Public Workshop on the Natural and Working Lands Sector to Inform Development of the 2030 Target Scoping Plan Update

March 23, 2016

Workshop Outline

- Introduction and Welcome
- 2030 Target Scoping Plan Overview
- Natural and Working Lands: Vision and Goal Setting
- Agricultural Food and Fiber Systems
- Development Patterns and Land Conservation
- Comments by Departments and Conservancies
- Guided Open Discussion Period

2030 Target Scoping Plan Overview

CALIFORNIA AIR RESOURCES BOARD

CALIFORNIA CLIMATE STRATEGY

An Integrated Plan for Addressing Climate Change

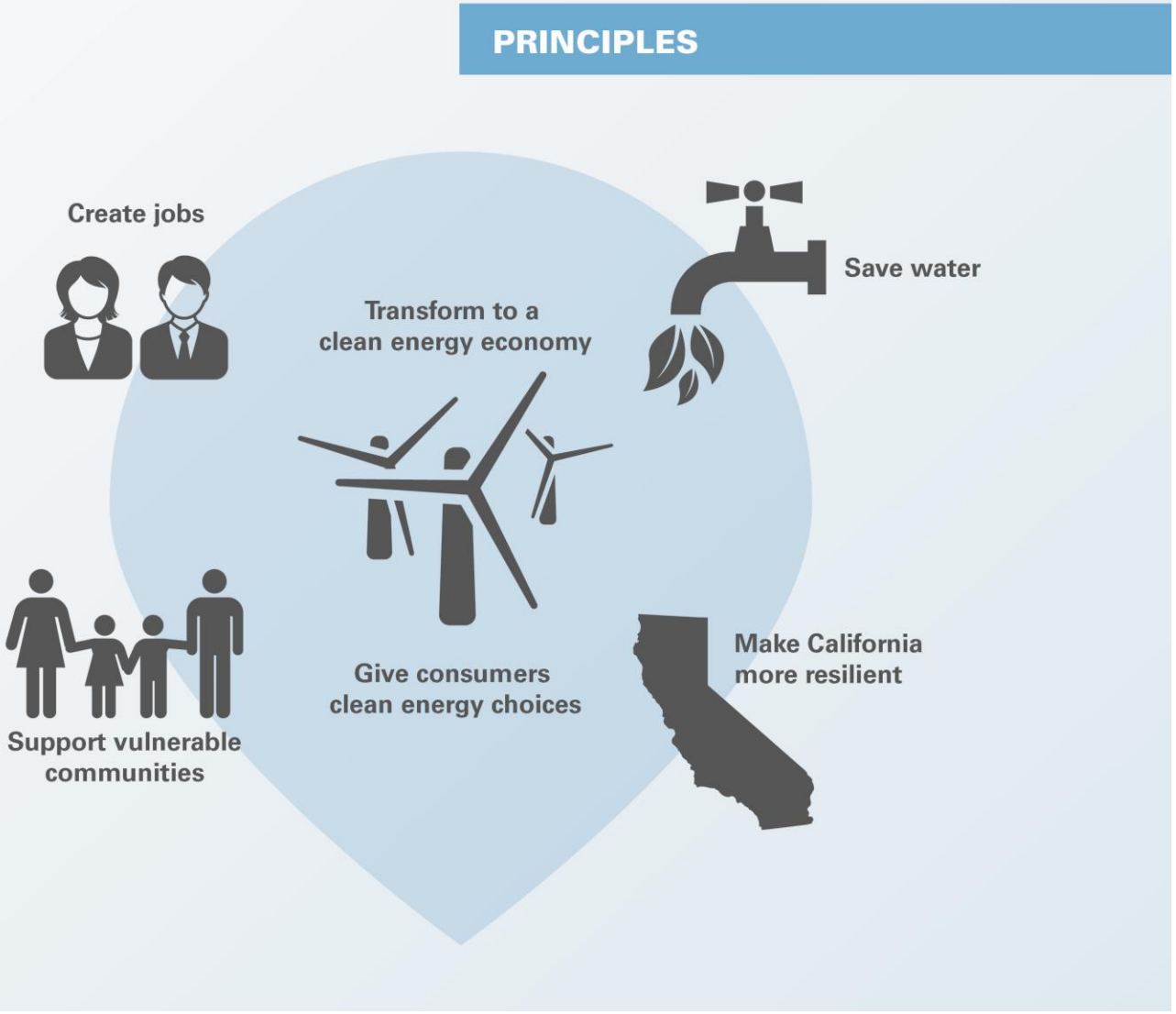
VISION

Reducing Greenhouse Gas Emissions to 40% Below 1990 Levels by 2030

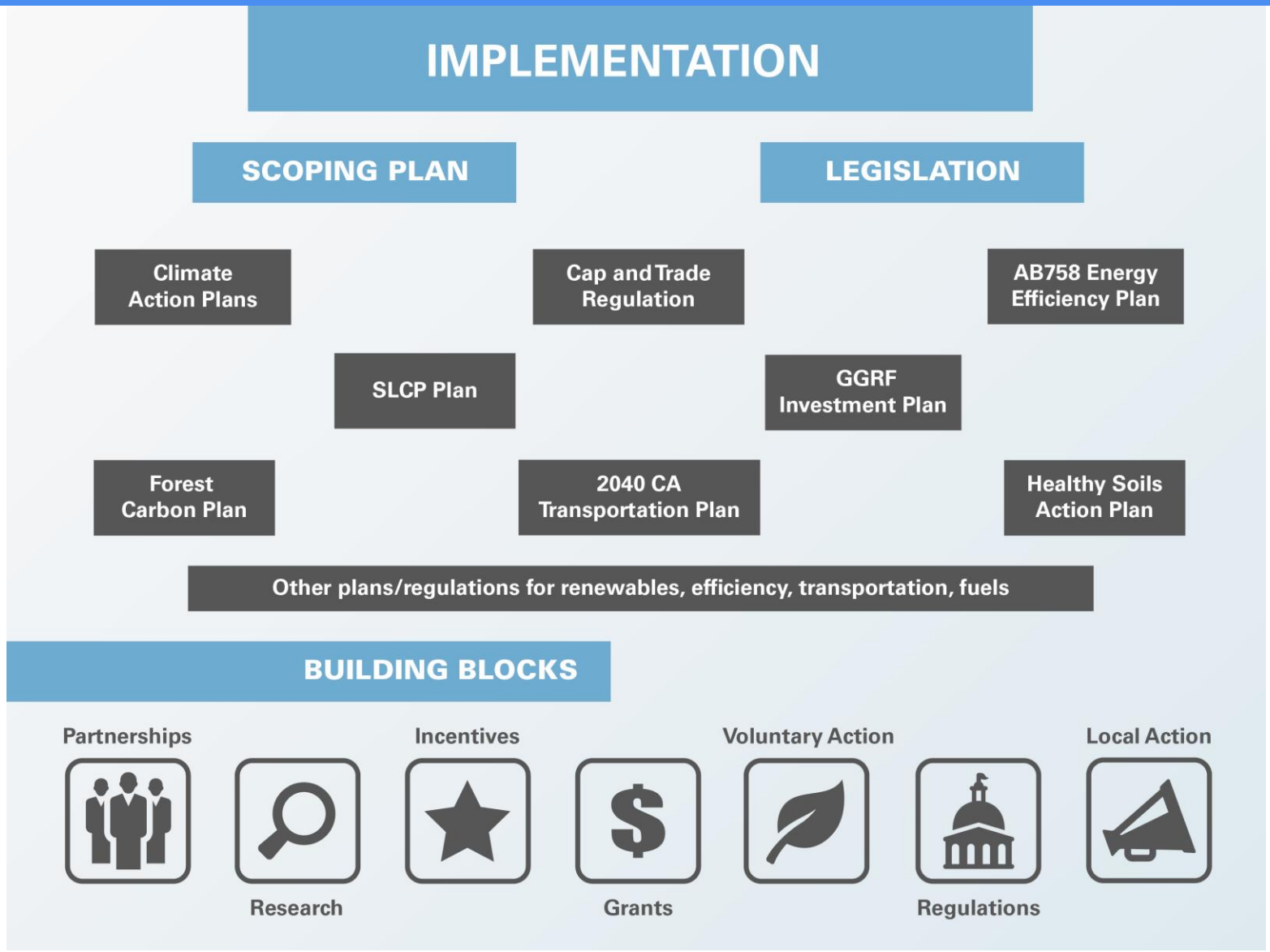
GOALS

- 50% renewable electricity
- 50% reduction in petroleum use in vehicles
- Double energy efficiency savings at existing buildings
- Carbon sequestration in the land base
- Reduce short-lived climate pollutants
- Safeguard California

CALIFORNIA CLIMATE STRATEGY



CALIFORNIA CLIMATE STRATEGY



Prior Scoping Plans

- First Scoping Plan required by AB32
- Established new paradigm for climate mitigation
- First economy-wide climate change plan
- Pioneered the concept of a market-based program supplemented with complementary measures
- Sector-by-sector approach
- Public outreach and education
- Must be updated at least every 5 years

Executive Order B-30-15

- Reduce greenhouse gas emissions to 40% below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80% below 1990 levels by 2050
- Update the AB 32 Scoping Plan to incorporate the 2030 greenhouse gas target
- Update the State's climate adaptation strategy and factor climate change into planning and investment decisions

2030 Target Scoping Plan Development

- Collaborate with State Agencies
- Engagement with Legislature
- Coordination with other plans (i.e. 111(d), Cap & Trade, SIP, Freight Strategy, etc.)
- Environmental Justice Advisory Committee Engagement
- Environmental Analysis (CEQA)
- Public Process: Workshops
- Economic Analysis with Peer Reviewers
- Draft Report / Final Report (targeted measures and estimated emission reductions)

Elements of 2030 Strategy

- Focus areas within the pillars framework
  - Energy
  - Green buildings
  - Transportation
  - Water
  - Natural and working lands/Agriculture
  - Waste management
  - Short-lived climate pollutants
  - Industry
- Maximize synergies among sectors

Goal Setting: Natural and Working Lands

- Long-term Goals and Vision
  - Set goals/vision at statewide or landscape level
  - May not currently have the tools to measure progress; part of a longer-timeframe effort to achieve success
  - Goals to continue to be implemented as part of future Scoping Plan efforts
- Short-term Targets to Inform 2030 Scoping Plan
  - Set targets to ensure sector is directionally on path to achieving long-term goals/vision, even in light of known data gaps
  - Must be able to measure progress towards meeting Scoping Plan targets

Environmental Analysis

- Environmental Analysis (EA) being prepared analyzing potentially significant adverse impacts caused by reasonably foreseeable actions.
- Meets requirements of ARB's certified program under the California Environmental Quality Act (CEQA).
- The CEQA Environmental Checklist (CEQA Guidelines Appendix G) is used to identify and evaluate potential indirect impacts.
- The EA will be an appendix to the proposed Draft 2030 Target Scoping Plan Update.

Environmental Analysis to be Prepared

- The EA will include:
  - Description of reasonably foreseeable actions taken in response to the plan.
  - Programmatic level analysis of potential adverse impacts caused by reasonably foreseeable actions
  - Beneficial impacts
  - Feasible mitigation measures to reduce/avoid significant impacts
  - Alternatives analysis
- Input invited at this early stage on appropriate scope and content of the EA.
- Draft EA will be released for 45 day public comment period.

Public Process to Date

- Governor's Climate Change Strategy Pillar Workshops
  - July/August 2015
- 2030 Target Scoping Plan Update Kickoff Workshop
  - October 1, 2015
- First EJAC Public Meeting
  - December 7, 2015
- Electricity/111(d) Public Workshop
  - December 14, 2015
- GHG Modelling/Economic Analysis Public Workshop
  - January 15, 2016
- Public Workshop on the Natural and Working Lands Sector
  - March 23, 2016

Next Steps: Tentative Schedule

- Technical and Economic Workshops – Early/Mid 2016
  - Economic/environmental analyses
- Sector-specific Public Workshops – Spring 2016
- Discussion Draft Scoping Plan – Spring 2016
- Draft 2030 Target Scoping Plan – Summer 2016
- Regional workshops - 2016
  - Bay Area, Los Angeles, Central Valley
- Final 2030 Target Scoping Plan presented to Board – Fall 2016

Public Comments

- Please provide comments on the Discussion Paper/Topics and Questions for Consideration by April 6, 2016 at 5:00 p.m.
- Links to submit both written comments and view all comments received can be found at: http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm
- Additional opportunities to comment will be available at subsequent workshops

Presentation 1

NATURAL AND WORKING LANDS:

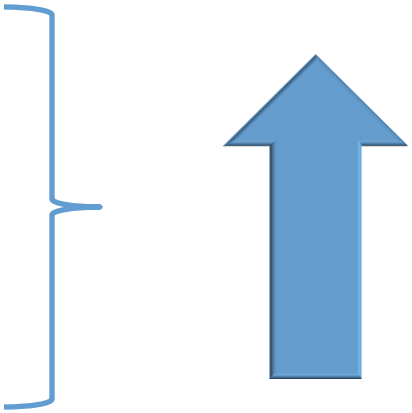
VISION AND GOAL-SETTING

Value of Natural & Working Lands

- California's land base stores carbon below ground, in soil and root systems, and above ground, in trees, shrubs, grasses and other plant biomass
- Healthy and resilient natural and working lands provide sustainable public benefits in addition to carbon sequestration, such as water filtration, improved air quality, wildlife habitat, temperature moderation through shading, and soil fertility
- Conservation supports sustainable communities
- Natural and working lands provide jobs, support regional economies and improve quality of life for all California residents.

These Values are Threatened

- Land Conversion
- Degradation
- Drought
- Sustained Heat
- Fire



Vision

- Promote robust, resilient carbon storage
- Co-manage for co-benefits
- Employ land and land management in reducing system-wide GHG emissions
- Build on existing resource conservation, management and restoration plans, programs and policies
- Assess and incorporate new science and data to inform goal-setting and decision-making

Vision – in Practice

- **Protect** the land base
- **Enhance** ecological function
- **Innovate** across sectors
- **Increase** green infrastructure

Guiding Principles

- Promote robust, resilient carbon storage
- Co-manage for co-benefits
- Balance land use demands
- Plan at scale, implement within it
- Utilize existing resource conservation and management plans
- Engage local communities and landowners
- Share and coordinate science

Protect

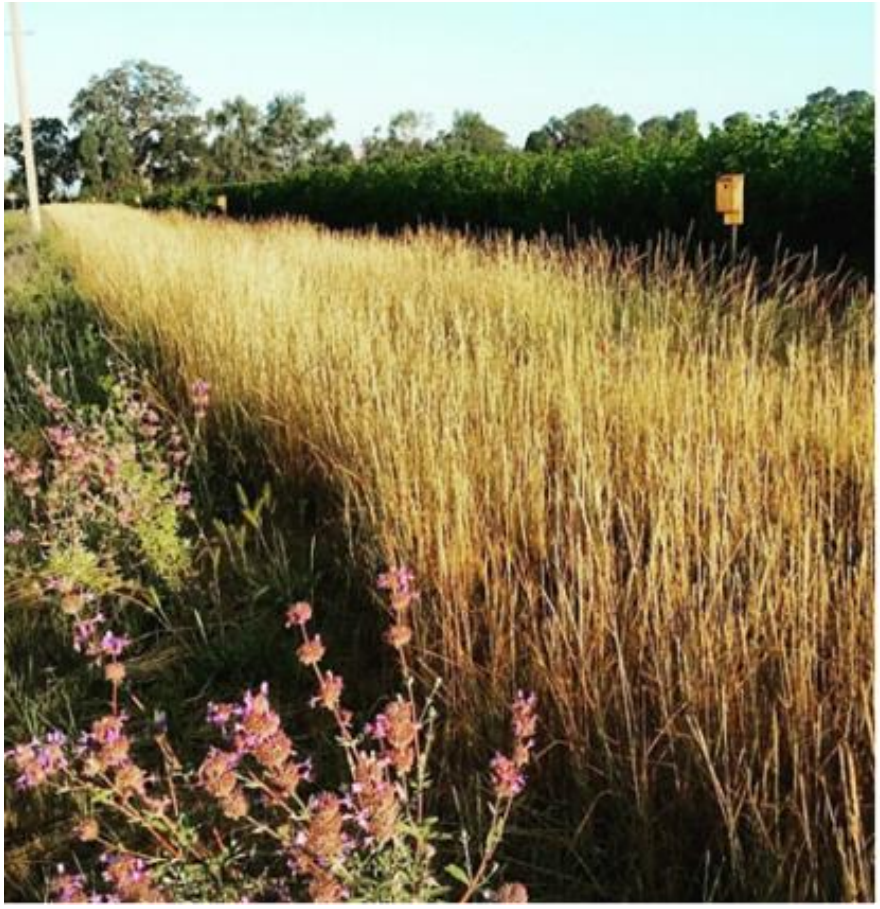
- **Increase protections on natural and working lands to reduce the rate of conversion to intensified uses, to preserve sequestration potential and promote infill and compact development.**
- Conservation easements and acquisition paired with stewardship
- Infill development and urban revitalization
- Promote and use plans for coordinated protection

Enhance

- **Manage and restore land to increase carbon storage and minimize GHG emissions in a sustainable manner.**
- Engage stakeholders to implement best practices
- Design strategies and implement to be effective at appropriate scales, including watershed or regionally relevant large landscape scale
- Build consensus around sequestration and emission quantification methods for management and restoration, and establish a statewide inventory and accounting framework that is compatible with project- or program-scale accounting.

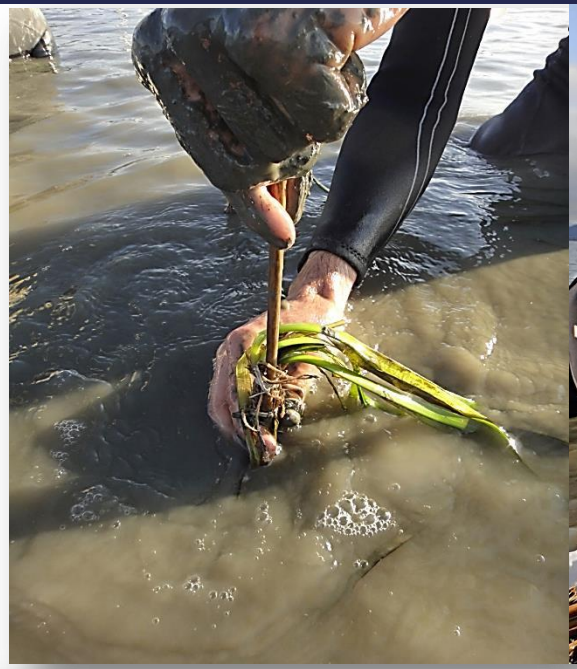
Enhance: Wetlands & Riparian Areas

Enhance: Carbon Farming



Enhance: Forest Health

Enhance: Blue Carbon



Innovate

- **Seek synergies that optimize contributions from natural and working lands while sustaining lands and local economies.**
- Support R&D and pathways to market for technologies that support resource management and other climate objectives, e.g., bioenergy, food crop, water and waste management, and product manufacturing and use.
- Build out the 50MW of wood-fired bioenergy mandated by SB1122 by 2020

Increase Green Infrastructure

- **Harness nature's benefits through urban greening to reduce GHG emissions and increase carbon storage in urban landscapes and improve human health and community resiliency.**
- Reduce the Urban Heat Island differential by 3°F between urban core and surrounding areas
- Increase urban tree canopy by 5% statewide
- Promote improved stormwater management and capture for groundwater infiltration
- Increase the percentage of people that live within ½ mile of open space, parks, green alleyways, and other green infrastructure

Increase Green Infrastructure

Increase Green Infrastructure

Make Science Actionable

- Extend California's science-driven policy leadership to land use and natural and working lands
- Review and assess existing and new science to inform policymaking

Discussion Questions

- What quantitative metrics should be used?
- What is the appropriate timescale for goal-setting, and what principles should be applied in choosing timeframes over which outcomes are assessed?
- What is the appropriate spatial scale for goals?
- How can we grow cross-sector synergies that promote land stewardship and system-wide GHG reductions?

Presentation 2

AGRICULTURAL FOOD AND FIBER SYSTEMS

Agricultural Food & Fiber Systems

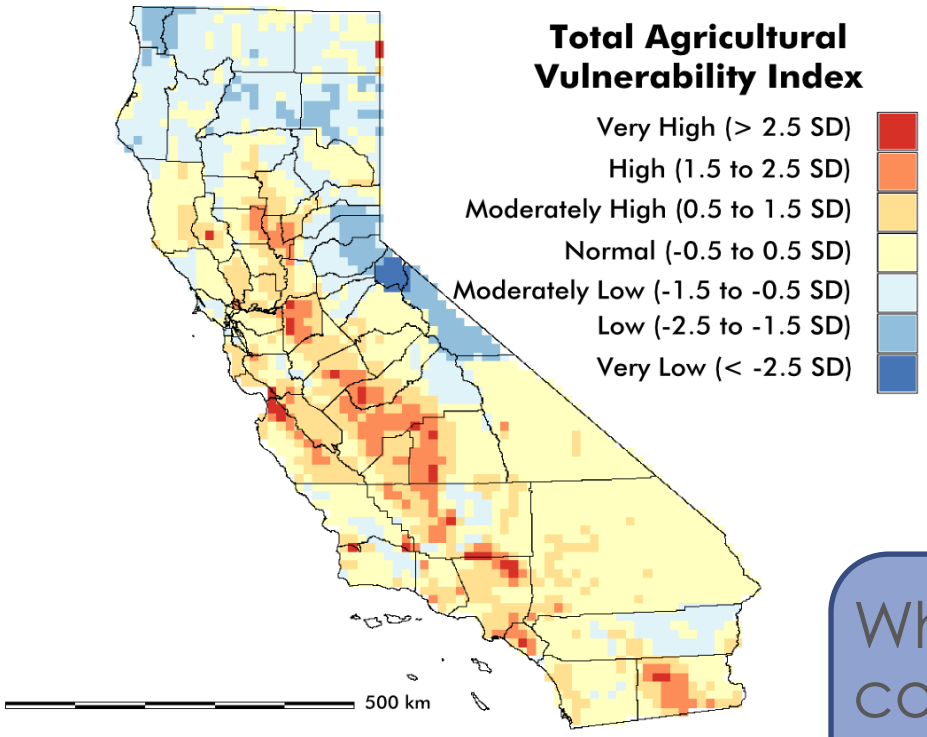
- Food Production
  - In 2014, California's farm production topped $54 billion
  - California has the most diverse food production in the country
- Vibrant Rural Communities
  - California's 77,500 farms and ranches cover 25.5 million acres

Rangeland

Farmland

Photo Credit: USDA NRCS

Climate Change Vulnerability



Vulnerability Index uses 4 sub indices:

1. Climate
2. Crop
3. Land use
4. Socioeconomic

When indices are combined, total agricultural vulnerability in some areas of the state is very high

Study by Jackson et al. UC Davis with funding from CEC

California's Climate Smart Ag Practices

Voluntary On-farm Practices Include:

- Soil Carbon Sequestration
- Manure Management
- Water Management
- Nitrogen Management
- Integrated Farming Systems
- On-farm Renewable Energy & Energy Efficiency
- Agricultural Land Conservation

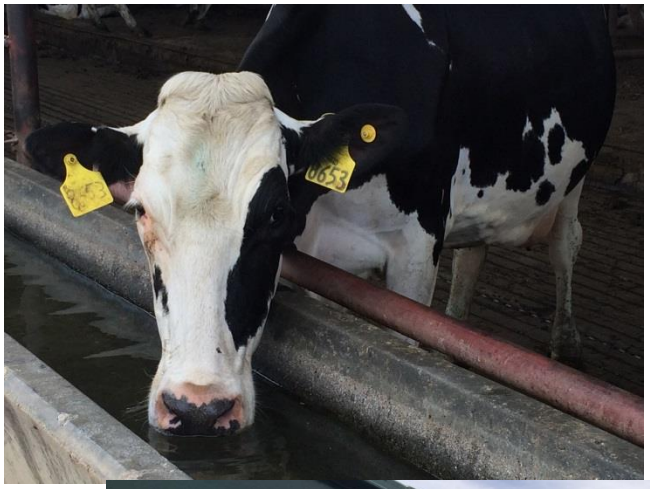
Soil Carbon Sequestration

Healthy Soils Initiative
An interagency plan to reduce greenhouse gases and improve drought resiliency through innovative farm and ranchland practices.

- **Climate Benefit**: Sequester and Reduce Greenhouse Gases
- Co-benefits
  - Increase water retention
  - Improve plant health and yields
  - Reduce sediment erosion and dust
  - Improve water and air quality
  - Improve biological diversity and wildlife habitat

Manure Management

- Methane is a powerful Short Lived Climate Pollutant that the state is committed to reduce by 40 percent below 1990 levels by 2030
- Practices to reduce methane emissions include digesters, dry scrape, solids separation, and other technologies
- Additional benefits include renewable energy production and soil amendments



Water Management

- **Increasing water and energy use efficiency**.
  - Techniques to increase water use efficiency – such as soil moisture sensors for irrigation scheduling and water conserving irrigation systems – can simultaneously reduce greenhouse gas emissions because less energy is required for water pumping
  - Energy use efficiency can be achieved though practices such as conversion to variable frequency drive pumps and incorporating renewable energy, such as solar power

Photo Credit: USDA NRCS

Nitrogen Management

- Optimizing the rate, timing, placement and type of nitrogen fertilizers has significant potential the reduce N_2O emissions

Integrated Farming Systems

- Planting perennial grasses, shrubs, and trees on croplands and rangelands can sequester substantial carbon while providing a range of other important services, such as:
  - Pollinators
  - Insect Pest Predators
  - Habitat for Wildlife
  - Reduce Soil Erosion
  - Water Quality

Photo Credit: USDA NRCS

On-Farm Renewable Energy & Energy Efficiency

- Biomass Waste Diversion
  - Bioenergy
  - Biofuels
  - Compost
- Solar
- Wind
- Energy Efficiency

Photo : Lange Twins Winery

Agricultural Land Conservation

- Agricultural and Rangeland Conservation
- Land Use Planning

UC Davis Research Forum

February 11, 2016

- Key Findings:
  1. Farmland conservation is one of the largest opportunities for reducing emissions; land use strategies at the urban edge benefit rural & urban communities
  2. Conversion to micro-irrigation, surface, and subsurface drip significantly reduces on-farm emissions and has co-benefits for sustainable water resource management
  3. Soil carbon is sequestered with addition of organic matter (e.g. cover crops, compost, crop rotation), even with periodic tillage, & offers co-benefits for soil moisture retention
  4. New studies show potential for on-farm renewable energy production, which more than doubled in CA from 2009-2012
  5. Integrated/diversified farming systems that build healthy soils & utilize biodiversity contribute to both mitigation and adaptation

NWL Discussion Paper: Draft Goals

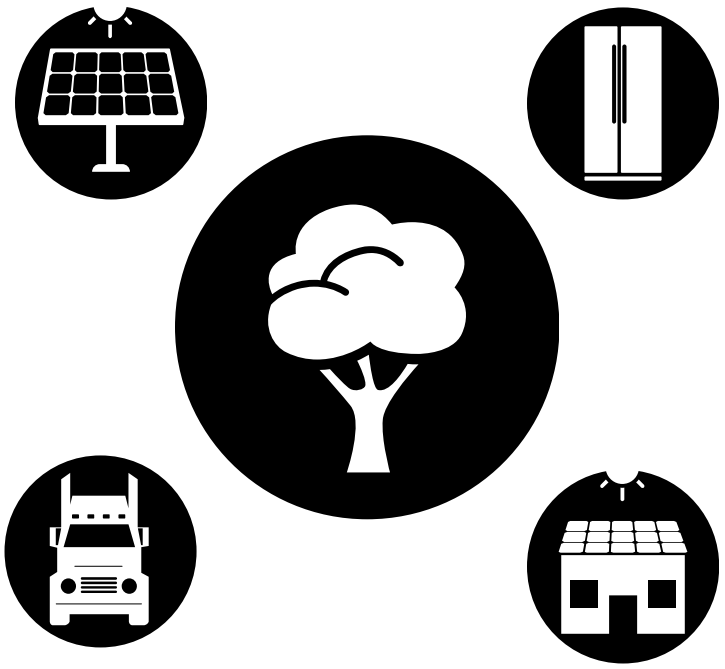
- Fulfill the Healthy Soils Initiative, an interagency plan announced by Governor Brown in 2015, to reduce GHG emissions and improve drought resiliency by updating farm and ranchland practices to build soil organic matter.
- Promote on-farm and ranch management practices that sequester carbon or reduce GHGs.
- Employ a suite of ready-to-implement practices, such as managing manure in dairies, and increasing the efficiency of on-farm water and energy use to increase net carbon sequestration and reduce GHG emissions across diverse agricultural systems.

Source: ARB Scoping Plan Website, posted March 17, 2016

Healthy Soils

Rangeland Enhancement

On-farm Renewable Energy



Integrated Farming Systems

Manure Management

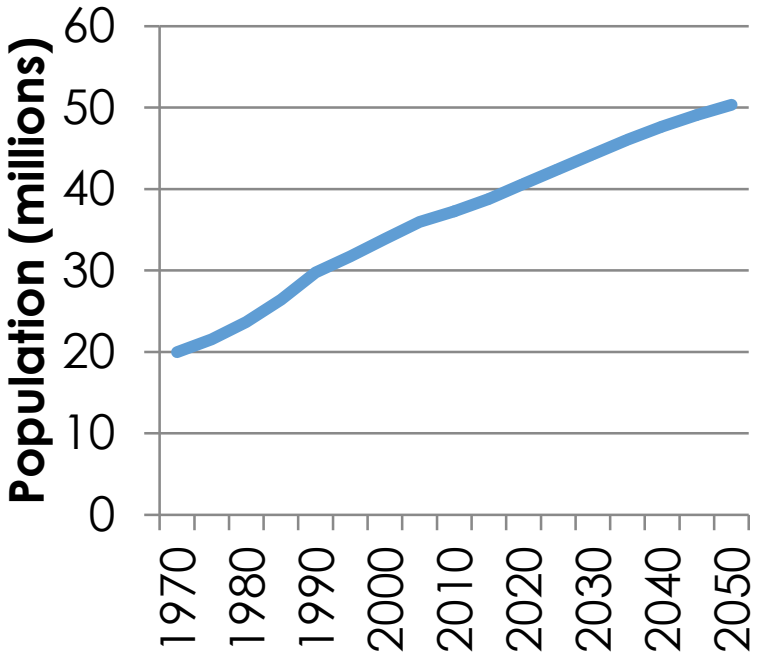
Land Conservation

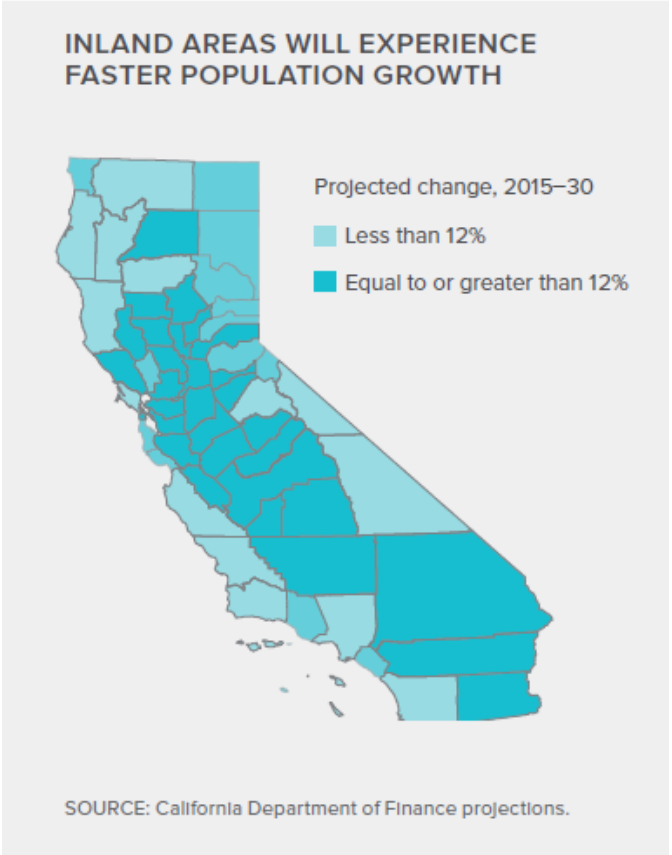
Fertilizer Management

Presentation 3

DEVELOPMENT PATTERNS AND LAND CONSERVATION

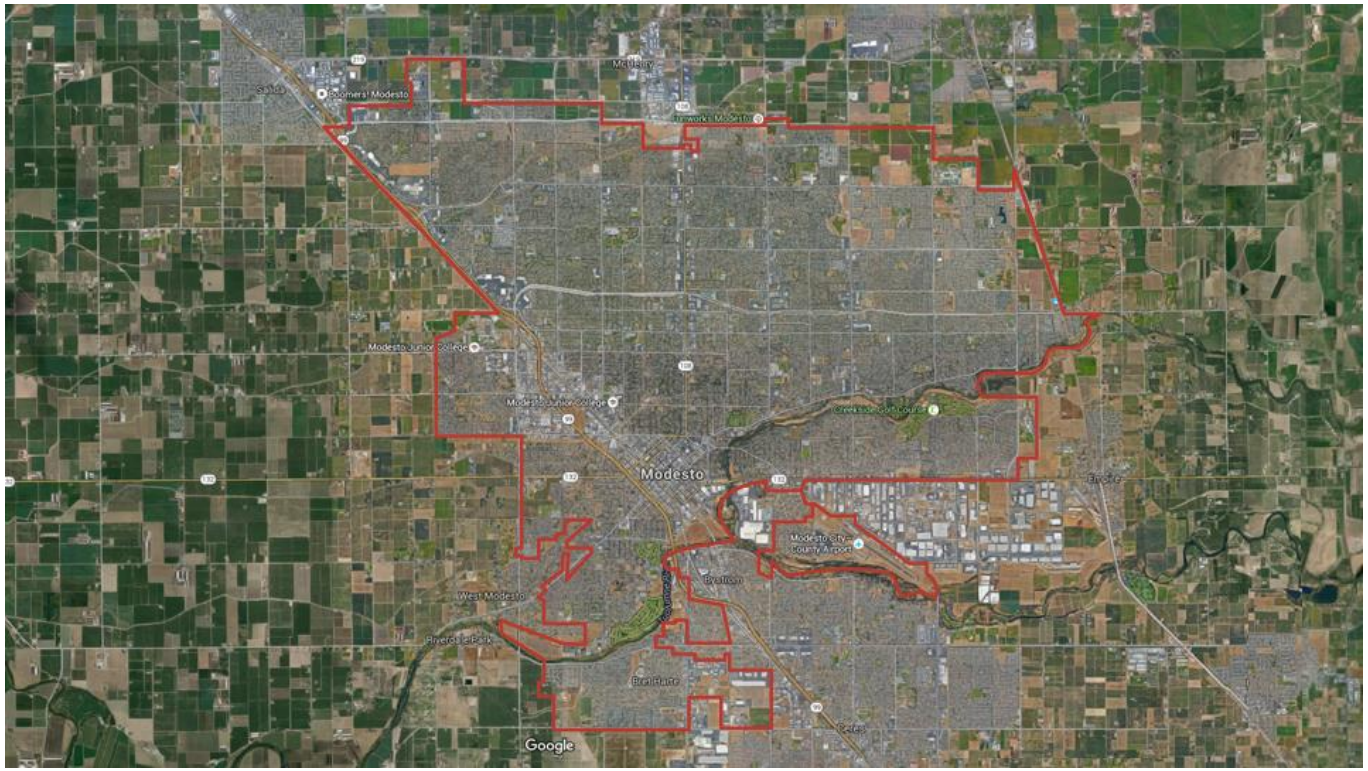
California is projected to grow to 50 million residents by 2050



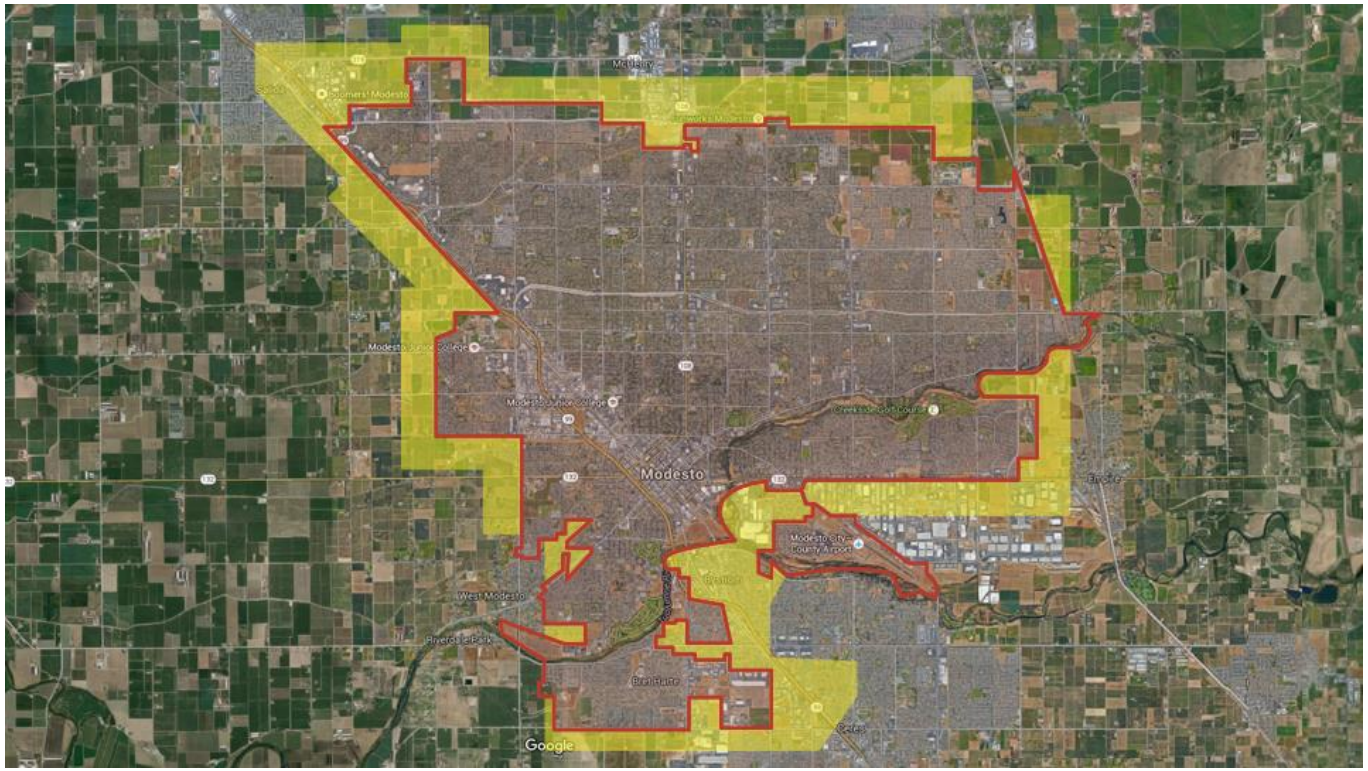


Map from PPIC, 2016

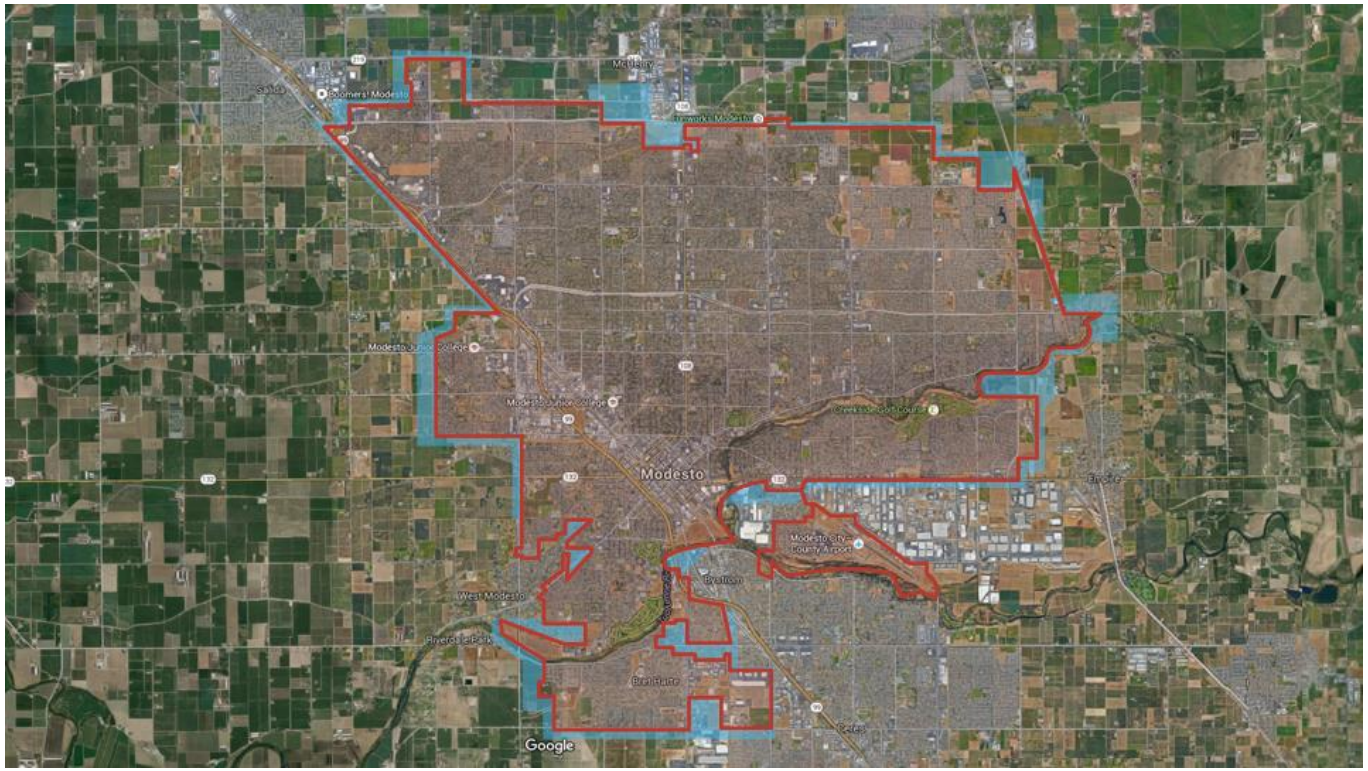
Modesto – Current Borders



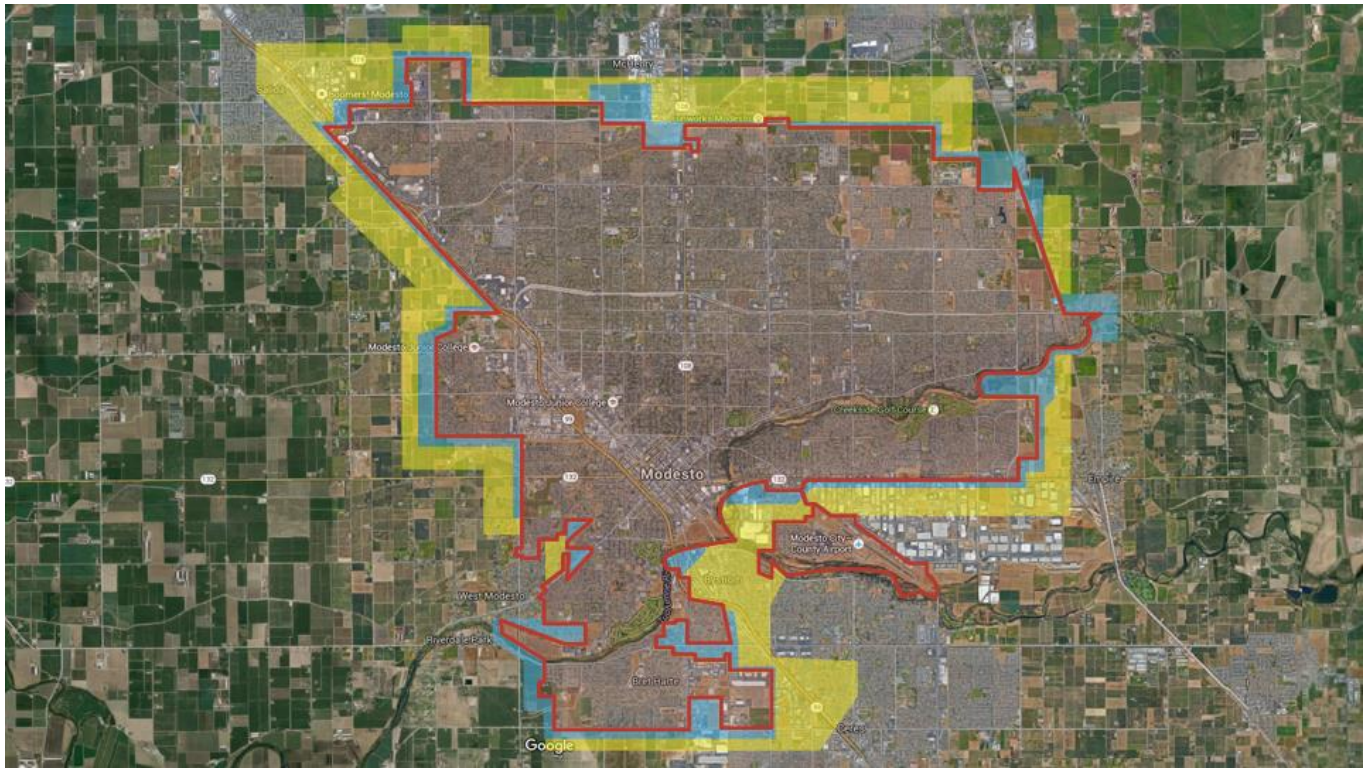
Modesto, 2030 – Continuation of Past Development Patterns



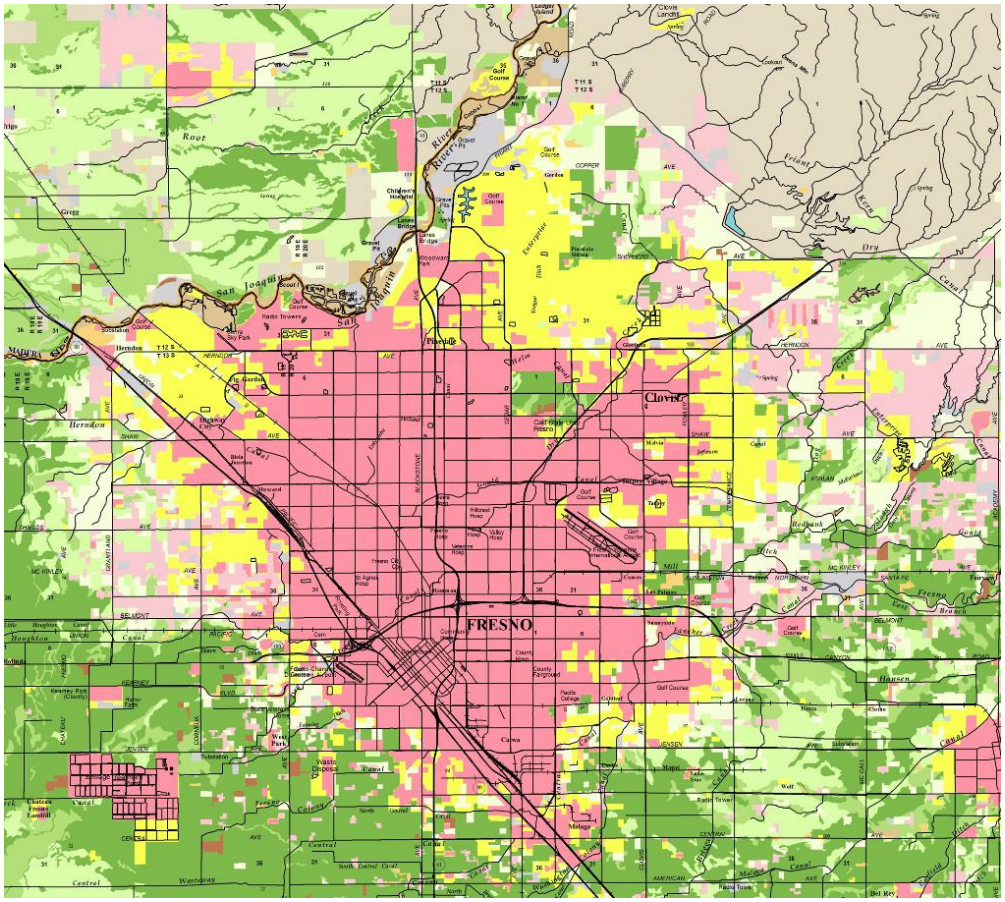
Modesto, 2030 – With Infill Focused Development



Modesto, 2030 – Land Conserved



Land Consumption in Fresno-Clovis Area, 1984 – 2012

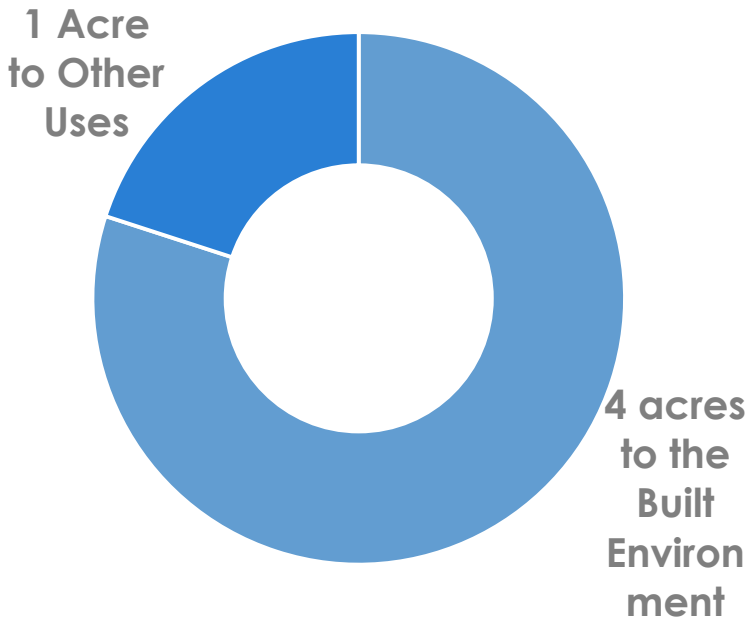


Source: Dept. of Conservation, 2015 FMMP Report

From 2010 to 2012, agricultural land was converted for multiple uses

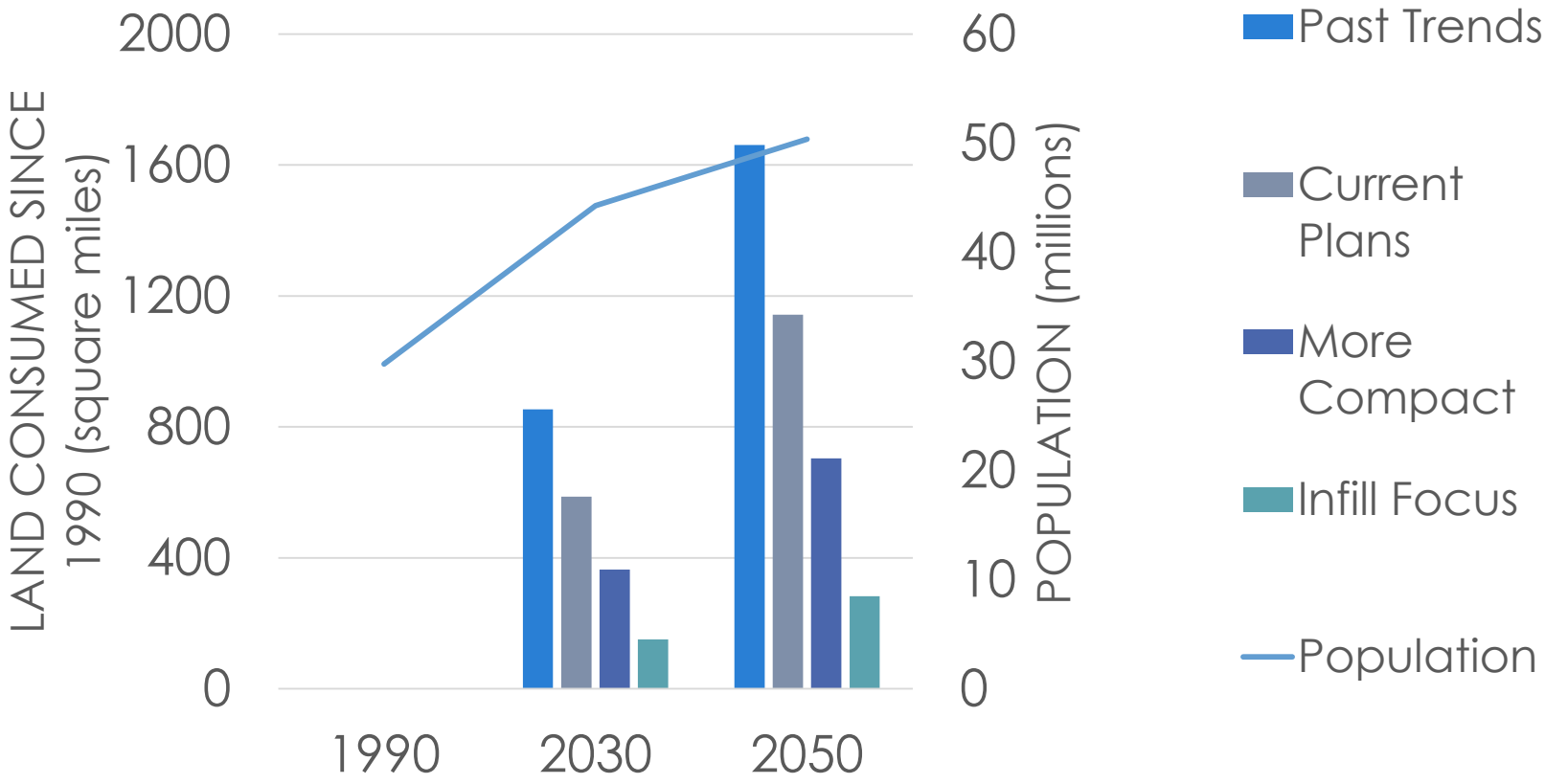
- Irrigated farm land declined by almost 60,000 acres between 2010 and 2012
- Over half was converted to the built environment, including:
  - Greenfield residential development
  - Renewable energy development
  - Water infrastructure
- Conversion is also driven by economic factors and resource availability

From 1984 to 2012, For Every 5 Acres of Ag Land Converted…



Source: CA Department of Cons, 2015 FMMP Report

Land consumed depends on development patterns



"Where and How We Grow"

Hollister - 0.3 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

Delano - 2 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

Fresno - 8.1 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

Hermosa Beach - 10 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

Pasadena - 35 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

Emeryville - 55 du/acre

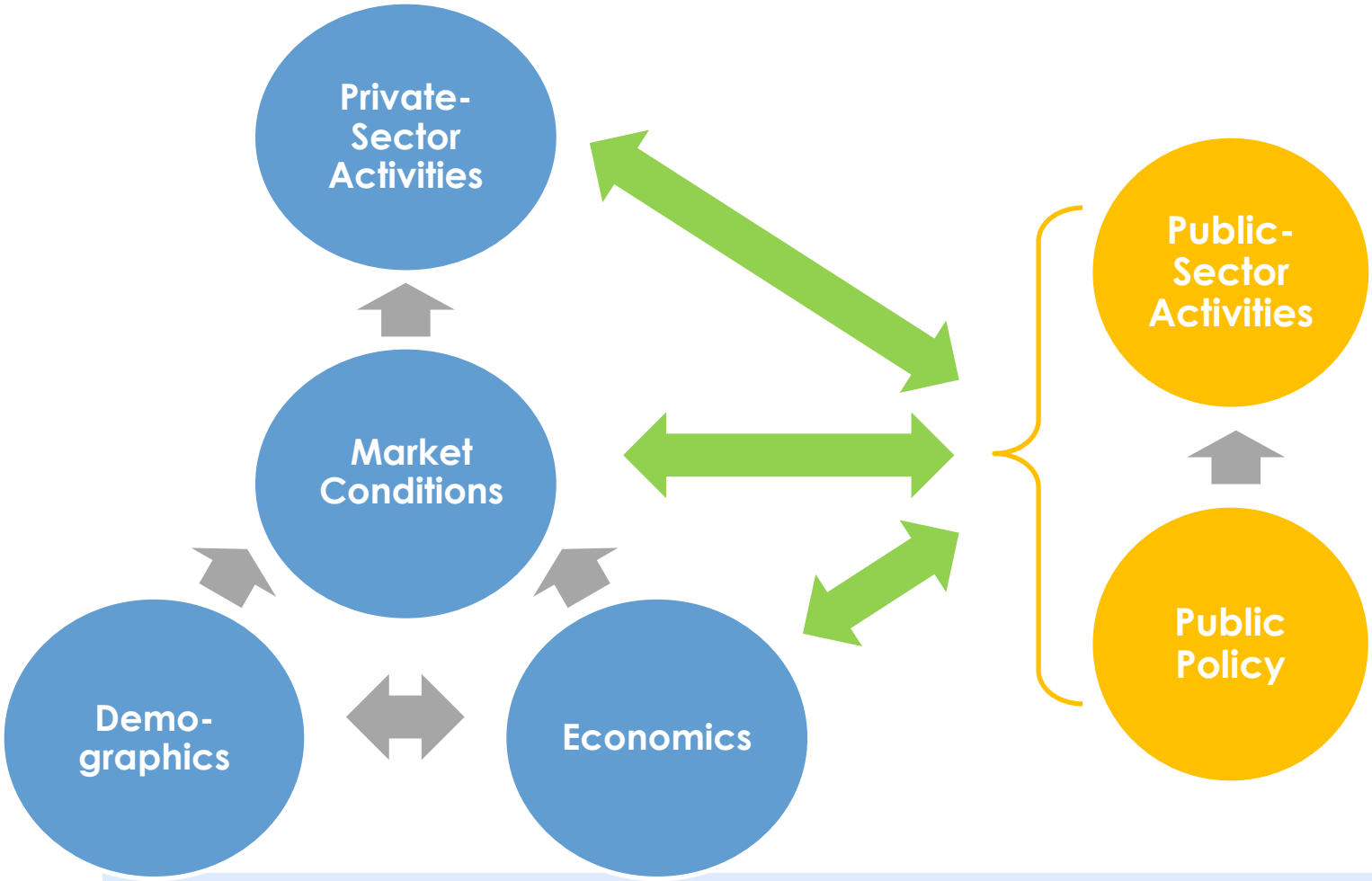
Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

"Where and How We Grow"

San Francisco - 222 du/acre

Images: "Visualizing Density" – Lincoln Institute of Land Policy:
http://www.lincolninst.edu/subcenters/visualizing-density/

Where & how we grow depends on…



Tools to Support Sustainable Growth

Public-Sector Activities

- Infrastructure and services
- Capacity-building and technical assistance

Public Policy

- Incentives
- Financing tools
- Pricing policies

Questions and Comments