 8.4% of the total incorporated land area. The City's CAP notes that this is far short of the optimal urban tree canopy cover of 25%. Woodland will adopt a policy of no net loss for City-maintained trees. Every tree removed will be required to be replaced within a year. Furthermore, these new trees must be equal to or greater than the trunk diameter of the previous tree, or offset the canopy area of any tree removed with the aggregate canopy area of the replacement tree(s) at two years from planting. Like Oroville, the City requires a permit to remove a city tree.[34]

Water

California uses more water than any other state with 38 billion gallons per day withdrawn from surface and groundwater reserves.[35] If water is pumped out at a faster rate than an aquifer is recharged, water levels can drop, resulting in decreased availability and quality.[36] With California's recent droughts, cities and communities have experienced a range of impacts including reduced hydroelectric power generation, widespread tree mortality, reduced wildlife habitat, agricultural losses, and less available water for agricultural and human use. Over time, sinking groundwater levels can lead to land subsidence, impacting a variety of structural and operational networks. As climate change may increase the incidence of droughts in the future, water conservation and recycling is a key issue for the state.

With conservation in mind, many of the jurisdictions in this compilation have adopted efficiency programs to combat drought and overconsumption of water. Cities will carry out this strategy in several ways; Woodland will promote targeted leak-detection assistance, while Lodi will continue to implement its water

[33] City of Oroville. *Ordinance No. 1819: Findings of Fact and Statement of Overriding Considerations for the Oroville Sustainability Updates*. 2016. Retrieved from: http://qcode.us/codes/oroville/revisions/1819.pdf

[34] City of Woodland, Public Works Department. *Final 2035 Climate Action Plan*. 2017. Retrieved from: http://web.cityofwoodland.org/civicax/filebank/blobdload.aspx?BlobID=18154

[35] U.S. Geological Survey. *California Water Use.* California Water Science Center. 2017. Retrieved from: https://ca.water.usgs.gov/water_use/

[36] U.S. Geological Survey. *Drought Impacts*. California Water Science Center. 2016. Retrieved from: https://ca.water.usgs.gov/data/drought/drought-impact.html

metering program. Oroville will work with its two local wastewater collection agencies to consider recycled water programs within the city.

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Promote the use of reclaimed water	■				■	■
Upgrade water system technology	■			■	■	
Implement water conservation programs		■	■	■	■	■
Use water-efficient landscaping practices	■		■	■		■

Innovative Policies: Expanded Recycled Water Use in Atascadero (W-1.3) and Educating Residents on Water Consumption in Woodland (W/W-1)

To exceed SB X7-7 (California Water Conservation Act of 2009), Atascadero identifies strategies to expand the use of reclaimed water. To do this, the city will work with water purveyors and educate the community on dual plumbing, greywater systems, and rainwater catchment.

Reclaimed water can be used for non-potable applications such as for irrigation or plumbing. Dual plumbing systems consist of two sets of pipes that deliver potable and non-potable water. Recycled water may be used in floor drains with trap priming fixtures, cooling towers, irrigation, air-conditioning devices, and for flushing toilets.[37] Dual water systems not only improve water safety and reduce the costs of drinking water distribution infrastructure, they give water management agencies diverse sources of water and different options for wastewater treatment.[38] Greywater systems can also help reduce water usage and can easily be scaled. Additionally, rainwater catchment systems can store water during heavy precipitation events, reduce flood risks, and recharge the water table during dry months, as well as be utilized for irrigation. Using recycled water through these mechanisms can reduce reliance on surface and groundwater and build resilience to future droughts.

The Atascadero Mutual Water District has estimated that dual plumbing, greywater, and rain catchment systems, combined with other water conservation and efficiency programs designated in the city's CAP, will result in 110,100,000 gallons of water saved by 2020.[39] Additionally, these strategies help conserve water, lower utility bills, and reduce energy demand for water delivery.

[37] California Department of Water Resources. *Dual Plumbing Code.* 2017. Retrieved from: http://www.water.ca.gov/recycling/DualPlumbingCode/

[38] Water Research Foundation. *Dual Water Systems: Characterization and Performance for Distribution of Reclaimed Water.* 2013. Retrieved from: http://www.waterrf.org/PublicReportLibrary/4333.pdf

[39] City of Atascadero. *Final Climate Action Plan, Appendix B.* 2014. Retrieved from: http://www.atascadero.org/files/CD/Climate%20Action%20Plan/1.%20Final%20Atascadero%20CAP%201.28.14.pdf

Woodland, while also deploying water conservation programs, uses an innovative approach to engage the community and promote conservation behaviors. Woodland has implemented an online Water Use Portal allowing customers to view water use, detect leaks, and manage their water bill.[40] They use a system called AquaHawk that retrieves data from Automatic Meter Infrastructure or Automatic Meter Reading systems, which every account in Woodland is connected to. Data is updated every four hours. Customers can view and compare consumption patterns by hour, day, month, and other time periods and adjust their usage as necessary. Users can set thresholds for amount of water consumed or an estimated bill amount, and receive alerts if they exceed these thresholds. AquaHawk also analyzes consumption data to identify and notify customers of abnormal use and potential leak patterns. Most leaks go undetected, resulting in large amounts of water wasted and costly utility bills. AquaHawk allows customers to pinpoint when leaks are occurring and promptly fix them.

Waste

California disposes of approximately 30 million tons of waste in landfills each year, of which more than 30 percent is organic material.[41] When added to landfills, this material generates methane, a potent greenhouse gas. Methane is 20 times more potent than carbon dioxide and contributes to climate change and poor air quality. California passed legislation (AB 1826) in 2014 that requires commercial businesses generating organic waste to begin recycling this waste by 2016. Organic waste includes green waste or landscaping waste, food waste, and food-soiled paper.

Many municipalities in this analysis included provisions to support composting. Not only will this help keep organic materials out of landfills, cities may be able to utilize this resource to generate renewable natural gas for electricity generation or vehicle fueling, or compost. Additionally, some food can be recovered for donation to feed the hungry. All municipalities have strategies to increase waste diversion rates. Woodland targets multi-family housing for recycling education, while Atascadero will set policies for recycling infrastructure at city-owned properties.

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Support recycling	■		■	■	■	■
Support composting	■	■	■	■		■
Divert construction and demolition waste			■		■	■

[40] City of Woodland. Water Use Portal. ND. Retrieved from: http://www.cityofwoodland.org/gov/depts/pw/areas/enviro/water/mywateruse/default.asp

[41] CalRecycle. *Mandatory Commercial Organics Recycling*, 2017. Retrieved from: http://www.calrecycle.ca.gov/Recycle/Commercial/Organics/

Innovative Policy: Extend Producer Responsibility (EPR) – Woodland W/W-2

EPR seeks to reduce a government's liability and subsequent cost of disposal for certain, typically industrial, items by shifting the liability and cost onto the producer of the good. According to the thinking behind this shift, the producer is directly responsible for product design and manufacturing, and thereby has more authority and responsibility to use environmentally friendly designs and decrease toxic materials.[42]

In the US, states may adopt EPR laws. For instance, California currently has eight EPR laws covering carpet, electronic waste, and paint, among others.[43] A bottle bill, where consumers are paid to return used bottles, is another form of EPR. Local ordinances involving EPR may also be adopted. For example, in 2015, Los Angeles County adopted an ordinance to require pharmaceutical and sharps manufacturers to create programs to take back used sharps.[44]

There is no one universal approach to implementing EPR regulations. Some places require mandatory take-back programs, while others update procurement guidelines to require a certain level of environmental rigor. Building upon Yolo County's Producer Responsibility Resolution of 2008,[45] the City of Woodland will support the expansion of EPR programs by taking a first step of collecting data on comparable EPR programs, as per their 2035 Climate Action Plan.[46]

Adaptation

Communities are already experiencing the effects of climate change. Some of the Sacramento region's most severe climate impacts include increased average temperatures, increased nighttime temperatures, more frequent and more intense extreme heat days and heat waves, stronger and more frequent storms, and increased flood risk, among others. Climate change will impact critical infrastructure such as roads and bridges, power supply and communication lines, and stormwater systems. Investing in our infrastructure wisely will help build resilient and thriving communities.[47]

Most climate action plans focus on mitigating climate change. However, some cities are starting to incorporate climate adaptation into their climate action plans. Adaptation policies may span a range of behavioral, technological, or planning strategies to prevent, prepare for, and respond to the impacts of climate change. Adaptation strategies can help cities understand and reduce climate change risks and increase the resilience of local communities. The California Energy Commission, for example, has

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[42] CalRecycle. *Product Stewardship and Extended Producer Responsibility (EPR).* 2015. Retrieved from: http://www.calrecycle.ca.gov/epr/

[43] CalRecycle. *Product Stewardship and Extended Producer Responsibility (EPR) Resources*. 2016. Retrieved from: http://www.calrecycle.ca.gov/EPR/Resources/default.htm#ApproachesEPR

[44] Los Angeles County. *Los Angeles County EPR Pharmaceuticals and Sharps Ordinance Objective, Program Goals, and TAG Purpose*. 2015. Retrieved from: http://publichealth.lacounty.gov/docs/EPRSharpOrdinance.pdf

[45] Gabor, Beth. *Yolo Adopts Producer Responsibility Resolution to Reduce Waste*. 2008. Retrieved from: http://www.yolocounty.org/Home/ShowDocument?id=6372

[46] City of Woodland, Public Works Department. *Final 2035 Climate Action Plan,* 2017. Retrieved from: http://web.cityofwoodland.org/civicax/filebank/blobdload.aspx?BlobID=18154

[47] Capital Region Climate Readiness Collaborative. *Investing in our Future: Resilient Infrastructure for a Stronger Capital Region.* 2017. Retrieved from: http://climatereadiness.info/wp-content/uploads/2017/02/Resilient-Infrastructure-Fact-Sheet.pdf

developed a website, Cal-Adapt, which helps local governments prepare for climate change by providing downscaled projections of future changes in temperature, sea-level rise, wildfire risk, and more.

Adaptation strategies are most effective when integrated into local government frameworks across jurisdictional and sectorial boundaries. In this region, the Capital Region Climate Readiness Collaborative (CRCRC) is one example of a network of local government agencies, businesses, non-profits, and other organizations that works to build regional resilience to climate impacts. Members in the CRCRC collaborate on projects and share best practices, resources, and funding opportunities. Participating in such a network can help local governments leverage resources to develop climate action and adaptation strategies.

The cities of Oroville and Atascadero specifically highlight adaptation policies in a separate Adaptation chapter. Oroville in particular, has robust policies corresponding to specific threats to their region, such as extreme weather. Many policies included in other cities' CAPs have adaptation benefits, although they are not explicitly identified. For example, policies aimed at increasing the urban forest canopy may reduce the urban heat island effect.

Strategy	Lancaster	Lodi	Woodland	Goleta	Atascadero	Oroville
Assess broad climate change vulnerabilities and incorporate into planning documents						
Consider and incorporate flood risks in planning documents						
Prepare for and adapt to extreme heat events		*	*	*	*	
Conserve water	**	**	**	**	**	
Educate community about emerging public health threats						
Implement public notification systems for disasters						
Reduce wildfire risks						

*Policies are included in CAP scorecard Green Space sector, Urban Forestry strategy themes
**Policies are included in CAP scorecard Water sector, all strategy themes

Innovative Policy: Responding to Climate Change in Oroville (Adapt-9)

Local governments can act proactively on climate change by evaluating risks and incorporating adaptation policies across long-term planning documents.[48] The State has given direction to local governments under SB 379, which requires that the safety element of a city's general plan – or the county's local hazard mitigation plan – include applicable climate adaptation and resilience strategies.[49] To do this, a city must identify and understand its local climate risks, and typically does so through a vulnerability assessment.

To develop adaptation policies, Oroville first assessed regional climate change vulnerabilities and mapped exposures across community functions, structures, and people. Orville then crafted policies to address climate risks regarding water supply, public health, and infrastructure. The city further identified stakeholders, such as Butte County Office of Emergency Management and the California Department of Transportation, as important stakeholders in policy implementation. As identified in their CAP, Oroville plans to incorporate these climate change projections into regional plans, such as its General Plan and Fire Hazard Objectives and Implementing Policies documents, as well as Butte County's Local Hazard Mitigation Plan and Flood Mitigation Plan. Oroville understands the importance of regional planning and quantified the community benefit as "medium to high."

[48] Picketts et al. *Incorporating Climate Change Adaptation Into Local Plans.* 2013. Journal of Environmental Planning and Management, Volume 57. Retrieved from: http://www.tandfonline.com/doi/abs/10.1080/09640568.2013.776951

[49] California Legislative Information. *SB-379 Land Use: General Plan: Safety Element.* 2015. Retrieved from: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB379