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CalEnviroScreen

cal-adapt



HPI®



THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE

THE PROPOSED STRATEGY FOR ACHIEVING
CALIFORNIA'S 2030 GREENHOUSE GAS TARGET

JANUARY 20, 2017

California Air Resources Board

Executive Summary

This Scoping Plan Update establishes a proposed framework of action for California to meet the most aggressive climate target in North America: a 40 percent reduction in greenhouse gases by 2030 compared to 1990 levels. This goal builds on California's success in establishing effective policies that are reducing emissions of greenhouse gases while delivering substantial economic and environmental benefits. Further, the goal aligns California with the rest of the world in the global effort to fight climate change. The Proposed Plan is designed to continue to shift the California economy away from dependence on fossil fuels to a thriving sustainable future that delivers continued economic growth, job generation, and a wide range of environmental benefits to all California communities through the coming decade and beyond.

At the signing ceremony for SB 32 Governor Edmund G. Brown noted that the 2030 target will “keep California on the move to clean up the environment, to encourage vast innovation and to make sure we have the environmental resilience that ... Californians really want and expect.”

This document marks the second chapter to California's groundbreaking efforts to fight climate change. The first Scoping Plan was required by Assembly Bill 32 (AB 32), The Global Warming Solutions Act, and adopted in 2008. Under that plan, California set in place a range of effective programs to slash greenhouse gases from cars, trucks, fuels, industry and electrical generation, and the State is well on its way to achieving the goal of AB 32 – to reach 1990 levels of greenhouse gases by 2020.

The Proposed Plan builds on those programs, and takes aim at the 2030 target established by Senate Bill 32 (SB 32) (Pavley). That bill, and related laws, is designed specifically to continue California's leadership in the fight against climate change and guide the State toward an equitable clean energy economy and

prosperous future.

To reach that future, this Proposed Plan draws on the successes and the lessons learned from the first chapter of California's efforts to fight climate change under AB 32. It proposes continuing the major programs that have been a hallmark of our success, and the approach that has served as a model for other states and jurisdictions around the nation and world. The key programs that the Proposed Plan builds on include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and much cleaner cars, trucks and freight movement, powering our State off of cleaner renewable energy, and strategies to reduce methane emissions from agricultural and other wastes by using it to meet our energy needs. It also comprehensively addresses for the first time the greenhouse gas emissions from natural and working lands of California – including the agriculture and forestry sectors.

The Proposed Plan was developed by the California Air Resources Board (CARB or Board) staff working alongside multiple agencies and departments within the

Administration. This effort was guided by, and fully addresses, direction provided by the Legislature and includes public comment from 15 Scoping Plan workshops statewide, and the input of the Environmental Justice Advisory Committee (EJAC) and many stakeholders.

By combating climate change at the level outlined in this plan, California joins the global effort to address the one overarching issue of our time that ties together all the strands of our energy and environmental policies – the escalating crisis of global climate change. The evidence for climate change is irrefutable and the scientific record today is even more definitive than when AB 32 was passed. The buildup of greenhouse gases released over many decades by the combustion of fossil fuels in our power plants and factories, and to move our people and goods, combined with the loss of carbon that was once stored in forests and natural lands, is creating an irreversible change in the earth's atmosphere, leading to an all-too familiar array of problems including forest fires, coastal erosion, disruption of water supply, spread of insect-borne diseases and intractable urban air pollution.

And while climate change is without doubt a global phenomenon, its effects are felt close to home, and California is already experiencing its impact. A recent State report noted the following observed changes in California, harbingers of further shifts that, if left unchecked, will disrupt the economy and impact public health and air quality.

- Annual average temperatures in the State are on the rise, including increases in daily minimum and maximum temperatures.
- Extreme events, including wildfire and heat waves, are more frequent.
- Spring runoff volumes are declining as a result of a diminished snowpack.
- The number of “winter chill hours” – crucial for the production of high-value fruit and nut crops – are declining.
- Species are on the move, showing up at different times and locations than previously recorded, including both flora and fauna at higher elevations.

Those findings make an even more persuasive case for California's vulnerability to climate change and the need to us to take action – as well as partner with others at an even faster rate – to stave off the most severe impacts of climate change. This was the reason why SB 32, the new law extends the State's climate actions beyond 2020, was passed and signed.

SB 32 fully recognizes those impacts and drew on global scientific research and consensus among experts that a 40 percent reduction of greenhouse gases by 2030 is necessary to put California on the path to contain the rise in global temperatures to below 2 degrees Celsius, to prevent the worst-case scenarios of rising temperatures.

The approaches to reach the goal outlined in this document require choices that can forestall those impacts, while also making our communities and economy more resilient – and more equitable at the same time.

It achieves that goal by ensuring, as did AB 32, that environmental justice and equity is an integral and irreducible priority of the plan overall, and is considered and addressed in each of its component programs.

To ensure the Proposed Plan acknowledges and addressed the issue of equity, CARB worked extensively with the EJAC during the development of the Proposed Plan. This work included extending the Scoping Plan development timeline to hold a series of meetings in environmental justice communities throughout the State with presentations and participation from both State agency representatives and members of the EJAC. Members of the EJAC also presented at workshops they held with support from CARB throughout the development of the proposed Scoping Plan.

The EJAC presented a series of recommendations based on these meetings and in response to public materials provided by the State. As a result CARB added, for example, a scenario with a so-called cap-and-tax program, in addition to the other alternative scenarios: no cap-and-trade but rather relying exclusively of prescriptive regulations; a carbon tax; and 'all' cap-and-trade. In response to AB 197 and environmental justice community concerns, the Proposed Plan includes a measure for prescriptive regulations for refineries that would reduce greenhouse gases potentially along with harmful criteria and toxic air pollutants.

Achieving the 2030 target under the Proposed Plan will also spur the transformation of the California economy and fix its course securely on achieving an 80 percent reduction in greenhouse gas emissions by 2050, consistent with the global consensus of the scale of reductions needed to stabilize atmospheric greenhouse gas concentrations at 450 parts per million carbon dioxide equivalent, and reduce the likelihood of catastrophic climate change. Currently, global levels are at just above 400 parts per million.

This approach is consistent with additional efforts by California to move in concert with the global community. As one example, the creation of the Under 2 Memorandum of Understanding brought together states, provinces, and nations around the world committed to limiting their greenhouse gas emissions to less than 2 metric tons per capita by 2050. To date, 165 jurisdictions representing over 1 billion people and 35 percent of the global economy have signed on, providing a powerful signal of the world's intent to address climate change.

But, reducing greenhouse gases is only one part of the equation for California. As we build our clean energy future, we must also ensure that our efforts to fight climate change continue to meet clean air standards and benefit community and ecosystem resilience. Achieving these intertwined goals requires a multi-pronged strategy that also delivers reductions in criteria and toxic pollution especially in disadvantaged communities that are disproportionately burdened by the impacts of pollution. In addition to regulatory measures, investment in communities through the Affordable Housing and Sustainable Communities Program, the Transformational Climate Communities Program, Low Carbon Transportation Program and the Transit and

Intercity Rail Capital Program, result in reduced pollution, increased jobs and improved conditions in communities throughout California that are the most impacted. Investments in forests and farms and in the waste sector help sequester carbon on the State's valuable landscapes.

An additional challenge in a successful climate program is to control greenhouse gas emissions while also supporting economic growth. To date, California has reduced greenhouse gas emissions by about 10 percent from our historic highs in the early 2000s, and the State's economy has demonstrated continued growth at a rate above the national average. And, year over year, the amount of carbon 'embedded' in the Gross State Product (GSP), expressed in the number of tons of carbon dioxide per million dollars of GSP, has dropped. This means the economy is experiencing greater fiscal growth for each unit of energy expended; in short – more economic growth with less carbon.

The State's experience to date strongly suggests that continuing with the successful programs currently in place – strengthening the programs with additional elements – is the right course to take to continue on the road of growth and declining carbon intensity of the economy.

With this in mind, and drawing on the input of stakeholders and the EJAC while following the direction of the Legislature, the major elements of the framework proposed in this document are as follows:

1. SB 350
 - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
 - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard (LCFS)
 - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
 - Maintaining existing GHG standards for light- and heavy-duty vehicles.
 - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
 - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
 - Improve freight system efficiency.
 - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
 - Deploy over 100,000 zero-emission trucks and equipment by 2030.
5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
 - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
 - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
6. SB 375 Sustainable Communities Strategies
 - Increased stringency of 2035 targets.

7. Post-2020 Cap-and-Trade Program
 - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
 - CARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. 20 percent reduction in greenhouse gas emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

This proposed approach is structured to address policy requirements and criteria while providing the widest range of environmental and economic benefits.

On the economic front, the Proposed Plan presents significant opportunities for employment and growth for California investors, business, and households. As we have seen in the past decade, an increase in clean technology employment, and growth in service industries and sectors providing health care and education, will replace sectors heavily dependent on fossil fuels. In 2030, Californians will spend less money on cars and utility bills and increase spending on cleaner fuels, recreation, and public transportation. Overall, under the Proposed Plan the California economy is anticipated to grow to \$3.4 trillion, roughly one-half percent less growth by that date when compared to a scenario where we did nothing at all.

In return, the State will continue to grow in the direction of a more balanced clean energy economy. The investments made in implementing the Proposed Plan will present significant opportunities for California investors and businesses; upfront capital investments will result in long-term fuel and energy efficiency savings, the benefits of which will continue far into the future.

We are already seeing these benefits. In 2015 California received 68% (\$9.8 billion) of total US clean tech company investment (\$14.5 billion), continuing California's first place finish over the past decade. These investments translate directly into jobs with 321,000 workers in energy efficiency jobs statewide, including 72,000 within Los Angeles County. Seventy percent of energy efficiency establishments in the State are small businesses.

The success stories are notable. As a whole, advanced energy enterprises employ over half a million workers in California – three times the combined total of motion pictures, television, and radio – bigger than agriculture, forestry, and fishing. And, the pace is quickening. In 2015, the advanced energy sector generated jobs at six times the rate of the State's economy overall.

The evidence of the transformation of California's economy is everywhere. It is impossible not to notice the number of houses with money-saving solar arrays, or the utility-scale solar and wind turbine installations throughout the State. They have become commonplace, and now ultra-clean transportation is rapidly becoming another California hallmark.

There are already more than one-quarter million electric vehicles in California – almost half the national total and clean transportation is fast becoming a significant part of the State's clean energy economy. In 2015, clean transportation was the hottest sector for venture capital investment in California, bringing in \$3.4 billion in that year, 90.5 percent of all clean transportation vehicle capital investment in the nation. In the coming months and years, more and more zero-emission and hybrid trucks and buses will be on the State's streets and highways, including many destined for disadvantage communities.

Under the Proposed Plan, these ultra-clean vehicles and a wide range of other climate investments in and for these communities will continue to come from an established program, structure and mechanism that is distributing revenues from the Cap-and-Trade Program to disadvantaged communities.

California Climate Investments from Cap-and-Trade auction proceeds are being strategically invested to further the goals of California's climate legislation by reducing GHG emissions and providing benefits to disadvantaged communities. To date, over \$3 billion has been appropriated from the Greenhouse Gas Reduction Fund, with approximately one third of the funding targeted to benefit disadvantaged communities.

The goal of this multi-billion dollar effort is to ensure the equitable transformation of the economy with a focus on investments to improve the environment and clean the air in the neighborhoods, communities and systems throughout the state that need them the most. Projects range from affordable housing close to transit, urban forestry projects, support for ultra-clean car purchases by low-income families, electric car-sharing programs, electric and hybrid buses for transit agencies, to solar roofs in disadvantaged communities to help slash energy costs for families who qualify.

There are other benefits of the Proposed Plan. The uncertainty in both forecast emissions and performance estimates of other measures means the Cap-and-Trade Program in the Proposed Plan, thanks to the declining cap, serves as a backstop and is able to 'scale' up to ensure that the 2030 target is met. By incorporating a refinery measure – which will likely also reduce criteria pollutants and toxic air contaminants – and advancing other measures, the Proposed Plan also prioritizes rules and regulations for direct emissions reductions at large stationary, mobile, and other sources.

The Proposed Plan protects against emissions leakage by allowing for a specified amount of free allocation of Cap-and-Trade Program allowances, where supported by research. It also supports the ability to link with other states and provinces, and develop further reductions through collaborative regional efforts.

A Comprehensive Approach

Working to propel the world's fifth largest economy to a clean energy future entails enacting policies at multiple governmental levels and across multiple agencies and organizations. The Proposed Plan draws much of its ability to respond to changing circumstances from the underlying network of crosscutting statewide programs that address GHG reductions through a comprehensive approach to broad, related economic activities or sectors.

For example, the Sustainable Freight Strategy achieves reductions through both increased efficiency and the transition to zero-emission equipment to move goods from production to your doorstep. The Mobile Source Strategy is designed to modernize and upgrade transportation infrastructure, enhance system-wide efficiency and mobility options, and promote clean economic growth in the mobile sector. The SB 375 Sustainable Communities Strategies and regional Climate Action Plans support safer streets, more walking and biking, improved transit options, more efficient land use and more vibrant communities. All three will deliver significant reductions in greenhouse gases and cut both smog-forming and toxic pollution.

The Proposed Plan sits at the center of this broad tapestry of California's other climate-oriented plans and strategies. These include, for example, the California Transportation Plan 2040, the State's Forest Carbon Plan, the State Wildlife Action Plan and the California Water Action Plan. These are designed to focus on reducing carbon pollution while also delivering targeted results and a broad range of co-benefits.

Conclusion

The Proposed Plan continues more than a half-century of California's nation-leading efforts to clean our air and water, and improve the environment. But, climate change poses a challenge of unprecedented proportions that will impact all Californians whether they are city dwellers in Los Angeles, San Diego, San Francisco, farmers in Salinas or the Central Valley, or the millions of Californians who live in the Sierra, the northern counties, or in the desert areas.

In this Proposed Plan, every sector in our thriving economy plays a crucial role. Cities and local governments are already rising to the challenge, and will play increasingly important roles with programs ranging from low-carbon and cleaner transit, to more walkable streets and the development of vibrant urban communities.

We will see a remarkable transformation of how we move throughout the State, away from cars that burn fossil fuels to cleaner, electric cars that will eventually even drive themselves. Freight will be moved around the State by trucks that are vastly cleaner than those on the road now, with our ports moving towards zero- and near-zero emissions technologies. The heavily travelled Los Angeles-San Francisco corridor will be serviced by comfortable, clean and affordable high speed rail.

These efforts will slash pollution now created from making and using gasoline and diesel fuel statewide. The greatest benefits of this shift away from fossil fuels will be in the disadvantaged communities of our State, which are so often located adjacent to ports, rail yards, freight distribution centers and freeways. And, thanks to the continued investment of auction proceeds from the Cap-and-Trade Program in these same communities, we can continue to work on bringing the benefits of clean technology – whether electric cars or solar roofs or other technologies – to those in our State who need them the most.

We will see enhanced efforts in our natural and working landscapes, ranging from efforts to restore forests to a natural condition that sequesters carbon, improves water quality, and protects residents from catastrophic wild fire, to converting waste to compost for application on the land base, to ensuring that wetlands can sequester carbon and clean our water.

In every sense possible, the Proposed Plan belongs to all Californians, and in one way or another, we will all have a role to play over the coming decades in making it work. Climate change presents us with unprecedented challenges – challenges that cannot be met with traditional ways of thinking or conventional solutions. As Governor Brown has declared, meeting these challenges will require “courage, creativity and boldness.”

Over the last decade we proved to ourselves, and the world, that Californians recognize the danger of climate change and are willing to take action to address it head on. We have also seen over the past decade that by being bold and creative, we can all benefit from the transition to clean energy with cleaner air, less carbon pollution and continued economic growth and job generation.

This Proposed Plan builds on those early steps and moves California into a new chapter that will deliver a thriving and more resilient economy and a clean environment to our children and grandchildren. It is a commitment to the future, but it begins today.

I. Introduction

A. Background

In November 2016, California Governor Edmund G. Brown affirmed California's role in the United States, noting, "We will protect the precious rights of our people and continue to confront the existential threat of our time—devastating climate change." By working to reduce the threat facing the State and setting an example for other jurisdictions that aim to take action, California continues to lead in the climate arena. The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target (Proposed Plan) identifies how the State can build upon its legacy of climate leadership, reach our 2030 climate goals, and substantially advance toward our 2050 climate goals. By selecting and pursuing a sustainable and clean economy path for 2030, the State will continue to successfully execute existing programs, demonstrate the coupling of economic growth and environmental progress, and enhance new opportunities for engagement within the State to address and prepare for climate change.

This Proposed Plan builds on and integrates efforts already underway to reduce the State's greenhouse gas (GHG), criteria, and toxics emissions. Programs such as the Low Carbon Fuel Standard and Renewables Portfolio Standard are delivering cleaner fuels and energy, the Advanced Clean Cars Program has put more than a quarter million clean vehicles on the road, and the Sustainable Freight Action Plan will result in efficient and cleaner systems to move goods throughout the State. Enhancing and implementing these ongoing efforts puts California on the path to achieving the 2030 target. This Proposed Plan relies on these, and other, foundational programs paired with an extended more stringent Cap-and-Trade Program and new refinery regulations to deliver GHG, air quality, and other benefits.

1. Climate Legislation and Directives

California has made progress on addressing climate change during periods of both Republican and Democratic national administrations and Democratic and Republican State administrations. California governors and legislatures have taken bold steps to ensure the State's leadership, and commitment to improving public health and the environment are always a priority. A series of executive orders and laws generated policies and actions across State government, among local and regional governments, and within industry. These policies also encouraged collaboration with federal agencies and spurred partnerships with many jurisdictions beyond California's borders. The State has been consistent and bold in its efforts to address climate change and serve as an example of how other regions can take similar action in reducing GHG emissions. Moving forward, California will continue its pursuit of collaborations and advocacy for action to address climate change.

Assembly Bill 32: California’s Global Warming Solutions Act

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006 (Nuñez, Chapter 488, Statutes of 2006), represented a defining moment in California’s long history of environmental stewardship and secured the State’s role as a leader in reducing GHGs. In response to AB 32, California began to address climate change by employing a comprehensive, long-term approach to cut the State’s GHG emissions to 1990 levels by 2020 and to maintain and continue reductions post 2020.

Pursuant to AB 32, the Scoping Plan must “*identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives*” in order to achieve the 2020 goal, and achieve “*the maximum technologically feasible and cost-effective GHG emission reductions*” by 2020 and maintain and continue reductions beyond 2020.

Executive Order B-30-15

In his January 2015 inaugural address, Governor Brown identified five key climate change strategy “pillars,” which recognize that several major areas of the California economy will need to reduce their emissions to meet California’s ambitious climate change goals. These five pillars are:

1. Reducing today’s petroleum use in cars and trucks by up to 50 percent;
2. Increasing from one-third to 50 percent our electricity derived from renewable sources;
3. Doubling the efficiency savings achieved at existing buildings and making heating fuels cleaner;
4. Reducing the release of methane, black carbon, and other short-lived climate pollutants; and
5. Managing farm and rangelands, forests, and wetlands so they can store carbon.

Consistent with these goals, Governor Brown signed Executive Order B-30-15 in April 2015, establishing a California GHG reduction target of 40 percent below 1990 levels by 2030. Executive Order B-30-15 also calls on the California Air Resources Board (CARB or Board), in coordination with sister agencies, to update the AB 32 Climate Change Scoping Plan to incorporate the 2030 target. Executive Order B-30-15 also builds out the “sixth pillar” of the Governor’s strategy—to safeguard California in the face of a changing climate—highlighting the need to prioritize actions to reduce GHG emissions and build resilience in the face of a changing climate.

Senate Bill 350: Golden State Standards

Senate Bill 350 (SB 350) (De Leon, Chapter 547, Statutes of 2015), Golden State Standards, requires the State to set GHG reduction planning targets both for the electricity sector as a whole and for individual utilities and other electricity providers

(collectively known as *load serving entities*), which will develop strategies to reduce GHG emissions through Integrated Resource Planning. The bill also codified an increase in the Renewables Portfolio Standard (RPS) to 50 percent by 2030¹ and doubling of energy savings in electricity and natural gas end uses as discussed in the Governor's inaugural address. By enacting these two complimentary targets into law, SB 350 aims to create jobs, grow the State's economy, and improve public health by setting new renewable energy standards for California's RPS and increasing energy efficiency, and by focusing long-term resource planning on reducing GHG emissions.²

Senate Bill 32: California Global Warming Solutions Act of 2016: emissions limit and Assembly Bill 197: State Air Resources Board: greenhouse gases: regulations.

In summer 2016 the Legislature passed, and the Governor signed, Senate Bill 32 (SB 32) (Pavley, Chapter 249, Statutes of 2016) and Assembly Bill 197 (AB 197) (Garcia, Chapter 250, Statutes of 2016). SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million carbon dioxide equivalent (CO₂e) and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to CARB on the following areas related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016:³

- It requires annual posting of GHG, criteria, and toxic air contaminant data throughout the State, organized by local and sub-county level for stationary sources and by at least a county level for mobile sources. Separate from the development of the Proposed Plan, CARB has begun the process to implement this provision of AB 197.
- When adopting rules and regulations to achieve emissions reductions to protect the State's most affected and disadvantaged communities, CARB shall consider the social costs of the emissions of GHGs, and prioritize both of the following:
 - Emission reduction rules and regulations that result in direct emission reductions at large stationary sources of GHG emissions and direct emission reductions from mobile sources.
 - Emission reduction rules and regulations that result in direct emission reductions from sources other than those listed above.

¹ <http://www.cpuc.ca.gov/renewables/>

² SB 350: Golden State Standards. Available at: focus.senate.ca.gov/sites/focus.senate.ca.gov/files/climate/505050.html

³ ARB. 2016. ARB's Emission Inventory Activities. <https://www.arb.ca.gov/ei/ei.htm>

- In the development of each scoping plan, AB 197 also directs CARB to identify for each emissions reduction measure, including each alternative compliance mechanism, a market-based compliance mechanism, and potential monetary and nonmonetary incentives the following information:
 - The range of projected GHG emissions reductions that result from the measure.
 - The range of projected air pollution reductions that result from the measure.
 - The cost-effectiveness, including avoided social costs, of the measure.

Senate Bill 1383: Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills.

Senate Bill 1383 (SB 1383) (Lara, Chapter 395, Statutes of 2016) requires the development, adoption, and implementation of a Short-Lived Climate Pollutant Strategy.^{4,5} Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane, are powerful climate forcers that have a dramatic and detrimental effect on air quality, public health, and climate change. These pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide. The State has issued a Proposed Short-Lived Climate Pollutant Reduction Strategy (Proposed SLCP Strategy), which establishes a path to decrease GHG emissions and displace fossil-based natural gas use. This includes deploying widely available technologies to avoid landfill methane emissions by reducing the disposal of organics, recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The Proposed SLCP Strategy also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. SB 1383 includes the following specific goals for 2030 from 2013 levels:

- 40 percent reduction in methane,
- 40 percent reduction in hydrofluorocarbon gases, and
- 50 percent reduction in anthropogenic black carbon.⁶

CARB released a revised Proposed SLCP Strategy in late November 2016 that reflects the direction in SB 1383.

Assembly Bill 1504: Forest resources: carbon sequestration.

AB 1504 requires the Board of Forestry and Fire Protection to adopt district forest practice rules and regulations in accordance with specified policies to, among other things, assure the continuous growing and harvesting of commercial forest tree species.

⁴ ARB. Reducing Short-Lived Climate Pollutants in California. www.arb.ca.gov/cc/shortlived/shortlived.htm

⁵ Senate Bill No. 605. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB605

⁶ Senate Bill No. 1383. leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383

The bill also requires the Board of Forestry and Fire Protection to ensure that its rules and regulations that govern the harvesting of commercial forest tree species consider the capacity of forest resources to sequester carbon dioxide emissions sufficient to meet or exceed the sequestration target of 5 million metric tons of carbon dioxide equivalent (MMTCO₂e)/year net annually, as established in the first AB 32 Climate Change Scoping Plan.

Senate Bill 1386: Resource conservation, natural and working lands.

SB 1386 (Wolk, Chapter 545, Statutes of 2016) declares it the policy of the State that protection and management of natural and working lands, as defined, is an important strategy in meeting the State's GHG reduction goals. In addition, State agencies must consider protection and management of natural and working lands in establishing policies and grant criteria, and in making expenditures, and "implement this requirement in conjunction with the State's other strategies to meet its greenhouse gas emissions reduction goals."

2. Initial Scoping Plan and First Update to the Scoping Plan

The Initial Scoping Plan⁷ in 2008 presented the first economy-wide approach to reducing emissions and highlighted the value of combining both carbon pricing with other complementary programs to meet California's 2020 GHG emissions cap while ensuring progress in all sectors. The coordinated set of policies in the Initial Scoping Plan employed strategies tailored to specific needs, including market-based compliance mechanisms, performance standards, technology requirements, and voluntary reductions. The Initial Scoping Plan also described a conceptual design for a cap-and-trade program that included eventual linkage to other cap-and-trade programs to form a larger regional trading program.

AB 32 requires CARB to update the scoping plan at least every five years. The First Update to the Scoping Plan⁸ (First Update), approved in 2014, presented an update on the program and its progress toward meeting the 2020 limit. It also developed the first vision for the long-term progress that the State endeavors to achieve. In doing so, the First Update laid the groundwork to transition to the post-2020 goals set forth in Executive Orders S-3-05⁹ and B-16-2012.¹⁰ It also recommended the need for a 2030 mid-term target to establish a continuum of actions to maintain and continue reductions, rather than only focusing on targets for 2020 or 2050.

⁷ ARB. Initial AB 32 Climate Change Scoping Plan. Available at:
www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

⁸ ARB. First Update to the AB 32 Scoping Plan. Available at:
www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm

⁹ <https://www.gov.ca.gov/news.php?id=1861>

¹⁰ <https://www.gov.ca.gov/news.php?id=17472>

3. Building on California's Environmental Legacy

California's successful climate policies and programs have already delivered emission reductions resulting from cleaner, more fuel-efficient cars and zero emission vehicles (ZEVs), cleaner low carbon fuels, more renewable energy, greater waste diversion from landfills, water conservation, improved forest management, and additional actions to improve the energy efficiency of homes and businesses. These policies and programs have also improved public health, created green jobs, and given consumers more clean energy choices. The 2030 GHG emissions reduction target in SB 32 will ensure that the State maintains this momentum beyond 2020, mindful of the State's population growth and needs. The Proposed Plan lays out a path to simultaneously make progress on the State's climate goals and improve air quality improvement in all parts of the State.

Moving forward, California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning, to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Analyses indicate that continuing the Cap-and-Trade Program would provide compliance flexibility, as the lowest cost GHG emission reductions would be undertaken first, continue opportunities to collaborate with other regions and achieve even greater GHG emission reductions. Further, proceeds collected through the Cap-and Trade Program in the Greenhouse Gas Reduction Fund (GGRF) can contribute to residents in disadvantaged communities having equitable access to clean technology, clean energy options, transit options, and infrastructure improvements that reduce GHGs and improve quality of life. Finally, meeting the State's climate, public health, and environmental goals will entail understanding, quantifying, and addressing emissions impacts from land use decisions at all governmental levels.

4. Purpose of the 2030 Target Scoping Plan Update

The 2030 limit puts California on the path to meeting the 2050 GHG emission reduction goal. However, the State's long-term climate goal can only be achieved by employing a coordinated policy framework. This Proposed Plan incorporates and leverages many existing and ongoing efforts while identifying new policies to progress toward the State's climate and air quality goals.

The actions identified in this Proposed Plan can reduce overall GHG emissions in California, and deliver strong policy signals that will continue to drive investment and certainty in a low carbon economy. The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197. The plan includes policies to require direct GHG reductions at some of the State's largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade Program, which constrains and reduces emissions at covered sources.

5. Process for Developing the Proposed 2030 Target Scoping Plan Update

This plan has been developed in an open and transparent manner, involving coordination with State agencies, engagement with the Legislature, and the opportunity for stakeholders and the public to engage in the process through workshops and other meetings. This plan was developed in close coordination with other State agency plans and regulations, including the Cap-and-Trade Regulation, the Low Carbon Fuel Standard (LCFS), the State Implementation Plan, the California Sustainable Freight Action Plan, California Transportation Plan 2040, the Forest Carbon Plan, and the Short-Lived Climate Pollutant Strategy, among others.

To date, CARB, in collaboration with the Governor's Office and other State agencies, has solicited comments and feedback from affected stakeholders and the Environmental Justice Advisory Committee (EJAC or Committee) that has informed the Proposed Plan. Below is a list of the public workshops and symposia where the development of the Proposed Plan has been discussed:

- Governor's Office Pillar Symposia – 2030 Climate Change Commitments
 - August 5, 2015: Natural and Working Lands Symposium
 - July 8, 2015: Symposium to Discuss Cutting Petroleum Use in Half by 2030
 - July 9, 2015: Renewables Symposium
- October 1, 2015: Kickoff Public Workshop on the Draft Scoping Plan Update to Reflect 2030 Target
- November 19, 2015: Board Hearing Informational Presentation on Status of the Draft 2030 Target Scoping Plan
- December 7, 2015: First Meeting of the EJAC to Inform Development of the Draft 2030 Target Scoping Plan
- January 15, 2016: Draft Scoping Plan Economic Analysis Workshop
- March 23, 2016: Public Workshop on the Natural and Working Lands Sector to Inform Development of the Draft 2030 Target Scoping Plan

- April 27, 2016: Public Workshop on the Agriculture Sector to Inform Development of the Draft 2030 Target Scoping Plan
- June 23, 2016: Board Hearing Informational Presentation on Status of the Draft 2030 Target Scoping Plan
- August 23, 2016: Public Workshop on the Energy Sector to Inform Development of the Draft 2030 Target Scoping Plan
- September 14, 2016: Public Workshop on the Transportation Sector to Inform Development of the Draft 2030 Target Scoping Plan
- November 7, 2016: Public Workshop on 2030 Target Scoping Plan: Greenhouse Gas Reduction Policy Scenarios, Natural and Working Lands, Local Action, and Public Health Analysis
- November 17, 2016: Board Hearing Informational Presentation on Status of the Draft 2030 Target Scoping Plan
- Details on additional EJAC, Community Meetings, and the EJAC’s Initial Recommendations are provided in Section I D.5.
- Methods and Initial Results for the Natural and Working Lands Sector in the 2030 Target Scoping Plan
- December 16, 2016: Public Workshop on the 2030 Target Scoping Plan Discussion Draft, including Economic Modeling Updates

One key message conveyed during engagement with the legislature, EJAC, and environmental justice communities was the need to place more emphasis on large stationary sources, with a particular focus on multi-pollutant strategies for these sources that reduce GHGs and harmful criteria and toxic air pollutants that result in localized health impacts, especially in disadvantaged communities. Another consistent message was the need for infrastructure and other community improvements that enhance quality of life, increase access to safe and viable transportation options, and improve physical activity and related health outcomes.

B. Updated Climate Science Supports the Need for More Action

Climate scientists agree that global warming trends and other shifts in the climate system observed over the past century are caused by human activities. These changes are proceeding at an unprecedented rate when compared with climate change that human society has lived through to date.¹¹ According to new research, unabated GHG emissions could allow sea levels to rise close to two meters in total (more than six feet) by the end of this century—nearly twice as much as previously predicted—an outcome that could devastate coastal communities in California and around the globe.¹²

¹¹ Cook, J., et al. 2016. Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters* 11:048002 doi:10.1088/1748-9326/11/4/048002. iopscience.iop.org/article/10.1088/1748-9326/11/4/048002.

¹² DeConto, R. M., and D. Pollard. 2016. Contribution of Antarctica to past and future sea-level rise. *Nature* 531:591–597, doi:10.1038/nature17145.

California is already feeling the effects of climate change, and projections show that these effects will continue and worsen over the coming centuries. The impacts of climate change have been reported by the Office of Environmental Health Hazard Assessment (OEHHA) in the climate change indicators report, which reports the following changes occurring already:¹³

- A recorded increase in annual average temperatures, as well as increases in daily minimum and maximum temperatures,
- An increase in the occurrence of extreme events, including wildfire and heat waves,
- A reduction in spring runoff volumes, as a result of declining snowpack,
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops, and
- Changes in the timing and location of species sightings, including migration upslope of flora and fauna, and earlier appearance of Central Valley butterflies.

In addition to these trends, the State's current conditions point to a changing climate. California is in the middle of an historic drought. Recent scientific studies show that such extreme drought conditions are more likely to occur under a changing climate.^{14,15} The total statewide economic cost of the 2013–2014 drought was estimated at \$2.2 billion, with a total loss of 17,100 jobs.¹⁶ In the Central Valley, the current drought has cost California agriculture about \$2.7 billion and more than 20,000 jobs in 2015, which highlights the critical need for developing drought resilience, even if wet conditions mitigate the current drought.¹⁷ Drought affects other sectors as well. An analysis of the amount of water consumed in meeting California's energy needs between 1990 and 2012 shows that while California's energy policies have supported climate mitigation efforts, they have increased vulnerability to climate impacts, especially greater hydrologic uncertainty.¹⁸

California has always been drought-prone, but the severity of this current drought (2013 was the driest year on record for the State, 2014 was the fourth driest, while 2015 was the warmest year on record) have led many to wonder whether global warming may be a contributing factor. Hence, several recent publications carefully examined the potential role of climate change in the California drought. One study examined both precipitation and runoff in the Sacramento and San Joaquin River basins, and found that 10 of the past 14 years have been below normal, and the past

¹³ Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): oehha.ca.gov/climate-change/document/indicators-climate-change-california

¹⁴ Diffenbaugh, N., D. L. Swain, and D. Touma. 2015. Anthropogenic Warming has Increased Drought Risk in California. *Proceedings of the National Academy of Sciences* 112(13): 3931–3936.

¹⁵ Cayan, D., T. Das, D. W. Pierce, T. P. Barnett, M. Tyree, and A. Gershunov. 2010. Future Dryness in the Southwest US and Hydrology of the Early 21st Century Drought. *Proceedings of the National Academy of Sciences* 107(50): 21272–21276.

¹⁶ Howitt, R., J. Medellin-Azuara, D. MacEwan, J. Lund, and D. Summer. 2014. Economic Impacts of 2014 Drought on California Agriculture. watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf.

¹⁷ Williams, A. P., et al. 2015. Contribution of anthropogenic warming to California drought during 2012–2014. *Geophysical Research Letters* doi:[onlinelibrary.wiley.com/doi/10.1002/2015GL064924/abstract](https://doi.org/10.1002/2015GL064924).

¹⁸ Fulton, J., and H. Cooley. 2015. The water footprint of California's energy system, 1990–2012. *Environmental Science & Technology* 49(6):3314–3321. pubs.acs.org/doi/abs/10.1021/es505034x.

three years have been the driest and hottest in the full instrumental record from 1895 through November 2014.¹⁹ In another study, the authors show that the increasing co-occurrence of dry years with warm years raises the risk of drought, highlighting the critical role of elevated temperatures in altering water availability and increasing overall drought intensity and impact.²⁰ Generally, there is growing risk of unprecedented drought in the western United States driven primarily by rising temperatures, regardless of whether or not there is a clear precipitation trend.²¹

According to the U.S. Forest Service report, *National Insect and Disease Forest Risk Assessment, 2013–2027* (Krist et al. 2012), California is at risk of losing at least 25 percent of standing live forest due to insects and disease over 5.7 million acres, or 12 percent of the total forested area in the State. Some species are expected to lose significant amounts of their total basal area (i.e., whitebark pine is projected to lose 60 percent of its basal area; lodgepole pine, 40 percent). While future climate change is not modeled within the risk assessment, and current drought conditions are not accounted for in these estimates, the projected climate changes over the next 15 years are expected to increase significantly the number of acres at risk, and will increase the risk from already highly destructive pests such as the mountain pine beetle. Extensive tree mortality is already prevalent in California. The western pine beetle and other bark beetles have killed a majority of the ponderosa pine in the foothills of the central and southern Sierra Nevada Mountains. A recent aerial survey by the U.S. Forest Service identified more than 100 million dead trees in California.²² As there is usually a lag time between drought years and tree mortality, we are now beginning to see a sharp rise in mortality from the past four years of drought. In response to the very high levels of tree mortality, Governor Brown issued an Emergency Proclamation on October 30, 2015.

A warming climate also causes sea level to rise; first, by warming the oceans which causes the water to expand, and second, by melting land ice which transfers water to the ocean. Even if storms do not become more intense and/or frequent, sea level rise itself will magnify the adverse impact of any storm surge and high waves on the California coast. Some observational studies report that the largest waves are already getting higher and winds are getting stronger.²³ The ocean is also changing as temperatures warm and GHG concentrations increase. Carbon dioxide is dissolving in the ocean, making it more acidic. More acidic ocean water affects a wide variety of marine species, including species that people use for food. This fundamental change is likely to have substantial ecological and economic consequences in California and

¹⁹ Mann, M. E., and P. H. Gleick. 2015. Climate change and California drought in the 21st century. *Proceedings of the National Academy of Sciences of the United States of America*, 112(13):3858–3859. doi.org/10.1073/pnas.1503667112.

²⁰ Diffenbaugh, N. S., D. L. Swain, and D. Touma. 2015. Anthropogenic warming has increased drought risk in California. *Proceedings of the National Academy of Sciences of the United States of America*. 10.1073/pnas.1422385112. www.pnas.org/content/112/13/3931.full.pdf

²¹ Cook, B. I., T. R. Ault, and J. E. Smerdon. 2015. Unprecedented 21st century drought risk in the American Southwest and Central Plains. *Science Advances* 1(1), e1400082, doi:10.1126/sciadv.1400082.

²² USDA. New Aerial Survey Identifies More Than 100 Million Dead Trees in California.

www.usda.gov/wps/portal/usda/usdahome?contentid=2016/11/0246.xml&contentidonly=true

²³ National Research Council of the National Academy of Sciences. 2012. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, National Academies Press.

worldwide.²⁴

A growing body of scientific evidence also shows that healthy tropical forests are central to solving climate change, as tropical forests exchange large amounts of water and energy with the atmosphere (affecting atmospheric rivers), controlling regional and global climate. Atmospheric rivers are relatively narrow regions in the atmosphere that are responsible for most of the horizontal transport of water vapor outside of the tropics. Deforestation and climate change have the capacity to alter rainfall regimes, water availability, and surface-atmosphere flux of water and energy of tropical forests. Between 2010 and 2015, despite some successful efforts at reducing the global rate of deforestation, trends continued to show losses of upwards of 6.6 million hectares per year, mainly from loss of natural forests in the tropics. Tropical deforestation accounts for about 15 percent of global GHG emissions—larger than the entire global transportation sector. Preserving tropical forests will help meet the aggressive global emissions reduction targets necessary to avoid catastrophic climate change and may help to preserve California’s historical rainfall patterns. While more intense dry periods are anticipated under warmer conditions, extremes on the wet end of the spectrum are also expected to increase, due to more frequent warm, wet atmospheric river events and a higher proportion of precipitation falling as rain instead of snow. In recent years, atmospheric rivers have also been recognized as the cause of the large majority of major floods in rivers all along the U.S. West Coast and as the source of 30–50 percent of all precipitation in the same region.²⁵ These extreme precipitation events, together with the rising snowline, often cause devastating floods in major river basins (e.g., California’s Russian River). It was estimated that the top 50 observed floods in the U.S. Pacific Northwest were due to atmospheric rivers.²⁶ Looking ahead, computer models predict that climate change will cause the very worst atmospheric river storms hitting California to become much more frequent and larger.

Sea level rise, droughts, floods, and forest impacts are just some of the environmental systems disrupted by climate change. As GHG emissions continue to accumulate and climate disruption grows, such destructive events will become more frequent. The historical record, which once set our expectations for the traditional range of weather and other natural events, is becoming an increasingly unreliable predictor of the conditions

Climate Impacts at the Community Level

To better understand how climate will impact local communities, the California Energy Commission hosts best available data on climate change projections downscaled to the local level.

Please visit:
Cal-Adapt.org

²⁴ Chan, F., et al. 2016. The West Coast Ocean Acidification and Hypoxia Science Panel: Major Findings, Recommendations, and Actions. California Ocean Science Trust, Oakland, California, USA.

²⁵ Dettlinger, M. D. 2013. Atmospheric rivers as drought busters on the U.S. West Coast. *Journal of Hydrometeorology* 14:1721-1732, doi:10.1175/JHM-D-13-02.1. journals.ametsoc.org/doi/abs/10.1175/JHM-D-13-02.1.

²⁶ Warner, M. D., C. F. Mass, and E. P. Salath'e. 2012. Wintertime extreme precipitation events along the Pacific Northwest coast: Climatology and synoptic evolution. *Monthly Weather Review* 140:2021–43. journals.ametsoc.org/doi/abs/10.1175/MWR-D-11-00197.

we will face in the future. Climate disruption can drive extreme weather events such as coastal storm surges, drought, wildfires, floods, and heat waves. Effective climate policy must be based in the best available science, so California is committed to further supporting new research on ways to mitigate climate change and how to understand its ongoing and projected impacts. California's Fourth Climate Change Assessment further updates our understanding of the many impacts from climate change in a way that directly informs State agencies' efforts to safeguard the State's people, economy, and environment.

Together, current conditions and future projections provide a picture of California's changing climate, with two important messages:

- Change is already being experienced and documented across California, and some of these changes have been directly linked to changing climatic conditions.
- Even with the uncertainty in future climate conditions, every scenario estimates further change in future conditions.

It is critical that California continue to take steps to reduce GHG emissions in order to avoid the worst of the projected impacts of climate change. At the same time, the State is taking steps to make the State more resilient to ongoing and projected climate impacts as laid out by the Safeguarding California plan.²⁷ Safeguarding California is being updated in 2017 with new policy recommendations and more actions to address California. California's efforts are vital steps toward minimizing the impact of GHG emissions and the three-pronged approach of reducing emissions, preparing for impacts, and conducting cutting-edge research can serve as a model for action.

C. California's Greenhouse Gas Emissions and the 2030 Target

1. Progress Toward Achieving the 2020 Limit

California has made progress toward achieving the 2020 statewide GHG target while also reducing criteria pollutants and toxic air contaminants and supporting economic growth. As shown in Figure I-1, in 2014, total GHG emissions decreased by 2.8 MMTCO₂e compared to 2013, representing an overall decrease of 9.4 percent since peak levels in 2004. The 2014 GHG Emission Inventory and a description of the methodology updates can be accessed at: www.arb.ca.gov/cc/inventory/inventory.htm.

AB 32 directs CARB to develop and track GHG emissions and progress toward the target. California Health and Safety Code section 38505 identifies seven GHGs that CARB is responsible for monitoring and regulating to reduce emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). The fluorinated gases are also referred to as "high global warming potential gases"

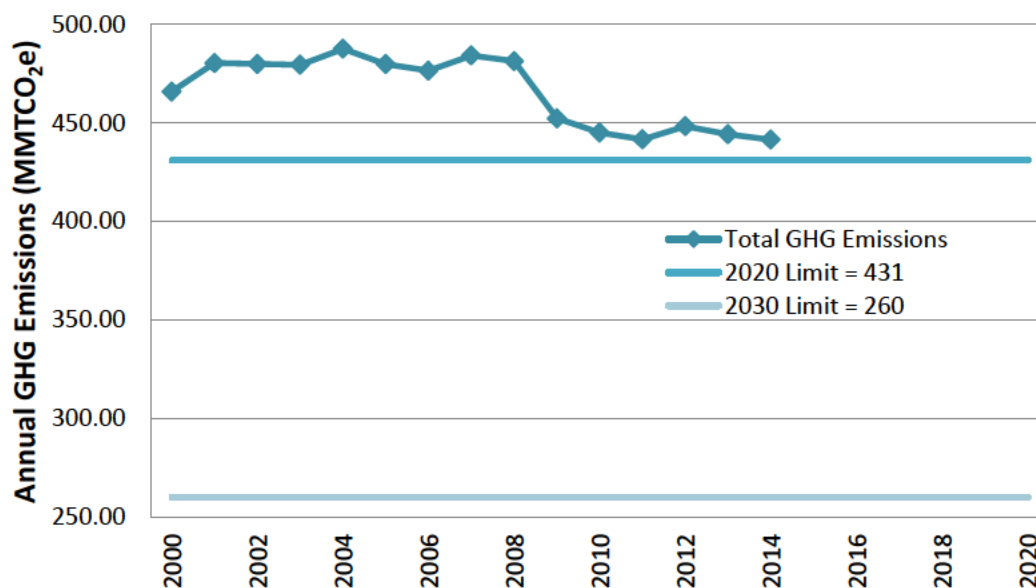
²⁷ California Natural Resources Agency. Safeguarding California. <http://resources.ca.gov/climate/safeguarding/>

(high-GWP gases). California's annual statewide GHG emission inventory has historically been the primary tool for tracking GHG emissions trends.

The 2014 GHG Emission Inventory includes improved methodology updates. For example, to align the GHG inventory with the IPCC guidelines and share consistent methods with other subnational jurisdictions, CARB is now separating biogenic CO₂ from transportation fuels from the total emissions and tracking those emissions separately as informational items (beginning with 2014 reporting). Figure I-1 provides the GHG inventory trend using this new method. Additional information on the methodology for the GHG inventory can also be found at:

www.arb.ca.gov/cc/inventory/data/data.htm.

Figure I-1. California GHG Inventory Trend



Carbon dioxide is the primary GHG emitted in California, accounting for 84 percent of total GHG emissions in 2014, as shown in Figure I-2 below. Figure I-3 illustrates that transportation, primarily on-road travel, is the single largest source of CO₂ emissions in California. Electricity production and industrial and residential sources also are important contributors to CO₂ emissions. Methane is the second most important GHG in California, accounting for 9 percent of California's 2014 GHG emissions in CO₂ equivalent units. Agriculture accounts for the majority of methane emissions, primarily from livestock enteric fermentation and manure management. Industrial sources and landfills are also important methane sources. Other sources contribute only a small fraction to methane emissions, and include residential, transportation, electricity generation, and commercial sources. Agriculture accounts for the majority of N₂O emissions, primarily from fertilizer and manure added to soil. Transportation and commercial and residential use of nitrogen fertilizer on turf are also important sources of

N₂O. Industrial sources of N₂O include solid waste and wastewater treatment, manufacturing, refining, and other sources.

High-GWP gases are fluorinated gases (F-gases) with GWPs hundreds to thousands of times greater than that of carbon dioxide. These gases are used across many different economic sectors, including energy, industry, commercial, residential, and transportation. High-GWP gases include: sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). SF₆, PFCs, and NF₃ are long-lived F-gases whose emissions are being reduced by CARB regulations covering the semiconductor industry, electrical transmission, magnesium casting, and miscellaneous SF₆ uses. HFCs are short-lived climate pollutant synthetic gases used in refrigeration, air conditioning, insulating foams, solvents, aerosol products, and fire protection. HFCs comprise approximately 97 percent of the high-GWP gas emissions, and 4 percent of all GHG emissions from all sources, but are the fastest growing GHG emissions source globally as HFCs continue to replace ozone-depleting substances.

Figures I-2 and I-3 show State GHG emission contributions by pollutant and sector based on the 2014 GHG Emission Inventory.

Figure I-2. Emissions by GHG

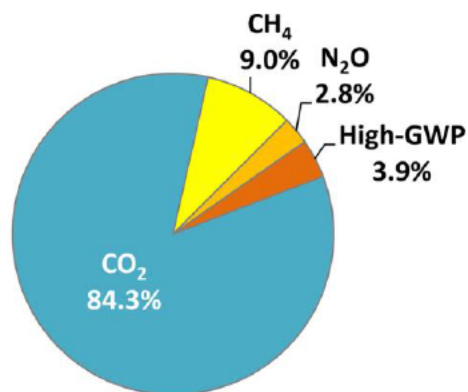
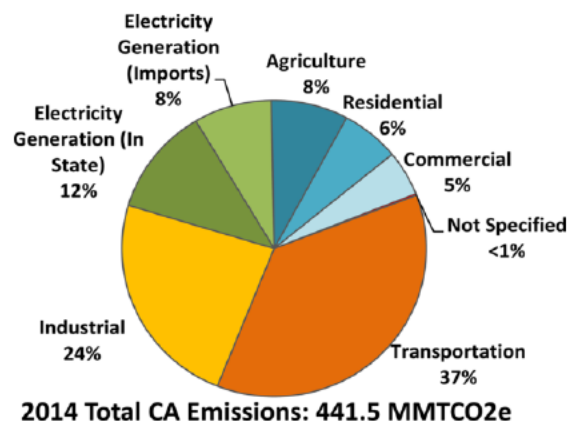


Figure I-3. Emissions by Sector



Another important climate-forcing pollutant not listed among the Kyoto Protocol gases is black carbon, which is also a short-lived climate pollutant. CARB has developed a statewide emission inventory for black carbon in support of the Proposed SLCP Strategy, which is reported in two categories: non-forestry (anthropogenic) sources and forestry sources.²⁸ The State's major anthropogenic sources of black carbon include off-road transportation, on-road transportation, residential wood burning, fuel combustion, and industrial processes (Figure I-4). The forestry category includes non-agricultural prescribed burning and wildfire emissions. For forest-related sources, wildfires account for the majority of black carbon emissions during a typical year.

²⁸ Per SB 1383, the Proposed SLCP Strategy only addresses anthropogenic black carbon. The Forest Carbon Plan will include the goal to reduce black carbon emissions from unmanaged wildfire events through forest management and restoration activities that are designed to reduce the risk of wildfire.

Because the extent and severity of wildfire varies from year to year, the State’s black carbon inventory uses a 10-year average of fine particulate matter (PM_{2.5}) emissions from wildfire to represent average conditions and avoid large variations (Table I-1). More information on CARB’s black carbon inventory can be found at: www.arb.ca.gov/cc/inventory/slcp/slcp.htm.

Figure I-4. California 2013 Anthropogenic Black Carbon Emission Sources*

*Using 100-year GWP

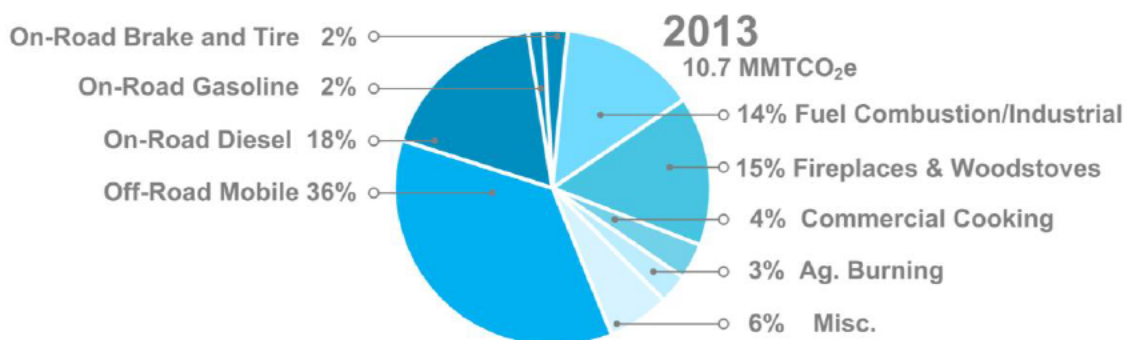


Table I-1. Ten Year Average California Forestry Black Carbon Emissions

Source	MMTCO ₂ e (20-yr)	MMTCO ₂ e (100-yr)
Prescribed Burning	3.6	1.0
Wildfire	86.7	24.4

The exchange of CO₂ between the atmosphere and California’s natural and working lands sector is not currently quantified and therefore, not included in the inventory. A natural and working lands carbon inventory is essential for monitoring land-based activities that may increase or decrease carbon sequestration over time. CARB staff is working to develop a comprehensive inventory of GHG fluxes from all of California’s natural and working lands using IPCC design principles. CARB released the Natural and Working Lands Inventory with the 2017 Scoping Plan Updated Discussion Draft.²⁹ This inventory provides an estimate of GHG emissions reductions and changes in carbon stock from some carbon pools in agricultural and natural and working lands. The CARB Natural and Working Lands Inventory includes an inventory of carbon stocks, stock-change (and by extension GHG flux associated with stock-change) with some attribution by disturbance process for the analysis period 2001–2010. Disturbance processes would include activities such as conversion from one land category to a different category, fire, and harvest. The CARB Natural and Working

²⁹ ARB. 2016. California Greenhouse Gas Inventory - Forests and Other Lands. <https://www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm>

Lands Inventory covers varieties of forests and woodlands, grasslands, and wetlands (biomass-stock-change only). The CARB Natural and Working Lands Inventory includes default carbon densities for croplands and urban/developed lands to facilitate stock-change estimation for natural lands that convert to cropland, natural lands that convert to developed lands, and for croplands that convert to developed lands.

2. Setting the 2030 Statewide Target

The 2030 target set by SB 32 of 40 percent reduction from 1990 levels by 2030 reflects the same science that informs the agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (IPCC), aimed at keeping the global temperature increase below 2 degrees Celsius (°C). The California 2030 statewide target represents the most ambitious GHG reduction goal for North America. Based on the emissions reductions directed by SB 32, the annual 2030 statewide target emissions level for California is 260 MMTCO₂e.

3. Greenhouse Gas Emissions Tracking

California maintains a GHG inventory that is consistent with IPCC practices to allow for comparison of the statewide GHG emissions with those at the national level and with other international GHG inventories. Statewide GHG emissions are calculated using many data sources. The primary data source is from reports submitted to CARB through the Regulation for the Mandatory Reporting of GHG Emissions (MRR). MRR requires facilities and entities with more than 10,000 metric tons of carbon dioxide equivalent (MTCO₂e) of combustion and process emissions, all facilities belonging to certain industries, and all electric power entities to submit an annual GHG emissions data report directly to CARB. Reports from facilities and entities that emit more than 25,000 MTCO₂e are verified by a CARB-accredited third-party verification body. More information on MRR emissions reports can be found at: www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

CARB also relies on data from other California State and federal agencies to develop an economy-wide GHG inventory for the State of California. All data sources used to develop the GHG Inventory are listed in the GHG Emission Inventory supporting documentation at: www.arb.ca.gov/cc/inventory/data/data.htm.

Concurrently, other State agencies, nonprofit organizations, and research institutions are developing and testing methodologies and models to quantify GHG fluxes from California's natural and working lands. CARB's ongoing work on this inventory will serve as one source of data to gauge the scope of GHG reduction potential from California's natural and working lands and monitor progress over time. CARB will evaluate other data sources and methodologies for use in validating or supporting the CARB inventory or project-scale tracking. Interagency work is also underway to integrate and account for the land use and management impacts of development, transportation, housing, and energy policies.

Greenhouse gas mitigation action may cross geographic borders as part of international and subnational collaboration, or as a natural result of implementation of regional policies. It is important to be able to track and attribute GHG reductions toward action and ensure any reductions claimed are real, without any double counting. CARB has begun exploring how to build an accounting framework that utilizes existing program data to better reflect the broader benefits of our policies. The ability for subnational regions to account for shared results of collaborative efforts, such as a linked cap-and-trade program, is important to support continued collaborative action at this level. California believes data transparency is critical to demonstrate real progress toward reducing GHGs in any context and fully understanding the impact of GHG mitigation policies.

D. California’s Approach to Addressing Climate Change

1. Integrated Systems

A comprehensive approach is needed to achieve the State’s climate goals. Therefore, this Proposed Plan integrates and builds upon multiple ongoing State efforts. For example, as we address future mobility, we must show how existing efforts underway—such as the California Sustainable Freight Action Plan, Mobile Source Strategy, California Transportation Plan 2040, High-Speed Rail,³⁰ urban planning, and goals for enhancement of the natural environment—can complement each other while providing multiple environmental benefits, including air quality and climate benefits. Each of these efforts is important in its own right, but considered together they provide insights into the synergies and conflicts between policies and demonstrate how the State will move toward a sustainable and resilient future. For example, land disturbance due to increased renewables through utility scale wind and solar and transmission can release GHGs from soil and disturb grasslands and rangelands that have the potential to sequester carbon. Further, policies that support sustainable land use not only reduce vehicle miles traveled (VMT) and its related emissions, but also avoid land disturbance that could result in GHG emissions or loss of sequestration potential in the natural environment. Identifying these types of trade-offs, and designing policies and implementation strategies to support goals across all sectors, will require ongoing efforts at the local, regional, and State level to ensure that sustainable action across both the built and natural environments help to achieve the State’s long-term climate goals.

2. Promoting Resilient Economic Growth

The existing policies, strategies, plans, and regulations that we already have in place are helping many California businesses to better compete in a global economy, and have created new investments, businesses, and jobs to support a clean energy economy. We have learned that California’s portfolio-based climate strategy can

³⁰ California’s High-Speed Rail is part of the International Union of Railways (UIC) and California signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UN Framework Convention on Climate Change as part of achieving global 2050 targets.

achieve great success when accompanied by consistent and rigorous GHG monitoring and reporting, a robust public process, and an effective enforcement program for the few that choose not to play by the rules. Our experience has also shown us that California's economy and infrastructure can be strengthened while also achieving other important environmental benefits such as reductions in criteria pollutants and toxic air contaminants, especially in California's most vulnerable communities.

The benefits to be achieved consistent with the Proposed Plan are part of California's comprehensive strategy to achieve lasting emissions reductions throughout the economy. California's strategic vision for achieving at least a 40 percent reduction in GHG emissions by 2030 is based on the principle that economic prosperity and environmental sustainability can be achieved together. Undertaking the actions that are presented in Proposed Plan presents opportunities for the future, but progress toward our goals is already evident today. For example, in 2015, California added more than 20,000 new jobs in the solar sector. This was more than half of the new jobs in this industry across the nation. Employment in the clean economy grew by 20 percent between 2002 and 2012, which included the period of economic recession around 2008.³¹ Shifting to clean, local, and efficient uses of energy reinvests our energy expenditures in our local economies and reduces risks to our economy associated with exposure to volatile global and national oil and gas commodity prices. Indeed, a clean economy is a resilient economy.

Achieving our global goals requires a structural shift in the global economy, which is already underway. Successfully driving this transition will require cleaner and more efficient technologies, new policies and incentives that better recognize and reward innovation, and prioritizing low carbon investments. It also requires new policies and incentives at multiple jurisdictional levels to ensure that this transition advances land use and natural resource management objectives for both GHG mitigation and climate adaptation. Synergistic linkages between technological advances and resource stewardship must be intentional to be successful, and must result in sustainable development. These efforts are already underway, as highlighted through the development and implementation of Sustainable Communities Strategies (SCSs) pursuant to Senate Bill (SB) 375, which link transportation, housing, and climate policy, and are designed to reduce per capita GHG emissions while providing benefits ranging from improved air quality and expanded transportation options to revitalization of city centers and investment in disadvantaged communities. SB 375 is just one of many ways to address housing and transportation needs and provide climate benefits. The Proposed Plan identifies new ways to promote the technologies and infrastructure required to meet our collective climate goals, while also presenting the vision for California's continuing efforts to foster a sustainable, clean energy economy.

³¹ California Business Alliance for a Clean Economy. 2015. Clean Energy and Climate Change Summary of Recent Analyses for California. clean-economy.org/wp-content/uploads/2015/01/Clean-Energy-Climate-Change-Analyses_January2015.pdf

3. Protecting, Enhancing, Innovating, and Increasing Sequestration in the Natural Environment and Working Lands

California's natural and working lands make the State a global leader in agriculture, a U.S. leader in forest products, and a global biodiversity hotspot. These lands support clean air, wildlife and pollinator habitat, and rural economies, and are critical components of California's water infrastructure. Keeping these lands and waters intact and at high levels of ecological function (including resilient carbon sequestration) is necessary for the well-being and security of Californians in 2030, 2050, and beyond. Forests, rangelands, farms, wetlands, riparian areas, deserts, coastal areas, and the ocean store substantial carbon in biomass and soils.

Natural and working lands are a key sector in the State's climate change strategy. Substantially storing carbon in trees, other vegetation, soils, and aquatic sediment is the most effective way to remove carbon dioxide from the atmosphere. This Proposed Plan includes policies and programs that prioritize protection and enhancement of California's landscapes, including urban landscapes, and identifies the next steps to ensure management actions are taken to increase the sequestration potential of those resources. We cannot ignore the relationships between sectors or the adverse impacts that climate change is having on the environment itself. We must consider important trade-offs in developing the State's climate strategy by understanding the near and long-term impacts of various policy scenarios and actions on our State and local communities.

4. Improving Public Health

The State has committed to addressing public health issues, including addressing chronic and infectious diseases, controlling tobacco, providing nutrition education and obesity prevention, reducing occupational and other types of injuries, promoting mental health, and protecting communities from environmental exposures and toxins. As part of these efforts, California has been protecting and improving air quality for more than 50 years. State and local regulations have been a model for other states, the federal government, and other countries. Our drive to improve air quality and promote community health and well-being will continue to remain a priority as we address climate change. Several of the strategies included in this plan were primarily developed to help the State achieve ambient air quality standards for air pollutants with direct health impacts, while also delivering GHG reductions.

Climate change itself is already affecting the health of our communities and is exacerbating existing health inequities. Those facing the greatest health burdens include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.³² Economic factors, such as income, poverty, and

³² California Department of Public Health (CDPH). 2015. *The Portrait of Promise: The California Statewide Draft Plan to Promote Health and Mental Health Equity*. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

wealth, are among the strongest determinants of health. Addressing climate change presents a significant opportunity to improve public health for all of California's residents and to further our work toward making our State the healthiest in the nation.

To successfully address public health inequities, we must continue to address environmental concerns in disadvantaged communities. At the same time, to achieve the 2030 target and the longer-term 2050 target, we must move forward with sustainable development. The United Nations defines sustainable development as "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs."³³ By identifying and addressing the disproportionate impacts felt today and planning, designing, and implementing actions for a sustainable future, we can be part of the solution to make public health inequities an issue of the past.

5. Environmental Justice

Fair and equitable climate action requires that the inequities that create and intensify community vulnerabilities be addressed. The capacity for resilience in the face of climate change is significantly driven by living conditions and the forces that shape them, such as access to services such as health care, healthy foods, air and water, and safe spaces for physical activity; income; education; housing; transportation; environmental quality; and good health status. Thus, strategies such as alleviating poverty, increasing access to economic opportunities, improving living conditions, and reducing health and social inequities will result in more climate-resilient communities. Promoting a low carbon California economy will reduce GHG emissions and create a healthier environment for all of California's residents, especially those living in the State's most disadvantaged communities. We must also recognize there is a need to tailor policies to address the unique characteristics of economically distressed communities in the State's rural areas.

The impacts of climate change and the health inequities in our communities share similar root causes: the inequitable distribution of social, political, and economic power. These power imbalances result in systems (i.e., economic, transportation, land use zoning, etc.) and conditions that drive both health inequities and GHG emissions. As a result, we see communities with inequitable living conditions, such as low-income communities of color living in more polluted areas, facing climate change impacts that compound and exacerbate existing sensitivities and vulnerabilities. Effective climate action requires that the inequities that create and intensify community vulnerabilities be addressed.

It is critical that environmental justice communities share in the benefits of the cleaner economy that California is building, including environmental and economic benefits. An example of this is that low-income customers that are enrolled in the California Alternate Rates for Energy (CARE) Program or the Family Electric Rate Assistance (FERA) Program are also eligible to receive a rebate under the California Climate Credit, or a

³³ General Assembly of the United Nations. Sustainable Development. www.un.org/en/ga/president/65/issues/sustdev.shtml

credit on residential and small business energy bills resulting from the sale of allowances received by investor-owned utilities as part of the Cap-and-Trade Program. SB 1018 (Committee on Budget and Fiscal Review, Chapter 39, Statutes of 2012) and other implementing legislation requires that Cap-and-Trade Program auction monies deposited into the GGRF be used to further the purposes of AB 32, while also fostering job creation by promoting in-state GHG emissions reduction projects carried out by California workers and businesses.

Further, SB 535 (De Leon, Chapter 830, Statutes of 2012) and AB 1550 (Gomez, Chapter 369, Statutes of 2016) direct State and local agencies to make significant investments from monies deposited into the GGRF that improve California’s most vulnerable communities. Specifically, these laws require that at least 35 percent of GGRF monies benefit disadvantaged

communities and low-income communities and households. Based on agency data reported as of December 2015, we are on track to meet these goals; 39 percent (\$356 million) of the approximately \$912 million are funding projects located within disadvantaged communities.

Environmental Justice Advisory Committee
 AB 32 calls for CARB to convene an Environmental Justice Advisory Committee (EJAC), to advise the Board in developing the Scoping Plan, and any other pertinent matter in implementing AB 32. It requires that the Committee be comprised of representatives from communities in the State with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income

Environmental Justice Advisory Committee

Martha Dina Argüello	Physicians for Social Responsibility	Los Angeles
Colin Bailey	The Environmental Justice Coalition for Water	Sacramento
Gisele Fong	End Oil	Los Angeles
Tom Frantz	Association of Irrigated Residents	Central Valley
Katie Valenzuela Garcia	Oak Park Neighborhood Association	Sacramento
Sekita Grant	The Greenlining Institute	Statewide
Kevin Hamilton	Central California Asthma Collaborative	Central Valley
Rey León	Valley LEAP	Central Valley
Luis Olmedo	Comité Civico Del Valley	Imperial Valley
Kemba Shakur	Urban Releaf	Bay Area
Mari Rose Taruc	Asian Pacific Environmental Network	Bay Area
Eleanor Torres	The Incredible Edible Community Garden	Inland Empire
Monica Wilson	Global Alliance for Incinerator Alternatives	Bay Area

populations, or both. CARB engaged 13 environmental justice and disadvantaged community representatives for the Proposed Plan, which kicked off the deliberation process with its first EJAC meeting in December 2015.

Environmental Justice Advisory Committee Public Committee Meetings	
December 7, 2015	Sacramento
January 6, 2016	8 locations by webinar
February 5, 2016	San Bernardino
April 4, 2016	Brawley
May 10, 2016	Sacramento
May 24–25, 2016	El Monte
June 6, 2016	8 locations by phone
June 21, 2016	8 locations by webinar
August 11–12, 2016	Huron
August 26, 2016	7 locations by phone
December 21–22, 2016	Bakersfield
January 18, 2017	Sacramento

As with the Initial Scoping Plan and First Update, this Proposed Plan development process to date includes extensive consultation with the EJAC. The consultation for this Proposed Plan also included extensive consultation and engagement directly with disadvantaged communities through 11 community meetings hosted by the EJAC and held throughout the State (see below).

Public Committee Meetings

The Committee has met twelve times across California since December 2015 to discuss this 2030 Target Scoping Plan and develop recommendations.

Statewide Community Engagement Meetings

Starting in July 2016, the EJAC hosted with CARB support, a robust community engagement process, conducting 11 community meetings throughout the State and collecting over 700 individual comments. The community meetings were well received and attended by several hundred residents and local community representatives. Additional community meetings are being planned through spring 2017.

Environmental Justice Advisory Committee Community Meetings	
July 11, 2016	San Bernardino
July 14, 2016	San Diego
July 19, 2016	Oakland
July 25, 2016	Wilmington
July 26, 2016	South Los Angeles
July 28, 2016	Modesto
July 28, 2016	Bakersfield
July 28, 2016	Fresno
July 29, 2016	Sacramento
October 22, 2016	Brawley
November 4, 2016	Orleans

To enhance the community engagement, CARB staff coordinated with staff from local government agencies and sister agencies. At the community meetings, staff from State and local agencies participated in extensive, topic-specific “world café” discussions with local residents at these meetings. The extensive collaboration between the EJAC, State agencies, and local agencies provided local residents the opportunity to meet with local advocates and local and State government officials to share concerns and provide input on ways California can meet its 2030 target while addressing a number of related issues and concerns.

EJAC Recommendations

The EJAC’s recommendations for the Proposed Plan were informed by comments received at community meetings listed above and Committee member expertise. Recommendations were provided for the sector focus areas, overarching environmental justice policy, and California Climate Investments. The Committee also sorted their recommendations into five themes: partnership with environmental justice communities, equity, economic opportunity, coordination, and long-term vision. Finally, the EJAC provided direction that their recommendations are intended “to be read and implemented holistically and not independently of each other.”

The EJAC’s overarching recommendations for partnership with environmental justice communities, equity, coordination, economic opportunity, and long-term vision include the following recommendations:

- Encourage long-term community engagement, a culture shift in California, and neighborhood-level solutions to promote the implementation of the State’s climate plans, using strategies identified by the Committee.

- Improve the balance of reducing greenhouse gases and compliance costs with other AB 32 goals of improving air quality in environmental justice communities while maximizing benefits for all Californians.
- Consider public health impacts and equity when examining issues in any sector and have CARB conduct an equity analysis on the Proposed Plan and each sector, with guidance from the Committee.
- Develop metrics to ensure actions are meeting targets and develop contingency plans for mitigation and adjustment if emissions increases occur as programs are implemented.
- Coordinate strategies between State, federal, and local agencies for strong, enforceable, evidence-based policies to prevent and address sprawl with equity at the center.
- Maximize the accessibility of safe jobs, incentives, and economic benefits for Californians and the development of a just transition for workers and communities in and around polluting industries.
- Ensure that AB 32 economic reviewers come from various areas around the State to represent insights on economic challenges and opportunities from those regions.
- Do not limit the Proposed Plan to examining interventions and impacts until 2030, or even 2050. Plan and analyze on a longer-term scale to prevent short-sighted mistakes and reach the long-term vision, as actions today and for the next 30 years will have impacts for seven generations.
- The Proposed Plan must prioritize GHG reductions and investments in California environmental justice communities first, before other California communities; and the innovation of new technologies or strategies to reach even deeper emissions cuts, whenever possible.
- Convene the Committee beyond the Scoping Plan development process.

The Committee's key Energy sector recommendations include developing aggressive energy goals toward 100 percent renewable energy by 2030, including a vision for a clean energy economy, and prioritizing actions in disadvantaged communities. Highlights of the Green Building sector recommendations include setting goals for green buildings, enforcing GHG reduction targets for existing buildings, and providing upgrades that enable buildings to use renewable energy technologies and water capture. Key Water sector recommendations include encouraging water conservation and recycling and prioritizing safe drinking water for all.

The Committee's key Industry sector recommendations include prioritizing direct emissions reductions in environmental justice communities and replacing the Cap-and-Trade Program with a carbon tax or fee and dividend program. The Committee also recommends eliminating offsets and the allocation of free allowances if the Cap-and-Trade Program continues.

The Committee's key Transportation sector recommendations include increasing access to affordable, reliable, clean, and safe mobility options in disadvantaged

communities, community-friendly land use planning, maximizing electrification, and restricting sprawl.

The Committee's key Natural and Working Lands, Agriculture, and Waste sector recommendations include diverting waste, returning carbon to the soil, not burning biomass, supporting healthy soils as a critical element to land and waste management, and integrating urban forestry within local communities.

Finally, the Committee provided recommendations for California Climate Investments. Those include ensuring that near-term technologies do not adversely impact communities and long-term investments move toward zero emissions, requiring GGRF projects to be transformative for disadvantaged communities as defined by each community, and eliminating funding for AB 32 regulated entities.

The EJAC's recommendations, in their entirety, are included in Appendix A and available at: www.arb.ca.gov/cc/ejac/ejac_recommendations_proposed_plan122216.pdf. At the EJAC's December 21–22, 2016 meeting, CARB provided the Committee with information about how their recommendations were incorporated in the Discussion Draft. CARB will update this information to reflect the Committee's current recommendations, as provided in Appendix A. CARB is also in the process of providing the Committee with information about the recommendations not incorporated in the Proposed Plan, which will be used as the Committee develops its final recommendations for the Final Plan. The Committee will continue to hold regular public meetings to discuss the Proposed Plan and formalize their recommendations to inform the Final Plan. More information about the EJAC and recommendations on the previous Scoping Plans and current Proposed Plan is located at: www.arb.ca.gov/ejac.

6. Relying on Sound Science and Research

Sound science underpins, updates, and strengthens climate policy. The scientific record overwhelmingly and undeniably demonstrates that climate change is occurring. It also connects human-related activities to the atmospheric burden of CO₂ with expansion at an unprecedented rate. In developing this Proposed Plan, time matters. The policies that are included must lead rapidly to real results to avoid the most catastrophic impacts of climate change. The Proposed Plan identifies policies based on solid science and identifies additional research needs, while also recognizing the need for flexibility in the face of a changing climate. Ongoing research to better understand systems where our knowledge is weaker will allow for additional opportunities to set targets and identify actionable policies.

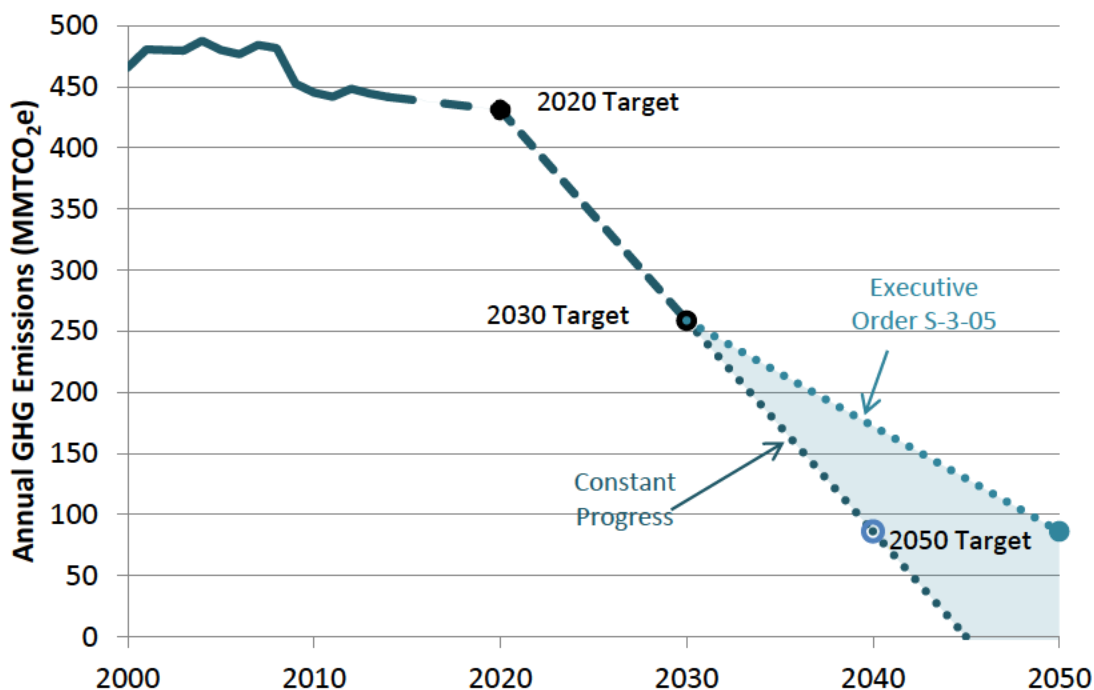
7. Setting the Path to 2050

While the Proposed Plan charts the path to achieving the 2030 GHG emissions reduction target, we need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). In developing the Proposed Plan, we considered what policies are needed for the mid-term and long-term, knowing that some policies for the

long-term must begin implementation now. For example, Zero Net Carbon Buildings is an important strategy to achieve the 2050 target, but work must begin now to review and evaluate research in this area, establish a planning horizon for targets, and identify implementation mechanisms. At the same time, we need to consider policies for 2030 that do not simply dead end in 2030, but rather can continue to help support the State's long-term climate objectives. As with all investments, whether financial or personal, the approach we take must balance risk, reward, longevity, and timing. For the forest sector, are we comfortable with policies that may result in some near-term carbon loss, but ultimately support more resilient and healthier forests in the longer time frame? And, are we willing to pursue policies that we know are needed for the 2050 target, but may not significantly reduce GHG emissions in the near-term?

Figure I-5 illustrates the potential GHG reductions that are possible by making consistent progress between 2020 and the 2050, versus an approach that begins with the 2030 target and then makes progress toward the 2050 level included in Executive Order S-3-05. Depending on the success of our achieving the 2030 target, taking a consistent approach may be possible and would help achieve the 2050 target earlier and potentially prevent global warming of 1.5°C. The path to achieving the 2050 target should leave open the possibility for both paths. Note that Figure I-5 does not include emissions from or sequestration potential from the natural and working lands sector.

Figure I-5. Plotting California's Path Forward



8. Intergovernmental Collaboration

Federal, State, and local action can be complementary. We have already seen federal action through the Clean Air Act, regulations for GHG emissions from passenger cars

and trucks, development of the Clean Power Plan to limit GHGs from power plants, and the advancement of methane rules for oil and gas production. There are also times when California, working with other climate leaders, acts to advance more ambitious federal action and protect the ability of states to move forward to address climate change. Both collaboration and advocacy will mark the road ahead. However, to the extent that California cannot implement policies or measures included in the Proposed Plan because of the lack of federal support, the State will develop alternative measures to achieve the reductions from the same sector to ensure we meet our GHG reduction targets.

Regional and local governments and agencies are leaders in addressing climate change and are uniquely positioned to reduce emissions from certain sources, especially by reducing the demand for electricity, transportation fuels, and natural gas. Many local governments have already initiated efforts to reduce GHG emissions beyond those required by the State. For example, many cities and counties are improving their municipal operations by upgrading their vehicle fleets, retrofitting government buildings and streetlights, purchasing greener products, and implementing waste-reduction policies. In addition, they are adopting more sustainable codes, standards, and general plan improvements to reduce their community's footprints and emissions. The State is striving to provide a supportive framework to advance these and other local efforts, while also recognizing the need to build on, and export, this success to other regional and local governments through California and beyond.

Local actions are critical for implementation of California's ambitious climate agenda. Importantly, at the same time, State policies, programs, and actions—such as many of those identified throughout this Proposed Plan—can help to support, incentivize, and accelerate local actions to achieve mutual goals, and are indeed critical to achieving both State and local goals and priorities for more sustainable and resilient communities. Local municipal code changes, zoning changes, or policy directions that apply broadly to the community within the general plan or climate action plan area can help promote the deployment of renewable, zero emission, and low carbon technologies such as zero net energy buildings, renewable fuel production facilities, and zero emission charging stations. Local decision-making has an especially important role in achieving reductions of GHG emissions generated from transportation. Over the last 60 years, development patterns have led to sprawling suburban neighborhoods, a vast highway system, growth in automobile ownership, and under-prioritization of infrastructure for public transit and active transportation. Local decisions about these policies today can establish a more sustainable built environment for the future. Local governments can incentivize locally generated renewable energy and infrastructure for alternative fuels and electric vehicles, implement water efficiency measures, develop waste-to-energy and waste-to-fuel projects, and preserve and enhance carbon sequestration in both rural and urban landscapes. Indeed, many local agencies are already implementing ambitious climate strategies. These types of local actions complement statewide measures and may be more cost-effective and provide more co-benefits than relying exclusively on top-down statewide regulations to achieve the State's climate stabilization goals. The Proposed

Plan explores the potential benefit of any regional or local targets to assist local agencies in their efforts to address climate change.

9. International Efforts

California is not alone in its efforts to address climate change and is committed to working at the international level to reduce global GHG emissions. The agreement reached in Paris by the 2015 Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at keeping the global temperature rise below 2°C, is spurring action across the world. The results of this agreement will translate into worldwide action to reduce GHGs and support decarbonization across the global economy. And, it is not just action and coordination at the international and national levels that is important. Subnational governments are front and center on this issue. With the establishment of the Under 2 Memorandum of Understanding (MOU),^{34,35} the Governors' Climate and Forests Task Force,³⁶ and the Western Climate Initiative,³⁷ among other partnership initiatives, subnational jurisdictions from around the world are collaborating on how best to address climate change and are leading the way.

From its inception, AB 32 recognized the importance of California's climate leadership and engagement with other jurisdictions, and directed CARB to consult with the federal government and other nations to identify the most effective strategies and methods to reduce GHGs, manage GHG control programs, and to facilitate the development of integrated and cost-effective regional, national, and international GHG reduction programs. California undertook a two-pronged approach: first, we assessed our State-specific circumstances to develop measures that would apply specifically in California; and second, we simultaneously assessed which measures might lend themselves, through careful design and collaboration with other interested jurisdictions, toward linked GHG reduction programs. Under the Clean Air Act, California has a special role as an innovator and leader in the area of motor vehicle emission regulations, which allows our State to adopt motor vehicle emission standards that are stricter than federal requirements. These motor vehicle standards have been emulated around the country and the world, leading to widespread health benefits. Similarly, by enacting a comprehensive strategy that can be exported nationally and internationally, California can lead the world in tackling climate change.

Today, the State's Cap-and-Trade Program is linked with Québec's program; ongoing discussions to link with Ontario's emerging emissions trading system are underway.

³⁴ Under 2 MOU website: under2mou.org/

³⁵ One of the Brown Administration's priorities is to highlight California's climate leadership on the subnational level, and to ensure that subnational activity is recognized at the international level. In the year preceding the Paris negotiations, the Governor's Office recruited subnational jurisdictions to sign onto the Memorandum of Understanding on Subnational Global Climate Leadership (Under 2 MOU), which brings together states and regions willing to commit to reducing their GHG emissions by 80 to 95 percent, or to limit emissions to 2 metric tons CO₂-equivalent per capita, by 2050. The governor led a California delegation to the Paris negotiations to highlight our successful climate programs and to champion subnational action and international cooperation on meeting the challenge of reducing GHG emissions. By the end of 2016, nearly 170 jurisdictions representing more than 1 billion people and more than one-third of the global economy had joined California in the Under 2 MOU.

³⁶ Governors' Climate and Forests Task Force website: www.gcftaskforce.org/

³⁷ Western Climate Initiative website: www.wci-inc.org/

Low carbon fuel mandates similar to California's LCFS have been adopted by the United States Environmental Protection Agency (U.S. EPA) and by other jurisdictions including Oregon, British Columbia, the European Union, and the United Kingdom. Over two-dozen states have a renewables portfolio standard. California is a member of the Pacific Coast Collaborative with Alaska, British Columbia, Oregon, and Washington, who collaborate on issues such as energy and sustainable resource management, among others.³⁸ California continues to discuss carbon pricing through a cap-and-trade program with international delegations. We have seen design features of the State's Cap-and-Trade Program incorporated into other emerging and existing programs, such as the European Union Emissions Trading System and China's emerging national trading program.

Recognizing the need to address the substantial GHG emissions caused by the deforestation and degradation of tropical forests, California worked with a group of subnational governments to form the Governors' Climate and Forests Task Force (GCF) in 2008.³⁹ The GCF is currently comprised of 35 different subnational jurisdictions—including states and provinces in Brazil, Colombia, Indonesia, Ivory Coast, Mexico, Nigeria, Peru, Spain, and the United States—that are contemplating or enacting programs for low-emissions rural development and reduced emissions from deforestation and land use. GCF members continue to engage in discussions to share information and experiences about the design of such programs and how the programs could potentially interact with carbon markets. Ongoing engagement between California and its GCF partners, as well as ongoing discussions with other stakeholders, continues to provide lessons on how such programs could fit within California's Cap-and-Trade Program.⁴⁰

Further, California's High-Speed Rail is part of the International Union of Railways (UIC), and California has signed the Railway Climate Responsibility Pledge, which was commended by the Secretary of the UNFCCC as part of achieving the global 2050 targets. This initiative is to demonstrate that rail transport is part of the solution for sustainable and carbon free mobility.

California will continue to engage in multi-lateral forums that help develop the policy foundation and technical infrastructure for GHG regulations in multiple jurisdictions. Recognizing that many efforts around the world were underway to use market forces to motivate GHG emission reductions, California worked with other governments to establish the International Carbon Action Partnership (ICAP) in 2007. The ICAP

³⁸ Pacific Coast Collaborative website: pacificcoastcollaborative.org/

³⁹ Governors' Climate and Forests Task Force Website: www.gcftaskforce.org/

⁴⁰ ARB staff identified the jurisdictional program in Acre, Brazil, as a program that is ready to be considered for linkage with California, and has committed to proposing regulatory standards for assessing tropical forestry programs and to proposing a linkage with the program in Acre as part of a future rulemaking process. From October 2015 to April 2016, ARB held public workshops that addressed the potential of approving the use of sector-based offset credits from the tropical forestry sector within the Cap-and-Trade Program. ARB will conduct additional stakeholder engagement before proposing any regulatory amendments. Furthermore, reducing emissions from tropical deforestation is a key topic within the United Nations Framework Convention on Climate Change (UNFCCC) and between national and subnational jurisdictions, including through collaboration between California and the U.S. Department of State. Continued evaluation of the tropical forestry sector and other sector-based offset programs further demonstrates California's ongoing climate leadership and could result in partnering on other mutually beneficial climate and low emissions development initiatives, including measures to encourage sustainable supply chain efforts by public and private entities.

provides a forum for sharing experiences and knowledge among jurisdictions that have already implemented or are actively pursuing market-based GHG programs.⁴¹ California has also participated in meetings of the Partnership for Market Readiness (PMR), a multilateral World Bank initiative that brings together more than 30 developed and developing countries to share experiences and build capacity for climate change mitigation efforts, particularly those implemented using market instruments.⁴² In November 2014, CARB became a Technical Partner of the PMR, and CARB staff members have provided technical information on the design and implementation of the Cap-and-Trade Program at several PMR meetings.

Many foreign jurisdictions seek out California's expertise because of our history of success in addressing air pollution and climate change. California also benefits from these interactions. Expanding global action to fight air pollution and climate change expands markets for clean technology. This can bolster business for companies in California developing clean energy products and services and help to bring down the cost of those products globally and in California. Additionally, innovative policies and lessons learned in our partners' jurisdictions can help inform future climate policies in California.

Governor Brown's focus on subnational collaborations on climate change and air quality has strengthened and deepened California's existing international relationships and forged new ones. These relationships are a critical component of reducing emissions of GHGs and other pollutants worldwide. As we move forward, CARB and other State agencies will continue to communicate and collaborate with international partners to find the most cost-effective ways to improve air quality and fight climate change, and to share California's experience and expertise in reducing air pollution and GHGs while growing a strong economy.

⁴¹ International Carbon Action Partnership website: icapcarbonaction.com/

⁴² Partnership for Market Readiness website: www.thepmr.org/

II. The Proposed Scenario

This chapter examines the Proposed Scoping Plan Scenario along with four alternative scenarios in terms of the most important criteria and priorities the State’s comprehensive climate action must deliver. All the scenarios are set against what is called the business-as-usual (BAU) yardstick—that is, what would the GHG emissions look like if we did nothing at all beyond the existing policies that are required and already in place to achieve the 2020 limit. It includes the existing renewables requirements, advanced clean cars, the “10 percent” Low Carbon Fuel Standard, and the SB 375 program for more vibrant communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years.

The Reference scenario (BAU) shows continuing but modest reductions followed by a later rise of GHG emissions as the economy and population grow. The comprehensive analysis of all five alternatives indicates that the Proposed Scenario—continuing the Cap-and-Trade Program with additional reductions from the refinery sector—is the clear choice to achieve the State’s climate and clean air goals. It also protects public health, provides a solid foundation for continued economic growth, and supports California’s quality of life.

All of the alternative scenarios outlined in this chapter are the product of a process of development informed by public input and Board and legislative direction over the course of a year and a half. They also all include a range of additional measures developed or required over the past two years with 2030 as their target date and include: extending the LCFS to 18 percent reduction beyond 2020, the requirements of SB 350 to increase renewables to 50 percent, and doubling energy efficiency savings. They also all include the Mobile Source Strategy with its targets for more zero emission vehicles and much cleaner trucks and transit, the Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission freight handling technologies, and the requirements under SB 1383 to slash black carbon 50 percent, and hydrofluorocarbon and methane emissions by 40 percent.

At this time, work is still underway on how to quantify the GHG emissions within the natural and working lands sector. As such, the analyses in this chapter do not include any estimates from this sector. Additional information on the current efforts to better understand emissions fluxes and model the actions needed to support the goal of net carbon sequestration in natural and working lands can be found in Chapter IV. Even absent any quantification data, the large potential role for this sector in achieving the State’s climate goals should be considered in conjunction with any efforts to reduce GHG emissions in the energy and industrial sectors.

The alternatives CARB evaluated have evolved over time. The original 2016 Concept Paper⁴³ included the following scenarios: cap-and-trade, carbon tax, direct regulations for all industry, and direct regulations for mobile GHG sources. Initial analysis indicated

⁴³ ARB. State of California. 2016. 2030 Target Scoping Plan Update Concept Paper. June 17, 2016. https://www.arb.ca.gov/cc/scopingplan/document/2030_sp_concept_paper2016.pdf

that neither of the latter two scenarios that focused on just prescriptive regulations in the mobile or stationary source sectors could deliver the reductions needed to reach the 2030 target. This led to a three-scenario approach in the December 2016 Discussion Draft⁴⁴: cap-and-trade, a carbon tax, and only prescriptive regulations (on both industry and mobile sources).

As a result of Board direction and public input, including that from the EJAC, the number of alternative scenarios was increased to include the following:

Proposed Scenario: Continuing the Cap-and-Trade Program combined with an additional 20 percent reduction of greenhouse gases in the refinery sector.

Alternative 1: Direct regulations on a wide variety of sectors, such as specific required reductions for all large GHG sources, more renewables, etc.

Alternative 2: A carbon tax to put a price on carbon, instead of the Cap-and-Trade Program.

Alternative 3: All Cap-and-Trade. This would remove the refinery measure and keep the LCFS at 10 percent.

Alternative 4: Cap-and-Tax. This would place a declining cap on industry, and natural gas and fuel suppliers, while also requiring them to pay a tax on each ton of GHG emitted.

Since the statutory direction on GHG reductions is definitive, the issue of certainty of reductions is paramount, and alternatives vary greatly as to the certainty of meeting the target. The year-over-year reductions under a Cap-and Trade Program, for instance, provide certain and measurable reductions over time; a carbon tax, while putting a price on carbon to be sure, may not be enough to drive reductions by altering behavior.

Then there are other considerations: to what extent does an alternative meet the target, but also deliver clean air benefits, prioritize reductions at large stationary sources, and allow for continued investment in disadvantaged communities? Does an alternative allow for California to link with other jurisdictions, and support the Clean Power Plan and other federal climate programs? Does an alternative provide for flexibility for regulated entities, and a cost-effective approach to reduce greenhouse gases?

On balance it is clear that the Proposed Scoping Plan Scenario is the only alternative to meet all the criteria.

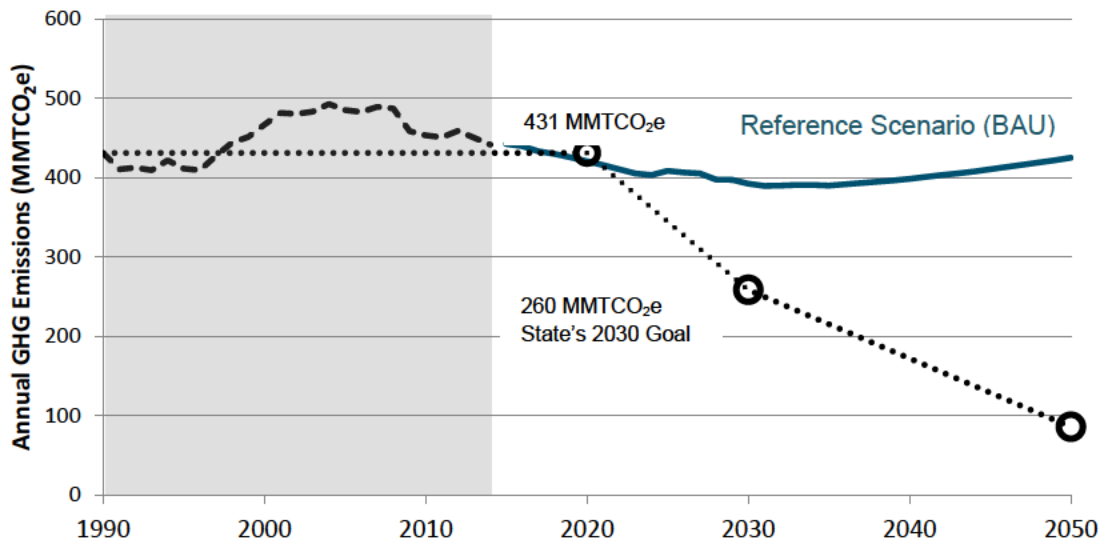
A. Proposed Scoping Plan Scenario

The development of the Proposed Plan began by first modeling a Reference scenario (the BAU). The Reference scenario is the forecasted statewide GHG emissions through 2030 with existing policies and programs, but without any further action to reduce GHGs. Figure II-1 provides the modeling results for a Reference scenario for this

⁴⁴ ARB. 2016. Discussion Draft 2030 Target Scoping Plan Update. December 2, 2016. <https://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>

Proposed Plan. The graph shows the State is expected to reduce emissions below the 2020 statewide GHG target, but additional effort will be needed to maintain and continue GHG reductions to meet the mid- (2030) and long-term (2050) targets. More details about the modeling for the Reference scenario can be found in Appendix D.

Figure II-1. 2030 Target Scoping Plan Reference Scenario



The Proposed Plan is summarized in Table II-1. As shown in the table, most of the measures are identified as “known commitments” (marked with “*”), meaning that they are already underway or required. The known commitments are not part of the Reference scenario in Figure II-1. The two primary newly proposed measures are: (1) a 20 percent reduction by 2030 in GHG emissions in the refinery sector from 2014 levels, and (2) a post-2020 Cap-and-Trade Program.

Policy	Primary Objective	Highlights	Implementation Time Frame
Measure	emissions by 20 percent in the sector.	improve efficiencies across the sector. <ul style="list-style-type: none"> Best available retrofit control technology (BARCT) may be used to identify and implement actions that reduce traditional air pollutants with co-benefits of reducing GHGs. 	
Post-2020 Cap-and-Trade Program	Reduce GHGs across largest GHG emissions sources	<ul style="list-style-type: none"> Continue the existing Cap-and-Trade Program with declining caps to ensure the State's 2030 target is achieved. 	
*These measures and policies are referred to as "known commitments."			

20 Percent Reduction in GHGs at Refineries

The refinery sector was chosen for direct regulation because it includes some of the largest stationary sources of GHG emissions and is part of the largest economic sector of GHG emissions—transportation. Further, this refinery measure prioritizes direct GHG reductions at large stationary sources pursuant to AB 197. Studies have shown that many of the largest sources of emissions are in disadvantaged communities, and in addition to reducing GHG emissions it may provide co-benefits of reducing criteria pollutants and toxic air contaminants in some of the most polluted and disadvantaged communities in the State.

The proposed new regulation to achieve a 20 percent GHG reduction in the refinery sector would require all refineries, by 2030, to achieve the benchmark of the most efficient existing refinery on a simple barrel basis. An efficiency benchmark is reflected as GHG emissions per unit of product. This regulation would not limit mass GHG emissions, but would require facilities to become more efficient through any combination of actions such as fuel switching; boiler electrification; onsite investments in newer, more energy efficient technologies; use of lighter crude slates; and any other process efficiencies that would be identified in consultation with local air districts and CARB. As part of the development process for this measure, other metrics such as complexity-weighted barrel may also be evaluated.

The potential effectiveness of this measure was determined by reviewing the benchmarking data provided by the refineries when the Cap-and-Trade Regulation was being developed. From those data, CARB staff was able to identify the most efficient refinery in the State. Staff then assumed that all refineries could achieve this same efficiency and calculated the resulting emissions using individual refinery production data for 2014. A comparison between the actual reported emissions for 2014 and the emissions calculated by assuming all refineries were as efficient as the most efficient refinery allowed staff to compare the difference between the two values and estimate the GHG difference. While not all refineries are designed the same way and each would be starting from a different efficiency level, this measure assumes some refineries may be able to do more than others to reduce their GHG emissions. Therefore, the actual measure would need to accommodate unique circumstances at individual facilities in this sector.

It would take time to develop and implement regulations for this measure. There would likely need to be several different regulatory paths based on facility type. The final control effectiveness could be different, pending a rulemaking effort that gathers more detail about specific opportunities for reductions that would also need to account for potential increased production activity, especially for biofuels.

One initial implementation step for this measure could be for the State to partner with California's local air districts, which traditionally permit these facilities for criteria pollutants and toxic air contaminants. Together, the State and local air districts could identify efficiency improvement opportunities for stationary source combustion equipment. This strategy would be prioritized for all refinery facilities subject to the

Energy Efficiency Audit⁵⁰ in the areas where Best Available Retrofit Control Technology (BARCT) requirements are applicable.⁵¹ BARCT measures could be implemented through the existing air district BARCT/All Feasible Measures process and would be required to demonstrate reductions of criteria pollutants while accounting for GHG emissions effects. The BARCT determinations also promote consistency of controls for similar emission sources among districts with the same air quality attainment designations. The BARCT/All Feasible Measures process could be required to demonstrate reductions of criteria pollutants and GHGs. Examples of possible BARCT/All Feasible Measures combustion controls include:

- Energy efficiency standards for larger combustion equipment.
- Mandatory equipment replacement requirements.
- Installation of new and emerging technologies.
- Heat rate improvement projects.
- Installation of electronic controls.
- Installation of waste heat recovery systems.
- Optimization study and implementation.

Post-2020 Cap-and-Trade Program with Declining Caps

This measure would extend the existing Cap-and-Trade Program post-2020. The program is up and running and has a four-year-long record of auctions and successful compliance. In the face of a growing economy, dry winters, and the closing of a nuclear plant, it is delivering GHG reductions. This is not to say, by any means, that California should continue on this road simply because the Cap-and-Trade Program is already in place. Far from it, the analyses in this chapter, and the economic analysis in Chapter III, clearly demonstrate that the most secure, reliable, and feasible clean energy future for California—one that will continue to provide crucial investments to improve the quality of life and the environment in disadvantaged communities— partially lies in extending the Cap-and-Trade Program through to 2030.

Under this measure, funds would also continue to be deposited into the Greenhouse Gas Reduction Fund (GGRF) to support projects that fulfill the goals of AB 32. Investment of the Cap-and-Trade Program proceeds furthers the goals of AB 32 by reducing GHG emissions, providing net GHG sequestration, providing co-benefits, investing in disadvantaged communities and low-income communities, and supporting the long-term, transformative efforts needed to improve public and environmental health and develop a clean energy economy. These investments support programs and projects that deliver major economic, environmental, and public health benefits for Californians, including meaningful benefits to the most disadvantaged communities. Investments are providing a multitude of benefits to disadvantaged communities including increased affordable housing opportunities, reduced transit and transportation

⁵⁰ ARB. 2015. Energy Efficiency and Co-Benefits Assessment for Large Industrial Sources - Regulatory Activities. www.arb.ca.gov/cc/energyaudits/energyaudits.htm

⁵¹ Bay Area, El Dorado (partial), Monterey Bay, Placer (partial), Sacramento, San Diego, San Joaquin Valley, South Coast, Ventura, and Yolo-Solano.

costs, access to cleaner vehicles, improved mobility options and air quality, job creation, energy and water savings, and greener and more vibrant communities.

Further, the Cap-and-Trade Program is designed to protect electricity and natural gas residential ratepayers from higher energy prices. The program includes a mechanism for electricity and natural gas utilities to auction their freely allocated allowances, with the auction proceeds being returned to residential ratepayers as a Climate Credit. The Climate Credit is a twice-annual bill credit given to all investor-owned utility and natural gas utility residential customers. The total value of the Climate Credit for just vintage 2013 auction allowances was over \$400 million. The first of these credits appeared on customer bills in April 2014.⁵²

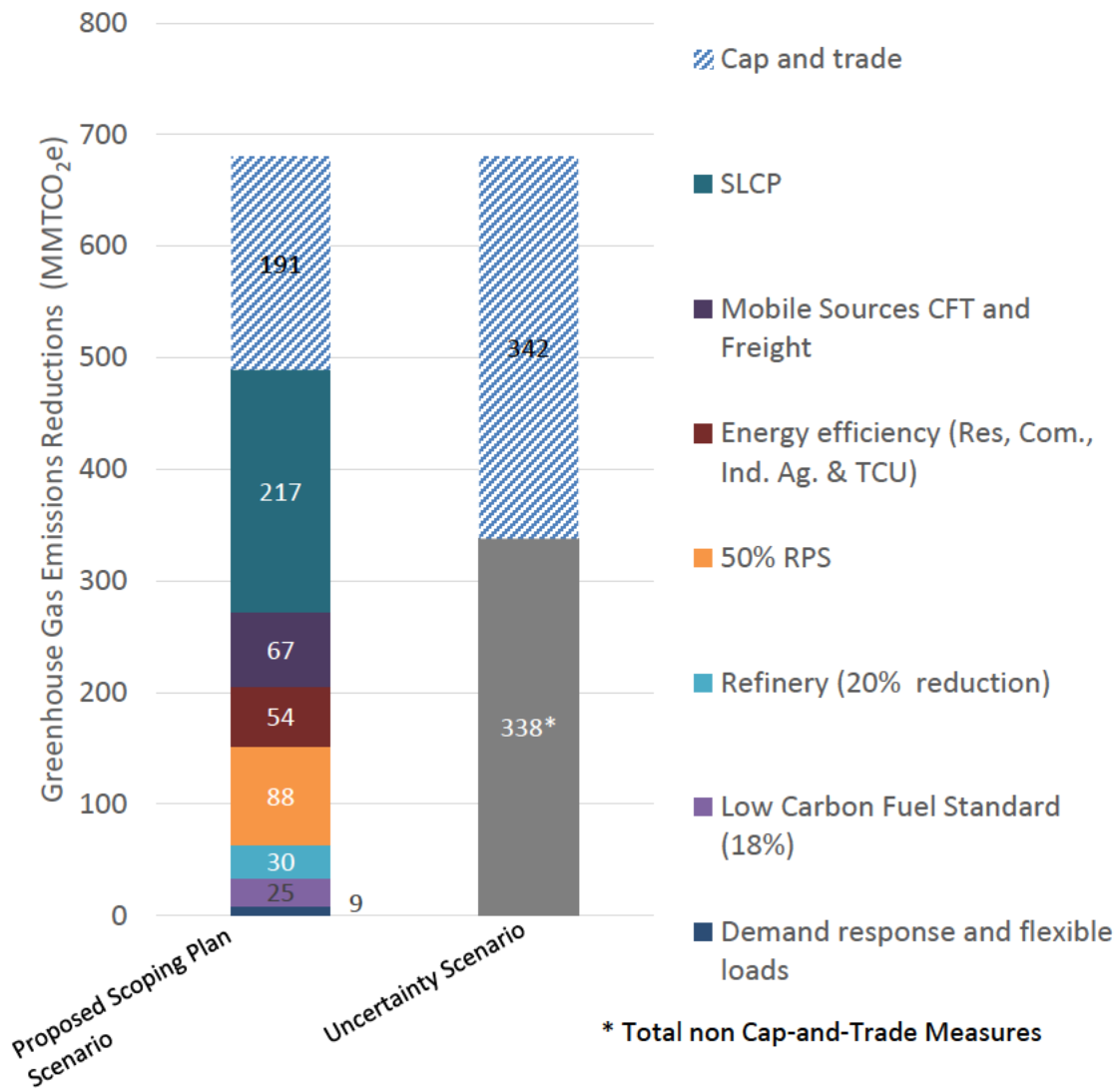
Under this measure, the State would preserve its current linkages and supports future linkages with other jurisdictions, thus facilitating international action to address climate change. The high compliance rates with the Cap-and-Trade Program also demonstrate that the infrastructure and implementation features of the program are effective and understood by the regulated community. This measure also lends itself to integration with the Clean Power Plan requirements and is flexible to allow expansion to other sectors or regions.

While GHG reductions will occur at covered entities under the current design of the Cap-and-Trade Program, CARB has begun the process to evaluate potential changes to program design features that would support greater direct GHG emissions reductions at Cap-and-Trade Program covered entities. These potential program design changes would need to be further evaluated for economic impacts, coordinated with linked partners, and be part of a future rulemaking. The areas to be evaluated include, but are not limited to the following:

- Reducing the offset usage limit. Offset use is currently limited to 8 percent of each covered entity's compliance obligation.
- Redesigning the allocation strategy to reduce free allocation at a rate to support increased technology and energy investment at covered entities to reduce GHG emissions.
- Reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.

⁵² <https://www.arb.ca.gov/cc/capandtrade/allowanceallocation/edu-v2013-allowance-value-report.pdf>

Figure II-2. Proposed Scoping Plan Scenario – Estimated Cumulative GHG Reductions by Measure (2021–2030)



The Proposed Scoping Plan Scenario represents an expected case where current and proposed GHG reduction policies and measures begin as expected and perform as expected, and technology is readily available and deployed on schedule. The GHG reductions with the Uncertainty Scenario represent uncertainty surrounding measure performance. This uncertainty was modeled by assumptions around the ability of the measure to achieve its full estimated potential GHG reductions as provided in the modeled scenario. Measures set in statute, like the 50 percent RPS, are more certain to achieve anticipated, or very close to anticipated, results. Other measures for which no policy mechanism has yet been designed, such as the 20 percent reduction in refinery emissions, may result in more, or fewer, reductions than anticipated, depending on how such a regulation is ultimately designed. Emissions ranges were created for

each measure based on the CARB staff's assessment of reduction uncertainty and stakeholder input.

The uncertainty analysis is conservative in that it assumes measures may achieve fewer reductions, but not greater reductions. The two bars in Figure II-2 represent a range of potential cumulative reductions between 2021 and 2030. An important strength of the Cap-and-Trade Program is that it scales up or down within the overall strategy depending on how the other measures perform. In the Proposed Scoping Plan Scenario, the Cap-and-Trade Program would need to deliver approximately 191 MMTCO₂e net savings of the 680 MMTCO₂e, which would account for about 28 percent of the total reductions between 2021 and 2030. In the Uncertainty Scenario, California still meets its target, even though the direct measures do not meet their predicted effectiveness, because the Cap-and-Trade Program makes up the difference.

Another way to look at this scenario is to understand the trajectory of GHG reductions over time, relative to the 2030 target. Figure II-3 provides the trajectory of GHG emissions modeled for the proposed strategy.

Figure II-3. Proposed Scoping Plan Scenario GHG Reductions

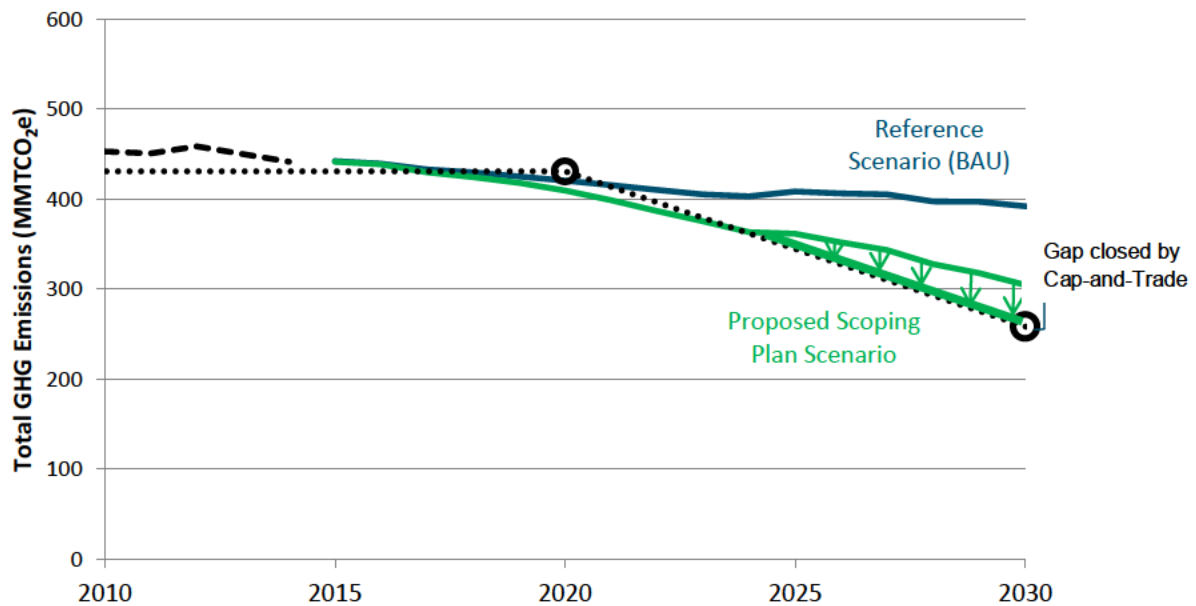


Figure II-3 shows the Reference scenario (blue) and the version of the Proposed Scoping Plan Scenario that excludes the Cap-and-Trade Program (green). Between the periods of 2020 and about 2025, the measures in the Proposed Scoping Plan Scenario constrain GHG emissions below the dotted straight line. After 2025, GHG emissions continue to fall, but at a slower rate than needed to meet the 2030 target. It is the Cap-and-Trade Program that will constrain the emissions to the necessary levels

to achieve the 2030 target. In this scenario, it is estimated that the known commitments and the refinery measure will result in an emissions level of about 305 MMTCO₂e in 2030. Thus, for the proposed scenario, the Cap-and-Trade Program would deliver about 45 MMTCO₂e in 2030 and ensure the 2030 target is achieved.

To understand how the Proposed Plan affects the main economic sectors, Table II-3 provides estimated GHG emissions by sector, compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030. This comparison helps to illustrate which sectors are reducing emissions more than others and where to focus additional actions to reduce GHGs across the entire economy.

Table II-3. Estimated Change in GHG Emissions by Sector

Estimated GHGs by Sector [MMTCO₂e]			
	1990	2030 Proposed Plan Ranges	% change from 1990
Agriculture	26	24–25	-4 to -8
Residential and Commercial	44	38–40	-9 to -14
Electric Power	108	42–62	-43 to -61
High GWP	3	8–11	167 to 267
Industrial	98	77–87	-11 to -21
Recycling and Waste	7	8–9	14 to 29
Transportation (Including TCU)	152	103–111	-27 to -32
Net Sink*	-7	TBD	TBD
Sub Total	431	300–345	-20 to -30
Cap-and-Trade Program	n/a	40–85	n/a
Total	431	260	-40

*Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

The sector ranges may change in response to how the sectors respond to the Cap-and-Trade Program. While the known commitments will deliver some reductions in each sector, the Cap-and-Trade Program will deliver additional reductions in the sectors it covers. Annual GHG reporting and the GHG inventory will track annual changes in emissions, and those will provide ongoing assessments of how each sector is reducing emissions due to the full complement of known commitments, refinery measure, and the Cap-and-Trade Program, as applicable.

B. Scenario Modeling

There are a variety of models that can be used to model GHG emissions. For this plan, the State is using the PATHWAYS model.⁵³ PATHWAYS is structured to model GHG emissions while recognizing the integrated nature of the industrial economic and energy sectors. For example, if the transportation sector adds more electric vehicles, PATHWAYS responds to reflect an energy demand increase in the electricity sector. However, PATHWAYS does not reflect any change in transportation infrastructure and land use demand associated with additional ZEVs on the road. The ability to capture a subset of interactive effects of policies and measures helps to provide a representation of the interconnected nature of the system and impacts to GHGs.

At this time, PATHWAYS does not include a module for natural and working lands. As such, PATHWAYS cannot be used to model the natural and working lands sector, the interactive effects of policies aimed at the economic and energy sectors and their effect on land use or conditions, or the interactive effects of policies aimed at the natural environment and their impact on the economic and energy sectors. For this plan, external inputs had to be developed for PATHWAYS to supply biofuel volumes. The natural and working lands sector is also being modeled separately as described in Chapter IV, Section D. CARB and other State agencies will work to integrate all the sectors into one model to fully capture interactive effects across both the natural and built environments before the next Scoping Plan update.

Lastly, the PATHWAYS assumptions and results in this plan show the significant action that the State must take to reach its GHG reduction goals. It is important to note that the modeling assumptions may differ from other models used by other State agencies. Modeling exercises undertaken in future regulatory proceedings may result in different measures, programs, and program results than those used in the modeling for this Scoping Plan. State agencies will engage on their specific policies and measure development processes separately from CARB Scoping Plan activities, in public forums to engage all stakeholders.

Uncertainty

Several types of uncertainty are important to understand in both forecasting future emissions and estimating the benefits of emission reduction packages. In developing the Proposed Plan, we have forecast a Reference scenario and estimated the GHG emissions outcome of the Proposed Plan using PATHWAYS. Inherent in the Reference scenario modeling is the expectation that many of the existing programs will continue in their current form, and the expected drivers for GHG emissions such as energy demand, population growth, and economic growth will match our current projections. However, it is unlikely that the future will precisely match our projections, leading to uncertainty in the forecast. Thus, the single “reference” line should be understood to represent one possible future in a range of possible predictions. For the Proposed Scoping Plan Scenario, PATHWAYS utilized inputs that are assumptions external to the model. PATHWAYS was provided plausible inputs such as energy demand over time,

⁵³ ARB. 2016. AB 32 Scoping Plan Public Workshops. www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

the start years for specific policies, and the penetration rates of associated technologies. Each of the assumptions provided to PATHWAYS has some uncertainty, which is also reflected in the results. Thus, while the results presented in the Proposed Plan may seem precise due to the need for precision in model inputs, these results are estimates, and the use of ranges in some of the results is meant to capture that uncertainty.

Further, as noted in the November 7, 2016, 2030 Target Scoping Plan Workshop, “All policies have a degree of uncertainty associated with them.”⁵⁴ As this Proposed Plan is meant to chart a path to achieving the 2030 target, additional work will be required to fully design and implement any policies identified in this plan. During the subsequent development of policies, CARB and other State agencies will learn more about technologies, cost, and how each industry works as a more comprehensive evaluation is conducted in coordination with stakeholders. Thus, the actual reductions may be different than what is estimated as part of this plan’s modeling. Given the uncertainty around assumptions used in modeling, and performance uncertainty as specific policies are fully designed and implemented, estimates associated with the Proposed Scoping Plan Scenario are certain to be different than what is actually implemented. One way to mitigate for this risk is to develop policies that can adapt and increase certainty in GHG emissions reductions. Periodic reviews of progress toward achieving the 2030 target and performance of specific policies also provide opportunities for the State to consider any changes to ensure we remain on course to achieve the 2030 target. The need for this periodic review process was anticipated in AB 32, as it calls for updates to the Scoping Plan at least once every five years.

C. Policy Analysis of Proposed Scoping Plan Scenario

The following are key criteria that were considered while evaluating potential policies beyond the known commitments. Also, the results of the economic analysis (presented in Chapter III) were important in the design of the plan.

- **Ensure the State achieves the 2030 target.** The strategy must ensure that GHG emissions reductions occur and are sufficient to achieve the 2030 target.
- **Provide air quality co-benefits.** An important concern for environmental justice communities is for any Proposed Plan to achieve air quality co-benefits.
- **Prioritize Rules and Regulations for Direct GHG Reductions.** Requires CARB in developing this Scoping Plan to prioritize emission reduction rules and regulations that result in direct emission reductions at large stationary sources of GHG emissions sources and direct emission reductions from mobile sources.
- **Provide potential to protect against emissions leakage.** Require any policies to achieve the statewide limits to minimize emissions leakage to the extent possible. Emissions leakage can occur when production moves out-of-state, so there appears to be a reduction in California’s emissions, but the production and

⁵⁴ Bushnell, James. Economic Modeling and Environmental Policy Choice. PowerPoint. Department of Economics, University of California, Davis. <https://www.arb.ca.gov/cc/scopingplan/meetings/110716/bushnellpresentation.pdf>

emissions have just moved elsewhere. This loss in production may be associated with loss in jobs and decreases in the State's gross domestic product (GDP) and could potentially increase global GHG emissions if the production moves to a less efficient facility outside of California.

- **Develop greenhouse gas reduction programs that can be readily exported to other jurisdictions.** Currently, California's Cap-and-Trade Program is linked with Québec's program and is proposing to link with Ontario's cap-and-trade program. At the same time, California's ambitious policies such as the RPS and LCFS have resulted in other regions adopting similar programs.
- **Invest in disadvantaged and low-income communities, and low-income households.** Currently, Cap-and-Trade auction proceeds from the sale of State-owned allowances are appropriated for a variety of programs to reduce GHGs, which lead to job creation and economic development. A minimum of 35 percent of the proceeds are to be invested in projects to benefit disadvantaged communities, low-income communities, and low-income households. It is important to understand if the strategy will require or result in funding to support GHG reductions.
- **Avoid or minimize the impacts of climate change on public health by continuing reductions in GHGs.** Climate change has the potential to significantly impact public health, including increases in heat illness and death, air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.
- **Provide compliance flexibility.** Flexibility is important as it allows each regulated entity the ability to pursue its own path toward compliance in a way that works best for its business model. Flexibility also acknowledges that regulatory agencies may not have a complete picture of all available low-cost compliance mechanisms or opportunities even across the same sector. In addition, under AB 32 and AB 197, the strategy to reduce GHGs requires consideration of cost-effectiveness, which compliance flexibility provides.
- **Support the Clean Power Plan and other federal climate programs.** The Clean Power Plan is the most prominent federal climate regulation applicable to stationary sources, and California will continue to support aggressive federal action, as well as to defend existing programs like the Clean Power Plan. California power plants are expected to be within their limits as set forth by the State's draft compliance plan. However, the State still needs a mechanism to ensure the emissions for the covered electricity generating plants do not exceed the federal limits. This mechanism must be federally enforceable with regard to the affected power plants, and limit their emissions in accordance with the federal limit.

Table II-4 provides an assessment of the Proposed Plan compared to the criteria provided above, while listing which specific policies and measures help to meet the criteria. This assessment is based on CARB staff evaluation as well as the analyses described in Chapter III.

D. Evaluation of Scoping Plan Alternatives

During the development of the Proposed Plan, stakeholders suggested alternative scenarios to achieve the 2030 target. While countless scenarios could potentially be developed and evaluated, the four below were considered, as they were most often included in comments by stakeholders and they bracket the range of potential scenarios. Several of these alternative scenarios were also evaluated in the Initial AB 32 Scoping Plan in 2008 (All Regulations, Carbon Tax).⁵⁵ Since the adoption of the Initial AB 32 Scoping Plan, some of the alternative scenarios have been implemented or contemplated by other jurisdictions, which has helped in the analysis and the development of this plan. This section provides a description and assessment of the alternatives against the policy criteria provided above. These assessments are based on CARB staff's evaluation and the analyses in Chapter III.

1. Alternative 1: No Cap-and-Trade

Alternative 1 includes the known commitments described in Section A of this chapter plus a 30 percent reduction in GHG emissions in the refinery sector, but it does not include a post-2020 Cap-and-Trade Program. To achieve the 2030 target without the Cap-and-Trade Program, significant additional actions beyond the known commitments would have to be put in place to achieve the 2030 target, many of which may currently have implementation barriers. For example, the RPS target of 50 percent would need to be increased to 60 percent or greater, and incentive programs would need statutory authority.

The enhancements to the known commitments and new policies and measures are illustrative of the additional type of action that would be needed in this alternative in the absence of a Cap-and-Trade Program, but they are not necessarily the exact suite of policies or measures that would be selected in the absence of a Cap-and-Trade Program. It is important to note that many of the specific policies and measures included in the modeling for this scenario may have technology, cost, or statutory barriers that may prevent implementation from occurring at this time. The modeled scenario for this alternative provides an illustrative example of how a No Cap-and-Trade alternative could be structured. Additional details of the modeling for this alternative are included in Appendix D. The bullets below summarize additional actions needed beyond the proposed strategy without a cap-and-trade program:

- Enhanced RPS, energy efficiency, LCFS, and refinery measure.
- New GHG prescriptive regulations for industry requiring a 25 percent reduction in the sector by 2030.
- Enhanced GHG prescriptive regulations for refineries requiring a 30 percent reduction in the sector by 2030.
- A low-emission diesel standard.

⁵⁵ ARB. 2013. Initial AB 32 Climate Change Scoping Plan Document.
<https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>

- Additional deployment of ZEVs.
- Incentive programs for early retirement of vehicles and heating, ventilation, and air conditioning systems.
- Increased VMT reductions.
- Increased electrification of the residential sector.
- Increased utilization of renewable natural gas.

Alternative 1 demonstrates the suite of specific measures and regulations that would need to be designed and implemented to achieve the 2030 target without the Cap-and-Trade Program, including establishing new incentive programs for early replacement of vehicles and other equipment. The modeling also assumes that all the policies and measures could be implemented and would perform as expected, which is highly uncertain. Many of the measures in this alternative face technology and cost barriers that must be overcome to ensure the reductions begin as soon as possible. If any measures are unable to be implemented or fail to perform, as needed, new measures would need to be identified, designed, and implemented. The time required to design and implement new measures could impede the State's ability to achieve its 2030 target. The modeling for the Proposed Scoping Plan Scenario already acknowledges some uncertainty for the known commitments; any enhancements called for in this alternative to these policies and measures would further increase the uncertainty of their ability to achieve the required GHG reductions. This alternative would require additional statutory authority and funding to implement the incentive programs. No funding would be generated for GGRF programs, including those in disadvantaged communities. While this alternative could also support air quality co-benefits and public health co-benefits, it has fewer options for mitigating emissions leakage, limited opportunities for linkages, and limited compliance flexibility. This alternative would not generate any funds for GGRF programs. Under Alternative 1, the State would also need to identify a new mechanism to demonstrate compliance with the Clean Power Plan.

2. **Alternative 2: Carbon Tax**

Alternative 2 includes the known commitments described in Section A of this chapter, the 20 percent reduction in GHG emissions at refineries, and a carbon tax in lieu of the post-2020 Cap-and-Trade Program.

A cap-and-trade program and a carbon tax are both carbon pricing mechanisms, but there are important differences. A cap-and-trade program sets an emission cap so that the maximum allowable GHG emission level is known and covered entities will have to reduce GHG emissions. With a carbon tax, there is no mechanism to limit the actual amount of GHG emissions either at a single source or in the aggregate, and a carbon tax requires entities to pay for all of their GHG emissions directly to the State. In other words, a cap-and-trade program provides environmental certainty while a carbon tax provides some carbon price certainty. There is no emissions limit with a carbon tax.

Alternative 2 only achieves the 2030 GHG target if we set the right price—a difficult task to do. A set carbon tax may not actually represent the actual cost of control for the

covered sectors. If we set the price too high, we have made the program unnecessarily expensive, and if we set the price too low, we will not achieve enough GHG reductions to meet the target. An approach to better ensure the GHG target is met is through a flexible tax that can be adjusted annually as part of the GHG emission inventory process. If the emission reductions are insufficient, the tax would be increased the following year to induce the needed GHG reductions. However, this approach is complex and is at odds with the carbon price certainty that many have advocated for as part of a carbon tax option.

This alternative would provide compliance flexibility, as it does not mandate specific actions, and it provides a funding source that could be used to fund GGRF programs or other programs. Moreover, this alternative could provide air-quality benefits, public health benefits, and direct emission reductions if the carbon tax is set appropriately to reduce GHGs. However, there is no obvious way to address trade exposure and to protect against emissions leakage as required under AB 32. One potential strategy to mitigate emissions leakage may be to exempt trade-exposed sectors from the carbon tax, but that would shift the burden to the sectors still subject to the tax and would pick “winners” across sectors as some industries may face a carbon cost and others may not. Any such exemptions would need to consider the role any exempt sector is expected to play in the long run, as supporting high carbon intensive or fossil fuel industry may not align well with the State’s long-term climate goals. Alternative 2 would also forgo any existing and future linkages along the lines of those that exist with the current Cap-and-Trade Program. The State also would need to identify a new mechanism to comply with the Clean Power Plan.

In addition, information is emerging regarding the efficacy of the carbon tax policy in British Columbia (BC), which has a jurisdictional goal of reducing its GHG emissions by at least 33 percent below 2007 levels by 2020.⁵⁶ British Columbia’s current carbon tax is \$30 CAD per metric ton of carbon. It has not increased since 2012, and BC’s emissions have increased by 2.7 percent from 2011 through 2014.⁵⁷ A report provided to the BC government by the Climate Action Leadership team found the province will fail to meet its 2020 target.^{58,59} A progress report issued by the BC government stated, “Some policies lose effectiveness over time if they are not updated. For example, the carbon tax impact effectively diminishes if the rate remains unchanged, as inflation dampens the price signal.”⁶⁰ This highlights the importance of how a carbon tax value is set and may need to change over time, and introduces the potential for some uncertainty around political support for higher carbon tax values. And, if data come to light that such an existing carbon tax is not working to achieve the State’s climate goals,

⁵⁶ British Columbia. Greenhouse Gas Reduction Targets Act. <http://www2.gov.bc.ca/gov/content/environment/climate-change/policy-legislation-programs/climate-action-legislation#GGRTA>

⁵⁷ British Columbia, Environmental Reporting BC. 2016. Sustainability. Trends in Greenhouse Gas Emissions in B.C. (1990–2014). <http://www.env.gov.bc.ca/soe/indicators/sustainability/ghg-emissions.html>

⁵⁸ British Columbia. Climate Leadership Team. <http://www2.gov.bc.ca/gov/content/environment/climate-change/policy-legislation-programs/climate-leadership-team>

⁵⁹ British Columbia. Climate Leadership Team. 2015. Recommendations to Government. October 31. http://engage.gov.bc.ca/climateleadership/files/2015/11/CLT-recommendations-to-government_Final.pdf

⁶⁰ British Columbia. 2014. Climate Action In British Columbia: 2014 Progress Report. <http://www2.gov.bc.ca/assets/gov/environment/climate-change/policy-legislation-and-responses/2014-progress-to-targets.pdf>

additional policies, such as prescriptive regulations, may need to be introduced, and they may need to be aggressive to make up for the time when reductions did not materialize as expected.

3. **Alternative 3: All Cap-and-Trade**

Alternative 3 is a variant of the Proposed Scoping Plan Scenario and would rely more heavily on the Cap-and-Trade Regulation. However, since the majority of this scenario is comprised of actions under the known commitments, with several in response to statutory requirements, there are only a limited number of policies and measures that can be removed. Alternative 3 is the Proposed Scoping Plan Scenario minus the 20 percent refinery sector measure and maintaining the LCFS stringency at a 10 percent reduction in carbon intensity through 2030.

This alternative meets the criteria outlined in Section C of this chapter similar to the staff proposal, with one exception. This alternative is not as responsive to the direction in AB 197, as it does not prioritize direct GHG reductions at large stationary sources. It may also limit progress in developing low carbon fuels, which will be needed in increasing quantities to meet 2030 and 2050 climate goals.

4. **Alternative 4: Cap-and-Tax**

Alternative 4 is a variant of Alternative 2 (Carbon Tax) with some features from the Proposed Scoping Plan Scenario. This alternative is designed to cap GHG emissions and incorporate carbon pricing through a tax. This alternative is structured to be the same as Alternative 2 with known commitments and a 20 percent refinery sector measure. Under this alternative, entities that would be covered by a post-2020 Cap-and-Trade Program would instead have an annual cap that declines each year from 2021 to 2030 for each covered entity. Each year, these entities would be required to reduce their emissions by the established annual cap decline and pay a tax to the State for each metric ton of GHGs they emit that year. There would be no trading mechanism in this alternative. This mechanism would be expected to deliver 191 MMTCO_{2e} cumulative GHG emission reductions. Or, 221 MMTCO_{2e} if the refinery measure is combined with the shortfall of 191 MMTCO_{2e} and all stationary facilities currently under the cap are part of this policy.

The modeling for Alternative 1 provides some insights into the potential design elements for this alternative. Modeling for Alternative 1 already assumes a 30 percent reduction in the refinery sector by 2030, or annual cap decline of 3 percent. And, the modeling assumes a 25 percent reduction in the industrial and oil and gas sectors, or 2.5 percent cap decline between 2021 and 2030. Alternative 1 also includes enhancements to some known commitments that may not be feasible to achieve. Holding the known commitments to the stringency in the Proposed Scoping Plan Scenario would require the annual cap decline in the refinery, industrial, and oil and gas sectors to be increased beyond the 3 and 2.5 percent, respectively. Further, this alternative would not rely on a carbon price signal to drive the GHG reductions; rather, the carbon tax may functionally act as a payment for every metric ton of GHGs emitted, and the cap may be the actual

constraint on emissions. Without a trading mechanism, compliance flexibility is reduced. To this point, the state of Washington has adopted its Clean Air Rule that caps and requires reductions at their covered entities.⁶¹ But, in the design of the rule, it became clear that not all covered entities could achieve the annual reductions of approximately 2 percent (lower cap decline than what California would need), and an offset and limited trading mechanism were added to the rule to provide compliance flexibility.

Under Alternative 4, direct GHG emissions reductions would occur at each covered entity and this alternative would provide a funding source for other actions, including climate investments in disadvantaged communities. By including a declining cap, GHG emissions reductions toward achieving the State's target are more certain if other measures deliver the anticipated reductions. This also may not be the most cost-effective way to meet the State's climate goals. This alternative would introduce two costs—(1) onsite investments for reductions at a higher cost or reductions in production, and (2) a carbon tax for actual emissions paid to the State—that must be absorbed by the covered entity or passed on to consumers. In the Cap-and-Trade Program, some allowances can be provided to help reduce the cost-pass through to consumers that may otherwise make the industry less competitive with other producers not subject to a carbon cost. Further, some sources may not be able to achieve a required percent reduction in GHGs each year, forcing them to cut production to meet their annual caps, potentially affecting jobs and the price of their products. This would negatively impact both the California economy and global GHG emissions. Goods that are currently produced in California would be produced elsewhere potentially reducing in-state employment. Assuming California residents still want buy these products, they would be produced out-of-state and imported in, potentially increasing GHG emissions. Under Alternative 4, there are limited mechanisms to address emissions leakage, which may increase under this scenario.

Developing such a program would require several years to design, as each large economic sector (energy, transportation, and industry) may need to have different annual reduction percentages based on the ability for that sector to achieve those reductions while minimizing for emissions leakage and avoiding high costs to consumers. Even within the industrial sector, there will need to be careful consideration of annual percentage reductions among industry. The Cap-and-Trade Program currently distinguishes between over 30 industrial sectors for purposes of free allowance allocation and minimizing emissions leakage. There would also be a need for extensive regulatory efforts to ensure that, without a hard cap on aggregate emissions, a host of separate facilities and sources achieve enough reductions to meet the 2030 target. This scenario may also result in fewer opportunities for linkages with subnational or national programs, since other jurisdictions have not adopted these types of programs. There would still be a need to identify a backstop measure under the Clean Power Plan if the power plants were not able to achieve the required reductions each year as identified in the State's compliance plan.

⁶¹ <http://www.ecy.wa.gov/climatechange/carbonlimit.htm>

III. Evaluations

A. Existing Programs for Air Quality Improvement in California

For half a century, CARB has been a leader in measuring, evaluating, and reducing sources of air pollution. Its air pollution programs have been adapted for national programs and emulated in other countries. Significant progress has been made in reducing diesel particulate matter (PM) and many other hazardous air pollutants. CARB partners with air districts to address stationary emissions sources and adopts and implements State-level regulations to address sources of criteria and toxic air pollution, including mobile sources. The key air quality strategies being implemented by CARB include the following:

- **State Implementation Plans.**⁶² Strategy and proposed control measures designed to achieve the emission reductions from mobile sources, fuels, stationary sources, and consumer products necessary to meet ozone and fine PM attainment deadlines established by the Clean Air Act.
- **Diesel Risk Reduction Plan.**⁶³ The plan recommends many control measures to reduce the risks associated with diesel PM and achieve a goal of 85 percent PM reduction by 2020. Diesel PM accounts for approximately 60 percent of the current estimated inhalation cancer risk for background ambient air.⁶⁴
- **Sustainable Freight Action Plan.**⁶⁵ Strategy to improve freight efficiency, transition to zero emission technologies, and increase competitiveness of California's freight system.
- **AB 32 Scoping Plan.**⁶⁶ Comprehensive strategy to achieve the State's climate goals.
- **AB 1807.**⁶⁷ CARB is required to use certain criteria in prioritizing the identification and control of air toxics.
- **AB 2588 Air Toxics "Hot Spots" Program.**⁶⁸ The goals of the program are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and to reduce those significant risks to acceptable levels.

To support efforts to advance the State's toxics program, the Office of Environmental Health Hazard Assessment (OEHHA) finalized a new health risk assessment methodology on March 6, 2015.⁶⁹ In light of this update, CARB is collaborating with air districts in the review of the existing toxics program under AB 2588 to strengthen the program.

⁶² ARB. 2016. California State Implementation Plans. <https://www.arb.ca.gov/planning/sip/sip.htm>

⁶³ ARB. 2000. Final Diesel Risk Reduction Plan with Appendices. <https://www.arb.ca.gov/diesel/documents/rppapp.htm>

⁶⁴ ARB and California Air Pollution Control Officers Association. 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23. <https://www.arb.ca.gov/toxics/rma/rmgssat.pdf>

⁶⁵ ARB. 2016. Sustainable Freight Transport. <https://www.arb.ca.gov/gmp/sfti/sfti.htm>

⁶⁶ ARB. 2016. AB 32 Scoping Plan. <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

⁶⁷ ARB. 2014. California Air Toxics Program – Background. <https://www.arb.ca.gov/toxics/background.htm>

⁶⁸ ARB. 2016. AB 2588 Air Toxics "Hot Spots" Program. <https://www.arb.ca.gov/ab2588/ab2588.htm>

⁶⁹ OEHHA. 2015. Notice of Adoption of Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments 2015. <http://oehha.ca.gov/air/cmr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0>

While the efforts to date have made a large impact on criteria and toxic emissions, and emissions are expected to continue to decline, more needs to be done to achieve healthful air and reduce community exposure to air pollution, especially in disadvantaged communities. To that end, California is pursuing a multipronged approach to reduce air pollution and address community exposure. In addition to continuing the many programs and policies to improve air quality, the following efforts are critical to addressing the disadvantaged community concerns:

- Take additional action to reduce industrial source emissions, with a focus on near-source exposure through CARB and air district actions.
- Integrate emissions and program data for toxics, criteria pollutants, and GHGs.
- Develop direct State measures that address each of these emissions sources, such as the Mobile Source Strategy and Sustainable Freight Action Plan.
- Implement Adaptive Management to monitor for and address any unlikely increases in toxic or criteria pollutant emissions due to implementation of the Cap-and-Trade Program.
- Work with air districts to assess emission reduction opportunities.
- Continue the toxics review process underway in response to OEHHA's risk methodology update.
- Continue implementation and enforcement of diesel risk reduction measures.
- Improve emissions inventory and data transparency.

B. AB 197 Measure Analyses

This section provides the required AB 197 estimates for the measures evaluated in this Proposed Plan. These estimates provide information on the relative impacts of the evaluated measures when compared to each other. Understanding if a measure will increase or reduce criteria pollutants or toxic air contaminant emissions, or if increasing stringency at additional costs yields few additional GHG reductions, supports the design of a suite of policies that result in GHG reductions, air quality co-benefits, and cost-effective measures. To this end, AB 197 (Garcia, Chapter 250, Statutes of 2016) requires the following for each potential reduction measure evaluated in any scoping plan update:

- The range of projected GHG emissions reductions that result from the measure.
- The range of projected air pollution reductions that result from the measure.
- The cost-effectiveness, including avoided social costs, of the measure.

The next three sub-sections provide the required AB 197 estimates for the measures evaluated in this Proposed Plan. As the Proposed Plan was developed, it was important to understand if any of the proposed policies or measures would increase criteria pollutant or toxic air contaminant emissions. Note the important caveats around some of the estimates; they must be considered when using the information in the tables below for purposes other than as intended.

1. **Estimated Emissions Reductions for Evaluated Measures**

For many of the existing programs with known commitments, such as the Mobile Source Strategy, previous analyses provide emission factors or other methods for estimating the impacts required by AB 197. Where available, these values were used. In some cases, estimates are based on data from other sources, such as the California Public Utilities Commission (CPUC) Renewables Portfolio Standard Calculator. For newly proposed measures, such as the refinery measures, assumptions were required to estimate the values. Consequently, the estimates for the newly proposed measures have substantial uncertainty. The uncertainty in the impacts of these measures would be reduced as the measures are defined in greater detail during the regulatory processes that are undertaken to define and adopt the programs. For example, as a measure is developed in detail, ways to obtain additional co-pollutant reductions or avoid co-pollutant increases may be identified and evaluated.

Table III-1 provides the estimates for the measures evaluated during the development of the Proposed Plan. Based on the estimates below, the Proposed Plan will provide air quality benefits. The table also provides important context, limitations, and caveats about the values.

As shown, the table includes GHG, criteria pollutant, and diesel PM estimates. As mentioned above, diesel PM accounts for 60 percent of the current estimated inhalation cancer risk for background ambient air. CARB is evaluating which additional toxic air contaminants can be estimated for the potential measures below.

Table III-1. Ranges of Estimated GHG and Air Pollution Reductions by Policy or Measure in 2030

Important: These estimates assume a 1:1 relationship between changes in GHGs, criteria pollutants, and toxic air contaminant emissions, and it is unclear whether that is always the case. The values should not be considered estimates of absolute changes for other analytical purposes. The ranges are estimates that represent current assumptions of how programs may be implemented; actual impacts may vary depending on the design, implementation, and performance of the policies and measures. The table does not show interactions between measures, such as the relationship with increased transportation electrification and associated increase in energy demand for the electricity sector. **The measures in bold are included in the Proposed Plan.**

Measure	Range of GHG Reductions (MMTCO₂)*	Range of NOx Reductions (Tons/Day)	Range of VOC Reductions (Tons/Day)	Range of PM_{2.5} Reductions (Tons/Day)	Range of Diesel PM Reductions (Tons/Day)
50% Renewables Portfolio Standard (RPS)	13–15	1.9–2.4	0.2–0.3	1.4–1.7	< 0.01
Mobile Sources CTF and Freight	12–14	64	6.0	1.1	6.8
18% Carbon Intensity Reduction Target for LCFS - Liquid Biofuels	~4	4.0–4.9	0.6–0.7	0.5–0.6	—
20% Refinery Measure	2–5	0.4–0.5	0.5–0.6	< 0.1	< 0.01
Short-Lived Climate Pollutant Strategy	17–35 (CO ₂ e 100-yr GWP)	—	—	—	< 0.01
10% of residential and commercial electric space heating, water heating, A/C, and refrigeration are assumed to be flexible by 2018	~2	0.3–0.4	< 0.1	0.2–0.3	(< 0.01)
60% RPS and additional 10 GW behind-the-meter solar PV*	~14	1.0–1.3	0.1–0.2	**	—

— CARB is evaluating how to best estimate these values.

Criteria and toxic values are shown in tons per day, as they are episodic emissions events with residence times of a few hours to days, unlike GHGs, which have atmospheric residence times of many decades.

A. Due to the inherent flexibility of the Cap-and-Trade Regulation, as well as the overlay of other complementary GHG reduction measures, the mix of compliance strategies that individual facilities may use is not known. However, based on current law and policies that control industrial and electricity generating sources of air pollution, and expected compliance responses, CARB believes that emissions increases at the statewide, regional, or local level due to the regulation are not likely. A more stringent post-2020 cap-and-trade program will provide an incentive for covered facilities to decrease GHG emissions and any related emissions of criteria and toxic pollutants. Please see CARB's Co-Pollutant Emissions Assessment for a more detailed evaluation of a cap-and-trade program and associated air emissions impacts: <https://www.arb.ca.gov/regact/2010/capandtrade10/capv6appp.pdf>

B. A carbon tax has the same inherent flexibility of a cap-and-trade program, with the distinction that without a cap, a carbon tax option may not result in any emissions reductions for GHGs or other air emissions. If a carbon tax resulted in the same amount of GHG reductions as the cap-and-trade measure, we would expect similar types of compliance responses and similar impacts to criteria and toxics emissions.

NO_x = nitrogen oxides; VOC = volatile organic compound

2. Estimated Economic Benefits for Evaluated Measures

Consideration of the social costs of carbon is a requirement in AB 197, including evaluation of cost-effectiveness for measures within this Proposed Plan. The U.S. Environmental Protection Agency (U.S. EPA) describes the social costs of carbon as follows:

EPA and other federal agencies use the social cost of carbon (SC-CO₂) to estimate the climate benefits of rulemakings. The SC-CO₂ is an estimate of the economic damages associated with a small increase in carbon dioxide (CO₂) emissions, conventionally one metric ton, in a given year. This dollar figure also represents the value of damages avoided for a small emission reduction (i.e., the benefit of a CO₂ reduction).

The SC-CO₂ is meant to be a comprehensive estimate of climate change damages and includes, among other things, changes in net agricultural productivity, human health, property damages from increased flood risk and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning. However, it does not currently include all important damages. The IPCC Fifth Assessment report observed that SC-CO₂ estimates omit various impacts that would likely increase damages. The models used to develop SC-CO₂ estimates do not currently include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature because of a lack of precise information on the nature of damages and because the science incorporated into these models naturally lags behind the most recent research. Nonetheless, the SC-CO₂ is a useful measure to assess the benefits of CO₂ reductions.⁷⁰

There continues to be active discussion within government and academia about the role of SC-CO₂ in assessing regulations, quantifying avoided climate damages, and the monetizing values themselves. To date, federal agencies such as the U.S. EPA, Department of Energy, and Department of Transportation have used SC-CO₂ in evaluating regulations.

The IPCC has stated that SC-CO₂ estimates are likely underestimated due to the omission of significant impacts that cannot be accurately monetized.⁷¹ In addition, the SC-CO₂ does not account for impacts related to changes in criteria pollutants or toxics resulting from GHG focused policies and programs.

The cost-effectiveness of regulations and policies represents the cost to control each unit of emissions, and is the traditional cost metric associated with emission control.

⁷⁰ U.S. Environmental Protection Agency. EPA Fact Sheet. Social Cost of Carbon.

www3.epa.gov/climatechange/Downloads/EPAactivities/social-cost-carbon.pdf

⁷¹ https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch3s3-5-3-3.html

SC-CO₂ allows California to begin to examine a different metric, the costs of no action, or the damages.

There may be technologies or policies that do not appear to be cost-effective when compared to the SC-CO₂ associated with the avoided GHG reductions. However, these actions may result in other benefits that are not reflected in the SC-CO₂, including diversification of the portfolio of transportation fuels (a goal outlined in the Low Carbon Fuel Standard) and reductions in criteria pollutant emissions from power plants (as in the Renewables Portfolio Standard). Regulatory mandates help to broaden the deployment of these technologies and address market failures. Policies may also reduce the cost of production and utilization of lower carbon technologies over time, helping the State achieve its climate goals and potentially providing other economic benefits such as clean economy jobs.

This Proposed Plan uses the SC-CO₂ to incorporate the concept of the avoided cost of economic damages due to climate change—including a range for the economic benefits that occur as a result of the avoided environmental damages that result from achieving the 2030 target. The State will continue to monitor and engage in discussions related to any updates to U.S. EPA's SC-CO₂ methods and values and initiate its own work to refine a SC-CO₂ method and values for California.

Table III-2 provides the ranges for the avoided value of economic damages in the year 2030. The U.S. EPA SC-CO₂ values in 2030 of \$16 using the 5 percent discount rate, \$50 using the 3 percent discount rate, and \$73 using the 2.5 percent discount rate were translated into 2015 dollars and multiplied across the range of estimated reductions by measure in 2030 to estimate the value of climate benefits from each measure in that year.⁷² Since all the measures are aimed at reducing GHGs, they all result in avoided economic damages. The Proposed Plan is a suite of policies developed to reduce GHGs to a specific level in 2030, and any alternative scenario that also achieves the 2030 target will have the same avoided economic damages for the single year 2030, which is equivalent to \$7.6 billion using the 3 percent discount rate, and ranges from \$2.4 to \$11.0 billion using the 2.5 to 5 percent discount rates.

⁷² The U.S. EPA SC-CO₂ values are in 2007 dollars. In 2015 dollars, \$16, \$50, and \$73 in 2007 translates to about \$18, \$57, and \$83, respectively, based on the Bureau of Labor Statistics CPI Inflation Calculator.

Table III-2. Estimated Climate Benefits (Avoided Economic Damages) by Policy or Measure in 2030

Measure (Measures in bold are included in the Proposed Plan)	Range of GHG Reductions (MMTCO ₂ *)	Range of Social Cost of Carbon \$million USD (2015 dollars)
50% Renewables Portfolio Standard (RPS)	13–15	\$230–\$1,260
Mobile Sources CTF and Freight	12–14	\$170–\$1,200
18% Carbon Intensity Reduction Target for LCFS -Liquid Biofuels	~4	\$55–\$340
20% Refinery Measure	2–5	\$55–\$460
Short-Lived Climate Pollutant Strategy	17–35 (CO ₂ e)	n/a
10% of residential and commercial electric space heating, water heating, A/C, and refrigeration are assumed to be flexible by 2018	~2	\$55–\$170
60% RPS and additional 10 GW behind-the-meter solar PV*	~14	\$230–\$1,200
25% Carbon Intensity Reduction Target for LCFS and a Low-Emission Standard - Liquid Biofuels*	~5	\$55–\$460
30% Refinery*	1–3	\$55–\$285
25% Industry	2–7	\$55–\$630
25% Oil and Gas	1–3	\$55–\$285
5% Increased Utilization of RNG (core and non-core)	~2	\$55–\$170
Mobile Source Strategy (CTF) with Increased ZEVs in South Coast and early retirement of LDVs with more efficient LDVs*	5–8	\$55–\$685
2x additional achievable energy efficiency in the 2015 IEPR	6–8	\$115–\$685
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps and res. electric stoves) and early retirement of HVAC*	6–9	\$115–\$800
Cap-and-Trade Program	45–100	\$800–\$8,400
Carbon Tax	45–100	\$800–\$8,400
Proposed Scenario	132.4	\$2,400-\$11,000
<p>Note: The SC-CO₂ ranges are representative of the relative values across the measures evaluated in the development of this scoping plan. They should be considered in the context of the uncertainty in the estimated GHG reductions in 2030 and the U.S. EPA definition of the SC-CO₂ and what the values represent over the course of a single year.</p> <p>*Where enhancements have been made to a measure or policy, the ranges in emissions reductions are incremental to the original measure. For example, the ranges for the 60% RPS are incremental to the emissions ranges for the 50% RPS.</p> <p>**All values have been rounded.</p> <p>~Some measures do not show a significant change in 2030 when there is an incremental increase in measure stringency or when modeling uncertainty was factored.</p>		

3. Estimated Cost Per Metric Ton by Measure

AB 197 also requires an estimation of the cost-effectiveness of the potential measures evaluated for the Proposed Plan. The values provided in Table III-3 are estimates of the cost per metric ton of estimated reductions for each measure in 2030. These estimates do not reflect the costs or GHG reductions of measures across all years, but focus solely on 2030. Depending on the measure, there will be costs or savings per metric ton of GHGs reduced. The costs represent the incremental costs to achieve the GHG reductions beyond the Reference scenario (BAU). While it is important to understand the relative cost effectiveness of measures in the table below, the economic analysis presented later in this chapter provides a more comprehensive analysis of how the Proposed Plan and alternative scenarios affect the State's economy and jobs.

CARB will expand this analysis to include an evaluation of the cost per metric ton based on the net present value of the cumulative GHG emissions reductions and costs for each potential measure from 2021 through 2050, in order to capture the fuel and GHG savings over the full economic lifetime of investments made to meet the 2030 GHG goal.

Table III-3 presents one way of estimating the cost (or savings) per tonne of CO₂e reduced for each of the measures in the Proposed Scoping Plan Scenario and the Alternative 1 scenario. The measures selected reflect many factors beyond the cost per tonne of an individual measure, including existing laws and policies, implementation feasibility, fuel diversity and technology transformation goals, as well as health and other benefits to California. These considerations are not reflected in the metric below.

Furthermore, many of the measures interact with other measures, making it analytically difficult to isolate the cost and GHG savings of an individual measure. For example, renewable electricity impacts the cost and GHG savings associated with electric vehicles. Likewise, electric vehicles impact the value of other flexible loads to the system, and the cost of meeting the low-carbon fuel standard directly depends on the success of other transportation measures, just to name a few examples.

For most of the measures shown in Table III-3, the 2030 cost per tonne metric is isolated from the other measures by performing a series of sensitivity model runs in the California PATHWAYS model. This cost per tonne metric is calculated as the difference in the 2030 annualized cost (or savings) of the PATHWAYS Scoping Plan (or Alternative 1) scenario as compared to the annualized cost of the Scoping Plan (or Alternative 1) scenario **excluding** that particular measure. This cost (or savings) delta is divided by the difference in 2030 GHG emissions in the scenario as compared to the scenario **excluding** that particular measure.

By removing each measure in isolation from the rest of the measures in the scenario, this approach results in an estimate of the annual incremental average cost (or cost savings) per tonne of the measure, relative to the Proposed Scoping Plan (or Alternative 1) scenario.

Costs that represent transfers within the state, such as incentive payments for early retirement of equipment, are not included in this California total cost metric. The cost ranges shown below represent some of the uncertainty inherent in estimating this metric. The details of how the ranges for each measure were estimated are described in the footnotes below. All cost estimates have been rounded representing further uncertainty in individual values.

It is important to note that this cost per tonne metric does not represent an expected market price value for carbon mitigation associated with these measures. In addition, since the table below reports a single year (2030) snap-shot of costs and savings, it does not capture the fuel savings or GHG savings associated with the full economic lifetime of measures that are implemented in 2030, but whose impacts extend beyond 2030, nor does it capture the climate or health benefits of the GHG mitigation measures.

For the measures where other sources beyond the PATHWAYS model are used to develop estimates of the cost per tonne, this is noted in the table below.

Table III-3. Estimated 2030 Cost Per Metric Ton by Measure

Measure	Cost/metric ton in 2030*
50% Renewables Portfolio Standard (RPS)^a	\$100 to \$300
Mobile Sources CFT and Freight^b	<\$50
Liquid Biofuels (18% Carbon Intensity Reduction Target for LCFS)^c	\$250
20% Refinery Measure^d	\$70 to \$200
Short-Lived Climate Pollutant Strategy	TBD
10% of residential and commercial electric space heating, water heating, A/C and refrigeration are assumed to be flexible by 2018^e	-\$500 to -\$300
60% RPS and additional 10 GW behind-the-meter solar PV ^a	\$300 to \$450
Liquid Biofuels (25% Carbon Intensity Reduction Target for LCFS and a Low-Emission Diesel Standard) ^b	\$400
30% Refinery ^d	\$70 to \$200
25% Industry ^d	\$70 to \$200
25% Oil and Gas ^d	\$70 to \$200
5% Increased Utilization of renewable natural gas - core and non-core ^f	\$300 to \$1500
Mobile Source Strategy (CFT) with Increased ZEVs in South Coast & additional reductions in VMT and energy demand & early retirement of LDVs with more efficient LDVs ^b	-\$150 to \$200
2x additional achievable energy efficiency in the 2015 IEPR^g	-\$550 to -\$300
2.5x additional achievable energy efficiency in the 2015 IEPR, electrification of buildings (heat pumps & res. electric stoves) and early retirement of HVAC ^g	\$100 to \$200
Cap-and-Trade Program^d	\$25 to \$85
Carbon Tax ^d	\$50 (2007 dollars)

Where enhancements have been made to a measure or policy the cost per tonnes are incremental to the original measure. For example, the cost per tonne for the 60% RPS are incremental to the costs per tonne for the 50% RPS.

^a Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The lower cost ranges are based on the EIA AEO's high oil and natural gas price forecast and a 20% reduction in the capital cost of wind and solar electricity generation relative to the base assumptions. The higher cost ranges are based on the EIA AEO's low oil and natural gas price forecast.

^b Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The lower cost ranges are based on the EIA AEO's high oil price forecast. The higher cost ranges are based on the EIA AEO's low oil price forecast.

^c Liquid biofuel values are calculated as the average unsubsidized cost of biofuels supplied above that of an equivalent volume of fossil fuels. These values do not reflect impacts from other biofuel policies, such as the Renewable Fuel Standard or production tax credits, that are partially supported by fuel purchasers/taxpayers outside of California. Therefore, these values do not represent LCFS program costs or potential LCFS credit prices.

^d <https://www.arb.ca.gov/regact/2016/capandtrade16/appc.pdf>

^e Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The lower cost range is based on an assumption that flexible loads can be implemented through retail rate design without additional capital expenditures; the higher cost range assumes that the cost of flexible loads is the same as the cost per ton of other building energy efficiency measures.

^f Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The **lower cost** range assumes **biogas in pipeline, using modeled** delivered prices for biogas. The higher cost range assumes renewable natural gas is provided by **hydrogen** generated from flexible grid electrolysis.

^g Cost estimate is based on PATHWAYS sensitivity analysis as described in the main text. The lower cost range is based on the EIA's **high** natural gas **price** forecast and **higher electricity prices**. The **higher cost** range is based on the EIA's **low** natural gas **price** forecast and **lower electricity prices**. The cost per tonne does not represent the results of the CPUC's or CEC's standard cost-effectiveness evaluation tests.

C. Economic Analyses

1. Economic Impacts

The following section outlines the economic impact of the Proposed Plan relative to the business-as-usual Reference scenario. Additional detail on the economic analysis, including modeling details and the estimated economic impact of alternative scenarios is presented in Appendix E.

The Proposed Plan outlines a path to achieve the SB 32 target that requires less reliance on fossil fuels and increased investment in low carbon fuels and clean energy technologies. Through this shift, California can lead the world in developing the technologies needed to reduce the global risks of climate change. Innovation in low-carbon technologies will open growth opportunities for investors and businesses in California. As modeled, the analysis in this 2030 Target Scoping Plan suggests that the

cost of transitioning to this lower carbon economy are small, even without counting the potential opportunities for new industries and innovation in California. Under the Proposed Plan, the California economy, employment, and personal income will continue to grow as California businesses and consumers make clean energy investments and improve efficiency and productivity to reduce energy costs.

Overview of Economic Modeling

Two models are used to estimate the economic impact of the Proposed Plan and California's continued clean energy transition: (1) the California PATHWAYS model, and (2) the Regional Economic Models, Inc. (REMI) Policy Insight Plus model. The California PATHWAYS model estimates the direct costs and GHG emission reductions of implementing the prescriptive (or non-Cap-and-Trade) measures in the Proposed Plan relative to the BAU scenario.⁷³ Direct costs are the sum of the incremental changes in capital expenditures and fuel expenditures, including fuel savings for reduced energy use from efficiency measures. In most cases, reducing GHG emissions requires the use of more expensive equipment that can be operated using less fuel. In the Proposed Plan, the prescriptive measures modeled in PATHWAYS account for a portion of the GHG reductions required to meet the 2030 target. The remaining reductions are delivered through the Cap-and-Trade Program (as outlined in Figure III-2). The direct costs associated with the Cap-and-Trade Program are calculated outside of PATHWAYS based on an assumed range of Cap-and-Trade allowance prices from 2021 through 2030.

To estimate the future costs of the Proposed Plan, this economic analysis necessarily creates a hypothetical future California that is essentially identical to today, adjusted for currently existing climate policy as well as projected economic and population growth through 2030. The analysis cannot predict the types of innovation that will create efficiencies nor can it fully account for the significant economic benefits associated with reducing emissions. Rather, the economic modeling is conducted by estimating incremental capital and clean fuel costs of measures and assigning those costs to certain sectors within this hypothetical future.

The macroeconomic impacts of the Proposed Plan on the California economy were modeled using the REMI model with output from California PATHWAYS and estimated Cap-and-Trade Program costs as inputs. Additional methodological detail is presented in Appendix E.⁷⁴

Estimated Cost of Prescriptive Measures

As described above, the Proposed Plan combines new measures addressing legislative mandates and the extension of existing measures, including a comprehensive cap on overall GHG emissions from the State's largest sources of pollution. The PATHWAYS model calculates costs and GHG emission reductions associated with the prescriptive measures in the Proposed Plan. Changes in energy use and capital investment are calculated in PATHWAYS and represent the estimated cost of achieving an estimated

⁷³ The PATHWAYS modeling is described in Chapter III, and additional detail is presented in Appendix D.

⁷⁴ Additional modeling details are available at the REMI PI+ webpage: <http://www.remi.com/products/pi>.

50 to 70 percent of the cumulative GHG reductions required to reach the SB 32 target between 2021 and 2030. The Cap-and-Trade Program delivers any remaining reductions, as shown in Figure III-2.

Table III-4 outlines the cost of prescriptive measures by sector in 2030, compared to the Reference scenario, as calculated in PATHWAYS. Estimated capital costs of equipment are levelized over the life of the equipment using a 10 percent discount rate and fuel costs are calculated on an annual basis.⁷⁵ The costs in Table III-4 are disaggregated into capital costs and fuel costs, which includes gasoline, diesel, biofuels, natural gas, electricity and other fuels.⁷⁶ Table III-4 assumes that all prescriptive measures deliver anticipated GHG reductions, and does not include any uncertainty in GHG reductions or cost.⁷⁷ The impact of uncertainty in GHG reductions is explored in more detail in Chapter III and in Appendices D and E, which include additional detail on measure, cost, and Reference scenario uncertainty.

The prescriptive measures result in incremental capital investments of \$5.1 billion per year in 2030, but these annual capital costs are nearly offset by annual fuel savings of \$4.1 billion in 2030. The incremental net cost of prescriptive measures in the Proposed Plan is estimated at \$1 billion in 2030, which represents 0.03 percent of the California economy in 2030. Residential and commercial sectors are anticipated to see net savings in 2030 as the fuel savings vastly outweigh the annual capital investment. Agriculture and transportation sectors will see a net cost increase from implementation of the prescriptive measures. The transportation sector sees higher capital costs due to the purchase of more efficient equipment and a reduction in fuel costs due to reduced vehicle miles traveled, more efficient equipment, and fuel-switching from fossil to electric fuels, relative to the Reference scenario. In the agriculture sector, capital expenditures are due to investments in more efficient lighting and the mitigation of agricultural methane and nitrogen oxides. Agricultural fuel costs increase due to higher electricity and liquid biofuel costs.

Table III-4. Change in PATHWAYS Sector Costs in 2030 Relative to the Reference Scenario (Billion \$2015)⁷⁸

End Use Sector ⁷⁹	Levelized Capital Cost	Fuel Cost	Total Annual Cost
Residential	\$0.1	-\$0.8	-\$0.7
Commercial	\$0.5	-\$0.9	-\$0.4

⁷⁵ PATHWAYS costs are calculated in real \$2012. For this analysis, all costs are reported in \$2015. The PATHWAYS costs are inflated using the Bureau of Economic Analysis (BEA) Table 1.1.4 available at: <https://bea.gov/national/pdf/dpqa.pdf>.

⁷⁶ Additional information on the fuels included in PATHWAYS is available at: <https://www.arb.ca.gov/cc/scopingplan/meetings/1142016/e3pathways.pdf>.

⁷⁷ More information on the inputs to the California PATHWAYS model is available at: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_scenario_description2016-12-01.pdf.

⁷⁸ PATHWAYS costs reported in \$2012 are inflated to \$2015 using the Bureau of Economic Analysis (BEA) Table 1.1.4 available at: <https://bea.gov/national/pdf/dpqa.pdf>

⁷⁹ Information on the end use sectors are available in the California PATHWAYS documentation available at: <https://www.arb.ca.gov/cc/scopingplan/meetings/1142016/technicalappendix.pdf>. This documentation is being updated for this 2030 Target Scoping Plan analysis.

Transportation	\$3.7	-\$3.2	\$0.5
Industrial	\$0.3	\$0.2	\$0.4
Oil and Gas Extraction	\$0.0	\$0.1	\$0.1
Petroleum Refining	\$0.1	-\$0.2	\$0.0
Agriculture	\$0.3	\$0.5	\$0.8
TCU (Transportation Communications and Utilities)	\$0.1	\$0.2	\$0.3
Total	\$5.1	-\$4.1	\$1.0

Note that table values may not add due to rounding.

Estimated Cost of the Cap-and-Trade Program

The direct cost of achieving GHG reductions through the Cap-and-Trade Program is estimated outside of PATHWAYS. The Cap-and-Trade Program sets an economy-wide GHG emissions cap and gives firms the flexibility to choose the lowest-cost approach to reduce emissions. As with the prescriptive measures, the direct costs of any single specific GHG reduction activity under the Cap-and-Trade Program is subject to a large degree of uncertainty. However, as Cap-and-Trade allows covered entities to pursue the reduction options that emerge as the most efficient, overall abatement costs can be bounded by the allowance price. Covered entities should pursue reduction actions with costs less than or equal to the allowance price. An upper bound on the compliance costs under the Cap-and-Trade Program can be therefore be estimated by multiplying the range of anticipated allowance prices by the anticipated GHG reductions needed (in conjunction with the reductions achieved through the prescriptive measures) to achieve the SB 32 target.

A large number of factors influence the allowance price, including the ease of substitution by firms to low carbon production methods, consumer price response, the pace of technological progress, and impacts to the price of fuel. Other policy factors that also affect the allowance price include the return of auction proceeds from the sale of State-owned allowances and linkage with other jurisdictions.

Flexibility allows the Cap-and-Trade allowance price to adjust to changes in supply and demand while a firm cap ensures GHG reductions are achieved. This analysis includes a range of allowance prices bounded by the Cap-and-Trade auction floor price (C+T Floor Price) which represents the minimum sales price for allowances sold at auction and the Allowance Price Containment Reserve Price (C+T Reserve Price), which represents the price at which an additional pool of allowances is made available and is the highest anticipated price under the Program. Table III-5 outlines the projected allowance prices used in this analysis.

Table III-5. Estimated Range of Cap-and-Trade Allowance Price 2020–2030

(\$2015)	2020	2025	2030
C+T Floor Price	\$15.4	\$19.7	\$25.2
C+T Reserve Price	\$72.1	\$73.0	\$78.4

Uncertainty in the GHG reduction potential of prescriptive measures in the Proposed Plan can affect the cost of achieving the 2030 target. The aggregate emissions cap of the Cap-and-Trade Program ensures that the 2030 target will be met—irrespective of the GHG emissions realized through prescriptive measures. If GHG reductions anticipated under prescriptive measures do not materialize, the Cap-and-Trade Program will be responsible for a larger share of the total emissions reductions. Under that scenario, the demand for Cap-and-Trade allowances may rise, resulting in an increase in allowance price. While the Cap-and-Trade allowance price may rise, it is highly unlikely that it will rise above the C+T Reserve price, given the program design. If prescriptive measures deliver anticipated GHG reductions, demand for allowances will be low, depressing the price of allowances. However, the C+T Floor Price represents the lowest price at which allowances can be sold at auction.

Table III-6 presents the estimated direct cost estimates for GHG reductions achieved through the Cap-and-Trade Program in 2030. These costs represent the lower and upper bounds of the cost of reducing GHG emissions to achieve the SB 32 target under the Proposed Plan. The estimated direct costs range from \$1.2 to \$3.6 billion dollars (in \$2015), depending on the allowance price in 2030. This range highlights the allowance price uncertainty that is a trade-off to the GHG reduction certainty provided by the Cap-and-Trade Program. The estimated cost of GHG reductions is calculated by multiplying the allowance price by the GHG emission reductions required to achieve the SB 32 target.

Sensitivity Analysis

In addition to uncertainty in the Cap-and-Trade allowance price and uncertainty in the GHG reductions achieved through the prescriptive measures, there is uncertainty in the GHG emissions that will occur under the Reference scenario, as presented in Figure II-1. There is also uncertainty in costs embedded within the Reference scenario including the price of oil, other energy costs, and technology costs.

The PATHWAYS incremental cost results are also sensitive to the fossil fuel price assumptions. Altering the fuel price trajectory in the Reference scenario directly impacts the incremental cost of achieving GHG reductions in the Proposed Plan, as costs are relative to the Reference scenario.

Fuel price sensitivity is directly modeled in PATHWAYS, resulting in a range of impacts from prescriptive measures. The range of costs labeled "2030 Total Cost" includes the cost of prescriptive measures estimated in PATHWAYS and the impact of the Cap and-Trade Program calculated at the C+T Floor Price (the lower bounds) and the C+T Reserve Price (the upper bounds).

Macroeconomic Impacts

The macroeconomic impacts of the Proposed Plan are estimated using the REMI model. Annual capital and fuel costs (for example, the costs in Table III-4) are estimated using PATHWAYS and input into the REMI model to estimate the impact of the Proposed Plan on the California economy each year relative to GDP, which is often used as a proxy for economic growth, as well as employment, personal income, and changes in output by sector and consumer spending. Table III-7 presents key macroeconomic impacts of implementing the Proposed Plan, based on the range of anticipated allowance prices. In 2030, under the Proposed Plan, growth across the indicators is about one-half of one percent less than the Reference scenario. The results in Table III-7 include not only the estimated direct cost of the Cap-and-Trade Program, but also the return of allowance value from the auction of Cap-and-Trade allowances to California and consumers. See Appendix E for more detail on the modeling of the return of allowance value under the Cap-and-Trade Program in REMI. The Cap-and-Trade Program is modeled in REMI as an increase in production cost to sectors based on estimated future GHG emissions and anticipated free allowance allocation. If a sector is expected to receive free allocation of allowances, the value of those free allowances is not modeled as a cost in REMI. The analysis does include the estimated benefit to sectors due to the proceeds from the auction of cap-and-trade allowances and assumes that each year \$2 billion of proceeds from the auction of State-owned cap-and-trade allowances are distributed to the economic sectors currently receiving GGRF appropriations. These funds work to achieve further GHG reductions in California, lower the cost of reducing GHG emissions to businesses, and protect disadvantaged communities. Any remaining auction proceeds after the distribution of \$2 billion through GGRF sectors are distributed evenly to consumers in California as a dividend. The estimated costs in Table III-7 include the cost of the GHG reductions to sectors, as well as the benefit of a portion of those costs disbursed through the GGRF and as a dividend to consumers, as detailed in Appendix E.

a major substitution of electricity and capital away from fossil fuels is anticipated to have a very small effect on California GDP, employment, and personal income—less than 1 percent relative to the Reference scenario in 2030. The economic impacts indicate that shifting money and investment away from fossil fuels and to clean energy is likely to have a negligible effect on the California economy. Additionally, it is certain that innovation will continue as new technologies are developed and implemented. While this analysis projects the costs and GHG reductions of current technologies over time, it does not capture the impact of new technologies that may shift the economy and California in unanticipated ways or benefits related to changes in air pollution and impacts on human health, avoided environmental damages, and impacts to natural and working lands. Thus, the results of this analysis very likely underestimate the benefits of shifting to a clean energy economy.

Consumer spending also shifts in response to implementation of the Proposed Plan relative to the Reference scenario. As presented in Table III-7, there is a negligible impact to consumer income, but small changes in income can alter the distribution of consumer spending among categories. In 2030, consumer spending is lower under the Proposed Plan than in the Reference scenario across all analyzed allowance prices. Consumers spend less on fuels, electricity, natural gas, and capital as a result of measures in the Proposed Plan that reduce demand, increase efficiency, and drive technological innovations. The estimated impact to California households is also modest in 2030, as outlined in Table III-8. In 2030, the average annual cost per household of the Proposed Plan ranges from \$30 to \$215 (labeled incremental cost in Table III-8), depending on the price of reductions under the Cap-and-Trade Program.⁸² In 2030, as modeled in the Reference scenario, households will spend \$3,533 on equipment and fuel.

Implementing the prescriptive measures in the Proposed Plan will change household fuel and equipment expenditures as is estimated to result in a \$45 savings per household in 2030. The additional reductions needed to achieve the SB 32 target, obtained through the Cap-and-Trade Program, result in a cumulative annual cost of \$30 to \$215 to households in 2030, relative to the Reference scenario. The household impact of the Cap-and-Trade Program assumes that all costs of GHG reductions in the Cap-and-Trade Program are passed to consumers and therefore represents the upper bounds of the estimated household impact. It does not account for benefits from reduced climate impacts, health savings from reduced air pollution impacts, or lower petroleum dependence costs that might impact households.

While not significant, the range of household impacts represents changes in fuel expenditures and capital investment as a result of the prescriptive measures and Cap-and-Trade component of the Proposed Plan. As modeled, the household impact of the Proposed Plan comprises less than 1 percent of average household expenditures in 2030. To ensure that vulnerable populations and low-income households are not disproportionately affected by California's climate policy, CARB is taking steps to better quantify localized economic impacts and ensure that low-income households see

⁸² Household projections were obtained from California Department of Finance. They are available at: <http://www.dof.ca.gov/Forecasting/Demographics/projections/>.

tangible benefits from the Proposed Plan. Researchers at the University of California, Los Angeles (UCLA) are currently working on a retrospective analysis that will estimate the impacts across California communities of the implementation of AB 32, which will help identify areas of focus as 2030 measures are developed. The Cap-and-Trade Program will also continue to provide benefit to disadvantaged communities through the disbursement of GGRF funds.

Table III-8. Estimated Annual Cost per Household in 2030

Scenario	2030 Annual Cost per Household
Reference Scenario	\$3,500
Proposed Plan	\$3,530 - \$3,715
Incremental Cost of Plan Relative to Reference Scenario	\$30-215

The investments made in implementing the Proposed Plan will have long-term benefits and present significant opportunities for California investors and businesses, as upfront capital investments will result in long-term fuel and energy efficiency savings, the benefits of which will continue into the future. The California economy will continue to grow under the Proposed Plan, but it will grow more resilient, more sustainable, and will be well positioned to reap the long-term benefits of lower carbon investments.

Estimating the Economic Impact on Disadvantaged Communities

As described above, and even with significant unquantified benefits, implementing the Proposed Plan is estimated to have a small impact on the Statewide California economy through 2030. However, shifting from fossil fuels can disproportionately affect specific geographic regions whose local economies rely on fossil fuel intensive industries. These regions can also include vulnerable populations and disadvantaged communities who may be disproportionately impacted by poor air quality and climate.

Achieving the SB 32 target will require sectors and regions to respond to the challenges and opportunities as California continues its transition to a clean energy economy. While the economic modeling does not show the impact to specific regions or populations, policy action at the State, regional, and local level can help to ensure that disadvantaged communities and vulnerable populations are able to benefit from technological innovation and the benefits of the clean energy economy.

This economic analysis will be revised prior to the final release of the 2030 Target Scoping Plan to include additional analyses including a regional impact analysis to estimate the distribution of economic impacts across regions of the State, including disadvantaged communities. In addition, there are currently three research contracts underway at CARB to quantify the impact of California’s climate policy on regions and disadvantaged communities throughout California. As mentioned above, researchers from UCLA are estimating the improvements in health outcomes associated with AB 32, with a focus on disadvantaged communities. This research will be informed by input from technical advisory committees including a group focused on environmental justice.

There are also two studies currently underway to quantify the impact of GGRF funds. A UCLA contract focuses on quantifying job creation under GGRF in California, while a University of California, Berkeley, contract is constructing methodologies to assess the co-benefits of GGRF projects across California. These research efforts will provide a regional analysis of the impact of and benefits to specific communities and sectors to ensure that all Californians see economic benefits, in addition to clean air benefits, from the implementing the Proposed Plan.

D. Public Health

Addressing climate change could represent the greatest opportunity to improve public health in our time.⁸³ Many measures to reduce GHG emissions also have significant health co-benefits that can address climate change *and* improve the health and well-being of all populations across the State. Climate change is already affecting the health of communities.⁸⁴ Climate-related health impacts can include increased heat illness and death, increases in air pollution-related exacerbation of cardiovascular and respiratory diseases, injury and loss of life due to severe storms and flooding, increased vector-borne and water-borne diseases, and stress and mental trauma due to extreme weather-related catastrophes.⁸⁵ The urgency of action to address the impacts already being felt from a changing climate and the threats in coming decades provides an unprecedented opportunity for California's leadership in climate action to reduce GHG emissions and create healthy, equitable, and resilient communities where all people thrive. This section discusses the link between climate change and public health. It does not analyze the specific measures included in the strategy but provides context for assessing the potential measures and scenarios.

Achieving Health Equity through Climate Action

Many populations in California face *health inequities*, or unfair and unjust health differences between population groups that are systemic and avoidable.⁸⁶ Differences in environmental and socioeconomic determinants of health result in these health inequities. Those facing the greatest health inequities include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.⁸⁷ It is these very same populations, along with those suffering existing health conditions and certain populations of workers (e.g., outdoor workers), that climate change will most disproportionately impact.⁸⁸ The inequitable distribution of social, political, and economic power results in health inequities, while perpetuating systems (e.g.,

⁸³ Watts, N., W. N. Adger, P. Agnolucci, et al. 2015. "Health and climate change: Policy responses to protect public health." *The Lancet* 386, 1861–1914.

⁸⁴ USGCRP. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Crimmins, A., J. Balbus, J. L. Gamble, C. B. Beard, J. E. Bell, D. Dodgen, R. J. Eisen, N. Fann, M. D. Hawkins, S. C. Herring, L. Jantarasami, D. M. Mills, S. Saha, M. C. Sarofim, J. Trtanj, and L. Ziska, Eds. U.S. Global Change Research Program, Washington, D.C., 312 pp.

⁸⁵ Ibid.

⁸⁶ Whitehead, M. 1992. "The concepts and principles of equity and health." *International Journal of Health Services* 22(3), 429–445.

⁸⁷ California Department of Public Health (CDPH). 2015. *The Portrait of Promise: The California Statewide Plan to Promote Health and Mental Health Equity*. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

⁸⁸ Shonkoff, S., R. Morello-Frosch, M. Pastor, and J. Sadd. 2011. "The climate gap: Environmental health and equity implications of climate change and mitigation policies in California—a review of the literature." *Climatic Change* 109 (Suppl 1):S485–S503.

economic, transportation, land use, etc.) drive GHG emissions. As a result, communities face inequitable living conditions. For example, low-income communities of color tend to live in more polluted areas and face climate change impacts that can compound and exacerbate existing sensitivities and vulnerabilities.^{89,90} Fair and healthy climate action requires that the inequities that create and intensify community vulnerabilities be addressed. The capacity for climate resilience is significantly driven by living conditions and the forces that shape them, such as income, education, housing, transportation, environmental quality, and access to services. Thus, strategies such as alleviating poverty, increasing access to opportunity, improving living conditions, and reducing health and social inequities will result in more climate-resilient communities. In fact, there are already many “no-regret” climate mitigation and adaptation measures available (discussed below) that can reduce health burdens, increase community resilience, and address social inequities.⁹¹ Focusing efforts to achieve health equity can thus lead to significant progress in addressing human-caused climate change.

Potential Health Impacts of Climate Change Mitigation Measures

Socioeconomic Factors: Income, Poverty, and Wealth

Economic factors, such as income, poverty, and wealth, are collectively one of the largest determinants of health. As such, climate mitigation measures that yield economic benefits can improve population health significantly, especially if the economic benefits are directed to those most vulnerable and disadvantaged (including those living in poverty) who often face the most health challenges. From the poorest to richest ends of the income spectrum, higher income is associated with greater longevity in the United States.^{92,93,94} The gap in life expectancy between the richest 1 percent and poorest 1 percent of Americans was almost 15 years for men in 2014, and about 10 years for women.⁹⁵ Early death among those living in poverty is not a result of those with higher incomes having better access to quality health care.⁹⁶ Only about 10–20 percent of a person’s health status is accounted for by health care (and 20–30 percent attributed to genetics), while the remainder is attributed to the social determinants of health. These include environmental quality, social and economic circumstances, and the social, media, policy, economic, retail, and built environments—all of which in turn shape stress levels and behaviors, including smoking, diet, and exercise.^{97,98,99,100,101,102,103,104,105,106,107} In fact, where people live, work, learn, and play

⁸⁹ Ibid.

⁹⁰ Rudolph, L. and S. Gould. 2015. “Climate change and health inequities: A framework for action.” *Annals of Global Health* 81:3, 432–444.

⁹¹ Watts N, Adger WN, Agnolucci P, et al. 2015. Health and climate change: policy responses to protect public health. *Lancet*: 386, 1861–1914

⁹² Chetty, R., M. Stepner, S. Abraham, et al. 2016. “The Association Between Income and Life Expectancy in the United States, 2001–2014.” *JAMA* Published online April 10, 2016. doi:10.1001/jama.2016.4226.

⁹³ Marmot, M., S. Friel, R. Bell, et al. 2008. “Closing the gap in a generation: Health equity through action on the social determinants of health.” *The Lancet* 372, 9650: 1661–1669.

⁹⁴ Woolf, S. H., and P. Braveman. 2011. “Where health disparities begin: The role of social and economic determinants—and why current policies may make matters worse.” *Health Affairs* (Millwood) 30(10), 1852–1859.

⁹⁵ Chetty R, Stepner M, Abraham S, et al. 2016. The Association between Income and Life Expectancy in the United States, 2001–2014. *JAMA*. Published online April 10, 2016. doi:10.1001/jama.2016.4226

⁹⁶ Ibid.

⁹⁷ DHHS, Public Health Service. 1980. *Ten leading causes of death in the United States*. Atlanta, GA: Bureau of State Services.

⁹⁸ McGinnis, J., and W. Foege. 1993. “Actual causes of death in the United States.” *JAMA* 270(18), 2207–2212.

is often a stronger predictor of life expectancy than their genetic and biological makeup.¹⁰⁸ The World Health Organization's Commission on the Social Determinants of Health concluded that the poor health of poor people, and the social gradient in health, are caused by the unequal distribution of power, income, goods, and services resulting from poor social policies and programs, unfair economic arrangements, and bad politics.¹⁰⁹ Thus, improving the conditions of daily life and tackling the inequitable distribution of power, money, and resources can remedy inequitable health outcomes.¹¹⁰ Simply put, the more evenly distributed the wealth, the healthier a society is.¹¹¹

The *wealth-health gradient* has significant implications for the Proposed Plan. State climate legislation and policies require prioritizing GHG reduction strategies that serve vulnerable populations and improve well-being for disadvantaged communities. As such, strategies that improve the financial security of communities facing disadvantage while reducing GHG emissions are win-win strategies. These include providing funds or services for GHG reduction programs (e.g., weatherization, energy efficiency, renewable energy, ZEVs, transit, housing, and others) to low-income individuals and households to help them reduce costs. Among the poorest 25 percent of people, per capita government expenditures are strongly associated with longer life spans.¹¹² Successful strategies California has already implemented to assure the poor do not pay higher costs for societal GHG reductions include low-income energy discount programs, in combination with direct climate credits, and policies and programs that help Californians reduce electricity, natural gas, and gasoline consumption.¹¹³ More such strategies could be pursued. To tackle the inequitable distribution of power that leads to disparate health outcomes, agencies can first assure they have robust structures for civic engagement so that people facing health inequities can themselves participate in decision-making about solutions. Whether it is absolute poverty or relative deprivation

⁹⁹ Lantz, P. et al. 1998. "Socioeconomic factors, health behaviors, and mortality: Results from a nationally representative prospective study of US adults." *JAMA* 279(21), 1703–1708.

¹⁰⁰ McGinnis, J. et al. 2002. "The case for more active policy attention to health promotion." *Health Affairs* 21(2), 78–93.

¹⁰¹ Mokdad, A. et al. 2004. "Actual causes of death in the United States, 2000." *JAMA* 291(10), 1238–1245.

¹⁰² Danaei, G. et al. 2009. "The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors." *PLoS Medicine* 6(4), e1000058.

¹⁰³ World Health Organization (WHO). 2009. *Global health risks: Mortality and burden of disease attributable to selected major risks*. Geneva: WHO.

¹⁰⁴ Booske, B. et al. 2010. Different perspectives for assigning weights to determinants of health. County Health Rankings Working Paper. Madison, WI: University of Wisconsin Population Health Institute.

¹⁰⁵ Stringhini, S. et al. 2010. "Association of socioeconomic position with health behaviors and mortality." *JAMA* 303(12), 1159–1166.

¹⁰⁶ Thoits, P. 2010. "Stress and health: Major findings and policy implications." *Journal of Health and Social Behavior* 51 Suppl, S41–53.

¹⁰⁷ McGovern, L., G. Miller and P. Highes-Cromwick. 2014. "Health policy brief: The relative contribution of multiple determinants to health outcomes." *Health Affairs*

¹⁰⁸ Iton, A. 2006. Tackling the root causes of health disparities through community capacity building. In: Hofrichter R, ed. *Tackling Health Inequities Through Public Health Practice: A Handbook for Action*. Washington, D.C., and Lansing, MI: National Association of County and City Health Officials and Ingham County Health Department; 116–136.

¹⁰⁹ Marmot M, Friel S, Bell R, et al. 2008. Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet*, Volume 372, Issue 9650, 1661 – 1669

¹¹⁰ Ibid.

¹¹¹ Smith, R. 1996. "The big idea." *British Medical Journal* 312:April 20th, Editor's choice.

¹¹² Chetty R, Stepner M, Abraham S, et al. 2016. The Association between Income and Life Expectancy in the United States, 2001–2014. *JAMA*. Published online April 10, 2016. doi:10.1001/jama.2016.4226

¹¹³ Gattacicecca, J., C. Callahan, and J. R. DeShazo. 2016. *Protecting the most vulnerable: A financial analysis of Cap-and-Trade's impact on households in disadvantaged communities across California*. UCLA Luskin School of Public Affairs: Los Angeles, CA. Available at: <http://innovation.luskin.ucla.edu/content/protecting-most-vulnerable>. Accessed April 22, 2016.

that leads to poor health, investments and policies that both lift up the poor and reduce wealth disparities will address the multiple problems of climate change mitigation, adaptation, and health inequities.

Employment

Employment status impacts human health in many ways. Poor health outcomes of unemployment include premature death, self-rated ill-health (a strong predictor of poor health outcomes), and mental illness.^{114,115,116,117} Economic strain related to unemployment can impact mental health and trigger stress that is linked to other health conditions.^{118,119} Populations of color are overrepresented in the unemployment and under-employment ranks, which likely contributes to racial health inequities. In 2014, 14.7 percent of African-Americans, 12.1 percent of American Indians and Alaska Natives, and 9.8 percent of Latinos were unemployed, compared to 7.9 percent of Whites.¹²⁰ In addition to providing income, the work experience has health consequences. There is a *work status–health gradient* similar to the wealth–health gradient. Workers with lower occupational status have a higher risk of death,¹²¹ increased blood pressure,¹²² and more heart attacks.^{123,124} Higher status workers often have a greater sense of autonomy, control over their work, and predictability, compared to lower status workers, whose lack of control and predictability translates to stress that shortens their lives.¹²⁵ Nonstandard working arrangements such as part-time, seasonal, shift, contract, or informal sector work have been linked to greater psychological distress and poorer physical health.^{126,127} Women are heavily overrepresented in nonstandard work, as are people of color and people with low levels of education.^{128,129}

¹¹⁴ Krueger, P., and S. Burgard. 2011. Income, occupations and work. In: Rogers R, Crimmins E, eds. *International Handbook of Adult Mortality*. New York: Springer: 263–288.

¹¹⁵ Rogers, R., R. Hummer, and C. Nam. 2000. *Living and Dying in the USA. Behavioral, health, and social differentials of adult mortality*. New York, NY: Academic.

¹¹⁶ Ross, C. and J. Mirowsky. 1995. “Does employment affect health?” *Journal of Health and Social Behavior* 36(3):230–243.

¹¹⁷ Burgard, S., and K. Lin. 2013. “Bad jobs, bad health? How work and working conditions contribute to health disparities.” *Am Behav Sci* 57(8).

¹¹⁸ Price, R., D. Friedland, J. Choi, and R. Caplan. 1998. Job-loss and work transitions in a time of global economic change.

¹¹⁹ Price, R., J. Choi, and A. Vinokur. 2002. “Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health.” *Journal of Occupational Health Psychology* 7(4), 302.

¹²⁰ U.S. Census Bureau. 2014. American Community Survey 1-Year Estimates. http://www2.census.gov/programs-surveys/acs/summary_file/2014/data/. Last updated August 31, 2015. Accessed April 20, 2016.

¹²¹ Rogers R, Hummer R, and Nam C. 2000. *Living and Dying in the USA. Behavioral, health, and social differentials of adult mortality*. New York, NY: Academic

¹²² Colhoun, H., H. Hemingway, and N. Poulter. 1998. “Socio-economic status and blood pressure: An overview analysis.” *Journal of Human Hypertension* 12(2).

¹²³ Möller, J., T. Theorell, U. De Faire, A. Ahlbom, and J. Hallqvist. 2005. “Work related stressful life events and the risk of myocardial infarction. Case-control and case-crossover analyses within the Stockholm heart epidemiology programme (SHEEP).” *Journal of Epidemiology and Community Health* 59(1), 23–30.

¹²⁴ Burgard S, Lin K. 2013. Bad jobs, bad health? How work and working conditions contribute to health disparities. *Am Behav Sci*: 57(8).

¹²⁵ Marmot, M., G. Rose, M. Shipley, and P. Hamilton. 1978. “Employment grade and coronary heart disease in British civil servants.” *Journal of Epidemiology and Community Health* 32(4), 244–249.

¹²⁶ Dooley, D., and J. Prause. 2004. Settling down: Psychological depression and underemployment. The social costs of underemployment, 134–157. In: Dooley, D. and J. Prause. *The Social Costs of Underemployment: Inadequate Employment as Disguised Unemployment*.

¹²⁷ Virtanen, M., M. Kivimäki, M. Joensuu, P. Virtanen, M. Elovainio, and J. Vahtera. 2005. “Temporary employment and health: A review.” *International Journal of Epidemiology* 34(3): 610–622.

¹²⁸ Nollen, S. 1996. “Negative aspects of temporary employment.” *Journal of Labor Research* 17(4): 567–582.

¹²⁹ Burgard S, Lin K. 2013. Bad jobs, bad health? How work and working conditions contribute to health disparities. *Am Behav Sci*: 57(8)

The implementation of California's climate change goals provides great opportunity to not only improve the habitability of the planet, but also to increase economic vitality, employ historically disadvantaged people in secure jobs, and improve the health of the population. Measures in the Proposed Plan that aim to reduce greenhouse gases can simultaneously improve health and social equity by prioritizing or requiring that: (1) infrastructure projects using public funds pay living wages, provide quality benefits to all employees, and minimize nonstandard work; (2) locals are hired as much as is feasible; (3) preference is given for women-owned and minority-owned businesses; (4) employers receiving public funds assess and reduce work stress and lack of workplace control; (5) projects benefiting from State climate investments prioritize hiring from historically hard-to-employ groups, such as youth (especially youth of color), formerly incarcerated people, and people with physical or mental illness; and (6) training is provided to these same groups to work in jobs in sectors that will support a sustainable economy.

Communications Supporting Climate Change Behaviors and Policies

California's leadership on GHG reduction is exceptional. However, climate mitigation goals are often treated independently by sector, and the public does not see a unified message that changes must take place on every level in every sector to preserve human health and well-being. Climate strategy could be supported by public communications campaigns that link sectors and present a message of the need for bold action, along with the benefits that action can yield. Mass media communications and social marketing campaigns can help shift social and cultural norms toward sustainable and healthy practices. Messaging about the co-benefits of climate change policies in improving health and well-being can lead to increased community and decision-maker support among vulnerable groups for policies and measures outlined in the Proposed Plan.

Community Engagement Leads to Robust, Lasting, and Effective Climate Policies

For California's climate change policies to be supported by the public and be implemented with enthusiasm, they must be developed through ample, genuine opportunities for community members to discuss and provide input. Californians' contributions to the policy arena strengthen the end products and assist in their implementation and enforcement.

Efforts to mitigate climate change through policy, environmental, and systems change present considerable opportunities to promote sustainable, healthy, resilient, and equitable communities. The measures in the Proposed Plan, and the way they are implemented, can help create living conditions that facilitate physical activity; encourage public transit use; provide access to affordable, fresh, and nutritious foods; protect the natural systems on which human health depends; spur economic development; provide safe, affordable, and energy-efficient housing; enable access to jobs; and increase social cohesion and civic engagement. These climate change mitigation measures can improve overall population health, as well as material conditions, access to opportunity, and health and well-being in communities facing health inequities. Approaching the policy solutions outlined in the Proposed Plan with a health and equity lens can

ultimately help lead to a California in which all current and future generations of Californians can benefit and thrive.

E. Environmental Analysis

CARB, as the lead agency for the Proposed 2030 Target Scoping Plan, prepared a Draft Environmental Analysis (EA) in accordance with the requirements of the California Environmental Quality Act (CEQA) and CARB's regulatory program certified by the Secretary of Natural Resources (California Code of Regulation, title 17, sections 60006–60008; California Code of Regulation, title 14, section 15251, subdivision (d)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for a programmatic environmental analysis of the reasonably foreseeable compliance responses resulting from implementation of the proposed measures discussed in the Proposed Plan. The Draft EA provides an analysis of both the beneficial and adverse impacts and feasible mitigation measures for the reasonably foreseeable compliance responses associated with the proposed measures. Collectively, the Draft EA concluded that implementation of these actions could result in the following short-term and long-term beneficial and adverse impacts:

- Beneficial long-term impacts to air quality, energy demand and greenhouse gas emissions.
- Less than significant impacts to air quality, energy demand, resources related to land use planning, mineral resources, population and housing, public services, and recreational services.
- Potentially significant and unavoidable adverse impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, resources related to land use planning, noise, recreational services, transportation/traffic, and utilities and service systems.

The potentially significant and unavoidable adverse impacts are primarily related to short-term construction-related activities, which explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. Please refer to the Draft EA in Appendix F for further details.

CARB will prepare written responses to all comments received on the Draft EA, which will be presented to the Board for consideration along with the Final EA.

IV. Key Sectors

Climate change mitigation policies must be considered in the context of the sector's contribution to the State's total GHGs, while also considering any co-benefits for criteria pollutant and toxic air contaminant reductions. The transportation, electricity (in-state and imported), and industrial sectors are the largest contributors to the GHG inventory and present the largest opportunities for GHG reductions. However, to ensure decarbonization across the entire economy and to meet our 2030 GHG target, policies must be considered for other sectors. Policies that support energy efficiency, alternative fuels, and renewable power also can provide co-benefits for both criteria and toxic air pollutants.

Any specific policies identified within the Final Plan that will ultimately be considered by the Board or other State agencies for adoption will be subject to subsequent analytical and public processes to develop and identify the full requirements and process for implementation. For example, a change in the LCFS Carbon Intensity (CI) target would only take effect after a subsequent rulemaking for that regulation that would include its own public process and environmental, economic, and public health analyses. Many policies for reducing emissions toward the 2030 target are already known. For instance, the increased RPS, energy efficiency requirements, and various transportation plans will go far in reducing GHGs toward achieving the 2030 target, while delivering reductions in criteria and toxic air pollutants. This Proposed Plan identifies these and additional policies or program enhancements we will need to achieve remaining GHG reductions in a complementary, flexible, and cost-effective manner to meet the 2030 target. These policies should continue to encourage reductions beyond 2030 to keep us on track to stabilize the climate. Policies that ensure economy-wide investment decisions that incorporate consideration of GHG emissions are particularly important.

As we pursue GHG reduction targets, we must acknowledge the integrated nature of our built and natural environments, and cross-sector impacts of policy choices. Some strategies do not fit neatly into one sector category, such as Green Buildings, which cross the energy, transportation, water, waste, and land use sectors. Green building regulations and programs offer complementary opportunities to address the direct and indirect effects of buildings on the environment by incorporating strategies to minimize overall energy use, water use, waste generation, and transportation impacts. The Governor's Green Buildings Executive Order B-18-12 for State buildings and the California Green Building Standards (CALGreen) Code¹³⁰ are key state initiatives supporting emission reductions associated with buildings, and some local governments are taking action by adopting "beyond code" green building standards. Looking forward, there is a need to establish a path toward transitioning to zero net carbon buildings, which will be the next generation of buildings that can contribute significantly to achieving long-term climate goals. Recent research activities have provided results to better quantify GHG emission reductions of green buildings, and additional research

¹³⁰ The authority to update and implement the CALGreen Code is the responsibility of several State agencies identified in California Building Standards Law.



















activities need to continue to expand their focus to support technical feasibility evaluations and implementation.






















Each of the policies directed at the built environment must be considered in the broader context of the high-level goals for other sectors, including the Natural and Working Lands sector. For example, policies that support natural and working lands can reduce emissions and sequester carbon, while also providing ecosystem benefits such as better water quality, increased water yield, soil health, reduced erosion, and habitat connectivity. These policies and co-benefits will be considered as part of the integrated strategy outlined above. Table IV-1 provides examples of the cross-sector interactions between and among the main sectors analyzed for the Proposed Plan that are discussed in this chapter (Energy, Transportation, Industry, Water, Waste Management, and Natural and Working Lands), and which are discussed in this chapter.

This chapter recognizes these interactions and relates these broad strategic options to the specific additional programs recommended in Chapter II of this document. Accordingly, Chapter IV provides an overview of each sector's contributions to the State's GHG emissions, a description of both ongoing and proposed programs and policies to meet the 2030 target, and additional climate policy steps that could be considered in the future. The wide array of complementary and supporting measures being contemplated or undertaken across State government are detailed here. The broad view of State action described in this chapter thus provides context for the narrower set of measures discussed in detail in Chapter II of this Proposed Plan. It is these measures in Chapter II that CARB staff has identified as specific actions to meet the 2030 target in SB 32.

The following phrases have specific meanings in this discussion of the policy landscape: "Ongoing and Proposed Measures" refers to programs and policies that are either ongoing existing efforts, or efforts required by statute or about to begin. These measures include those identified as necessary specific actions to meet the 2030 GHG target, and which are set apart and described in greater detail in Chapter II. "Sector Measures" listed also include cross-cutting measures that affect many entities in the sector; some of these are also identified in Chapter II. "Potential Additional Actions" are not being proposed as part of the specific strategy to achieve the 2030 target in this Proposed Plan. However, this Proposed Plan aims to spur thinking and exploration of innovative new technologies and policies that may help the State achieve its long-term climate goals. Some of these items may not ever be formally proposed, but they are included here because CARB, other agencies, and stakeholders believe their potential should be explored with stakeholders in coming years.

Table IV-1. Cross-Sector Relationships

Sector	Example Interactions with Other Sectors
 Energy	<ul style="list-style-type: none"> <li>  Hydroelectric power, cooling, cleaning, waste water treatment plant (WWTP) bioenergy <li>  Vehicle-to-grid power; electricity supply to vehicle charging infrastructure <li>  Biomass feedstock for bioenergy, land for utility-scale renewable energy (solar, wind) <li>  Agricultural waste and manure feedstocks for bioenergy <li>  Organic waste for bioenergy
 Transportation	<ul style="list-style-type: none"> <li>  Electric vehicles, natural gas vehicles, transit/rail; more compact development patterns that reduce vehicle miles traveled (VMT) also demand less energy per capita <li>  More compact development patterns that reduce VMT also demand less water per capita and reduce conversion of natural and working lands <li>  Reducing VMT also reduces energy demands necessary for producing and distributing fuels and vehicles and construction and maintenance of roads <li>  Biomass feedstock for biofuels <li>  Agricultural waste and manure feedstocks for biofuels <li>  Organic waste for biofuels <li>   Greenfield suburban development on natural and working lands leads to increased VMT
 Industry	<ul style="list-style-type: none"> <li>  Potential to electrify fossil natural gas equipment, substitution of fossil-based energy with renewable energy <li>  Greenfield urban development impacts

 Water	 Energy consumption for water pumping, treatment, heating; resource for cooling, cleaning; WWTP bioenergy  Use of compost to help with water retention / conservation / drought mitigation  Land conservation results in healthier watersheds by reducing polluted runoff, allowing groundwater recharge, and maintaining properly functioning ecosystems
 Waste Management	 Composting, anaerobic digestion, and wastewater treatment plant capacity to help process organic waste diverted from landfills  Compost for carbon sequestration, erosion control in fire-ravaged lands, water conservation, and healthy soils  Replacing virgin materials with recycled materials associated with goods production; enhanced producer responsibility reduces energy impacts of consumption   Efficient packaging materials reduces energy consumption and transportation fuel use
 Agriculture	 Crop production, manure management; WWTP biosolids for soil amendments  Agricultural waste and manure feedstocks for bioenergy  Compost production in support of Healthy Soils Initiative
 Natural and Working Lands	 Healthy forestlands provide wood and other forest products  Restoring coastal and sub-tidal areas improves habitat for commercial and other fisheries.  Sustainable management can provide biomass for electricity.  Sustainable management can provide biomass for biofuels.  Resilient natural and working lands provide habitat for species and functions to store water, recharge groundwater, naturally purify water, and moderate flooding. Forests are also a source of compost and other soil amendments  Conservation and land protections help reduce VMT and increase stable carbon pools in soils and above-ground biomass.

A. Low Carbon Energy

The energy sector in California is composed of electricity and natural gas infrastructure, which brings electricity and natural gas to homes, businesses, and industry. This vast system is critical to California's economy and public well-being, and pivotal to reducing its GHG emissions.

Historically, power plants generated electricity largely by combusting fossil fuels. In the 1970s and early 1980s, a significant portion of California's power supply came from coal and petroleum resources. To reduce air pollution and promote fuel diversity, the State has shifted away from these resources to natural gas, renewable energy, and energy efficiency programs, resulting in significant GHG emissions reductions. Emissions from the electricity sector are currently approximately 20 percent below 1990 levels and are well on their way to achieving deeper emissions cuts by 2030. Since 2008, renewable generation almost doubled, coal generation was reduced by more than half, and GHG emissions were reduced by a quarter.

Carbon dioxide is the primary GHG associated with the electricity and natural gas systems. The electricity sector, which is composed of in-state generation and imported power to serve California load, has made great strides to help California achieve its climate change objectives. Renewable energy has shown tremendous growth, with capacity from large-scale solar, wind, geothermal, hydropower, and biomass power plants growing from 6,600 megawatts (MW) in 2010 to nearly 14,300 MW in 2015.^{131,132}

Renewable energy adoption in California has been promoted through the RPS and several funding mechanisms, such as the California Solar Initiative (CSI) programs, Self-Generation Incentive Program (SGIP), Net-Energy Metering (NEM), and federal tax credits. These mandates and incentives have spurred both utility-scale and small-scale customer-developed renewable energy projects.

SB 350 requires large publicly owned utilities and all load-serving entities under the jurisdiction of the California Public Utilities Commission (CPUC) to file integrated resource plans (IRPs) with the California Energy Commission (CEC) and CPUC, respectively. Through their IRPs, filing entities will demonstrate how they will meet the electricity sector's share of the State's 2030 GHG reduction target while ensuring reliability in a cost-effective manner. The CEC and CPUC are currently developing the guidelines that publicly owned utilities and load-serving entities will follow to prepare and submit IRPs. The Proposed Plan is expected to provide information to help establish the range of GHG reductions required for the electricity sector, and those numbers will be translated into planning target ranges in the IRP process. The IRP process will grant retail electricity sellers in California some flexibility to determine the

¹³¹ Large-scale means 20 MW or larger capacity.

¹³² California Energy Commission. 2016. Tracking Progress. Renewable Energy – Overview. www.energy.ca.gov/renewables/trackingprogress/documents/renewable.pdf

optimal way to reduce GHG emissions, based on the IRP Reference System Plan,¹³³ to achieve the electricity sector's share of the 2030 goal.

Energy efficiency is another key component to reducing energy sector GHG emissions, and it will be another consideration in each agency's IRP process. Utilities have been offering energy efficiency programs, such as incentives, to California customers for decades, and CEC has continually updated building and appliance standards. In the context of IRPs, utility-ratepayer-funded energy efficiency programs will likely continue to play an important role in reducing GHG emissions in the electricity sector.

SB 350 requires CEC and CPUC to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030. These targets can be achieved through appliance and building energy efficiency standards; utility incentive, rebate, and technical assistance programs; third-party delivered energy efficiency programs; and other programs. Achieving greater efficiency savings in existing buildings, as directed by Governor Brown in his 2015 inaugural speech, will be essential to meet the goal of doubling energy efficiency savings. In September 2015, CEC adopted the Existing Buildings Energy Efficiency Action Draft Plan, which is designed to provide foundational support and strategies to enable scaling of energy efficiency in the built environment. Pursuant to SB 350, CEC published an updated Existing Buildings Energy Efficiency Action Plan prior to January 2017. More than \$10 billion in private capital investment will be needed to double statewide efficiency savings in California.¹³⁴ Energy efficiency programs are one part of the broader green buildings strategy, which incorporates additional measures to minimize water use, waste generation, and transportation impacts.

Fossil-fuel-based natural gas is a significant fuel source for both in-State electricity generation and electricity imported into California. It is also used in transportation applications and in residential, commercial, industrial, and agricultural sector end uses. Greenhouse gas emissions from combustion of fossil natural gas decreased from 134.71 MMTCO_{2e} in 2000 to 127.73 MMTCO_{2e} in 2014, while natural gas pipeline fugitive emissions were estimated to be 4.0 MMTCO_{2e} in 2014 and have been nearly unchanged since 2000.¹³⁵ Greenhouse gas-reduction strategies should focus on efficiency, reducing leakage from well and pipelines, implementing the SLCP strategy, and studying the potential for renewable natural gas (RNG) fuel switching (i.e., renewable hydrogen blended with methane or biomethane).

Renewable natural gas volume has been increasing from approximately 1.5 million diesel gallon equivalent (dge) in 2011 to more than 68.5 million dge in 2015, and continued substitution of RNG for fossil natural gas would help California reduce its

¹³³ The Reference System Plan will be used in the IRP process to guide investment, resource acquisition, and programmatic decisions to reach the State's policy goals, in addition to informing the development of individual load serving entities IRPs.

¹³⁴ California Energy Commission. 2016. *Existing Building Energy Efficiency Action Plan*. page 61. Available at: http://docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficiency_Plan_Update_Deceber_2016_Thi.pdf

¹³⁵ ARB. 2016. ARB's Emission Inventory Activities. www.arb.ca.gov/ei/ei.htm

dependence on fossil fuels. In addition, RNG can be sourced by recovering methane from landfills, livestock operations, and wastewater treatment facilities through the use of existing technologies, thereby also reducing methane emissions. The capture and productive use of renewable methane from these and other sources is consistent with requirements of SB 1383.

Collectively, renewable energy and energy efficiency measures can result in significant public health and climate benefits by displacing air pollution and GHG emissions from fossil-fuel based energy sources, as well as by reducing the health and environmental risks associated with the drilling, extraction, transportation, and storage of fossil fuels, especially for communities living near fossil-fuel based energy operations.¹³⁶

As the energy sector continues to evolve and decarbonize, both the behavior of individual facilities and the design of the grid itself will change, with important distributional effects. Some power plants may operate more flexibly to balance renewables, emerging resources (including storage) will become more prevalent, and aging facilities may retire and be replaced. In turn, this may shift patterns of criteria pollutant emissions at these facilities. Because many existing power plants are in, or near, disadvantaged communities, it is of particular importance to ensure that this transition to a cleaner grid does not result in unintended negative impacts to these communities.

1. Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Electricity Goals

- Achieve sector-wide and load-serving entity specific GHG reduction planning targets set by the State through Integrated Resource Planning.
- Reduce fossil fuel use.
- Reduce energy demand.

Natural Gas Goals

- Ensure safety of natural gas system.
- Decrease fugitive methane emissions.
- Reduce dependence on fossil natural gas.

2. Cross-Sector Interactions

The energy sector interacts with nearly all sectors of the economy. Siting of power plants (including solar and wind facilities) and transmission and distribution lines has impacts on land use in California—be it conversion of agricultural or natural and working lands, impacts to sensitive species and habitats, or implications to disadvantaged, vulnerable, and environmental justice communities. Additionally, more compact

¹³⁶ For a detailed analysis of public health implications and impacts of climate mitigation measures, please see Appendix J: Public Health Analysis (to be released in early 2017).

development patterns reduce per capita energy demands, while less-compact sprawl increases them. Further, efforts to reduce GHG emissions in the transportation sector include electrification. Some industrial sources also use electricity as a primary or auxiliary source of power for manufacturing. In the future, industrial facilities may electrify their systems instead of relying on natural gas. These activities will increase demand for this sector. In addition, water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. Given California's historic drought, water use for the electricity sector is an important consideration for operation, maintenance, and construction activities.

Continued planning and coordination with federal, State, and local agencies, governments, tribes, and stakeholders will be crucial to minimizing environmental and health impacts from the energy sector, deploying new technologies, and identifying feedstocks.

3. Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Electricity

- Per SB 350, with respect to Integrated Resource Plans, establish GHG planning targets for the electricity sector and each load-serving entity.
- Per SB 350, ensure meaningful GHG emission reductions by load-serving entities through Integrated Resource Planning.
- Per AB 197, prioritize direct reductions at large stationary sources, including power-generating facilities.
- Per SB 350, increase the RPS to 50 percent of retail sales by 2030 and ensure grid reliability.
- Per Governor Brown's Clean Energy Jobs Plan, increase development of distributed renewable generation.
- Continue to increase use of distributed renewable generation at State facilities where space allows.
- Increase retail customers' use of renewable energy through optional utility 100 percent renewable energy tariffs.
- Per SB 350, efforts to evaluate, develop, and deploy regionalization of the grid and integration of renewables via regionalization of the California Independent System Operator (CAISO) should continue while maintaining the accounting accuracy and rigor of California's greenhouse gas policies.
- Per SB 350, establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030.

- Per SB 350, conduct and publish studies on barriers to increasing access to renewable energy generation for low-income customers, energy efficiency and weatherization investments for low-income customers, and contracting opportunities for local small business in disadvantaged communities, as well as recommendations on how to achieve those goals.
- Continue implementation of the Regulations Establishing and Implementing a Greenhouse Gases Emission Performance Standard for Local Publicly Owned Electric Utilities as required by SB 1368 (Perata, Chapter 598, Statutes of 2006), which effectively prohibits electric utilities from making new long-term investments in high-GHG emitting resources such as coal power.
- Per AB 802, adopt the forthcoming CEC regulations governing building energy use data access, benchmarking, and public disclosure.
- Per AB 2868, encourage development of additional energy storage capacity on the transmission and distribution system.
- Per AB 758,¹³⁷ implement recommendations under State jurisdiction included in the AB 758 Action Plan developed by CEC.

Ongoing and Proposed Measures – Natural Gas

- Adopt the forthcoming CARB Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities to reduce fugitive methane emissions from storage and distribution infrastructure.
- Per SB 1371, adopt improvements in investor-owned utility (IOU) natural gas systems to address methane leaks.
- Implement the SLCP Strategy to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use.
- Per SB 1383, adopt regulations to reduce methane emissions from livestock manure and dairy manure management operations by up to 40 percent below the dairy sector's and livestock sector's 2013 levels by 2030, including establishing energy infrastructure development and procurement policies needed to encourage dairy biomethane projects. The regulations will take effect on or after January 1, 2024.
- Per SB 887, initiate continuous monitoring at natural gas storage facilities and (by January 1, 2018) mechanical integrity testing regimes at gas storage wells, develop regulations for leak reporting, and require risk assessments of potential leaks for proposed new underground gas storage facilities.
- Per SB 1383, CEC will develop recommendations for the development and use of renewable gas as part of its 2017 Integrated Energy Policy Report (IEPR).
- Per Public Utilities (PU) Code 454.56, CPUC, in consultation with CEC, (1) identifies all potentially achievable cost-effective natural gas efficiency savings and establishes gas efficiency targets for the gas corporation to achieve, and (2) requires gas corporations to first meet unmet resource needs through available natural gas efficiency and demand reduction resources that are cost-

¹³⁷ AB 758 requires CEC, in collaboration with CPUC, to develop a comprehensive program to achieve greater energy efficiency in the State's existing buildings.

effective, reliable, and feasible (PU Codes 890–900 provide public goods charge funding authorization for these programs).

- Per SB 185 (De Leon, Chapter 605, Statutes of 2015), implement the requirement for the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) to sell their holdings in coal-producing companies by June 1, 2017, and explore extending divestiture requirements for additional fossil-fuel assets.

Sector Measures

- Adopt a post 2020 Cap-and-Trade Program.
- Evaluate and implement additional policies and measures that support further reductions of emissions of criteria and toxics air pollutants from fossil power plants, especially plants located near disadvantaged communities.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter II. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Increase use of renewable energy through long-term agreements between customers and utilities (such as Sacramento Municipal Utility District Solar Shares).
- Develop clear and feasible rules needed for the development of electricity storage technologies.
- Adopt a zero net energy (ZNE) standard for residential buildings by 2018/2019, and for commercial buildings by 2030.
- Expand the State Low-Income Weatherization Program (LIWP) to continue to improve energy efficiency and weatherize existing residential buildings, particularly for low-income individuals and households.
- Decrease usage of fossil natural gas through a combination of energy efficiency programs, fuel switching, and the development and use of RNG in the residential, commercial, and industrial sectors.
- Accelerate the deployment of heat pumps.
- Consider enhanced energy efficiency (high efficiency air conditioners, light-emitting diode (LED) lamps, efficiency improvements in industrial process cooling and refrigeration, efficient street lighting).
- Promote programs to support third-party delivered energy efficiency projects.
- Per AB 33, consider large-scale electricity storage.
- Support more compact development patterns to promote reduced per capita energy demand (see the Transportation sector for specific policy recommendations).
- Establish target dates and pathways for a zero carbon building State policy.
 - Form a multi-agency and stakeholder working group to:

- Compile a literature review and evaluate research on zero carbon buildings;
- Propose a definition for zero carbon buildings; and
- Recommend target dates and pathways to implement policy.

B. Industry

California's robust economy, with the largest manufacturing sector in the United States, is supported by a variety of sub-industrial sectors, some of which include cement plants, refineries, food processors, paper products, wineries, steel plants, and industrial gas, entertainment, technology and software, aerospace, and defense companies.

Together, industrial sources account for approximately 21 percent of the State's GHG emissions—almost equal to the amount of GHG emissions from the energy sector. Emissions in this sector are mainly due to fuel combustion and, in some industries, process-related emissions. Changes in this sector strongly correlate with changes in the overall economy. For example, housing and construction growth usually increases demand for cement. Moving toward a cleaner economy and ensuring we meet the statewide targets requires us to address GHG emissions in this sector, which has the potential to provide local co-benefits in criteria pollutant and toxic air contaminant reductions in immediate surrounding locations, especially in vulnerable communities. At the same time, we must ensure there is a smooth path to a cleaner future to support a resilient and robust economy with a strong job force, including training opportunities for workers in disadvantaged communities, while continuing to support economic growth in existing and new industries.

Greenhouse gas emissions in the Industrial sector have remained relatively flat for the last few years while the State's economy has continued to grow, meaning the GHG emissions to produce each dollar of gross standard product is decreasing. In 2015, this sector accounted for approximately 20 percent of the State's GDP. In 2015, California industry exported \$165.4 billion in merchandise.¹³⁸ Policies to address GHG emission reductions must continue to balance the State's economic well-being with making progress toward achievement of the statewide limits.

As this sector is dominated by combustion-related emissions, policies and measures to supply cleaner fuels and more efficient technology are the key to reducing GHG emissions. Some sectors, such as cement and glass, also have significant process emissions, and there may be fewer opportunities to address those process emissions, as they are related to chemical reactions and processes to meet safety, product-specific, or regulatory standards for the final products. Another important aspect for this sector is its role as the State transitions to a cleaner future. Infrastructure, including existing facilities and new facilities, can support the production of new technology to bolster the State's efforts to address GHGs. For example, existing refineries have an opportunity to move away from fossil fuel production and switch to the production of biofuels and clean technology. Another example of a switch to a cleaner technology is

¹³⁸ U.S. Department of Commerce. International Trade Administration. 2016. California Exports, Jobs, & Foreign Investment. www.trade.gov/mas/ian/statereports/states/ca.pdf

Tesla's Fremont, California, facility that was a former General Motors and Toyota factory. As the State works to double energy efficiency in existing buildings, there will be an increased demand for efficient lighting fixtures, building insulation, low-e¹³⁹ coatings for existing windows, or new windows—goods which could be produced in California. Three predominant in-State paths to reducing GHG emissions for the Industrial sector are: fuel switching, energy efficiency improvements, or the relocation of production to outside the State. Carbon capture and sequestration also offers a potential new, long-term path for reducing GHGs for large stationary sources.

While fuel switching and energy efficiency are beneficial strategies, relocation of production to outside the State is disadvantageous for a couple of reasons. First, AB 32 requires the State's climate policies to minimize emissions leakage, and relocation would shift GHG emissions outside of the State, resulting in emissions leakage. Second, it could also reduce the availability of associated jobs and could impact a local tax base that supports local services such as public transportation, emergency response, and social services, as well as funding sources critical to protecting the natural environment and keeping it available for current and future generations.

Even while we continue to seek further GHG reductions in the sector, it is important to recognize the State has a long history of addressing health-based air pollutants in this sector. Many of the actions for addressing criteria pollutants and toxic air contaminants in the industrial sector are driven by California's local air district stationary source requirements to ensure progress toward achieving State and national ambient air quality standards. Some of those actions, such as use of Best Available Control Technology, have resulted in co-benefits in the form of GHG reductions. The State must continue to strengthen its existing criteria and toxic air pollutant programs and relationships with local air districts to ensure all Californians have healthy, clean air. This is especially true in disadvantaged communities.

AB 32 directed CARB to take several actions to address GHG emissions, such as early action measures, GHG reporting requirements for the largest GHG sources, and other measures. In response, the State adopted multiple measures and regulations, including regulations for high global warming potential (high-GWP) gases used in refrigeration systems and the semiconductor industry.¹⁴⁰ These regulations apply to specific GHGs and types of equipment that can be found across the economy. For example, high-GWP gases are found in refrigeration systems in large food processing plants and chemical and petrochemical facilities, among others.¹⁴¹

¹³⁹ Low-e coatings reduce the emissivity, or heat transfer, from a window to improve its insulating properties.

¹⁴⁰ ARB. Refrigerant Management Program. www.arb.ca.gov/cc/rmp/rmp.htm

¹⁴¹ The U.S. Environmental Protection Agency (U.S. EPA) has also enacted regulations to reduce hydrofluorocarbon (HFC) emissions by prohibiting high-GWP refrigerants in new retail food refrigeration equipment and in chillers used for large air-conditioning applications. On the international level, the European Union F-gas regulations went into effect January 1, 2015. Those regulations prohibit high-GWP HFCs in new equipment and require a gradual phasedown in the production and import of HFCs. A similar HFC phasedown that would take place globally was the subject of international negotiations during the Montreal Protocol meeting in Rwanda from October 10–14, 2016. Those negotiations resulted in an agreement that will phase down the use of HFCs and put the world on track to avoid nearly 0.5°C of warming by 2100.

The State has also adopted the first in the world economy-wide cap-and-trade program that applies to all large industrial GHG emitters, imported electricity, and fuel and natural gas suppliers. The Cap-and-Trade Program is a key element of California's GHG reduction strategy. The Cap-and-Trade Regulation establishes a declining limit on major sources of GHG emissions, and it creates a powerful economic incentive for major investment in cleaner, more efficient technologies. The Cap-and-Trade Program applies to emissions that cover about 80 percent of the State's GHG emissions. CARB creates allowances equal to the total amount of permissible emissions (i.e., the "cap") over a given compliance period. One allowance equals one metric ton of GHG emissions. Fewer allowances are created each year, thus the annual cap declines and statewide emissions are reduced over time. An increasing annual auction reserve (or floor) price for allowances and the reduction in annual allowance budgets creates a steady and sustained pressure for covered entities to reduce their GHGs. All covered entities in the Cap-and-Trade Program are still subject to the air quality permit limits for criteria and toxic air pollutants.

The Cap-and-Trade Program is designed to achieve the most cost-effective statewide GHG emission reductions; there are no individual or facility-specific GHG emission reduction requirements. Each entity covered by the Cap-and-Trade Regulation has a compliance obligation that is set by its GHG emissions over a compliance period, and entities are required to meet that compliance obligation by acquiring and surrendering allowances in an amount equal to their compliance obligation. Companies can also meet a limited portion of their compliance obligation by acquiring and surrendering offset credits, which are compliance instruments that are based on rigorously verified emission reductions that occur from projects outside the scope of the Cap-and-Trade Program. Like allowances, each offset credit is equal to one metric ton of GHG emissions. The program began in January 2013 and achieved a near 100 percent compliance rate for the first compliance period (2013–2014). Reported and verified emissions covered by the Cap-and-Trade Program have been below the cap throughout the first years of the Program.¹⁴²

Allowances are issued by CARB and distributed by free allocation and by sale at auctions. CARB also provides for free allocation to some entities covered by the Program to address potential trade exposure due to the cost of compliance with the Program and address concerns of relocation of production out-of-state and resulting emissions leakage. Offset credits are issued by CARB to qualifying offset projects. Secondary markets exist where allowances and offset credits may be sold and traded among Cap-and-Trade Program participants. Facilities must submit allowances and offsets to match their annual GHG emissions. Facilities that emit more GHG emissions must surrender more allowances or offset credits, and facilities that can cut their emissions need to surrender fewer compliance instruments. Entities have flexibility to choose the lowest-cost approach to achieving program compliance; they may purchase allowances at auction, trade allowances and offset credits with others, take steps to reduce emissions at their own facilities, or utilize a combination of these approaches.

¹⁴² ARB. 2016. Mandatory Greenhouse Gas Emissions Reporting. www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm

Proceeds from the sale of State-owned allowances at auction are placed into the Greenhouse Gas Reduction Fund.

It is important to note that while the Cap-and-Trade Program is designed to reduce GHGs for the industrial sector, there are recommendations from the EJAC (or Committee) for the State to pursue more facility-specific GHG reduction measures to achieve potential local air quality co-benefits, and AB 197 directs CARB to prioritize direct reductions at large stationary sources. The Committee has expressed a strong preference to forgo the existing Cap-and-Trade Program and rely on prescriptive facility level regulations. It is also important to note that GHG, criteria pollutant, and toxic air contaminant trends are not always correlated. In some situations, criteria pollutants may actually be produced by actions such as destruction of methane through combustion devices or remain unchanged when fossil natural gas is displaced with renewable natural gas in large boilers. Regardless, there remains a need to develop or enhance existing measures to address criteria and toxic air pollutants as those pose local air quality health issues for communities adjacent to industrial sources. To address these specific concerns, State and local agencies must continue to evaluate and implement measures that result in quantifiable reductions in criteria and toxic air pollutants.

1. **Looking to the Future**

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Increase energy efficiency.
- Increase fuel switching to non-fossil fuel.
- Promote and support industry that provides products and clean technology needed to achieve the State's climate goals.
- Create market signals for low carbon intensity products.
- Maximize air quality co-benefits.
- Support a resilient low carbon economy and strong job force.
- Make California the epicenter for research, development, and deployment of technology needed to achieve a near-zero carbon future.

2. **Cross-Sector Interactions**

There are clear, direct relationships between the industrial sector and other sectors that go beyond the economic support that a strong economy provides. For instance, this sector could increase its use of renewable fuels such as biomethane, which would be sourced from landfills or dairies. Additionally, some industries could shift from raw materials to recycled materials to reduce waste and reduce GHG emissions associated with processing of raw materials. Further, addressing energy efficiency could reduce onsite heating, water, and fuel demand. Moreover, supporting mass-transit or ride share programs for employees would reduce VMT. Finally, upgrading existing facilities

or repurposing existing infrastructure instead of constructing new facilities or infrastructure would support land conservation and smart growth goals.

3. Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures

- International agreement to globally phase down HFC production were agreed upon at the October 2016 annual Montreal Protocol Meeting of Parties in Kigali, Rwanda.
- Depending on the level of future HFC emission reductions expected for California from this agreement, California may also: (1) consider placing restrictions on the sale or distribution of refrigerants with a GWP > 2,500, and (2) consider prohibiting refrigerants with a GWP > 150 in new stationary refrigeration equipment and refrigerants with a GWP > 750 for new stationary air-conditioning equipment.
- Develop a regulatory monitoring, reporting, verification, and implementation methodology for the implementation of carbon capture and sequestration projects.

Sector Measures

- Adopt a post-2020 Cap-and-Trade Program.
- Continue and strategically expand research and development efforts to identify, evaluate, and help deploy innovative strategies that reduce GHG emissions in the industrial sector.
- Promote procurement policies that value low carbon production to delivery options, including at the State and local government levels.
- Identify and remove barriers to existing grant funding for onsite clean technology or efficiency upgrades.
- Evaluate and implement policies and measures to continue to reduce GHG, criteria, and toxic air contaminant emissions in a cost-effective manner, focusing on the largest GHG emission sources.

Potential Additional Actions

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter II. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals. It is anticipated that there will be workshops and other stakeholder forums in the years following finalization of the Scoping Plan to explore these potential actions.

- Further deploy fuel cells using renewable fuels.

- Increase utilization of renewable natural gas.
- Partner with California’s local air districts to effectively use BARCT to achieve air quality and GHG reduction co-benefits at large industrial sources.
- Evaluate the potential for and promote electrification for industrial stationary sources whose main emissions are onsite natural gas combustion.
- Identify new funding for grants for onsite clean technology or efficiency upgrades.
- Develop an incentive program to install low-GWP refrigeration systems in retail food stores.
- Evaluate and design additional mechanisms to further minimize emissions leakage in the Cap-and-Trade Program.

C. Transportation Sustainability

California’s population is projected to grow to 50 million people by 2050. How and where the State grows will have important implications for all sectors of the economy, especially the transportation sector. Supporting this growth while continuing to protect the environment, developing livable and vibrant communities, and growing the economy is dependent on transitioning the State’s transportation system to one powered by ZEVs and low carbon fuels. It must also offer other attractive and convenient low carbon transportation choices, including safe walking and bicycling, as well as quality public transportation. Investments should consider California’s diverse communities and provide accessible and clean travel options to all.

The transportation system in California moves people between home, work, school, shopping, recreation, and other destinations, and connects ports, industry, residential communities, commercial centers, educational facilities, and natural wonders.¹⁴³ California’s vast transportation system includes roads and highways totaling more than 175,000 miles and valued at approximately \$1.2 trillion, 500 transit agencies, 245 public-use airports, 12 major ports, and the nation’s first high-speed rail system, now under construction.¹⁴⁴ Transportation infrastructure also includes sidewalks, bicycle paths, parking, transit stations and shelters, street trees and landscaping, signage, lighting, and other elements that affect the convenience, safety, and accessibility of transportation choices. Increasingly, technologies such as real-time, web- and mobile-enabled trip planning and ride-sharing services are changing how people travel. In the near future, automated and connected vehicles, and unmanned aerial systems (e.g., drones) are expected to be part of our transportation landscape and to transform the way that people and freight are transported. Responsibility for the transportation system is spread across State, regional, and local levels.

Through effective policy design, the State has an opportunity to guide technology transformation and influence investment decisions with a view to mitigate climate and environmental impacts while promoting economic opportunities and community health and safety. The network of transportation technology and infrastructure, in turn, shapes

¹⁴³ Caltrans. California Transportation Plan 2040, February 2016.

www.dot.ca.gov/hq/tpp/californiatransportationplan2040/final-draft-ctp2040/docs/ctp2040-final-draft.pdf

¹⁴⁴ Ibid.

and is shaped by development and land use patterns that can either support or detract from a more sustainable, low carbon, multi-modal transportation future. Strategies to reduce GHG emissions from the transportation sector, therefore, must actively address not only infrastructure and technology, but also coordinated strategies to achieve development, conservation, and land use patterns that align with the State's GHG and other policy goals.

Transportation also enables the movement of freight such as food, building materials, and other consumable products. The California freight system includes myriad equipment and facilities,¹⁴⁵ and is the most extensive, complex, and interconnected system in the country, with approximately 1.5 billion tons of freight valued at \$2.8 trillion shipped in 2015 to, through, and within California.¹⁴⁶ Freight-dependent industries accounted for over \$740 billion of California's GDP and over 5 million California jobs in 2014.^{147,148}

Transportation has a profound and varied impact on individuals and communities, including benefits such as economic growth, greater accessibility, and transport-related physical activity and adverse consequences such as GHG emissions, smog-forming and toxic air pollutants, traffic congestion, and sedentary behaviors. The sector is the largest emitter of GHG emissions in California.¹⁴⁹ Air pollution from tailpipe emissions contributes to respiratory ailments, cardiovascular disease, and early death, with disproportionate impacts on vulnerable populations such as children, the elderly, those with existing health conditions (e.g., chronic obstructive pulmonary disease, or COPD), low-income communities, and communities of color.^{150,151,152,153} Importantly, transportation costs are also a major portion of most Californian's household budgets.¹⁵⁴ Additionally, dependence on cars has a direct impact on levels of physical activity, which is closely linked to multiple adverse health outcomes.

Fortunately, many measures that reduce transportation sector GHG emissions simultaneously present opportunities to bolster the economy, enhance public health, revitalize disadvantaged communities, strengthen resilience to disasters and changing climate, and improve Californians' ability to conveniently access daily destinations and

¹⁴⁵ The freight system includes trucks, ocean-going vessels, locomotives, aircraft, transport refrigeration units, commercial harborcraft and cargo handling, industrial and ground service equipment used to move freight at seaports, airports, border crossings, railyards, warehouses, and distribution centers.

¹⁴⁶ U.S. Department of Transportation, Bureau of Transportation Statistics and Federal Highway Administration. Freight Analysis Framework, V 4.1, 2016.

¹⁴⁷ U.S. Department of Commerce, Bureau of Economic Analysis. Regional Economic Accounts. Available at: www.bea.gov/regional/index.htm, accessed March 11, 2016.

¹⁴⁸ State of California Employment Development Department. Labor Market Information by California Geographic Areas. Available at: www.labormarketinfo.edd.ca.gov/geography/lmi-by-geography.html, accessed March 21, 2016.

¹⁴⁹ ARB. May 2016. Mobile Source Strategy. Available at: www.arb.ca.gov/planning/sip/2016sip/2016mobsrsrc.pdf

¹⁵⁰ Hoek, G., Krishnan, R. M., Beelen, R., Peters, A., Ostro, B., Brunekreef, B., and Kaufman, J. D. 2013. Long-term air pollution exposure and cardio-respiratory mortality: a review. *Environmental Health*, 12(1), 1.

¹⁵¹ Friedman, M. S., K. E. Powell, L. Hutwagner, L. M. Graham, and W. G. Teague. 2001. "Impact of changes in transportation and commuting behaviors during the 1996 Summer Olympic Games in Atlanta on air quality and childhood asthma." *JAMA* 285(7), 897–905.

¹⁵² Bell, M. L., and K. Ebisu. 2012. "Environmental inequality in exposures to airborne particulate matter components in the United States." *Environmental Health Perspectives* 120(12), 1699.

¹⁵³ Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. "Understanding the cumulative impacts of inequalities in environmental health: implications for policy." *Health Affairs* 30(5), 879–887.

¹⁵⁴ H + T® Index website. htaindex.cnt.org/

nature. These opportunities are particularly important for those who are not able to, or cannot afford to, drive. In addition, a growing market demand for walkable, bikeable, and transit-accessible communities presents a significant opportunity to shift California's transportation systems toward a lower-carbon future while realizing significant public health benefits through increased levels of physical activity (i.e., walking and bicycling). In fact, transport-related physical activity could result in reducing risks from chronic diseases such as cardiovascular disease, diabetes, certain cancers, and more, to such an extent that it would rank among the top public health accomplishments in modern history, and help to reduce the billions of dollars California spends each year to treat chronic diseases. Just as California was the first to mitigate the contribution of cars and trucks to urban smog, it is leading the way toward a clean, low carbon, healthy, interconnected, and equitable transportation system.

Continuing to advance the significant progress already underway in the areas of vehicle and fuel technology is critical to the Transportation sector strategy and to reducing GHG emissions in the transportation sector. The rapid technological and behavioral changes underway with automated and connected vehicles, unmanned aerial systems, and ride-sharing services are redefining the transportation sector, and should be part of the solution for a lower carbon transportation sector. It is critical to support and accelerate progress on transitioning to a zero carbon transportation system. The growing severity of climate impacts, persistent public health impacts and costs from air pollution,¹⁵⁵ and rapid technology progress that supports the expectation that cost parity between some ZEVs and comparable internal combustion vehicles will be attained in a few years, underscores the need for further action on ZEVs. Therefore, CARB solicits input on additional policies to move toward a goal of achieving 100 percent ZEV sales in the light-duty vehicle sector. Austria, Germany, India, Netherlands, and Norway are all taking steps to, or have indicated a desire to, move to 100 percent ZEV sales in the 2020–2030 time frame.

In addition, policies that maximize the integration of electrified rail and transit to improve reliability and travel times, increase active transportation such as walking and bicycling, encourage use of streets for multiple modes of transportation, improve freight efficiency and infrastructure development, and shift demand to low carbon modes will need to play a greater role as California strives to achieve its 2030 and 2050 climate targets.¹⁵⁶

The State's rail modernization program has identified critical elements of the rail network where improvements, either in timing of service or infrastructure, provide benefits across the entire statewide network, furthering the attractiveness of rail for a range of trip distances.¹⁵⁷ The State also uses the Transit and Intercity Rail Capital Program (TIRCP) and Low Carbon Transit Operations Program (LCTOP) to provide grants from the Greenhouse Gas Reduction Fund to fund transformative improvements

¹⁵⁵ For example, a recent report by the American Lung Association estimates the costs of climate and air pollution from passenger vehicles in California to be \$15 billion annually. Holmes-Gen, B. and W. Barrett. 2016. *Clean Air Future – Health and Climate Benefits of Zero Emission Vehicles*. American Lung Association in California, October.

¹⁵⁶ Morello-Frosch, R., M. Zuk, M. Jerrett, B. Shamasunder, and A. D. Kyle. 2011. "Understanding the cumulative impacts of inequalities in environmental health: Implications for policy." *Health Affairs* 30(5), 879–887.

¹⁵⁷ California State Transportation Agency. 2016. 2018 California State Rail Plan factsheet and TIRCP fact sheet.

modernizing California's intercity, commuter, and urban rail systems, as well as bus and ferry transit systems, to reduce emissions of GHGs by reducing congestion and VMT throughout California. As the backbone of an electrified mass-transportation network for the State, the high-speed rail system catalyzes and relies on focused, compact, and walkable development well-served by local transit to funnel riders onto the system and provide alternative options to airplanes and automobiles for interregional travel. Concentrated development, such as that incentivized by the Affordable Housing and Sustainable Communities (AHSC) grant program, can improve ridership and revenue for the system while providing vibrant communities for all.²

While most of the GHG reductions from the transportation sector in this Proposed Plan will come from technologies and low carbon fuels, a reduction in the growth of VMT is also needed. VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals. More needs to be done to fully exploit synergies with emerging mobility solutions like ridesourcing and more effective infrastructure planning to anticipate and guide the necessary changes in travel behavior, especially among millennials. Uniquely, high-speed rail also affects air-miles traveled, diverting, at minimum, 30 percent of the intrastate air travel market in 2040.¹⁵⁸

In September 2016, the Administration released a discussion document entitled "Vibrant Communities and Landscapes"¹⁵⁹ that set out potential actions that can be taken in parallel to SB 375 Sustainable Community Strategies by State government, regional planning agencies, and local governments, to achieve a broad, statewide vision for more sustainable land use. The document "Potential VMT Reduction Strategies for Discussion" in Appendix C further details State-level strategies that could be employed to close the VMT gap.¹⁶⁰ Discussions among a broad suite of stakeholders from the building community, financial institutions, housing advocates, environmental organizations, and community groups are needed to develop a set of strategies to ensure that we can achieve necessary VMT reductions, and that the associated benefits are shared by all Californians.

At the State level, a number of important policies are being developed. Governor Brown signed Senate Bill 743 (Steinberg, Chapter 386, Statutes of 2013), which called for an update to the metric of transportation impact in the CEQA. That update to the CEQA Guidelines is currently underway. Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in

¹⁵⁸ California High-Speed Rail Authority. 2016. 2016 Business Plan. Ridership and Revenue Forecast.

¹⁵⁹ Governor's Office of Planning and Research, et al. 2016. *Vibrant Communities and Landscapes: A Vision for California in 2050*. Draft for Comment and Discussion. September. Available at:

www.arb.ca.gov/cc/scopingplan/meetings/091316/vibrant%20communities.pdf

¹⁶⁰ ARB. Potential State - Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) -- for Discussion.

www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf

creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375. The State can provide guidance and tools to assist local governments in achieving those objectives.

1. Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Vibrant Communities and Landscapes / VMT Reduction Goals

- Update the CEQA metric of transportation impact from level of service (LOS) to VMT statewide.
- Promote all feasible policies to reduce VMT, including:
 - Land use and community design that reduce VMT,
 - Transit oriented development,
 - Street design policies that prioritize transit, biking, and walking, and
 - Increasing low carbon mobility choices, including improved access to viable and affordable public transportation and active transportation opportunities.
- Complete the construction of high-speed rail integrated with enhanced rail and transit systems throughout the State.
- Promote transportation fuel system infrastructure for electric, fuel-cell, and other emerging clean technologies that is accessible to the public where possible.
- Increase the number, safety, connectivity, and attractiveness of biking and walking facilities to increase use.
- Promote potential efficiency gains from automated transportation systems and identify policy priorities to maximize sustainable outcomes from automated and connected vehicles (preferably ZEVs), including VMT reduction, coordination with transit, and shared mobility.
- Promote shared-use mobility, such as bike sharing, car sharing and ridesharing services to bridge the “first mile, last mile” gap between commuters’ transit stops and their destinations.
- Continue research and development on transportation system infrastructure, including:
 - Integrate frameworks for lifecycle analysis of GHG emissions with life-cycle costs for pavement and large infrastructure projects, and
 - Health benefits and costs savings from shifting from driving to walking, bicycling, and transit use.
- Quadruple the proportion of trips taken by foot by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).
- Strive for a nine-fold increase in the proportion of trips taken by bicycle by 2030 (from a baseline of the 2010–2012 California Household Travel Survey).

- Strive, in passenger rail hubs, for a transit mode share of between 10 percent and 50 percent and for a walk and bike mode share of between 10 percent and 15 percent.

Vehicle Technology Goals

- Through a strong set of complementary policies—including reliable incentives, significant infrastructure investment, broad education and outreach, and potential regulation—aim to reach 100 percent ZEV sales.
- Make significant progress in ZEV penetrations in non-light-duty segments.
- Deploy low-emission and electrified rail vehicles.

Clean Fuels Goals

- Electrify the transportation sector using both electricity and hydrogen.
- Promote research development and deployment of low carbon fuels such as RNG and renewable hydrogen.
- Rapidly reduce carbon intensity of existing liquid and gaseous transportation fuels.

Sustainable Freight Goals

- Increase freight system efficiency of freight operations at specific facilities and along freight corridors such that more cargo can be moved with fewer emissions.
- Accelerate use of clean vehicle and equipment technologies and fuels of freight through targeted introduction of zero emission or near-zero emission (ZE/NZE) technologies, and continued development of renewable fuels.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects.

Accelerate use of clean vehicle and equipment technologies and fuels of freight through targeted introduction of ZE/NZE technologies, and continued development of renewable fuels. This includes developing policy options that encourage ZE/NZE vehicles on primary freight corridors (e.g., I-710); examples of such policy options include a separated ZE/NZE freight lane, employing market mechanisms such as favorable road pricing for ZE/NZE vehicles, and developing fuel storage and distribution infrastructure along those corridors.

2. Cross-Sector Interactions

The Transportation sector has considerable influence on other sectors and industries in the State. California's transportation sector is still primarily powered by petroleum, and to reduce statewide emissions, California must reduce demand for driving; continue to reduce its gasoline and diesel fuel consumption; diversify its transportation fuel sources by increasing the adoption of low- and zero-carbon fuels; increase the ease and integration of the rail and transit networks to shift travel mode; and deploy ZE/NZE vehicles.

As California's population continues to increase, the location and types of future land use development will directly impact GHG emissions from the transportation sector, as well as those associated with the conversion and development of previously undeveloped land. Specifically, where and how the State population grows will have implications on distances traveled and tailpipe emissions; as well as on "secondary" emissions from the transportation sector, including emissions from vehicle manufacturing and distribution, fuel refining and distribution, demand for new infrastructure (including roads, transit, and active transportation infrastructure), demand for maintenance and upkeep of existing infrastructure, and conversion of natural and working lands, with the attendant impacts to food security, watershed health, and ecosystems. Less dense development also demands higher energy and water use. With the exception of VMT reductions, none of these "secondary" emissions are currently accounted for in the GHG models used in this Proposed Plan, but are nonetheless important considerations. Additionally, compact, lower-VMT future development patterns are essential to achieving public health, equity, economic, and conservation goals, which are also not modeled but are important co-benefits of the overall transportation sector strategy. For example, high-speed rail station locations were identified to reinforce existing city centers.

Achieving LCFS targets and shifting from petroleum dependence toward greater reliance on low carbon fuels also has the potential to affect land use in multiple ways. For example, increased demand for conventional biofuels could require greater use of land and water for purpose-grown crops, which includes interactions with the agricultural and natural and working lands sectors. On the other hand, continuing growth in fuels from waste biomass such as by-processing residues and agricultural waste and excess forest biomass acts to alleviate the pressure on croplands to meet the need for food, feed, and fuel. Likewise, captured methane from landfills or dairy farms for use in vehicles requires close interaction with the waste and farming sectors. Also, as more electric vehicles and charging stations are deployed, drivers' charging behavior will affect the extent to which additional electric generation capacity and ancillary services are needed to maintain a reliable grid and accommodate a portfolio of 50 percent renewable electricity by 2030. Charging control and optimization technologies will determine how well integrated the electric and transportation sectors can become, including, for instance, the widespread use of electric vehicles as storage for excess renewable generation, vehicle to grid, smart charging, and/or smart grid. The GHG emissions intensity of electricity affects the GHG savings of fuel switching from petroleum-based fuels to electricity; the cleaner the electric grid, the greater the benefits of switching to electricity as a fuel. Hydrogen fuel cell vehicles can help expand renewable energy production, but may require additional electric generation capacity to accommodate the energy demand associated with hydrogen production and may require more fuel storage and pipeline infrastructure.

3. Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for the

transportation sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit.

Ongoing and Proposed Measures – Vibrant Communities and Landscapes / VMT Reduction Goals

- Mobile Source Strategy –15 percent reduction in total light-duty VMT in 2050 (with measures to achieve this goal not specified; potential measures identified in Appendix C).
- Work with regions to update SB 375 Sustainable Communities Strategies targets for 2035 to better align with the 2030 GHG target and take advantage of State rail investments.
- Stabilize transportation funding so investments are available to develop sustainable and well-maintained multi-modal transportation networks in California.
- SB 743 – complete the update to the CEQA metric of transportation impact such that it promotes GHG reduction, the development of multimodal transportation networks, and a diversity of land uses.
- Streamline CEQA compliance and other barriers to infill development.
- Complete the pilot road usage charge program pursuant to SB 1077 and evaluate deployment of a statewide program.
- Continue promoting active transportation pursuant to SB 99 – The Active Transportation Program and beyond.
- Continue to build high-speed rail and broader statewide rail modernization pursuant to the funding program in SB 862 and other sources.
- Encourage use of streets for multiple modes of transportation (including public transit and active transportation, such as walking and bicycling), and for all users, including the elderly, young, and less able bodied, pursuant to AB 1358 – Complete Streets policies.
- Support and assist local and regional governments, through grant programs and technical assistance, to develop and implement plans that are consistent with the goals in “Vibrant Communities and Landscapes,” including the following:
 - AB 2722 – Implement Transformative Climate Communities Program, ensuring promotion of GHG reductions from neighborhood-level community plans in disadvantaged communities.
 - AB 2087 – Help local and State agencies apply core investment principles when planning conservation or mitigation projects.
 - High speed rail station area plans.
 - Implementation of updated General Plan Guidelines.
- Per SB 350, conduct and publish a study on barriers to accessing ZE/NZE transportation options for low-income customers and recommendations on how to increase access.

Ongoing and Proposed Measures – Vehicle Technology

- Implement the Cleaner Technology and Fuels Scenario of CARB’s Mobile Source Strategy, which includes:
 - 4.3 million zero emission and plug-in hybrid light-duty electric vehicles by 2030,
 - Phase 1 and 2 GHG regulations for medium- and heavy-duty trucks,
 - An Advanced Clean Cars program, and
 - Advanced Clean Transit.
- Periodically assess and promote cleaner fleet standards.
- Deploy ZEVs across all vehicle classes, including rail vehicles.
- Encourage State and federal incentive programs to continue supporting zero and near-zero pilot and demonstration projects.
- Collaborate with the U.S. Environmental Protection Agency to promulgate more stringent locomotives requirements, work with California seaports, ocean carriers, and other stakeholders to develop the criteria to incentivize introduction of Super-Low Emission Efficient Ships, and investigate potential energy efficiency improvements for transport refrigeration units and insulated truck and trailer cargo vans.
- Promote research, development, and deployment of new technology to reduce GHGs, criteria pollutants, and toxics.

Ongoing and Proposed Measures – Clean Fuels

- Continue LCFS activities, with increasing stringency of at least 18 percent reduction in carbon intensity (CI).
- Continue to develop and commercialize clean transportation fuels through renewable energy integration goals, tax incentives, research investments, support for project demonstration, public outreach, and State procurement contracts.
- Per SB 1383 and the Short-Lived Climate Pollutant Strategy, adopt regulations to reduce and recover methane from landfills, wastewater treatment facilities, and manure at dairies; use the methane as a renewable source of natural gas (RNG) to fuel vehicles and generate electricity; and establish infrastructure development and procurement policies to deliver RNG to the market.
- Accelerate deployment of alternative fueling infrastructure pursuant to the following:
 - SB 350 – CPUC to accelerate widespread transportation electrification.
 - Executive Order B-16-2012 and 2016 ZEV Action Plan – call for infrastructure to support 1 million ZEVs by 2020.
 - CEC’s Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP).
 - CPUC’s NRG settlement.
 - CalGreen Code provisions mandate installation of PEV charging infrastructure in new residential and commercial buildings.¹⁶¹
 - IOU electric vehicle charging infrastructure pilot programs.

¹⁶¹ Such as raceway and panel capacity to support future installation of electrical vehicle charging stations.

Ongoing and Proposed Measures – Sustainable Freight

- Implement the California Sustainable Freight Action Plan:
 - 25 percent improvement of freight system efficiency by 2030.
 - Deployment of over 100,000 freight vehicles and equipment capable of zero emission operation, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.

Sector Measures

- Adopt a post-2020 Cap-and-Trade Program.

Potential Additional Action

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter II. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Develop a set of complementary policies to make light-duty ZEVs clear market winners, with a goal of reaching 100 percent light-duty ZEV sales. This could include the following:
 - Reliable purchase/trade-in incentives for at least 10 years.
 - Dealer incentives for ZEV sales.
 - Policies to ensure operating cost savings for ZEVs relative to internal combustion engines, including low cost, and potentially free, electricity.
 - Significant investments in charging and ZEV refueling infrastructure.
 - A broad and effective marketing and outreach campaign.
 - Collaborations with cities to develop complementary incentive and use policies for ZEVs.
 - Targeted policies to support ZEV sales and use in low income and disadvantaged communities.
- Develop a Low Emission Diesel Standard to diversify the fuel pool by incentivizing increased production of low-emission diesel fuels. This standard would require incremental progress toward a goal of low-emission diesel comprising 50 percent of the on-and off-road diesel sold in-state by 2030.
- Stabilize transportation funding so investments are available to develop sustainable and well-maintained multi-modal transportation networks in California.
- Continue to develop and explore pathways to implement State-level VMT reduction strategies, such as those outlined in the document “Potential State-Level Strategies to Advance Sustainable, Equitable Communities and Reduce Vehicle Miles of Travel (VMT) for Discussion”¹⁶² (included in Appendix C) through a transparent and inclusive interagency policy development process to evaluate and identify implementation pathways for additional policies to reduce VMT and promote sustainable communities, with a focus on the following:

¹⁶² This refers to the document discussed at the September 2016 Public Workshop on the Transportation Sector to Inform Development of the 2030 Target Scoping Plan Update, also available at: www.arb.ca.gov/cc/scopingplan/meetings/091316/Potential%20VMT%20Measures%20For%20Discussion_9.13.16.pdf.

- Accelerating equitable and affordable transit-oriented and infill development through new and enhanced financing and policy incentives and mechanisms.
- Promoting stronger boundaries to suburban growth through enhanced support for sprawl containment mechanisms, including urban growth boundaries and transfer of development rights programs.
- Identifying performance criteria for transportation and other infrastructure investments, to ensure alignment with GHG reduction goals and other State policy priorities, and improve proximity, expanded access to transit, shared mobility, and active transportation choices.
- Promoting efficient development patterns that maximize protection of natural and working lands.
- Developing pricing mechanisms such as road user/VMT-based pricing, congestion pricing, and parking pricing strategies.
- Reducing congestion and related GHG emissions through commute trip reduction strategies.
- Programs to maximize the use of alternatives to single-occupant vehicles, including bicycling, walking, transit use, and shared mobility options.
- Take into account the current and future impacts of climate change when planning, designing, building, operating, maintaining, and investing in State infrastructure.

D. Natural and Working Lands Including Agricultural Lands

In his 2015 State of the State address, Governor Brown established 2030 targets for GHG emission reductions and called for policies and actions to reduce GHG emissions from natural and working lands, including forests, rangelands, farms, wetlands, and soils. This policy objective was codified through passage of SB 1386 in 2016. The 2030 Target Scoping Plan focuses renewed attention on California's natural and working lands and the contribution they make to meet the State's long-term goals for carbon sequestration, GHG reduction, and climate change adaptation.

California's natural and working lands encompass a range of land types and uses, including farms, ranches, forests, grasslands, deserts, wetlands, riparian areas, coastal areas and the ocean-- as well as the green spaces in urban and built environments. These lands provide significant environmental and public health benefits to the State, and they support clean air, wildlife and pollinator habitat, and strong economies. They are home to the largest and most diverse sources of food and fiber production and renewable energy in the United States. And, they are the foundation of the State's water supply, with more than two-thirds of California's water supply originating in the Sierra Nevada.¹⁶³

Policy in this sector must balance carbon sequestration with other co-benefits. California's climate objective for natural and working lands is to maintain them as a carbon sink (i.e., net zero or even negative GHG emissions) and minimize the net GHG

¹⁶³ www.sierranevada.ca.gov/our-region/ca-primary-watershed

and black carbon emissions associated with management, biomass utilization, and wildfire events. The State's lands, as well as sub-tidal waters, can be both a source and sink for GHG emissions. The carbon contained in vegetation and soils represents the accumulated exchange of carbon between the land surface and the atmosphere.

CARB has worked extensively with other State agencies, academic researchers and the public to quantify the individual components of the Natural and Working Lands inventory. Recent work has focused on estimating the 2001- 2010 total carbon and carbon fluxes for forests in California. The initial results from this work show that, for 2010, California's natural lands contained an estimated 898 million metric tons of carbon (MMT C) in above-ground live stock for all natural lands combined (forest, grasslands, wetlands and other natural lands), and an additional 1,603 MMT C in additional pools included in the Natural and Working Lands inventory.¹⁶⁴ CARB continues to expand the scope of the inventory using the most recent data available and plans to update the forest component of the Natural and Working Lands (to include 2012 GHG emissions estimates) inventory next year, followed by emissions estimates for soil carbon, urban forestry, and croplands by mid-2018. Work currently in progress applies airborne and space-based technologies to monitor forest health and quantify emissions associated with land-based carbon. Remote sensing technology is maturing rapidly. California and federal agencies are working with researchers and funding studies to enhance our understanding of the roles of forests and other lands in climate change using this advanced technology.^{165,166} CARB is continuously reviewing the latest science in this sector and is committed to working closely with other State agencies and the public to ensure a comprehensive review of the updates to the inventory.

While not all of this stored carbon is in imminent danger of emission to the atmosphere, recent trends indicate that significant pools of carbon risk reversal: an estimated 150 MMT C was lost to disturbance over the period 2001–2010, with the majority—approximately 120 MMT C—lost through wildland fire. At the same time, energy use, methane, and N₂O emissions from the agricultural sector accounts for 8 percent of the emissions in the statewide GHG inventory. While growing trees and other vegetation, as well as soil carbon sequestration, make up for some of these losses, climate change itself is expected to further stress many of these systems and affect the ability of California's landscapes to maintain its carbon sink without proactive management. There are ways to slow and reverse this trend, in concert with other productive and ecological objectives of land use, and the State will continue to rely on best available science to promote those actions. These efforts can not only protect California's natural carbon stocks, they can also improve quality of life in urban and rural communities alike and increase the climate resilience of agricultural, forestry, and recreational industries and the rural communities they support; the State's water supply; biodiversity; and the safety and environmental health of all who call California home.

¹⁶⁴ ARB's forest and other natural lands inventory tables, methodology development publications, and a workshop presentation providing an overview of the inventory development are available at: www.arb.ca.gov/cc/inventory/sectors/forest/forest.htm

¹⁶⁵ Asner, G. et al. (2015) Progressive forest canopy water loss during the 2012–2015 California drought. PNAS 113.2: E249-E255

¹⁶⁶ Battles, J. et al. (in progress) Innovations in measuring and managing forest carbon stocks in California. Project 2C: 4th California Climate Change Assessment. Natural Resources Agency. resources.ca.gov/climate/fourth/

This Proposed Plan includes an initial analysis of business-as-usual net carbon sequestration rates from natural and working lands, including forecasts to 2030 and 2050. This is being done outside of the PATHWAYS model used for the other sectors in the Proposed Plan through a research contract with Lawrence Berkeley National Laboratory that is managed by the California Natural Resources Agency (CNRA). Additional 2030 and 2050 scenarios assess the expected impact of a set of development, land protection, management, and restoration objectives on carbon sequestration and GHG emissions. The Discussion Draft includes more information on the initial modeling as does Appendix G.¹⁶⁷ These projections will continue to be developed in the coming months. The projections will be used to estimate the difference between current carbon sequestration levels and expected sequestration levels in the scenarios to achieve the net zero loss goal by 2030 and net sequestration goal by 2050. This work will help guide near and long-term State policies to ensure net sequestration in our natural and working lands. Refinement of these projections will need to continue after the Final Plan is adopted. These refinements will be important to support implementation planning and to model implementation scenarios to 2100 to better understand the response of natural and working lands to major climate change impacts such as increased temperature, drought, and wildfire. The business-as-usual statewide baseline emission projection and carbon sequestration results may also inform the accounting framework requirements set forth in SB 859.

1. Looking to the Future

This section outlines the high-level objectives to reduce GHGs in the natural and working lands sector to meet California's climate objective to: (1) maintain them as a resilient carbon sink (i.e., net zero or even negative GHG emissions) to 2030 and beyond, and (2) minimize the net GHG and black carbon emissions associated with management, biomass disposal, and wildfire events to 2030 and beyond. Achieving these objectives will include establishment of agriculture sector GHG emission reduction planning targets for the mid-term time frame and 2050.

Implementation will include policy and program pathways, with activities related to land protection; enhanced carbon sequestration; and innovative biomass utilization:

- (1) **Protect** land from conversion to more intensified uses by increasing conservation opportunities and pursuing local planning processes urban and infrastructure development patterns that avoid greenfield development. The latter is being done in coordination with transportation and infrastructure climate policy, as described in prior sections of this Proposed Plan.
- (2) **Enhance** the resilience of and potential for carbon sequestration on those lands through management and restoration, and reduce GHG and black carbon emissions from wildfire and management activities. This includes expansion and management of green space in urban areas.
- (3) **Innovate** biomass utilization such that harvested wood and excess agricultural and forest biomass can be used to advance statewide objectives for renewable

¹⁶⁷ <https://www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm>

energy and fuels, wood product manufacturing, agricultural markets, and soil health, resulting in avoided GHG emissions relative to traditional utilization pathways. Associated activities should increase the resilience of rural communities and economies.

The Forest Climate Action Team, Healthy Soils Initiative, State Coastal Conservancy's Climate Ready Program, various Greenhouse Gas Reduction Fund programs, and CARB's compliance offset program already undertake this work. Future work will identify and seek to fill gaps, and set a comprehensive and strategic path forward. Research is underway across agencies to advance the state of the science on natural and working lands carbon dynamics, including a number of projects within the Fourth Climate Change Assessment.

2. Cross-Sector Interactions

Strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors, most notably at intersections with land use, biomass and waste utilization, and water.

Landowner, local, and regional decisions affect land use development patterns and natural and working land conversion rates; conversely, conservation activities can support infill-oriented regional development and related transportation needs. As discussed earlier in the Transportation Sustainability section, under SB 375, Sustainable Communities Strategies (SCSs) aim to link transportation, housing, and climate policy to reduce per capita GHG emissions while providing a range of other important benefits for Californians. Some SCSs include policies, objectives or implementation measures relating to conservation and land protections, and to urban greening.¹⁶⁸ Protecting natural and working lands that are under threat of conversion can promote infill development, reduce VMT, limit infrastructure expansion, and curb associated GHG emissions. An integrated vision for community development, land conservation and management, and transportation was presented at the 2030 Target Scoping Plan Workshop on September 14, 2016.¹⁶⁹

Agricultural and commercial forestry operations produce biomass as both an objective (i.e., food and fiber production) and a waste product. How this material is utilized can either increase or decrease emissions associated with management and restoration activities, turn waste into usable products, displace fossil fuels used in energy and transportation, and increase carbon stored in durable wood products in the built environment. Finding productive ways to use this material offers new opportunities to reduce GHG emissions, promote carbon sequestration, and generate economic resources for forest, agricultural, and waste sectors and communities. California is investigating ways to transform how organic waste from the agricultural and municipal sectors is managed to meet emission reduction targets required by SB 1383,¹⁷⁰ and to

¹⁶⁸ Livingston, Adam. Sustainable Communities Strategies and Conservation. January 2016. Available at:

www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/sustainable-communities-strategies-and-conservation.pdf

¹⁶⁹ www.arb.ca.gov/cc/scopingplan/meetings/meetings.htm

¹⁷⁰ SB 1383 (Lara, Chapter 396, Statutes of 2016) requires a 50 percent reduction in anthropogenic black carbon emissions by 2030.

protect public health. Cross-sector synergies and complete waste inter-cycles, discussed further in the Waste Management section, result from conscientious treatment of these resources, including opportunities to improve soil health, increase renewable energy generation, and enhance market support for non-commercial products and waste. Productive utilization of dead and dying trees is a significant focus of the Governor's Tree Mortality Task Force, and efforts to resolve the current shortfall in utilization capacity is addressed in that State of Emergency Declaration as well as in SB 859.

Natural and working lands stewardship is essential to securing the State's water supply along the entire supply chain, from protection and management of the forested headwaters to preserving retention function of mountain meadows, ensuring flows and habitat in the Delta and its tributaries, end use efficiencies in agricultural and urban uses, and groundwater infiltration and utilization statewide. For example, efforts to increase water and energy use efficiency of farming operations could support GHG emission reduction goals in the energy sectors. And improving forest health in the Sierra Nevada and other headwaters will protect water quality and availability, in alignment with the California Water Action Plan.

a) Agriculture's Role in Emission Reduction and Carbon Sequestration

As the State works to meet emission reduction goals, the agricultural sector can contribute by reducing emissions from production and by playing a role in cross-sectoral efforts to maximize the many benefits of natural and working lands.

Climate-smart agriculture is an integrated approach to achieving GHG reductions while also ensuring food security in the face of climate change and promoting agricultural adaptation to the compounding impacts of climate change. Conserving agricultural land, sequestering carbon in agricultural soils, employing a variety of techniques to manage manure on dairies, and increasing the efficiency of on-farm water and energy use are examples of practices that can achieve climate and food production goals across diverse agricultural systems. Climate-smart agriculture can support the goals of Protect, Enhance, and Innovate. Focus areas that can lead to reduced emissions and other co-benefits are discussed in the following paragraphs.

California agriculture accounts for 8 percent of the State's GHG emission inventory. A large percentage of agricultural emissions are methane emissions from the dairy and livestock sectors. Emissions come from the animals themselves, through enteric fermentation, as well as from manure management—especially at dairies. Senate Bill 1383 and the resultant Proposed SLCP Reduction Strategy identify a mix of voluntary, incentive-based, and potential regulatory actions to achieve significant emissions reductions from these sources. A variety of techniques will be employed to attain the best results for each specific farming operation, and effectively implementing a broad mix of strategies will reduce the GHG emissions from the agricultural sector significantly.

Another source of GHG from agriculture is nitrous oxide resulting from nitrogen fertilizer applications. Optimizing the rate, timing, placement and type of nitrogen fertilizers has significant potential to reduce nitrous oxide (N₂O) emissions. Reducing synthetic nitrogen fertilizer sources by enhancing the use of organic nitrogen sources (such as cover crops and compost) can achieve net GHG reductions as well. Over the last several years steps have been taken to help farms optimize fertilizer applications to protect water quality, reduce N₂O emissions, and maintain high yields. Farmers are required through the Irrigated Lands Regulatory Program to manage nitrogen fertilizers carefully to protect water quality through the use of nitrogen management plans. Nitrogen management plans are a tool designed to prevent over-applications of nitrogen through an approach that accounts for the nitrogen inputs from water, soil amendments and other sources, and also accounts for nitrogen removed from the field. The California Department of Food and Agriculture's (CDFA's) Fertilizer Research and Education Program, in coordination with university researchers and others, has developed fertilization guidelines to optimize the rate, timing and placement of fertilizers for crops that represent more than half of the irrigated agriculture in California. Similarly, innovations in water management and the expansion of high efficiency irrigation methods also are contributing to N₂O reductions.

California's farms and ranches have the ability to remove carbon from the atmosphere through practices that build and retain soil organic matter. Adequate soil organic matter ensures the soil's continued capacity to function as a vital living ecosystem with multiple benefits, producing food for plants, animals, and humans. The Healthy Soils Initiative, announced by Governor Brown in 2015, offers an opportunity to incentivize the management of farmland for increased carbon sequestration in soil, also augmenting co-benefits such as increased water-holding capacity and soil fertility and supporting biodiversity and integrated farming techniques. State and local efforts to manage land for carbon sequestration must work in conjunction with existing plans, incentives, and programs protecting California's water supply, agricultural lands, and wildlife habitat. The Proposed Plan fits within a wide range of ongoing planning efforts throughout the State to advance economic and environmental priorities associated with natural and working lands.

3. Potential Actions to Enhance Carbon Sequestration and Reduce Greenhouse Gases

The land management targets outlined below are illustrative of the types of actions that will be necessary to maintain California's natural and working lands and urban green space as a net sink of carbon, and are being used to aid in development of the Lawrence Berkeley National Laboratory scenario modeling—both the Reference scenario and “with-policy” scenarios. Once the carbon implications of these activities are established within that scenario modeling framework, the State and stakeholders can begin the process of more accurately scoping the scale of action needed to reach the carbon sequestration and GHG emission reduction targets. The preliminary modeling results were included in the Discussion Draft and Appendix G.

a) Protection of Land and Land Use

California will continue to pursue development and new infrastructure construction patterns that avoid greenfield development, limit conflicts with neighboring land uses, and increase conservation opportunities for natural and working lands to reduce conversion to intensified uses. Success here will depend on working through local and regional land use planning and permitting, as well as developing incentives for participation by local governments and individual landowners. The preliminary modeling results are included in Discussion Draft and Appendix G.

b) Enhance Carbon Sequestration and Resilience through Management and Restoration

California will increase efforts to manage and restore land to secure and increase carbon storage and minimize GHG and black carbon emissions in a sustainable manner so that the carbon bank is resilient over time.

To better understand the potential carbon outcomes of this strategy, the initial modeling for this sector, as detailed in the Discussion Draft and Appendix G, considers a variety of management and restoration activities employed across the State. The model considers two potential scenarios, a “low” and a “high” rate of implementation to 2030, with resulting carbon sequestration outcomes to 2050. The acreages given in the “low” scenario all represent implementation above and beyond current rates for the listed activity, but that could be considered reasonably achievable if additional funding and other supporting resources are available. This applies to implementation on both private and public lands. Many of these goals can be accomplished through existing administrative structures, but will require additional public and private investment. The “high” scenario includes more ambitious targets, and may entail new programs and policies, including additional coordination with federal partners, to support implementation. Details about the modeling are included in the Discussion Draft and Appendix G.

The activities presented in Discussion Draft and Appendix G as part of the initial modeling are not inclusive of all activities that will be considered under this strategy. The modeled management strategies were included because well-established science indicates that the strategies increase carbon sequestration and resilience. For example, an increase in urban tree canopy is included in the initial modeling exercise though urban greening initiatives will not be limited to tree planting. State agencies seek input through this Scoping Plan process on the suite of activities to be considered under this strategy to improve modeling and projections. Because modeling will need to continue beyond finalization of the Final Plan, actions to reduce emissions and increase carbon sequestration for this sector include next steps to identify and analyze land management and restoration activities to advance the State’s climate objectives and improvements in modeling projections or other quantification protocols.

Management and restoration activities to be considered beyond those included in the initial modeling include, but are not limited to the following:

- Improved forest management such as forest fuel reduction treatments, reforestation, other restoration activities, prescribed fire and managed ignition.
- Restoration of mountain meadows, managed wetlands in the Sacramento San Joaquin Delta, coastal wetlands and desert habitat.
- Increased extent of eelgrass beds.
- Creation and management of parks and other greenspace in urban areas, including expansion of the existing urban tree canopy.
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) management practices suitable for California agriculture.

The Discussion Draft includes additional information about the initial modeling inputs, assumptions, and results.

State agencies will require additional resources to complete efforts to model projections for this sector.

c) Innovate Biomass Utilization Pathways

Excess biomass generated by commercial agricultural and forestry operations, biomass and wood harvested through forest health and restoration treatments, and material that is generated in response to Tree Mortality Emergency activities, should be used in a manner that minimizes GHG and black carbon emissions and promotes public and environmental health. The legislature has called for reducing disposal of organic waste in landfills, including millions of tons of wood and green waste that can be composted or turned into other products, fuels, and electricity. The State must develop targeted policies or incentives to support durable markets for all of this material. Achieving this outcome will require diversion of this biomass to production of renewable electricity and biofuels, commercial products including durable wood products, compost and other soil amendments, animal feed and bedding, and other uses. Research, development, and implementation activities underway in energy, wood products, and soil amendment fields should be evaluated for utility in optimizing these resources on regional and community scales.

4. Efforts to Support Sector Objectives

To ensure the natural and working lands sector is a net carbon sink, the State will complete an Integrated Natural and Working Lands Climate Change Action Plan by 2018. Modeling efforts currently underway with Lawrence Berkeley National Laboratory and additional modeling efforts, as needed, will support the development of this plan. This plan will consider aggregation of eco-regional plans and efforts to achieve net sequestration goals. The following list includes additional efforts that support this sector's goals, many of which will be included in the Action Plan.

Protect

- Promote and provide incentives for infill development through community revitalization and urban greening and support for permanent and temporary voluntary conservation of lands under threat of development, paired with stewardship plans where possible.
- Promote the adoption of regional transportation and development plans, such as SB 375 Sustainable Communities Strategies and Climate Action Plans that prioritize infill and compact development and also consider the climate change impacts of land use and management.
- Provide support and technical assistance for counties, cities, and regions to integrate natural and working lands conservation priorities into plans, drawing from existing Natural Community Conservation Plans, Habitat Conservation Plans, the State Wildlife Action Plan, and critical agricultural lands. Partner with landowners, local and federal agencies, and private conservation organizations to conserve critical lands.
- Coordinate State-funded land and easement acquisition and management among departments within the Natural Resources Agency, including the Department of Parks and Recreation, Department of Conservation, Department of Fish and Wildlife, Department of Forestry and Fire Protection, Department of Water Resources, Wildlife Conservation Board, Ocean Protection Council, and State Conservancies, to effectively leverage State resources to meet common goals.
- Support ocean management actions that result in protection of subtidal habitats such as eelgrass, to avoid loss of these systems.

Enhance

- Identify land use and management and restoration treatments that are expected to increase the resilience and/or level of carbon sequestration and reduce GHG and black carbon emissions, based on best available science.
- Promote on-farm and ranch management practices that sequester carbon or reduce GHG emissions.
- Engage local communities and private and public landowners to implement best practices for carbon sequestration to achieve net GHG benefits by undertaking actions that reduce on-farm GHG emissions, improve soil and biomass carbon sequestration, restore wetlands and other natural systems, or reduce the risk of wildfire. Support implementation with technical assistance.
- Research, develop, and deploy actions and initiatives for oceans and trophic systems to mitigate and adapt to climate change.
- Increase the use of green infrastructure in urban areas to enhance carbon sequestration potential in a manner that also results in co-benefits of energy efficiency of the built environment and transportation systems, reduction of the urban heat island effect, and improvement of water capture and storage, and supports direct, long-lasting benefits to disadvantaged communities and public health benefits.¹⁷¹

¹⁷¹ For a detailed analysis of public health implications and impacts of climate mitigation measures, please see Appendix J: Public Health Analysis (to be released in early 2017).

- Promote local and regional performance targets for mitigation of the urban heat island (UHI) effect and provide technical support for identification and implementation of urban greening, building and transportation policies, and programs to achieve it. Such a goal might take the form of reducing the UHI differential by 3°F between urban core and surrounding rural areas, versus current UHI impacts in major metropolitan areas.¹⁷²

Innovate

- By 2019, develop through an interagency working group a holistic plan to address excess biomass generated by commercial agricultural and forestry operations and urban biomass, while minimizing GHG and black carbon emissions, through a transition to technologies that can produce cleaner bioenergy, transportation fuels, other commercial products, and soil amendments. This working group will build upon work initiated by the 2012 Bioenergy Action Plan.
- Scale bioenergy capacity to contribute significantly to meeting community and regional agricultural and forest biomass disposal needs over time, in a manner that protects public health. This includes accelerated build-out of the capacity mandated by SB 1122 and the procurement requirements contained in the Tree Mortality State of Emergency Declaration and SB 859.
- Develop recommendations and identify pilot projects to expand wood products markets, as per SB 859. Support research and development and pathways to market for wood products made from non-merchantable timber.

Scoping and Tracking Progress

- Collaborate with other State agencies to ensure the initiatives below complement other Proposed Plan measures:
 - Expand the scope of lands targeted for carbon sequestration, building off of the Initial Scoping Plan goal for forest carbon sequestration (later codified in AB 1504) and the First Update's broader discussion of sequestration potential from agricultural and natural systems.
 - Identify implementation mechanisms to protect and manage land at relevant scales. Implementation will rely on existing regulatory, policy, and incentive structures, and include mandated programs, voluntary efforts, and state, local, regional and federal partnerships with the U.S. Forest Service and USDA NRCS, among others.
 - Identify the scale and scope of implementation for mechanisms to reduce GHG emissions and achieve the goal of maintaining natural and working

¹⁷² CalEPA's Urban Heat Island Index Maps acts as a tool to establish baselines for 31 urban areas. The Index is calculated as a positive temperature differential over time between an urban census tract and nearby upwind rural reference points at a height of two meters above ground level, where people experience heat. See more at: www.calepa.ca.gov/UrbanHeat/Index.htm#sthash.SZkxGYIA.dpuf. CalEPA concludes daytime temperatures in urban areas are on average 1°F–6°F higher than in rural areas, while nighttime temperatures can be as much as 22°F higher as the heat is gradually released from buildings and pavement. The U.S. Environmental Protection Agency (EPA) encourages cities to set quantitative goals. For example, the City of Los Angeles's The Sustainable City pLAn aims to reduce the temperature difference between the urban core and the surrounding rural areas by 1.7°F by 2025 and 3.0°F by 2035.

- lands as a carbon sink, as well as the resources and policy pathways for implementation.
- Evaluate the GHG benefits that result from cross-sectoral programs or programs with alternative goals than GHG emission reductions; for example, the Agricultural Tractor Replacement Program and the Irrigated Lands Regulatory Program.
- Complete the Reference Case, with-policy carbon sequestration, GHG and black carbon emissions scenario projections in order to set targets and develop statewide and regional plans.
- Complete CARB's Natural and Working Lands inventory, including estimates of black carbon emissions from natural and working lands, in concert with the Action Plan. Continue to refine the natural and working lands inventory based on input from other State agencies, stakeholders, and academic experts. Complete a standardized accounting framework for forests and other lands, as described in SB 859, by December 30, 2018.
- Develop implementation tracking and performance monitoring systems for the Action Plan.
- Incorporate a variety of cropland types, agricultural management practices, and bundling of those practices into carbon accounting models to assess the potential for carbon sequestration.
- Develop and implement a Healthy Soils Action Plan.
- Complete and implement the Forest Carbon Plan.
- Design planning and implementation for conservation and restoration strategies to be effective at the watershed or other regionally relevant large landscape scale.

Efforts to reduce GHGs in the agricultural sector:

- Employ a suite of ready-to-implement voluntary practices, such as increasing the efficiency of on-farm water and energy use, managing manure in dairies, and agricultural practices that increase net carbon sequestration and reduce GHG emissions across diverse agricultural systems.
- Per SB 1383, reduce methane emissions from livestock manure and dairy manure management operations, including establishment of energy infrastructure development and procurement policies. The regulations will take effect on or after January 1, 2024, if CARB determines the regulations are technologically and economically feasible and cost effective.
- Implement a Healthy Soils Program to incentivize a variety of practices that are known to sequester carbon in agricultural soils and plants and provide multiple ecosystem services.
- Increase the number of agricultural acres using innovative on-farm water management practices.
- Utilizing existing reporting mechanisms, such as the Irrigated Lands Regulatory Program, identify metrics that can be tracked into the future to evaluate reductions in nitrous oxide emissions from fertilizing materials on California's agricultural lands.

- Further the development and calibration of quantification tools (Comet-Farm, Comet-Planner, and others) and monitoring tools for agriculture to understand trends in practices (aerial imagery, mapping, and sampling).
- Continue to support research to understand emission factors from soils throughout California and to understand sequestration potential.
- Support research and development and pathways to market for dairy digesters, including pipeline injection and interconnection.
- Support research and development for non-digester dairy manure methane mitigation options including scrape, solids separation, converting to pasture-based systems, and other technologies to help meet CARB's proposed methane reduction goals on dairies.
- Facilitate agricultural biomass utilization.
- Increase the number of farms generating on-farm renewable energy (solar, wind, bioenergy, geothermal, etc.).
- Continue to implement and evaluate other potential actions to include in the Compliance Offset Program to generate GHG reductions in the agricultural sector.

E. Waste Management

The Waste Management sector covers all aspects of solid waste¹⁷³ and materials management including reduction/reuse; recycling, and remanufacturing of recovered material; composting and in-vessel (anaerobic and aerobic) digestion; biomass management (chip and grind, composting, biomass conversion); municipal solid waste transformation; and landfilling. This sector also includes market development programs, such as the State's recycled-content product procurement program and a range of grant and loan programs. Data from CalRecycle's report, *2014 Disposal Facility-Based Characterization of Solid waste in California*, shows that materials, such as organics, that decompose in landfills and generate methane comprise a significant portion of the waste stream. Methane is a potent SLCP with a global warming potential 25 times greater than that of carbon dioxide on a 100-year time horizon and more than 70 times greater than that of carbon dioxide on a 20-year time horizon.¹⁷⁴

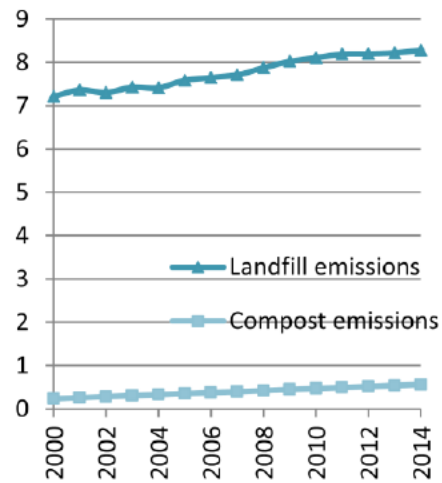
Within CARB's greenhouse gas inventory, emissions from the waste management sector consist of methane and nitrous oxide emissions from landfills and from commercial-scale composting, with methane being the primary contributor to the sector's emissions. The sector emitted 8.85 MMTCO₂e in 2014, comprising approximately 2 percent of the State's GHG emissions.

¹⁷³ In general, the term *solid waste* refers to garbage, refuse, sludges, and other discarded solid materials resulting from residential activities, and industrial and commercial operations. This term generally does not include solids or dissolved material in domestic sewage or other significant pollutants in water such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

¹⁷⁴ Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Working Group I: The Physical Science Basis*. 2.10.2 Direct Global Warming Potentials. Fourth Assessment Report. www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

Emissions from recycling and waste have grown by 19 percent since 2000 (Figure IV-3).¹⁷⁵ The majority of those emissions are attributed to landfills, despite the majority of landfills having gas collection systems in place.¹⁷⁶ Landfill emissions account for 94 percent of the emissions in this sector, while compost production facilities make up a small fraction of emissions.¹⁷⁷ The annual amount of solid waste deposited in California landfills grew from 37 million tons in 2000 to its peak of 46 million tons in 2005, followed by a declining trend until 2009 when landfilled solid waste stabilized to relatively constant levels. Landfill emissions are driven by the total waste-in-place, rather than year-to-year fluctuation in annual deposition of solid waste, as the rate and volume of gas produced during decomposition depends on the characteristics of the waste and a number of environmental factors. As a result, waste disposed in a given year contributes to emissions that year and in subsequent years.

Figure IV-3. Emissions from Landfill and Compost (MMTCO₂e)



In addition to direct emissions, the reduction, reuse, and recycling of waste materials decreases upstream GHG emissions associated with the extraction and processing of virgin materials and their use in production and transport of products. Although many of these upstream GHG emissions happen outside of California, California’s waste policies can reduce both local and global GHG emissions and create jobs within the State. While landfills are an effective and relatively safe way to manage some waste, disposal-centric activities result in squandering valuable resources and generate landfill gases as well as other risks. A large fraction of the organics in the waste stream can be diverted from landfills to composting or digestion facilities to produce beneficial products. Moreover, food waste is the largest component of organics disposed in landfills; a portion of this is edible and should be captured at its source and, for example, provided to food banks to feed people in need. A State waste management sector “loading order” should focus more attention on reducing how much waste we generate and recovering and recycling whatever resources we can, using landfills as a last resort.

Landmark initiatives like the Integrated Waste Management Act of 1989 (AB 939) demonstrate California’s efforts to build communities that consume less, recycle more, and take resource conservation to higher and higher levels. Statewide, Californians achieved a 49 percent recycling rate in 2014, and recycling programs support an estimated 75,000 to 115,000 green jobs in California. If California were to achieve a

¹⁷⁵ ARB. 2016. Documentation of California’s 2000–2014 GHG Inventory – Index. Last modified March 30, 2016.

www.arb.ca.gov/cc/inventory/doc/doc_index.php

¹⁷⁶ ARB. 2013. California Greenhouse Gas Inventory for 2000–2013 – by Category as Defined in the 2008 Scoping Draft Plan (based upon IPCC Fourth Assessment Report’s Global Warming Potentials).

¹⁷⁷ ARB. 2016. 2016 Edition California GHG Emission Inventory. California Greenhouse Gas Emission Inventory: 2000–2014. Version June 17, 2016.

75 percent statewide solid waste recycling rate by 2020—a goal set out by the Legislature in AB 341 (Chesboro, Chapter 476, Statutes of 2011) —by recycling and remanufacturing at in-state facilities, the State could potentially generate an additional 100,000 green jobs.¹⁷⁸ In addition to employment contributions, diversion of organic waste from landfills can generate positive environmental impacts. Compost from organic matter provides soil amendments to revitalize farmland, reduces irrigation and landscaping water demands, contributes to erosion control in fire-ravaged landscapes, and potentially increase long-term carbon storage in rangelands. Production and use of bioenergy in the form of biofuels and renewable natural gas has the potential to reduce dependency on fossil fuels for the transportation sector. For the energy sector, however, renewable natural gas faces safety, feasibility, and cost issues.

The State has a robust waste management system in place, with established programs that reduce air emissions through activities such as gas collection systems from landfills¹⁷⁹ and stringent recycling mandates. AB 939 required cities and counties to reduce the amount of waste going to landfills by 50 percent in 2000, and municipalities have nearly universally met this mandate. Californians dispose about 30 million tons of solid waste in landfills each year. To further reduce landfilled solid waste, the Legislature adopted AB 341 to achieve more significant waste reductions by setting a goal that 75 percent of solid waste generated be reduced, recycled, or composted by 2020, and by mandating commercial recycling. AB 1826 (Chesboro, Chapter 727, Statutes of 2014) added requirements regarding mandatory commercial organics recycling.

Although solid waste management has evolved over the last 27 years and diversion rates (which include more than recycling) have increased more than six-fold since 1989, if no further changes in policy are made, the State's growing population and economy will lead to higher amounts of overall disposal along with associated increases in GHG emissions. The pathway to reducing disposal and associated GHG emissions will require significant expansion of the composting, anaerobic digestion, and recycling manufacturing infrastructure in the State.

To help reduce GHG emissions by 40 percent below 1990 levels by 2030 and meet California's waste reduction goals, California's waste management sector strives to achieve in-state processing and management of waste generated in California. To carry out this vision, we must work with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction. Packaging comprises approximately 8 million tons of waste landfilled in California annually, or about one quarter of the State's total disposal stream. To reduce the climate change footprint of packaging, the State is promoting the inclusion of source reduction principles in packaging and product design; fostering recycling and recyclability as a front end design parameter for packaging and products

¹⁷⁸ CalRecycle. 2013. AB 341's 75 Percent Goal and Potential New Recycling Jobs in California by 2020. July. www.calrecycle.ca.gov/Publications/Documents/1463/20131463.pdf

¹⁷⁹ ARB approved a regulation to reduce methane from municipal solid waste landfills as a discrete early action measure under AB 32. The regulation became effective June 17, 2010. Additional information is available at: www.arb.ca.gov/regact/2009/landfills09/landfillfinalfro.pdf

that cannot be reduced; and encouraging recycling markets and market development for recycled-content products and packaging. CalRecycle is developing a packaging policy model containing components necessary for a mandatory comprehensive, statewide packaging program in California; this would need to be legislatively enacted to achieve a packaging reduction goal, such as 50 percent by 2030. CalRecycle is also continuing to work with stakeholder organizations and industry to explore complementary voluntary activities that have the potential to significantly decrease packaging disposal in California. In addition, large-scale shifts in materials management will be necessary, including steps to maximize recycling and diversion from landfills and build the necessary infrastructure to support a sustainable, low carbon waste management system within California. Working together, State and local agencies will identify ways to increase the use of waste diversion alternatives and expand potential markets, obtain funds and incentives for building the infrastructure and strengthening markets, and evaluate the need for additional research to achieve California's GHG reduction and waste management goals.

Recently adopted legislation outlines new opportunities and requirements to reduce GHG emissions from the waste sector, with a focus on reducing organic waste sent to landfills. SB 605 (Lara, Chapter 523, Statutes of 2014) requires that CARB develop a strategy to reduce SLCPs and SB 1383 requires the strategy to be implemented by January 1, 2018. CARB's Proposed SLCP Reduction Strategy includes organic waste diversion targets for 2020 and 2025 consistent with SB 1383 to reduce methane emissions from landfills. It requires CalRecycle, in consultation with CARB, to adopt regulations to achieve statewide disposal targets to reduce landfilling of organic waste by: (1) 50 percent from the 2014 level by 2020, and (2) 75 percent from the 2014 level by 2025. Under SB 1383, of the edible food destined for the organic waste stream, not less than 20 percent is to be recovered to feed people in need by 2025. The regulations are to take effect on or after January 1, 2022, and CalRecycle, in consultation with CARB, must analyze the progress that the waste management sector, State government, and local government have made in achieving the 2020 and 2025 goals by July 1, 2020. Incorporating SB 1383 requirements, CARB's Final SLCP Reduction Strategy is expected to be presented to the Board for approval in the first quarter of 2017. It is estimated that the combined effect of the food waste prevention and rescue programs and organics diversion from landfills will reduce 4 MMTCO₂e of methane in 2030 (using a 20-year GWP), but one year of waste diversion in 2030 is expected to result in a reduction of 14 MMTCO₂e of emissions over the lifetime of waste decomposition.

1. **Looking to the Future**

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Take full ownership of the waste generated in California.
- View waste as a resource.

- Develop a sustainable, low carbon waste management system that processes collected waste within California and generates jobs.
- Maximize recycling and diversion from landfills.
- Reduce direct emissions from composting and digestion operations through improved technologies.
- Build the infrastructure needed to support a sustainable, low carbon waste management system within California.
- Increase organics markets which complement and support other sectors.¹⁸⁰
- Capture edible food before it enters the waste stream and provide to people in need.
- Increase production of renewable transportation fuels from anaerobic digestion of waste.
- Recognize the co-benefits of compost application.

2. Cross-Sector Interactions

The waste management sector interacts with all of the other sectors of the State's economy. Reducing waste, including food waste, is key to reducing the State's overall carbon footprint. Additionally, replacing virgin materials with recycled materials reduces the energy and GHGs associated with the goods we produce and consume.

California leads the United States in agricultural production in terms of value and crop diversity. Soil carbon is the main source of energy for important soil microbes and is key for making nutrients available to plants. Waste-derived compost and other organic soil amendments support the State's Healthy Soils Initiative being implemented by CDFA. In addition, the use of compost to increase soil organic matter in the agricultural sector provides other benefits, including reduced GHG emissions, conserved water, reduced synthetic (petroleum-based) fertilizer and herbicide use, and sequestered carbon.

3. Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, to move forward with the goals of the waste management sector and achieve the 2030 target, certain actions are recommended to help set the groundwork. These actions affect several broad areas and are necessary for reducing the challenges facing this sector, and they are listed below as supporting actions.

¹⁸⁰ Examples may include renewable energy (biogas to renewable transportation fuels or electricity); soils (application of organics to agricultural soils for building soil organic matter and conserving water; application of organics to mulch for erosion control; application of organics to rangelands for increased carbon sequestration); and forests (support use of forest residues for erosion control; stabilization of fire-ravaged lands).

Ongoing and Proposed Measures

- Continue implementation of the Landfill Methane Control Measure.
- Continue implementation of the Mandatory Commercial Recycling Regulation and the Mandatory Commercial Organics Recycling requirements.
- As required by SB 1383:
 - By 2018, CARB will adopt and implement the Short-Lived Climate Pollutant Reduction Strategy.
 - CalRecycle will develop regulations to require 50 percent organic waste diversion from landfills from 2014 levels by 2020 and 75 percent by 2025, including programs to achieve an edible food waste recovery goal of 20 percent below 2016 levels by 2025. The regulations shall take effect on or after January 1, 2022. By July 1, 2020, analyze the progress that the waste sector, State government, and local governments have made in achieving these goals.
 - CEC will develop recommendations for the development and use of renewable gas as part of the 2017 Integrated Energy Policy Report. Based on these recommendations, adopt policies and incentives to significantly increase sustainable production and use of renewable gas.

Potential Additional or Supporting Action

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter II. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Establishing a sustainable State funding source (such as an increased landfill tip fee and new generator charge) for development of waste management infrastructure, programs, and incentives.
- Working with residents and producers to reduce the volume of waste generated overall and capitalize on technology and social changes that might enable waste reduction.
- Increasing organics diversion from landfills, building on established mandates (AB 341's 75 percent by 2020 solid waste diversion goal, AB 1594,¹⁸¹ AB 1826,¹⁸² AB 876¹⁸³) and new short-lived climate pollutant targets for 2025 (SB 605, SB 1383) to be accomplished via prevention (including food rescue), recycling, composting/digestion, and biomass options.
- Addressing challenges and issues associated with significant expansion and construction of organics and recycling infrastructure in California that is needed to achieve recycling and diversion goals. Challenges and issues include permitting, grid/pipeline connection, funding, local siting, markets, and research.
- Developing programmatic Environmental Impact Reports (EIRs) and model permit and guidance documents to assist in environmental review and CEQA for new facilities.
- Providing incentives for expanded and new facilities to handle organics and recyclables to meet 2020 and 2030 goals.

¹⁸¹ Assembly Bill 1594, *Waste Management* (Williams, Chapter 719, Statutes of 2014).

¹⁸² Assembly Bill 1826, *Solid Waste: Organic Waste* (Chesbro, Chapter 727, Statutes of 2014).

¹⁸³ Assembly Bill 876, *Compostable Organics* (McCarty, Chapter 593, Statutes of 2015).

- Providing incentives to develop and expand food rescue programs to reduce the amount of edible food being sent to landfills.
- Further quantifying co-benefits of compost products and addressing regulatory barriers that do not provide for consideration of co-benefits.
- Supporting existing and new technologies and markets for excess woody biomass from urban areas, forests, and agriculture.
- Supporting the development of transportation fuel production at digestion facilities to generate renewable transportation fuels.
- Resolving issues of pipeline injection and grid connection to make renewable energy projects competitive.
- Supporting the use of available capacity at wastewater treatment plants that have digesters to process food waste.
- Working with local entities to provide a supportive framework to advance community-wide efforts that are consistent with, or exceed, statewide goals.
- Supporting research and development and pathways to market for dairy and co-digestion digesters, including pipeline injection and interconnection.
- Supporting research on digestate characterization and end products.

F. Water

Water is essential to all life, and is vital to our overall health and well-being. A reliable, clean, and abundant supply of water is also a critical component of California's economy and has particularly important connections to energy, food, and the environment. California's water system includes a complex infrastructure that has been developed to support the capture, use, conveyance, storage, conservation, and treatment of water and wastewater. This elaborate network of storage and delivery systems enables the State to prosper and support populations, amidst wide variability in annual precipitation rates and concentration of rain north of Sacramento, through storing and moving water when and where it is needed.

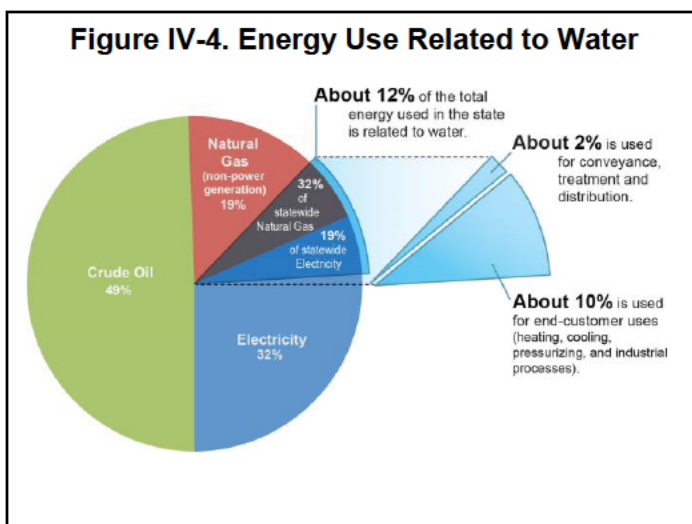
Local water agencies play an important role in delivering water to communities, farms, and businesses. Some purchase water from the major State and federal projects, treat the water as needed, and deliver it to their customers; others act as wholesale agencies that buy or import water and sell it to retail water suppliers. Some agencies operate their own local water supply systems, including reservoirs and canals that store and move water as needed. Many agencies rely on groundwater exclusively, and operate local wells and distribution systems. In recent decades, local agencies have developed more diversified sources of water supplies. Many agencies use a combination of imported surface water and local groundwater, and also produce or purchase recycled water for end uses such as landscape irrigation.¹⁸⁴

¹⁸⁴ California Department of Water Resources. Regional Energy Intensity of Water Supplies. www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

The State's developed surface and groundwater resources support a variety of residential, commercial, industrial, and agricultural activities. California's rapidly growing population—estimated to reach 44 million by 2030¹⁸⁵—is putting mounting pressure on the water supply system. In the future, the ability to meet most new demand for water will come from a combination of increased conservation and water use efficiency, improved coordination of management of surface and groundwater, recycled water, new technologies in drinking water treatment, groundwater remediation, and brackish and seawater desalination.¹⁸⁶

One of the State's largest uses of energy is attributed to several aspects of the water life cycle, including treatment, heating, and conveyance of water. As shown in Figure IV-4, overall, 10 percent of the State's energy use is associated with water-related end uses, while water and wastewater systems account for 2 percent of the State's energy use.¹⁸⁷ Therefore, as water demand grows, energy demand may increase concurrently. Population growth drives demand for both water and energy resources, so both grow at about the same rates and in many of the same geographic areas.¹⁸⁸ This dynamic is further exacerbated by the precipitation-population mismatch between Northern and Southern California.

The principal source of GHG emissions from the water sector comes from the fossil fuel-based energy used to “produce” (e.g., pump, convey, treat) water and the fossil fuel-based energy consumed for water end uses (e.g., heating). Therefore, emission reduction strategies are primarily associated with reducing the energy intensity of the water sector. Energy intensity is a measure of the amount of energy required to take a unit of water from its origin (such as a river or aquifer) and extract and convey it to its end use.¹⁸⁹ Within California, the energy intensity of water varies greatly depending on the geography and water source. The California Department of Water Resources (DWR) subdivides the State into 10 regions corresponding to the State's major drainage basins. An interactive map on the DWR website allows users to see a summary of the energy intensity of



¹⁸⁵ www.dof.ca.gov/research/demographic/reports/projections/P-1/

¹⁸⁶ California Natural Resources Agency, California Department of Food and Agriculture, and California Environmental Protection Agency. California Water Action Plan. resources.ca.gov/docs/californiawateractionDraftPlan/2014CaliforniaWaterActionDraftPlan.pdf

¹⁸⁷ California Department of Water Resources. Water-Energy Nexus: Statewide. Web page accessed November 2016 at: www.water.ca.gov/climatechange/WaterEnergyStatewide.cfm.

¹⁸⁸ Ibid.

¹⁸⁹ A broader definition of energy intensity could consider the “downstream” energy (i.e., wastewater treatment) as well as the upstream components. More robust data are needed, and the State is working to better quantify these upstream and downstream emissions.

regional water supplies.¹⁹⁰ As the energy sector is decarbonized through measures such as increased renewable energy and improved efficiency, energy intensities will also be reduced. It is also important to note that end user actions to reduce water consumption or replace fresh water with recycled water do not automatically translate into GHG reductions. The integrated nature of the water supply system means that a reduction by one end user can be offset by an increase in consumption by another user. Likewise, use of recycled water has the potential to reduce GHGs if it replaces, and not merely serves as an alternative to, an existing, higher-carbon water supply.

The State is currently implementing several targeted, agricultural, urban, and industrial-based water conservation, recycling, and water use efficiency programs as part of an integrated water management effort that will help achieve GHG reductions through reduced energy demand within the water sector.

While it is important for every sector to contribute to the State's climate goals, ensuring universal access to clean water as outlined in AB 685 (Eng, Chapter 524, Statutes of 2012), also known as the "human right to water" bill, should take precedence over achieving GHG emission reductions from water sector activities where a potential conflict exists. AB 685 states that it is the policy of the State that "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." As described in this section, water supplies vary in energy intensity and resulting GHGs, depending on the source of the water, treatment requirements, and location of the end user.

1. Looking to the Future

This section outlines the high-level objectives and goals to reduce GHGs in this sector.

Goals

- Develop and support more reliable water supplies for people, agriculture, and the environment, provided by a more resilient, diversified, sustainably managed water resources system with a focus on actions that provide direct GHG reductions.
- Make conservation a California way of life by using and reusing water more efficiently through greater water conservation, drought tolerant landscaping, stormwater capture, water recycling, and reuse to help meet future water demands and adapt to climate change.
- Develop and support programs and projects that increase water sector energy efficiency and reduce GHG emissions through reduced water and energy use.
- Increase the use of renewable energy to pump, convey, treat, and utilize water.
- Reduce the carbon footprint of water systems and water uses for both surface and groundwater supplies through integrated strategies that reduce GHG emissions while meeting the needs of a growing population, improving public

¹⁹⁰ California Department of Water Resources. Regional Energy Intensity of Water Supplies. www.water.ca.gov/climatechange/RegionalEnergyIntensity.cfm

safety, fostering environmental stewardship, aiding in adaptation to climate change, and supporting a stable economy.

2. Cross-Sector Interactions

Water, energy, food, and ecosystems are inextricably linked, and meeting future climate challenges will require an integrated approach to managing the resources in these sectors.

Water is used in various applications in the energy sector, ranging in intensity from cooling of turbines and other equipment at power plants to cleaning solar photovoltaic panels. In 2003, CEC adopted a water conservation policy for power plants to limit the use of freshwater for power plant cooling, and has since encouraged project owners proposing to build new power plants in California to reduce water consumption with water-efficiency technologies such as dry cooling and to conserve fresh water by using recycled water. Likewise, energy is used in multiple ways and at multiple steps in water delivery and treatment systems, including energy for treating and delivering drinking water; heating and chilling water; conveying water; extracting groundwater; desalination; pressurizing water for irrigation; and wastewater collection, treatment, and disposal.

Although GHG reduction strategies for the water sector have the closest ties to energy, the water sector also interacts with the natural and working lands, agricultural, waste management, and transportation sectors. Water flows from mountains to downstream regions through natural and working lands, which provide habitat for many species and function to store water, recharge groundwater, naturally purify water, and moderate flooding. Protection of key lands from conversion results in healthier watersheds by reducing polluted runoff and maintaining a properly functioning ecosystem. California is the United States' leading agricultural production state in terms of value and crop diversity. Approximately nine million acres of farmland in California are irrigated.¹⁹¹ In addition, water use is associated with livestock watering, feedlots, dairy operations, and other on-farm needs. Altogether, agriculture uses about 40 percent of the State's managed water supply.¹⁹² In the end, agricultural products produced in California are consumed by humans throughout the world as food, fiber, and fuel. Wastewater treatment plants provide a complementary opportunity for the waste management sector to help process organic waste diversion from landfills. Treatment plants with spare capacity can potentially accommodate organic waste for anaerobic co-digestion of materials such as food waste and fats, oil, and grease from residential, commercial, or industrial facilities to create useful by-products such as electricity, biofuels, and soil amendments. The water sector is also essential to our community health and long-term well-being, and measures must ensure that we continue to have access to clean and reliable sources of drinking water. Climate change threatens to impact our water supplies, for example, with long-term droughts leading to wells and other sources of

¹⁹¹ Hanson, Blaine. No date. Irrigation of Agricultural Crops in California. PowerPoint. Department of Land, Air and Water Resources University of California, Davis. www.arb.ca.gov/fuels/lcfs/workgroups/lcfsustain/hanson.pdf

¹⁹² *Applied water use* is the official terminology used by DWR. "Applied water refers to the total amount of water that is diverted from any source to meet the demands of water users without adjusting for water that is used up, returned to the developed supply, or considered irrecoverable."

water running dry. This can have devastating consequences, especially on communities already vulnerable and sensitive to changes in their water supply and natural hydrological systems, including rural communities who have limited options for water supplies. Water conservation and management strategies that are energy efficient can also ensure a continued supply of water for our health and well-being.

3. Efforts to Reduce Greenhouse Gases

The measures below include some required and new potential measures to help achieve the State's 2030 target and to support the high-level objectives for this sector. Some measures may be designed to directly address GHG reductions, while others may result in GHG reductions as a co-benefit. In addition, several recommended actions are identified to help the water sector move forward with the identified goals and measures to achieve the 2030 target; these are listed as supporting actions.

Ongoing and Proposed Measures

- As directed by Governor Brown's Executive Order B-37-16, DWR and State Water Resources Control Board (SWRCB) will develop and implement new water use targets to generate more statewide water conservation than existing targets (the existing State law requires a 20 percent reduction in urban water use by 2020 [SBx7-7, Steinberg, Chapter 4, Statutes of 2009]). The new water use targets will be based on strengthened standards for indoor use, outdoor irrigation, commercial, industrial, and institutional water use.
- SWRCB will develop long-term water conservation regulation, and permanently prohibit practices that waste potable water.
- DWR and SWRCB will develop and implement actions to minimize water system leaks, and to set performance standards for water loss, as required by SB 555 (Wolk, Chapter 679, Statutes of 2015).
- DWR and CDFA will update existing requirements for agricultural water management plans to increase water system efficiency.
- CEC will certify innovative technologies for water conservation and water loss detection and control.
- CEC will continue to update the State's Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601–1608) for appliances offered for sale in California to establish standards that reduce energy consumption for devices that use electricity, gas, and/or water.
- California Environmental Protection Agency (CalEPA) will oversee development of a registry for GHG emissions resulting from the water-energy nexus, as required by SB 1425 (Pavley, Chapter 596, Statutes of 2016).
- The State Water Project has entered long-term contracts to procure renewable electricity from 140 MW solar installations in California.
- As described in its Climate Action Plan, DWR will continue to increase the use of renewable energy to operate the State Water Project.

Overall, these actions will contribute to the broader energy efficiency goals discussed in the Low Carbon Energy section of this chapter.

Potential Additional or Supporting Action

The actions below have the potential to reduce GHGs and complement the measures and policies identified in Chapter II. These are included to spur thinking and exploration of innovation that may help the State achieve its long-term climate goals.

- Local water and wastewater utilities should adopt a long-term goal to reduce GHGs by 80 percent below 1990 levels by 2050 (consistent with DWR's Climate Action Plan), and thereafter move toward low carbon or net-zero carbon water management systems where technically feasible and cost-effective.
- Local water and wastewater utilities should develop distributed renewable energy where feasible, using the expanded Local Government Renewable Energy Bill Credit (RES-BCT) tariff and new Net Energy Metering (which allow for installation without system size limit).
- In support of the Short-Lived Climate Pollutant Strategy, encourage resource recovering wastewater treatment projects to help achieve the goal of reducing fugitive methane by 40 percent by 2030, to include:
 - Determining opportunities to support co-digestion of food-related waste streams at wastewater treatment plants.
 - Incentivizing methane capture systems at wastewater treatment plants to produce renewable electricity, transportation fuel, or pipeline biomethane.
- Support compact development and land use patterns, and associated conservation and management strategies for natural and working lands that reduce per capita water consumption through more water-efficient built environments.

V. Achieving Success

Meeting, and exceeding, our mandated GHG reduction goals in 2020 and through 2030 requires building on California’s decade of success in implementing effective climate policies. State agencies are increasingly coordinating planning activities to align with overarching climate, clean air, social equity, and broader economic objectives.

However, to definitely tip the scales in favor of rapidly declining emissions, we also need to reach beyond State policy-making and engage all Californians. Further progress can be made by supporting innovative actions at the local level—among governments, small businesses, schools, and individual households. Ultimately, success depends on a mix of regulatory program development, incentives, institutional support, and education and outreach to ensure that clean energy and other climate strategies are clear, winning alternatives in the marketplace—to drive business development and consumer adoption.

A. Enabling Local Action

Local governments are essential partners in achieving California’s goals to reduce GHG emissions. They can implement climate strategies to address local conditions and issues, and they can often more effectively engage citizens than the State can. They have broad jurisdiction—and in some cases, unique authorities—through community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and municipal operations. And local jurisdictions often develop new, innovative approaches to reduce emissions that are then adopted elsewhere. Their efforts are critical to supporting the State’s efforts to reduce emissions and can ultimately deliver additional GHG and criteria emissions reductions beyond what State policy can, along with local economic benefits.

Many cities and counties are already setting GHG reduction targets, developing climate action plans, and making progress toward reducing emissions. Climate action plans allow a local government or region to look holistically at their GHG emissions and develop their own strategies to reduce them, while providing specific, local co-benefits. These plans should include the carbon sequestration values associated with natural and working lands, as well as the importance of jurisdictional lands with regards to water, habitat, agricultural, and recreational resources. Examples of plan-level GHG reduction actions that could be implemented by local governments are listed in Appendix B.

The Statewide Energy Efficiency Collaborative and ICLEI recently released a report, *The State of Local Climate Action: California 2016*,¹⁹³ which highlights local government efforts, including the following:

¹⁹³ Statewide Energy Efficiency Collaborative. 2016. *State of Local Climate Action: California 2016*. californiaseec.org/wp-content/uploads/2016/10/State-of-Local-Climate-Action-California-2016_Screen.pdf

- In California, 60 percent of cities and over 70 percent of counties have completed a GHG inventory, and 42 percent of local governments have completed a climate, energy, or sustainability plan that directly addresses GHG emissions. Many other community-scale local plans such as general plans, have emissions reduction measures incorporated as well (see Governor’s Office of Planning and Research [OPR] Survey questions 23 and 24).¹⁹⁴
- Over one hundred California local governments have developed emissions reduction targets that, if achieved, would result in a reduction of more than 45 MMTCO_{2e} each year by 2020, and 83 MMTCO_{2e} each year by 2050.

Several other local government agencies have important impacts on GHG emissions. Local air districts have a key role to play in reducing regional and local sources of criteria pollutants and GHG emissions. As State agencies are doing, many air districts are actively integrating climate protection into air quality programs. Air districts also support local climate protection programs by providing technical assistance and data, quantification tools, and even funding.¹⁹⁵ Local metropolitan planning organizations (MPOs) support the State’s climate action goals via sustainable communities strategies (SCSs), required by the Sustainable Communities and Climate Protection Act of 2008 (SB 375, Chapter 728, Statutes of 2008). Per SB 375, MPOs must prepare SCSs as part of their regional transportation plan to meet regional GHG reduction targets for passenger vehicles in 2020 and 2035. The SCSs contain land use, housing, and transportation strategies that allow regions to meet their GHG emission reduction targets.

State agencies support these local government actions in a number of ways. CoolCalifornia.org is an informational website that includes a “local government toolkit” to help local governments, small businesses, schools, and households reduce emissions. The local government toolkit includes carbon calculators, success stories, climate action plan templates, a Funding Wizard that outlines available grant and loan programs, and monitoring and tracking tools developed through the Statewide Energy Efficiency Collaborative in coordination with CARB and OPR. Additionally, OPR’s forthcoming General Plan Guidelines will provide specific, updated guidance for addressing GHG emissions in general plans and related documents. Finally, a significant portion of the \$3.4 billion in cap-and-trade expenditures to date has either directly or indirectly supported local government efforts to reduce emissions, including \$142 million to support Transformative Climate Communities and provide technical assistance for local planning efforts.

¹⁹⁴ Governor’s Office of Planning and Research. 2016. *2016 Annual Planning Survey Results*. November. www.opr.ca.gov/docs/2016_APS_final.pdf

¹⁹⁵ Examples include: (1) Bay Area Air Quality Management District (BAAQMD). *2016 Clean Air Plan and Regional Climate Protection Strategy*. Available at: www.baaqmd.gov/plans-and-climate/air-quality-plans/plans-under-development; (2) California Air Pollution Control Officers Association. California Emissions Estimator Model (CalEEMod). Available at: www.caleemod.com/; (3) San Joaquin Valley Air Pollution Control District. Grants and Incentives. Available at: valleyair.org/grants/; (4) BAAQMD. Grant Funding. Available at: www.baaqmd.gov/grant-funding; (5) South Coast Air Quality Management District. Funding. Available at: www.aqmd.gov/grants-bids/funding; (6) Sacramento Metropolitan Air Quality Management District. Incentive Programs. Available at: www.airquality.org/Residents/Incentive-Programs.

State agencies are interested in ideas to further support local government, small business, school, and household efforts to reduce GHG emissions. Along these lines, CARB is currently developing a centralized database and map that will allow local governments to view and compare emission inventories, reduction targets, climate action planning strategies, and other climate planning materials. This information will help jurisdictions around California identify what climate action strategies are working in other, similar jurisdictions across the State, and will facilitate collaboration among local governments pursuing GHG reduction strategies and goals. This database and map will be featured on the CoolCalifornia.org website and are anticipated to be available in 2017. Additional information on local government activities is available on Cal-Adapt (www.cal-adapt.org), OPR (www.opr.ca.gov), and Cool California's websites.

CoolCalifornia City Challenge

To engage communities in efforts to reduce GHG emissions, CARB has partnered with Energy Upgrade California on the CoolCalifornia Challenge. It's a competition among California cities to reduce their carbon footprints and build more vibrant and sustainable communities. Three challenges have been completed. Most recently, the 2015–2016 Challenge included 22 cities and engaged nearly 3,200 households, who each took actions to reduce energy use and carbon GHG emissions. In total, the participants reported that they completed actions that will collectively save 5,638 MTCO₂, equivalent to the emissions more than 1,000 cars or from electricity used by more than 2,500 California homes in a year.

B. Climate Action through Local Planning and Permitting

Local governments play an important role in achieving the State's long-term GHG goals because they have broad influence, and sometimes-exclusive authority, over activities that enable or thwart uptake of policies that can contribute to significant direct and indirect GHG emissions. These actions include their community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and municipal operations. Local government efforts to reduce emissions within their jurisdiction can also provide important co-benefits, including improved air quality, local economic benefits, more sustainable communities, and an improved quality of life.

Although the Proposed Plan focuses on State agency actions necessary to achieve the 2030 GHG limit, local governments are essential partners in achieving California's goals to reduce GHG emissions. The 2030 target will require an increase in the rate of emission reductions compared to what was needed to achieve the 2020 limit, and this will require action and collaboration at all levels, including local government action to complement and support State-level actions. Cities and counties are already setting targets, developing climate action plans, and making progress toward reducing emissions.

Recommended Local Plan-Level Greenhouse Gas Emissions Reduction Goals

CARB recommends that local governments aim to achieve community-wide goal to achieve emissions of no more than six metric tons CO₂e per capita by 2030 and no more than two metric tons CO₂e per capita by 2050.¹⁹⁶ Per capita and mass emissions goals are consistent with the statewide emissions limits established in AB 32, SB 32, SB 391,¹⁹⁷ and Executive Order S-3-05 and B-30-15.¹⁹⁸ Service population goals allow for linkages with metropolitan planning organization reductions required under SB 375. To develop a GHG mitigation strategy to achieve these targets, local governments should refer to “The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions,” which provides detailed guidance on completing a GHG emissions inventory at the community scale in the United States—including emissions from businesses, residents, and transportation. Tools such as ClearPath California, which was developed with California agencies, may also be used to support analysis of community-scale GHG emissions.

These per-capita goals are also consistent with the Under 2 MOU that California originated with Baden-Württemberg and has now been signed or endorsed by 165 jurisdictions representing 33 countries and six continents.^{199,200} Central to the Under 2 MOU is that all signatories agree to reduce their GHG emissions to two metric tons CO₂e per capita by 2050. This limit represents California’s and these other governments’ recognition of their “fair share” to reduce GHG emissions to the scientifically based levels necessary to limit global warming below two degrees Celsius. This limit is also consistent with the Paris Agreement, which sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to below 2°C.²⁰¹ This local government-recommended goal expands upon the reduction of 15 percent from “current” (2005–2008) levels by 2020 previously recommended in the 2008 Scoping Plan.²⁰² This is a statewide goal based on all emissions sectors in the State, and local jurisdictions may choose to derive region-specific evidenced based on per capita or per service population GHG emissions goals tied to these statewide goals. Once adopted, the plan and policies to achieve this goal can serve as a performance metric for subsequent projects.

The State must accommodate population growth and economic growth in a far more sustainable manner than in the past. While State-level investments, policies, and actions play an important role in shaping growth and development patterns, regional and local governments and agencies are uniquely positioned to influence the future of the built environment and its associated GHG emissions. Contributions from policies and programs such as renewable energy and energy efficiency are helping achieve the

¹⁹⁶ These goals are appropriate for the plan level (city, county, subregional, or regional level, as appropriate), but not for specific individual projects because they include all emissions sectors in the State.

¹⁹⁷ http://www.leginfo.ca.gov/pub/09-10/bill/sen/sb_0351-0400/sb_391_bill_20091011_chaptered.html

¹⁹⁸ This number represents the 2030 and 2050 limits divided by total population projections from California Department of Finance.

¹⁹⁹ <http://under2mou.org/> California signed the Under 2 MOU on May 19, 2015. See under2mou.org/wp-content/uploads/2015/05/California-appendix-English.pdf and under2mou.org/wp-content/uploads/2015/05/California-Signature-Page.pdf.

²⁰⁰ The Under 2 MOU signatories include jurisdictions ranging from cities to countries to multiple-country partnerships. Therefore, like the goals set forth above for local and regional climate planning, the Under 2 MOU is scalable to various types of jurisdictions.

²⁰¹ UNFCCC. The Paris Agreement. unfccc.int/paris_agreement/items/9485.php

²⁰² 2008 Scoping Plan, page 27. <https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>

near-term 2020 target, but longer-term targets cannot be achieved without land use decisions that allows more efficient use and management of land and infrastructure. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth, economic growth, and the changing needs of their jurisdictions. Land use decisions affect GHG emissions associated with transportation, water use, wastewater treatment, waste generation and treatment, energy consumption, and conversion of natural and working lands. Local land use decisions also play a particularly critical role in reducing GHG emissions associated with the transportation sector, both at the project level, and in long-term plans, including general plans, local and regional climate action plans, specific plans, transportation plans, and supporting sustainable community strategies developed under SB 375 among others. While the State can do more to accelerate and incentivize these local decisions to better align with State and local climate and other goals, local actions that reduce VMT are also necessary to meet transportation sector-specific goals and achieve the 2030 target under SB 32.

Climate action plans (CAPs) allow a local government or region to look holistically at regional GHG emissions and local strategies to support the statewide GHG limit. Greenhouse gas strategies in CAPs can also lead to important co-benefits, such as improved air quality, local economic benefits such as green jobs, more transportation choices, improved public health and quality of life, protection of locally, statewide, and globally important natural resources, and more equitable sharing of these benefits across communities. These plans should include the carbon sequestration values associated with natural and working lands, as well as the importance of jurisdictional lands with regards to water, habitat, agricultural, and recreational resources. Examples of plan-level GHG reduction actions that could be implemented by local governments are listed in Appendix B.

Sufficiently detailed and adequately supported GHG reduction plans (including CAPs) also provide local governments and project applicants with a valuable tool for streamlining project-level environmental review. For example, under CEQA, individual projects that comply with the strategies and actions within an adequate local CAP can streamline the project-specific GHG analysis.²⁰³ The California Supreme Court in a recent decision expressly called out this provision in CEQA that allows tiering from a geographically specific GHG reduction plan.²⁰⁴ The court also recognized that GHG determinations in CEQA should be consistent with the statewide Scoping Plan goals, including the State's long-term 2050 goals.²⁰⁵ The recommended local government goals of six metric tons CO₂e per capita by 2030 and no more than two metric tons CO₂e per capita by 2050 are intended to provide consistency with the 2030 Target Scoping Plan and the State's long term goals. Knowing that the per capita emissions goals may not be appropriate in some jurisdictions, mass emissions and service population emissions are also important to discuss. Per the community protocol, a local government should focus on those emissions that the jurisdiction controls, while

²⁰³ CEQA Guidelines, § 15183.5, sub. (b).

²⁰⁴ *Center for Biological Diversity v. California Dept. of Fish and Wildlife* (2015) 62 Cal.4th 204, 229–230.

²⁰⁵ *Id.* at pp. 223–224.

disclosing emissions within its geographical boundary but for which the local government does not have regulatory authority.

Project-Level Greenhouse Gas Emissions Reduction Actions and Thresholds

For transportation projects or transportation components of projects that affect amounts and patterns of vehicle travel, refer to OPR's guidance on CEQA VMT thresholds of significance and for examples of VMT mitigation.

Beyond plan-level thresholds and actions, local governments can also support climate action when considering discretionary approvals and entitlements of individual projects through CEQA.²⁰⁶ Absent conformity with an adequate geographically specific GHG reduction plan, CARB recommends that all new land use development implement all feasible measures to reduce GHG emissions.²⁰⁷

Several recent examples of sustainable land use development projects in California have demonstrated that it is feasible to design projects that achieve zero net additional GHG emissions. For example, several projects have received certification from the governor under AB 900, the Jobs and Economic Improvement through Environmental Leadership Act (Buchanan, Chapter 354, Statutes of 2011), demonstrating an ability to design economically viable projects that create jobs without contributing any net additional GHG emissions.²⁰⁸ Another example is the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan, in which the applicant, Newhall Land and Farming Company, proposed a commitment to achieve net-zero GHG emissions for a very large-scale residential and commercial specific planned development in Santa Clarita Valley.²⁰⁹

CARB believes that achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Proposed Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible.²¹⁰ Otherwise, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.

²⁰⁶ For transportation projects or transportation components of projects that affect amounts and patterns of vehicle travel, refer to OPR's guidance on CEQA VMT thresholds of significance and examples of VMT mitigation.

²⁰⁷ This is where there is no adequate climate action plan to tier from, as discussed earlier.

²⁰⁸ Governor's Office of Planning and Research. California Jobs. www.opr.ca.gov/s_californiajobs.php

²⁰⁹ California Department of Fish and Wildlife. Newhall Ranch Resource Management and Development Plan and the Spineflower Conservation Plan Environmental Impact Report. www.wildlife.ca.gov/regions/5/newhall

²¹⁰ ARB provided some guidance on developing project thresholds in a paper issued in October 2008, which included a concept utilizing a bright-line mass numeric threshold based on capturing approximately 90 percent of emissions in that sector and a concept of minimum performance based standards. Some districts built upon that work to develop thresholds. For example, Santa Barbara County adopted a bright-line numeric threshold of 1,000 MTCO₂e/yr for industrial stationary-source projects, and Sacramento Metropolitan Air Quality Management District adopted a 10,000 MTCO₂e/yr threshold for stationary source projects and a 1,100 MTCO₂e threshold for construction activities and land development projects in their operational phase. ARB is not endorsing any one of these approaches.

To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features and direct investments in GHG reductions in the vicinity of the project, to help provide potential air quality and economic co-benefits locally. For example, direct investment in a local building retrofit program can pay for cool roofs, solar panels, solar water heaters, smart meters, energy efficient lighting, energy efficient appliances, energy efficient windows, insulation, and water conservation measures for homes within the geographic area of the project. This type of local program generates real demand side benefits and local jobs, while creating the market signals for energy efficiency materials and goods—some of which can be and are currently produced in California. Other examples of local direct investments include financing installation of regional electric vehicle (EV) charging stations, paying for electrification of public school buses, and investing in local urban forests. It is critical that any such investments in actions to reduce GHG emissions are real and quantifiable. Where further project design or regional investments are infeasible or not proven to be effective, it may be appropriate and feasible to mitigate project emissions through purchasing and retiring carbon credits issued by a recognized and reputable accredited carbon registry. Appendix B includes other examples of on-site project design features, mitigation measures, and direct regional investments that may be feasible to minimize GHG emissions from land use development projects.

C. Implementing the Proposed Plan

This Proposed Plan outlines the regulations, programs, and other mechanisms needed to reduce GHG emissions in California. CARB and other State agencies will work closely with local agencies, stakeholders, and the public to develop regulatory measures and other programs to implement the Proposed Plan. CARB and other State agencies will develop regulations in accordance with established rulemaking guidelines. Per Executive Order B-30-15, as these regulatory measures and other programs are developed, building programs for climate resiliency must also be a consideration. Additionally, agencies will further collaborate and work to provide the institutional support needed to overcome barriers that may currently hinder certain efforts to reduce GHG emissions and to support the goals, actions, and measures identified for key sectors in Chapter IV. Table V-1 provides a high-level summary of the Climate Change Policies and Measures discussed in the Proposed Plan, including but not limited to, those identified specifically to achieve the 2030 target.

Table V-1. Climate Change Policies and Measures

Recommended Action	Lead Agency
<p>By 2018, develop Integrated Natural and Working Lands Action Plan to secure California’s land base as a net carbon sink:</p> <ul style="list-style-type: none"> • Protect land from conversion through conservation easements and other incentives. • Increase the long-term resilience of carbon storage in the land base and enhance sequestration capacity • Utilize wood and agricultural products to increase the 	<p>CNRA and departments within</p>

<p>amount of carbon stored in the natural and built environments</p> <ul style="list-style-type: none"> Establish scenario projections to serve as the foundation for the Action Plan and a carbon accounting framework for natural and working lands as described in SB 859 	
<p>By 2019, develop a Utilization of Biomass and Waste Plan:</p> <ul style="list-style-type: none"> Develop through an interagency working group a holistic plan to address excess biomass generated by commercial agricultural and forestry operations and urban biomass, while minimizing GHG and black carbon emissions, through a transition to technologies that can produce cleaner bioenergy, transportation fuels, other commercial products, and soil amendments. This working group will build upon work initiated by the 2012 Bioenergy Action Plan. 	<p>CNRA and departments within</p> <p>CalEPA and departments within</p> <p>CPUC CEC</p>
<p>Implement SB 350 by 2030:</p> <ul style="list-style-type: none"> Reduce GHG emissions in the electricity sector through the implementation of GHG emission reduction planning targets in the IRP process. Load-serving entities meet GHG emission reduction planning targets through a combination <p>retail sales by 2030 and ensure grid reliability.</p> <ul style="list-style-type: none"> Establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings 	<p>CPUC CEC CARB</p>
<p>Increase in Low Carbon Fuel Standard by 2030: Carbon intensity reduction of at least 18%.</p>	<p>CARB</p>
<p>Implement currently proposed Short-Lived Climate Pollutant Strategy by 2030:</p> <ul style="list-style-type: none"> 40% reduction in methane and hydrofluorocarbon 	<p>CalRecycle</p>
<p>Increase stringency of SB 375 Sustainable Communities Strategy (2035 targets).</p>	<p>CARB</p>
<p>Implement Mobile Source Strategy (Cleaner Technology and Fuels):</p> <ul style="list-style-type: none"> At least 1.5 million zero emission and plug-in hybrid light-duty electric vehicles by 2025. At least 4.2 million ZEVs by 2030. Medium- and heavy-duty GHG Phase 2. Advanced Clean Transit: 20% of new urban buses purchased beginning in 2018 will be zero emission buses, 	<p>CARB CalSTA SGC CalTrans CEC OPR Local agencies</p>

<p>ramping up to 100% of new sales in 2030. New natural gas buses starting in 2018, and diesel buses starting in 2020, meet the optional heavy-duty low-NOx standard.</p> <ul style="list-style-type: none"> • Last Mile Delivery: Requirement to purchase low-NOx engines if available, and phase-in of zero emission trucks for Class 3–7 last mile delivery trucks starting in 2020. Zero emission vehicles comprise 2.5% of new Class 3–7 truck sales in local fleets starting in 2020, increasing to 10% in 2025 and remaining flat through 2030. • Further reduce VMT through continued implementation of SB 375 and regional Sustainable Communities Strategies; forthcoming statewide implementation of SB 743; and additional VMT reduction strategies not specified in the Mobile Source Strategy but included in the document “Potential VMT Reduction Strategies for Discussion.” 	
<p>Implement California Sustainable Freight Action Plan:</p> <ul style="list-style-type: none"> • Improve freight system efficiency. • Deploy over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030. 	<p>CalSTA Cal/EPA CNRA CARB CalTrans CEC GoBiz</p>
<p>Adopt a post-2020 Cap-and-Trade Program with declining annual caps.</p>	<p>CARB</p>
<p>Adopt a regulation to achieve a 20% reduction in GHG emissions from refineries in California by 2030.</p>	<p>CARB</p>

D. A Comprehensive Approach to Support Climate Action

Ultimately, successfully tipping the scales in the fight against climate change relies on our ability to make clean technologies clear winners in the marketplace and other climate strategies clearly understood and easily accessible. We must support and guide our businesses as they continue to innovate and make clean technologies ever more attractive to ever more savvy consumers. Until the point that clean technologies become the best and lowest cost option—which is clearly on the horizon for many technologies, including renewable energy and electric cars—we must continue to support emerging markets through incentives and outreach efforts. More than just coordinating among agencies and providing institutional support as described above, we will succeed if we tackle climate change from all angles—through regulatory and policy development, targeted incentives, and education and outreach.

Regulations and Programmatic Development

Our decade of climate leadership has demonstrated that developing mitigation strategies through a public process, where all stakeholders have a voice, leads to effective actions that address climate change and yield a series of additional economic

and environmental co-benefits to the State. As we implement this Proposed Plan, State agencies will continue to develop and implement new and existing programs, as described herein. During any rulemaking process, there are many opportunities for both informal interaction with technical staff in meetings and workshops, and formal interaction at Board meetings, Commission business meetings, monthly public meetings, and others. Each State agency will consider all information and stakeholder input during the rulemaking process. Based on this information, the agency may modify proposed measures to reflect the status of technological development, the cost of the measure, the cost-effectiveness of the measures, and other factors before presenting them for consideration and adoption.

Further, to achieve cost-effective GHG reductions, California State agencies must consider the environmental impact of small businesses and provide mechanisms to assist businesses as GHG reduction measures are implemented. CARB provides resources and tips for small businesses to prevent pollution, minimize waste, and save energy and water on an informational website: www.CoolCalifornia.org. California's small businesses and their employees represent a valuable economic resource in the State and "greening" existing businesses is not only achievable, but sets an example for new businesses which will prove significant as California transitions to a low carbon state.

State agencies conduct environmental and environmental justice assessments of our regulatory actions. Many of the requirements in AB 32 overlap with agency traditional evaluations. In adopting regulations to implement the measures recommended in the Proposed Plan, or including in the regulations the use of market-based compliance mechanisms to comply with the regulations, the agency will ensure that the measures have undergone the aforementioned screenings and meet the requirements established in California Health and Safety Code Section 38562(b)(1-9) and Section 38570(b)(1-3).

Incentive Programs

Financial incentives and direct funding are critical components of the State's climate framework. In particular, incentives and funding are necessary to support GHG emission reduction strategies for priority sectors, sources, and technologies. Although California has a number of existing incentive programs, available funding is limited. It is critical to target public investments efficiently and in ways that encourage integrated, systemwide solutions to produce deep and lasting public benefits. Significant investments of private capital, supported by targeted, priority investments of public funding, are necessary to scale deployment and to maximize benefits. Public investments can help incentivize early action to accelerate market transition to cleaner technologies, which can also be supported by regulatory measures.

Many existing State funding programs work in tandem to reduce emissions from GHGs, criteria pollutants, and toxic air contaminants, and are helping to foster the transition to a clean energy economy and are protecting and managing land for carbon sequestration. State law, including Senate Bill 535 (De León, Chapter 830, Statutes of

2012) and Assembly Bill 1550 (Gomez, Chapter 369, Statutes of 2016) also requires focused investment in low income and disadvantaged communities.

The State will need to continue to coordinate and utilize funding sources, such as the Greenhouse Gas Reduction Fund (cap-and-trade auction proceeds), the Alternative and Renewable Fuel and Vehicle Technology Program (AB 118), Electric Program Investment Charge (EPIC) Program, Carl Moyer Program, Air Quality Improvement Program, and Proposition 39 to expand clean energy investments in California and further reduce GHG and criteria emissions. Additionally, programs including the Bioenergy Feed-In Tariff, created by Senate Bill 1122 (Rubio, Chapter 612, Statutes of 2012), Low Carbon Fuel Standard, Cap-and-Trade, Self-Generation Incentive Program, Federal Renewable Fuel Standard, utility incentives pursuant to Assembly Bill 1900 (Gatto, Chapter 602, Statutes of 2012), and others provide important market signals and potential revenue streams to support projects to reduce GHG emissions.

These programs represent just a portion of the opportunities that exist at the federal, State, and local levels to incentivize GHG emission reductions. The availability of dedicated and long-lasting funding sources is critical to help meet the State's climate objectives and help provide certainty and additional partnership opportunities at the national, State, regional, and local levels for further investing in projects that have the potential to expand investments in California's clean economy and further reductions in GHG emissions.

Public Education and Outreach Efforts

California State agencies are committed to meaningful opportunities for public input and effective engagement with stakeholders and the public through the development of the Scoping Plan, and as measures are implemented through workshops and other meetings. Additionally, the State has broad public education and outreach campaigns to support markets for key technologies, like ZEVs and energy efficiency, as well as resources to support local and voluntary actions, such as CoolCalifornia.org.

In developing this Proposed Plan, there has been extensive outreach with environmental justice organizations and disadvantaged communities. The EJAC launched a community engagement process starting in July 2016, conducting 11 community meetings throughout the State and collecting hundreds of individual comments. To enhance the engagement opportunity, CARB coordinated with local government agencies and sister State agencies to hold collaborative discussions with local residents about specific climate issues that impact their lives. This effort was well received and attended by local community residents and initiated a new community engagement endeavor for CARB. Recognizing the value of the input received and the opportunity to present California's climate strategy to communities across the State, CARB intends to continue this community involvement to generate awareness about California's climate strategy and be responsive to specific community needs as climate programs are implemented.

Education and Environment Initiative

The California Environmental Protection Agency (CalEPA), the California Department of Education, and the California Natural Resources Agency have developed an environmental curriculum that is being taught in more than half of California's school districts. The [Education and Environment Initiative](#) (EEI) provides California's teachers with tools to educate students about the natural environment and how everyday choices can improve our planet and save money.

GDP	gross domestic product
GGRF	Greenhouse Gas Reduction Fund
GHG	greenhouse gas
GoBiz	Governor's Office of Business and Economic Development
GWP	global warming potential
HFC	hydrofluorocarbon
HVAC	heating, ventilation and air conditioning
ICAP	International Carbon Action Partnership
IEPR	Integrated Energy Policy Report
IOU	investor-owned utility
IPCC	United Nations Intergovernmental Panel on Climate Change
IRP	integrated resource plan
LCFS	Low Carbon Fuel Standard
LCTOP	Low Carbon Transit Operations Program
LDV	light-duty vehicle
LED	light-emitting diode
LIWP	Low-Income Weatherization Program
LOS	level of service
MMTCO _{2e}	million metric tons of carbon dioxide equivalent
MOU	memorandum of understanding
MPO	metropolitan planning organization
MRR	Regulation for the Mandatory Reporting of GHG Emissions
MTCO ₂	metric tons of carbon dioxide
MW	megawatt
N ₂ O	nitrous oxide
NAICS	North American Industry Classification System
NEM	Net-Energy Metering
NF ₃	nitrogen trifluoride
NO _x	nitrogen oxide
NZE	near-zero emission
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
PEV	plug-in electric vehicle
PFC	perfluorocarbon
PM	particulate matter
PM _{2.5}	fine particulate matter
PMR	Partnership for Market Readiness
REMI	Regional Economic Models, Inc.
RES-BCT	Renewable Energy Bill Credit
RNG	renewable natural gas
RPS	renewable portfolio standard
RTP	regional transportation plan
SB	Senate bill
SCS	Sustainable Communities Strategies
SF ₆	sulfur hexafluoride

SGC	Strategic Growth Council
SGIP	Self-Generation Incentive Program
SLCP	Short-lived climate pollutant
SWRCB	State Water Resources Control Board
TBD	to be determined
TCU	Transportation Communications and Utilities
TIRCP	Transit and Intercity Rail Capital Program
UCLA	University of California, Los Angeles
UHI	urban heat island
UIC	International Union of Railways
UNFCCC	United Nations Framework Convention on Climate Change
USDA	U.S. Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VMT	vehicle miles traveled
WWTP	waste water treatment plant
ZE	zero emission
ZEV	zero emission vehicles

Global Warming Potential Values

The following table includes the 100-year time horizon global warming potentials (GWP) relative to CO₂. This table is adapted from the IPCC Fifth Assessment Report, 2014 (AR5)ⁱ. The AR5 values are the most recent, but the second assessment report (1995) and fourth assessment report (2007) values are also listed because they are sometimes used for inventory and reporting purposes. For more information, please see the IPCC website (www.ipcc.ch). The use of the latest (AR5) values is recommended. Please note that the GWP values provided here from the AR5 for non-CO₂ gases do not include climate-carbon feedbacks.

Global warming potential (GWP) values relative to CO₂

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon		
		Second Assessment Report (SAR)	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
Carbon dioxide	CO ₂	1	1	1
Methane	CH ₄	21	25	28
Nitrous oxide	N ₂ O	310	298	265

Substances controlled by the Montreal Protocol

CFC-11	CCl ₃ F	3,800	4,750	4,660
CFC-12	CCl ₂ F ₂	8,100	10,900	10,200
CFC-13	CClF ₃		14,400	13,900
CFC-113	CCl ₂ FCClF ₂	4,800	6,130	5,820
CFC-114	CClF ₂ CClF ₂		10,000	8,590
CFC-115	CClF ₂ CF ₃		7,370	7,670
Halon-1301	CBrF ₃	5,400	7,140	6,290
Halon-1211	CBrClF ₂		1,890	1,750
Halon-2402	CBrF ₂ CBrF ₂		1,640	1,470
Carbon tetrachloride	CCl ₄	1,400	1,400	1,730
Methyl bromide	CH ₃ Br		5	2
Methyl chloroform	CH ₃ CCl ₃	100	146	160

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon		
		Second assessment report (SAR)	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
HCFC-21	CHCl ₂ F			148
HCFC-22	CHClF ₂	1,500	1,810	1,760
HCFC-123	CHCl ₂ CF ₃	90	77	79
HCFC-124	CHClFCF ₃	470	609	527
HCFC-141b	CH ₃ CCl ₂ F	600	725	782
HCFC-142b	CH ₃ CClF ₂	1,800	2,310	1,980
HCFC-225ca	CHCl ₂ CF ₂ CF ₃		122	127
HCFC-225cb	CHClFCF ₂ CClF ₂		595	525
Hydrofluorocarbons (HFCs)				
HFC-23	CHF ₃	11,700	14,800	12,400
HFC-32	CH ₂ F ₂	650	675	677
HFC-41	CH ₃ F ₂	150		116
HFC-125	CHF ₂ CF ₃	2,800	3,500	3,170
HFC-134	CHF ₂ CHF ₂	1000		1,120
HFC-134a	CH ₂ FCF ₃	1,300	1,430	1,300
HFC-143	CH ₂ FCHF ₂	300		328
HFC-143a	CH ₃ CF ₃	3,800	4,470	4,800
HFC-152	CH ₂ FCH ₂ F			16
HFC-152a	CH ₃ CHF ₂	140	124	138
HFC-161	CH ₃ CH ₂ F			4
HFC-227ea	CF ₃ CHFCF ₃	2,900	3,220	3,350
HFC-236cb	CH ₂ FCF ₂ CF ₃			1,210
HFC-236ea	CHF ₂ CHFCF ₃			1,330
HFC-236fa	CF ₃ CH ₂ CF ₃	6,300	9,810	8,060
HFC-245ca	CH ₂ FCF ₂ CHF ₂	560		716
HFC-245fa	CHF ₂ CH ₂ CF ₃		1,030	858
HFC-365mfc	CH ₃ CF ₂ CH ₂ CF ₃		794	804
HFC-43-10mee	CF ₃ CHFCF ₂ CF ₃	1,300	1,640	1,650

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon		
		Second assessment report (SAR)	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
Perfluorinated compounds				
Sulfur hexafluoride	SF ₆	23,900	22,800	23,500
Nitrogen trifluoride	NF ₃		17,200	16,100
PFC-14	CF ₄	6,500	7,390	6,630
PFC-116	C ₂ F ₆	9,200	12,200	11,100
PFC-218	C ₃ F ₈	7,000	8,830	8,900
PFC-318	C-C ₄ F ₈	8,700	10,300	9,540
PFC-31-10	C ₄ F ₁₀	7,000	8,860	9,200
PFC-41-12	C ₅ F ₁₂	7,500	9,160	8,550
PFC-51-14	C ₆ F ₁₄	7,400	9,300	7,910
PCF-91-18	C ₁₀ F ₁₈		>7,500	7,190
Trifluoromethyl sulfur pentafluoride	SF ₅ CF ₃		17,700	17,400
Perfluorocyclopropane	C-C ₃ F ₆			9,200
Fluorinated ethers				
HFE-125	CHF ₂ OCF ₃		14,900	12,400
HFE-134	CHF ₂ OCHF ₂		6,320	5,560
HFE-143a	CH ₃ OCF ₃		756	523
HCFE-235da2	CHF ₂ OCHClCF ₃		350	491
HFE-245cb2	CH ₃ OCF ₂ CF ₃		708	654
HFE-245fa2	CHF ₂ OCH ₂ CF ₃		659	812
HFE-347mcc3	CH ₃ OCF ₂ CF ₂ CF ₃		575	530
HFE-347pcf2	CHF ₂ CF ₂ OCH ₂ CF ₃		580	889
HFE-356pcc3	CH ₃ OCF ₂ CF ₂ CHF ₂		110	413
HFE-449sl (HFE-7100)	C ₄ F ₉ OCH ₃		297	421
HFE-569sf2 (HFE-7200)	C ₄ F ₉ OC ₂ H ₅		59	57
HFE-43-10pccc124 (H-Galden 1040x)	CHF ₂ OCF ₂ OC ₂ F ₄ OCHF ₂		1,870	2,820
HFE-236ca12 (HG-10)	CHF ₂ OCF ₂ OCHF ₂		2,800	5,350

Industrial designation or common name	Chemical formula	GWP values for 100-year time horizon		
		Second assessment report (SAR)	Fourth Assessment Report (AR4)	Fifth Assessment Report (AR5)
HFE-338pcc13 (HG-01)	CHF ₂ OCF ₂ CF ₂ OCHF ₂		1,500	2,910
HFE-227ea	CF ₃ CHFOCF ₃			6,450
HFE-236ea2	CHF ₂ OCHF ₂ CF ₃			1,790
HFE-236fa	CF ₃ CH ₂ OCF ₃			979
HFE-245fa1	CHF ₂ CH ₂ OCF ₃			828
HFE 263fb2	CF ₃ CH ₂ OCH ₃			1
HFE-329mcc2	CHF ₂ CF ₂ OCF ₂ CF ₃			3,070
HFE-338mcf2	CF ₃ CH ₂ OCF ₂ CF ₃			929
HFE-347mcf2	CHF ₂ CH ₂ OCF ₂ CF ₃			854
HFE-356mec3	CH ₃ OCF ₂ CHFCF ₃			387
HFE-356pcf2	CHF ₂ CH ₂ OCF ₂ CHF ₂			719
HFE-356pcf3	CHF ₂ OCH ₂ CF ₂ CHF ₂			446
HFE 365mcf3	CF ₃ CF ₂ CH ₂ OCH ₃			<1
HFE-374pc2	CHF ₂ CF ₂ OCH ₂ CH ₃			627

Perfluoropolyethers

PPFMIIE	CF ₃ OCF(CF ₃)CF ₂ OCF ₂ OCF ₃		10,300	9,710
---------	--	--	--------	-------

Hydrocarbons and other compounds - direct effects

Chloroform	CHCl ₃	4		16
Methylene chloride	CH ₂ Cl ₂	9	8.7	9
Methyl chloride	CH ₃ Cl		13	12
Halon-1201	CHBrF ₂			376

IPCC data sources for more information:

- AR4 values: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html
- AR5 values: https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter08_FINAL.pdf (p. 73-79)

ⁱ Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, 2013: Anthropogenic and Natural Radiative Forcing. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

2022 Scoping Plan Documents

CATEGORIES

Topics Climate Change

Programs AB 32 Climate Change Scoping Plan

Type Presentation

The 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) lays out a path to achieve targets for carbon neutrality and reduce anthropogenic greenhouse gas (GHG) emissions by 85 percent below 1990 levels no later than 2045, as directed by Assembly Bill 1279. The actions and outcomes in the plan will achieve: significant reductions in fossil fuel combustion by deploying clean technologies and fuels, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands to reduce emissions and sequester carbon, and the capture and storage of carbon.

DOCUMENTS

2022 Scoping Plan

2022-SP_1.PDF · 4.104 MB

Appendix A: Public Process

2022-SP-APPENDIX-A-PUBLIC-PROCESS.PDF · 72 KB

Appendix B: Final Environmental Analysis

2022-SP-APPENDIX-B-FINAL-ENVIRONMENTAL-ANALYSIS.PDF · 2.069 MB

Response to Comments on the Draft Environmental Analysis

2022-SP-APPENDIX-B-RESPONSE-TO-COMMENTS.PDF · 5.129 MB

Supplemental Response to Comments on the Environmental Analysis Prepared for the 2022 Scoping Plan for Achieving Carbon Neutrality

2022-SP-APPENDIX-B-SUPPLEMENTAL-RESPONSE-TO-COMMENTS.PDF · 100 KB

Attachment A to Proposed Resolution 22-21: Findings and Statement of Overriding Considerations

2022-SP-APPENDIX-B-ATTACHMENT-A.PDF · 353 KB

2022 Scoping Plan for Achieving Carbon Neutrality - Notice of Decision

2022-SP-APPENDIX-B-NOTICE-OF-DECISION.PDF · 1.178 MB

Appendix C: AB 197 Measure Analysis

2022-SP-APPENDIX-C-AB-197-MEASURE-ANALYSIS.PDF · 591 KB

Appendix D: Local Actions

2022-SP-APPENDIX-D-LOCAL-ACTIONS.PDF · 852 KB

Appendix E: Sustainable and Equitable Communities

2022-SP-APPENDIX-E-SUSTAINABLE-AND-EQUITABLE-COMMUNITIES.PDF · 694 KB

Appendix F: Building Decarbonization

2022-SP-APPENDIX-F-BUILDING-DECARBONIZATION.PDF · 1.051 MB

Appendix G: Public Health

2022-SP-APPENDIX-G-PUBLIC-HEALTH.PDF · 7.046 MB

Appendix H: AB 32 GHG Inventory Sector Modeling

2022-SP-APPENDIX-H-AB-32-GHG-INVENTORY-SECTOR-MODELING.PDF · 2.17 MB

Appendix I: Natural and Working Lands Technical Support Document

2022-SP-APPENDIX-I-NWL-MODELING.PDF · 8.585 MB

Appendix J: Uncertainty Analysis

2022-SP-APPENDIX-J-UNCERTAINTY-ANALYSIS.PDF · 221 KB

Appendix K: Climate Vulnerability Metric

2022-SP-APPENDIX-K-CLIMATE-VULNERABILITY-METRIC_0.PDF · 10.068 MB

Appendix K (Attachment A): Census Tract CVM Estimates

2022-SP-CVM-BY-CENSUS-TRACTS-DATA-UCSB.XLSX · 661 KB

AB 32 GHG Inventory Sectors Modeling Data Spreadsheet

2022-SP-PATHWAYS-DATA-E3_0.XLSX · 649 KB

AB 32 GHG Inventory Sectors Air Quality and Health Analysis Data Spreadsheet

2022-SP-AIR-QUALITY-HEALTH-DATA-UCI.XLSX · 18 KB

Natural and Working Lands Modeling Data Spreadsheet

2022-SP-NWL-DATA-CARB.XLSX · 29.413 MB

RELATED RESOURCES

**Summary of Market
Transfers Report**

**Compliance
Instrument Report**

**CITSS Registrants
Report**

(800) 242-4450 | helpline@arb.ca.gov
1001 I Street, Sacramento, CA 95814
P.O. Box 2815, Sacramento, CA 95812



Welcome to EMFAC

This website provides California's emissions inventories of onroad and offroad mobile sources and tools to perform project-level assessment with custom meteorological conditions and scenario analysis with custom vehicle activity. It also provides detailed vehicle registration information aggregated up to the census block group level. This website is named after EMISSION FACTOR (EMFAC), a model that estimates the official emissions inventories of onroad mobile sources in California.

Updates

- May 2023: [Fleet Database](#) provides data generated from the 2021 vehicle registration database.
- Source code for EMFAC2021 v1.0.2 available upon request at emfac@arb.ca.gov.
- April 2022: [EMFAC2021 is updated to v1.0.2](#). For more details about this update, please check the [public notice](#).
- April 2021: [EMFAC2021 is updated to v1.0.1](#) and the [Technical Document](#) is available online.
- January 2021: [EMFAC2021 is released](#). EMFAC2021 is now provided on this website, too.

- March 2020: This new EMFAC website is available, starting to provide [Emissions Inventory](#), [Project Analysis](#), [Scenario Analysis](#) with results from EMFAC2017 v1.0.2 that is [approved by USEPA in 2019](#) and OFFROAD ORION v1.0.1. It also provides [Fleet Database](#) with DMV vehicle registration data. Please also try our website on your mobile devices as it is designed to be mobile friendly.

Tutorials on how to use EMFAC Web Platform

1. Introduction to the website



Related Resources

- [EMFAC2014 Web Database](#)
- [EMFAC Onroad Documentation](#)
- [EMFAC Offroad Documentation](#)
- [Mobile Source Emissions Inventory](#)

Contact Us

This website is developed by the Mobile Source Analysis Branch in the Air Quality Planning and Science Division at California Air Resources Board. Please contact [the EMFAC team \(emfac@arb.ca.gov\)](#) with any questions or comments.

WE THE PEOPLE
of Ventura, in order to
ensure that our City
continues to be a great place
for us to live ...



ACHIEVING THE VISION
2005 ventura general plan

CITY OF SAN BUENAVENTURA

2005 VENTURA GENERAL PLAN

ADOPTED AUGUST 8, 2005

RESOLUTION NOS.2005-072 AND 2005-073

The following people contributed to the preparation of the 2005 Ventura General Plan:

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...and to the countless citizens who gave their time and energy towards the making of this plan.

This plan is dedicated to the citizens of Ventura.

August 8, 2005

In loving memory of Roma Armbrust and
Dennis R. Mackay

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"The building of cities is one of man's greatest achievements. The form of his city always has been and always will be a pitiless indicator of the state of his civilization. This form is determined by the multiplicity of decisions made by the people who live in it."

— Edmund N. Bacon
Design of Cities, 1967

We, the people of Ventura, in order to ensure that our City remains a great place for us to live ...



. . . establish these goals for our community's future:

OUR NATURAL COMMUNITY

Our goal is to be a model for other communities of environmental responsibility, living in balance with our natural setting of coastline, rivers, and hillside ecosystems.

OUR PROSPEROUS COMMUNITY

Our goal is to attract and retain enterprises that provide high-value, high wage jobs; to diversify the local economy; to increase the local tax base; and to anticipate our economic future in order to strengthen our economy and help fund vital public services.

OUR WELL-PLANNED COMMUNITY

Our goal is to protect our hillsides, farmlands, and open spaces; enhance Ventura's historic and cultural resources; respect our diverse neighborhoods; reinvest in older areas of our community; and make great places by insisting on the highest standards of quality in architecture, landscaping and urban design.

OUR ACCESSIBLE COMMUNITY

Our goal is to provide residents with more transportation choices by strengthening and balancing bicycle, pedestrian and transit connections in the City and surrounding region.

OUR SUSTAINABLE INFRASTRUCTURE

Our goal is to safeguard public health, well being and prosperity by providing and maintaining facilities that enable the community to live in balance with natural systems.

OUR ACTIVE COMMUNITY

Our goal is to add to and enhance our parks and open spaces to provide enriching recreation options for the entire community.

OUR HEALTHY AND SAFE COMMUNITY

Our goal is to build effective community partnerships that protect and improve the social well being and security of all our citizens.

OUR EDUCATED COMMUNITY

Our goal is to encourage academic excellence and life-long learning resources to promote a highly-educated citizenry.

OUR CREATIVE COMMUNITY

Our goal is to become a vibrant cultural center by weaving the arts and local heritage into everyday life.

OUR INVOLVED COMMUNITY

Our goal is to strive to work together as a community to achieve the Ventura Vision through civic engagement, partnerships, and volunteer service.

State law requires each California city to adopt a comprehensive, long-term General Plan for the physical development of the community that guides local decision-making by expressing community goals about the future distribution and character of land uses and activities. The plan should be comprehensive by both covering the City's entire planning area and addressing the broad range of issues facing the community, including physical, social, aesthetic and economic concerns. The plan must be internally consistent and serve as a long-term guide, establishing policies for day-to-day land use decisions over an approximately 20-year period.

Introduction and Background

“To remain successful, Ventura must periodically renew itself, re-examine its goals and create a shared vision to guide the community into the future.”

With these opening words, the citizens of our community proclaimed the **Ventura Vision**, which was unanimously accepted by the City Council in March 2000. That landmark report captured the results of “a partnership encompassing city government, non-profit organizations, community groups, businesses, schools and individual residents to chart the community’s future through a process of visioning.”

Building on that shared vision, the City embarked on an effort to revise the 1989 Comprehensive Plan that served as the General Plan that all cities are required by State law to use to guide land use, transportation and other important policy decisions. This new General Plan is the culmination of that effort to translate the Ventura Vision into a coherent and comprehensive implementation plan to guide future development and preservation.

Throughout the visioning process and at the ballot box, Ventura residents have made clear we want a well-planned approach to managing growth. We don’t want continued suburban sprawl paving over farm land and sensitive hillside areas. Instead, we want vacant or run-down properties to be improved with high quality “infill” to provide new jobs, new homes and new stores and services.

Managing growth to improve our quality of life and standard of living is the smart thing to do.

Ventura residents don’t want uncontrolled growth and suburban sprawl. We also don’t want traffic gridlock, more “cookie cutter” tract houses or housing prices that make Ventura unaffordable for working families. By targeting new development to areas that would benefit from reinvestment – and by respecting our historic character and sense of place – “smart growth” is a better alternative.

Our vision is for a prosperous and well-planned community.

Smart Growth emphasizes reusing existing buildings and land, revitalizing our historic downtown and neighborhoods, and protecting the environment for future generations. Smart Growth channels new businesses and homes into appropriate areas. It also provides options for public transportation, creates neighborhoods where homes are in walking distance of local services and ensures green space for public use.

We seek to protect and enhance our unique “sense of place”

that builds on our pride in Ventura’s history and natural setting. Instead of new development that looks like everywhere else, our vision is for interesting, unique neighborhoods and districts, which reflect our values and heritage. The policies for pursuing these goals are spelled out in this new General Plan.

The Ventura General Plan

The *2005 Ventura General Plan* is the second in a series of three connected documents that will guide future conservation and change in the city. The *Ventura Vision* set the stage for this plan and enumerated four overarching principles that were affirmed by the community to guide Ventura into the future:

- Reach broadly and deeply into the community.
- Build on existing cultural, natural, and economic assets.
- Emphasize and encourage connections within the community.
- Work proactively and collaboratively to achieve the community's shared vision.

The final piece of the trilogy is a form-based *Development Code*. This code represents a new approach to zoning that prioritizes the appearance of development, while still ensuring that neighboring land uses are compatible and appropriate.

The *General Plan* will be put into action through the *Development Code* and a variety of other mechanisms, such as a mobility plan, specific plans, community plans, and capital improvement projects that will together shape the future of Ventura. The *General Plan* purposefully anticipates the *Code* focusing on the districts, corridors, and neighborhood centers where future change will be most pronounced.

The following vision statements reflect a high level of community consensus about a desired future for Ventura.



In the future, Ventura is a community that...

Environment

- Seeks sustainability by simultaneously promoting ecological health, economic vitality, and social well-being for current and future generations.
- Acts as an environmentally responsible model for other coastal areas.
- Protects and restores the natural character of its beaches, ocean views, hillsides, barrancas, and rivers as a scenic backdrop for its high quality urban environment.

Economy

- Develops a flourishing and balanced economy by encouraging a broad range of high quality employment and entrepreneurial opportunities.
- Encourages private economic development that supports public services and amenities associated with high quality of life.
- Has a vital, prosperous, and stable economy while maintaining its small-town feel.
- Is noted for private and public sector cooperation that enhances economic vitality.
- Actively participates in regional economic development efforts.

Planning, Design, and Circulation

- Retains its character as an attractive coastal town by growing slowly and sustainably, and by emphasizing its history, diversity, and natural environment.
- Cherishes its distinctive, diverse, and eclectic neighborhoods, and preserves their character.
- Has safe, accessible, and balanced transportation that promotes multiple modes of travel to local and regional destinations.

Social Activity

- Is known as an inclusive, diverse, and tolerant place that welcomes and celebrates all people.
- Provides all residents access to quality and affordable health and social services.
- Recognizes the importance of children and seniors by providing exceptional cultural, educational, and social support programs.
- Offers a diverse range of active and passive recreation for residents and visitors of all ages and abilities.
- Is dedicated to educational excellence and an emphasis on lifelong learning.
- Celebrates and is enriched by the arts and diverse cultural opportunities.

Collaboration

- Encourages residents to collaborate with each other and City government in an informed, active, and constructive manner to assess and resolve common issues.



Building on the Vision



Following adoption of the *Ventura Vision*, the City Council established a 19-member Comprehensive Plan Advisory Committee (CPAC) to shape the *Vision* concepts into issues and priorities for revision of the 1989 Comprehensive Plan. The CPAC included representatives of varied interests, including neighborhoods, agriculture, seniors and schools, as well as one member from the Planning Commission and one from the City Council. The committee met more than 30 times over almost three years. During that effort, the City published the August 2002 *Comprehensive Plan Update Background Report*, which provides a highly detailed account and analysis of opportunities and constraints that affect planning and land use in Ventura. This ultimately led to their findings, contained in the September 2003 *CPAC Issues & Alternatives Report*.



CPAC endeavored to create strategies to resolve planning and land use issues in Ventura utilizing the smart growth principles formulated by the U.S. Environmental Protection Agency:



- Mix land uses.
- Achieve compact building design.
- Provide a range of housing opportunities.
- Create walkable neighborhoods.
- Foster distinctive, attractive communities with a strong sense of place.
- Preserve open space, farmland, natural beauty, and critical environmental areas.
- Strengthen and direct development toward existing communities.

- Provide a variety of transportation choices.
- Make development decisions predictable, fair, and cost effective.
- Encourage community collaboration in planning decisions.

The recommendations of the CPAC were presented to the Planning Commission and City Council. After several months of reviewing the CPAC recommendations, the Planning Commission in December 2003 made some modifications to the CPAC's recommended land use scenario.

The City Council met 11 times from February through August 2004 to consider the CPAC and Planning Commission recommendations, review relevant data, and formulate broad goals, policies, and a diagram to guide growth and change in the City until 2025. In September 2004, the City Council established an ad-hoc General Plan Committee consisting of three Planning Commissioners and three City Council members to work with City staff and consultants to ensure that the *General Plan* would be completed expeditiously and with ample public participation, and to ensure open communication, transparency, and coordination among all parties interested in the creation of the *Plan*. All of the CPAC, Planning Commission, City Council, and General Plan Committee workshops, meetings, and hearings were open to the public and included significant, meaningful, and often extensive citizen input and participation.

Goals summarize how conservation, development, and future growth should occur by identifying physical, economic and social ends that the community wishes to achieve.

Policies establish basic courses of action for the Planning Commission and City Council to follow in working to achieve community goals, by directly guiding the response of elected and appointed officials to development proposals and related community actions.

Actions need to be undertaken by the City to implement policies.

Plan Format

The comprehensive and involved process of creating what is really a totally new (not just updated) *General Plan* – based on a new community vision and smart growth principles – resulted in a new set of goals, policies, and actions to guide future decision-making in Ventura that truly reflect the planning objectives of the community. These policy directives are organized by subject area in *General Plan* Chapters 1 through 10, which follow the organizational framework established in the *Ventura Vision* (see Table 1). Each topic is introduced with an overarching goal that carries forward the *Vision*, a description of issues needing resolution and methods for remedying them, and finally measurable policies and actions to achieve those solutions. Each of the policies contained within the Plan are intended to be understood and read with the following preface: “It is the intent of the City of San Buenaventura to...”. All of the actions are summarized in table form in Appendix A, along with the City department or division responsible for implementing each action and timeframe for completion. Also included in the Plan are the legally binding Appendices B through E. Attachment A is provided as a reference, while Attachment B is provided to serve as guidelines for future development until an update to the Zoning Ordinance is completed.

**Table 1
General Plan Organization**

Vision/General Plan Chapter	Required/ <i>Optional</i> Elements	Examples of Topics Covered
1. Our Natural Community	Conservation Open Space	Open space, hillsides, watersheds, riparian areas, sensitive plants and animals
2. Our Prosperous Community	<i>Economic Development</i>	Commercial and industrial growth, economic diversification, job opportunities, tourism
3. Our Well-Planned and Designed Community	Land Use/ <i>Design</i> Housing <i>Park & Recreation</i>	Development patterns, neighborhoods, visual character, urban design, streetscapes, demographics, housing needs, affordability, constraints on production
4. Our Accessible Community	Circulation	Traffic, street network, parking, transit services, bike routes
5. Our Sustainable Infrastructure	Land Use	Water supply, wastewater treatment, drainage
6. Our Active Community	Land Use <i>Park & Recreation</i>	Park and recreation facilities, youth and senior programs
7. Our Healthy and Safe Community	Safety Noise Land Use	Development in hazardous areas, hazardous waste management, seismicity, flood control, water quality, brownfields, noise, police, fire, air quality
8. Our Educated Community	Land Use	Schools and libraries
9. Our Creative Community	<i>Culture</i>	Arts, events, community programs, cultural and historic resources
10. Our Involved Community	<i>Citizen Input</i>	Participation in governance

The format of the *General Plan* satisfies the State requirement that every general plan include policies for seven “elements,” as follows:

Land use – establishes the general distribution and intensity of land uses, including housing, commerce, industry, open space, education, and public facilities.

Circulation – identifies the location and type of existing and proposed highways, arterial and collector roadways, bicycle routes, and other transportation facilities.

Conservation – addresses treatment of natural and cultural resources, including watersheds, wetlands, trees, rivers and barrancas, and cultural and historic landmarks.

Housing – assesses current and projected housing needs of all segments of the community and identifies land to provide adequate housing to meet those needs. Although the City’s Housing Element and Technical Report is contained in a separate document to facilitate the frequent updating required by the State, the goals, policies and programs of the Housing Element must be and are consistent with the goals, policies, and actions of the *2005 Ventura General Plan*. (See Chapter 3, page 3-28, for 2004 Housing Element Goals and Policies.)

Noise – appraises noise sources in the community and develops means to mitigate nuisances.

Open Space – details techniques for preserving open space areas for natural resources, outdoor recreation, public health and safety, and agricultural activities.

Safety – establishes policies to protect the community from risks associated with seismic, geologic, flood, fire, and other hazards.

The *General Plan* also contains a number of special elements that aren’t required by State law but are integral to the unique identity of Ventura. These cover a range of topics including education, recreation, arts and culture, and community involvement in local government. Another chapter treats the very important subject of the local economy, providing guidance to citizens, City staff and policy makers regarding strategies and priorities for economic development in Ventura.



California Coastal Act

The *General Plan* also satisfies State requirements for the City's **Local Coastal Program** in accordance with the California Coastal Act (*Public Resources Code § 30000 et seq.*). Actions in the *General Plan* that affect coastal resources are intended to become part of the Land Use Plan of the Local Coastal Program, which will be accomplished through specific or community plans for those areas. These actions are identified with the logo of the California Coastal Commission (which oversees all Local Coastal Programs). The basic goals of the State for the coastal zone are to:

- Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.
- Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.
- Maximize public access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of the private property owners.

- Assure priority for coastal-dependent and coastal-related development over other development on the coast.
- Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

(Public Resources Code § 30001.5)





"As age comes on, one source of enjoyment after another is closed, but Nature's sources never fail. Like a generous host, she offers her brimming cups in endless variety, served in a grand hall, the sky its ceiling, the mountains its walls, decorated with glorious paintings and enlivened with bands of music ever playing."

— John Muir
20th Century Naturalist

CITY OF
VENTURA

OUR NATURAL COMMUNITY
ventura's general plan

1. OUR NATURAL COMMUNITY

Our goal is to be a model for other communities of environmental responsibility, living in balance with our natural setting of coastline, rivers, and hillside ecosystems.

Natural Context

Ventura's natural setting is one of its greatest assets, and preserving the environment is a top community priority. Situated between the ocean, hills, and two rivers, the city affords its residents and visitors with a significant amount of accessible, beautiful, and biologically diverse open space. Although a number of programs are in place to protect coastal and watershed ecosystems and to maintain and preserve existing open lands, some natural features in and around the city have been compromised by the impacts of human activity.

As in many communities across the nation, concern is growing in Ventura about human impacts on natural resources. The historic spread of local development has given rise to grassroots efforts aimed at preserving Ventura's viable agricultural land, open space, and hillsides. The 1995 Save Our Agricultural Resources initiative (see Appendix B) and the 2001 Hillside Voter Participation Area (Appendix C) measure require voter approval before the city can expand into open space areas. The Ventura Hillsides Conservancy formed in 2003 seeks to preserve local hillsides, canyons, and open space.

Ventura, Oxnard, Ventura County, and the County Local Agency Formation Commission have adopted agreements to preserve agricultural and open space land located between the cities. A change that amends these greenbelts requires the approval of all signatories.

Protecting Ventura's fragile natural resources is a fundamental focus of the *2005 Ventura General Plan*. Policies and actions in this chapter intend to ensure that coastal, hillside, and watershed features are preserved, remain visible and accessible, and demarcate boundaries for urban development to define and enhance the city's identity.



The community cherishes the shoreline as one of Ventura's best features. Coastal facilities in the city include:

- Emma Wood State Beach
- Ventura Seaside Park and Fairgrounds
- Surfers Point at Seaside Park
- Beachfront Promenade Park
- San Buenaventura State Beach
- Pierpont Community Beach
- Marina Beach/Cove Port District Beach
- Channel Islands National Park Headquarters
- Surfers Knoll
- Santa Clara River Mouth

Coastal Resources

Ventura boasts seven miles of beautiful sand beaches and valuable shoreline habitat. This “string of pearls” has long been identified by the community as one of the city’s most prized features. At its eastern end, the Ventura Harbor offers opportunities for residents and visitors to explore the local marine environment, including the Channel Islands National Park and Marine Sanctuary. Elsewhere along the coast, shoreline and dune habitat provide nesting, feeding, and mating grounds for a wide variety of wildlife, including threatened or endangered species such as the western snowy plover and the least tern.

Shoreline conservation programs underway include the Surfers Point Managed Shoreline Retreat, San Buenaventura State Beach restoration, Ventura Harbor wetland rehabilitation, and coastline water quality monitoring. The City will continue to invest in restoration to enhance the shoreline ecosystem, with the actions in this chapter augmenting current efforts.



Hillsides

The hills of the Transverse Range rise 1,200 feet above Ventura, providing an important visual backdrop that frames the City. Not only do these hills provide residents and visitors with scenic vistas, they are also part of a larger integrated ecosystem comprised by the hillsides, coastal areas, rivers and barrancas that together provide a rich habitat for many species. It is vital to the community that these hillsides that lie outside the city limits (with a County land use designation of either Open Space or Agriculture), are protected and preserved.

These hillsides, by definition, are coterminous with the Hillside Voter Participation Area, and comprise the Hillside Open Space community as depicted on the General Plan Diagram (page 3-22). Because the Hillside Voter Participation Area measure prohibits the extension of City urban services to the hillsides through 2030 without voter approval, the General Plan Diagram identifies the hillsides affected by the measure with a Planning Designation of Open Space. The full text and map of the Hillside Voter Participation Area appears in Appendix C (as required by the act). This chapter calls working with land conservation organizations to establish a Ventura hillsides preserve, and Chapter 6, *Our Active Community*, contains actions to work with the County to create public trails in the hillsides.

Definitions for “Hillside Open Space,” “Hillside Area,” “hillsides,” and “Hillside Voter Participation Area” can be found in the Glossary (Attachment A).





Rivers and Barrancas

The Ventura River flows south to the Pacific Ocean along the western edge of the city, and the Santa Clara River bisects the Oxnard coastal plain south of Ventura. A series of seasonal watercourses called barrancas traverse the city in narrow incised drainage channels running down from the hillsides. The rivers and barrancas and their larger watersheds provide undeveloped open space, riparian vegetation, wildlife habitat and corridors, recreational opportunities, and aesthetic beauty.

Where local watercourses have not been channelized, riparian trees and shrubs grow in fringing woodlands and thickets. Several sensitive bird species breed in these areas, including the least Bell's vireo, willow flycatcher, yellow warbler, and yellow-breasted chat. Steelhead and rainbow trout seasonally inhabit both the Ventura and Santa Clara Rivers.

Riparian and freshwater marsh areas in Ventura represent only a remnant of pre-human coverage, but the City has initiated conservation and restoration efforts such as the Ventura River Estuary Program to help reverse this trend. The estuaries at the mouths of the Ventura and Santa Clara Rivers serve as breeding grounds and feeding areas for migratory and resident shorebirds and waterfowl, as well as home to many terrestrial animals, fish, and free-swimming invertebrates.


Actions in this chapter – such as maintaining adequate buffers from watercourses, requiring


restoration of natural drainage features, and prohibiting the placement of manmade materials in drainages – can protect and improve water and habitat quality in local watersheds. The bolder action of removing concrete channel structures would further enhance natural functions and aesthetics.


Resource Conservation


As Ventura continues to grow, conserving resources, increasing energy efficiency, and achieving environmental sustainability become ever more important. The City desires to incorporate green building measures into the design, construction, and maintenance of public and private buildings which can result in significant cost savings and promote overall health and productivity of residents, workers, and visitors to the city. Raising conservation awareness can help minimize waste and pollution released into the natural environment. Improving energy efficiency in buildings, expanding recycling programs, and reducing transportation-related energy consumption will make the city a greener place. The policies and actions in this chapter provide clear direction to guide conservation, green practices, and responsible use of resources.


Policy 1A: Reduce beach and hillside erosion and threats to coastal ecosystem health.

Action 1.1: Adhere to the policies and directives of the California Coastal Act in reviewing and permitting any proposed development in the Coastal Zone. 

Action 1.2: Prohibit non-coastal-dependent energy facilities within the Coastal Zone, and require any coastal-dependent facilities including pipelines and public utility structures to avoid coastal resources (including recreation, habitat, and archaeological areas) to the extent feasible, or to minimize any impacts if development in such areas is unavoidable. 

Action 1.3: Work with the State Department of Parks and Recreation, Ventura County Watershed Protection Agency, and the Ventura Port District to determine and carry out appropriate methods for protecting and restoring coastal resources, including by supplying sand at beaches under the Beach Erosion Authority for Control Operations and Nourishment (BEACON) South Central Coast Beach Enhancement program. 


Action 1.4: Require new coastal development to provide non-structural shoreline protection that avoids adverse impacts to coastal processes and nearby beaches. 


Action 1.5: Collect suitable material from dredging and development, and add it to beaches as needed and feasible. 


Action 1.6: Support continued efforts to decommission Matilija Dam to improve the sand supply to local beaches. 


Action 1.7: Update the Hillside Management Program to address and be consistent with the Planning Designations as defined and depicted on the General Plan Diagram.

Policy 1B: Increase the area of open space protected from development impacts.

Action 1.8: Buffer barrancas and creeks that retain natural soil slopes from development according to State and Federal guidelines. 

Action 1.9: Prohibit placement of material in watercourses other than native plants and required flood control structures, and remove debris periodically. 

Action 1.10: Remove concrete channel structures as funding allows, and where doing so will fit the context of the surrounding area and not create unacceptable flood or erosion potential. 

Action 1.11: Require that sensitive wetland and coastal areas be preserved as undeveloped open space wherever feasible and that future developments result in no net loss of wetlands or “natural” coastal areas. 

Action 1.12: Update the provisions of the Hillside Management Program as necessary to ensure protection of open space lands.

Action 1.13: Recommend that the City's Sphere of Influence boundary be coterminous with the existing City limits in the hillsides in order to preserve the hillsides as open space.

Action 1.14: Work with established land conservation organizations toward establishing a Ventura hillsides preserve.

Action 1.15: Actively seek local, State, and federal funding sources to achieve preservation of the hillsides.

Policy 1C: Improve protection for native plants and animals.

Action 1.16: Comply with directives from regulatory authorities to update and enforce stormwater quality and watershed protection measures that limit impacts to aquatic ecosystems and that preserve and restore the beneficial uses of natural watercourses and wetlands in the city.

Action 1.17: Require development to mitigate its impacts on wildlife through the development review process.

Action 1.18: Require new development adjacent to rivers, creeks, and barrancas to use native or non-invasive plant species, preferably drought tolerant, for landscaping.

Action 1.19: Require projects near watercourses, shoreline areas, and other sensitive habitat areas to include surveys for State and/or federally listed sensitive species and to provide appropriate

buffers and other mitigation necessary to protect habitat for listed species.

Action 1.20: Conduct coastal dredging in accordance with the U.S. Army Corps of Engineers and California Department of Fish and Game requirements in order to avoid impacts to sensitive fish and bird species.

Action 1.21: Work with State Parks on restoring the Alessandro Lagoon and pursue funding cooperatively.

Action 1.22: Adopt development code provisions to protect mature trees, as defined by minimum height, canopy, and/or trunk diameter.

Action 1.23: Require, where appropriate, the preservation of healthy tree windrows associated with current and former agricultural uses, and incorporate trees into the design of new developments.

Action 1.24: Require new development to maintain all indigenous tree species or provide adequately sized replacement native trees on a 3:1 basis.


Policy 1D: Expand the use of green practices.

Action 1.25: Purchase and use recycled materials and alternative and renewable energy sources as feasible in City operations.


Action 1.26: Reduce pesticide use in City operations.


Action 1.27: Utilize green waste as biomass/compost in City operations.

Action 1.28: Purchase low-emission City vehicles, and convert existing gasoline-powered fleet vehicles to cleaner fuels as technology becomes available.

Action 1.29: Require all City funded projects that enter design and construction after January 1, 2006 to meet a design construction standard equivalent to the minimum U.S. Green Building Council LEED™ Certified rating in accordance with the City's Green Building Standards for Private and Municipal Construction Projects. 

Action 1.30: Provide information to businesses about how to reduce waste and pollution and conserve resources.

Action 1.31: Provide incentives for green building projects in both the public and private sectors to comply with either the LEED™ Rating System, California Green Builder, or the Residential Built Green program and to pursue registration and certification; incentives include “Head-of-the-Line” discretionary processing and “Head-of-the-Line” building permit processing. 

Action 1.32: Apply for grants, rebates, and other funding to install solar panels on all City-owned structures to provide at least half of their electric energy requirements. 

Action 1.33: Publicly acknowledge individuals and businesses that implement green construction and building practices.



"Every increment of construction should be done in such a way as to heal the city."

— Christopher Alexander
Author of *A Pattern Language*, 1977

CITY OF
VENTURA

OUR PROSPEROUS COMMUNITY
ventura's general plan

2. OUR PROSPEROUS COMMUNITY

Our goal is to attract and retain enterprises that provide high-value, high wage jobs; to diversify the local economy; to increase the local tax base; and to anticipate our economic future in order to strengthen our economy and help fund vital public services.

Adapting in the 21st Century

Great communities are prosperous communities. A successful city brings people, institutions, ideas, and capital together in creative ways that enrich the lives of those who live and work there. In today's global economy, high-wage high-value jobs are the foundation of the prosperity that instills a city with the financial resources necessary to provide high quality of life and excellent community amenities.

Ventura has been blessed with a history of prosperity, thanks in large part to success in harnessing the area's natural assets for economic benefit. For most of the 20th Century, Ventura was sustained largely by its role as the hub of the region's oil and agriculture industries. These two sectors not only provided a stable source of jobs and business opportunities, but also helped to shape Ventura's role as the legal, governmental, and cultural center of the County.

In the 21st Century, however, Venturans can't take continued prosperity for granted. Competition occurs regionally, nationally, and globally for innovative businesses, top talent, and

good jobs. The community must build on its resources and constantly be on the lookout for new economic opportunities.

County government will likely remain the city's largest employer, providing an important element of economic stability, but government employment is not likely to grow significantly. Oil and agriculture will continue to be important, but their roles are diminishing. While Ventura is a regional center for healthcare, that industry will continue to face intense pressures to reduce costs. Still, the City of Ventura is positioned to move into an era dominated by innovation and reliant on emerging technologies. Cities and regions that excel in the "New Economy" promote high tech industries and boast a high quality of life. Likewise, to remain competitive, Ventura must continue to support economic development, but also create a more attractive living environment, including by providing appropriate housing for all segments of the local workforce. Efforts to boost economic development must be supported by a high quality of life, including a thriving cultural arts scene, award winning schools, and an engaged community. Tourism is also a strong market for Ventura. The beaches, museums, downtown, harbor and the nearby Channel Islands National Park attract more than 1.5 million visitors a year.

The policies and actions in this chapter seek to identify business niches that can thrive locally to diversify the economic base and ensure future community prosperity.

Economic Challenges

Ventura faces a variety of interrelated challenges to continued economic vitality, including:

1. Capturing a share of high-value job markets, such as biotechnology, computer software, communications, entertainment, multimedia, education, and business and financial services.
2. Diversifying the local economy to reduce dependence on the service, retail, and government sectors.
3. Building on the success of the tourism, manufacturing, business, and financial services sectors through marketing and job training programs that will ensure retention and attraction of these enterprises.
4. Finding appropriate locations for commercial and industrial land, including through revitalization opportunities in the Westside and Downtown and possibly via annexations of sites in the North Ventura Avenue and 101 Business Corridor areas.
5. Expanding the retail base, because sales tax represents a major City revenue source.
6. Providing housing for the full range of workforce households at all income levels.
7. Providing adequate infrastructure and financing resources.

Meeting all of these challenges in an integrated, strategic manner will be necessary to achieve long-term economic stability and success. The City must endeavor to identify the businesses most likely to remain and grow in an area that has very high costs – especially for housing – but also has outstanding community amenities, including good weather, a spectacular natural setting, and a safe and desirable community fabric.

The *Ventura Vision* calls for targeting industries that demonstrate the greatest promise for long-term community prosperity by:

- Providing high-wage, high skilled jobs,
- Possessing a local competitive advantage in the global economy,
- Being committed to local responsibility,
- Growing from local ownership, control or management,
- Practicing environmental leadership in their markets, and
- Strengthening the community's creative, cultural identity.

The *Vision* also offers principles for the City to pursue in charting future strategies for economic development:

- Encourage a broad range of high-quality employment and entrepreneurial opportunities.
- Encourage private economic prosperity that can support public services and quality-of-life amenities.

- Develop a vital, prosperous, and stable economy while maintaining a “small-town” flavor.
- Encourage the public and private sectors to work together to achieve prosperity.
- Participate constructively in regional economic development efforts.

Implementing these strategies will not be simple or easy. For one reason, California’s current tax system contains provisions that result in some of the lowest-paying economic sectors providing the city with the most tax revenue, and vice versa.

Pillars for Prosperity

Community prosperity is not something that a city government can create by itself. Any successful economic development effort requires the participation of many partners, including community-based business organizations, educational and training institutions, venture capitalists, individual entrepreneurs and business owners, networks of suppliers, and other government agencies that have a mission to enhance prosperity.

Together, the City and its economic partners must ensure that the building blocks for community prosperity are in place. These foundations include organizations and institutions that can coordinate local economic development efforts, as well as land and other economic infrastructure required to make Ventura an attractive business location.

This organizational infrastructure is evolving in Ventura. Business groups such as the Chamber of Commerce and the Ventura County Economic Development Association (a countywide group) are already active, but a wider network is needed to assemble the resources and capacity of entrepreneurs, venture capitalists, educators, and other stakeholders in building a healthy business climate. Greater synergy is needed among the area’s higher education institutions – including California State University Channel Islands, Ventura College, Brooks Institute, and satellite campuses of other colleges and universities.

Appropriate and sufficient land will also be necessary to ensure continued economic prosperity over the next 20 years, even as we seek to protect open space and combat sprawl. Demand for land to support retail and office development is likely to outstrip current supply unless allowable building intensities are significantly increased. While some increased density is likely, and some older industrial land may be recycled for new business uses, the City must take care to reserve sufficient land for these purposes – especially in an environment where short-term pressure is likely to encourage conversion of land to commuter housing.

Thus, the strategy for community prosperity must be coordinated with area-specific planning efforts, especially on the Westside (where industrial land is likely to be recycled), Downtown (which must stress office, studio, and retail business growth as well as an emerging residential component), and in the 101 Corridor between Mills Road and

Johnson Drive (where most of the city's business activity now takes place). The City will advance on a set of defined focused areas:

Auto Center – efforts over the short term will focus on making the area a regional retail destination. The City will strengthen its partnership with Auto Center dealers to realize beautification projects and facilitate land use entitlements for additional dealerships.

McGrath Property – the 76-acre site provides Ventura with the very best opportunity to attract new industry with high-value, high-wage jobs. The City and property owners will work on securing project entitlement approvals and recruiting desired tenants. The objective is to attract targeted industries and provide the impetus for initial site development over the short-term.

Westside – the feasibility of establishing a redevelopment project area will be considered by the City and Westside citizens. Such legal designation would provide the resources needed to leverage and implement planned initiatives in various Westside plans. Brownfield reuse efforts will also continue to secure funding for much needed site assessment and remediation activities.

Upper North Avenue – the objective is to transform this area from an oilfield industrial area to a dynamic economic engine. Development efforts will address reuse of the former USA Petroleum site, including and evaluation of the

site's potential to emerge as a component of a campus expansion opportunity for Brooks Institute. Keys to this effort are site remediation, compatibility issues, and future annexation to the City.

Downtown – proposed initiatives include well defined design standards in the updated Downtown Specific Plan, enhanced efforts to market the Downtown Cultural District, formation of a downtown management entity, and attracting uses that create “around-the-clock” activity.

Anticipating Our Economic Future – Ventura's economic growth is built on a foundation of concerted efforts that fuel innovation, collaboration, and continuous learning. The focus will be on attracting high technology and knowledge-based businesses including biotechnology, non-durable manufacturing, and business and financial services. Continuous learning opportunities for job seekers, workers, and employers will acknowledge demographic pressures and rapidly changing skill needs. Through specific strategies, the community will develop leaders for tomorrow, and attract and retain new graduates and skilled employees. Critical players will include the Workforce Investment Board, Ventura College, California State Channel Islands, and the Brooks Institute.

The policies and actions in this chapter attempt to provide the means to support these targeted efforts to achieve a stable and balanced economic base.


Policy 2A: Establish a clear economic strategy.

Action 2.1: Track economic indicators for changes that may affect City land resources, tax base, or employment base, such as terms and conditions of sale or lease of available office, retail, and manufacturing space.


Action 2.2: Prepare an economic base analysis that identifies opportunities to capture retail sales in sectors where resident purchasing has leaked to other jurisdictions.

Action 2.3: Maintain and update an Economic Development Strategy to implement City economic goals and objectives.

Policy 2B: Make the local economic climate more supportive of businesses investment.

Action 2.4: Map priority locations for commercial and industrial development and revitalization, including a range of parcel sizes targeted for high-technology, non-durables manufacturing, finance, business services, tourism, and retail uses. 

Action 2.5: Share economic and demographic information with organizations that may refer businesses to Ventura.

Action 2.6: Encourage intensification and diversification of uses and properties in districts, corridors, and neighborhood centers, including through assembly of vacant and underutilized parcels. 


Action 2.7: Partner with local commerce groups to recruit companies and pursue funding for business development and land re-utilization.


Action 2.8: Carry out Housing Element programs that provide housing to all segments of the local workforce.

Action 2.9: Expedite review for childcare facilities that will provide support to local employees.


Policy 2C: Encourage niche industries.

Action 2.10: Expedite review of the entitlement process for installation of infrastructure necessary to support high technology and multimedia companies.


Action 2.11: Allow mixed-use development in commercial and industrial districts as appropriate. 


Action 2.12: Allow uses such as conference centers with resort amenities on appropriately sized and located parcels. 


Action 2.13: Market the city to businesses that link agriculture with high technology, such as biotechnology enterprises.


Action 2.14: Partner with local farms to promote farmers markets and high quality locally grown food. 


Policy 2D: Expand tourism opportunities.


Action 2.15: Provide incentives for use of waterfront parcels for recreation, visitor-serving commerce, restaurant, marina, and fishing uses. 

Action 2.16: Work with the State to create year-round commercial opportunities at the fairgrounds. 

Action 2.17: Partner with the Harbor District and National Park Service to promote Channel Islands tours and develop a marine learning center. 

Action 2.18: Prioritize uses within the Harbor master plan area as follows: (1) coastal dependent, (2) commercial fishing, (3) coastal access, and (4) visitor serving commercial and recreational uses. 

Action 2.19: Partner with hotels and the Chamber of Commerce to promote city golf courses. 

Action 2.20: Promote outdoor recreation as part of an enhanced visitor opportunities strategy. 



"Communities should be designed to serve the cycle of the day and the cycle of the lifetime."

— Andres Duany
Architect & Town Planner

3. OUR WELL PLANNED & DESIGNED COMMUNITY

Our goal is to protect our hillsides, farmlands and open spaces; enhance Ventura’s historic and cultural resources; respect our diverse neighborhoods; reinvest in older areas of our community; and make great places by insisting on the highest standards of quality in architecture, landscaping and urban design.

Our City

Ventura is a unique coastal community, proud of our heritage and dedicated to being a national model for effectively managing growth to protect our natural environment and continue to be a great place for us to live.

It is our public responsibility to plan and shape the physical realm to achieve these goals. Past policies, particularly the 1989 Comprehensive Plan, reined in rapid outward suburban sprawl. The 1992 Downtown Specific Plan set the direction for revitalization of the historic heart of our community. Voter-approved measures clearly underscored a mandate to protect agricultural resources and open space, particularly in our hillsides.

Guided by the Ventura Vision of 2000, the centerpiece for this General Plan is creating a “well-planned and designed community.” The policies build on the foundation of the past.

This plan also represents an historic commitment to *smart* growth:

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable communities
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development toward existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost effective
10. Encourage community and stakeholder collaboration in development decisions

Source: U.S. Environmental Protection Agency

Infill First

Ventura today is the product of decades of earlier growth and development. These patterns have largely established our community’s character and will continue to do so in the future. The passage of SOAR, the Hillside Voter Protection Area, and other land-use constraints, along with natural boundaries, such as the ocean and the rivers, make it abundantly clear that before we expand outward any further, we must pursue an “Infill First” strategy. Such a strategy will help avoid sacrificing farmland and sensitive areas in our hillsides and along our rivers.

"Smart growth is about being good stewards of our communities and of our rural lands, parks, and forests. It is about ensuring that the best of the past is preserved, while creating new communities that are attractive, vital, and enduring."
--Michael Leavitt, EPA Administrator

Our “Infill First” strategy for Ventura means avoiding suburban sprawl by directing new development to vacant land in the City and Sphere of Influence (with the exception of SOAR land), and by focusing new public and private investment in carefully selected districts, corridors, and neighborhood centers where concentrated development and adaptive reuse will improve the standard of living and quality of life for the entire community.

Recognizing that the rate of future population growth is not subject to City control, this plan has been analyzed (in the accompanying Environmental Impact Report) on the basis of estimates of what new homes and other development might be expected to take place over the next twenty years (see Table 3-2). Looking at the rate of growth over the past decade and recognizing the challenges to “infill” development compared to “greenfield” expansion, a projection of roughly 8,300 additional housing units and approximately 5 million square feet of non-residential development has been used for the plan’s 20 year planning horizon. Table 3-2 provides estimates of the amount of development that could reasonably be expected to occur in the City and Sphere of Influence.

The actual distribution of future growth in the City may vary based on market forces and other factors. The districts, corridors, and neighborhood center areas, shown on Figure 3-1 Infill Areas, could accommodate more development and/or a different mix of

development than shown in Table 3-2. To demonstrate this, Table 3-1 shows the potential development based on the overall carrying capacity of the land.

Distribution of growth in the districts and corridors is based on the following general assumptions:

- Development in the Downtown and Harbor Districts will conform to the plans for those areas,
- The Downtown area and, to a lesser extent, the Ventura Avenue corridor will be the focus of future residential and commercial growth, and
- The Arundell, North Avenue, and Upper North Avenue areas will be the focus of future economic growth, potential expansion of the Brooks Institute, with some residential uses.

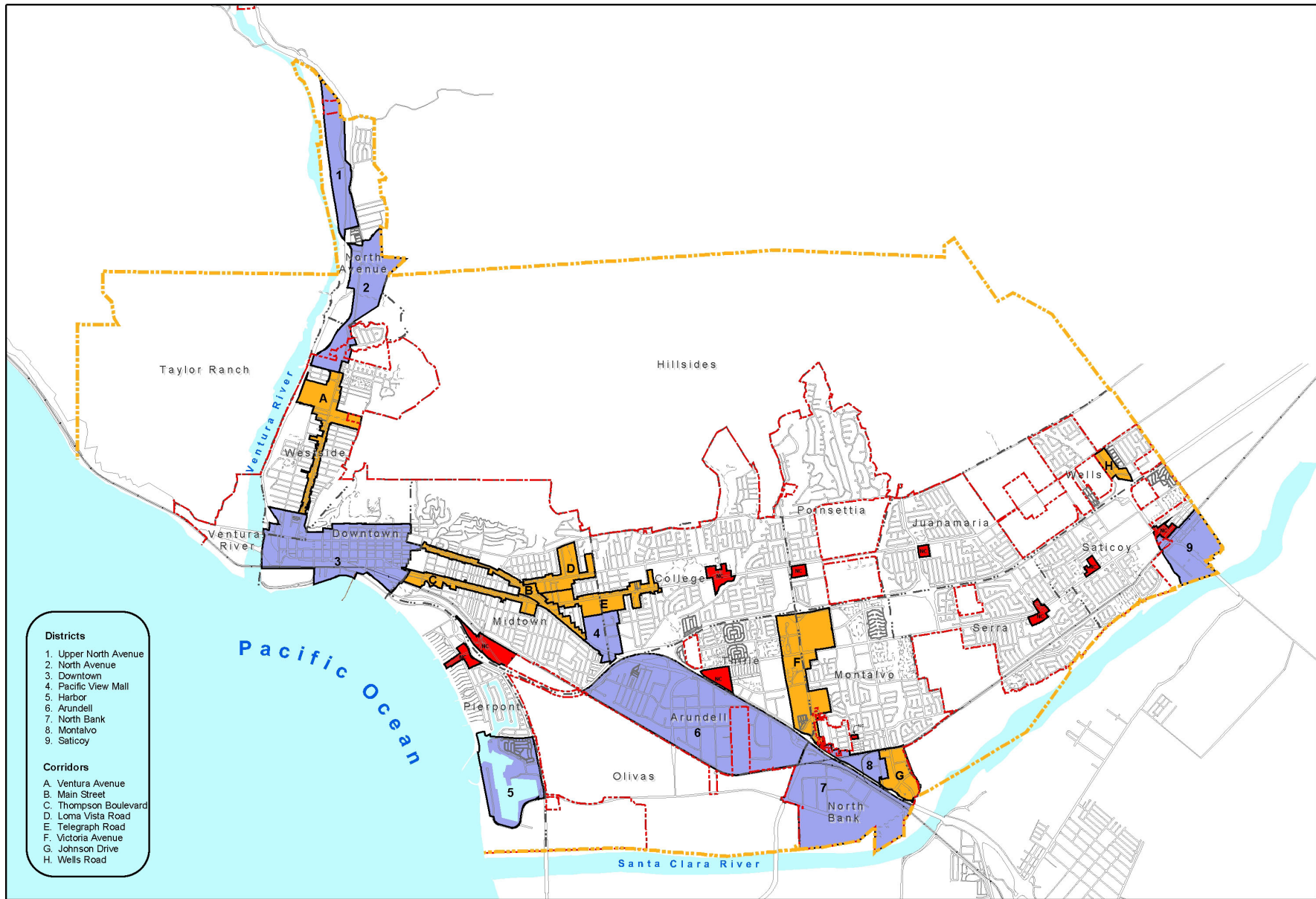
Table 3-1. Potential Development Based on Carrying Capacity of Land Area

Planning Designation	Allowed Density (du/acre)	Existing Development 2004					General Plan Capacity			
		Single Family Units	Multi Family Units	Comm./Ind. Sq. Ft.	Parcels	Acres	Vacant		Additional Potential ³	
							Parcels	Acres	Units	Sq. Ft.
Neighborhood Low	0-8	19,425	3,335	49,386	22,511	4,629	108	426	1,221	
Neighborhood Medium	9-20	1,163	8,965	149,513	4,414	1,061	32	116	4,859	
Neighborhood High	21-54	814	2,468	194,143	1,634	303	8	16	8,477	
Commerce ¹		257	490	4,995,248	1,366	808	95	108	7,892	22,328,276
Industry ²		29	31	8,299,840	1,037	1,401	89	392	4,724	34,215,483
Public & Institutional		4	0	54,422	66	571				
Park & Open Space		6	0	15,491	264	11,693				
Agriculture		4	0	19,550	154	6,857				
Downtown Specific Plan	21-54	332	1,543	1,795,401	1,174	307	45	20	2,500	450,000
Harbor District		0	310	350,160	10	254	1	21	300	876,100
Total		22,034	17,142	15,923,154	32,630	27,884	378	1099	29,910	57,869,859

1. Commerce residential unit capacity is for property within a Corridor, District, or Neighborhood Center and assumes buildout to the maximum FAR and that 25% of floor area would be commercial (with the remainder residential).
 2. Industry residential unit capacity is for property within a Corridor, District, or Neighborhood Center and assumes buildout to the maximum FAR and that 75% of floor area would be industrial (with the remainder residential).
 3. "Additional Potential" assumes a historic buildout rate of 70% for both residential and non-residential.

CHAPTER 3

Table 3-2. Predicted Development Intensity & Pattern	Residential Development (units)	Non-Residential Development (square feet)				
		Retail	Office	Industrial	Hotel	Total
DISTRICTS						
Upper North Avenue	100	10,000	50,000	150,000	-	210,000
North Avenue	50	10,000	50,000	250,000	-	310,000
Downtown Specific Plan	1,600	100,000	200,000	-	150,000	450,000
Pacific View Mall	25	25,000	-	-	-	25,000
Harbor	300	315,000	-	-	230,000	545,000
Arundell	200	25,000	300,000	1,000,000	-	1,325,000
North Bank	50	300,000	50,000	300,000	-	650,000
Montalvo	50	-	50,000	25,000	-	75,000
Saticoy	50	-	-	25,000	-	25,000
Subtotals (Districts)	2,425	785,000	700,000	1,750,000	380,000	3,615,000
CORRIDORS						
Ventura Avenue	800	40,000	100,000	50,000	-	190,000
Main Street	100	15,000	40,000	-	-	55,000
Thompson Boulevard	300	15,000	40,000	-	-	55,000
Loma Vista Road	25	15,000	40,000	-	-	55,000
Telegraph Road	250	15,000	40,000	-	-	55,000
Victoria Avenue	50	15,000	40,000	-	-	55,000
Johnson Drive	150	50,000	20,000	-	-	70,000
Wells Road	50	15,000	20,000	-	-	35,000
Subtotals (Corridors)	1,725	180,000	340,000	50,000	0	570,000
SPHERE OF INFLUENCE (SOI)/OTHER INFILL/NEIGHBORHOOD CENTERS						
101/126 Agriculture	200	-	-	-	-	-
Wells/Saticoy	1,050	-	-	-	-	-
Pierpont	100	30,000	-	-	-	30,000
Other Neighborhood Centers	100	-	-	-	-	-
Second Units	300	-	-	-	-	-
Underutilized	250	-	-	-	-	-
Vacant	450	165,000	50,000	-	-	215,000
Subtotals (Other Infill)	2,450	195,000	50,000	0	0	245,000
TOTAL INFILL	6,600	1,160,000	1,090,000	1,800,000	380,000	4,430,000
PLANNED AND PENDING DEVELOPMENTS						
Downtown	50	1,072	-	-	150,000	151,072
Ventura Avenue/Westside	238	7,086	-	27,000	-	34,086
Midtown	34	13,751	-	-	-	13,751
College (Telegraph/Loma Vista)	4	2,718	8,843	-	-	11,567
Telephone Road Corridor	256	-	54,785	-	-	54,785
Montalvo/Victoria	296	-	4,300	-	-	4,300
Saticoy/East End	840	7,950	5,600	-	-	13,550
Arundell	-	41,640	42,614	18,080	-	102,334
Olivas	-	7,160	7,066	390,053	-	404,279
Subtotals (Planned/Pending)	1,718	81,377	123,214	435,133	150,000	789,724
TOTAL (Infill+SOI/Other+Pending)	8,318	1,241,377	1,213,214	2,235,133	530,000	5,219,724



SOURCE: City of Ventura

Figure 3-1
Infill Areas

Footnotes for Table 3-2:

Growth estimates for the Arundell community consider the likely development of the 75-acre McGrath property with a mix of uses and development of other vacant lands. Growth estimates for the North Bank area consider the possibility of a large retailer in that area. Estimates of growth in the SOI/Other Infill sites are based on the following general assumptions: (a) 101/126 Orchard site will develop similarly to a project recently proposed for that site; (b) Wells/Saticoy sites will develop in accordance with ongoing planning efforts for those areas; (c) the Pierpont area will develop generally in accordance with a conceptual project recently considered by the City; (d) Second Units will be added at a rate of 15/year; (e) roughly half of underutilized lands identified in the Housing Element will be re-developed over the next 20 years; (f) all vacant lands outside the districts and corridors will be developed in accordance with the proposed planning designations. Planned and Pending Developments based upon the City's 2004 Pending Projects list. Building areas do not include self storage facilities.

The following potential projects not included in the 2004 Planned and Pending Developments list have been included in the future development totals: (1) 150,000 square feet of industrial development in the North Bank area; (2) 165,000 square feet of retail development along Wells Road in the Saticoy area; (3) 50,000 square feet of office development on a 3.5-acre site along Ralston Drive. The Auto Center industrial project is included in the North Bank district; the other two projects are included in the "vacant" category. The square footage associated with these projects has been added to the projections of future growth to provide a conservative analysis of possible future impacts.

Together Table 3-2 and Figure 3-1, Infill Areas, offer a sense of how much growth Ventura might experience by 2025, and a picture of where such change is likely to occur. Precisely how and when development happens and what resources are conserved will be determined by the actions presented in the ten chapters of the *General Plan*, and by the specific land development standards. This plan is one of many tools the City will use to control where and how any future development takes place.

21st Century Tool Kit

The City has a wide array of tools at its disposal to achieve our “Infill First” strategy in ways that respect Ventura’s heritage and result in beautiful buildings, blocks, streetscapes, and public places that enhance and enrich quality of life for the entire community. Shaping the City’s physical form in the 21st Century will be achieved most effectively and aesthetically by combining Planning Designations with a transect-based approach, and with a new form-based Development Code. Together these can strongly influence the design and functioning of Ventura’s distinct and unique neighborhoods, districts, and corridors.

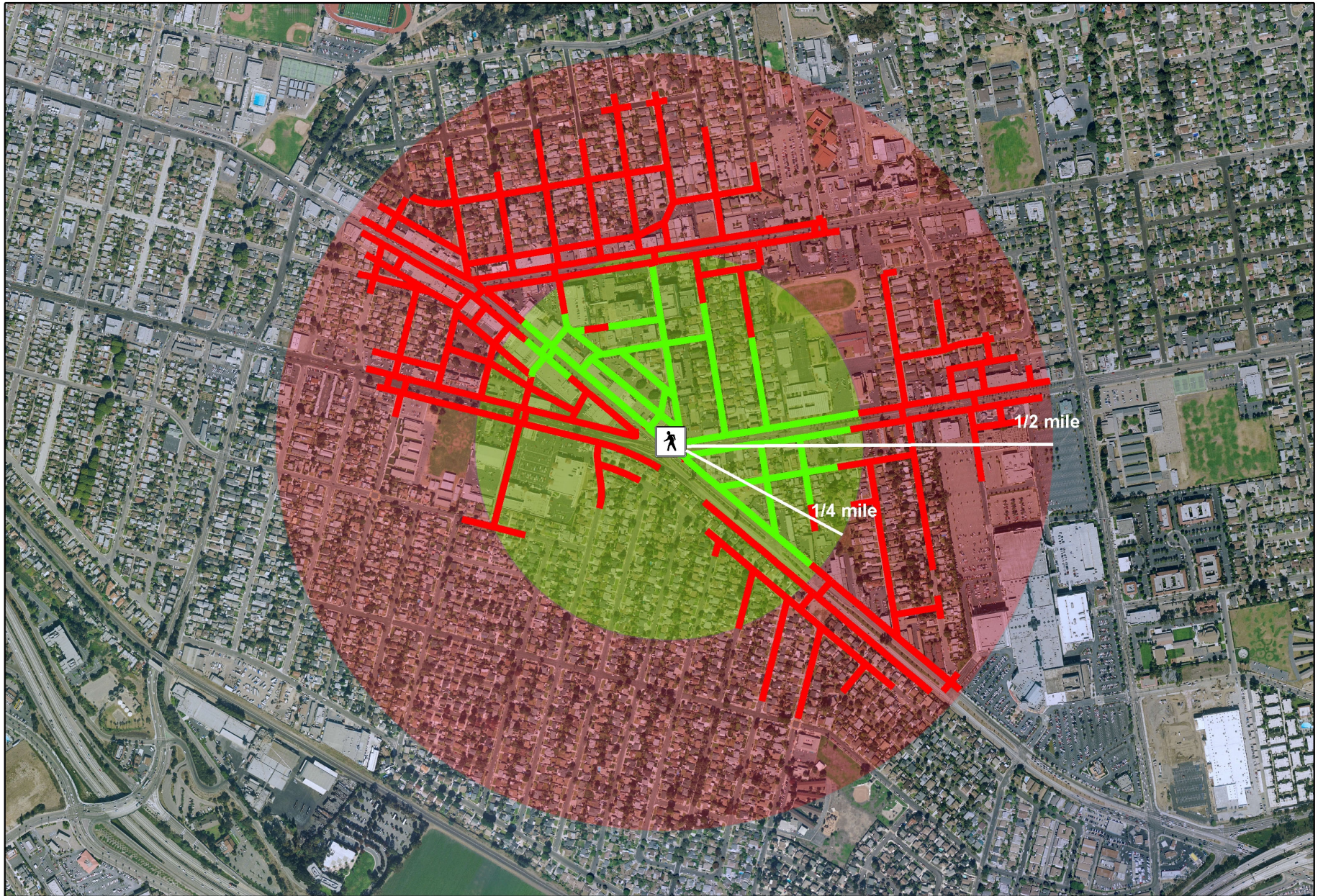
The policies and actions in this chapter seek to enrich Ventura’s urban fabric through appropriate design that showcases the attractive features of neighborhoods, districts, and corridors. To promote high-quality infill, the policies and actions encourage neighborhood centers, pedestrian access, established and desirable building types, and dynamic, neighborhood-serving nodes of mixed-use development along primary streets and corridors. This chapter specifically calls for detailed attention to community design through a form-based approach.

Neighborhoods: The Basic Building Blocks of Community

Like any great city, Ventura has grown around the basic unit of the neighborhood. A true neighborhood is not a subdivision of similar

houses disconnected from surrounding places. Instead it is an identifiable area containing a neighborhood center with a pedestrian-friendly mix of uses and a palette of housing types for people in all stages of their lives. Neighborhoods are often defined by a quarter-mile “pedestrian shed” (see Figure 3-2), in which most residents’ daily needs can be met within a five-minute walk. The organic nature of neighborhoods and their interdependency is what makes them viable for generations. Neighborhoods are not static places that resist change, but rather evolve naturally through periods of transformation to accommodate new residents’ needs and desires.






“In a neighborhood, everything that is needed is there and everything that is there is needed.”
- Anonymous



SOURCE: City of Ventura, Created for the Midtown Ventura Design Charette, March 2005

Figure 3-2

Pedestrian Shed, Theoretical versus Actual

- | | | | | | |
|---|---------------------------------|---|---------------------------------------|---|----------------------------------|
|  | Northeast corner of Five Points |  | Theoretical 5 minute walk (1/4 mile) |  | Actual 5 minute walk (1/4 mile) |
| | |  | Theoretical 10 minute walk (1/2 mile) |  | Actual 10 minute walk (1/2 mile) |

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.

The City is rich in a variety of neighborhoods, most of which are within one of Ventura's distinct communities. A total of 17 communities were identified in the 1989 Comprehensive Plan and have been carried forward, with some modifications to allow for a more detailed approach to describe Ventura's geography. Figure 3-3 illustrates 19 distinct communities, some of which are composed of a group of neighborhoods, each boasting their own unique attractions and potential. The oldest settled area is nearest the ocean, with newer areas found eastward, with the exception of Saticoy. Some of Ventura's communities have neighborhood centers established around parks, community gathering places, or civic buildings, and contain or are near services they share with surrounding areas, such as schools, libraries, post offices, and specialty shopping.

Ventura also has residential subdivisions and commercial and industrial districts that could evolve into true neighborhoods. A long-term strategy should be developed to gradually transform these areas that do not yet follow the neighborhood pattern. Existing subdivisions could be linked by pedestrian routes to new small-scale retail and service centers. Congested commercial areas could be redesigned as mixed-use centers on a grid of streets with walkable blocks that connect with surrounding neighborhoods and central plazas. These streets could be lined with buildings containing upper level housing and lower level commercial, office, and civic spaces that hide internal parking structures. Industrial sites that are fast converting

to light industry, high tech manufacturing, and assembly could become factory villages with green space, multiple types of housing, small-scale retail to serve workers, and spin-off businesses.

Ventura's 19 communities (Figure 3-3) can each be enriched by using the *transect* (see discussion page 3-10) as a lens to understanding the ways in which it functions and by applying form-based development controls to respect and enhance its character to ensure that, where appropriate, each community provides one, if not more, walkable neighborhoods.



SOURCE: City of Ventura

- City Limits
- Planning Communities

Figure 3-3
Planning Communities

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.

Taylor Ranch

This area is essentially undeveloped, with agriculture as the primary activity. Taylor Ranch is within the City's Planning Area, including a portion within the Coastal Zone Boundary.

Ventura River

This area includes the Ventura River Basin, is within the Coastal Zone Boundary, and with Emma Wood State Beach Park, its major activity is recreation offering day use and overnight camping. Opportunities exist for passive recreation and nature study.

Hillside Open Space

Within the City's Planning Area, is undeveloped, and designated Open Space. Plant communities include chaparral, riparian willow forest, and oak woodland. This area has tremendous potential for passive recreation including scenic trails with panoramic views. This area is coterminous with the Hillside Voter Participation Area or "HVPA" (see Chapter 1 and Appendix C).

North Avenue

Within the City's Planning Area. Historically, largely oilfield industrial. Includes both the Upper North Avenue and North Avenue districts, and is home to the Brooks Institute, which is world renown for its professional photographic and motion picture education. Opportunities exist to strengthen the economy of this area and provide for the expansion of the Brooks Institute into a campus-village including spin-off businesses with a mix of housing types and transit options for all ages.

Westside

Includes the Ventura Avenue corridor and is home to several neighborhood centers that are surrounded by well-connected neighborhood blocks. Opportunities exist to realize the potential of neighborhood improvements initiated in ongoing and past grassroots efforts, such as the Westside Revitalization Plan. This community includes "Hillside Areas" (see definition in Attachment A), which are subject to the Hillside Management Program that provides necessary development criteria in order to retain the natural qualities and minimize potential hazards.

Downtown

The area is regulated by the Downtown Specific Plan. This community is both an urban core with opportunity to grow economically stronger, and the historic center of the City. Civic uses include City Hall, Seaside Park, Grant Park, the Ventura County Museum, San Buenaventura Mission, and is home to a number of historic sites and landmarks. Additional opportunity to enhance the area's already strong cultural climate, including art, cookery, music, performance, and entertainment. Tremendous potential to create "around-the-clock activity" leading to increased vitality. This community includes "Hillside Areas".

Midtown

Includes the Main, Thompson, and Loma Vista corridors, a portion of the Telegraph corridor, as well as the Seaward/Alessandro neighborhood center. Home to the Pacific View Mall, the City's Bus Transfer Center, Ventura High School. Blanche Reynolds Park, Ocean Avenue Park,

and Memorial Park. Includes a small amount of agriculture. Opportunities exist to realize potential improvements initiated in ongoing and past grassroots efforts, such as Midtown by Design, and more recently the Midtown Urban Design Charrette. This community includes “Hillside Areas”.

Pierpont

Within the Coastal Zone Boundary, a unique-beach oriented predominantly residential community, with high-quality beachfront homes. Includes the Harbor district and the Pierpont neighborhood center. Home to the Ventura Harbor, Seaward Elementary School, a mobile home park, and Marina Park. Currently offers highway retail such as motels, hotels, and fast food, but opportunity exists to offer residents and visitors with more attractive and improved neighborhood and coastal oriented services and to develop a specific plan for the Harbor district.

College

Includes a portion of the Telegraph corridor, and the College/Day neighborhood center. Major civic uses are Arroyo Verde and Camino Real Park, Ventura Community College and Buena High School. This community includes “Hillside Areas”.

Thille

Includes the Gateway neighborhood center and shares the Victoria corridor with Montalvo to the east. Contains mix of housing types built mostly between 1960 and 1980, with some newer development in the 1990’s and early 2000’s. Its

primary civic use is the County Square Linear Park

Arundell

This community contains the main industrial and warehouse district of Ventura, but also has mixed-use areas with retail, restaurants, and offices within walking distance of many workers. Callens Road, the historic center of this community, has great potential to expand and increase the mix of uses it contains, including residential. A significant vacant parcel, the 75-acre McGrath property, offers great economic opportunity to attract new industry that provides high value, high wage jobs to the City.

Olivas

Predominantly agricultural. Its major civic use is the Olivas Park Golf Course and is home to the Olivas Adobe. Contains some commercial and industrial.

North Bank

This community contains a portion regulated by the Auto Center Specific Plan. Its major civic use the Buenaventura Golf Course. Predominantly industrial, with some agriculture. Opportunity to enhance the area as a regional retail destination, while providing workforce serving retail uses.

Poinsettia

Includes the Victoria Plaza neighborhood center. Its primary civic uses include elementary and middle schools. Predominantly residential, with some housing in the Hillside Area, and a significant amount of agricultural operations.

Montalvo

Includes the Johnson Drive corridor, Bristol neighborhood center, and shares the Victoria corridor with Thille to the west. Its major civic use is the County Government Center (equal size to 12 downtown blocks), but also the Rancho Ventura Linear Park and the Barranca Vista Park. Contains mix of housing types and is home to the Metrolink Station.

and a mix of housing types at various intensities. Its major civic uses are the Fritz Huntsinger Youth Sports Complex, Saticoy Regional Golf Course and the Saticoy neighborhood park.

Serra

Includes the Telephone/Petit neighborhood center, and is home to the City's newest civic use – the Community Park, set to open Fall 2005. Also includes the Chumash Park, Junipero Serra Park, North Bank Linear Park, and Bristol Bay Linear Park. Contains a significant amount of agricultural land.

Juanamaria

Includes the Kimball/Telegraph neighborhood center. Primary civic use is Hobert Park; this community contains some agricultural land.

Wells

Includes the Wells corridor. The Brown Barranca runs through the northerly portion of this area. Contains agricultural land.

Saticoy

Includes the Telephone/Cachuma and Saticoy neighborhood centers and the Saticoy district. Developed originally as a rural town in the late 1800s, Saticoy has the full range of transect characteristics: from the Santa Clara river and the rural eastern edge, to its neighborhood centers,

Planning Designations and Transect Zones

Land in the City's Planning Area is divided into eight basic Planning Designations on the General Plan Diagram (page 3-22). Each acknowledges a particular predominant development pattern that exhibits certain desirable characteristics, such as building types and functions that can be measured and described.

The wide range of building forms in Ventura offers great potential for compatible infill and viable mixed-use projects in existing neighborhoods, districts, corridors, and neighborhood centers. The wealth of building types includes attached and detached housing, duplexes, courtyard bungalows, second units (often over garages), lofts (some live-work), urban villas, neighborhood shopfronts, concentrated retail developments, and civic buildings. Public buildings retain special importance by serving as prominent landmarks that shape the visual character of the city.

Streetscapes set the tone for quality of life in Ventura by providing the shared outdoor living space of the community. Although the city's distinct neighborhoods, commercial and industrial districts, and agricultural areas are linked by corridors that have evolved primarily to accommodate motor vehicles, opportunities abound to make those streets more livable and to focus activities in neighborhood centers that emphasize walking, biking, and public gathering, and thereby ease traffic and reinforce community vitality. Accordingly, new development needs to

be high quality, compact, and walkable, and it should incorporate design diversity that increases lifestyle choices and bolsters commerce and industry.

Determining which building types are most appropriate in specific locations requires shifting away from conventional zoning that emphasizes use toward a form-based approach that prioritizes function, appearance, and compatibility with surrounding context. A powerful tool for understanding this context is the *Transect*, which depicts the continuum from rural to urban conditions (see Figure 3-4).

The transect is a tool that can be used by the community to understand and describe the full range of unique environmental and built characteristics within each of Ventura's neighborhoods. Using the six parenthetical transect zones to better understand the broad Planning Designations of the General Plan Diagram, a finer-grained (site specific) set of development standards can be created to ensure that new development is in keeping with local preferences for building.

This new Development Code will better accommodate the diversity of lifestyles Ventura desires – from the *rural* farm to the *sub-urban* house and yard to the *urban core* with apartments above shops – and will contribute to the identity and character desired by the community. Common elements that the transect will help measure and describe, and that the Development Code will prescribe, include the types and

arrangements of buildings, their “intensity” of lot coverage, height and mass, the details of streets, public and private frontages and the requirements for and character of open spaces. In general it will prescribe individual neighborhood preferences for urban design and building characteristics, including standards.

In many cases, area specific codes, applying the Planning Designations including districts, corridors, and neighborhood centers, will be developed as part of community or specific plans that establish a detailed strategy for public and private investment and policies to promote the appropriate preservation and development of community desired character.

The following descriptions of the Planning Designations include a parenthetical reference to the transect zones they encompass that will be used as guidance in interpreting the planning designations while drafting detailed plans and codes:

"A **transect** is a geographical cross-section of a region used to reveal a sequence of environments. For human environments, this cross-section can be used to identify a set of habitats that vary by their level and intensity of urban character, a continuum that ranges from rural to urban. In transect planning, this range of environments is the basis for organizing the components of the built world: building, lot, land use, street, and all of the other physical elements of the human habitat."
 --SmartCode, Volume 6.5, 2005

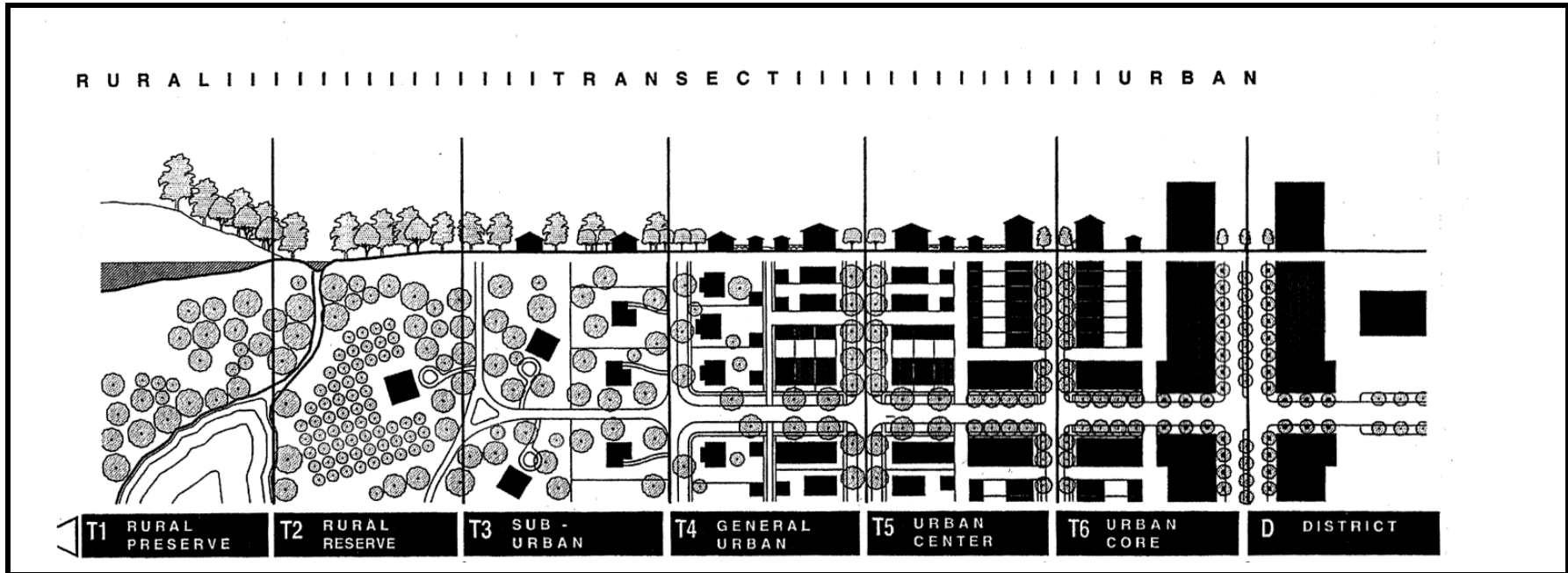
"All architecture should be beautiful. All towns should be beautiful. Beauty nurtures the soul and the spirit. It makes life worth living."
 -Camillo Sitte

- **Neighborhood Low – (T3 Sub-Urban and T4 General Urban)**
 emphasizes detached houses with some attached units in a small mix of building types from 0 up to 8 dwelling units per acre. Predominantly residential, with opportunity for limited home occupation and neighborhood services sensitively located along corridors and at intersections.
- **Neighborhood Medium – (T3 Sub-Urban, T4 General Urban and T5 Urban Center)**
 anticipates a mixture of detached and attached dwellings and higher building types at approximately 9 to 20 dwelling units per acre. Predominantly residential with small scale commercial at key locations, primarily at intersections and adjacent to corridors.
- **Neighborhood High – (T3 Sub-Urban through T6 Urban Core)**
 accommodates a broader mix of building types, primarily attached, from 21 to 54 dwelling units per acre; A mix of residential, commercial, office, and entertainment that includes mixed-use buildings.
- **Commerce – (T4 General Urban through T6 Urban Core, neighborhood center downtown, regional center, town center or village center)**
 encourages a wide range of building types of anywhere from two to six stories (depending on neighborhood characteristics) that house a mix of functions, including commercial, entertainment, office and housing.
- **Industry – (T2 Rural through T6 Urban Core)**
 encourages intensive manufacturing,

processing, warehousing and similar uses, as well as light, clean industries and support offices; also encourages workplace-serving retail functions and work-live residences where such secondary functions would complement and be compatible with industrial uses. Primarily large-scale buildings. Also can be developed as Transit Oriented Development, employment center or working village with a mix of uses.

- **Public and Institutional – (T1 Preserve through T6 Urban Core)**
 accommodates civic functions such as government offices, hospitals, libraries, schools and public green space.
- **Agriculture – (T2 Rural)**
 predominantly commercial cultivation of food and plants and raising of animals.
Pursuant to SOAR: The Agricultural use (not to be considered until after the Year 2030) category identifies those lands that are designated for agricultural use on the General Plan Diagram. The target date of 2030 associated with the Agricultural Use designation indicates a review date after which agriculturally designated lands may be reconsidered for urban uses. However, during the life of this Plan as amended by initiative, it is intended that only agricultural uses are permitted on these lands, except as such lands may be appropriate to public open space and recreational usage. Furthermore, any updates to this Plan are not intended to imply that development would necessarily be appropriate at that time.
- **Parks and Open Space – (T1 Preserve through T6 Urban Core)**
 designate lands to public recreation and leisure and visual resources, and can range from neighborhood tot lots and pocket parks to urban squares and plazas and playgrounds to large regional parks and natural preserves.

Figure 3-4. The Transect



Transect: a system of ordering human habitats in a range from the most natural to the most urban. For convenience, the Transect is divided into six zones which describe the physical character of place at any scale, according to the intensity of land use and urbanism. The T-Zones are T1 Natural, T2 Rural, T3 Sub-Urban, T4 General Urban, T5 Urban Center, and T6 Urban Core.

Natural Zone (T1): consists of lands approximating or reverting to a wilderness condition, includes lands unsuitable for settlement due to topography, hydrology, or vegetation.

Rural Zone (T2): consists of lands in open or cultivated state or sparsely settled. These may include woodlands, agricultural lands, grasslands and irrigable deserts.

Sub-Urban Zone (T3): though similar in density to conventional suburban residential areas, differs by its superior connectivity and by allowing home occupations. It is typically adjacent to other urban T-zones. This zone is naturalistic in its planting. Blocks may be large and the roads irregular to accommodate site conditions.

General Urban (T4): has a denser and primary residential urban fabric. Mixed-use is usually confined to certain corner locations. This zone has a wide range of building types: singles, side yard and rowhouses. Setbacks and street tree settings are variable.

Urban Center (T5): is the equivalent of the main street area. This zone includes mixed-use building types that accommodate retail, offices and dwellings, including rowhouses and apartments. This zone is a tight network of streets and blocks with wide sidewalks, steady street tree planting and buildings set close to the frontages.

Urban Core (T6): is the equivalent of a downtown. It contains the densest urbanism – the tallest buildings and the greatest variety of uses, particularly unique ones such as financial districts and important civic buildings. This zone is the least naturalistic of all the zones; street trees are formally arranged or non-existent.

Source: Duany, Plater Zyberk & Company's SmartCode, Volume 6.5, Spring 2005

The General Plan Diagram (page 3-22) also depicts the Downtown, Auto Center, and Saticoy Village Specific Plan areas, which are subject to detailed standards for form and use. In addition, the Diagram identifies Districts, Corridors, and Neighborhood Centers – where the development of housing alongside commercial uses is specifically encouraged. These Districts, Corridors, and Neighborhood Centers make up the growth priority areas as the City’s “Infill First” strategy (See Figure 3-1 Infill Areas).

Districts, Corridors, and Neighborhood Centers

One of the primary objectives for infill in Ventura is to produce mixed-use development that places most people’s daily needs within walking distance of their dwellings. This may include encouraging “flex space” where a single building functions as both living and working area for the owner, combining housing and commercial uses in the same structures, or sensitively integrating small-scale retail, service, and entertainment within convenient distance of residential areas. Mixed-use places inherently reduce automobile trips and improve the pedestrian experience, resulting in safer neighborhoods, healthier citizens, and better access to everyday needs. The City’s corridors and districts already encompass significant mixed-use development. Opportunities exist to augment those areas in ways that complement and enhance existing urban form and streetscapes to better serve Ventura’s residents.

Districts

Districts consist of streets or areas emphasizing specific types of activities and exhibiting distinct characteristics. A neighborhood or parts of neighborhoods can form a district. A thoroughfare may also be a district, such as when a major shopping avenue runs between adjoining neighborhoods. The following nine districts are depicted on the General Plan Diagram:

1. Upper North Avenue – home to a mix of industrial uses, including an abandoned oil refinery and Brooks Institute. Tremendous opportunities exist for the remediation and reuse of the former USA Petroleum site, as well as for the expansion of the Brooks Institute as a campus village, surrounded by a green edge to define the upper limits of Ventura.
2. North Avenue – an area with oilfield, industrial, and residential development, which has potential to fully develop into a more balanced mix of building types and uses with unique character, to serve as a major neighborhood anchor for northwest Ventura.
3. Downtown – the most intensely developed area of the city and its urban core. The Downtown Specific Plan regulates this area. Proposed initiatives include well-defined design standards via the Downtown Specific Plan update; enhanced efforts to market the Downtown Cultural District; formation of a

downtown management entity; and attracting uses that create “around-the-clock” activity.

4. Pacific View Mall – an enclosed shopping center and adjacent commercial uses. Large expanses of surface parking paired with significant building mass offer opportunity for the reintroduction of the block pattern and a reinvention of single-use retail into a much more sustainable mix of high intensity uses.
5. Harbor – an area with visitor serving uses, marine facilities, boating and commercial and recreational fishing activities, as well mixed-use places. A specific plan (based on the draft Harbor Master Plan) is being prepared for the Harbor District that will ensure a mix of uses, including residential, and highly defined public frontages and shared civic space for increased accessibility to ocean-front amenities.
6. Arundell – is currently an industrial center with a mix of small-scale industrial uses, business park development, and limited retail services. The McGrath Property – is a 76-acre site of undeveloped land that could provide the catalyst for Ventura’s redefinition of 21st Century light industry, manufacturing, research and development, and technological innovation. It is centrally located in the Arundell area, which is ripe for redevelopment into a new form of community plan and building that incorporates large-scale employment, workforce housing and neighborhood commercial in an economically diverse setting.
7. North Bank – a combination of automobile retail, regulated by the Auto Center Specific Plan, and industrial/business park uses. Auto Center – efforts over the short term will focus on making the area a regional retail destination. The City will strengthen its partnership with Auto Center dealers to realize beautification projects and facilitate land use entitlements for additional dealerships, as well as nurture creative partnerships to discover potential for unique attractions of regional interest.
8. Montalvo – an area of industrial and heavier commercial uses, and currently home to the Metrolink Station. Because of the strategic location of this area between east and west Ventura and its transportation-rich infrastructure, it needs a strong plan for connectivity and a strategic mix of uses for evolution that is economically sustainable.
9. Saticoy – a mix of homes, older industrial and agricultural operations, and the planned site for the County maintenance yard. The Saticoy Village Specific Plan governs a small portion of this area. A larger effort should ensure Saticoy’s seamless connection with adjacent areas, including a greenspace and circulation plan.

Corridors

Corridors, which can be natural or urban, often form boundaries, as well as connections, between neighborhoods and/or districts. Natural corridors can be those such as streams, barrancas, canyons, or green parkways. Urban corridors can be transportation thoroughfares that frequently encompass major access routes, especially ones with commercial destinations, including transit routes and rail lines. The following eight urban corridors are depicted on the General Plan Diagram. Each has the potential to evolve into a vibrant mixed-use City street with a distinct character borrowed from the neighborhoods that share it:

- A. Ventura Avenue – a mix of older, small-scale commercial, industrial, and residential uses, with potential to grow even more vibrant by building on existing strengths, including its historic role as a major “working center.” Using the warehouse model and diversity of building materials as a cue, “The Avenue” could harness cultural expression and become an eclectic center for the emerging arts and manufacturing crafts.
- B. Main Street – currently a commerce-oriented area with a limited amount of mixed use development, this corridor displays the broadest range of architectural types and styles in the city, as well as the widest spectrum of transect characteristics. It has the most potential for increased mixed use and housing with improved streetscape and pedestrian enhancement to slow traffic.
- C. Thompson Boulevard – a commercial thoroughfare in need of streetscape improvements and pedestrian amenities, this corridor is much like Main Street in that it boasts tremendous history as a “gateway to Ventura” and epitomizes a beach town character. It is a natural for a major transit or streetcar corridor, where nodes of mixed-use development and pedestrian and bike enhancement could support parallel neighborhoods and increase access to the ocean.
- D. Loma Vista Road – a mix of commercial and residential development at varying scales, with a high concentration of medical facilities, this is the ideal place for Ventura to focus on creating a concentration of medical and research-centered business, with a high intensity of workforce housing and services housed in large-scale mixed-use buildings of high-tech character and serviced by increased transit.
- E. Telegraph Road – a sub-urban-scale commercial area with some detached homes and multifamily buildings. The City’s bus transfer station is located along this corridor, creating the perfect opportunity for a multi-modal connection with an intense node of housing and employment. The streetscape could change character along its length, with a mixture of intensities of development.
- F. Victoria Avenue – currently a wide artery with high traffic volumes and shopping centers, Victoria needs effective traffic management

and pedestrian and streetscape improvements with strong attention to additional mobility options. Actions in this General Plan, along with the new Development Code, will call for revitalizing this corridor by redesigning the current array of single-use shopping centers and retail parcels with a mix of building types, uses, and public and private frontages. By eliminating "big box", mega-block, auto-oriented strip development, and the traffic patterns it generates, Victoria Avenue could create tremendous opportunity for healthy economic investment in walkable blocks, connected to better serve surrounding neighborhoods. Creative solutions, including dedicating transit or streetcar lanes, wider sidewalks, and bike lanes could transform Victoria's image into a regional thoroughfare of great and sophisticated diversity. All new commercial development within the Victoria Avenue corridor must follow this approach.

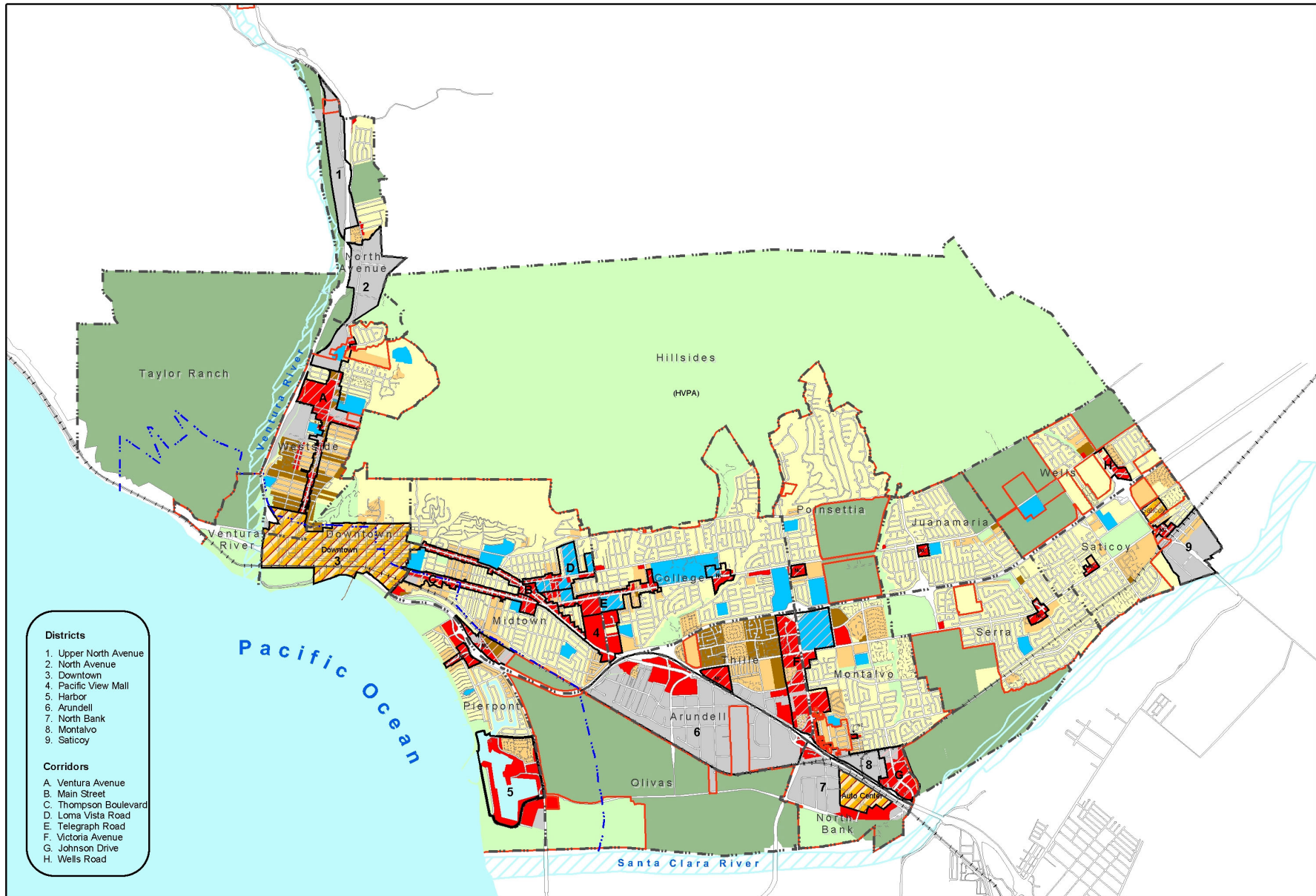
- G. Johnson Drive – a connector between eastern Ventura and Highway 101 with sub-urban scale retail. Opportunities exist for high-quality, mixed-uses (such as child-care, restaurants, offices, light industrial, and housing) with ground floor commercial space to strengthen its economic presence and provide a visual gateway.
- H. Wells Road – a mix of older industrial uses and newer sub-urban commercial and residential development. Well's Road should be returned to the neighborhoods it serves, so that new development can

emulate the country charm that existed prior to its widening. Traffic calming in appropriate locations would encourage neighborhood connectivity, and end the current trend toward walls and buildings that turn their back to the street. This would also encourage redevelopment of the old neighborhood centers.

Neighborhood Centers

Community evolves from individual conversations and the best places to grow community are in individual neighborhoods. Every neighborhood should have at least one center where people can meet by chance at a local coffee shop, market, bookstore, diner, or even hardware store. *Our Involved Community* needs places to gather to have meaningful conversations and share civic information. Ventura's existing neighborhood centers have the opportunity to become such places. The General Plan Diagram identifies 10 neighborhood centers – where the development of housing alongside commercial uses is specifically encouraged. These centers include:

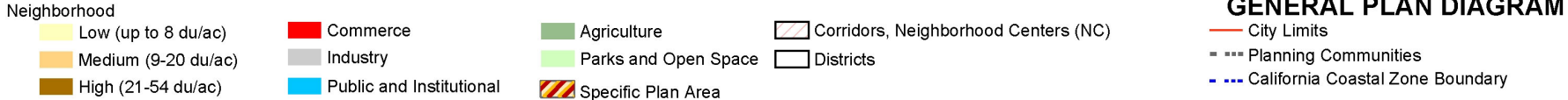
- (1) Pierpont, (2) Seaward/Alessandro, (3) College/Day, (4) Gateway Plaza, (5) Victoria Plaza, (6) Bristol, (7) Kimball/Telegraph, (8) Petit/Telephone, (9) Telephone/Cachuma, and (10) Saticoy.



Note: Areas prone to flooding are shown on Figure 7-1 in Chapter 7.

Figure 3-5

GENERAL PLAN DIAGRAM



This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.

Special Topics

Agricultural Lands

During the 20th Century, the value of agricultural land in Ventura became secondary to that for development. However, this pattern is not irreversible, and protecting green land to save the aesthetic beauty of open space, preserve the cultural landscape of the community's heritage, and conserve land for environmental quality are high priorities in Ventura. In fact, the land's historic role for food production may soon be more highly valued once again, as prime agricultural areas continue to disappear to development at an astounding rate.

Ventura is fortunate to retain much of its rural landscape. Agriculture still plays an important role in the economy of the City and County of Ventura. Significant yields are made possible by the presence of high quality soils, adequate water supply, favorable climate, long growing season, and level topography. Mechanisms such as the California Land Conservation Act (more popularly known as the Williamson Act), the Save Our Agricultural Resources (SOAR) initiative (see Appendix B), and greenbelt agreements with neighboring jurisdictions continue to help maintain a balance between urban growth and agricultural preservation. The SOAR initiative that was adopted by the voters in 1995, and that, by its own terms, remains in full legal effect until 2030, refers to specific policies from the 1989 Comprehensive Plan that are still in effect and, as such, have been carried forward into this Plan under Policy 3D and Action 3.20 in addition to

being incorporated in this General Plan as set forth in Appendix B.

A primary agricultural concern is the potential conflict with adjacent urban uses over pesticides, dust, odors, noise, and the visual impact of large greenhouses. Other issues of importance to agricultural producers include restrictions on farm-related activities, access to water, and provision of farmworker housing. Paralleling these concerns is a community interest in sustainability, the ability to provide for the needs of future generations. The policies and actions in this chapter intend to sustain viable farm operations in areas designated for agricultural use.

Growth Management

Growth management seeks to preserve public good, improve social equity, and minimize adverse impacts of development while still accommodating new housing and business attraction. The effects of growth management policies on housing prices are complex due to the idiosyncrasies of local real estate markets. Properly designed, growth management programs can plan for all development needs, such as open space, access to public transportation, and walkable neighborhoods.

The City's Residential Growth Management Program (originally established in 1979 to ensure that housing development would not outpace needed infrastructure) has not always contributed to housing affordability or quality design. This General Plan calls for revising the Residential



Subsequent to the adoption of the **SOAR** initiative, there have been two general plan amendments, which redesignated individual agricultural properties through a vote of the electorate as required by SOAR. These remain in full legal effect and have been carried forward into this Plan. These include the new Community Park at Kimball Road and the southeast corner of Montgomery and Bristol (see Appendix E and F).

Growth Management Program with an integrated set of growth management tools. Such tools not only include the adoption of a new form-based Development Code, but also community or specific plans based on availability of infrastructure and resources.


Long Term Potential Expansion Strategy


Indeed, the community has indicated that before the City expands any further, the first priority for achieving planning goals should be in the vacant and underutilized areas of the City. Yet, even the most successful effort to achieve community planning goals through infill may need to be supplemented at some point by expanding into areas outside the city limits. Such expansion may not only be necessary to fulfill development objectives; it also may be needed to provide open space, parklands, and natural areas to be preserved and restored. To address this, citizens discussed during the preparation of this General Plan which areas, if any, should be possible expansion areas. These areas were identified because they embody opportunities for achieving a variety of community vision objectives that may not be feasible within existing city limits. The community further went on to agree upon a set of rules about how these areas should be planned. These areas were analyzed in the environmental impact report prepared for this General Plan, and a “long term potential expansion strategy” will be formulated to guide the process of prioritizing any potential future expansion areas to fulfill General Plan objectives that may not be able to be achieved by our “Infill First” approach. Should


any areas be selected for future planning, a specific plan, a public vote (if required pursuant to SOAR), and an amendment with the regulatory planning framework would have to occur.


The policies and actions in this chapter call for measured and appropriate growth in Ventura by prioritizing areas appropriate for additional development based on community values and infrastructure potential.


Policy 3A: Sustain and complement cherished community characteristics.


Action 3.1: Preserve the stock of existing homes by carrying out Housing Element programs. 

Action 3.2: Enhance the appearance of districts, corridors, and gateways (including views from highways) through controls on building placement, design elements, and signage. 

Action 3.3: Require preservation of public view sheds and solar access. 


Action: 3.4 Require all shoreline development (including anti-erosion or other protective structures) to provide public access to and along the coast, unless it would duplicate adequate access existing nearby, adversely affect agriculture, or be inconsistent with public safety, military security, or protection of fragile coastal resources. 


Action 3.5: Establish land development incentives to upgrade the appearance of poorly maintained or otherwise unattractive sites, and enforce existing land maintenance regulations. 


Action 3.6: Expand and maintain the City's urban forest and thoroughfare landscaping, using native species, in accordance with the City's Park and Development Guidelines and Irrigation and Landscape Guidelines. 


Action 3.7: Evaluate whether lot coverage standards should be changed based on neighborhood characteristics.

Policy 3B: Integrate uses in building forms that increase choice and encourage community vitality.

Action 3.8: Adopt new development code provisions that designate neighborhood centers, as depicted on the General Plan Diagram, for a mixture of residences and small-scale, local-serving businesses. 

Action 3.9: Adopt new development code provisions that designate areas within districts and corridors for mixed-use development that combines businesses with housing, and focuses on the redesign of single-use shopping centers and retilers parcels into walkable, well connected blocks, with a mix of building types, uses, and public and private frontages. 

Action 3.10: Allow intensification of commercial areas through conversion of surface parking to building area under a district-wide parking management strategy in the Downtown Specific Plan. 

Action 3.11: Expand the downtown redevelopment area to include parcels around future transit areas and along freeway frontage. 

Action 3.12: The City will work with the hospitals on the new Development Code treatment for the Loma Vista corridor, which includes both hospitals.

Action 3.13: Assess whether the City's Affordable Housing Programs respond to current needs, and modify them as necessary within State mandated Housing Element updates.

Specific Plan Requirements

Specific Plans must include a statement of its relationship to the General Plan and specify all of the following:


1. distribution, location, and extent of uses
2. distribution, location, extent, and intensity of public and private transportation, sewage, water, drainage, solid waste disposal, energy
3. standards and criteria by which development will proceed and standards for conservation, development, and utilization of natural resources
4. program of implementation measures, including regulations, programs, public works projects, and financing
5. any other subjects that are necessary


(§65450-65452)


Policy 3C: Maximize use of land in the city before considering expansion.

Action 3.14: Utilize infill, to the extent possible, development to accommodate the targeted number and type of housing units described in the Housing Element.


Action 3.15: Adopt new development code provisions that ensure compliance with Housing Element objectives.

Action 3.16: Renew and modify greenbelt agreements as necessary to direct development to already urbanized areas. 

Action 3.17: Continue to support the Guidelines for Orderly Development as a means of implementing the General Plan, and encourage adherence to these Guidelines by all the cities, the County of Ventura, and the Local Agency Formation Commission (LAFCO); and work with other nearby cities and agencies to avoid urban sprawl and preserve the rural character in areas outside the urban edge. 


Action 3.18: Complete community or specific plans, subject to funding, for areas such as Westside, Midtown, Downtown, Wells, Saticoy, Pierpont, Harbor, Loma Vista/Medical District, Victoria Corridor, and others as appropriate. These plans will set clear development standards for public and private investments, foster neighborhood partnerships, and be updated as needed. 


Action 3.19: Preparation of the new Development Code will take into account existing or proposed

community or specific plans to ensure efficient use of City resources and ample citizen input. 


Policy 3D: Continue to preserve agricultural and other open space lands within the City's Planning Area.

Action 3.20: Pursuant to SOAR, adopt development code provisions to "preserve agricultural and open space lands as a desirable means of shaping the City's internal and external form and size, and of serving the needs of the residents.

Action 3.21: Adopt performance standards for non-farm activities in agricultural areas that protect and support farm operations, including requiring non-farm uses to provide all appropriate buffers as determined by the Agriculture Commissioner's Office. 


Action 3.22: Offer incentives for agricultural production operations to develop systems of raw product and product processing locally. 


Policy 3E: Ensure the appropriateness of urban form through modified development review.

Action 3.23: Develop and adopt a form-based Development Code that emphasizes pedestrian orientation, integration of land uses, treatment of streetscapes as community living space, and environmentally sensitive building design and operation. 

Action 3.24: Revise the Residential Growth Management Program (RGMP) with an integrated set of growth management tools including:

- community or specific plans and development codes based on availability of infrastructure and transit that regulate community form and character by directing new residential development to appropriate locations and in ways that integrate with and enhance existing neighborhoods, districts and corridors;
- appropriate mechanisms to ensure that new residential development produces high-quality designs and a range of housing types across all income levels; and,
- numeric limitations linked to the implementation of community or specific plans and development codes and the availability of appropriate infrastructure and resources; within those limitations, the RGMP should provide greater flexibility for timing new residential development.

Action 3.25: Establish first priority growth areas to include the districts, corridors, and neighborhood centers as identified on the General Plan Diagram; and second priority areas to include vacant undeveloped land when a community plan has been prepared for such (within the City limits). 

Action 3.26: Establish and administer a system for the gradual growth of the City through identification of areas set aside for long-term preservation, for controlled growth, and for encouraged growth. 

Action 3.27: Require the use of techniques such as digital simulation and modeling to assist in project review.

Action 3.28: Revise the planning processes to be more user-friendly to both applicants and neighborhood residents in order to implement City policies more efficiently.

Policies and actions related to the preservation of **historic architecture and resources** are contained in Chapter 9.

2000-2006 HOUSING ELEMENT GOALS AND POLICIES, City Council Adopted Resolution 2004-014. Adopted April 12, 2004

Goal 1

Maintain and improve the quality of existing housing and residential neighborhoods in Ventura.

Policy 1.1 Encourage citizen involvement in addressing the maintenance and improvement of the housing stock and neighborhood quality.

Policy 1.2 Continue to preserve and maintain the City's historical and architecturally significant buildings and neighborhoods.

Policy 1.3 Encourage homeowners and landlords to maintain properties in sound condition through the City's residential rehabilitation assistance programs and code enforcement efforts.

Policy 1.4 Cooperate with housing providers in the acquisition, rehabilitation, and maintenance of older residential properties as long-term affordable housing.

Policy 1.5 Permit the conversion of apartments to condominiums only when such conversion would not

adversely affect the overall supply and availability of rental units, particularly units occupied by lower- and moderate-income households.

Policy 1.6 Continue to support the provision of rental assistance to lower-income households, and encourage property owners to list units with the Housing Authority.

Policy 1.7 Continue to preserve the affordability of mobile homes through the Rent Stabilization Ordinance. Support the acquisition and ownership of mobile home parks by non-profit housing providers and resident organizations.

Policy 1.8 Preserve the existing stock of affordable housing, including mobilehomes, through City regulations, as well as financial and other forms of assistance.

Goal 2

Facilitate the provision of a range of housing types to meet the diverse needs of the community.

Policy 2.1 Provide high quality housing for current and future residents with a diverse range of income levels.

- | | | | |
|-------------------|--|--------------------|--|
| Policy 2.2 | <p>Promote housing that is developed under modern sustainable community standards.</p> <p>Provide expanded housing opportunities for the City's workforce. Promote the City's affordable housing programs with employers in Ventura.</p> | Policy 2.6 | <p>Support a variety of housing types to address the needs of agricultural workers, including affordable rentals, mobilehome parks, single room occupancy hotels (SROs), and group housing for migrant laborers.</p> |
| Policy 2.3 | <p>Continue to offer and promote homeownership assistance programs to lower- and moderate-income households to purchase both new and existing housing. Pursue participation in other homeownership programs available in the private market.</p> | Policy 2.7 | <p>Facilitate the provision of housing to address Ventura's growing senior population, including senior housing with supportive services, assisted living facilities, and second units.</p> |
| Policy 2.4 | <p>Continue to provide financial and regulatory incentives to non-profits, private housing developers, and public agencies for the construction of the types of housing required to meet identified needs.</p> | Policy 2.8 | <p>Encourage the provision of housing adaptable to the physically disabled through integration of universal design features in new development, and compliance with Title 24 of the California Health and Safety Code.</p> |
| Policy 2.5 | <p>Support the provision of quality rental housing with three or more bedrooms to accommodate large families, and encourage room additions in the existing housing stock to address household overcrowding.</p> | Policy 2.9 | <p>Encourage the provision of supportive housing for persons with mental illness to address the severe shortage of housing for this special needs population.</p> |
| | | Policy 2.10 | <p>Support efforts by non-profits to expand transitional and emergency housing in Ventura, including support of grant applications and assistance in identification of suitable sites.</p> |

Policy 2.11 Evaluate adoption of an inclusionary housing ordinance as a means of integrating affordable units within new residential development: 1) Require affordable units to be provided on or off-site, with allowance for payment of an in-lieu fee at the discretion of the City; 2) Evaluate the financial impact of inclusionary requirements on development, and assess incentive-based alternative strategies for provision of affordable housing.

Policy 2.12 Facilitate the provision of second units as a means of providing affordable rental housing in existing neighborhoods. Ensure compatibility with the primary unit and surrounding neighborhood.

Policy 2.13 Encourage the production of housing that meets the needs of all economic segments, including lower, moderate, and above moderate-income households, to achieve a balanced community.

Policy 2.14 Promote and facilitate non-traditional housing types and options, including co-housing, assisted living facilities, live-work spaces, and artist lofts.

Policy 2.15 Direct City-controlled housing funds towards programs that address the needs of very low- and low-income households.

Policy 2.16 Prioritize affordable housing opportunities and assistance for public service employees.

Policy 2.17 Annually monitor the City's progress in meeting its housing needs for all income levels.

Goal 3

Provide adequate housing sites through appropriate land use and zoning designations to accommodate the City's share of the regional housing needs.

Policy 3.1 Maintain an up-to-date inventory of vacant and underutilized parcels and provide to interested developers in conjunction with information on available development incentives. Within redevelopment project areas, provide assistance in land assembly in support of affordable housing.

Policy 3.2 Implement smart growth principles by rewarding quality infill projects that utilize existing infrastructure.

Policy 3.3 Encourage efficient utilization of the City’s limited land resources by encouraging development at the upper end of the permitted Zoning Code/Comprehensive Plan density.

Policy 3.4 Utilize the Urban Infill Overlay Zone and Downtown Specific Plan as a tool to facilitate higher density residential and mixed-use development.

Policy 3.5 Explore residential reuse opportunities on obsolete commercial properties, such as older motels and underutilized historic structures.

Policy 3.6 Pursue use of publicly owned land, such as public parking lots, for development of affordable housing.

Policy 3.7 Identify opportunities for housing development that achieves other community goals such as neighborhood improvement, recreation opportunities, and the preservation of sensitive lands and neighborhood character.

Policy 3.8 Facilitate the development of mixed-use projects in appropriate commercial areas, including stand-alone residential developments

(horizontal mixed-use) and housing above ground floor commercial uses (vertical mixed-use).

Policy 3.9 Promote higher density housing as part of mixed-use developments along parts of Thompson Boulevard and Main Street in Midtown Ventura, as well as other areas such as Westside, Downtown and East Ventura.

Policy 3.10 Promote mixed-use developments on the Westside of Ventura.

Policy 3.11 Ensure that the updated Land Use Element designates adequate sites for housing for executives to enhance the City’s ability to attract businesses with higher paying jobs.

Goal 4

Mitigate or remove any potential governmental constraints to housing production and affordability.

Policy 4.1 Provide regulatory and/or financial incentives, where appropriate, to offset or reduce the costs of affordable housing development, including density bonuses and flexibility in site development standards.

Policy 4.2 Utilize the Affordable Housing Program to provide incentives for production of affordable units, including streamlined permit processing, reduced fees and exemption from the required competition for RGMP allocations.

Policy 4.3 Amend the City's Residential Growth Management Plan (RGMP) to better facilitate housing production, while discouraging sprawl and maintaining quality of life goals.

Policy 4.4 Undertake a comprehensive review of the City's residential development project review procedures and establish modified procedures as appropriate to streamline processing times, while maintaining adequate levels of public review.

Policy 4.5 Provide flexibility in development standards to accommodate new models and approaches to providing affordable housing, such as co-housing, live/work units and assisted living facilities.

Goal 5

Promote equal opportunity for all residents to reside in the housing of their choice.

Policy 5.1 Continue to enforce fair housing laws prohibiting arbitrary discrimination in the building, financing, selling or renting of housing on the basis of race, religion, family status, national origin, physical or mental disability, or other such factors.

Policy 5.2 Continue to support organizations that offer fair housing and mediation services to Ventura residents.

Policy 5.3 Promote housing that meets the special needs of large families, elderly persons, agricultural workers, and the disabled.

Policy 5.4 Continue to enforce notification and provide relocation assistance for lower-income persons displaced due to demolition, reuse, condominium conversion, or rehabilitation as a result of code enforcement.



"Restore human legs as a means of travel.
Pedestrians rely on food for fuel and need no
special parking facilities."

— Lewis Mumford
Author of *The City in History*, 1961

4. OUR ACCESSIBLE COMMUNITY

Our goal is to provide residents with more transportation choices by strengthening and balancing bicycle, pedestrian and transit opportunities in the City and surrounding region.

An Integrated Mobility System

Central to the well-being of Ventura's citizens and visitors is *mobility*, the ability to get from one place to another. Mobility depends on the range, efficiency, and connectivity of the various components that comprise the transportation network – sidewalks, bicycle routes, and thoroughfares, as well as transit services – and that enable people to access the things they need, from the most basic to the extraordinary (See Figures 4-1 Bicycle Facilities, 4-2 Bus and Rail Routes, and 4-3 Roadway Classification Plan). Ventura is a community that recognizes that thoroughfares serve a variety of functions and are not simply conduits for automobile traffic.

Balancing automobile use with other means of travel is essential to maintaining social and physical health. Safe and enjoyable routes for pedestrians and bicyclists should connect every part of the city, and neighborhoods need to be linked by ample and convenient transit service along corridors. Ventura also must be connected to the larger region by a variety of transportation modes.

Thoroughfares have a tremendous effect on neighborhood character and therefore quality of life for both residents and visitors.

Thoroughfares are essentially the stage of public life where a diversity of citizens interact. They can create places of remembrance, chance encounters, and discovery. Ensuring that Ventura thoroughfares are *great places* requires improving design and quality as well as connectivity. In some cases, city thoroughfares are over-engineered to accommodate the worst-case scenario.

Slowing down automobiles, especially in residential neighborhoods, is a desire shared by many residents. Vehicle travel should be directed toward routes that minimize congestion, avoid conflicts with walkers and bicyclists, and keep residential neighborhoods free of excessive cut-through traffic. Additionally, in some areas of the city, suburban patterns have resulted in less connectivity than is desired by the community. Transportation modes and land uses in the city need to be distributed so that residents have close and easy access to meet their basic needs and travel destinations.

Traffic congestion is a major concern among Ventura residents. Although traffic on local roads is generally free-flowing, a few key intersections and road segments experience congestion during peak traffic hours. Simply widening roads to add lanes will not solve traffic congestion. Instead, the system needs integrated solutions that improve mobility for all

The essential qualities of a properly functioning mobility system are:

1. Well connected, interesting components
2. Convenient accessibility
3. Integrated linkage of all modes
4. Comfort and safety
5. Design reflecting natural and urban context

means of travel. While walking, biking, and transit use are already popular, these alternative modes need to be enhanced and better linked. For example, bus and rail systems serve Ventura, but not thoroughly enough to provide a reasonable alternative to auto use for most travelers. And while pedestrian access exists in most areas of Ventura, the network lacks continuous routes in some key locations.

As expressed in the *Ventura Vision*, a top community priority is to minimize automobile use through a fully integrated multi-modal transportation system. The policies and actions in this chapter aim to achieve this objective.

Travel Modes

Walking

Sidewalks are arguably the most important component of the city's mobility system. As with circulation in general, the utility of pedestrian systems is inextricably linked to land use patterns. Combined with urban design elements, land use patterns influence how much walking can safely and effectively occur in the community. Circulation systems that are designed with pedestrians in mind tend to increase outdoor activity and community interaction, while those oriented toward motor vehicles tend to create disincentives to walking.

Ventura's pedestrian system consists of sidewalks, access ramps, crosswalks, linear park paths, and overpasses and tunnels. Special corridors such as the Beachfront Promenade, California Plaza, and Figueroa Plaza have been designated especially for pedestrians. The pedestrian system also includes neighborhood and park path systems, and dedicated trail facilities that are shared with bicyclists and other users.

Pedestrian paths need to be interesting, enjoyable, and lead to a destination, from the most simple – such as a pocket park – to more grand points of arrival, such as major civic spaces. Creating a network of paths that connect key features such as parks, schools, civic facilities, shops, and services is vital to the success of reducing dependence on the

automobile. Those most in need of pedestrian access include children, teenagers, and the elderly, as well as those who cannot afford a car or choose not to drive.

The main deficiency of Ventura's pedestrian system is its discontinuity. Some sections of thoroughfares lack sidewalks, and pedestrian connections between some key use areas are in need of repair. Crosswalks are prohibited along some corridors, and pedestrian signal phases are not always long enough for all walkers. Traffic-calming measures also are needed to improve walkability in many neighborhoods. Citizens have placed a high emphasis on improving the pedestrian network, recommending specific improvements such as:

- narrowing selected thoroughfare segments,
- improving sidewalks and road crossings,
- lengthening pedestrian signal phases,
- adding marked crossings at key intersections,
- developing safe and attractive walkways from Downtown and Midtown to the beach,
- ensuring that new development provides ample pedestrian access,
- creating trails along watercourses and through the hillsides, and
- improving pedestrian facilities near schools.

Figure 4-1 illustrates the three State defined classes of bikeway facilities:

- Bike Path (Class I) – Class I bike paths are separated from roads by distance or barriers, and cross-traffic by motor vehicles is minimized.
- Bike Lane (Class II) – Class II bikeways are roadway lanes reserved for bicycles. These lanes are painted with pavement lines and markings and are signed.
- Bike Route (Class III) – Class III bike routes share existing roads and provide continuity to other bikeways or designated preferred routes through high traffic areas. There are no separate lanes, and bike routes are established by placing signs that direct cyclists and warn drivers of the presence of bicyclists.

Policies and actions in this chapter intend to improve pedestrian access through this range of methods.

Biking

Because bicycles are an integral component of the city’s mobility system, they are allowed on *all* city thoroughfares. The City has adopted a General Bikeway Plan intended to create a safe, accessible, and interconnected network of bike paths, lanes, and routes that will ensure Ventura becomes and remains a truly bicycle-friendly community. The General Bikeway Plan is a flexible, comprehensive, and long-range guide for bicycle transportation and recreation planning, design, and budget decision-making. Accordingly, it is designed to:

- refine and implement City bicycle-related policies,
- establish bikeway design standards,
- enhance bicycle safety and education programs,
- set priorities and phasing for improvements and amenities depicted on the Select System of Bikeways map, and
- identify funding means and opportunities for interagency cooperation.

The City places high emphasis on improving the local bicycle network by following the recommendations of the General Bikeway Plan, which include:

- connecting schools, parks, activity areas, housing areas, and employment centers with bike paths and lanes, particularly in areas without thoroughfares,
- constructing additional Class I or Class II bikeways in a number of locations, including along the Santa Clara River and the coast to connect to the Ventura River Trail,
- installing bicycle racks,
- updating bicycle facility standards to ensure proper design and maintenance,
- constructing improvements to resolve bicycle/automobile conflicts,
- establishing a highly visible route identification and signage program that fits the character of the community, and
- mitigating impacts on bicyclists from new development and during and following construction of roadway projects.

Policies and actions in this chapter seek to improve bicycle access and safety by carrying out these recommendations.

Public Transit – Bus & Rail

Transit service in Ventura includes bus and rail operations (see Figure 4-2). South Coast Area Transit (SCAT) provides local bus service, Ventura Intercity Transit Authority (VISTA) runs regional routes, and Greyhound offers statewide and national connections. Metrolink provides rail service to and from Los Angeles – although on a very limited schedule, while Amtrak trains that stop in Ventura run between San Luis Obispo and San Diego.

Although local bus routes connect most activity centers, the East End is not well served, and more frequent service is needed to key destinations such as the beach and downtown. Metrolink and Amtrak need to be linked to each other and accessed by local bus routes. An agreement between the City and the Ventura County Transportation Commission calls for identifying a permanent Metrolink site, and the best way to integrate all of these services is with a major multi-modal transit center that also accommodates potential additional future alternative transportation modes.

SCAT buses are equipped with wheelchair lifts and adjustable steps to ensure access for all riders. SCAT also offers discounted fares for seniors and disabled riders, as well as dial-a-ride service. However, seniors and mobility-impaired persons also desire frequent fixed-route service in smaller vehicles, and all riders need upgraded amenities at a number of stops. Bus routes also need increased frequency and

stops to make transit a viable alternative to driving.

Other transit system needs include:

- reduced-emission vehicles,
- continued use of schedule synchronization to accommodate route transfers, and
- service to regional destinations such as California State University Channel Islands and airports.

Policies and actions in this Chapter aim to improve transit efficiency, encourage ridesharing, and preserve long-term transit options.



The Automobile and Types of Roadways

The most basic component of the mobility system is the *thoroughfare*, used not only by people who drive, but also by people who ride the bus, bike and walk. Thoroughfares encompass sidewalks, bicycle lanes, travel lanes, and are the most utilized means of travel in Ventura. This system is organized into the following classifications: local thoroughfares, collectors, and arterials (see Figure 4-3, Roadway Classification Plan – also known as “Circulation Plan”).

Local Thoroughfares

Local thoroughfares provide mobility within neighborhoods and are generally not shown on the Roadway Classification Plan. Local thoroughfares include *alleys, lanes,* and “*yield*” *streets.*

Collectors

Collectors serve as links between local thoroughfares. Collectors may front residential and neighborhood-serving commercial uses. Collectors can be configured as *boulevards, avenues, streets,* and *main streets.*

Arterials

Arterials are the primary mechanism for cross-town travel and serve the major centers of activity. These roads typically carry a high proportion of the total urban area travel. Arterials can be configured as *boulevards, avenues,* and *streets.*

Collector and arterial thoroughfare segments in the City are characterized in two ways that describe their physical features: *design* classification and *functional* classification. Design Classification defines the number of travel lanes using the following categories: Primary Arterial (6 lanes or more), Secondary Arterial (4 lanes), and Collector (2 lanes), as shown on the Roadway Classification Plan, Figure 4-3. Functional Classification describes how a thoroughfare is used: essentially as a *boulevard*, *avenue*, *street*, or *main street*.

Functional Classification also identifies whether roadways have medians, parking, bike lanes, and other streetscape attributes needed to achieve objectives other than just moving traffic, such as accommodating pedestrians, bicycles, and adjoining land uses and public spaces. Table 4-1 shows the design and functional classifications for thoroughfares in the City.

Ventura is mainly connected by 2-lane and 4-lane thoroughfares. The classification for each type of road segment represents a balance between vehicle capacity, pedestrian and bicycle access, parking requirements, streetscape character, and right-of-way limitations.

Boulevard

A multi-lane and generally urban corridor with a central, planted median.

Avenue

Avenues are typically multi-lane, short distance connectors, with a painted median, used in both residential and commercial areas, and often terminate at prominent buildings or plazas.

Table 4-1 Thoroughfare Sizes and Types

	Street Sizes (Engineering Design Classification)		
	Primary Arterial (6 or more lane roadway)	Secondary Arterial (4 lane roadway)	Collector (2 lane roadway)
Existing			
Future Widening			
Future Extension			
	Thoroughfare Types (Functional Classification)		
	Boulevard	Boulevard	Boulevard
	Avenue	Avenue	Avenue
		Street	Street
			Main Street

Source: Definitions for Design Classifications are the City's modifications to the American Association of State Highway and Transportation Officials (AASHTO) standards. Definitions for Functional Classifications are the City's modifications to the Traditional Neighborhood Development Street Design Guidelines.

Street

Street typically allows two way travel and may be multi-lane and does not have a central median and generally provides access to predominantly residential areas.

Main Street

Main streets have 2 vehicle lanes. Their main purpose is to provide low-speed access to commercial, mixed-uses, and higher density neighborhoods.

Consistency between the design and functional classifications is determined based on the number of through lanes. Temporary improvements, such as restriping to change the number of lanes are allowed, however a permanent improvement that moves the curbs and changes the number of lanes would require an amendment to this plan.

The *Ventura Vision* offers several key recommendations to improve the city thoroughfare system:

- add or enhance north-south arterials;
- consider an additional Santa Clara River bridge, Portola Avenue overcrossing of U.S. 101, and Johnson Drive overcrossing of Route 126; and
- soften the barrier impact of U.S. 101 by working with Caltrans to improve signage, aesthetics, undercrossings, and overcrossings.

Policies, actions, and the Roadway Classification Plan work together to address these recommendations. To improve the safety and functioning of the thoroughfare network and to maintain its compatibility with the character of the community, the policies and actions in this

chapter also call for upgrading problem thoroughfares and intersections, improving and constructing freeway ramps, and connecting unfinished roadways. Additional actions intend to protect views from scenic routes, including State-designated scenic highways.


Policy 4A: Ensure that the transportation system is safe and easily accessible to all travelers.

Action 4.1: Direct city transportation investment to efforts that improve user safety and keep the circulation system structurally sound and adequately maintained. First priority for capital funding will go to our pavement management program to return Ventura streets to excellent condition.


Action 4.2: Develop a prioritized list of projects needed to improve safety for all travel modes and provide needed connections and multiple route options.

Action 4.3: Provide transportation services that meet the special mobility needs of the community including youth, elderly, and disabled persons.


Action 4.4: Combine education with enforcement to instill safe and courteous use of the shared public roadway.

Action 4.5: Utilize existing roadways to meet mobility needs, and only consider additional travel lanes when other alternatives are not feasible. 

Action 4.6: Require new development to be designed with interconnected transportation modes and routes to complete a grid network.


Action 4.7: Update the traffic mitigation fee program to fund necessary citywide circulation system and mobility improvements needed in conjunction with new development. 


Action 4.8: Implement the City's Neighborhood Traffic Management Program and update as necessary to improve livability in residential areas.

Action 4.9: Identify, designate, and enforce truck routes to minimize the impact of truck traffic on residential neighborhoods. 


Action 4.10: Modify traffic signal timing to ensure safety and minimize delay for all users.

Action 4.11: Refine level of service standards to encourage use of alternative modes of transportation while meeting state and regional mandates.


Action 4.12: Design roadway improvements and facility modifications to minimize the potential for conflict between pedestrians, bicycles, and automobiles. 


Action 4.13: Require project proponents to analyze traffic impacts and provide adequate mitigation in the form of needed improvements, in-lieu fee, or a combination thereof. 


Policy 4B: Help reduce dependence on the automobile.


Action 4.14: Provide development incentives to encourage projects that reduce automobile trips. 

Action 4.15: Encourage the placement of facilities that house or serve elderly, disabled, or socioeconomically disadvantaged persons in areas with existing public transportation services and pedestrian and bicycle amenities.

Action 4.16: Install roadway, transit, and alternative transportation improvements along existing or planned multi-modal corridors, including primary bike and transit routes, and at land use intensity nodes. 


Action 4.17: Prepare and periodically update a Mobility Plan that integrates a variety of travel alternatives to minimize reliance on any single mode. 


Action 4.18: Promote the development and use of recreational trails as transportation routes to connect housing with services, entertainment, and employment. 


Action 4.19: Adopt new development code provisions that establish vehicle trip reduction requirements for all development. 


Action 4.20: Develop a transportation demand management program to shift travel behavior toward alternative modes and services.


Action 4.21: Require new development to provide pedestrian and bicycle access and

facilities as appropriate, including connected paths along the shoreline and watercourses. 

Action 4.22: Update the General Bikeway Plan as needed to encourage bicycle use as a viable transportation alternative to the automobile and include the bikeway plan as part of a new Mobility Plan. 

Action 4.23: Upgrade and add bicycle lanes when conducting roadway maintenance as feasible. 

Action 4.24: Require sidewalks wide enough to encourage walking that include ramps and other features needed to ensure access for mobility-impaired persons. 


Action 4.25: Adopt new development code provisions that require the construction of sidewalks in all future projects. 

Action 4.26: Establish a parking management program to protect the livability of residential neighborhoods, as needed.

Action 4.27: Extend stubbed-end streets through future developments, where appropriate, to provide necessary circulation within a developing area and for adequate internal circulation within and between neighborhoods. Require new developments in the North Avenue area, where applicable, to extend Norway Drive and Floral Drive to connect to Canada Larga Road; and connect the existing segments of Floral Drive. Designate

the extension of Cedar Street between Warner Street and south of Franklin Lane and the linking of the Cameron Street segments in the Westside community as high priority projects.


Policy 4C: Increase transit efficiency and options.


Action 4.28: Require all new development to provide for citywide improvements to transit stops that have sufficient quality and amenities, including shelters and benches, to encourage ridership. 

Action 4.29: Develop incentives to encourage City employees and local employers to use transit, rideshare, walk, or bike.

Action 4.30: Work with public transit agencies to provide information to riders at transit stops, libraries, lodging, and event facilities.

Action 4.31: Work with public and private transit providers to enhance public transit service.


Action 4.32: Coordinate with public transit systems for the provision of additional routes as demand and funding allow. 

Action 4.33: Work with Amtrak, Metrolink, and Union Pacific to maximize efficiency of passenger and freight rail service to the City and to integrate and coordinate passenger rail service with other transportation modes. 

Action 4.34: Lobby for additional transportation funding and changes to Federal, State, and regional transportation policy that support local decision-making.

Action 4.35: The City shall pursue funding and site location for a multi-modal transit facility in coordination with VCTC, SCAT, U.P.R.R., Metrolink, Greyhound Bus Lines, and other forms of transportation.


Policy 4D: Protect views along scenic routes.


Action 4.36: Require development along the following roadways – including noise mitigation, landscaping, and advertising – to respect and preserve views of the community and its natural context. 

- State Route 33
- U.S. HWY 101
- Anchors Way
- Brakey Road
- Fairgrounds Loop
- Ferro Drive
- Figueroa Street
- Harbor Boulevard
- Main Street
- Navigator Drive
- North Bank Drive
- Poli Street/Foothill Road
- Olivas Park Drive
- Schooner Drive
- Spinnaker Drive
- Summit Drive

- Telegraph Road – east of Victoria Avenue
- Victoria Avenue – south of U.S. 101
- Wells Road

Action 4.37: Request that State Route 126 and 33, and U.S. HWY 101 be designated as State Scenic Highways.

Action 4.38: Continue to work with Caltrans to soften the barrier impact of U.S. HWY 101 by improving signage, aesthetics and undercrossings and overcrossings. 

Action 4.39: Maintain street trees along scenic thoroughfares, and replace unhealthy or missing trees along arterials and collectors throughout the City. 

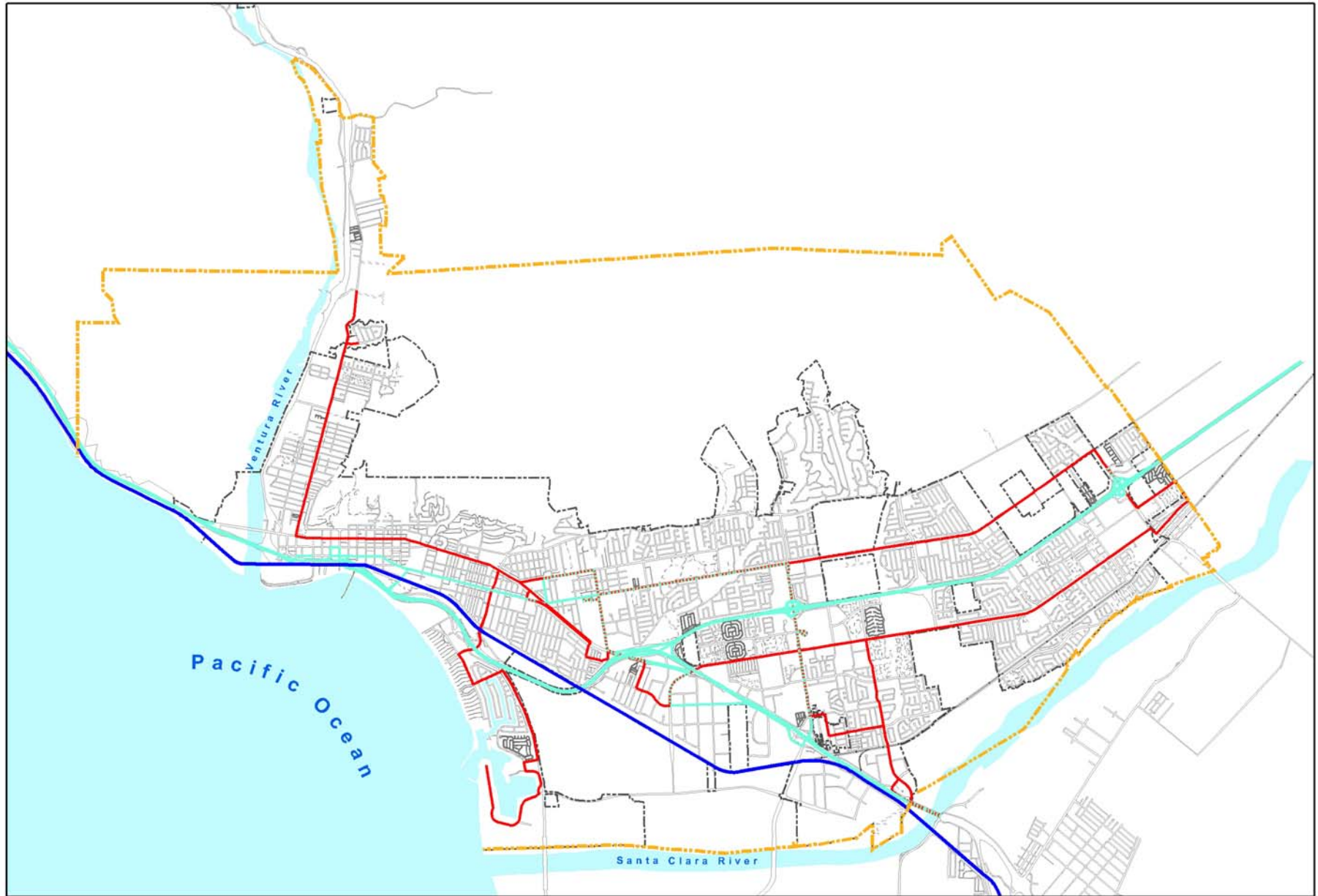


Note: Bike facilities shown on this figure are taken from the 1999 General Bikeway Plan and may change as updates to the General Bikeway Plan are completed.

Figure 4-1
Bicycle Facilities









This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.

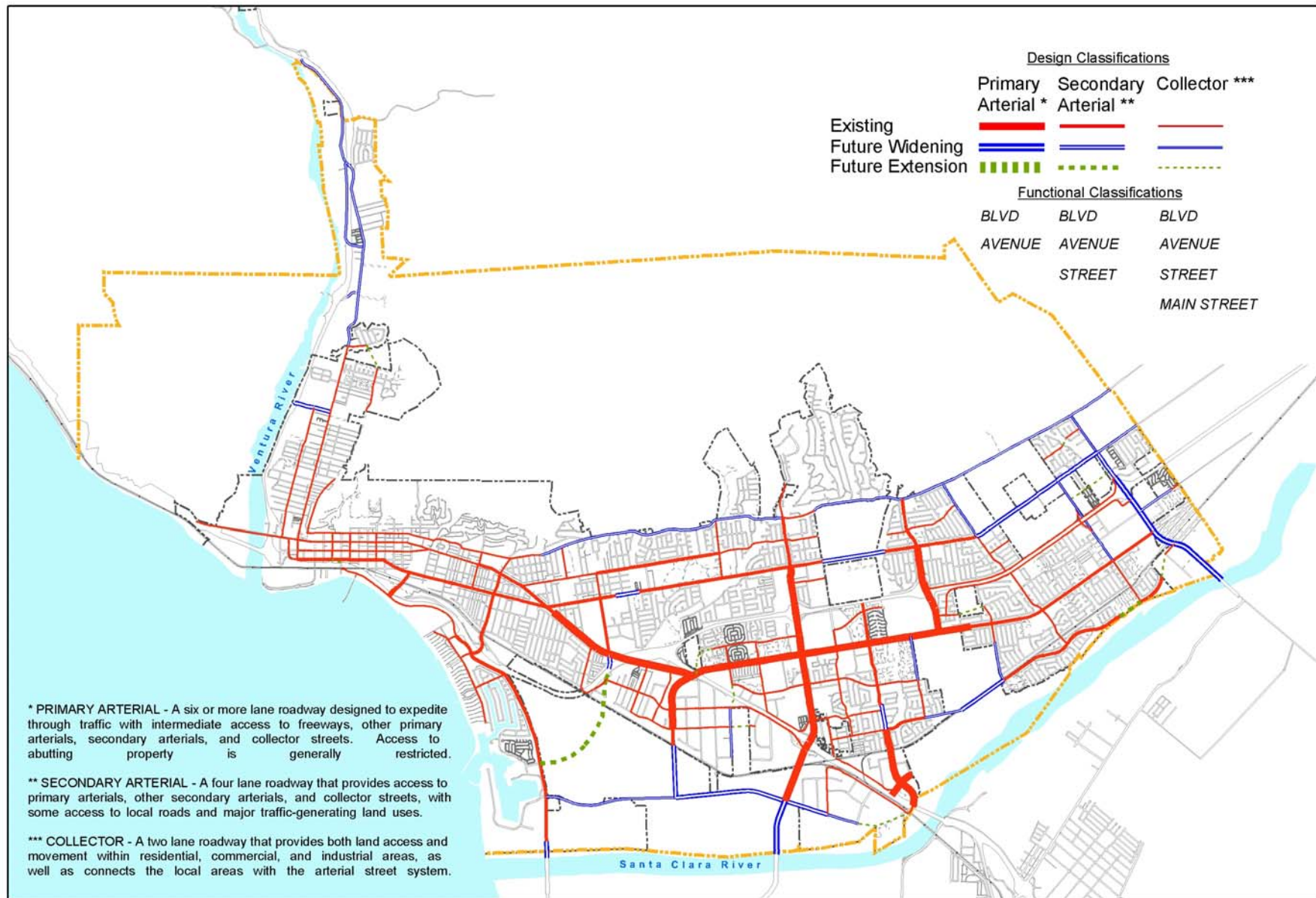


Note: Bus and Rail routes shown on this figure are current as of August 8, 2005 and may change as determined by each operator.

Figure 4-2
Bus and Rail Routes

Routes		Other	
SCAT		--- City Limits	
VISTA	 Planning Boundary	
SCAT & VISTA			
RAIL			

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.



- - - City Limits
- - - Planning Boundary

Note: Future extensions shown are conceptual in nature, unless a specific alignment has been approved by the City Council.

Figure 4-3
Roadway Classification Plan



"Now, I truly believe, that we in this generation, must come to terms with nature, and I think we're challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves."

— Rachel Carson
Biologist, Writer, Ecologist 1907-1964

5. OUR SUSTAINABLE INFRASTRUCTURE

Our goal is to safeguard public health, well-being and prosperity by providing and maintaining facilities that enable the community to live in balance with natural systems.

Essential Support Systems

Infrastructure is an extremely important though largely unnoticed foundation of quality of life in Ventura. Efficient water supply, wastewater treatment, and drainage systems are vital to most daily activities. These facilities on which the community depends need regular maintenance, and they frequently require upgrading both to meet the demands of a growing population and to be sensitive to environmental resources.

To ensure that citizens get high-quality drinking water, the City owns and operates a State-certified laboratory where water quality is tested continuously. Each City treatment plant is also run by State-certified operators who monitor water quality. As a result, City water exceeds State and federal water quality requirements.

The City employs conservation measures and emerging technology in its effort to achieve a high standard for wastewater treatment while protecting natural systems. As a result, treatment capability historically has outpaced community needs, with even peak flows typically reaching only 75 percent of plant capacity. Even so, further expanding the use of reclaimed water and

reducing water consumption will be vital to maintaining long-term water supplies.

Much of the storm drain system is aging and in need of repair or replacement, especially corrugated metal pipes in some of the older areas of Ventura. Collecting adequate fees that truly reflect the cost of serving development can help support City efforts to preclude additional deficiencies, and relying on and complementing natural drainage features can both help avoid the need for expensive and environmentally damaging channelization and improve the functioning of the overall drainage system.

Water Supply

The City provides drinking water, and water for fire protection, to households and businesses in Ventura through a complex system with more than 500 miles of distribution mains, 3 water treatment plants, 22 booster pump stations, 25 treated water reservoirs, and 13 wells. Five distinct sources provide surface and ground water to the City supply system:

- Casitas Municipal Water District
- Ventura River surface water intake, subsurface water and wells (Foster Park)
- Mound groundwater basin
- Oxnard Plain groundwater basin (Fox Canyon Aquifer)
- Santa Paula groundwater basin

The City also holds a State Water Project entitlement of 10,000 acre-feet per year;



however, new facilities would need to be constructed to transport this water to the City. The City updates its Urban Water Management Plan every two years (instead of every five years as required by State law) as part of its ongoing effort to ensure that City-managed water supplies will continue to accommodate demand in Ventura.

Meeting future water demands requires saving and reusing every drop possible. The City utilizes recycled water from its reclamation facility (a tertiary wastewater treatment plant) near the Harbor to augment the municipal water supply. Recycled water is used to irrigate City and private landscaping in the area and the Buenaventura and Olivas Park municipal golf courses. The remaining effluent is discharged to the Santa Clara River Estuary.

Largely as a result of conservation efforts, water consumption per city resident has generally declined (see Table 5-1). Projections anticipate that the City will continue to be able to meet consumer needs. Policies and actions in this chapter seek to refine demand management practices and conservation programs to further reduce per capita water use so that Ventura can sustain water resources for many more generations.

**Table 5-1
Historic and Projected Water Production (Acre Feet)**

Year	Estimated Population Served	Per Capita Use ¹	Treated Water Production	Raw Water Production	Total Water Production
Historic					
1980	73,774	0.236	17,381	4,766	22,147
1990	94,856	0.177	16,831	2,317	19,148
1995	99,668	0.165	16,428	1,602	18,030
1996	100,482	0.180	18,038	1,500	19,538
1997	101,096	0.178	18,002	1,829	19,831
1998	101,610	0.165	16,775	1,769	18,544
1999	102,224	0.192	19,658	1,067	20,725
2000	103,238	0.198	20,437	1,129	21,566
2001	104,153	0.173	18,071	889	18,960
2002	105,267	0.180	18,965	968	19,933
2003	106,782	0.183	19,510	846	20,356
Projected					
2005	109,465	0.179	19,594	1,000	20,594
2010	115,774	0.179	20,724	1,000	21,724
2015	122,447	0.179	21,918	1,000	22,918
2020	129,504	0.179	23,181	1,000	24,181

Sources: City of Ventura Urban Water Management Plan, Dec. 2000, City of Ventura 2004 Biennial Water Supply Report, as amended, September 2004.

¹ Per Capita use excludes raw water.

Wastewater Treatment

Ventura residents generate millions of gallons of wastewater each day, which is carried by more than 450 miles of sewer mains and 12 lift stations to the water reclamation facility in the Harbor area near the mouth of the Santa Clara River. While most residents receive sewer service directly from the City, three other sanitary sewer agencies with their own treatment facilities provide service to some citizens in the Montalvo, Saticoy, and North Ventura Avenue areas. As shown in Table 5-2, all local treatment facilities operate well below capacity.

About two-thirds of the wastewater treated locally is discharged to the Santa Clara River Estuary, as allowed by the Regional Water Quality Control Board. The remaining effluent is either transferred to recycling ponds, where some is delivered as reclaimed water, or it percolates to underground aquifers or evaporates. The policies and actions in this chapter call for improving treatment system efficiency to reclaim and reuse as much water as possible.

Table 5-2 Treatment Facilities

Treatment Facilities	Treatment Type	Capacity	Average Daily Flow
Ventura Water Reclamation Facility	Tertiary	14 MGD	9.0 MGD (68% capacity)
Montalvo Municipal Improvement District Treatment Plant	Secondary	0.36 MGD	0.242 MGD (67% capacity)
Saticoy Sanitary District Treatment Plant	Secondary ²	0.25 MGD	0.16 MGD (64% capacity)
Ojai Valley Sanitary District Treatment Plant	Tertiary	3 MGD	2.0 MGD (71% capacity)

² Includes nutrient removal prior to percolation.
Source: Individual agencies listed





Storm Drainage

Storm runoff travels from the hills above Ventura through the City until it is absorbed into the ground or reaches the Ventura River, the Santa Clara River, or the Pacific Ocean. To convey the occasional high flows associated with storms, the Ventura County Flood Control District oversees about 20 natural or concrete lined barrancas that serve as the major drainage courses for local watersheds. The City has about 20 miles of off-street drain system designed to convey runoff from all but the most severe of storms, in which case water also runs off via city streets.

Maintaining the barrancas and other watercourses that are not already lined with concrete as natural flood channels can help reduce peak flows by limiting water velocity. Incorporating natural features into drainage systems rather than hard treatment devices also can improve water quality and reduce maintenance costs. The policies and actions in this chapter seek to prevent increases in future storm water impacts by incorporating natural drainage and flood control features such as wildlife ponds and wetlands – instead of cement retention basins – into the storm drain system where possible. Such less intensive approaches not only cost less, but they also preserve environmental resources and protect water quality.


Policy 5A: Follow an approach that contributes to resource conservation.

Action 5.1: Require low flow fixtures, leak repair, and drought tolerant landscaping (native species if possible), plus emerging water conservation techniques, such as reclamation, as they become available. 


Action 5.2: Use natural features such as bioswales, wildlife ponds, and wetlands for flood control and water quality treatment when feasible. 

Action 5.3: Demonstrate low water use techniques at community gardens and city-owned facilities.


Action 5.4: Update the Urban Water Management plan as necessary in compliance with the State 1983 Urban Water Management Planning Act.


Action 5.5: Provide incentives for new residences and businesses to incorporate recycling and waste diversion practices, pursuant to guidelines provided by the Environmental Services Office. 


Policy 5B: Improve services in ways that respect and even benefit the environment.


Action 5.6: Require project proponents to conduct sewer collection system analyses to determine if downstream facilities are adequate to handle the proposed development. 

Action 5.7: Require project proponents to conduct evaluations of the existing water distribution system, pump station, and storage


requirements in order to determine if there are any system deficiencies or needed improvements for the proposed development. 


Action 5.8: Locate new development in or close to developed areas with adequate public services, where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. 


Action 5.9: Update development fee and assessment district requirements as appropriate to cover the true costs associated with development. 


Action 5.10: Utilize existing waste source reduction requirements, and continue to expand and improve composting and recycling options. 


Action 5.11: Increase emergency water supply capacity through cooperative tie-ins with neighboring suppliers.


Action 5.12: Apply new technologies to increase the efficiency of the wastewater treatment system. 

Action 5.13: Increase frequency of city street sweeping, and post schedules at key points within each neighborhood. 

Action 5.14: Develop a financing program for the replacement of failing corrugated metal storm drain pipes in the City. 

Action 5.15: Establish assessment districts or other financing mechanisms to address storm drain system deficiencies in areas where new development is anticipated and deficiencies exist. 

Action 5.16: Require new developments to incorporate stormwater treatment practices that allow percolation to the underlying aquifer and minimize offsite surface runoff utilizing methods such as pervious paving material for parking and other paved areas to facilitate rainwater percolation and retention/detention basins that limit runoff to pre-development levels. 

Action 5.17: Require stormwater treatment measures within new development to reduce the amount of urban pollutant runoff in the Ventura and Santa Clara Rivers and other watercourses. 

Action 5.18: Work with the Ventura Regional Sanitation District and the County to expand the capacity of existing landfills, site new landfills, and/or develop alternative means of disposal that will provide sufficient capacity for solid waste generated in the City.



"Leave all the afternoon for exercise and recreation, which are as necessary as reading. I will rather say more necessary because health is worth more than learning."

— Thomas Jefferson
3rd President of the United States
1801-1809

CITY OF
VENTURA

OUR ACTIVE COMMUNITY
ventura's general plan

6. OUR ACTIVE COMMUNITY

Our goal is to add to and enhance our parks and open spaces to provide enriching recreation options for the entire community.

Higher Standards

For many people, spending time outdoors and participating in recreational activities represent some of life’s most cherished rewards. Ventura’s superb public park, open space, and recreation system offers a myriad of ways to partake in these privileges. The city offers 34 developed parks, 45 miles of linear park and trail network, stellar beaches, specialized play and sports facilities and programs, communitywide events, senior and youth activities, and two 18-hole tournament class public golf courses. Figure 6-1 at the end of this chapter shows the locations of various public facilities in the city.

The City is committed to ensuring that its citizens have ample access to high quality spaces for leisure and active recreation. The City’s adopted standard of 10 acres per 1,000 residents has created far more park area than would be possible under the basic State level of 3 acres per 1,000, and also tops the more ambitious National Park and Recreation Association benchmarks for specific park types (see Table 6-1). The City continues to create customized facilities like the Community Park (approved by the voters pursuant to SOAR) to expand opportunities for local residents to enjoy healthy, active lifestyles.

Park Type	Standards	
	City of Ventura	National Park & Recreation Association
Neighborhood	2 acres	1.5 acres
Community	3 acres	2.5 acres
Citywide	5 acres	5 acres
Total	10 acres	9 acres

Sources: City of Ventura, www.nrpa.org.



City Parks and Open Space

The public park and open space system in Ventura includes neighborhood, community, citywide, and linear parks. As shown in Table 6-2, the City oversees nearly 600 acres of developed park facilities, plus the linear park network, which provides important connections among watersheds for both people and wildlife.



As the City continually strives to improve the quality of leisure and recreation opportunities for everyone in the community, it must address a number of challenges such as:

- modernizing existing facilities,
- finding appropriate land for new facilities,
- developing useful and enjoyable public spaces, such as plazas and mini-parks in urban settings,
- formalizing shared use arrangements for non-City facilities like school playfields,
- meeting increasing demand for athletic courts, fields and pools,
- provide opportunities for passive recreation, and
- providing services needed by youth, seniors, and residents with special needs.



Neighborhood Parks

Typically less than 8 acres each, these smaller parks primarily serve specific residential areas in the community. The 18 neighborhood parks in Ventura cover about 73 total acres. Any future development outside the current city limits will have to provide new neighborhood parks to serve the added population.

Community Parks

These parks are designed to offer specialized opportunities and facilities to residents of more than one neighborhood. Amenities in community parks may include formal athletic fields, courts, recreation buildings, preschool and youth play structures, group and individual picnic areas, and landscaped areas for informal activity or leisure.

Citywide Parks

These parks feature recreational opportunities that draw a wide range of age and interest groups from throughout the city. They offer a variety of attractive amenities, such as large open spaces, unique natural resources, interpretive centers, cultural amenities, group picnic areas, sports facilities, and equestrian, bicycling, and hiking trails. The Ventura Community Park also serves some citywide park functions and attracts visitors from outside the city with its high-quality playing fields and aquatic center.

Linear Parks

Ventura's unique linear park network intersperses trails and picnic areas among a mostly undeveloped web of barranca and riverbanks that provide valuable wildlife habitat and migration corridors. The linear parks also merge with a number of neighborhood and community parks, complementing developed recreation areas with natural riparian qualities. Extending trails through the linear park network can create additional opportunities for low-impact contact with nature, and in some cases even provide pleasant non-automobile commuting options.

Table 6-2 City Park Facilities

Park	Park Size (in acres)				
	Neighborhood Parks	Community Parks	Citywide Parks	Special Use Facilities	Total
Albinger Archaeological Museum				0.9	0.9
Arroyo Verde Park	2.0	23.0	104.3		129.3
Barranca Vista Park	8.7				8.7
Blanche Reynolds Park	3.4				3.4
Camino Real Park			38.2		38.2
Cemetery Memorial Park	7.1				7.1
Chumash Park	6.1				6.1
Downtown Mini-Park	0.4				0.4
Eastwood Park				0.7	0.7
Fritz Huntsinger Youth Sports Complex	4.3	14.0			18.3
Grant Park			107.3		107.3
Harry A. Lyon Park			10.7		10.7
Hobert Park	7.1				7.1
Juanamaria Park	5.0				5.0
Junipero Serra Park	2.7				2.7
Linear Park Network				46.0	46.0
Marina Park			15.3		15.3
Marion Cannon Park	5.0				5.0
Mission Park	1.5				1.5
Ocean Avenue Park	1.3				1.3
Olivas Adobe Historical Park				22.5	22.5
Ortega Adobe Historic Residence				0.3	0.3
Plaza Park	3.7				3.7
Promenade Park	1.0				1.0
Seaside Wilderness Park ^{1, 2}				24.0	24.0
Surfers Point at Seaside Park ¹				3.4	3.4
Ventura Community Park		100.0			100.0
Westpark	1.5	5.8			7.3
Total	60.8	142.7	275.8	97.8	577.1

Sources: City of Ventura, 2004. Note: several parks serve functions in more than one category.
¹ Acreage varies with ocean high levels.
² Acreage varies with fluctuations in Ventura River level.

As with most parks in the city, resources for linear park system improvements typically come through conditions placed on adjacent development. City regulations establish standards for park width, landscaping, fencing, lighting, and tree rows that apply specifically along barrancas, freeways, rivers, the shoreline, harbor, hillsides, and utility rights-of-way.



Recreation Programs


The City operates four neighborhood centers where recreation programs and senior services are available: the Ventura Avenue Adult Center, Senior Recreation Center, Barranca Vista Center, and Westpark Community Center. The City also offers a wide range of sports programs, including youth and adult sports programs, classes, aquatics, and corporate games. Other City-sponsored recreational activities include arts and environmental education, community gardening, recreation programs for special needs residents, and after-school activities and summer camps.


A variety of other recreation opportunities are available in Ventura in addition to City programs. Foremost among these are all of the activities possible at State beaches and developed waterfront areas. Other local non-City facilities include the County Fairgrounds and local golf courses. In addition, joint-use agreements allow city residents to use sports fields, pools, and gymnasiums during certain times at public schools and Ventura College.


The policies and actions in this chapter seek to further expand local park and recreation choices by:


- identifying sites for new parks,
- increasing public access to open space, including via linear park trails,
- collaborating with schools and other local agencies and organizations,
- ensuring universal and equal access to parks and recreation facilities, and
- allowing appropriate revenue-generating activities at City parks.


Policy 6A: Expand the park and trail network to link shoreline, hillside, and watershed areas.


Action 6.1: Develop new neighborhood parks, pocket parks, and community gardens as feasible and appropriate to meet citizen needs, and require them in new development. 

Action 6.2: Require higher density development to provide pocket parks, tot lots, seating plazas, and other aesthetic green spaces. 

Action 6.3: Work with the County to plan and develop trails that link the City with surrounding open space and natural areas, and require development projects to include trails when appropriate. 


Action 6.4: Request Flood Control District approval of public access along unchannelized watercourses for hiking. 

Action 6.5: Seek landowner permission to allow public access on properties adjacent to open space where needed to connect trails. 

Action 6.6: Update plans for and complete the linear park system as resources allow. 

Action 6.7: Work with the County of Ventura to initiate efforts to create public trails in the hillsides.


Action 6.8: Update and require periodic reviews of the Park and Recreation Workbook as necessary to reflect City objectives and community needs.

Action 6.9: Require dedication of land identified as part of the City's Linear Park System in conjunction with new development. 

Action 6.10: Evaluate and incorporate, as feasible, linear park segments in the General Bikeway Plan.

Action 6.11: Update standards for citywide public parks and open space to include an expanded menu of shared park types, and identify locations and potential funding sources for acquiring new facilities in existing neighborhoods.

Action 6.12: Update and carry out the Grant Park Master Plan.

Action 6.13: Foster the partnership between the City and Fair Board to improve Seaside Park. 

Policy 6B: Ensure equal access to facilities and programs.


Action 6.14: Improve facilities at City parks to respond to the requirements of special needs groups.


Action 6.15: Adjust and subsidize fees to ensure that all residents have the opportunity to participate in recreation programs.

Action 6.16: Update the project fee schedule as necessary to ensure that development provides its fair share of park and recreation facilities.

Policy 6C: Provide additional gathering spaces and recreation opportunities.

Action 6.17: Update and create new agreements for joint use of school and City recreational and park facilities.

Action 6.18: Offer programs that highlight natural assets, such as surfing, sailing, kayaking, climbing, gardening, and bird watching. 

Action 6.19: Provide additional boating and swimming access as feasible. 

Action 6.20: Earmark funds for adequate maintenance and rehabilitation of existing skatepark facilities, and identify locations and funding for new development of advanced level skatepark facilities.

Policy 6D: Increase funding and support for park and recreation programs.

Action 6.21: Promote the use of City facilities for special events, such as festivals, tournaments, and races.

Action 6.22: Enter into concession or service agreements where appropriate to supplement City services.



- Police Station
- Fire Stations
- Hospitals
- Government Center
- Elementary School
- Middle School
- High School
- Community College
- Library
- Recreational Facilities
- Linear Park
- Parks
- Golf Courses
- City Limits
- Planning Area

Figure 6-1
Public Facilities

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.



"A city, like a living thing, is a united and continuous whole."

— Plutarch
ca. 50-120 AD, author of *Moralia*

7. OUR HEALTHY AND SAFE COMMUNITY

Our goal is to build effective community partnerships that protect and improve the social well-being and security of all our citizens.

Community Wellness

Keeping the small town feel of Ventura depends on working together as a community to look out for the well being of all residents, especially those most at risk. Community wellness requires comprehensive preventative care, as well as careful preparation for and response to dangers within the built environment and to risks posed by natural processes (see Figure 7-1).

Adequate shelter, sufficient medical services, walkable neighborhoods, and proper nutrition create an essential foundation for a healthy community. Reducing as much as possible the threat to people and property from earthquakes, landslides, floods, and fires further enhance the collective wellness of the city. In addition, a healthy Ventura community requires thorough protection from crime, and freedom from pollution, unwanted noise, and the threat of hazardous materials.

Alquist-Priolo designation requires a geologic investigation prior to the approval of a development permit to determine if a specific site within the zone is threatened by surface displacement from future fault movement.

Geologic and Flood Hazards

Ventura lies in an active geologic region and is therefore subject to a variety of seismic hazards, including ground shaking, liquefaction, and slope failure. State law requires the City to regulate development in mapped seismic hazard zones. Major faults in the city include the Ventura-Foothill (a State-designated Alquist-Priolo Earthquake Fault Zone), Oak Ridge, McGrath, Red Mountain and Country Club Faults. Areas closest to these faults are most likely to experience ground shaking or rupture in the event of an earthquake. Liquefaction during an earthquake is most likely to occur in areas with loose, granular soils where the water table lies within 50 feet of the surface. As the soil liquefies, buildings and other objects may tilt or sink.

Hillside stability varies based on slope, soil, rock type and groundwater depth. The hills north of Poli Street/Foothill Road have experienced many historic landslides and are prone to future movement. The City Hillside Management Program limits development in the area to minimize dangers from landsliding, erosion, flooding, and fire, and to retain natural and scenic character.

The Federal Emergency Management Agency regulates development along watercourses based on the likelihood of flooding: the basic benchmark – the 100-year flood – has a one percent chance of occurring in any given year. Although the mapped 100-year flood hazard areas for local rivers and barrancas are fairly limited in size, the largest recorded flood events along the Ventura

and Santa Clara Rivers, both following heavy rains in 1969, exceeded the 100-year flood zone. The policies and actions in this Chapter intend to limit harm from geologic and flood events by requiring detailed risk analyses and mitigation prior to development of sites in hazard prone areas.

Fire and Emergency Response

The Ventura Fire Department responds to fire, medical, and disaster calls from six stations in the city. The Department's goal is to reach the scene within 4 minutes 90% of the time. The Department has a reciprocal agreement with the County Fire Protection District to ensure that Ventura residents receive the swiftest service possible. The Department also has a responsibility to provide disaster preparedness for the City. Particular fire department concerns in the City include:



- the need for reliable and sustainable source of fire service revenue,
- lengthy response times to areas farthest from existing stations (See Figure 7-2),
- firefighter and support staffing levels that are far below the .98 firefighter per 1,000 population averages of other municipal fire departments with comparable city size, age, and population,
- the threat of wildland fire entering urban area, and
- the lack of fire protection systems in older structures.

The policies and actions in this Chapter aim to optimize firefighting and emergency response capabilities through oversight of new development, improved facilities, and added staff.



Police Protection

Ventura Police response to crimes in progress or alarm soundings averages less than six minutes, and less than sixteen minutes for most other calls. While the local crime rate is slightly higher than State average, the Department hopes to better engage the community in policing efforts to lower crime levels. As part of a Strategic Planning Process, the Department has established the following goals:

- reduce crime and the fear of crime
- improve the quality of life in neighborhoods
- enhance community and police partnerships
- develop personnel
- continued accountability

One-time grant funding has helped add officers dedicated to community crime prevention, gang control, and youth mentoring programs. As these grants end the City must face the challenge of funding these services. Actions in this Chapter seek to improve the full range of police services to maximize community safety by increasing staffing, outreach efforts, and public access to police services.

Noise

Noise is generally defined as unwanted sound. Its effects can range from annoyance to nuisances to health problems. State law requires the City to identify and address noise sources and establish projected noise levels for roadways, railroads, industrial uses, and other significant generators. The Noise Contours map (Figure 7-3) is used to help guide land use in a way that minimizes exposure of residents to excessive noise.

Vehicle traffic is by far the greatest source of noise affecting Ventura residents. Other sources include the Seaside Park raceway, the Grant Park shooting range, and railroad, commercial, and industrial activity. Homes, schools, hotels, and hospitals are considered sensitive receptors where excessive noise can interfere with normal activities.

Noise intensity is customarily measured on the decibel scale, an index of loudness. Sounds as faint as 10 decibels (dB) are barely audible, while noise over 120 dB can be painful or damaging to hearing (Table 7-1 shows some typical noise levels). A sound 10 dB higher than another is perceived as about twice as loud. A 5 dB change is readily noticeable, but a 3 dB difference is barely perceptible.

As shown in Table 7-2, normally acceptable outdoor noise in residential areas may reach 65 decibels. The Ldn label in the table indicates that sound is averaged over time to account for the fact that sources like traffic or aircraft may cause fluctuations of more than 20 dB over a few

seconds. CNEL refers to the fact that 5 dB is added to noise after 7 p.m. and 10 dB added from 10 p.m. to 7 a.m., when quieter conditions make sound more noticeable.

The State Building Code requires an acoustical study whenever outdoor noise would exceed 60 decibels at a proposed duplex, multifamily residence, hotel, motel or other attached dwelling. The study must show that the proposed project design would result in interior noise levels of 45 dB or less.

Although future increases in traffic are not expected to produce a significant change in perceived noise levels, other specific sound generators have been identified as problems in the community. The policies and actions in this chapter look to reduce the exposure of people in Ventura to these noise sources.

Table 7-1. Typical Noise Levels

Type of Noise or Environment	Decibels
Recording Studio	20
Soft Whisper; Quiet Bedroom	30
Busy Open-plan Office	55
Normal Conversation	60-65
Automobile at 20 mph 25 ft. away	65
Vacuum Cleaner 10 ft. away	70
Dump Truck at 50 mph 50 ft. away	90
Train Horn 100 ft. away	105
Claw Hammer; Jet Takeoff 200 ft. away	120
Shotgun at shooter's ear	140

**Table 7-2
Acceptable Noise Levels**

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE Ldn or CNEL, dBA						
	55	60	65	70	75	80	85
RESIDENTIAL - LOW DENSITY SINGLE FAMILY, DUPLEX, MOBILE HOMES	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
RESIDENTIAL - MULTI-FAMILY	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
TRANSIENT LODGING - MOTELS, HOTELS	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
SCHOOLS, LIBRARIES, CHURCHES, HOSPITALS, NURSING HOMES	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
AUDITORIUMS, CONCERT HALLS, AMPHITHEATRES	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
SPORTS ARENA, OUTDOOR SPECTATOR SPORTS	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
PLAYGROUNDS, NEIGHBORHOOD PARKS	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
OFFICE BUILDINGS, BUSINESS COMMERCIAL AND PROFESSIONAL	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]
INDUSTRIAL, MANUFACTURING, UTILITIES, AGRICULTURE	[Yellow bar from 55 to 60]		[Cyan bar from 60 to 70]		[Dark Cyan bar from 70 to 75]		[Black bar from 75 to 80]

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: General Plan Guidelines, California Office of Planning and Research

Hazardous Materials

Hazardous materials include medical and industrial wastes, pesticides, herbicides, radioactive materials, and combustible fuels. Improper use, storage, transport, or disposal of these materials may result in harm to humans, surface or ground water degradation, air pollution, fire, or explosion. Most of the several hundred facilities in Ventura that use or store hazardous materials lie along Ventura Avenue or in the Arundell industrial district.

The Fire Department maintains a team specially trained and equipped to respond to hazardous materials emergencies. Additional equipment and personnel for large-scale hazardous materials incidents is available from the County Fire Protection District, the City of Oxnard, and the U.S. Naval Construction Battalion Center in Port Hueneme.

The Westside and North Avenue neighborhoods include about 30 brownfields: sites that may possess contaminated soils but also have potential for reuse. Cleanup of these sites will make them more attractive for redevelopment that can improve the neighborhoods and generate employment and tax revenue. The City has established a Brownfield Assessment Demonstration Pilot Program to fund site assessments and initiate remediation. The policies and actions in this chapter intend to minimize the risk of adverse health effects of hazardous materials by regulating their location and seeking funding for cleanup of brownfield sites to encourage their reuse.

Policy 7A: Encourage wellness through care and prevention.

Action 7.1: Work with interested parties to identify appropriate locations for assisted-living, hospice, and other care-provision facilities.

Action 7.2: Provide technical assistance to local organizations that deliver health and social services to seniors, homeless persons, low-income citizens, and other groups with special needs.


Action 7.3: Participate in school and agency programs to:


- provide healthy meals,
- combat tobacco, alcohol, and drug dependency,
- distribute city park and recreation materials through the schools, and
- distribute information about the benefits of proper nutrition and exercise.

Action 7.4: Enhance or create ordinances which increase control over ABC licensed premises.


Action 7.5: Investigate the creation of new land use fees to enhance funding of alcohol related enforcement, prevention and training efforts.

Policy 7B: Minimize risks from geologic and flood hazards.


Action 7.6: Adopt updated editions of the California Construction Codes and International Codes as published by the State of California and the International Code Council respectively. 


Action 7.7: Require project proponents to perform geotechnical evaluations and implement mitigation prior to development of any site: 

- with slopes greater than 10 percent or that otherwise have potential for landsliding,
- along bluffs, dunes, beaches, or other coastal features
- in an Alquist-Priolo earthquake fault zone or within 100 feet of an identified active or potentially active fault,
- in areas mapped as having moderate or high risk of liquefaction, subsidence, or expansive soils,
- in areas within 100-year flood zones, in conformance with all Federal Emergency Management Agency regulations.


Action 7.8: To the extent feasible, require new critical facilities (hospital, police, fire, and emergency service facilities, and utility “lifeline” facilities) to be located outside of fault and tsunami hazard zones, and require critical facilities within hazard zones to incorporate construction principles that resist damage and facilitate evacuation on short notice. 


Action 7.9: Maintain and implement the Standardized Emergency Management System (SEMS) Multihazard Functional Response Plan.

Action 7.10: Require proponents of any new developments within the 100-year floodplain to implement measures, as identified in the Flood Plain Ordinance, to protect structures from 100-year flood hazards (e.g., by raising the finished floor elevation outside the floodplain). 

Action 7.11: Prohibit grading for vehicle access and parking or operation of vehicles within any floodway. 

Policy 7C: Optimize firefighting and emergency response capabilities.

Action 7.12: Refer development plans to the Fire Department to assure adequacy of structural fire protection, access for firefighting, water supply, and vegetation clearance. 

Action 7.13: Resolve extended response time problems by: 

- adding a fire station at the Pierpont/Harbor area,
- relocating Fire Station #4 to the Community Park site,
- increasing firefighting and support staff resources,
- reviewing and conditioning annexations and development applications, and
- require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.

Action 7.14: Educate and reinforce City staff understanding of the Standardized Emergency Management System for the State of California.


Policy 7D: Improve community safety through enhanced police service.

Action 7.15: Increase public access to police services by:

- increasing police staffing to coincide with increasing population, development, and calls for service,
- increasing community participation by creating a Volunteers in Policing Program, and,
- require the funding of new services from fees, assessments, or taxes as new subdivisions are developed.


Action 7.16: Provide education about specific safety concerns such as gang activity, senior-targeted fraud, and property crimes.

Action: 7.17: Establish a nexus between police department resources and increased demands associated with new development.


Action 7.18: Continue to operate the Downtown police storefront. 


Action 7.19: Expand Police Department headquarters as necessary to accommodate staff growth.


Policy 7D: Minimize exposure to air pollution and hazardous substances.

Action 7.20: Require air pollution point sources to be located at safe distances from sensitive sites such as homes and schools. 

Action 7.21: Require analysis of individual development projects in accordance with the most current version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines and, when significant impacts are

identified, require implementation of air pollutant mitigation measures determined to be feasible at the time of project approval. 

Action 7.22: In accordance with Ordinance 93-37, require payment of fees to fund regional transportation demand management (TDM) programs for all projects generating emissions in excess of Ventura County Air Pollution Control District adopted levels. 


Action 7.23: Require individual contractors to implement the construction mitigation measures included in the most recent version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines. 

Action 7.24: Only approve projects involving sensitive land uses (such as residences, schools, daycare centers, playgrounds, medical facilities) within or adjacent to industrially designated areas if an analysis provided by the proponent demonstrates that the health risk will not be significant.


Action 7.25: Adopt new development code provisions that ensure uses in mixed-use projects do not pose significant health effects.


Action 7.26: Seek funding for cleanup of sites within the Brownfield Assessment Demonstration Pilot Program and other contaminated areas in West Ventura.


Action 7.27: Require proponents of projects on or immediately adjacent to lands in industrial,

commercial, or agricultural use to perform soil and groundwater contamination assessments in accordance with American Society for Testing and Materials standards, and if contamination exceeds regulatory action levels, require the proponent to undertake remediation procedures prior to grading and development under the supervision of the County Environmental Health Division, County Department of Toxic Substances Control, or Regional Water Quality Control Board (depending upon the nature of any identified contamination). 


Action 7.28: Educate residents and businesses about how to reduce or eliminate the use of hazardous materials, including by using safer non-toxic equivalents.

Action 7.29: Require non-agricultural development to provide all necessary buffers, as determined by the Agriculture Commissioner's Office, from agricultural operations to minimize the potential for pesticide drift. 


Action 7.30: Require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport, and to notify the appropriate City, County, State and Federal agencies in the event of a violation. 


Action 7.31: Work toward voluntary reduction or elimination of aerial and synthetic chemical application in cooperation with local agricultural interests and the Ventura County agricultural commissioner. 


Policy 7E: Minimize the harmful effects of noise.


Action 7.32: Require acoustical analyses for new residential developments within the mapped 60 decibel (dBA) CNEL contour, or within any area designated for commercial or industrial use, and require mitigation necessary to ensure that: 


- Exterior noise in exterior spaces of new residences and other noise sensitive uses that are used for recreation (such as patios and gardens) does not exceed 65 dBA CNEL, and
- Interior noise in habitable rooms of new residences does not exceed 45 dBA CNEL with all windows closed.


Action 7.33: As funding becomes available, construct sound walls along U.S. 101, SR 126, and SR 33 in areas where existing residences are exposed to exterior noise exceeding 65 dBA CNEL. 

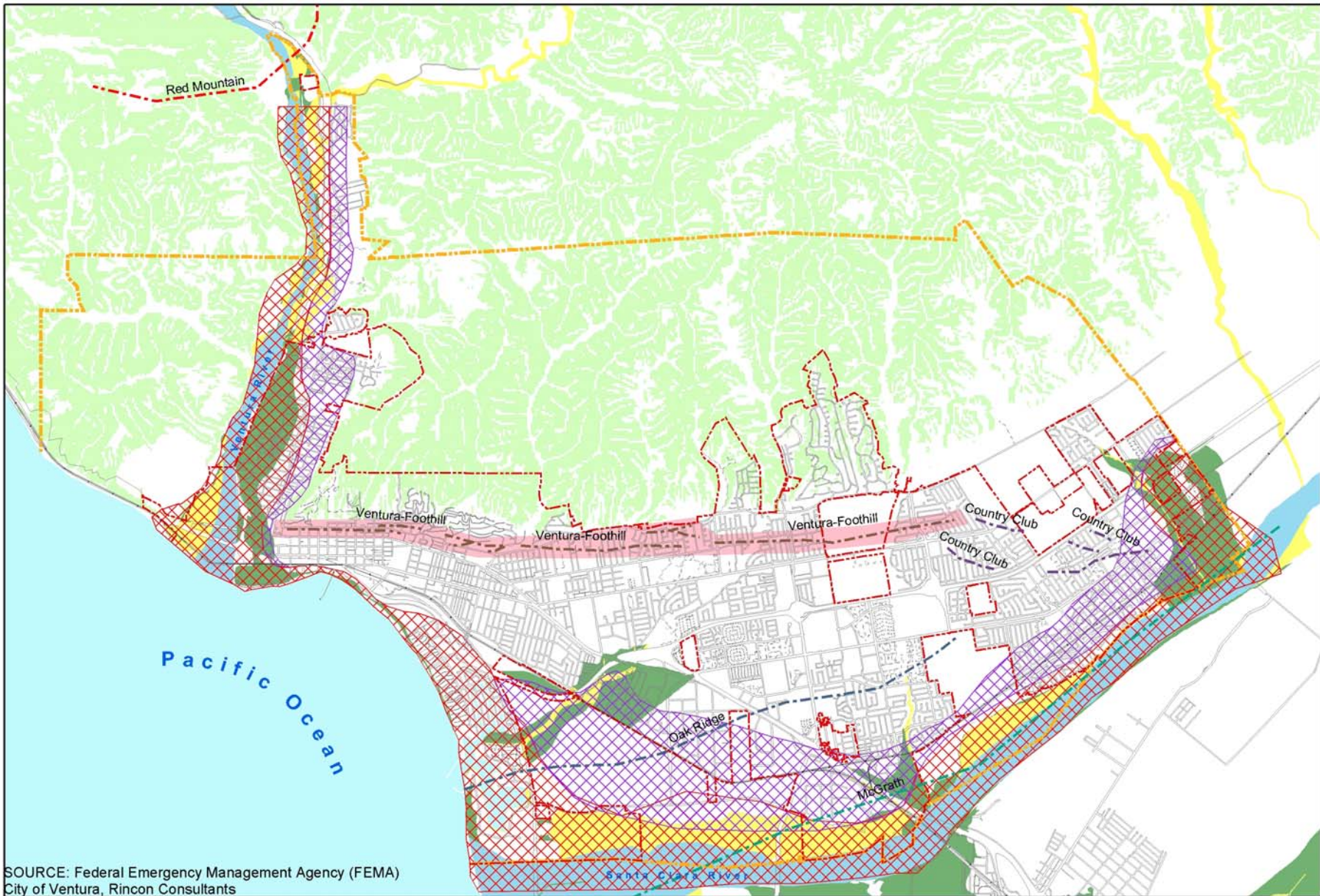
Action 7.34: Request that sound levels associated with concerts at the County Fairgrounds be limited to 70 dBA at the eastern edge of that property. 

Action 7.35: Request the termination of auto racing at the County fairgrounds. 

Action 7.36: Amend the noise ordinance to restrict leaf blowing, amplified music, trash collection, and other activities that generate complaints. 

Action 7.37: Use rubberized asphalt or other sound reducing material for paving and re-paving of City streets. 

Action 7.38: Update the Noise Ordinance to provide standards for residential projects and residential components of mixed-use projects within commercial and industrial districts. 



SOURCE: Federal Emergency Management Agency (FEMA)
 City of Ventura, Rincon Consultants

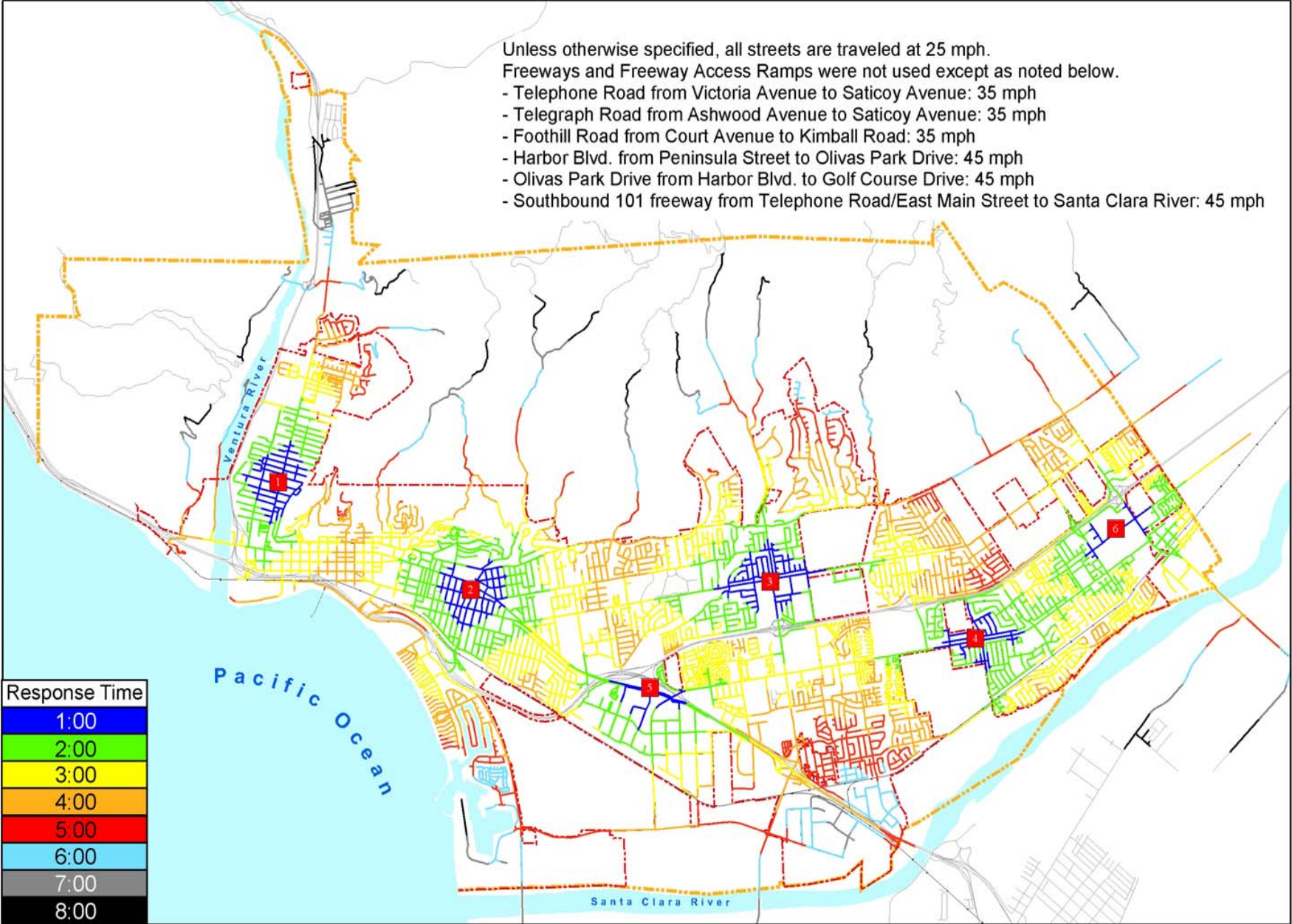
Figure 7-1
 Natural Hazards

- | | | | |
|----------------------------------|---|--------------------------------------|---------------------------------------|
| FEMA Flood Hazard Zones | Liquefaction Zones | Major Fault Systems | Other |
| Yellow box: A (100-yr floodzone) | Red cross-hatch box: High Water Table | Dashed blue line: Country Club | Dashed red line: City Limits |
| Green box: B (500-yr floodzone) | Purple cross-hatch box: Low Water Table | Dashed green line: McGrath | Dashed orange line: Planning Boundary |
| Blue box: Floodway | | Dashed black line: Oak Ridge | Light green box: >30% Slope |
| | | Dashed red line: Red Mountain | |
| | | Dashed orange line: Ventura-Foothill | |

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.

Unless otherwise specified, all streets are traveled at 25 mph.
 Freeways and Freeway Access Ramps were not used except as noted below.

- Telephone Road from Victoria Avenue to Saticoy Avenue: 35 mph
- Telegraph Road from Ashwood Avenue to Saticoy Avenue: 35 mph
- Foothill Road from Court Avenue to Kimball Road: 35 mph
- Harbor Blvd. from Peninsula Street to Olivas Park Drive: 45 mph
- Olivas Park Drive from Harbor Blvd. to Golf Course Drive: 45 mph
- Southbound 101 freeway from Telephone Road/East Main Street to Santa Clara River: 45 mph



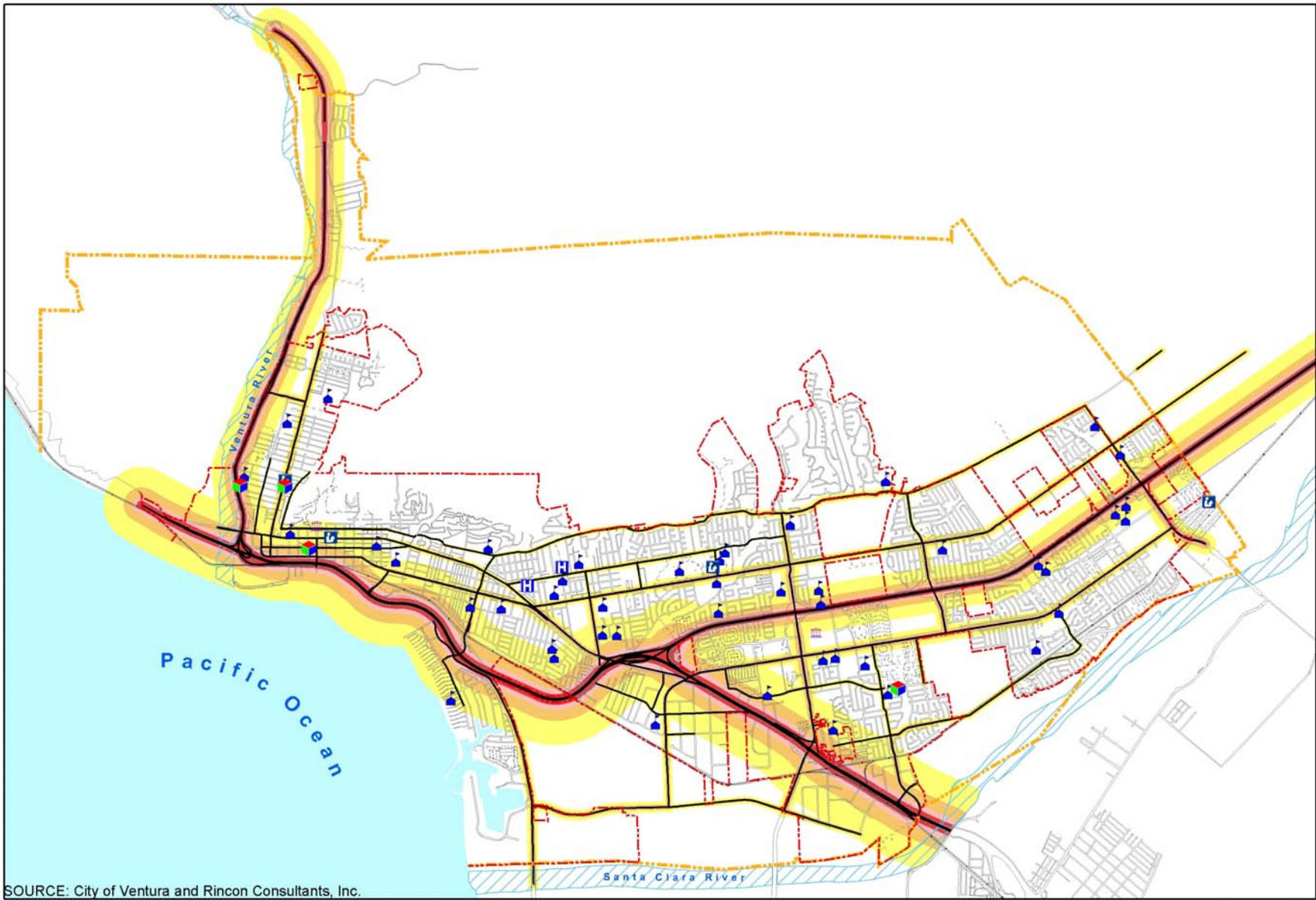
Response Time	
1:00	Blue
2:00	Green
3:00	Yellow
4:00	Orange
5:00	Red
6:00	Light Blue
7:00	Grey
8:00	Dark Grey

SOURCE: City of Ventura

- - - City Limits
- - - Planning Boundary
- Existing Fire Stations 1-6

Figure 7-2
Fire Response Time

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.



SOURCE: City of Ventura and Rincon Consultants, Inc.

Figure 7-3
Noise Contours

- Noise Contours
- 60dBA
 - 65dBA
 - 70dBA
 - 75dBA
 - Countoured Streets (Over 5000 ADT)
 - Recreation Centers
 - Hospitals
 - Schools
 - Library
 - Government Centers
 - City Limits
 - Planning Boundary

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.



"A vigorous culture capable of making corrective, stabilizing changes depends heavily on its educated people, and especially upon their critical capacities and depth of understanding."

— Jane Jacobs
Dark Age Ahead

8. OUR EDUCATED COMMUNITY

Our goal is to encourage academic excellence and life-long learning resources to promote a highly-educated citizenry.

Lifelong Learning

Education is more important than ever before as the foundation for the vitality of informed community participation in Ventura. The *Ventura Vision* calls for the city to be “a community dedicated to educational excellence and an emphasis on lifelong learning.” A truly educated community is key to achieving most of the goals in this General Plan because:

- In the 21st Century information economy a highly educated and skilled workforce is vital to community prosperity,
- Education and the institutions that provide it are critical to achieving environmental and cultural leadership, and
- An educated and informed citizenry is essential to sound planning and decision-making.

While Ventura has a comparatively well-educated population (see Table 8-1), the high costs of doing business and finding housing in the city will force even greater emphasis on businesses and jobs that require ever-higher levels of skill. The need and desire for lifelong learning will require relentlessly expanding educational resources and access to them in the years ahead. Plus, the assets that strong educational institutions provide

are necessary to bring a rich cultural life to the community as well.

Ventura can build on an impressive base of well-regarded public schools, array of private alternatives, major community college, satellite university campuses, expanding media-training institute, law school, and three branch libraries, among other educational resources. The key to becoming renowned as a local “learning community” lies in creating stronger linkages between these existing resources and integrating them into the physical and social landscape of our community.

Leveraging our Assets

Excellence in public education is the top priority for the Ventura Unified School District (whose boundaries extend beyond the city). In Ventura, the District manages 16 elementary schools, four middle schools, three high schools, and one continuation high school, plus independent study and adult education programs.

In addition to District schools, the city also is home to more than a dozen private schools (see Table 8-2), serving 13 percent of elementary and high school students living in Ventura, according to the 2000 Census. Figure 6-1 shows school locations in the city.

**Table 8-1
Education Level**

Schooling Completed	Percent of Population
High School	21.7
Some College	28.2
Associate Degree only	9.6
Bachelors Degree only	15.4
Graduate Degree	9.3
High School Diploma & Above	84.1
Associate Degree & Above	34.2

Source: 2001 Ventura County Economic Outlook

**Table 8-2
Private Schools**

School	Grades
First Baptist Day	K-5
St. Augustine Academy	4-12
Sacred Heart	K-8
Ventura Missionary Christian Day	K-8
College Heights Christian	K-8
St. Bonaventure High School	9-12
Holy Cross	K-8
Our Lady of The Assumption	K-8
St. Paul's Parish Day	K-8
Grace Lutheran Christian Day	K-6
Jameson	K-12
Ventura County Christian	K-12
Hill Road Montessori Preschool	K-3
Wells Road Baptist Academy	K-12

Most public schools operate at or near capacity (see Table 8-3), and continuing growth in Ventura requires the District to search for sites for new schools (see Table 8-4). Developers of new projects are required to dedicate land or pay fees for school purposes, and any major annexation of land outside the city is likely to have to provide a school site to serve new resident children. Still, the scarcity and cost of suitable sites means that greater thought will need to be given to shared facility use and other non-traditional approaches to expanding capacity.

Table 8-3. Ventura Unified School District Enrollment

Schools – No.	Students	Capacity
Elementary – 17	8,093	95%
Middle – 4	4,304	93%
High - 3	4,820	85%
TOTAL	17,217	92%

Source: Ventura Unified School District, 2003

Table 8-4. Public School Demand

School Type	Students/School	School Needs	Acres Needed ¹
Elementary	600	4	40
Middle	1,000	1	20
High	2,000	1	40
TOTAL		6	100

1. Assumes 10 acres for elementary schools, 20 acres for middle schools, and 40 acres for high schools.

Source: Ventura Unified School District, 2003

Ventura is increasingly becoming recognized as a center for higher education. Ventura College is a highly respected two-year school with more than 12,000 students, providing everything from a

distinguished transfer opportunity for the University of California to certificates and associates degrees in important fields such as manufacturing and nursing. Students also can obtain four-year degrees in certain fields at the UCSB Ventura Center. Brooks Institute of Photography provides education in photojournalism, filmmaking, and related fields, providing the city with a significant cultural asset. Residents can earn graduate degrees in law, public policy, and education at the Ventura campuses of California Lutheran University, Azusa Pacific University, the Ventura College of Law, and the Southern California Institute of Law. The opening of the nearby California State University Channel Islands has drawn many students and faculty to live in Ventura, especially those in creative fields.

Combined, these institutions of higher learning provide Ventura with tremendous educational assets. Through the policies and actions in this chapter, the City is committed to nurturing these institutions, creating synergy among them, and instilling both cultural and economic opportunities.

Libraries of the Future

The County public library system in Ventura currently operates three branch libraries that serve about 200,000 visits annually (see Table 8-5). But in a digital age where more and more content is available online, the traditional book borrowing function is becoming outmoded. Library administrators and staff, the City’s Library Advisory Commission, and patrons have all pointed to needs for adding library space, extending operating hours, and updating and expanding learning resources.

At a more fundamental level, the ideas of what constitutes a library and how it fits the patterns of a learning community need to be reexamined. Integration with school libraries, including the Ventura College Learning Center, is a top priority for this reevaluation, as embodied in the policies and actions in this chapter.

City and Community Programs

Traditional classroom settings alone cannot provide the complete set of educational skills and experience needed by people of all ages. The City provides a variety of learning opportunities, including youth and adult art programs, environmental education, adaptive recreation programs, youth after-school activities, and summer camps. Community organizations also provide a range of classes and experiences, including tours, museums, lectures, and hands-on activities. Expanding venues for such activities and promoting participation in them are key challenges.

Policies and actions in this chapter seek to expand lifelong learning opportunities for everyone in the community.

Table 8-5. Local Libraries

Library	Card-Holders	2003-2004 Patronage	Hours Open Weekly	Facility Size (sq. ft.)
E. P. Foster	48,195	366,134	54	31,000
H. P. Wright			39	12,000
Avenue			25	3,000

Source: Ventura County Library Administration, 2005

Policy 8A: Reach out to institutions and educators to advance lifelong learning.

Action 8.1: Work closely with schools, colleges, and libraries to provide input into site and facility planning.


Action 8.2: Organize a regional education summit to generate interest in and ideas about learning opportunities.


Action 8.3: Adopt joint-use agreements with libraries, schools, and other institutions to maximize use of educational facilities.

Action 8.4: Distribute information about local educational programs.

Policy 8B: Increase the availability and diversity of learning resources.

Action 8.5: Install infrastructure for wireless technology and computer networking in City facilities.

Action 8.6: Establish educational centers at City parks. 

Action 8.7: Work with the State Parks Department to establish a marine learning center at the Harbor. 

Action 8.8: Work with the Ventura Unified School District to ensure that school facilities can be provided to serve new development.

Policy 8C: Reshape public libraries as 21st Century learning centers.

Action 8.9: Complete a new analysis of community needs, rethinking the role of public libraries in light of the ongoing advances in information technology and the changing ways that individuals and families seek out information and life-long learning opportunities.

Action 8.10: Reassess the formal and informal relationships between our current three branch public libraries and school libraries – including the new Ventura College Learning Resource Center – as well as joint use of facilities for a broader range or compatible public, cultural, and educational uses.

Action 8.11: Develop a Master Plan for Facilities, Programs, and Partnerships to create an accessible, robust, and vibrant library for the 21st Century system, taking into consideration that circulation of books is no longer the dominant function but will continue to be an important part of a linked network of learning centers.

Action 8.12: Develop formal partnerships, funding, capital strategies, and joint use agreements to implement the new libraries Master Plan.



"Whatever you can do, or dream you can,
begin it. Boldness has genius, power and
magic in it."

— Johann Wolfgang von Goethe

CITY OF
VENTURA

OUR CREATIVE COMMUNITY
ventura's general plan

9. OUR CREATIVE COMMUNITY

Our goal is to become a vibrant cultural center by weaving the arts and local heritage into everyday life.

A Rich Foundation

Local history, artistic expression, and cultural diversity play vital roles in making Ventura a vibrant and interesting place. The heritage of Chumash civilization, which developed over the course of about 9,000 years, and influences of Mexican settlement establish a rich tableau for the modern development of the city. Art in museums, galleries, and public places, as well as space and energy devoted to the creation of artwork and crafts connect the community in complex and fundamental ways. Cultural expression in the form of festivals and informal gatherings provide additional and essential bonds that strengthen the community.

Historic Context

Abundant food and water, temperate climate, and ample material for tool manufacturing attracted early local inhabitants. Chumash peoples were living in a string of coastal villages when Spanish explorers arrived in 1542. Shisholop village (at the south end of present-day Figueroa Street) was a thriving Chumash provincial capital at the time of the Spanish arrival. Other Chumash villages and burial sites have been found in what are now the North Avenue and Saticoy neighborhoods, as well as north of the Ventura River. Mexican settlers began to arrive in earnest

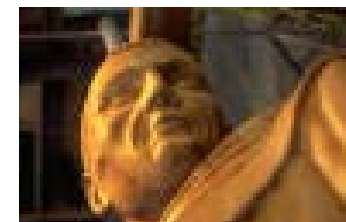
**Table 9-1
Key Historical and Cultural Sites**

Site	Description
Albinger Museum	Artifacts spanning 3,500 years excavated from a site next to the Mission are on display in this former adobe at 113 East Main Street.
Downtown	Downtown Ventura is home to a variety of 19 th Century buildings that house restaurants and retail establishments in a small-town setting with a variety of cultural amenities.
Olivas Adobe Park	Completed in 1849 for the Raymundo ranching family, the well-preserved hacienda at 4200 Olivas Park Road is utilized as concert and banquet facility.
Ortega Adobe	Built in 1857, the adobe is only remaining example of the middle class homes that once lined West Main Street. The building has since been used as a police station and restaurant.
San Buenaventura Mission	Built in 1782, the Mission anchors the western part of the downtown area and is still used for regular Catholic services.
Santa Gertrudis Chapel	The Chapel was originally completed around 1809. The site is located along Highway 33 near Foster Park.
San Miguel Chapel	The site is located at Thompson Boulevard and Palm Street. The original chapel dated back to the early 1800s.
Ventura County Museum of History and Art	The museum at 100 East Main Street houses exhibits featuring local artists and historical artifacts. Expansion plans include a 200-seat auditorium and a gallery with touring exhibits.

Source: City of Ventura

after the founding of Mission San Buenaventura in 1782.

More than 90 historic sites have been identified in the planning area (which includes areas outside the city). Notable ones include the Mission, the Ortega and Olivas Adobes, and the locations of the Santa Gertrudis and San Miguel Chapels (See Table 9-1 and Figure 9-1). Many of the existing buildings in Ventura were constructed between 1880 and 1940, a period that coincided with development of the railroads and harbor. City



Hall (formerly the County Courthouse) and the Mission aqueduct are listed as landmarks on the National Register of Historic Places, and structures in the following historic districts are protected by City architectural controls:

- the grounds within the Mission District,
- the Mitchell block (south of Thompson Boulevard between Chestnut and Fir Streets),
- the Selwyn Shaw block (north of Poli Street between Ann and Hemlock Streets), and
- the Simpson Tract (west of Ventura Avenue between Simpson and Prospect Streets).



Arts and Culture

When the City first adopted a Community Cultural Plan in 1992, Ventura’s creative community was in its fledgling stage. Few of the now-thriving professional art and cultural organizations existed (see Table 9-2). A burgeoning visual artist community had made the city its home, but was fairly invisible except to the more intrepid arts supporters and collectors.

Since completion of that plan, the City has either implemented or initiated all of its recommendations, which were developed through extensive public involvement. As a result, the growth of the cultural community has been extraordinary. Now Ventura is home to a wealth of active artists and arts organizations. From 1994-2004, the budgets of arts organizations in Downtown Ventura alone increased from \$500,000 to more than \$4 million.

Ventura also now has a complement of major cultural institutions unique for a city of its size, including the Ventura Music Festival, the Rubicon Theatre Company, the Ventura County Museum of History and Art, and Focus on the Masters. The individual artists who live and work in the city continue to comprise a major part of its cultural fabric, and are highlighted in popular cultural events like the Downtown ArtWalks.

A strong focus of the City’s general is to build the arts infrastructure of Ventura. A strong cultural infrastructure is the foundation of a healthy arts

ecosystem: this includes *places* (for arts creation, sales, exhibition, performance, rehearsal, living), *people* (artists, audiences, patrons), and *organizations* (production, support, and presentation).

In keeping with the community’s respect for its roots, the Ventura arts scene remains authentic, no small feat in today’s competitive environment. While many communities focus on importing Broadway shows or big-name art exhibits to increase their profile, Ventura successfully continues to highlight local artists, architecture, culture, history, and the environment – the unique threads that together comprise the rich tapestry of the Ventura community. Policies and actions in this chapter call for continuing to build the cultural foundations of the community by involving everyone in the production, support, and presentation of art and cultural programs, installing art in public places, providing working and display space for local artists, and identifying a site for an arts and cultural center.





**Table 9-2
Art and Cultural Institutions**

Name	Description	Years in Operation	Annual Patronage
Buenaventura Arts Association	Fine art gallery in downtown Ventura.	50	5,000
Channelaire Chorus	Women's chorus	42	2,500
City of Ventura Cultural Affairs Division	Supports local arts organizations; produces cultural programs (ArtWalks, Street Fairs, Music Under the Stars, Arts Education classes, grants, public art, etc.)	13	132,000
Focus on the Masters	Documentation of extraordinary artists (photographs, audio and video interviews)	10	15,000
Kids' Art	Ongoing, free kids' creative arts programs	12	350
Music 4 Kids	After school music instruction at Boys & Girls Clubs	4	800
Plexus Dance Theater	Professional modern dance performances	20	1,400
Rubicon Theater	Regional theater – classic and contemporary	6	37,000
San Buenaventura Foundation for the Arts	Arts umbrella organization - supports development of the Cultural Center and produces Arts Explosion	5	5,900
Ventura Area Theater Sports	Live improvisational theater in downtown Ventura	15	5,000
Ventura Artists' Union	Art gallery and weekly arts shows on California Plaza	15	17,000
Ventura College Opera Workshop	Opera and theater company at Ventura College	21	4,500
Ventura County Ballet	Ballet school with twice annual performances	6	11,000
Ventura County Master Chorale	Professional vocal music ensemble	23	6,000
Ventura County Museum of History and Art	Museum featuring exhibits on the history and art of Ventura County	26	55,000
Ventura Music Festival	Annual concert festival presenting international and local performers	11	9,000

Policy 9A: Increase public art and cultural expression throughout the community.

Action 9.1: Require works of art in public spaces per the City’s Public Art Program Ordinance.

Action 9.2: Sponsor and organize local art exhibits, performances, festivals, cultural events, and forums for local arts organizations and artists. 

Action 9.3: Expand outreach and publicity by: 

- promoting locally produced art and local cultural programs
- publishing a monthly calendar of local art and cultural features,
- distributing the *State of the Arts* quarterly report, and
- offering free or subsidized tickets to events.

Action 9.4: Support the creative sector through training and other professional development opportunities.

Action 9.5: Work with the schools to integrate arts education into the core curriculum.

Action 9.6: Promote the cultural and artistic expressions of Ventura’s underrepresented cultural groups.


Action 9.7: Offer ticket subsidy and distribution programs and facilitate transportation to cultural offerings.

Policy 9B: Meet diverse needs for performance, exhibition, and workspace.


Action 9.8: Increase the amount of live-work development, and allow its use for production, display, and sale of art.


Action 9.9: Work with community groups to locate sites for venues for theater, dance, music, and children’s programming.

Policy 9C: Integrate local history and heritage into urban form and daily life.


Action 9.10: Provide incentives for preserving structures and sites that are representative of the various periods of the city’s social and physical development. 


Action 9.11: Organize and promote multi-cultural programs and events that celebrate local history and diversity.


Action 9.12: Allow adaptive reuse of historic buildings. 


Action 9.13: Work with community groups to identify locations for facilities that celebrate local cultural heritage, such as a living history Chumash village and an agricultural history museum. 


Policy 9D: Ensure proper treatment of archeological and historic resources.


Action 9.14: Require archaeological assessments for projects proposed in the Coastal Zone and other areas where cultural resources are likely to be located. 

Action 9.15: Suspend development activity when archaeological resources are discovered, and require the developer to retain a qualified archaeologist to oversee handling of the resources in coordination with the Ventura County Archaeological Society and local Native American organizations as appropriate. 

Action 9.16: Pursue funding to preserve historic resources. 


Action 9.17: Provide incentives to owners of eligible structures to seek historic landmark status and invest in restoration efforts. 


Action 9.18: Require that modifications to historically-designated buildings maintain their character. 


Action 9.19: For any project in a historic district or that would affect any potential historic resource or structure more than 40 years old, require an assessment of eligibility for State and federal register and landmark status and appropriate mitigation to protect the resource. 


Action 9.20: Seek input from the City's Historic Preservation Commission on any proposed

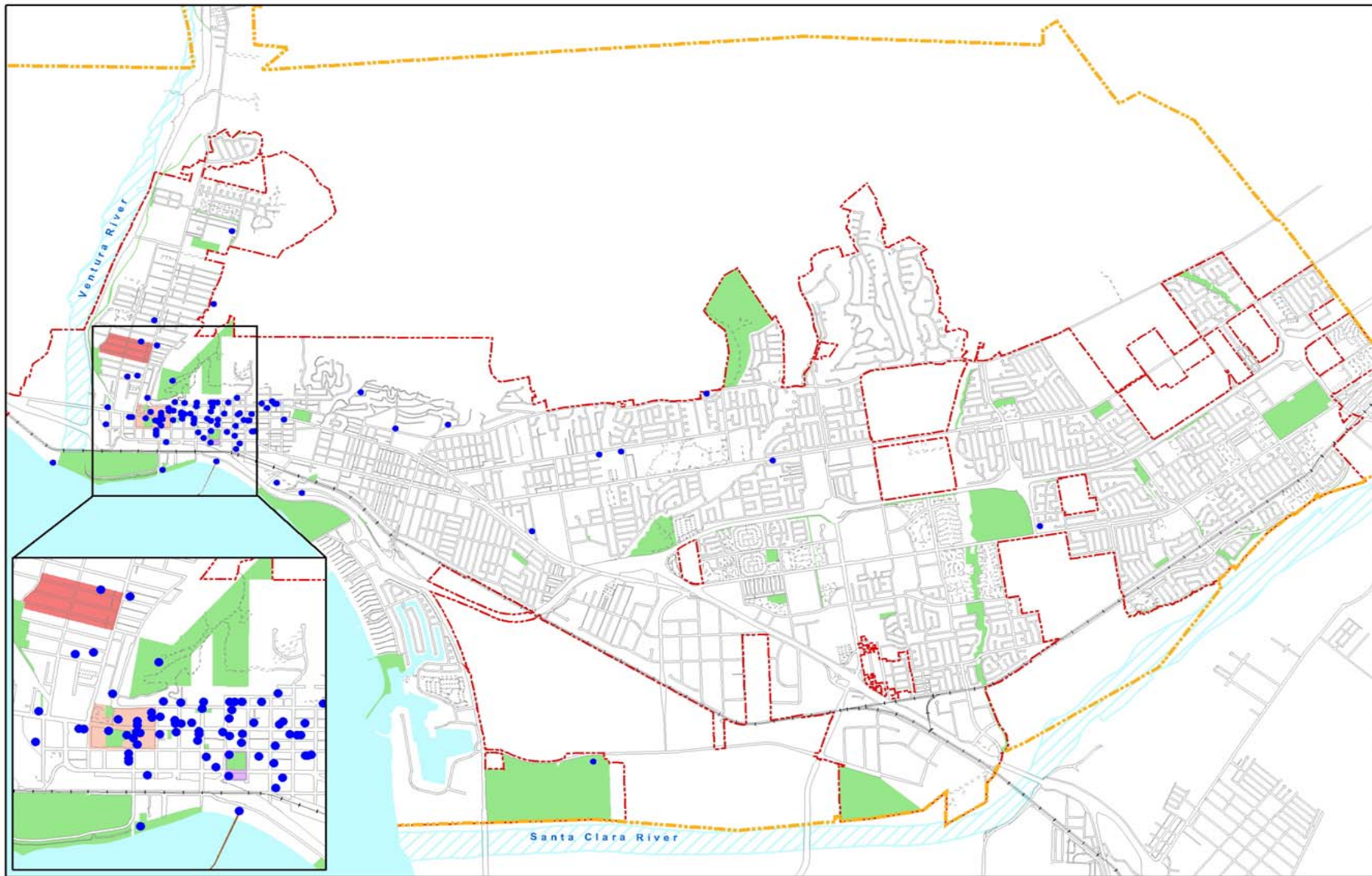
development that may affect any designated or potential landmark. 

Action 9.21: Update the inventory of historic properties. 

Action 9.22: Create a set of guidelines and/or policies directing staff, private property owners, developers, and the public regarding treatment of historic resources that will be readily available at the counter. 

Action 9.23: Complete and maintain historic resource surveys containing all the present and future components of the historic fabric within the built, natural, and cultural environments. 

Action 9.24: Create a historic preservation element. 



- Historical Sites
- City Limits
- Mission Historic District
- Mitchell Block Historic District
- Selwyn Shaw Historic District
- Simpson Tract Historic District
- Parks
- Planning Area

Figure 9-1
Historic Districts and Sites

This map is a product of the City of San Buenaventura, California. Although reasonable efforts have been made to ensure the accuracy of this map, the City of San Buenaventura cannot guarantee its accuracy.



"Never believe that a few caring people can't change the world. For indeed, that's all who ever have."

— Margaret Mead
Renowned Anthropologist

10. OUR INVOLVED COMMUNITY

Our goal is to strive to work together as a community to achieve the Ventura Vision through civic engagement, partnerships, and volunteer service.

Civic Engagement

It is not enough to have a vision of smart growth for Ventura. Achieving that vision requires the active and ongoing participation of an engaged and active community. Fortunately, Ventura builds on a strong foundation: thousands of Ventura citizens are involved in their schools and places of worship and give their time to civic, cultural, and charitable organizations. City Commissions, the Community Councils, the Chamber of Commerce and other well-established avenues provide opportunities for community leadership.

This is what Alexis De Toqueville celebrated in his famous book, *Democracy in America*, calling our nation, “the one country in the world, day in and day out, that makes use of an unlimited freedom of association.” Yet today in Ventura, as all across America, there is concern about the health of our democracy. Sociologist Robert Putnam gained national attention with his research showing that “by almost every measure, Americans’ direct engagement in politics and government has fallen steadily and sharply over the last generation.”

Among the symptoms in Ventura have been a decline in voter turnout in recent local elections – (a 36% drop from 1995 through 2003.) Over those years, the ability to build consensus about future development has been undermined by sharply polarized divisions, showdowns at the ballot box, and often rancorous public hearings. The complaint often recurs that planning decisions are made without adequate notice or consideration of the views of those affected. Many citizens criticize the City decision-making process as convoluted and counterproductive.

Moreover, ongoing participation of an engaged community requires civic places where citizens can come together. It is not insignificant that a decline in public participation and the quality of civic discourse has paralleled the loss of civic places in our cities. Historically, governments provided open spaces and buildings that were at the center of a community, physically and symbolically. Town squares and plazas, often faced by a hall for formal gathering and civic engagement, have all but disappeared. The poverty of American public places was apparent after the Columbine High School shooting in Colorado, when citizens gathered to mourn, not in a shared place for people, but in a parking lot.

Nearly everyone agrees we can and should do better. The best model for doing this was the citywide effort to craft the *Ventura Vision*. Thousands participated in a year-long partnership encompassing City government, non-profit organizations, community groups, business,

schools and individual residents to chart the community's future.

The vision of an "involved community" was described in the *Ventura Vision* report as: seeking "broad community collaboration; more widely publicizing city government services, planning processes and policies; better involvement of typically under-represented groups such as youth, seniors and ethnic minorities in community planning; and developing public parks, plazas, neighborhood greenways and other spaces that promote civic interaction and events."

Since that vision was adopted by the City Council in 2000, the City has worked to implement it, building on existing community assets and strengthening the linkages and interconnections that already exist among people, organizations, and shared community goals. A remarkable example of broad community collaboration earned attention throughout Southern California in late 2004. Facing the prospect of winter flooding, the City undertook to evacuate homeless people living in the channel of the Ventura River. This was accomplished by a partnership involving non-profit social service agencies, faith-based organizations, City staff, business leaders, community volunteers and the affected homeless population.

There are many more models of successful community collaboration in Ventura, including: the restoration of the pier, the community's rich array of after-school programs, the implementation of the 1992 Cultural Plan, the 2004 Downtown

Charrette, the 2005 Midtown Design Charrette and the establishment of conservancies to preserve the Grant Park cross and Ventura's cherished hillsides.

City government has learned from these efforts to reach broadly and deeply into the community. Civic engagement and trust are built when City representatives actively seek to involve everyone in positive and transparent partnerships. That goal requires a continually evolving effort to promote participation:

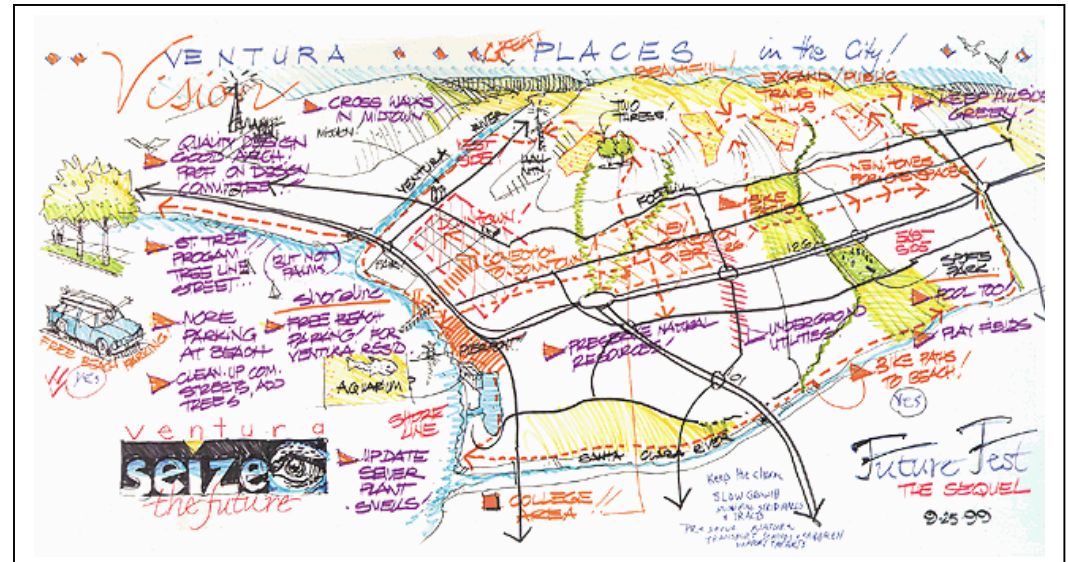
- through proactive and interactive media outreach in the press, on the web, on radio and television,
- by striving to include everyone in decision making and making it convenient for them to participate by seeking them out in their neighborhoods and gathering places like schools, houses of worship and public spaces, and
- through community dialogues, workshops, charrettes, town hall forums, and community councils, in addition to formal public hearings.

More effort needs to be put into building consensus about future growth and change upfront through community planning, rather than waiting until specific development projects are proposed. That effort will continue with the work to craft a citywide "form-based code" and concentrated planning efforts for specific neighborhoods and districts.

Focused attention should be paid to making our public decision-making processes easier to understand and participate in. Citizens have little time or patience for complicated planning and entitlement processes that drag on for years. By establishing clearer rules and public processes for applying them, the policies and actions in this chapter will enable more citizens to feel that they will be heard and their contributions valued. By involving a wider range of the community in clearly setting Ventura's planning goals and standards of quality, we can devote more time to achieving those goals and less time wrangling over specific proposals.

Ventura also needs to reestablish places for civic discourse. While the City will continue to encourage the use of our beautiful City Hall for its historic role of government by and for the people, we also need a hierarchy of civic spaces citywide that are strategically located in neighborhood centers and accessible by pedestrians (see Chapter Three, Action 3.8). Every neighborhood should have access to a physical location designated for public gathering and civic purposes.

Our long-range vision is to build an ethic and a fabric of robust civic engagement – what De Toqueville called “the habits of the heart.” His phrase evokes what the Ventura Vision called “direct engagement in public affairs” through “participation, hard work and collaboration . . . sustaining Ventura as an exceptional place.” The policies and actions in this chapter aim to do just that.



Policy 10A: Work collaboratively to increase citizen participation in public affairs. including the website, cable channels, newsletters, kiosks, and water billing statements.

Action 10.1: Conduct focused outreach efforts to encourage all members of the community – including youth, seniors, special needs groups, and non-English speakers – to participate in City activities.

Action 10.2: Obtain public participation by seeking out citizens in their neighborhoods and gathering places such as schools, houses of worship and public spaces.

Action 10.3: Invite civic, neighborhood, and non-profit groups to assist with City project and program planning and implementation.

Action 10.4: Provide incentives for City staff to participate in community and volunteer activities.

Action 10.5: Invite seniors to mentor youth and serve as guides at historical sites.

Action 10.6: Offer internships in City governance, and include youth representatives on public bodies.

Action 10.7: Continue to offer the Ambassadors program to obtain citizens assistance with City projects.

Policy 10B: Raise awareness of City operations and be clear about City objectives.


Action 10.8: Utilize the City website as a key source of information and expand it to serve as a tool for civic engagement.


Action 10.9: Publish an annual report that evaluates City performance in such areas as conservation, housing, and economic development.

Action 10.10: Continue to improve the user-friendliness of the media that communicate information about the City,

Policy 10 C: Work at the neighborhood level to promote citizen engagement.

Action 10.11: Establish a clear policy toward the scope, role, boundaries, and jurisdiction of neighborhood Community Councils citywide, with the objectives of strengthening their roles in decision-making.

Action 10.12: Establish stronger partnerships with neighborhood Community Councils to set area priorities for capital investment, community policing, City services, commercial investment, physical planning, education, and other concerns, to guide both City policies and day-to-day cooperation and problem-solving. 


Action 10.13: Recognizing that neighborhood empowerment must be balanced and sustained by overall City policies and citywide vision and resources – establish a citywide Neighborhood Community Congress where local neighborhood Community Councils can collaborate and learn from each other. 








Action 10.14: Establish clear liaison relationships to foster communication, training, and involvement efforts between the City, neighborhood Community Councils and other community partners, including the Ventura Unified School District and business, civic, cultural and religious groups.




DONNA GRANATA






"Individual commitment to a group effort, that is what makes a team work, a company work, a society work, a civilization work."
— Vince Lombardi
Author of *What It Takes To Be #1*, 2001

<p>KEY TO ABBREVIATIONS AS = Administrative Services Department AS [P] = Purchasing CA = City Attorney CD = Community Development Department CD [A] = Administration CD [CP] = Current Planning CD [LRP] = Long Range Planning CD [ED] = Economic Development CD [LD] = Land Development CD [RDA] = Redevelopment Agency CC = City Council CM = City Manager's Department CM [CE] = Civic Engagement CS = Community Services Department CS [CR] = Community Recreation</p>	<p>CS [CA] = Cultural Affairs CS [GS/AS] = Golf Services/Adult Sports CS [SS] = Social Services FD = Fire Department FD [IS] = Inspection Services HR = Human Resources Department PD = Police Department PW = Public Works Department PW [E] = Engineering PW [P] = Parks PW [MS] = Maintenance Services PW [U] = Utilities</p>	<p>Short-term = 0-5 years Mid-term = 5-10 years Long-term = 10-20 years Ongoing = May require short-, mid-, and long-term action</p>
<p> = Action included in the Land Use Plan of the City's Local Coastal Program</p>		

Number	Action	Lead Entity	Timeframe
1.1	 Adhere to the policies and directives of the California Coastal Act in reviewing and permitting any proposed development in the Coastal Zone.	CD [CP]	Ongoing
1.2	 Prohibit non-coastal-dependent energy facilities within the Coastal Zone, and require any coastal-dependent facilities including pipelines and public utility structures to avoid coastal resources (including recreation, habitat, and archaeological areas) to the extent feasible, or to minimize any impacts if development in such areas is unavoidable.	CD [CP]	Ongoing
1.3	 Work with the State Department of Parks and Recreation, Ventura County Watershed Protection Agency, and the Ventura Port District to determine and carry out appropriate methods for protecting and restoring coastal resources, including by supplying sand at beaches under the Beach Erosion Authority for Control Operations and Nourishment (BEACON) South Central Coast Beach Enhancement program.	PW [E]	Ongoing
1.4	 Require new coastal development to provide non-structural shoreline protection that avoids adverse impacts to coastal processes and nearby beaches.	CD [CP]	Ongoing
1.5	 Collect suitable material from dredging and development, and add it to beaches as needed and feasible.	PW [E]	Ongoing
1.6	 Support continued efforts to decommission Matilija Dam to improve the sand supply to local beaches.	PW [U]	Long-term
1.7	 Update the Hillside Management Program to address and be consistent with the Planning Designations as defined and depicted on the General Plan Diagram.	CD [LRP]	Short-term

APPENDIX A

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Number	Action	Lead Entity	Timeframe
1.8	 Buffer barrancas and creeks that retain natural soil slopes from development according to state and Federal guidelines.	CD [LD]	Ongoing
1.9	 Prohibit placement of material in watercourses other than native plants and required flood control structures, and remove debris periodically.	PW [MS/P]	Ongoing
1.10	 Remove concrete channel structures as funding allows, and where doing so will fit the context of the surrounding area and not create unacceptable flood or erosion potential.	PW [MS/P]	Long-term
1.11	 Require that sensitive wetland and coastal areas be preserved as undeveloped open space wherever feasible and that future developments result in no net loss of wetlands or "natural" areas.	CD [LRP]	Short-term
1.12	Update the provisions of the Hillside Management Program as necessary to ensure protection of open space lands.	CD [LRP]	Mid-term
1.13	Recommend that the City's Sphere of Influence be coterminous with existing City limits in the hillsides in order to preserve the hillsides as open space.	CD [LRP]	Short-term
1.14	Work with established land conservation organizations toward establishing a Ventura hillsides preserve.	PW [P]	Long-term
1.15	Actively seek local, state, and Federal funding sources to achieve preservation of the hillsides.	PW [P]	Mid-term
1.16	 Comply with directives from regulatory authorities to update and enforce stormwater quality and watershed protection measures that limit impacts to aquatic ecosystems and that preserve and restore the beneficial uses of natural watercourses and wetlands in the city.	PW	Ongoing

S U M M A R Y O F A C T I O N S


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Number	Action	Lead Entity	Timeframe
1.17	Require development to mitigate its impacts on wildlife through the development review process.	CD [CP]	Ongoing
1.18	Require new development adjacent to rivers, creeks, and barrancas to use native or non-invasive plant species, preferably drought tolerant, for landscaping.	CD [CP] PW [P]	Ongoing
1.19	Require projects near watercourses, shoreline areas, and other sensitive habitat areas to include surveys for State and/or federally listed sensitive species and to provide appropriate buffers and other mitigation necessary to protect habitat for listed species.	CD [LRP]	Long-term
1.20	Conduct coastal dredging in accordance with the U.S. Army Corps of Engineers and California Department of Fish and Game requirements in order to avoid impacts to sensitive fish and bird species.	PW [E]	Ongoing
1.21	Work with State Parks on restoring the Alessandro Lagoon and pursue funding cooperatively.	PW [P]	Long-term
1.22	Adopt development code provisions to protect mature trees as defined by minimum height, canopy, and/or tree trunk diameter.	CD [LRP]	Short-term
1.23	Require, where appropriate, the preservation of healthy tree windrows associated with current and former agricultural uses, and incorporate trees into the design of new developments.	CD [CP]	Short-term
1.24	Require new development to maintain all indigenous tree species or provide adequately sized replacement native trees on a 3:1 basis.	CD [CP]	Ongoing
1.25	Purchase and use recycled materials and alternative and renewable energy sources as feasible in	AS [P]	Ongoing

APPENDIX A

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CD [RDA] = Redevelopment Agency	PW [P] = Parks
CC = City Council	PW [MS] = Maintenance Services
CM = City Manager's Department	PW [U] = Utilities
CM [CE] = Civic Engagement	
CS = Community Services Department	
CS [CR] = Community Recreation	

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Mid-term = 5-10 years
Long-term = 10-20 years
Ongoing = May require short-, mid-, and long-term action


 = Action included in the Land Use Plan of the City's Local Coastal Program






Number	Action	Lead Entity	Timeframe
	City operations.		
1.26	 Reduce pesticide use in City operations.	PW [P]	Mid-term
1.27	Utilize green waste as biomass/compost in City operations.	PW [P]	Mid-term
1.28	Purchase low-emission City vehicles, and convert existing gasoline-powered fleet vehicles to cleaner fuels as technology becomes available.	PW [MS]	Mid-term
1.29	 Require all City funded projects that enter design and construction after January 1, 2006 to meet a design construction standard equivalent to the minimum U.S. Green Building Council LEED™ Certified rating in accordance with the City's Green Building Standards for Private and Municipal Construction Projects.	FD [IS]	Short-term
1.30	Provide information to businesses about how to reduce waste and pollution and conserve resources.	PW [MS]	Short-term
1.31	 Provide incentives for green building projects in both the public and private sectors to comply with either the LEED™ Rating System, California Green Builder, or the Residential Built Green program and to pursue registration and certification; incentives include "Head-of-the-Line" discretionary processing and "Head-of-the-Line" building permit processing.	FD [IS]	Short-term
1.32	 Apply for grants, rebates, and other funding to install solar panels on all City-owned structures to provide at least half of their electric energy requirements.	PW	Ongoing


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Number	Action	Lead Entity	Timeframe
1.33	Publicly acknowledge individuals and businesses that implement green construction and building practices.	FD [IS]	Ongoing
2.1	Track economic indicators for changes that may affect City land resources, tax base, or employment base, such as terms and conditions of sale or lease of available office, retail, and manufacturing space.	CD [ED]	Ongoing
2.2	Prepare an economic base analysis that identifies opportunities to capture retail sales in sectors where resident purchasing has leaked to other jurisdictions.	CD [ED]	Short-term
2.3	Maintain and update an Economic Development Strategy to implement City economic goals and objectives.	CD [ED]	Ongoing
2.4	Map priority locations for commercial and industrial development and revitalization, including a range of parcel sizes targeted for high-technology, non-durables manufacturing, finance, business services, tourism, and retail uses.	CD	Short-term
2.5	Share economic and demographic information with organizations that may refer businesses to Ventura.	CD [ED]	Ongoing
2.6	Encourage intensification and diversification of uses and properties in districts, corridors, and neighborhood centers, including through assembly of vacant and underutilized parcels.	CD [ED]	Ongoing

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Number	Action	Lead Entity	Timeframe
2.7	Partner with local commerce groups to recruit companies and pursue funding for business development and land re-utilization.	CD [ED]	Ongoing
2.8	Carry out Housing Element programs that provide housing to all segments of the local workforce.	CD	Ongoing
2.9	Expedite review for childcare facilities that will provide support to local employees.	CD [CP]	Short-term
2.10	Expedite review of the entitlement process for installation of infrastructure necessary to support high technology and multimedia companies.	CA	Mid-term
2.11	 Allow mixed-use development in commercial and industrial districts as appropriate.	CD [LRP]	Short-term
2.12	 Allow uses such as conference centers with resort amenities on appropriately sized and located parcels.	CD [LRP]	Short-term
2.13	Market the city to businesses that link agriculture with high technology, such as biotechnology enterprises.	CD [ED]	Ongoing
2.14	 Partner with local farms to promote farmers markets and high quality locally grown food.	CS	Ongoing
2.15	 Provide incentives for use of waterfront parcels for recreation, visitor-serving commerce, restaurant, marina, and fishing uses.	CD [ED]	Short-term
2.16	 Work with the State to create year-round commercial opportunities at the fairgrounds.	CD [ED]	Long-term

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2.17	 Partner with the Harbor District and National Park Service to promote Channel Islands tours and develop a marine learning center.	CS	Long-term
2.18	 Prioritize uses within the Harbor Specific Plan area as follows: (1) coastal dependent, (2) commercial fishing, (3) coastal access, and (4) visitor serving commercial and recreational uses.	CD	Short-term
2.19	 Partner with hotels and the Chamber of Commerce to promote city golf courses.	CS [GS/AS]	Long-term
2.20	 Promote outdoor recreation as part of an enhanced visitor opportunity strategy.	CS	Mid-term
3.1	 Preserve the stock of existing homes by carrying out Housing Element programs.	CD	Ongoing
3.2	 Enhance the appearance of districts, corridors, and gateways (including views from highways) through controls on building placement, design elements, and signage.	CD [LRP]	Short-term
3.3	 Require preservation of public view sheds and solar access.	CD [CP]	Short-term
3.4	 Require all shoreline development (including anti-erosion or other protective structures) to provide public access to and along the coast, unless it would duplicate adequate access existing nearby, adversely affect agriculture, or be inconsistent with public safety, military security, or protection of fragile coastal resources.	CD [CP]	Ongoing
3.5	 Establish land development incentives to upgrade the appearance of poorly maintained or	FD [IS]	Mid-term

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Number	Action	Lead Entity	Timeframe
	otherwise unattractive sites, and enforce existing land maintenance regulations.		
3.6	 Expand and maintain the City's urban forest and thoroughfare landscaping, using native species, in accordance with the City's Park and Development Guidelines and Irrigation and Landscape Guidelines.	PW [P]	Ongoing
3.7	Evaluate whether lot coverage standards should be changed based on neighborhood character.	CD [LRP]	Short-term
3.8	 Adopt new development code provisions that designate neighborhood centers, as depicted on the General Plan Diagram, for a mixture of residences and small-scale, local-serving businesses.	CD [LRP]	Short-term
3.9	 Adopt new development code provisions that designate areas within districts and corridors for mixed-use development that combines businesses with housing and focuses on the redesign of single-use shopping centers and retail parcels into walkable, well connected blocks, with a mix of building types, uses, and public and private frontages.	CD [LRP]	Short-term
3.10	 Allow intensification of commercial areas through conversion of surface parking to building area under a districtwide parking management strategy in the Downtown Specific Plan.	CD [LRP]	Short-term
3.11	 Expand the downtown redevelopment area to include parcels around future transit areas and along freeway frontage.	CD [RDA]	Mid-term
3.12	The City will work with the hospitals on the new Development Code treatment for the Loma Vista corridor, which includes both hospitals.	CD [LRP]	Short-term




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3.13	Assess whether the City's Affordable Housing Programs respond to current needs, and modify them as necessary within State mandated Housing Element updates	CD	Ongoing
3.14	Utilize infill development, to the extent possible, to accommodate the targeted number and type of housing units described in the Housing Element	CD [LRP]	Ongoing
3.15	Adopt new development code provisions that ensure compliance with Housing Element objectives.	CD [LRP]	Short-term
3.16	Renew and modify greenbelt agreements as necessary to direct development to already urbanized areas.	CD [LRP]	Long-term
3.17	Continue to support the Guidelines for Orderly Development as a means of implementing the General Plan, and encourage adherence to these Guidelines by all the cities, the County of Ventura, and the Local Agency Formation Commission (LAFCO); and work with other nearby cities and agencies to avoid sprawl and preserve the rural character in areas outside the urban edge.	CD [LRP]	Ongoing
3.18	Complete community or specific plans, subject to funding, for areas such as Westside, Midtown, Downtown, Wells, Saticoy, Pierpont, Harbor, Loma Vista/Medical District, Victoria Corridor, and others as appropriate. These plans will set clear development standards for public and private investments, foster neighborhood partnerships, and be updated as needed.	CD [LRP]	Ongoing
3.19	Preparation of the new Development Code will take into account existing or proposed community or specific plans to ensure efficient use of City resources and ample citizen input.	CD [LRP]	Short-term

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Number	Action	Lead Entity	Timeframe
3.20	Pursuant to SOAR, adopt development code provisions to “preserve agricultural and open space lands as a desirable means of shaping the City’s internal and external form and size, and of serving the needs of the residents.”	CD [LRP]	Short-term
3.21	 Adopt performance standards for non-farm activities in agricultural areas that protect and support farm operations, including requiring non-farm uses to provide all necessary buffers as determined by the Agriculture Commissioner’s Office.	CD [LRP]	Short-term
3.22	 Offer incentives for agricultural production operations to develop systems of raw product and product processing locally.	CD [ED]	Mid-term
3.23	 Develop and adopt a form-based Development Code that emphasizes pedestrian orientation, integration of land uses, treatment of streetscapes as community living space, and environmentally sensitive building design and operation.	CD [LRP]	Short-term
3.24	Revise the Residential Growth Management Program (RGMP) with an integrated set of growth management tools including: <ul style="list-style-type: none"> Community or specific plans and development codes based on availability of infrastructure and transit that regulate community form and character by directing new residential development to appropriate locations and in ways that integrate with and enhance existing neighborhoods, districts and corridors; appropriate mechanisms to ensure that new residential development produces high-quality 	CD [LRP]	Short-term

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	<p>designs and a range of housing types across all income levels; and,</p> <ul style="list-style-type: none"> • numeric limitations linked to the implementation of community or specific plans and development codes and the availability of appropriate infrastructure and resources; within those limitations, the RGMP should provide greater flexibility for timing new residential development. 		
3.25	Establish first priority growth areas to include the districts, corridors, and neighborhood centers as identified on the General Plan Diagram; and second priority areas to include vacant undeveloped land when a community plan has been prepared for such (within the City limits).	CD [LRP]	Short-term
3.26	Establish and administer a system for the gradual growth of the City through identification of areas set aside for long-term preservation, for controlled growth, and for encouraged growth.	CD [LRP]	Mid-term
3.27	Require the use of techniques such as digital simulation and modeling to assist in project review.	CD [CP]	Short-term
3.28	Revise the planning processes to be more user-friendly to both applicants and neighborhood residents in order to implement City policies more efficiently.	CD [CP]	Short-term
4. OUR ACCESSIBLE COMMUNITY			
4.1	Direct city transportation investment to efforts that improve user safety and keep the circulation system structurally sound and adequately maintained. First priority for capital funding will go to our pavement management program to return Ventura streets to excellent conditions.	PW [E]	Ongoing

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Number	Action	Lead Entity	Timeframe
4.2	Develop a prioritized list of projects needed to improve safety for all travel modes and provide needed connections and multiple route options.	PW [E]	Short-term
4.3	Provide transportation services that meet the special mobility needs of the community including youth, elderly, and disabled persons.	PW [E]	Ongoing
4.4	Combine education with enforcement to instill safe and courteous use of the shared public roadway.	CS	Ongoing
4.5	 Utilize existing roadways to meet mobility needs, and only consider additional travel lanes when other alternatives are not feasible.	CD [LRP]	Ongoing
4.6	Require new development to be designed with interconnected transportation modes and routes to complete a grid network.	CD [CP]	Short-term
4.7	 Update the traffic mitigation fee program to fund necessary citywide circulation system and mobility improvements needed in conjunction with new development.	CD [LD]	Short-term
4.8	Implement the City's Neighborhood Traffic Management Program and update as necessary to improve livability in residential areas.	PW [E]	Ongoing
4.9	 Identify, designate, and enforce truck routes to minimize the impact of truck traffic on residential neighborhoods.	PW [E]	Ongoing
4.10	Modify traffic signal timing to ensure safety and minimize delay for all users.	PW [E]	Short-term

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Number	Action	Lead Entity	Timeframe
4.11	Refine level of service standards to encourage use of alternative modes of transportation while meeting state and regional mandates.	PW [E]	Short-term
4.12	Design roadway improvements and facility modifications to minimize the potential for conflict between pedestrians, bicycles, and automobiles.	PW [E]	Ongoing
4.13	Require project proponents to analyze traffic impacts and provide adequate mitigation in the form of needed improvements, in-lieu fee, or a combination thereof.	CD [LD]	Ongoing
4.14	Provide development incentives to encourage projects that reduce automobile trips.	CD [CP]	Short-term
4.15	Encourage the placement of facilities that house or serve elderly, disabled, or socioeconomically disadvantaged persons in areas with existing public transportation services and pedestrian and bicycle amenities.	CD [CP]	Ongoing
4.16	Install roadway, transit, and alternative transportation improvements along existing or planned multi-modal corridors, including primary bike and transit routes, and at land use intensity nodes.	PW [E]	Ongoing
4.17	Prepare and periodically update a Mobility Plan that integrates a variety of travel alternatives to minimize reliance on any single mode.	CD [LRP]	Short-term
4.18	Promote the development and use of recreational trails as transportation routes to connect housing with services, entertainment, and employment.	PW [P]	Ongoing
4.19	Adopt new development code provisions that establish vehicle trip reduction requirements for all development.	CD [LRP]	Short-term

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4.20	Develop a transportation demand management program to shift travel behavior toward alternative modes and services.	PW [E]	Mid-term
4.21	 Require new development to provide pedestrian and bicycle access and facilities as appropriate, including connected paths along the shoreline and watercourses.	PW [E/P]	Short-term
4.22	 Update the General Bikeway Plan as needed to encourage bicycle use as a viable transportation alternative to the automobile and include the bikeway plan as part of a new Mobility Plan.	PW [E]	Mid-term
4.23	 Upgrade and add bicycle lanes when conducting roadway maintenance as feasible.	PW [E]	Ongoing
4.24	 Require sidewalks wide enough to encourage walking that include ramps and other features needed to ensure access for mobility-impaired persons.	PW [E]	Short-term
4.25	 Adopt new development code provisions that require the construction of sidewalks in all future projects, where appropriate.	CD [LRP]	Short-term
4.26	Establish a parking management program to protect the livability of residential neighborhoods, as needed.	CD [LRP]	Short-term
4.27	Extend stubbed-end streets through future developments, where appropriate, to provide necessary circulation within a developing area and for adequate internal circulation within and between neighborhoods. Require new developments in the North Avenue area, where applicable, to extend Norway Drive and Floral Drive to connect to Canada Larga Road; and connect the existing segments of Floral Drive. Designate the extension of Cedar Street between Warner Street and	PW [E]	Mid-term


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	south of Franklin Lane and the linking of the Cameron Street segments in the Westside community as high priority projects.		
4.28	Require all new development to provide for citywide improvements to transit stops that have sufficient quality and amenities, including shelters and benches, to encourage ridership.	PW [E]	Short-term
4.29	Develop incentives to encourage City employees and local employers to use transit, rideshare, walk, or bike.	HR	Mid-term
4.30	Work with public transit agencies to provide information to riders at transit stops, libraries, lodging, and event facilities.	PW [E]	Ongoing
4.31	Work with public and private transit providers to enhance public transit service.	PW [E]	Mid-term
4.32	Coordinate with public transit systems for the provision of additional routes as demand and funding allow.	PW [E]	Long-term
4.33	Work with Amtrak, Metrolink, and Union Pacific to maximize efficiency of passenger and freight rail service to the City and to integrate and coordinate passenger rail service with other transportation modes.	PW [E]	Mid-term
4.34	Lobby for additional transportation funding and changes to Federal, State, and regional transportation policy that support local decision-making.	PW [E]	Ongoing
4.35	The City shall pursue funding and site location for a multi-modal transit facility in coordination with VCTC, SCAT, U.P.R.R., Metrolink, Greyhound Bus Lines, and other forms of	PW [E]	Mid-term

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	transportation.		
4.36	<p> Require development along the following roadways – including noise mitigation, landscaping, and advertising – to respect and preserve views of the community and its natural context.</p> <ul style="list-style-type: none"> • State Route 33 • U.S. HWY 101 • Anchors Way • Brakey Road • Fairgrounds Loop • Ferro Drive • Figueroa Street • Harbor Boulevard • Main Street • Navigator Drive • North Bank Drive • Poli Street/Foothill Road • Olivas Park Drive • Schooner Drive 	CD [CP]	Ongoing


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	<ul style="list-style-type: none"> Spinnaker Drive Summit Drive Telegraph Road – east of Victoria Avenue Victoria Avenue – south of U.S. 101 Wells Road 		
4.37	Request that State Route 126 and 33, and U.S. HWY 101 be designated as State Scenic Highways.	CD [LRP]	Short-term
4.38	Continue to work with Caltrans to soften the barrier impact of U.S. HWY 101 by improving signage, aesthetics and undercrossings and overcrossings.	PW [E/P]	Ongoing
4.39	Maintain street trees along scenic thoroughfares, and replace unhealthy or missing trees along arterials and collectors throughout the City.	PW [P]	Ongoing
5. OUR SUSTAINABLE INFRASTRUCTURE			
5.1	Require low flow fixtures, leak repair, and drought tolerant landscaping (native species if possible), plus emerging water conservation techniques, such as reclamation, as they become available.	CD [CP]	Ongoing
5.2	Use natural features such as bioswales, wildlife ponds, and wetlands for flood control and water quality treatment when feasible.	PW [MS/P]	Ongoing
5.3	Demonstrate low water use techniques at community gardens and city-owned facilities.	PW [U/P]	Mid-term

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5.4	Update the Urban Water Management plan as necessary in compliance with the State 1983 Urban Water Management Planning Act.	PW [U]	Ongoing
5.5	 Provide incentives for new residences and businesses to incorporate recycling and waste diversion practices, pursuant to guidelines provided by the Environmental Services Office.	PW [MS]	Ongoing
5.6	 Require project proponents to conduct sewer collection system analyses to determine if downstream facilities are adequate to handle the proposed development.	PW [U]	Ongoing
5.7	 Require project proponents to conduct evaluations of the existing water distribution system, pump station, and storage requirements in order to determine if there are any system deficiencies or needed improvements for the proposed development.	PW [U]	Ongoing
5.8	 Locate new development in or close to developed areas with adequate public services, where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.	CD [LRP]	Ongoing
5.9	 Update development fee and assessment district requirements as appropriate to cover the true costs associated with development.	AS	Mid-term
5.10	 Utilize existing waste source reduction requirements, and continue to expand and improve composting and recycling options.	PW [MS]	Mid-term
5.11	Increase emergency water supply capacity through cooperative tie-ins with neighboring suppliers.	PW [U]	Mid-term
5.12	 Apply new technologies to increase the efficiency of the wastewater treatment system.	PW [U]	Mid-term








S U M M A R Y O F A C T I O N S

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Number	Action	Lead Entity	Timeframe
5.13	Increase frequency of city street sweeping, and post schedules at key points within each neighborhood.	PW [MS]	Mid-term
5.14	Develop a financing program for the replacement of failing corrugated metal storm drain pipes in the City.	PW [MS]	Short-term
5.15	Establish assessment districts or other financing mechanisms to address storm drain system deficiencies in areas where new development is anticipated and deficiencies exist.	PW [MS]	Mid-term
5.16	Require new developments to incorporate stormwater treatment practices that allow percolation to the underlying aquifer and minimize offsite surface runoff utilizing methods such as pervious paving material for parking and other paved areas to facilitate rainwater percolation and retention/detention basins that limit runoff to pre-development levels.	CD [LD]	Ongoing
5.17	Require stormwater treatment measures within new development to reduce the amount of urban pollutant runoff in the Ventura and Santa Clara Rivers and other watercourses.	CD [LD]	Ongoing
5.18	Work with the Ventura Regional Sanitation District and the County to expand the capacity of existing landfills, site new landfills, and/or develop alternative means of disposal that will provide sufficient capacity for solid waste generated in the City.	PW [MS]	Long-term

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Number	Action	Lead Entity	Timeframe
6. OUR ACTIVE COMMUNITY			
6.1	 Develop new neighborhood parks, pocket parks, and community gardens as feasible and appropriate to meet citizen needs, and require them in new development.	PW [P]	Long-term
6.2	 Require higher density development to provide pocket parks, tot lots, seating plazas, and other aesthetic green spaces.	CD [CP]	Short-term
6.3	 Work with the County to plan and develop trails that link the City with surrounding open space and natural areas, and require development projects to include trails when appropriate.	PW [P]	Ongoing
6.4	 Request Flood Control District approval of public access to unchannelized watercourses for hiking.	PW [P]	Mid-term
6.5	 Seek landowner permission to allow public access on properties adjacent to open space where needed to connect trails.	PW [P]	Ongoing
6.6	 Update plans for and complete the linear park system as resources allow.	PW [P]	Long-term
6.7	Work with the County of Ventura to initiate efforts to create public trails in the hillside area.	PW [P]	Mid-term
6.8	Update and require periodic reviews of the Park and Recreation Workbook as necessary to reflect City objectives and community needs.	PW [P]	Mid-term
6.9	 Require dedication of land identified as part of the City's Linear Park System in conjunction with new development.	PW [P]	Ongoing


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6.10	Evaluate and incorporate, as feasible, linear park segments in the General Bikeway Plan.	PW [E]	Ongoing
6.11	Update standards for citywide public parks and open space to include an expanded menu of shared park types, and identify locations and potential funding sources for acquiring new facilities in existing neighborhoods.	PW [P]	Short-term
6.12	Update and carry out the Grant Park Master Plan.	PW [P]	Mid-term
6.13	Foster the partnership between the City and Fair Board to improve Seaside Park.	CD [ED]	Ongoing
6.14	Improve facilities at City parks to respond to the requirements of special needs groups.	PW [P]	Mid-term
6.15	Adjust and subsidize fees to ensure that all residents have the opportunity to participate in recreation programs.	CS [CR]	Short-term
6.16	Update the project fee schedule as necessary to ensure that development provides its fair share of park and recreation facilities.	PW [P]	Short-term
6.17	Update and create new agreements for joint use of school and City recreational and park facilities.	CS [CR] PW [P]	Mid-term
6.18	Offer programs that highlight natural assets, such as surfing, sailing, kayaking, climbing, gardening, and bird watching.	CS [CR]	Ongoing
6.19	Provide additional boating and swimming access as feasible.	PW	Long-term

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Number	Action	Lead Entity	Timeframe
6.20	Earmark funds for adequate maintenance and rehabilitation of existing skatepark facilities, and identify locations and funding for new development of advanced level skatepark facilities.	PW [P]	Mid-term
6.21	Promote the use of City facilities for special events, such as festivals, tournaments, and races.	CS [CA]	Ongoing
6.22	Enter into concession or service agreements where appropriate to supplement City services.	PW	Ongoing
7. OUR HEALTHY AND SAFE COMMUNITY			
7.1	Work with interested parties to identify appropriate locations for assisted-living, hospice, and other care-provision facilities.	CS [SS]	Short-term
7.2	Provide technical assistance to local organizations that deliver health and social services to seniors, homeless persons, low-income citizens, and other groups with special needs.	CS [SS]	Ongoing
7.3	Participate in school and agency programs to: <ul style="list-style-type: none"> ◆ provide healthy meals, ◆ combat tobacco, alcohol, and drug dependency, ◆ distribute city park and recreation materials through schools, and ◆ distribute information about the benefits of proper nutrition and exercise. 	CS [SS]	Ongoing
7.4	Enhance or create ordinances which increase control over ABC licensed premises.	PD	Mid-term
7.5	Investigate the creation of new land use fees to enhance funding of alcohol related enforcement, prevention and training efforts.	PD	Mid-term

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7.6	 Adopt updated editions of the California Construction Codes and International Codes as published by the State of California and the International Code Council respectively.	FD [IS]	Ongoing
7.7	 Require project proponents to perform geotechnical evaluations and implement mitigation prior to development of any site: <ul style="list-style-type: none"> • with slopes greater than 10 percent or that otherwise have potential for landsliding, • along bluffs, dunes, beaches, or other coastal features • in an Alquist-Priolo earthquake fault zone or within 100 feet of an identified active or potentially active fault, • in areas mapped as having moderate or high risk of liquefaction, subsidence, or expansive soils, • in areas within 100-year flood zones, in conformance with all Federal Emergency Management Agency regulations. 	CD [CP/LD]	Ongoing
7.8	 To the extent feasible, require new critical facilities (hospital, police, fire, and emergency service facilities, and utility “lifeline” facilities) to be located outside of fault and tsunami hazard zones, and require critical facilities within hazard zones to incorporate construction principles that resist damage and facilitate evacuation on short notice.	FD	Ongoing
7.9	Maintain and implement the Standardized Emergency Management System (SEMS) Multihazard Functional Response Plan.	FD	Ongoing

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7.10	 Require proponents of any new developments within the 100-year floodplain to implement measures, as identified in the Floodplain Ordinance, to protect structures from 100-year flood hazards (e.g., by raising the finished floor elevation outside the floodplain).	FD [IS]	Ongoing
7.11	 Prohibit grading for vehicle access and parking or operation of vehicles within any floodway.	FD [IS]	Ongoing
7.12	 Refer development plans to the Fire Department to assure adequacy of structural fire protection, access for firefighting, water supply, and vegetation clearance.	CD [CP]	Ongoing
7.13	 Resolve extended response time problems by: <ul style="list-style-type: none"> • adding a fire station at the Pierpont/Harbor area, • relocating Fire Station #4 to the Community Park site, • increasing firefighting and support staff resources, • reviewing and conditioning annexations and development applications, and • require the funding of new services from fees, assessments, or taxes as new subdivisions are developed. 	FD	Long-term
7.14	Educate and reinforce City staff understanding of the Standardized Emergency Management System for the State of California.	FD	Ongoing
7.15	Increase public access to police services by: <ul style="list-style-type: none"> • increasing police staffing to coincide with increasing population, development, and calls for 	PD	Ongoing

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	service, <ul style="list-style-type: none"> • increasing community participation by creating a Volunteers in Policing Program, and • require the funding of new services from fees, assessments, or taxes as new subdivisions are developed. 		
7.16	Provide education about specific safety concerns such as gang activity, senior-targeted fraud, and property crimes.	PD	Ongoing
7.17	Establish a nexus between police department resources and increased service demands associated with new development.	PD	Mid-term
7.18	Continue to operate the Downtown police storefront.	PD	Ongoing
7.19	Expand Police Department headquarters as necessary to accommodate staff growth	PD	Mid-term
7.20	Require air pollution point sources to be located at safe distances from sensitive sites such as homes and schools.	FD [IS]	Short-term
7.21	Require analysis of individual development projects in accordance with the most current version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines and, when significant impacts are identified, require implementation of air pollutant mitigation measures determined to be feasible at the time of project approval.	FD [IS]	Ongoing
7.22	In accordance with Ordinance 93-37, require payment of fees to fund regional transportation demand	CD [LD]	Ongoing

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	management (TDM) programs for all projects generating emissions in excess of Ventura County Air Pollution Control District adopted levels.		
7.23	 Require individual contractors to implement the construction mitigation measures included in the most recent version of the Ventura County Air Pollution Control District Air Quality Assessment Guidelines.	PW [E]	Ongoing
7.24	Only approve projects involving sensitive land uses (such as residences, schools, daycare centers, playgrounds, medical facilities) within or adjacent to industrially designated areas if an analysis provided by the proponent demonstrates that the health risk will not be significant.	CD [CP]	Ongoing
7.25	Adopt new development code provisions that ensure uses in mixed-use projects do not pose significant health effects.	CD [LRP]	Short-term
7.26	Seek funding for cleanup of sites within the Brownfield Assessment Demonstration Pilot Program and other contaminated areas in West Ventura.	CD [ED]	Mid-term
7.27	 Require proponents of projects on or immediately adjacent to lands in industrial, commercial, or agricultural use to perform soil and groundwater contamination assessments in accordance with American Society for Testing and Materials standards, and if contamination exceeds regulatory action levels, require the proponent to undertake remediation procedures prior to grading and development under the supervision of the County Environmental Health Division, County Department of Toxic Substances Control, or Regional Water Quality Control Board (depending	FD [IS]	Ongoing

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	upon the nature of any identified contamination).		
7.28	Educate residents and businesses about how to reduce or eliminate the use of hazardous materials, including by using safer non-toxic equivalents.	PW [MS]	Ongoing
7.29	Require non-agricultural development to provide buffers, as determined by the Agriculture Commissioner's Office, from agricultural operations to minimize the potential for pesticide drift.	CD [CP]	Short-term
7.30	Require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport, and to notify the appropriate City, County, State and Federal agencies in the event of a violation.	FD [IS]	Ongoing
7.31	Work toward voluntary reduction or elimination of aerial and synthetic chemical application in cooperation with local agricultural interests and the Ventura County agricultural commissioner.	FD [IS]	Mid-term
7.32	Require acoustical analyses for new residential developments within the mapped 60 decibel (dBA) CNEL contour, or within any area designated for commercial or industrial use, and require mitigation necessary to ensure that: <ul style="list-style-type: none"> • Exterior noise in exterior spaces of new residences and other noise sensitive uses that are used for recreation (such as patios and gardens) does not exceed 65 dBA CNEL, and • Interior noise in habitable rooms of new residences does not exceed 45 dBA CNEL with all windows closed. 	FD [IS]	Ongoing

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7.33	 As funding becomes available, construct sound walls along U.S. 101, SR 126, and SR 33 in areas where existing residences are exposed to exterior noise exceeding 65 dBA CNEL.	PW [E]	Long-term
7.34	 Request that sound levels associated with concerts at the County Fairgrounds be limited to 70 dBA at the eastern edge of that property.	CS	Short-term
7.35	 Request the termination of auto racing at the County fairgrounds	CS	Short-term
7.36	 Amend the noise ordinance to restrict leaf blowing, amplified music, trash collection, and other activities that generate complaints.	FD [IS]	Short-term
7.37	 Use rubberized asphalt or other sound reducing material for paving and re-paving of City streets.	PW [E]	Ongoing
7.38	 Update the Noise Ordinance to provide standards for residential projects and residential components of mixed-use projects within commercial and industrial districts.	CD [LRP]	Short-term
8.1	Work closely with schools, colleges, and libraries to provide input into site and facility planning.	CS	Ongoing
8.2	Organize a regional education summit to generate interest in and ideas about learning opportunities.	CS	Mid-term
8.3	Adopt joint-use agreements with libraries, schools, and other institutions to maximize use of educational facilities.	CS	Mid-term
8.4	Distribute information about local educational programs.	CS	Mid-term

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8.5	Install infrastructure for wireless technology and computer networking in City facilities.	AS	Short-term
8.6	Establish educational centers at City parks.	PW [P] CS	Mid-term
8.7	Work with the State Parks Department to establish a marine learning center at the Harbor.	PW [P]	Long-term
8.8	Work with the Ventura Unified School District to ensure that school facilities can be provided to serve new development.	CD [LRP]	Ongoing
8.9	Complete a new analysis of community needs, rethinking the role of public libraries in light of the ongoing advances in information technology and the changing ways that individuals and families seek out information and life-long learning opportunities.	CS	Mid-term
8.10	Reassess the formal and informal relationships between our current three branch public libraries and school libraries – including the new Ventura College Learning Resource Center – as well as joint use of facilities for a broader range or compatible public, cultural, and educational uses.	CS	Mid-term
8.11	Develop a Master Plan for Facilities, Programs, and Partnerships to create an accessible, robust, and vibrant library for the 21 st Century system, taking into consideration that circulation of books is no longer the dominant function but will continue to be an important part of a linked network of learning centers.	CS	Mid-term
8.12	Develop formal partnerships, funding, capital strategies, and joint use agreements to implement the	CS	Ongoing

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	new libraries Master Plan.		
9. OUR CREATIVE COMMUNITY			
9.1	Require works of art in public spaces per the City's Public Art Program Ordinance.	CD [CP]	Mid-term
9.2	 Sponsor and organize local art exhibits, performances, festivals, cultural events, and forums for local arts organizations and artists.	CS	Ongoing
9.3	 Expand outreach and publicity by: <ul style="list-style-type: none"> ◆ promoting locally produced art and local cultural programs, ◆ publishing a monthly calendar of local art and cultural features, ◆ distributing the <i>State of the Arts</i> quarterly report, and ◆ offering free or subsidized tickets to events. 	CS	Ongoing
9.4	Support the creative sector through training and other professional development opportunities.	CS	Short-term
9.5	Work with the schools to integrate arts education into the core curriculum	CS	Short-term
9.6	Promote the cultural and artistic expressions of Ventura's underrepresented cultural groups.	CS	Mid-term
9.7	Offer ticket subsidy and distribution programs and facilitate transportation to cultural offerings.	CS	Ongoing
9.8	Increase the amount of live-work development, and allow its use for production, display, and sale of	CD [LRP]	Ongoing

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Number	Action	Lead Entity	Timeframe
	art.		
9.9	Work with community groups to locate sites for venues for theater, dance, music, and children's programming.	CS [CR]	Mid-term
9.10	Provide incentives for preserving structures and sites that are representative of the various periods of the city's social and physical development.	CD [LRP]	Mid-term
9.11	Organize and promote multi-cultural programs and events that celebrate local history and diversity.	CS [CA]	Ongoing
9.12	Allow adaptive reuse of historic buildings.	CD [LRP]	Short-term
9.13	Work with community groups to identify locations for facilities that celebrate local cultural heritage, such as a living history Chumash village and an agricultural history museum.	CS [CA]	Long-term
9.14	Require archaeological assessments for projects proposed in the Coastal Zone and other areas where cultural resources are likely to be located.	CD [CP]	Ongoing
9.15	Suspend development activity when archaeological resources are discovered, and require the developer to retain a qualified archaeologist to oversee handling of the resources in coordination with the Ventura County Archaeological Society and local Native American organizations as appropriate.	CD [CP]	Ongoing
9.16	Pursue funding to preserve historic resources.	CS	Ongoing

APPENDIX A

KEY TO ABBREVIATIONS	
AS = Administrative Services Department AS [P] = Purchasing CA = City Attorney CD = Community Development Department CD [A] = Administration CD [CP] = Current Planning CD [LRP] = Long Range Planning CD [ED] = Economic Development CD [LD] = Land Development CD [RDA] = Redevelopment Agency CC = City Council CM = City Manager's Department CM [CE] = Civic Engagement CS = Community Services Department CS [CR] = Community Recreation	CS [CA] = Cultural Affairs CS [GS/AS] = Golf Services/Adult Sports CS [SS] = Social Services FD = Fire Department FD [IS] = Inspection Services HR = Human Resources Department PD = Police Department PW = Public Works Department PW [E] = Engineering PW [P] = Parks PW [MS] = Maintenance Services PW [U] = Utilities
	Short-term = 0-5 years Mid-term = 5-10 years Long-term = 10-20 years Ongoing = May require short-, mid-, and long-term action
 = Action included in the Land Use Plan of the City's Local Coastal Program	

Number	Action	Lead Entity	Timeframe
9.17	 Provide incentives to owners of eligible structures to seek historic landmark status and invest in restoration efforts.	CD [LRP]	Short-term
9.18	 Require that modifications to historically-designated buildings maintain their character.	CD [CP]	Ongoing
9.19	 For any project in a historic district or that would affect any potential historic resource or structure more than 40 years old, require an assessment of eligibility for State and federal register and landmark status and appropriate mitigation to protect the resource.	CD [CP]	Ongoing
9.20	 Seek input from the City's Historic Preservation Commission on any proposed development that may affect any designated or potential landmark.	CD [CP]	Ongoing
9.21	 Update the inventory of historic properties.	CD [LRP]	Ongoing
9.22	 Create a set of guidelines and/or policies directing staff, private property owners, developers, and the public regarding treatment of historic resources that will be readily available at the counter.	CD [LRP]	Short-term
9.23	 Complete and maintain historic resource surveys containing all the present and future components of the historic fabric within the built, natural, and cultural environments.	CD [LRP]	Ongoing
9.24	 Create a historic preservation element.	CD [LRP]	Long-term
10. OUR INVOLVED COMMUNITY			
10.1	Conduct focused outreach efforts to encourage all members of the community – including youth, seniors, special needs groups, and non-English speakers – to participate in City activities.	CM [CE]	Short-term


S U M M A R Y O F A C T I O N S



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= Action included in the Land Use Plan of the City's Local Coastal Program	

Number	Action	Lead Entity	Timeframe
10.2	Obtain public participation by seeking out citizens in their neighborhoods and gathering places such as schools, houses of worship and public spaces.	CM [CE]	Ongoing
10.3	Invite civic, neighborhood, and non-profit groups to assist with City project and program planning and implementation.	CD	Ongoing
10.4	Provide incentives for City staff to participate in community and volunteer activities.	HR	Short-term
10.5	Invite seniors to mentor youth and serve as guides at historical sites.	CS	Short-term
10.6	Offer internships in City governance, and include youth representatives on public bodies.	CS	Mid-term
10.7	Continue to offer the Ambassadors program to obtain citizens assistance with City projects.	PW	Ongoing
10.8	Utilize the City website as a key source of information and expand it to serve as a tool for civic engagement.	CM [CE]	Short-term
10.9	Publish an annual report that evaluates City performance in such areas as conservation, housing, and economic development.	CD	Mid-term
10.10	Continue to improve the user-friendliness of the media that communicate information about the City, including the website, cable channels, newsletters, kiosks, and water billing statements.	CM [CE]	Short-term
10.11	Establish a clear policy toward the scope, role, boundaries, and jurisdiction of neighborhood Community Councils citywide, with the objectives of strengthening their roles in decision-making.	CD [LRP]	Mid-term

APPENDIX A

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Number	Action	Lead Entity	Timeframe
10.12	 Establish stronger partnerships with neighborhood Community Councils to set area priorities for capital investment, community policing, City services, commercial investment, physical planning, education, and other concerns, to guide both City policies and day-to-day cooperation and problem-solving.	CD [LRP]	Ongoing
10.13	 Recognizing that neighborhood empowerment must be balanced and sustained by overall City policies and citywide vision and resources – establish a citywide Neighborhood Community Congress where local neighborhood Community Councils can collaborate and learn from each other.	CM[CE]	Mid-term
10.14	Establish clear liaison relationships to foster communication, training, and involvement efforts between the City, neighborhood Community Councils and other community partners, including the Ventura Unified School District and business, civic, cultural and religious groups.	CM [CE]	Short-term

ORDINANCE NO. 95-33

AN ORDINANCE OF THE PEOPLE OF THE CITY OF SAN BUENAVENTURA ADOPTING AN ORDINANCE AMENDING THE COMPREHENSIVE PLAN WITH RESPECT TO THE PRESERVATION OF AGRICULTURAL LANDS.

The people of the City of San Buenaventura do hereby ordain as follows:

Section 1. Findings and Purpose.

A. The protection of existing agricultural and watershed lands is of critical importance to present and future residents of the City of San Buenaventura (City of Ventura). Agriculture has been and remains the major contributor to the economy of the City and County of Ventura, creating employment for many people, directly and indirectly, and generating substantial tax revenues for the City.

B. In particular, the City of Ventura and surrounding area, with its unique combination of soils, micro-climate and hydrology, has become one of the finest growing regions in the world. Vegetable and fruit production from the County of Ventura and in particular production from the soils and silt from the Santa Clara and Ventura rivers have achieved international acclaim, enhancing the City's economy and reputation.

C. Uncontrolled urban encroachment into agricultural and watershed areas will impair agriculture and threaten the public health, safety and welfare by causing increased traffic congestion, associated air pollution, and potentially serious water problems, such as pollution, depletion, and sedimentation of available water resources. Such urban encroachment would eventually result in both the unnecessary, expensive extension of public services and facilities and inevitable conflicts between urban and agricultural uses.

D. The unique character of the City of Ventura and quality of life of City residents depend on the protection of a substantial amount of open space lands. The protection of such lands not only ensures the continued viability of agriculture, but also protects the available water supply and contributes to flood control and the protection of wildlife, environmentally sensitive areas, and irreplaceable natural resources.

E. The Resolution by which the City of Ventura adopted its Comprehensive Plan on August 28, 1989, Resolution No. 89-103, at page 4, contains in part the following “mitigation measures” in recognition of the importance of preserving agriculture resources:

“Any potential significant adverse impacts are mitigated by substantially limiting the amount of agricultural land converted from an agricultural land use designation limiting the amount of prime farmland converted, and by making the various agricultural land areas designated for potential development subject to conditions which narrowly limit the possible land use.”

F. The Comprehensive Plan sets out as Objective 4 (at II-9) the desire to:

“Continue to preserve agricultural and other open space lands within the City’s Planning Area.”

And, the Comprehensive Plan describes as the first Goal of its Resource Element (at II-3) the objective to:

“Preserve agricultural and open space lands as a desirable means of shaping the City’s internal and external form and size, and of serving the needs of residents.”

G. The purpose of this initiative is to ensure that the Goals and Objectives of the Comprehensive Plan are inviolable by transitory short-term political decisions and that agricultural, watershed and open space lands are not prematurely or unnecessarily converted to other non-agricultural or non-open space uses without public debate and a vote of the people. Accordingly, the initiative ensures that until December 31, 2030, the general plan provisions governing agricultural land use designation and intent may not be change except by vote of the people. In addition, the initiative provides that any lands designated as “Agriculture Use”, referring to both “Agricultural Use (not to be reconsidered until after the Year 2010” and Agricultural/Institutional” on the City of Ventura’s General Plan “Land Use Plan Map” adopted by the City Council by Resolution 89-103 on August 28, 1989, as amended through February 1, 1995, will remain designated as Agricultural Use until December 31, 2030, unless the land is redesignated to another land use category by vote of the people, or redesignated by the City Council for the City of San Buenaventura pursuant to the procedures set forth in this initiative.

H. This initiative allows the City Council to redesignate agriculture lands only if certain findings can be made, including (among other things) that the land is proven to be unsuitable for any form of agriculture and redesignation is necessary to avoid an unconstitutional taking of property without just compensation.

Section 2. General Plan Amendment.

The Agricultural Lands Preservation Initiative hereby reaffirms and readopts until December 31, 2030, The “Agricultural Use” designations as defined in the City of San Buenaventura Comprehensive Plan adopted August 28, 1989, as amended through February 1, 1995, at pages III-25 and III-26, with the modification that the “target date” is extended from 2010 until after December 31, 2030.

The following terminology shall replace the current “Agricultural Use” designation defined at page III-25 of The Plan:

Agricultural Use

The Agricultural Use (not to be reconsidered until after the Year 2030) category identifies those lands that are designated for agricultural use on the Land Use Plan Map.

The target date of 2030 associated with the Agricultural Use designation indicates a review date after which agriculturally designated lands may be reconsidered for urban uses. However, during the life of this plan as amended by initiative, it is intended that only agricultural uses are permitted on these lands, except as such lands may be appropriate to public open space and recreational usage. Furthermore, any updates to this Plan are not intended to imply that development would necessarily be appropriate at that time.

In addition, the initiative hereby reaffirms and readopts until December 31, 2030, the “Agricultural” designations set forth on the of the City of Ventura Comprehensive Plan “Land Use Plan Map” adopted by the City Council on August 28, 1989, as amended through February 1, 1995, which map is incorporated herein by reference, modified, as appropriate, to delete the reference year 2010 and replace it with the reference year 2030.

Finally, the text of the Amendment Procedures of the City of Ventura Comprehensive Plan adopted August 28, 1989, as amended through February 1, 1995, (at XI-I) shall be amended to add a new subsection which provides:

Limitation on General Plan Amendments Relating to “Agricultural Use”

- a) Until December 31, 2030, the provisions and designations governing the intent for lands designated “Agricultural Use” of the Land Use Element and Resource Element adopted on August 28, 1989, as amended through February 1, 1995, shall not be amended unless such amendment is approved by vote of the people.
- b) All those lands designated as “Agricultural Use” in the City of Ventura Comprehensive Plan “Land Use Plan Map” adopted by the City Council on August 28, 1989 as amended through February 1, 1995, shall remain so designated until December 31, 2030 unless redesignated to another general plan land use category by vote of the people, or redesignated by the City Council pursuant to the procedures set forth in subsections c) or d), below.
- c) Except as provided in subsection d), below, land designated as “Agricultural Use” may be redesignated by the City Council to a land use other than “Agricultural Use” as defined by the Comprehensive Plan adopted by the City Council on August 28, 1989, as amended through February 1, 1995, only if the City Council makes all of the following findings supported by the evidence:
 - i) The land is immediately adjacent to areas developed in a manner comparable to the proposed use;
 - ii) Adequate public services and facilities are available and have the capacity and capability to accommodate the proposed use;
 - iii) The proposed use is compatible with agricultural uses, does not interfere with accepted agricultural practices, and does not adversely affect the stability of land use patterns in the area;
 - iv) The land proposed for redesignation has not been used for agricultural purposes in the past 2 years and is unusable for agriculture due to its topography, drainage, flooding, adverse soil conditions or other physical reasons; and

- v) The land proposed for redesignation pursuant to this subsection (c) does not exceed 40 acres for any one landowner in any calendar year, and one landowner may not obtain redesignation in the Comprehensive Plan of “Agricultural Use” land pursuant to this subsection (c) more often than every other year. Landowners with any unity of interest are considered one landowner for purposes of this limitation.
- d) Land designated as “Agricultural Use” on the Land Use Plan Map may be redesignated to another land use category by the City Council if each of the following conditions are satisfied:
 - i) The City Council makes a finding that the application of the provisions of Section 2 (a) would constitute an unconstitutional taking of the landowners’ property; and
 - ii) In permitting the redesignation, the City Council allows additional land uses only to the extent necessary to avoid said unconstitutional taking of the landowner’s property.
- e) Approval by a vote of the people is accomplished when a Comprehensive Plan amendment is placed on the ballot through any procedure provided for in the Election Code, and a majority of the voters vote in favor of it. Whenever the City Council adopts an amendment requiring approval by a vote of the people pursuant to the provisions of this subsection, the City Council’s action shall have no effect until after such a vote is held and a majority of the voters vote in favor of it. The City Council shall follow the provisions of the Election Code in all matters pertaining to such an election.

Section 3. Implementation.

A. Upon the effective date of this initiative, the initiative shall be deemed inserted in the City of Ventura’s Comprehensive Plan as an amendment thereof; except, that if the four amendments of the mandatory elements of the general plan permitted by state law for any given calendar year have already been utilized in 1995, prior to the effective date of this initiative, this Comprehensive Plan amendment shall be deemed inserted in the City’s General Plan on January 1, 1996. At such time as this Comprehensive Plan amendment is deemed inserted in the City’s Comprehensive Plan (hereinafter, the “insertion date”) any provisions of the City’s Zoning Ordinance inconsistent with that amendment shall not be enforced to the extent of the inconsistency. Within 180 days of the insertion date, the City shall complete

such revisions of its Comprehensive Plan, including, but not limited to, the Comprehensive Plan Land Use Plan Map adopted by the City Council on August 28, 1989, (as amended through February 1, 1995) and accompanying test, as are necessary to achieve consistency with all provisions of this initiative. Also, within 180 days of the insertion date, the City Council shall complete such revisions of its Zoning Ordinance and other land use regulations as are necessary to conform to and be consistent with all provisions of this initiative.

B. The provisions of this initiative shall prevail over any revisions to the City of Ventura's Comprehensive Plan as amended through February 1, 1995, or to the City of Ventura's Land Use Plan Map as amended through February 1, 1995 which conflict with the initiative. Except as provided in Section 4 below, upon the specific plans, tentative or final subdivision maps, parcel maps, conditional use permits, building permits or other ministerial or discretionary entitlements for use not yet approved or issued shall not be approved or issued unless consistent with the policies and provisions of this initiative.

Section 4. Exemptions for Certain Projects.

This initiative shall not apply to or affect any property owner whose property has acquired any of the following prior to its effective date:

- A. A vested right pursuant to state law;
- B. A validly approved and fully executed development agreement with the City; or
- C. Approval of a vesting tentative map.

Section 5. Severability.

If any portion of this initiative is declared invalid by a court, the remaining portions are to be considered valid.

Section 6. Amendment or Repeal.

This initiative may be amended or repealed only by the voters at a general election.

STATE OF CALIFORNIA)
COUNTY OF VENTURA) ss
CITY OF SAN BUENAVENTURA)

I, BARBARA J. KAM, City Clerk of the City of San Buenaventura, California, do hereby certify that the foregoing Ordinance was adopted by the voters of the City of San Buenaventura at the General Municipal Election held on November 7, 1995 and subsequently declared adopted by the City Council of the City of San Buenaventura on November 27, 1995. The Ordinance shall take effect December 7, 1995. This ordinance shall not be repealed or amended except by a vote of the people, unless provision is otherwise made in the original ordinance.

Dated this 30th day of November, 1995.

Barbara J. Kam, CMC
City Clerk

Ventura Hillside Voter Participation Measure

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This measure shall be known as the Ventura Hillside Voter Participation Measure.

Section 2. Purpose

The overall purpose of this measure is to allow City voters to participate in the review process relating to non-exempt development projects that may be proposed in a certain portion of the “Hillside Area” of the City as defined in the City’s Comprehensive Plan Update to the Year 2010 (hereafter the “Comprehensive Plan”). The portion of the Hillside Area under consideration lies generally north of the City, constitutes an area approximately 9108 acres in size, and is further depicted as the “Hillside Voter Participation Area” indicated in Exhibit “A” attached hereto and made a part hereof. The proposed Hillside Voter Participation Area (also referred to from time to time hereafter as “HVP Area” or “HVPA”) is outside the Ventura City limits, but it is within the “Planning Area” of the City of San Buenaventura as further indicated on Exhibit “A.” The Comprehensive Plan Land Use Map currently designates the properties within the proposed Hillside Voter Participation Area as “Hillside Planned Residential” or “HPR” rather than “Agricultural” and, therefore, these properties are not subject to the Save Our Agricultural Resources (“SOAR”) Initiative adopted by the voters in 1995.

In the recent past, some property owners within the proposed Hillside Voter Participation Area have publicly presented initial proposals to develop those properties with a combination of residential uses and open space and recreational areas proposed to include, among other things, hiking and equestrian trails for use by the public. In the course of public meetings and informational workshops discussing these proposals, it has become apparent that there is a high level of public concern over potential issues of scenic resource protection, open space and recreational opportunities, infrastructure needs, traffic circulation, and other development-related issues arising from any proposed changes in the use of this important part of the City’s Planning Area. This measure, in recognition of this heightened public concern, is intended to provide the electorate of the City of San Buenaventura with an opportunity to vote on the approval of any such development proposals or any similar proposals to extend urban services to the Hillside Voter Participation Area or develop property in the Hillside Voter Participation Area with urbanized land uses.

More particularly, this measure proposes to amend the Comprehensive Plan of the City of San Buenaventura by adding a requirement that approvals for extensions of “urban services” (defined in the City’s Hillside Management Program as the provision of domestic water and sewers) or any proposed “urbanized uses of land” (as defined herein) in the Hillside Voter Participation Area cannot be granted without prior approval by a majority vote of the electorate.

Section 3. Comprehensive Plan Amendment

The following text shall be inserted into the Land Use Element of the Comprehensive Plan at page 111-8 thereof:

Hillside Voter Participation Area

The electorate of the City of Ventura has adopted a Hillside Voter Participation Area (Ventura HVP Area). Its purpose, principles, implementation procedures, and methodologies for amendment are set forth in this Comprehensive Plan amendment.

A. PURPOSE

The City of Ventura Hillside Area, with its unique topography, viewsheds, watershed lands; its unique microclimate and hydrology, and its diversity of plant and wildlife resources, is one of the finest scenic resources in the Southern California region. The Comprehensive Plan recognizes the unique and important qualities and potential of the Hillside Area in, among other provisions, the declaration of specialized Objectives and Policies for the Hillside Area in the Resources Element of the Plan and the Plan’s requirements for continuing operation of, and compliance with, the City’s Hillside Management Program.

This Comprehensive Plan amendment is intended to provide for an increased level of public awareness and participation in the development review process applicable to that portion of the Hillside Area described and depicted in Exhibit “A” as the “Hillside Voter Participation Area.” It is further intended to provide assurance to the public that any proposed development in the Hillside Voter Participation Area appropriately takes into account the Area’s unique combination of viewshed, watershed, open space, scenic area, and environmentally sensitive habitat, and that agricultural, viewshed, watershed, and open space lands in the Hillside Voter Participation Area are not converted to urban or other non-open space uses without public discussion and a vote of the people. Increasing citizen participation in the development review process through the establishment of a Hillside Voter Participation Area enhances the City’s sense of community, allows for development unique to the City of Ventura, and promotes the efficient use of the City’s infrastructure.

More specifically, this Comprehensive Plan amendment is intended to provide an opportunity for the public to be involved in insuring that any development projects proposed in the Hillside Voter Participation Area, shall, at a minimum:

1. Maintain the scenic character of the hillsides in areas of future development, by preserving significant natural landmarks and scenic ridgelines and slopes.
2. Provide increased recreational opportunities for existing and future hillside and other City residents, by improving access to existing parks and establishing additional parks or open, non-developed areas in conjunction with future hillside development.
3. Maximize public access to hillside open space and recreation areas, by establishing a system of linear parks and hiking trails along scenic ridges and barrancas.
4. Minimize the impact of hillside development on sensitive natural habitats and historical or archaeological resources.

B. PRINCIPLES

Inappropriate urban encroachment into Hillside open space, viewshed, watershed, scenic areas, and biological resource areas would have the potential to impact sensitive environmental areas, unwarrantedly intrude on open space, diminish the quality of life and threaten the public health, safety and welfare by leading to increased traffic congestion, associated air pollution, erosion, alteration of sensitive lands in watershed areas and causing potentially serious water problems, such as pollution, depletion and sedimentation of available water resources not only for the City of Ventura, but for its jurisdictional neighbors. Inappropriate urban encroachment could further result in the unwarranted extension of public services and facilities into sensitive areas.

The unique character of the City of Ventura and quality of life of City residents depends on the appropriate protection of the Hillside Area's substantial amount of open space, viewshed, watershed, scenic resources, and biological resources. The increased public awareness and involvement in the fate of such lands through the implementation of this Comprehensive Plan amendment will provide the public a special opportunity to assure that future generations of Ventura citizens will not be deprived of the benefits of access to a viable water supply, flood and erosion control, protection of viewsheds, wildlife, environmentally sensitive areas, open space and recreational areas, and irreplaceable natural resources.

C. IMPLEMENTATION

(1) There is hereby established a Ventura Hillside Voter Participation Area (Ventura HVP Area). The Ventura HVP Area is that portion of the Hillside Area delineated and depicted in Exhibit “A” of this Comprehensive Plan amendment (hereafter, the “HVP Area Map”). As shown on the HVP Area Map, the southern boundary of the HVP Area generally follows the northern segment of the City’s incorporated limit as established by the Local Agency Formation Commission for the City of Ventura, except as the HVP boundary line runs northerly of some small residential lots on or near Foothill Road west of Arroyo Verde Park as further depicted on Exhibit “A.” East of Harmon Barranca, the HVP Area boundary generally follows the alignment of Foothill Road eastward to the boundary of the City’s Planning Area. The northerly boundary of the HVP Area continues, generally, as the northern boundary of the City’s Planning Area. The westerly boundary of the HVP Area alternately follows the City limit boundary or Sphere of Influence boundary easterly of the North Avenue area. The foregoing narrative description is intended to be general in nature and all of the foregoing is more particularly depicted and described in Exhibit “A’

Insofar as the HVP Area boundary described and depicted in this Comprehensive Plan amendment, including Exhibit “A” hereto, is said or shown to be coterminous with either the City’s incorporated limit or the City’s Sphere of Influence boundary, or with the boundary of the City’s Planning Area, such references are intended to be, and shall be construed to be, the location of the City limit boundary or Sphere of Influence boundary or boundary of the City’s Planning Area. as applicable, as each of those boundaries are established for the City of Ventura as of January 1, 2001. Although the HVP Area boundary is established, in part, in generally the same location as the City limit boundary, or in some instances, the Sphere of Influence boundary, the establishment of the HVP Area boundary is not intended to and shall in no way inhibit the Local Agency Formation Commission from changing or altering the City limit boundary or Sphere of Influence boundary in accordance with State law. The boundary of the HVP Area, although incidentally coterminous as of one point in time with the City limit boundary or Sphere of Influence boundary or boundary of the City’s Planning Area, is independent from these boundaries in legal significance and purpose. While the City limit boundary or Sphere of Influence boundary may be, from time to time, altered by the Local Agency Formation Commission, or the boundary of the City’s Planning Area may be changed, the HVP Area boundary shall not be changed except as provided herein.

(2) Until December 31, 2030, the City of Ventura shall not extend urban services into, and shall not authorize urbanized uses of land within, the Ventura Hillside Voter Participation Area unless otherwise authorized by a vote of the people, except for the purpose of construction of public potable water facilities, public parks or other city government facilities or as otherwise provided or excepted herein. Upon the effective date of this Hillside Voter Participation Area Comprehensive

Plan amendment, the City and its departments, boards, commissions, officers and employees shall not grant, or by inaction allow to be approved by operation of law, any Comprehensive Plan amendment, rezoning, specific plan, subdivision map, conditional use permit, building permit or any other ministerial or discretionary entitlement, which is inconsistent with the purposes of this Comprehensive Plan amendment, unless in accordance with the amendment procedures of Section 4 of this Comprehensive Plan amendment.

(3) "Urbanized uses of land" shall mean any development that would require the establishment of new community sewer systems or the significant expansion of existing community sewer systems; or, would result in the creation of residential densities greater than one primary residential unit per 40 acres in area; or, would result in the establishment of commercial or industrial uses that are neither agriculturally-related nor related to the production of mineral resources.

(4) The Land Use Map is amended to reflect the existence of the Ventura Hillside Voter Participation Area as generally described in paragraph (1) above and as depicted in Exhibit "A," attached hereto.

(5) The Hillside Voter Participation Area, as defined herein, may not be amended, altered, revoked or otherwise changed prior to December 31, 2030, except by vote of the people or by the City Council pursuant to the procedures set forth in Section 4 of this Comprehensive Plan amendment. For purposes of this Ordinance, approval by a vote of the people is accomplished when a Comprehensive Plan amendment is placed on the ballot through any procedure provided for in the Election Code, and a majority of the voters vote in favor of it. Whenever the City Council adopts an amendment requiring approval by a vote of the people pursuant to the provisions of this subsection, the City Council's action shall have no effect until after such a vote is held and a majority of the voters vote in favor of it. The City Council shall follow the provisions of the Election Code in all matters pertaining to such an election.

Section 4. Changes to Area: Procedures.

Until December 31, 2030, the foregoing Purposes, Principles and Implementation provisions of this Comprehensive Plan amendment, and the Hillside Voter Participation Area may be amended only by a vote of the people commenced pursuant to the initiative process by the public, or pursuant to the procedures set forth below:

A. The City Council may amend the boundary of the Hillside Voter Participation Area depicted on Exhibit "A" if it finds such amendment to be in the public interest, provided that the amended boundary enlarges said Hillside Voter Participation Area established by this Comprehensive Plan amendment.

B. The City Council, following at least one public hearing for presentation by an applicant and the public, and after compliance with the California Environmental Quality Act, may amend the Hillside Voter Participation Area described herein, based on substantial evidence in the record, if the City Council makes each of the following findings:

- (1) Application of the provisions of subsections (A) or (B) of the amendment procedures set forth in this Section 4 are unworkable and failure to amend the Hillside Voter Participation Area would constitute an unconstitutional taking of a landowner's property for which compensation would be required or would deprive the landowner of a vested right; and
- (2) The amendment and associated land use designations will allow additional land uses only to the minimum extent necessary to avoid said unconstitutional taking of the landowner's property or to give effect to the vested right.

C. The City Council, following at least one public hearing for presentations by an applicant and the public, and after compliance with the California Environmental Quality Act, may place any amendment to the Hillside Voter Participation Area or the provisions of this Comprehensive Plan amendment on the ballot pursuant to the mechanisms provided by state law.

D. The Comprehensive Plan may be reorganized and individual provisions, including the provisions of this ordinance, maybe renumbered or reordered in the course of ongoing updates of the Comprehensive Plan in accordance with the requirements of state law.

Section 5. No Changes to Save Our Agricultural Resources Initiative

Any restrictions imposed upon the City of San Buenaventura limiting the City's ability to redesignate, or allow development of, property designated "Agricultural" that are in effect as a result of the "SOAR" initiative approved by the voters in 1995 and adopted by the City Council as Ordinance No. 95-33 shall remain in full force and effect and shall not be amended, modified, altered, or abridged by the adoption of this ordinance.

Section 6. Exemptions:

The provisions of this ordinance do not apply to:

A. Construction or reconstruction of, or related to, public potable water facilities, public parks or other city government facilities; or

B. Construction or reconstruction of no more than one residential dwelling unit, and incidental uses or structures related thereto, on an individual parcel of land that is lawfully established of record as of the effective date of this Comprehensive Plan amendment and that is contiguous to the City's incorporation boundary but only to the extent that such a legally established parcel is developed with, or proposed to be developed with, no more than one residential dwelling unit; or

C. Any development that would result in the creation of residential densities equal to or less than one primary residential unit per 40 acres in area; or, would result in the establishment of commercial or industrial uses that are agriculturally-related or related to the production of mineral resources; or

D. Any development project that has obtained, as of the effective date of this Comprehensive Plan amendment, a vested right pursuant to state or local law; or

E. Uses that are "incidental" (as the City's Zoning Ordinance defines "incidental uses") to uses lawfully established as of the effective date of this Comprehensive Plan amendment.

Section 7. Interpretation

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this measure shall be interpreted by the City and others in a manner that promotes public participation in decision-making relating to future development proposals within in the Hillside Voter Participation Area.

Section 8. Insertion Date

A. Upon the effective date of this ordinance, Sections 3, 4, 5, 6, and 7 of this ordinance shall be deemed inserted in the Comprehensive Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until it can be carried out by the staff of the City of San Buenaventura.

B. The Comprehensive Plan in effect at the time the City Council decided to place this measure on the ballot, and the Comprehensive Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura. In order to ensure that the Comprehensive Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the Comprehensive Plan that is adopted between July 23, 2001 and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 9. Amendment or Repeal

This ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law, except as expressly provided by Section 4 herein.

V E N T U R A C O M M U N I T Y P A R K S O A R A M E N D M E N T

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This measure shall be known as the Ventura Community Park SOAR Amendment.

Section 2. Purpose

The purpose of this measure is to allow the City to develop a Community Park on a parcel of property located at the northwest corner of the intersection of Kimball Road and Telephone Road. The subject property, which is approximately 100 acres in size, is further described in Exhibit "A," attached hereto and made a part hereof, and is hereafter referred to as the "Property." Most of the Property is outside the Ventura City limits but within the "Planning Area" of the City of San Buenaventura and therefore covered by the City's Comprehensive Plan Update to the Year 2010 (hereafter the "Comprehensive Plan"). The Property is currently designated "Agricultural" under the Comprehensive Plan and, therefore, also subject to the 1995 Save Our Agricultural Resources ("SOAR") Initiative.

The City is proposing to develop the Property with community-oriented public park facilities that may include, among other things, athletic fields, an aquatic facility, a community center and other related buildings and structures for use by the public. If this measure is approved, the City may also construct and operate a fire station on a portion of the Property.

This initiative proposes to amend the Comprehensive Plan of the City of San Buenaventura, by changing the designation of the Property in the Comprehensive Plan Land Use Plan Map from "Agricultural" (or "A") to "Parks" (or "P"). This will allow the City of San Buenaventura to potentially develop the Property with a Community Park without being restricted by the SOAR Initiative.

Section 3. Comprehensive Plan Amendment

Part A.

The following paragraph titled “Parks Uses” is hereby added to the Land Use Element of the Comprehensive Plan, more particularly, to the provisions of the Serra Community Intent and Rationale Statement on page III-96, to read as follows:

“Parks Uses: The Parks Land Use Plan designation is applied to an approximately 100-acre site at the northwest corner of Kimball Road and Telephone Road for the purpose of developing a multi-purpose community-oriented public park on this site. It is further intended that this site should be zoned to the “P” (Parks) zone if and when it is annexed to the City. Design Review should be carried out by the City's Planning Commission prior to the development of any Recreation Services use types on the site to assure that the range of community park uses potentially permitted on the site by the "P" zone are well integrated on the site and compatible with adjacent land uses.”

Part B.

The Property is deleted from the discussion of “Agricultural Uses” in the Serra Community provisions of the Land Use Element of the Comprehensive Plan. To that end, the final paragraph with the heading “Agricultural Use” beginning at the bottom of page III-95 and ending at the top of page III-96 is hereby revised to read as follows:

“Agricultural Use: A 297-acre area between Telephone Road and the Southern Pacific Railroad and a 172-acre area between Bristol Road and the Santa Clara River are designated Agricultural Use, not to be reconsidered until after the Year 2010, to preserve their existing agricultural character.”

Part C.

The Land Use Plan Map incorporated in the Comprehensive Plan is hereby amended, and official copies thereof shall be revised by City staff, to reflect the foregoing amendments to the text of the Land Use Element.

Section 4. Zoning

Upon annexation to the City of San Buenaventura, the zoning classification for the Property shall be “P” (Parks) and the Official Zoning District Map incorporated in the Zoning Ordinance shall, by this Measure, be amended, and official copies thereof shall be revised by City staff, to reflect the foregoing zone change to the Property.

Section 5. Save Open-Space and Agricultural Resources

Any restrictions imposed upon the City of San Buenaventura limiting the City’s ability to redesignate, or allow development of, property designated “Agricultural” that are in effect on the day that this Initiative is approved by the voters shall remain in full force and effect except as to the Property. The City of San Buenaventura may allow development of a community park on the Property in accordance with this ordinance.

Section 6. Interpretation

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this ordinance shall be interpreted by the City of San Buenaventura and others in a manner that facilitates the development of a community park on the Property in accordance with the purposes of this ordinance.

Section 7. Insertion Date

Part A. Upon the effective date of this ordinance, Part A and Part B of Section 3 of this ordinance shall be deemed inserted in the Comprehensive Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until it can be carried out by the staff of the City of San Buenaventura.

Part B. The Comprehensive Plan in effect at the time the City Council decided to place this measure on the ballot, and the Comprehensive Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura.

V E N T U R A C O M M U N I T Y P A R K S O A R A M E N D M E N T

In order to ensure that the Comprehensive Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the Comprehensive Plan that is adopted between [the date the City Council decided to place this measure on the ballot] and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 8. Amendment or Repeal

Section 3 and Section 4 of this ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law.

The people of the City of San Buenaventura do ordain as follows:

Section 1. Title

This ordinance shall be known as the First Assembly of God Land Initiative.

Section 2. Purpose

The purpose of this ordinance is to allow the First Assembly of God (hereafter “Church”) to develop a property located at the northwest corner of the intersection of Montgomery Avenue and Northbank Drive. Such property is 25.59 acres and is further described in Exhibit A, attached hereto and made a part hereof, and is hereafter referred to as “Property”. The Church wishes to develop the Property in accordance with City of San Buenaventura Ordinance No 95-33 (commonly known as “SOAR”) guidelines for a sanctuary, related Church buildings, and athletic fields for use by the community of San Buenaventura.

Since the Property is within the sphere of influence of the City of San Buenaventura, this ordinance (1) amends the Comprehensive Plan Update to the Year 2010 (hereafter the “General Plan”) of the City of San Buenaventura, and (2) rezones the Property to the R-1 Single Family zone with a subzone of R-1-1AC. This will allow the City of San Buenaventura to annex the Property with a restricted land use that is compatible with the Church’s development of the Property.

Section 3. General Plan Amendment

Part A.

The second paragraph under the heading “Residential Uses” appearing on page III-94 of the General Plan describes the areas that may be used for low-density, single family homes in the Serra Community area of the City of San Buenaventura. The single family use (designated as SF in the General Plan) is the most restrictive land use that will allow the Church to build a sanctuary, related church buildings, and athletic fields. Section 4 of this initiative will further restrict the Property by pre-zoning the Property and requiring a minimum of one acre for each parcel. This will make the Property unattractive for single family development but still acceptable for the Church sanctuary, related Church buildings, and athletic fields. This ordinance adds the Church’s 25.59 acre parcel to the SF land use.

The second paragraph under the heading “Residential Uses” appearing on page III-94 of the General Plan is hereby amended to read as follows:

“The SF category is applied to an approximately 3-acre site at the southeast corner of Henderson and Petit Avenue, a 1.7-acre site southerly of Darling Road extended, and a 25.59-acre site located at the northwest corner of Montgomery Avenue and Northbank Drive.”

Part B.

The final paragraph with the heading “Agricultural Use” beginning at the bottom of page III-95 and ending at the top of page III-96 of the General Plan describes that portion of the Serra Community area of the City of San Buenaventura which may only be used for agricultural uses. This ordinance deletes the Church’s 25.59 acre parcel from the agricultural use category.

The final paragraph with the heading “Agricultural Use” beginning at the bottom of page III-95 and ending at the top of page III-96 of the General Plan is hereby amended to read as follows:

“Agricultural Use: A 100-acre site at the northwest corner of Kimball Road and Telephone, a 297-acre area between Telephone Road and the Southern Pacific Railroad except for the 25.59-acre site located at the northwest corner of Montgomery Avenue and Northbank Drive, and a 172-acre area between Bristol Road and the Santa Clara River are designated Agricultural Use, not to be reconsidered until after the Year 2010, to preserve their existing agricultural character.”

Part C.

The map of the Land Use Plan contained in the General Plan shall be redrafted to reflect the foregoing amendments.

Section 4. Zoning

The most restrictive zoning in the City of San Buenaventura which will allow the Church to build a sanctuary, related Church buildings, and athletic fields on the Property is an R-1 Single Family zone with a subzone of R-1-1AC. The R-1-1AC subzone restricts the Property by requiring a minimum of one acre for each parcel. This will make the Property unattractive for single family development but still acceptable for the Church's sanctuary, related Church buildings, and athletic fields.

Therefore, upon annexation of the Property to the City of San Buenaventura the zoning designation for the Property shall be the R-1 Single Family zone with a subzone of R-1-1AC.

Section 5. Save Open-Space and Agricultural Resources

Any restrictions imposed upon the City of San Buenaventura limiting the City's ability to annex property and allow development of such property shall remain in full force and effect except as to the 25.59-acres of the Property.

Section 6. Construction

This ordinance shall be broadly construed in order to achieve the purposes stated in this ordinance. It is the intent of the voters that the provisions of this ordinance shall be interpreted by the City of San Buenaventura and others in a manner that facilitates the development of the Property in accordance with the purposes of this ordinance.

Section 7. Insertion Date

Part A. Upon the effective date of this ordinance, Part A and Part B of Section 3 of this ordinance shall be deemed inserted in the General Plan and the Land Use Map referred to in Part C of Section 3 shall be deemed amended even though the reprinting may not occur until deemed convenient by the City of San Buenaventura.

Part B. The General Plan in effect at the time the Notice of Intention to circulate this initiative was submitted to the City Clerk of the City of San Buenaventura, and the General Plan as amended by this ordinance, comprise an integrated, internally consistent and compatible statement of policies for the City of San Buenaventura. In order to ensure that the General Plan remains an integrated, internally consistent and compatible statement of policies and to ensure that the actions of the voters in enacting this ordinance are given effect, any provision of the General Plan that is adopted between the Notice of Intention and the effective date of this ordinance, to the extent that such provision is inconsistent with this ordinance, shall be amended as soon as possible and in the manner and time required by state law to ensure consistency between such provision and Section 3 of this ordinance. In the alternative, such interim-enacted inconsistent provisions shall be repealed.

Section 8. Amendment or Repeal

Section 3 and Section 4 of this ordinance may be amended or repealed only by the voters of the City of San Buenaventura at an election held in accordance with state law.

EXHIBIT "A"

PARCEL 1:

That portion of Subdivision 98 of Rancho Santa Paula y Saticoy, in the county of Ventura, state of California, as per map recorded in book "A" pag3 290 of Miscellaneous Records (Transcribed Records from Santa Barbara County), in the office of the county recorder of said county, described as follows:

Beginning at the point of intersection of the centerline of the right of way of the Southern Pacific Railroad and the boundary line between Subdivisions 98 and 99 of said Rancho Santa Paula y Saticoy; thence from said point of beginning,

1st: - North 10° 30' West 9.482 chains, more or less, to the southeast corner of that certain Parcel of land conveyed to Charles H. Fowler, by deed dated March 18, 1892, recorded in book 36 page 86 of Deeds; thence,

2nd: - South 79° 30' West 19.25 chains, along the south line of said lands of Charles H. Fowler, to the northeast corner of that certain Parcel of land as conveyed to Emma J. Tyler, by deed dated June 20, 1894, recorded in book 43 page 90 of Deeds; thence,

3rd: - South 10° 30' East 18.982 chains, more or less, along the east line of said lands of Emma J. Tyler, to a point in the centerline of the right of way of the Southern Pacific Railroad; thence along same,

4th: - North 53° 15' East 22.57 chains, more or less, to the point of beginning.

EXCEPT a strip of parcel of land 50 feet wide lying adjoining and immediately west of the east line of the above described land, conveyed to the County of Ventura, as a public highway, by deed recorded July 12, 1889, in book 28 page 338 of Deeds.

ALSO EXCEPT that portion thereof conveyed to the Southern Pacific Railroad Company by deed recorded January 27, 1887 in book 18 page 146 of Deeds.

RESERVING unto the grantor herein, all oil, gas and mineral rights in and to said land, without however, any right of surface entry in and to a depth of 500 feet.

PARCEL 3:

That certain parcel in Lot 99 of the Rancho Santa Paula y Saticoy, marked "not a part of this subdivision" on the map of Tract No. 1333-1, in the City of San Buenaventura, county of Ventura, state of California, as per map recorded in book 30 page 51 of Maps, in the office of the county recorder of said county, and lying northwesterly of the Southern Pacific Railroad right of way, easterly of Bristol Road and southwesterly of Montgomery Avenue, as shown on said map.

RESERVING unto the grantor herein, all oil, gas and mineral rights in and to said land, without however, any right of surface entry in and to a depth of 500 feet from the surface thereof.



"The desire for community is a constant of human nature."

— Steven Price
Urban Advantage
Berkeley, California

CITY OF
VENTURA

A T T A C H M E N T S

ventura's general plan

21ST CENTURY TOOL KIT

Prelude

The 2005 Ventura General Plan envisions a new direction to protect and preserve its citizens' quality of life. This direction is based on the recognition that zoning and land development, as practiced for the past several decades, has not served our citizens, our city, or our environment as well as it should.

Currently, the two most successful movements created to alleviate this situation are "Smart Growth" and "New Urbanism." Smart Growth is a government initiated approach against sprawl that addresses underlying policy from the top-down, and is primarily marketed by government and similar agencies. New Urbanism is a grass roots, market response to outdated zoning and land use policy as it impacts development and the physical properties of the public realm. Its chief advocates are architects and town designers.

Smart Growth grew out of early New Urbanist work, and both are concerned with the real outcomes of the built environment and how it affects communities environmentally, economically, culturally, and socially.

The Ahwahnee Principles and the Charter for the New Urbanism, listed below, were created early on as "constitutions" that governed these movements. Both are valuable tools that Ventura would be wise to include in its 21st Century Tool Kit to understand and solve long-standing problems associated with growth and change.

AHWAHNEE PRINCIPLES**Preamble:**

Existing patterns of urban and suburban development seriously impair our quality of life. The symptoms are: more congestion and air pollution resulting from our increased dependence on automobiles, the loss of precious open space, the need for costly improvements to roads and public services, the inequitable distribution of economic resources, and the loss of a sense of community. By drawing upon the best from the past and the present, we can plan communities that will more successfully serve the needs of those who live and work within them. Such planning should adhere to certain fundamental principles.

Community Principles

1. All planning should be in the form of complete and integrated communities containing housing, shops, work places, schools, parks and civic facilities essential to the daily life of the residents.

2. Community size should be designed so that housing, jobs, daily needs and other activities are within easy walking distance of each other.
3. As many activities as possible should be located within easy walking distance of transit stops.
4. A community should contain a diversity of housing types to enable citizens from a wide range of economic levels and age groups to live within its boundaries.
5. Businesses within the community should provide a range of job types for the community's residents.
6. The location and character of the community should be consistent with a larger transit network.
7. The community should have a center focus that combines commercial, civic, cultural and recreational uses.
8. The community should contain an ample supply of specialized open space in the form of squares, greens and parks whose frequent use is encouraged through placement and design.
9. Public spaces should be designed to encourage the attention and presence of people at all hours of the day and night.
10. Each community or cluster of communities should have a well-defined edge, such as agricultural greenbelts or wildlife corridors, permanently protected from development.
11. Streets, pedestrian paths and bike paths should contribute to a system of fully-connected and interesting routes to all destinations. Their design should encourage pedestrian and bicycle use by being small and spatially defined by buildings, trees and lighting; and by discouraging high speed traffic.
12. Wherever possible, the natural terrain, drainage and vegetation of the community should be preserved with superior examples contained within parks or greenbelts.
13. The community design should help conserve resources and minimize waste.
14. Communities should provide for the efficient use of water through the use of natural drainage, drought tolerant landscaping and recycling.
15. The street orientation, the placement of buildings and the use of shading should contribute to the energy efficiency of the community.

Regional Principles

1. The regional land-use planning structure should be integrated within a larger transportation network built around transit rather than freeways.
2. Regions should be bounded by and provide a continuous system of greenbelt/wildlife corridors to be determined by natural conditions.
3. Regional institutions and services (government, stadiums, museums, etc.) should be located in the urban core.
4. Materials and methods of construction should be specific to the region, exhibiting a continuity of history and culture and compatibility with the climate to encourage the development of local character and community identity.

Implementation Principles

1. The general plan should be updated to incorporate the above principles.
2. Rather than allowing developer-initiated, piecemeal development, local governments should take charge of the planning process. General plans should designate where new growth, infill or redevelopment will be allowed to occur.

3. Prior to any development, a specific plan should be prepared based on these planning principles.
4. Plans should be developed through an open process and participants in the process should be provided visual models of all planning proposals.

CONGRESS FOR THE NEW URBANISM

THE CONGRESS FOR THE NEW URBANISM views disinvestment in central cities, the spread of placeless sprawl, increasing separation by race and income, environmental deterioration, loss of agricultural lands and wilderness, and the erosion of society's built heritage as one interrelated community building challenge.

WE STAND for the restoration of existing urban centers and towns within coherent metropolitan regions, the reconfiguration of sprawling suburbs into communities of real neighborhoods and diverse districts, the conservation of natural environments, and the preservation of our built legacy.

WE RECOGNIZE that physical solutions by themselves will not solve social and economic problems, but neither can economic vitality, community stability, and environmental health be sustained without a coherent supportive physical framework.

WE ADVOCATE the restructuring of public policy and development practices to support the following principles: neighborhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.

WE REPRESENT a broad-based citizenry, composed of public and private sector leaders, community activists, and multidisciplinary professionals. We are committed to reestablishing the relationship between the art of building and the making of community, through citizen-based participatory planning and design.

WE DEDICATE ourselves to reclaiming our homes, blocks, streets, parks, neighborhoods, districts, towns, cities, regions, and environment.

We assert the following principles to guide public policy, development practice, urban planning, and design:

The region: Metropolis, city, and town

1. Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made of multiple centers that are cities, towns, and villages, each with its own identifiable center and edges.
2. The metropolitan region is a fundamental economic unit of the contemporary world. Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.
3. The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. Farmland and nature are as important to the metropolis as the garden is to the house.
4. Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric, while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.
5. Where appropriate, new development contiguous to urban boundaries should be organized as neighborhoods and districts, and be integrated with the existing urban pattern. Noncontiguous development should be organized as towns and villages with their own urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.
6. The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.
7. Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributed throughout the region to match job opportunities and to avoid concentrations of poverty.
8. The physical organization of the region should be supported by a framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the region while reducing dependence upon the automobile.
9. Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

The neighborhood, the district, and the corridor

1. The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.
2. Neighborhoods should be compact, pedestrian-friendly, and mixed-use. Districts generally emphasize a special single use, and should follow the principles of neighborhood design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways.
3. Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.
4. Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.
5. Transit corridors, when properly planned and coordinated, can help organize metropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers.
6. Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to become a viable alternative to the automobile.
7. Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods, and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.
8. The economic health and harmonious evolution of neighborhoods, districts, and corridors can be improved through graphic urban design codes that serve as predictable guides for change.
9. A range of parks, from tot-lots and village greens to ball fields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighborhoods and districts.

The block, the street, and the building

1. A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.
2. Individual architectural projects should be seamlessly linked to their surroundings. This issue transcends style.
3. The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.
4. In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.
5. Streets and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.
6. Architecture and landscape design should grow from local climate, topography, history, and building practice.
7. Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.
8. All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.
9. Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.

Congress of the New Urbanism, 140 S. Dearborn St., Suite 310, Chicago, IL, 60603, (312) 551-7300
For information, visit www.cnu.org

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GLOSSARY OF TERMS IN THE 2005 VENTURA GENERAL PLAN

Abbreviations

ADT: Average number of vehicle trips per day
 CEQA: California Environmental Quality Act
 CIP: Capital Improvements Program
 CNEL: Community Noise Equivalent Level
 dB: Decibel
 DOF: California Department of Finance
 EIR: Environmental Impact Report
 FAR: Floor Area Ratio
 FEMA: Federal Emergency Management Agency
 LAFCo: Local Agency Formation Commission
 Ldn: Day and Night Average Sound Level
 Leq: Sound Energy Equivalent Level
 LOS: Traffic Intersection Level of Service
 RDA: City of Ventura Redevelopment Agency
 SCAG: Southern California Association of Governments
 SOI: Sphere of Influence
 TDM: Transportation Demand Management
 TOD: Transit-Oriented Development
 VCOG: Ventura County Council of Governments

Definitions

Acre: Approximately 43,560 square feet.

Acres, Gross: The entire acreage of a site calculated to the centerline of proposed bounding streets and to the edge of the right-of-way of existing or dedicated streets.

Acres, Net: The portion of a site that can actually be built upon. The following generally are not included in the net acreage of a site: public or private road rights-of-way, public open space, and flood ways.

Action: A strategy carried out in response to adopted policy to achieve a specific goal or objective. Policies and action statements establish the “who,” “how” and “when” for carrying out the “what” and “where” of goals and objectives.

Adaptive Reuse: The conversion of obsolescent or historic buildings from their original or most recent use to a new use; for example, the conversion of former hospital or school buildings to residential use, or the conversion of a historic single-family home to office use.

Affordable Housing: Housing capable of being purchased or rented by a household with very low, low, or moderate income, based on a household’s ability to make monthly payments necessary to obtain housing. Housing is considered affordable when a household pays less than 30 percent of its gross monthly income (GMI) for housing including utilities.

Alley: A narrow service way, either public or private, which provides a permanently reserved but secondary means of public access not intended for general traffic circulation. Alleys typically are located along rear property lines.

Ambient: Surrounding on all sides; used to describe measurements of existing conditions with respect to traffic, noise, air and other environments.

Annex, v: To incorporate a land area into an existing district or municipality, with a resulting change in the boundaries of the annexing jurisdiction.

Aquifer: An underground, water-bearing layer of earth, porous rock, sand, or gravel, through which water can seep or be held in natural storage. Aquifers generally hold sufficient water to be used as a water supply.

Arterial: Medium-speed (30-40 mph), medium-capacity (10,000-35,000 average daily trips) roadway that provides intra-community travel and access to the county-wide highway system. Access to community arterials should be provided at collector roads and local streets, but direct access from parcels to existing arterials is common.

Bicycle Lane (Class II): A corridor expressly reserved for bicycles, existing on a street or roadway in addition to any lanes for use by motorized vehicles.

Bicycle Path (Class I): A paved route not on a street or roadway and expressly reserved for bicycles traversing an otherwise unpaved area. Bicycle paths may parallel roads but typically are separated from them by landscaping.

Bicycle Route (Class III): A facility shared with motorists and identified only by signs, a bicycle route has no pavement markings or lane stripes.

Buffer: An area of land separating two distinct land uses that acts to soften or mitigate the effects of one land use on the other.

Building: Any structure used or intended for supporting or sheltering any use or occupancy.

Building Type: a structure category determined by function, disposition on the lot, and configuration, including frontage and height. For example, a rowhouse is a type, not a style.

Buildout: Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning designations.

California Environmental Quality Act (CEQA): Law requiring State and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an Environmental Impact Report (EIR) must be prepared and certified before taking action on the proposed project.

Capital Improvements Program (CIP): A program that schedules permanent City improvements at least five years ahead to fit projected fiscal capability. The CIP is reviewed annually.

Channelization: The straightening and/or deepening of a watercourse for purposes of runoff control or ease of navigation; often includes lining banks with retaining material such as concrete.

Character: Special physical characteristics of a structure or area that set it apart from its surroundings and contribute to its individuality.

Charrette: An interactive, multi-day public process in which the community works together with planning and design professionals and City staff and officials to create and support a feasible plan for a specific area of the City that will produce positive and transformative community change.

City: When capitalized, refers to the governmental entity; “city” refers to the geographic area.

Civic: the term defining not-for-profit organizations dedicated to the arts, culture, education, recreation, government, transit, and municipal parking.

Clustered Development: Buildings placed close together with the purpose of retaining open space area.

Co-housing: A residential development with dwelling units for grouped around a common kitchen, gathering room, and child-care facilities. Co-housing developments normally are organized as condominiums.

Collector: Relatively-low-speed (25-30 mph), relatively low-volume (5,000-10,000 average daily trips) street that provides circulation within and between neighborhoods. Collectors usually serve short trips and are intended for collecting trips from local streets and distributing them to the arterial network.

Commerce; Commercial: The buying and selling of commodities and services.

Community Noise Equivalent Level (CNEL): A 24-hour energy equivalent level derived from a variety of single-noise events, with weighting factors of 5 and 10 dBA applied to the evening (7 PM to 10 PM) and nighttime (10 PM to 7 AM) periods, respectively, to allow for the greater sensitivity to noise during these hours.

Community Park: Land with full public access intended to provide recreation opportunities beyond those supplied by neighborhood parks. Community parks are larger in scale than neighborhood parks but smaller than regional parks.

Corridor: Linear features that may form boundaries, as well as connections, between neighborhoods. Corridors frequently encompass major access routes, especially ones with commercial destinations. Corridors also can incorporate parks or natural features such as streams or canyons.

dB: Decibel; a unit used to express the relative intensity of a sound as it is heard by the human ear.

dBA: The "A-weighted" scale for measuring sound in decibels; weighs or reduces the effects of low and high frequencies in order to simulate human hearing. Every increase of 10 dBA doubles the perceived loudness though the noise is actually ten times more intense.

Dedication: The turning over by an owner or developer of private land for public use, and the acceptance of land for such use by the governmental agency having jurisdiction over the public function for which it will be used. Dedications for roads, parks, school sites, or other public uses often are made conditions for approval of a development by a city or county.

Density, Residential: The number of permanent residential dwelling units per gross acres of land.

Density Bonus: The allocation of development rights that allow a parcel to accommodate additional square footage or additional residential units beyond the maximum for which the parcel is zoned, usually in exchange for the provision or preservation of an amenity at the same site or at another location. Under California law, a housing development that provides 20 percent of its units for lower income households, or 10 percent of its units for very low-income households, or 50 percent of its units for seniors, is entitled to a density bonus.

Design Review: The comprehensive evaluation of a development and its impact on neighboring properties and the community as a whole, from the standpoint of site and landscape design, architecture, materials, colors, lighting, and signs, in accordance with a set of adopted criteria and standards.

Detention Basin: A structure constructed to retard flood runoff and minimize the effect of sudden floods. Water is temporarily stored and released through an outlet structure at a rate that will not exceed the carrying capacity of the channel downstream. Basins often are planted with grass and used for open space or recreation in periods of dry weather.

Developer: An individual or business that prepares raw land for the construction of buildings or causes to be built physical space for use primarily by others, and in which the preparation of the land or the creation of the building space is in itself a business and is not incidental to another business or activity.

Development: The physical extension and/or construction of urban land uses, including: subdivision of land; construction or alteration of structures, roads, utilities, and other facilities; installation of septic systems; grading; deposit of refuse, debris, or fill materials; and clearing of natural vegetative cover (with the exception of agricultural activities). Routine repair and maintenance activities are exempted.

Development Fee: (See "Impact Fee.")

District: An area of the city that has a unique character identifiable as different from surrounding areas because of distinctive architecture, streets, geographic features, culture, landmarks, activities, and/or land uses. A neighborhood or parts of neighborhoods can form a district. Districts consist of streets or areas emphasizing specific types of activities. A corridor may also be a district, as when a major shopping avenue runs between adjoining neighborhoods.

Dwelling Unit: A room or group of rooms (including sleeping, eating, cooking, and sanitation facilities, but not more than one kitchen), which constitutes an independent housekeeping unit, occupied or intended for occupancy by one household on a long-term basis.

Encourage, v: To stimulate or foster a particular condition through direct or indirect action by the private sector or government agencies.

Enhance, v: To improve existing conditions by increasing the quantity or quality of beneficial uses or features.

Environment: The existing physical conditions in an area that will be affected by a proposed project, including land, air, water, mineral, flora, fauna, noise, and objects of historic or aesthetic significance.

Environmental Impact Report (EIR): A report required by CEQA that assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action.

Fault: A fracture in the earth's crust forming a boundary between rock masses that have shifted.

Flood, 100-Year: The magnitude of a flood expected to occur on the average every 100 years, based on historical data. The 100-year flood has a one percent chance of occurring in any given year.

Floodplain: The relatively level land area on either side of the banks of a stream regularly subject to flooding. That part of the flood plain subject to a one percent chance of flooding in any given year is designated as an "area of special flood hazard" by the Federal Insurance Administration.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the "base flood" without cumulatively increasing the water surface elevation more than one foot. No development is allowed in floodways.

General Plan: A compendium of city or county policies regarding its long-term development, in the form of maps and accompanying text. The General Plan is a legal document required by the State of California Government Code Section 65301 and adopted by the City Council.

Gateway: A point along the edge of a city at which a person gains a sense of having left the environs and entered the city.

Goal: A general, overall, and ultimate purpose, aim, or end toward which the City will direct effort.

Green: A whole-building and systems approach to siting, design, construction, and operation that employs techniques that minimize environmental impacts and reduce the energy consumption of buildings while contributing to the health and productivity of occupants.

Hazardous Material: Any substance that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. The term includes, but is not limited to, hazardous substances and hazardous wastes.

Hillside Area: All that area north of Foothill and Poli Street, and east of Cedar Street and within City limits. This area is subject to the Hillside Management Program.

Hillside Open Space: One of the 19 distinct communities within the City's Planning Area; coterminous with the Hillside Voter Participation Area; generally referred to as "hillsides".

Hillside Voter Participation Area or HVPA: The area subject to the "Hillside Voter Participation Act" (also known as Measure "P") as set forth in Appendix X and coterminous with the "Hillside Open Space" area depicted on the Land Use Diagram.

Hillsides: Synonymous and coterminous with HVPA and "Hillside Open Space".

Historic: Noteworthy for significance in local, state, or national history or culture, architecture or design, or housing works of art, memorabilia, or artifacts.

Household: Persons who occupy a housing unit.

Housing Element: A separately published State-mandated general plan element that assesses existing and projected housing needs of all economic segments of the community, identifies potential sites adequate to provide the amount and kind of housing needed, and contains adopted goals, policies, and implementation programs for the preservation, improvement, and development of housing. The Housing Elements is updated every five years.

Housing Unit: A rooms or a rooms intended for occupancy, separate from any other living space, with direct access from outside or through a common area.

Impact: The direct or indirect effect of human action on existing physical, social, or economic conditions.

Impact or Development Fee: A fee levied on the developer of a project as compensation for otherwise-unmitigated impacts the project will produce, not to exceed the estimated reasonable cost of providing the service for which the fee is charged.

Industry/Industrial: The manufacture, production, and processing of consumer goods. Industrial is often divided into "heavy industrial" uses, such as construction yards, quarrying, and factories; and "light industrial" uses, such as research and development and less intensive warehousing and manufacturing.

Infill: Development of vacant and/or underutilized land within areas already largely developed with urban uses.

Infrastructure: Public services and facilities, such as sewage-disposal systems, water-supply systems, and other utilities.

In-lieu Fee: Payment that substitutes for required dedication of land or provision of structures or amenities.

Institutional: Uses such as hospitals, museums, schools, places of worship, and nonprofit activities of a welfare, educational, or philanthropic nature that cannot be considered residential, commercial, or industrial activities.

Landmark: (1) A building, site, object, structure, or significant tree, having historical, architectural, social, or cultural significance and marked for preservation by the local, state, or federal government. (2) A visually prominent or outstanding structure or natural feature that functions as a point of orientation or identification.

Ldn: Day-Night Average Sound Level. The A-weighted average sound level for a given area (measured in decibels) during a 24-hour period with a 10 dB weighting applied to night-time sound levels. The Ldn is approximately numerically equal to the CNEL for most environmental settings.

Leq: The energy equivalent level, defined as the average sound level on the basis of sound energy (or sound pressure squared). The Leq is a "dosage" type measure and is the basis for the descriptors used in current standards, such as the 24-hour CNEL used by the State of California.

Lease: A contractual agreement by which an owner of real property (the lessor) gives the right of possession to another (a lessee) for a specified period of time (term) and for a specified consideration (rent).

Level of Service, Intersection (LOS): A scale that measures the amount of traffic an intersection is capable of handling. Levels range from A, representing free-flow, to F corresponding to significant stoppage.

Liquefaction: The transformation of loose water-saturated granular materials (such as sand or silt) from a solid into a liquid state, which can lead to ground failure during an earthquake.

Live-Work: A dwelling unit that contains, to a limited extent, a commercial component. A live-work unit is a fee-simple unit on its own lot with the commercial component limited to the ground level. (see Work-Live)

Local Agency Formation Commission (LAFCo): A commission in each county that reviews and evaluates proposals for formation of special districts, incorporation of cities, annexation to special districts or cities, consolidation of districts, and merger of districts with cities. LAFCo members include two county supervisors, two city council members, and one member representing the general public.

Local Coastal Program (LCP): A combination of City land use plans, zoning regulations, and zoning district maps that control land use in the Coastal Zone established under the California Coastal Act of 1976.

Local Street: Relatively low-volume, low-speed streets (not shown on the Roadway Classifications map), whose primary purpose is to provide access to fronting properties.

Lot: A legally-recognized parcel with frontage on a public or City-approved private street.

Low Income: Households with annual income 80 percent of the County median or less.

Maintain: Keep in an existing state. (See "Preserve.")

Median: The dividing area between opposing lanes of traffic.

Mitigate: Alleviate or avoid to the extent feasible.

Mixed Use: Properties on which various uses, such as office, commercial, and institutional, are combined with residences in a single building or site in an integrated development project with significant functional interrelationships and a coherent physical design. A single site may include contiguous properties.

Neighborhood: The basic building blocks of a community that together comprise the city. Each neighborhood is limited in physical area, with a defined edge and a center. The size of a neighborhood is usually based on the distance that a person can walk in five minutes from the center to the edge – a quarter-mile. Neighborhoods have a fine-grained mix of land uses, providing places to live, work, shop, and be entertained.

Neighborhood Center: The focal point of a neighborhood, commonly featuring places for work, shopping, services, entertainment, leisure, recreation, and social and civic interaction.

Neighborhood Park: A facility intended to serve the recreation needs of people living or working within a one-half mile radius of the park.

Noise: Sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying.

Noise Contour: A line connecting points of equal noise level as measured on the same scale. Noise levels greater than the 60 Ldn contour (measured in dBA) require mitigation in residential development.

Office: Professional or consulting services in fields such as accounting, architecture, design, engineering, finance, law, insurance, medicine, real estate, and similar types of work.

Open Space: An area of land or water that is essentially unimproved and devoted to outdoor recreation and/or the preservation of natural resources.

Outdoor Recreation: Recreation in an urbanized outdoor setting (active recreation) or open-space outdoor setting (passive recreation).

- (a) *Active outdoor recreation* includes participant sports or other activities conducted in open or partially enclosed or screened recreational activities facilities. Typical uses include driving ranges, miniature golf courses, golf courses, amusement parks, swimming pools, and tennis courts and usually rely on permanent above-ground improvements, including, but not limited to, playing fields or courts, restrooms, and tables.
- (b) *Passive outdoor recreation* includes recreational activities, usually of an individual or small group nature, such as sunbathing, walking, hiking, bird watching, or nature study, conducted in an open-space setting and which, generally, do not rely on the use of permanent aboveground improvements or involve motorized vehicle use.

Parcel: A lot, or contiguous group of lots, in single ownership or under single control, usually considered a unit for purposes of development.

Parks: Open space lands whose primary purpose is recreation.

Parkway: The area between curb and sidewalk, usually planted with ground cover and/or trees.

Pedestrian Shed: an area defined by the average distance that may be traversed at an easy walking pace from its edge to its center. This distance is applied to determine the size of a neighborhood or extent of a community. A standard Pedestrian Shed is one quarter of a mile radius or 1,320 feet. With transit available or proposed, a long Pedestrian Shed has an average walking distance of ½-mile or 2,640 feet. Pedestrian Sheds should be conceived as oriented toward a central destination containing one or more important intersections, meeting places, civic spaces, civic buildings, and the capacity to accommodate a T5 Transect Zone in the future. Sometimes called a Walkshed.

Planning Area: The land area addressed by the General Plan, which includes the City Limits, potentially annexable land in the Sphere of Influence, and neighboring open space and agricultural areas of Ventura County that the City desires to remain in rural condition.

Policy: A statement of principle that anticipates specific actions to be undertaken to meet City goals.

Pollution: The presence of matter or energy whose nature, location, or quantity produces undesired environmental effects.

Preserve: Keep intact and safe from destruction or decay.

Protect: Maintain and preserve beneficial uses in their present condition.

Public and Quasi-public Facilities: Institutional, academic, governmental and community service uses, either publicly owned or operated by non-profit organizations.

Public Art: Signs, other monuments, sculptures, murals, statues, fountains, and other artistic installations in spaces accessible to the general public that accentuate or draw attention to a particular place or feature of the city, provide a focal point for public gathering, and/or serve a specific function, such as to provide seating.

Recreation, Active: A type of recreation that requires organized play areas, such as softball, baseball, football and soccer fields, tennis and basketball courts and various forms of children's play equipment.

Recreation, Passive: Recreation that does not require organized play areas.

Recycling: The process of extracting and reusing materials from waste products.

Redevelop: To demolish existing buildings, or increase the overall floor area existing on a property, or both, irrespective of whether a change occurs in land use.

Redevelopment Agency: The City division created under California Redevelopment Law for the purpose of planning, developing, re-planning, redesigning, clearing, reconstructing, and/or rehabilitating all or part of a specified area with residential, commercial, industrial, and/or public (including recreational) structures and facilities.

Regional: Pertaining to activities or economies at a scale greater than that of a single jurisdiction and affecting a broad geographic area.

Regional Park: A park typically 150-500 acres in size focusing on activities and natural features not included in most other types of parks and often based on a specific scenic or recreational opportunity.

Restore: Renew, rebuild, or reconstruct to a former state.

Ridesharing: Vehicle travel other than driving alone.

Ridgeline: A line connecting the highest points along a ridge and separating drainage basins or small-scale drainage systems from one another.

Right-of-way: Land intended to be occupied by transportation and public use facilities such as roadways, railroads, and utility lines.

Riparian: Areas adjacent to perennial and intermittent streams delineated by the existence of plant species normally found near fresh water.

Runoff: The portion of precipitation that does not percolate into the ground.

Seismic: Caused by or subject to earthquakes or earth vibrations.

Sidewalk: the paved layer of the public frontage dedicated exclusively to pedestrian activity.

Specific Plan: A legal tool allowed by State Government Code Section 65450 et seq. that prescribes detailed regulations, conditions, programs, and/or proposed legislation for a defined area of the city.

Sphere of Influence: The probable ultimate physical boundaries and service area of the city, as determined by LAFCo.

Streetscape: the urban element that establishes the major part of the public realm. The streetscape is composed of thoroughfares (travel lanes for vehicles and bicycles, parking lanes for cars, and sidewalks or paths for pedestrians) as well as the visible private frontages (building facades and elevations, porches, yards, fences, awnings, etc.), and the amenities of the public frontages (street trees and plantings, benches, and streetlights, etc.).

Structure: Anything constructed or erected that requires location on the ground (excluding swimming pools, fences, and walls used as fences).

Subdivision: The division of a land into defined lots or condominiums that can be separately conveyed by sale or lease.

Sustainable: Meeting the needs of the present without compromising the ability of future generations to meet their needs, and successfully balancing economic, environmental, and social equity concerns.

Tourism: The business of providing services for persons traveling for pleasure.

Transect: a system of ordering human habitats in a range from the most natural to the most urban. Based upon six Transect Zones that describe the physical character of place at any scale, according to the density and intensity of land use and urbanism.

Transit-Oriented Development (TOD): Relatively high-density development located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping designed primarily for pedestrians.

Transit, Public: A system of regularly-scheduled buses and/or trains available to the public on a fee-per-ride basis.

Transportation Demand Management (TDM): Strategies for reducing the number of vehicle trips by increasing ridesharing, transit use, walking, and biking.

Trip: A one-way journey that proceeds from an origin to a destination via a single mode of transportation.

Truck Route: A route required for all vehicles exceeding set weight or axle limits, which follows major arterials through commercial or industrial areas and avoids sensitive areas.

Underutilized: Non-vacant properties that have not been fully developed with improvements that reach the allowed density and/or floor area.

Urban Design: The attempt to give form, in terms of both beauty and function, to selected urban areas or to whole cities. Urban design is concerned with the location, mass, and design of various urban components and combines elements of urban planning, architecture, and landscape architecture.

Use Permit: The discretionary and conditional review of an activity or function or operation on a site or in a building or facility.

Very Low Income: Households with annual income 50 percent of the County median or less.

View Corridor: The line of sight of an observer looking toward an object of significance (e.g., ridgeline, river, historic building, etc.).

Viewshed: The area within view from a defined point.

Watercourse: Presently or once naturally perennially or intermittently flowing water, including rivers, streams, barrancas, and creeks. Includes waterways that have been channelized, but not ditches or underground drainage and sewage systems.

Watershed: The total area above a given point on a watercourse that contributes water to its flow; also, the entire region drained by a watercourse.

Wetlands: Transitional areas between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Federal agencies establish hydrology, vegetation, and soil criteria to define wetlands.

Work-Live: A dwelling unit that contains a commercial component. A Work-Live unit is a fee-simple unit on a lot with the commercial component anywhere within the unit. (see Live-Work)

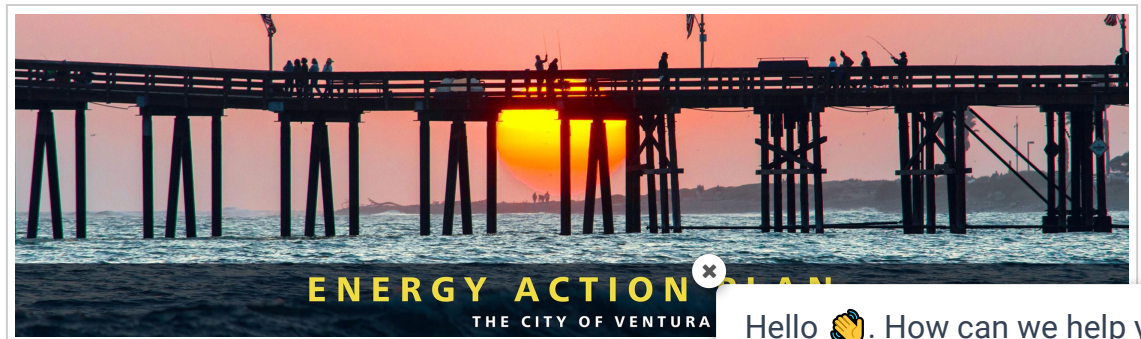
Yield Street: A street whereby by two vehicles, going in opposite directions, one car will often have to pull over slightly and yield to the other vehicle, depending on how many cars are parked on the street. A standard residential street.

Zoning: The regulation of building forms and land uses throughout the city.

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Energy Action Plan



Hello 🙋. How can we help you?



Energy Action Plan

An Energy Action Plan (EAP) is a strategic planning document that lays out goals and possible actions to reduce energy consumption by increasing energy efficiency and procuring more renewable energy. The EAP will establish energy reduction targets in 5 year increments relative to the community's total energy consumption from the 2010 baseline year. To achieve these goals, an EAP outlines the most cost-effective and impactful strategies the City and community may take to reduce overall energy consumption.

The EAP will outline a pathway to accomplish many other objectives, including:

- Increase energy efficiency and lower utility costs
- Lower harmful greenhouse gas emissions and improve air quality
- Adopt local renewable energy projects
- Support a fair transition from fossil fuels
- Strengthen energy reliability and community safety in the event of an outage
- Accelerate the development of local sustainability projects and plans

Community Engagement

City staff and partners are working with the community to make EAP development and engagement open and accessible to all that wish to contribute. Because the EAP will outline goals and strategies for reducing electricity use for the next 10 years in Ventura, it will incorporate the ideas and preferences of the community. This will help the EAP be most effective in creating a smooth transition to a more sustainable community.

Surveys

Round 1 Surveys are now closed. The [survey results](#) helped inform the development of the initial energy action plan strategies. These strategies are currently being analyzed for feasibility and practicality of implementation. Please help us refine these strategies by completing our Round 2 Survey for the City of Ventura in either [English](#) or [Spanish](#). Your voice and insight is a vital component to creating a sustainable future. Please offer your input and enter for a chance to win tickets to the [Wild and Scenic Film Festival](#). Or, visit the VCREA booth at the [Ventura EcoFest](#) to win [solar lights](#) or a [compost bin](#). If you'd like to stay involved, please see our recommended steps below.

Calendar

Community-based meetings and workshops will be the primary sources for the community's contribution to the development of the City's EAP. We welcome you to exercise your public power of speech!

At the events below, you will be able to discuss your ideas with City Staff, community partners and energy experts. At all workshops, free Pizza and snacks will be provided to participating community members. At all tabling events, there will be opportunities to get involved with raffles, surveys, games and other interactive exercises.

Ventura Earth Day Eco Fest

Saturday, April 27, 2019

10 AM to 4 PM

Ventura Plaza Park

Community Outreach Meeting

Saturday, June 8, 2019

10 AM to 12 PM

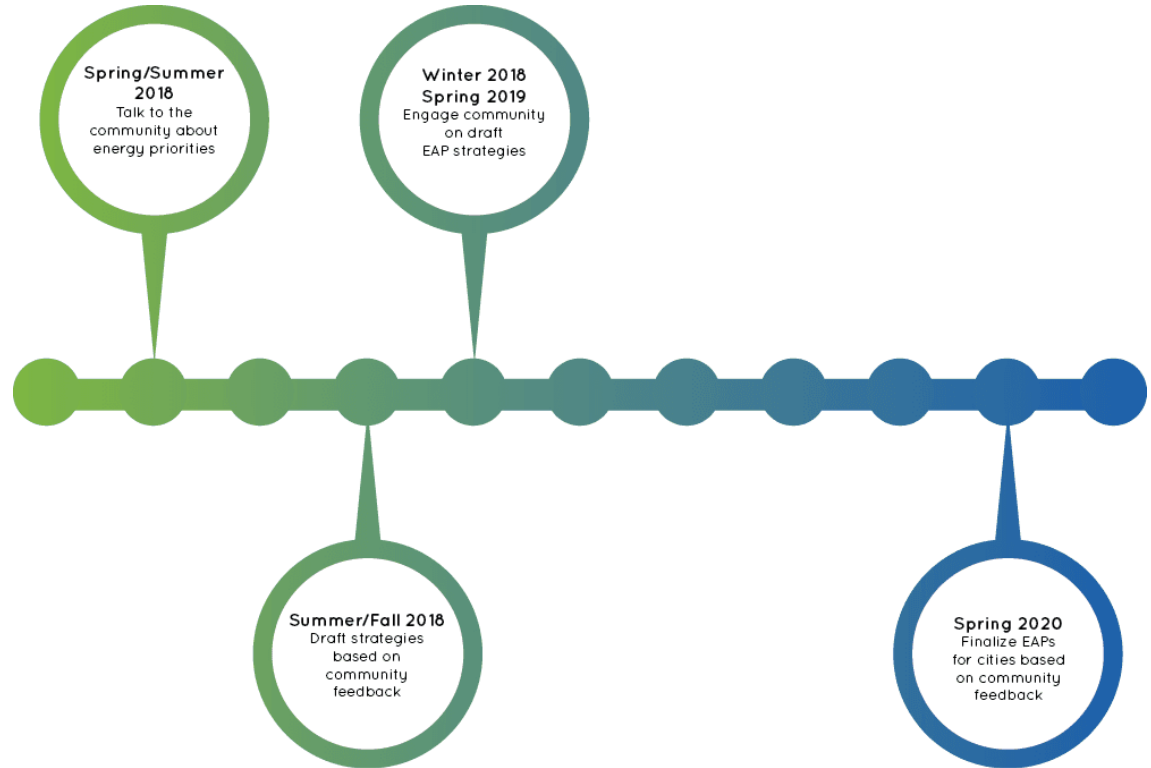
Community Meeting Room - Ventura City Hall

Ventura's 4th July Street Fair & Pushem-Pullem Parade

Wednesday, July 4, 2019

10 AM to 5 PM

Ventura's Downtown Cultural District



Climate Action and Resilience Plan

Public Review Draft October 2022



City of Ventura

Climate Action and Resilience Plan

Public Review Draft October 2022

Climate Action and Resilience Plan

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Rincon Consultants

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DISCLAIMER

This Climate Action and Resilience Plan (CARP) articulates broad policies to achieve equitable climate action. The CARP does not approve, fund, or authorize implementation of any specific projects. Each implementation program will be reviewed and approved over time and follow protocols for adoption, which may require additional public review, review by City Council, and/or environmental review under the California Environmental Quality Act.

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Chapter 1

Overview

Over the past several decades, communities around the State and country have taken local action to address climate change. This Climate Action and Resilience Plan (CARP) proposes focused solutions to reduce greenhouse gas emissions while advancing related goals associated with community resilience and climate adaptation.

Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes include heatwaves, heavy precipitation, droughts, and hurricanes.¹ California and Ventura are already experiencing the effects of a changing climate.² Both gradual climate change (e.g., sea level rise) and climate hazard events (e.g., extreme heat days) expose people, infrastructure, buildings and properties, and ecosystems to a wide range of stress-inducing and hazardous situations.³ These hazards and their impacts disproportionately affect the most sensitive populations in the city.⁴

The extent to which Ventura is impacted by climate change is dependent on our actions today. By curbing greenhouse gas emissions and adapting our community to the already changing environment, we can significantly reduce the damages incurred from climate change. The City is in a unique position to become a regional climate leader by implementing city-wide policies, incentives, and education programs to deploy innovative technologies, to pilot regulatory mechanisms, and spark behavioral change to meet the deep greenhouse gas reduction targets established by the State of California. Ventura has prepared this CARP to be a guide for the community's response to challenges posed by climate change, and to build on the City's ongoing efforts to mitigate and adapt to the impacts of climate change.

¹ Intergovernmental Panel on Climate Change 2021. Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

² Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

³ State of California. California Climate Adaptation Strategy. 2021. Retrieved from <https://climateresilience.ca.gov/>

⁴ Ibid

A History of Action

The City of Ventura has a strong history of taking environmental action. Residents, businesses, and community groups maintain a strong environmental ethic and work to conserve the ecological wealth of the community. While the City of Ventura has historically been a good steward of the environment, efforts to address greenhouse gas emissions have been decentralized. The City of Ventura’s Environmental Sustainability Division was created in 2009 to bring all stakeholders to the table to create a plan for a more resilient, equitable, and energy-efficient future. Table 1 lists the plans, policies, and programs in place to enhance sustainability and become more resilient to climate hazards. More detailed plan and program descriptions are included in Appendix A.



Table 1. Ventura’s Key Actions to Support Sustainability and Greenhouse Gas Reductions

Year	Key Action
2007	City Council passed the “ Green Initiative ,” a ten-point action plan designed to reduce environmental impacts
2012	Environmental Sustainability Strategy (ESS) was developed
2012	Launched Green Business Program
2015	Published Climate on the Move report, which included a community-level GHG emissions inventory and a CAP template for the City
2018	Joined the Clean Power Alliance
2019	Created Electric Vehicle Accelerator Plan
2020	Adopted City Tree Master
2021	Established Water Efficiency Plan
2022	Preparing an Active Transportation Plan

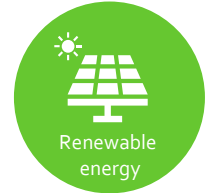
What is a Climate Action and Resilience Plan?

The CARP is the City's strategic planning document that serves two distinct functions:

1. Acts as the City's **greenhouse gas reduction program**
 - Inventories current emissions, estimates future emissions, and establishes greenhouse gas reduction measures
 - Assesses the effectiveness of greenhouse gas reduction measures at meeting State targets
2. Defines **climate adaptation measures** consistent with the Multi-jurisdiction Hazard Mitigation Plan
 - Describes climate changes and identified potential vulnerabilities from climate hazards
 - Defines specific policies and actions for the City to implement to address those vulnerabilities.

Mitigation

Actions that are taken to reduce and curb greenhouse gas emissions



Adaptation

Actions to reduce vulnerability to the effects of climate change



The CARP establishes a shared vision for climate action. It is a short-range (5-10 year) implementation focused plan that outlines the strategies, policies, and programs that the City and community need to implement to reduce greenhouse emissions in line with State goals, and to build resilience to the impacts of climate change. It builds on the City's existing climate work from the General Plan, Active Transportation Plan, and Hazard Mitigation Plan and incorporates new and innovative practices.

Development of the CARP has been partially funded by the California Proposition 84 Integrated Climate Action and Resilience (ICARP) program. Starting in January of 2017, the Governor's Office of Planning and Research (OPR) built a Climate Adaptation Clearinghouse, which includes a library of case studies showing how local and regional partners are responding to climate change. The City of Ventura CARP development process will be utilized as a case study to the ICARP Climate Adaptation Clearinghouse about how and why communities, businesses, and organizations are responding to climate change impacts.

CEQA Qualified Plan

The greenhouse gas reduction targets specified by the State are consistent with substantial scientific evidence published by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) regarding the need to reduce global greenhouse gas emissions to 80% below 1990 levels by 2050. This consistency is important for creating a "qualified" CAP. The concept of having a "qualified" CAP means that a CAP meets the criteria specified in CEQA

Guidelines Section 15183.5(b) for a plan for the reduction of greenhouse gas emissions, such that a “qualified” CAP may then be used for the specific purpose of streamlining the analysis of greenhouse gas emissions in subsequent projects. Local governments have discretion on what levels or targets are established in a “qualified” CAP, provided they address adopted policies and are based on substantial evidence. Most often, local targets align with the California Senate Bill 32 reduction requirement of a 40% reduction below 1990 levels by 2030 to achieve qualified status. The CARP greenhouse gas reduction program has demonstrated the ability to achieve a 40% reduction by 2030, if implemented as outlined in Chapter 4 of the CARP.

Relation to Other Planning Efforts

Development of the CARP complements Ventura’s other long-range planning efforts including the General Plan Update, Active Transportation Plan, and Multi-jurisdictional Hazard Mitigation Plan. Measures in the CARP will be consistent with the relevant climate and resilience policies outlined in those documents.

- **General Plan Update.** The General Plan Update (GPU) is a long-range policy document that maps out how the City of Ventura serves its community. California law requires that every city and county in the state develop and maintain a General Plan. The GPU sets forth a shared 20-year vision for the future. It builds on community strengths and assets, while tackling new and emerging challenges like climate change. The CARP’s greenhouse gas forecast and analysis is based on the GPU’s growth projections.
- **Energy Action Plan.** The City of Ventura was in the process of developing an Energy Action Plan (EAP) in partnership with the Ventura County Regional Energy Alliance (VCREA) and the Community Environmental Council when the CARP process initiated. Focused on planning for greenhouse gas emissions reductions associated with the generation and consumption of energy, including electricity and natural gas, the analysis, policies, and implementation actions initially developed for the EAP have been integrated directly into the CARP. The EAP received funding from the California Energy Commission (CEC), Southern California Edison (SCE), and Southern California Gas Company (SoCalGas).
- **Active Transportation Plan.** The City is developing an Active Transportation Plan (ATP) to incorporate bicycle and pedestrian mobility, suggested Routes to School (SRTS), and Complete Streets components, in an ambitious path toward increasing mobility options for all City residents. The ATP outcomes will feed directly into the City’s General Plan update and are critical measures to reduce community transportation-related emissions as outlined in the transportation sector of the CARP.
- **Multi-Jurisdiction Hazard Mitigation Plan.** The Ventura County Multi-Jurisdiction Hazard Mitigation Plan describes hazard mitigation policies for landslides, flooding, wildfires, sea level rise, and drought. The CARP will include policies and strategies from this plan to increase the City’s resilience to the climate hazards outlined in the Ventura Climate Vulnerability Assessment (Appendix C). Furthermore, incorporating these resilience measures into the CARP and GPU will satisfy the requirements of SB 379.

Analysis, policies, and actions initially developed for the EAP have been integrated into the relevant sections of the CARP along with additional measures to round out the City’s climate action approach.

Community Engagement

The City of Ventura understands how crucial community input is in understanding and addressing climate change mitigation, resilience, and adaptation. Community members – residents, businesses, visitors, and others – offer unique knowledge, perspectives, and experiences navigating the impacts of climate shocks and stressors in the city. Community members will also be called upon to be active participants in climate mitigation and resilience measure implementation. The City created and executed a public participation plan to ensure that community members and other stakeholders had a diversity of opportunities to share their opinions and take part in the development of the CARP. This section describes the community engagement activities and the key themes heard during the process.



See Appendix B for detailed summaries of the engagement events.

Community Engagement Activities

The community engagement strategy included a multi-pronged approach to ensure participation of a wide range of stakeholders and community groups. Community engagement opportunities included in-person and virtual community workshops, online surveys, stakeholder meetings, and focus groups.

Project Website

The CARP information was part of the City's PlanVentura.com website for the GPU. The website was regularly updated throughout the CARP development process to include announcements of upcoming events, online survey links, and to share results and summaries of past events.

Online Surveys

Two web-based surveys were distributed to solicit information from the community at two distinct stages in the CARP development process. The first survey, distributed in fall 2021, was about the community experience with natural disasters and climate change. The second survey, distributed in summer 2022, was about greenhouse gas reduction measures. The

surveys were available in English and Spanish and garnered a total of 1,925 responses.

Central Coast Alliance United for a Sustainable Economy (CAUSE) conducted targeted outreach and in-person canvassing with the survey to Spanish-speaking community members on the Westside.

Community Workshops

The City hosted two in-person and one virtual workshop in summer 2022. The first objective was to educate the community about climate change, the community's greenhouse emissions, and potential climate hazards and vulnerabilities in Ventura. The second was to receive input on the greenhouse reduction and climate adaptation and resilience measures to include in the CARP. There were forty-five attendees at the two in-person workshops and

thirty-five attendees at the online workshop, along with City staff members and members of the consultant team.

The in-person workshops included a series of boards about introduction to climate change, vision, greenhouse gas reduction sectors, and adaptation and resilience with activities facilitated by City and consultant staff. The online workshop included a presentation followed by small group discussions in breakout rooms. It featured live translation in Spanish and was recorded and uploaded to the website for those who could not attend.

Focus Groups

CAUSE conducted focus groups in summer 2022 to hear community members' thoughts on Clean Energy and Buildings and Land Use and Transportation measures. CAUSE hosted two focus group sessions, one specifically for youth and one for Spanish-speaking adults, which had a combined total of twenty-nine attendees. The sessions included a brief presentation on what contributes to climate change, and the different issues that contribute to climate change locally in their communities. Participants were then broken into two groups to have facilitated discussions about clean energy and buildings and land use/transportation challenges and solutions.

Social Media and Newsletters

The City used its social media channels (Instagram, Facebook) and email newsletters to disseminate information throughout the CARP development process. This included notice of upcoming meetings and invitations to participate in surveys. The City also used Instagram Live to host a live interview with R+A staff about the CARP.

Energy Action Plan Engagement

Engagement about energy efficiency, conservation, and generation was also conducted from 2018-2019 as part of the EAP. This process helped identify and refine goals, strategies, and actions for reducing energy consumption, increasing energy efficiency, and using more renewable energy. Community outreach and engagement activities included community surveys, a community workshop, tabling events, and stakeholder meetings.

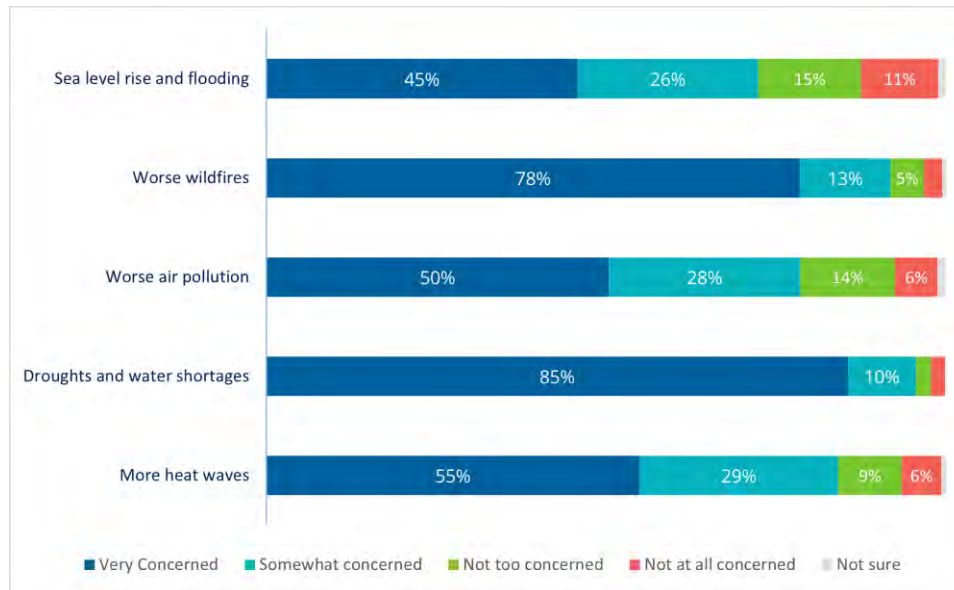


Summary of Community Engagement

Climate Hazards and Resilience

Community members expressed their experiences with recent natural disasters, thoughts on preparation for potential future natural disasters, and knowledge about climate change through the first online survey. Droughts and water shortages and worse wildfires were the most concerning climate change impacts for community members. Figure 1 shows the climate impacts of most concern to the community.

Figure 1. Most Concerning Climate Impacts



Source: *Community Survey on Natural Hazards and Climate Change: Summary of Results*

The most common impacts of wildfire experienced by community members was loss of power, cell phone reception, groceries, and work or income. Health impacts including mental health issues and cardiovascular illness from smoke were also reported. To improve the City's disaster response and preparedness, community members highlighted the need to expand the emergency communications network, developing local battery storage infrastructure to prevent power outages, and improving evacuation routes.

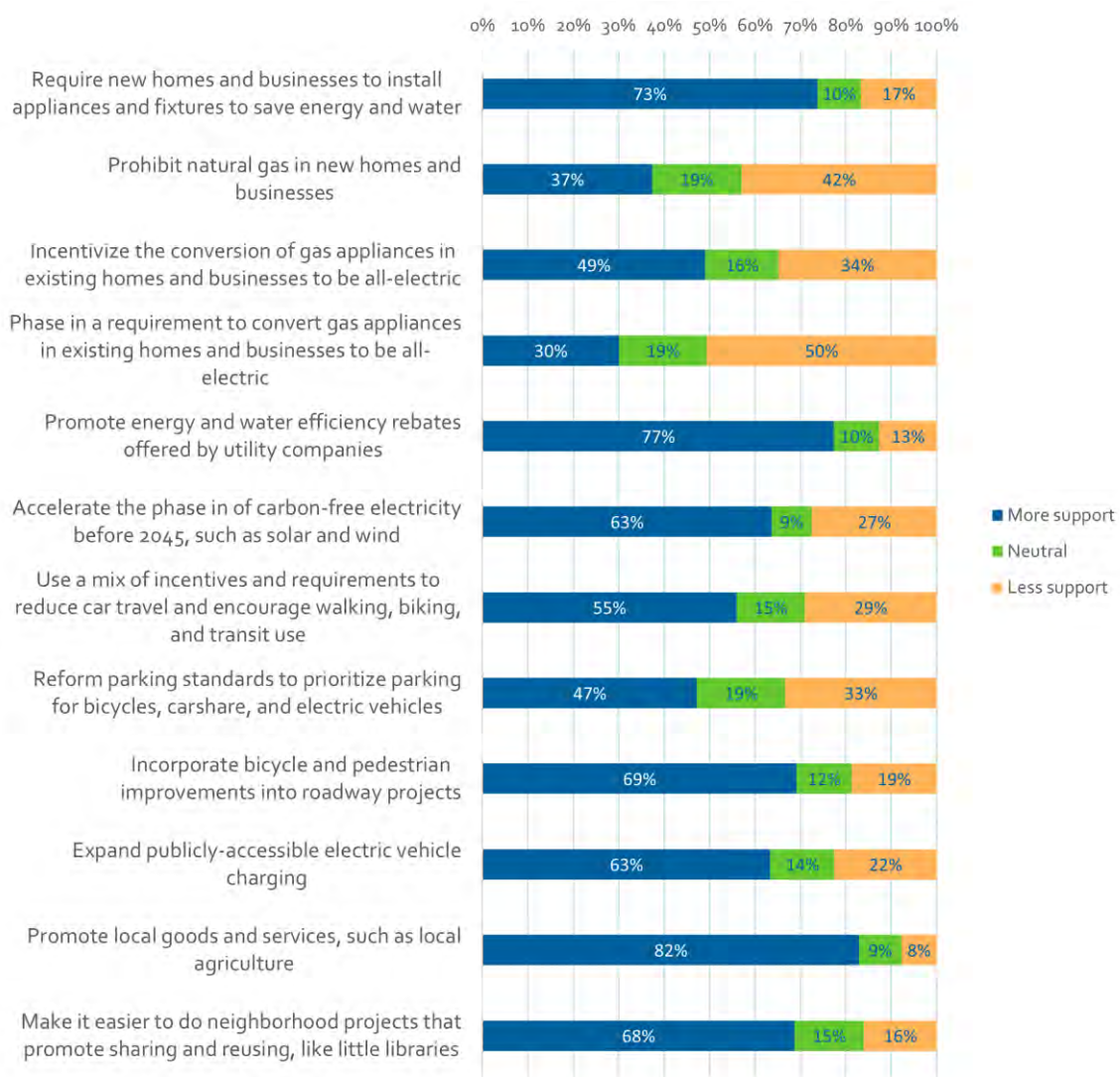
Community members identified habitat conservation and regulations for new development in shoreline areas subject to sea level rise as priority adaptation and resilience actions. Regarding shoreline regulations, community members stressed that they must be applied with nuance for diverse kinds of land use and infrastructure. Community members shared that they desire more education about local climate change impacts and specific actions they can take at home and in their communities. They also expressed their desire for City leaders to demonstrate climate leadership to guide and motivate them (especially Ventura's youth).

Greenhouse Gas Reduction

Community members favored the City taking a bold approach to meet or exceed State greenhouse gas emissions reduction goals. Community members prefer a mix of voluntary incentives and mandatory programs - or only voluntary programs and incentives - to encourage action. Highly supported energy policies include promoting water and energy rebates from utilities and requiring new development to install energy and water efficient appliances.

If the [Spanish-speaking] community was better informed about the Clean Power Alliance – what it is, how it works, and the benefits to our health and our environment – that more people would be willing to make the switch even if it’s a bit more expensive. Adults also shared that the term “clean energy” is something they had not heard before.

Figure 2. Level of Support for Greenhouse Gas Reduction Policies



Source: Community Survey on Greenhouse Gas Reduction in the City of Ventura: Summary of Results

Equity and Affordability Considerations

Community members highlighted the challenges renters, low-income households, and Spanish-speaking individuals could face when implementing CARP greenhouse gas reduction measures. The main concern is about the cost to implement various upgrades especially related to building improvements. Another issue that arose is that renters have little agency over their homes and must rely on a landlord to implement improvements.

Making the transition [to electric] seemed particularly difficult for low-income families who are already struggling financially due to the housing crisis and high inflation. Participants also worried that costs for landlords required to upgrade their appliances would be passed down to renters via higher rent costs in a time when rent costs are alarmingly high.

As a result, the CARP includes funding and financing mechanisms to reduce the burden on disadvantaged communities. Additionally, through implementation of the CARP and ATP, the City will develop infrastructure that meets the needs of all and is inviting to everyone. For example, transit, walking, and biking infrastructure need to create a safe environment for all users.

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Chapter 2

Ventura's Contribution to Climate Change

Human emissions of carbon dioxide and other greenhouse gas emissions (greenhouse gases) are important drivers of global climate change, and recent changes across the climate system are unprecedented. Greenhouse gases trap heat in the atmosphere, resulting in warming over time. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans.

This chapter details the city's current emissions profile and describes pathways to emission reduction.



Current Emissions Profile

The 2019 community inventory serves as the foundation for projecting emission trends and informing measures and actions that the City needs to implement to achieve carbon neutrality by 2045. The City conducted its first inventory in 2015. The 2019 City of Ventura greenhouse gas emissions inventory captures communitywide emissions generated from transportation, energy consumption in homes and buildings, solid waste, water, and off-road transportation (e.g., emissions from construction, landscaping equipment) within the city. It was developed using the ICELI Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.

The 2019 total community emissions were 546,513 metric tons of carbon dioxide equivalent (MTCO₂e), a 9% decrease from 2015 emissions of 598,478 MTCO₂e. This inventory is an estimate based on the best available data. As in 2015, on-road transportation was the largest contributor to total greenhouse gas emissions with an estimated 263,148 MTCO₂e or 48% of the City's total 2019 emissions. Energy use including residential and nonresidential electricity and natural gas was the second largest sector with estimated emissions of 190,539 MTCO₂e or 35% of emissions. The remaining 17% of emissions include solid waste, water, off-road transportation, and process and fugitive emissions (see Table 2).⁵ Figure 3 depicts the proportion of emissions by sector for 2019.

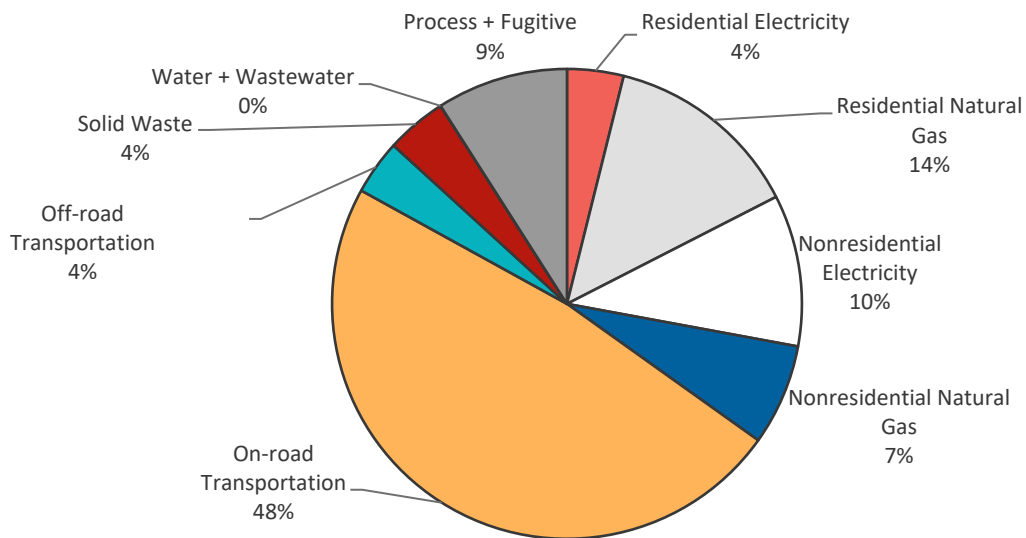
Table 2. Total Annual Community Greenhouse Gas Emissions by Sector in 2019

Emissions Sector	Subsector	Subsector Emissions (MTCO ₂ e)	Total Sector Emissions (MTCO ₂ e)	Percent of Total
Transportation	On-road Transportation	263,148	283,707	48%
	Off-road Transportation	20,559		4%
Residential Energy	Electricity	21,233	95,503	4%
	Natural Gas	74,270		14%
Nonresidential Energy	Electricity	56,989	95,036	10%
	Natural Gas	38,047		7%
Solid Waste		22,826	22,826	4%
Water + Wastewater		20	20	< 1%
Process + Fugitive		49,420	49,420	9%

Source: 2019 City of Ventura Community Emissions Inventory (2022)

⁵ Process emissions generally include emissions from chemical transformation of raw materials and fugitive emissions. The chemical transformation of raw materials often releases greenhouse gases such as CO₂, CH₄, and N₂O. These processes include iron and steel production, cement production, petrochemical production, and nitric acid production, among others. Fugitive emissions refer to emissions of gases due to leaks or other unintended or irregular releases (US EPA 2008).

Figure 3. Total Annual Community Greenhouse Gas Emissions by Sector in 2019



Source: 2019 City of Ventura Community Emissions Inventory (2022)

In addition to a 9% decrease in overall emissions from 2015 to 2019, annual per service population emissions decreased by 9% from 3.6 MTCO₂e in 2015 to 3.3 MTCO₂e in 2019, while the service population increased less than 1%. The service area population is a sum of the populations that live and/or work in the city (population and jobs). These numbers show that despite consistent population and employment within the city, State, federal, and local greenhouse mitigation programs are achieving the desired reductions.

Pathways to Emissions Reductions

The bold targets set forth in this plan demonstrate Ventura's commitment to mitigating climate change and the adverse impacts it causes. Ventura has set the following greenhouse reduction targets to align with the State climate goals:

- 40% below 1990 levels by 2030 (Senate Bill 32)
- 80% reduction by 2040 (Interim)
- Carbon neutrality by 2045 (Executive Order B-55-18)

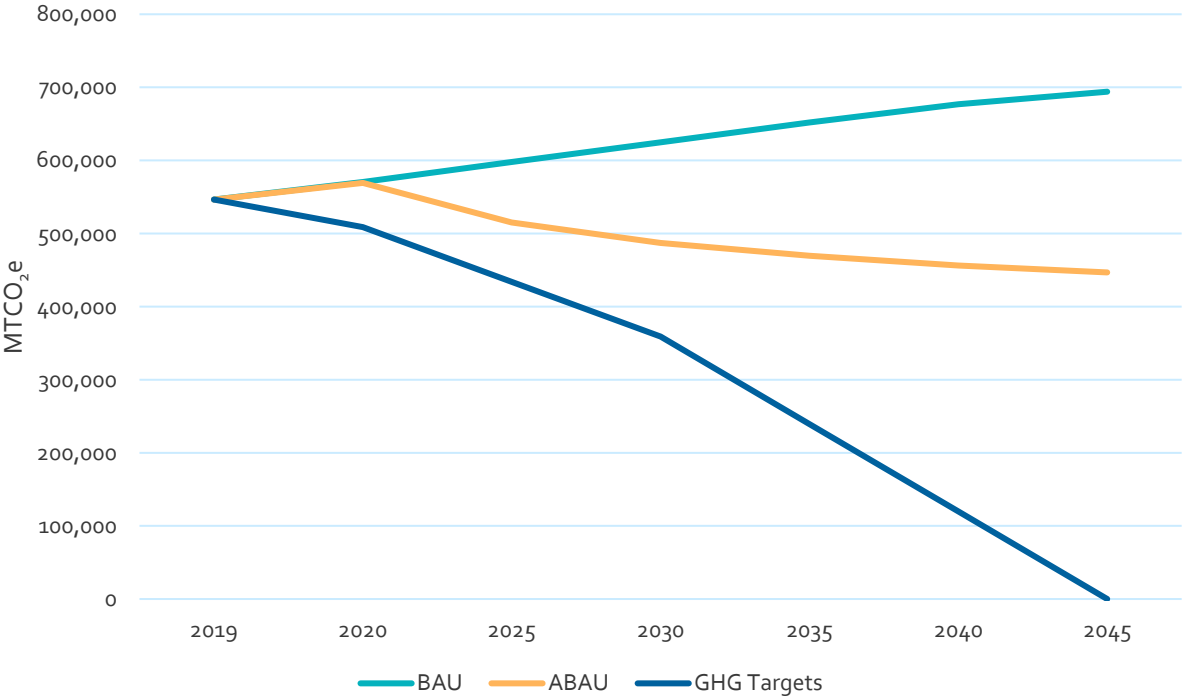
This CARP includes innovative strategies and actions to significantly reduce greenhouse gas emissions into the future—but technological constraints may prevent reducing emissions to absolute zero by 2045. The CARP will need to be updated in the future to reflect technological advancements, changes in State policy, and local attitudes and conditions.

Greenhouse Gas Emissions Projections

Two emissions forecasts were prepared to estimate Ventura’s emissions from 2020-2045 as presented in Figure 4. These forecasts show the emissions reductions the CARP actions will need to achieve to become carbon neutral by 2045.

- Business-As-Usual (BAU).** The BAU scenario projects future emissions based on current population and regional growth trends, climate patterns and their impacts on energy use, and regulations (federal, State, and local) introduced before the 2019 inventory year. BAU projections demonstrate the expected growth in greenhouse gas emissions if no further action is taken by the State or at the local level after 2019. Under this “do nothing” scenario, the City’s emissions are estimated to increase by 29% by 2045.
- Adjusted Business-as-Usual (ABAU).** The ABAU forecast shows how Ventura’s emissions are anticipated to change accounting for the impacts of adopted State climate-related policies if no action is taken at the local level. Based on the results of the ABAU forecast, emissions are expected to decrease 18% by 2045.

Figure 4. Greenhouse Gas Emissions Reductions from CARP Mitigation Measures



Chapter 3

Our Changing Climate

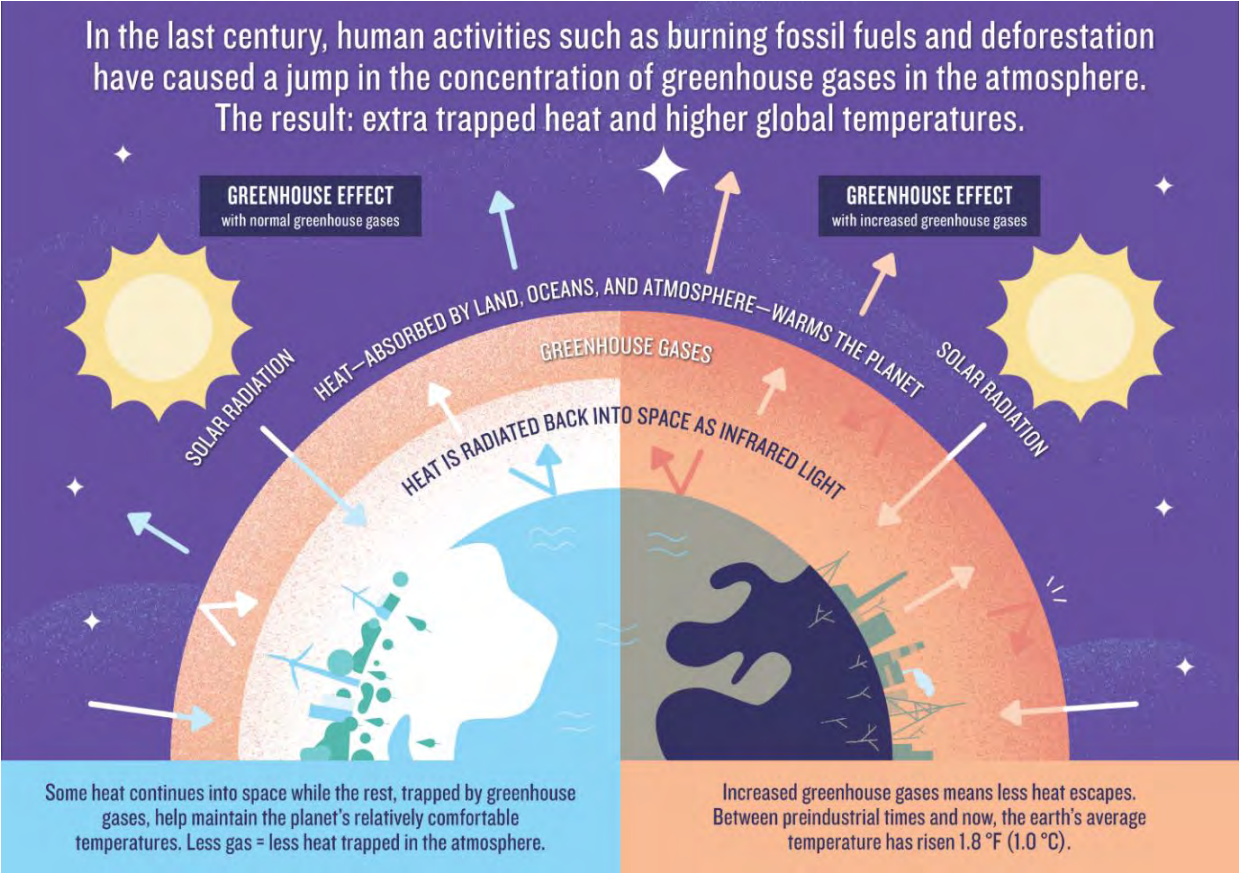
The City of Ventura recognizes that climate change is altering local climatic conditions and requires planning across sectors and industries to prepare for and mitigate impacts. Climate change is causing more severe temperatures and prolonged droughts, among other impacts. These circumstances can trigger dangerous events that imperil life and property, such as the Thomas Fire.

One of the primary objectives of this CARP is to prepare the community of Ventura for the impacts of climate change. This chapter summarizes the climate hazards the City is facing and will continue to face and the resilience and adaptation measures and sub-actions to reduce vulnerability to the effects of climate change.

Climate Change

Climate is the long-term behavior of the atmosphere – typically represented as averages – for a given time of year. This includes average annual temperature, snowpack, or rainfall. Human emissions of carbon dioxide and other greenhouse gas emissions (greenhouse gases) are important drivers of global climate change, and recent changes across the climate system are unprecedented. Greenhouse gases trap heat in the atmosphere, resulting in warming over time. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes include heatwaves, heavy precipitation, droughts, and hurricanes.⁶

Figure 3. The Greenhouse Effect



Source: NRDC (2019).

⁶ Intergovernmental Panel on Climate Change 2021. Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press.

California and Ventura are already experiencing the effects of a changing climate. Both gradual climate change (e.g., sea level rise) and climate hazard events (e.g., extreme heat days), which expose people, infrastructure, buildings and properties, and ecosystems to a wide range of stress-inducing and hazardous situations. These hazards and their impacts disproportionately affect the most sensitive populations in the city, including children and elderly adults, low-income populations, renters, immigrants, and BIPOC residents, among others.

While climate projections cannot predict what will happen at a certain date in the future, projections can provide cities with information about what to expect from the climate in the future. For example, climate projections can estimate how much warmer the temperature will be in summer or how many more extreme weather events are likely to occur in the future. Climate projections, however, cannot forecast with precision when those events will occur.

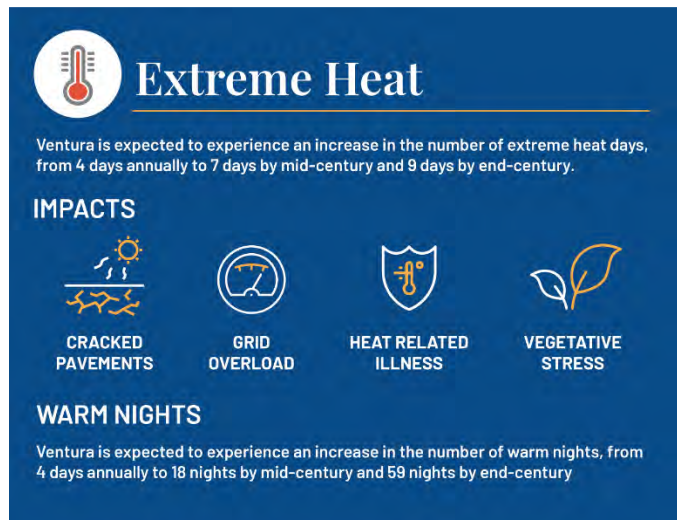
Future climate projections are created using global climate models. These models simulate climate conditions both in the past and in the future. Climate scientists can use these models to assess how the climate will change (or not) based on scenarios of greenhouse gas emissions.

Climate Hazards in Ventura

This section presents information on projected changes to natural hazards, including extreme heat and warm nights, drought, wildfire, landslides, riverine and stormwater flooding, air quality, and sea level rise, which result from changes to climate drivers.

Extreme Heat

Extreme heat events are defined as days in which the daily maximum temperature exceeds the 98th percentile value of the historical average.⁷ For Ventura, the threshold temperature is 91.9°F.⁸ Increased frequency of extreme heat days can result in increased public health risks, which tend to be disproportionate for vulnerable populations such as those experiencing homelessness, outdoor workers, older adults, children, and individuals with underlying chronic diseases. Ventura has historically experienced four warm nights a year and is projected to experience a mid-century total of 25 nights (RCP 8.5) and an end-century total of 26 (RCP 4.5) to 59 nights (RCP 8.5).⁹ Extreme heat can also damage roadways, overload electrical grid systems, and result in vegetation die-off or stress.



Source: City of Ventura Climate Change Vulnerability Assessment (2022)

⁷ California Energy Commission (CEC). Cal-Adapt Local Climate Change Snapshot for Ventura. 2021. <https://cal-adapt.org/tools/local-climate-change-snapshot/>

⁸ Ibid.

⁹ Ibid.

Drought

Climate change will increase the likelihood that low-precipitation years will coincide with above-average temperature years. In California’s highly variable climate setting, climate models project less frequent but more extreme daily precipitation, with year-to-year precipitation becoming more volatile and the number of dry years increasing.¹⁰ Drought can affect vulnerable populations as can suppress economic productivity throughout the Ventura region. Vulnerabilities for natural resources can include stressed vegetation and habitat depletion and populations may be more vulnerable to heat stress and dehydration.¹¹ Additionally, sustained drought conditions can lead to dry, dusty conditions which can impact health.

Wildfire

Wildfire events are a product of temperature increases compounded with precipitation declines creating wildfire prone conditions. Ventura County’s wildfires are influenced by Santa Ana Winds, downed power lines, and fuel availability.¹² Wildfires can create risk of injury, death, or financial hardship if private property is damaged as well as physical damage to all other assets creating cascading risks for vulnerable populations when infrastructure is damaged or off-line. For example, individuals with chronic health conditions who rely on medical equipment for critical health care could be severely impacted by a wildfire-caused power outage. Since 2005 there have been fourteen federal disaster declarations for Wildfire events in Ventura County, including the 2017 Thomas Fire which burned numerous structures and residences in the City of Ventura.

Worsening air quality due to climate change can create respiratory issues for vulnerable populations and impact indoor areas without adequate air filtration systems. Air quality decline sources include dust, smog, fewer natural filtrations, and wildfire smoke.



Source: City of Ventura Climate Change Vulnerability Assessment (2022)

¹⁰ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California’s Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

¹¹ Ibid.

¹² Ibid.

2017 Thomas Fire

The Thomas Fire started in December 2017 and burned in Ventura and Santa Barbara Counties. The fire burned a total of 281, 893 acres and destroyed 1,063 structures, becoming one of California's largest and most destructive wildfires.¹³ In the City of Ventura alone, the fire destroyed 535 buildings, 504 of which were residences.¹⁴ Additionally, the fire left burn scars on many surrounding hillsides leaving them susceptible to mudslides. Fire season in California used to run from April to October; however, according to CALFIRE, California continues to experience longer wildfire seasons as a direct result of climate change.¹⁵ Sparking in December, the Thomas Fire illustrates the year-round fire season California and Ventura are now experiencing.

According to survey results, almost three quarters of respondents experienced disaster(s) in recent years. Seventy-two percent of respondents reported experiencing the impacts of the Thomas Fire and/or the subsequent mudslides. Reported impacts of the Thomas Fire in Ventura included: loss of income/work, loss of power, loss of cell service, respiratory and cardiovascular illness due to smoke, mandatory evacuation, and mental health impacts.

The survey also suggested that individuals and the City could be better prepared for future large-scale natural disasters by expanding the emergency communication network, improving evacuation routes, and developing local solar plus storage projects to reduce the impacts of power outages. The CARP, GPU, and Multi-Jurisdiction Hazard Mitigation Plan include complementary measures and sub-actions to reduce the risks associated with wildfires and prepare the community through a combination of robust community engagement and physical hardening strategies.



¹³ CALFIRE. (2020). Thomas Fire Incident Report. Accessed from: <https://www.fire.ca.gov/incidents/2017/12/4/thomas-fire/>.

¹⁴ Mitchell, Carmel, Nick Pivaroff, Vijay Mepani, and Tiffany Meyer. (2017) Thomas Incident Damage Inspection Report CAVNC 103156. Accessed from: <https://www.documentcloud.org/documents/4434210-Final-Damage-Report.html>.

¹⁵ CALFIRE. (2022). Incidents. Accessed from: <https://www.fire.ca.gov/incidents/>.

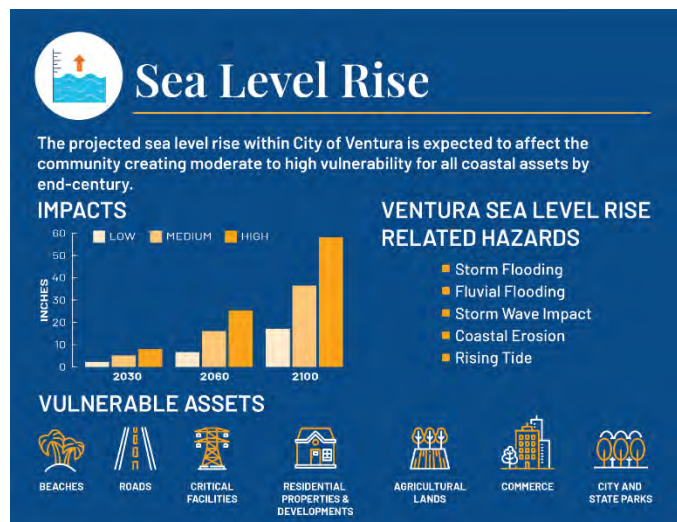
Landslides

Triggered by extreme bouts of precipitation or wildfires, the susceptibility of the larger Ventura region to landslides is projected to increase as precipitation variability increases and wildfires increase in frequency, area, and severity.¹⁶ The Ventura County Multi-Jurisdictional Hazard Mitigation Plan ranks the risk for landslides as the highest of all other climate hazards for the City of Ventura. The projected increase in precipitation extremes, alone and in combination with the projected increase in wildfires, creates increased overall potential for floods, mudslides, and debris flows in the City.

Flooding and Sea Level Rise

Climate change may cause low-lying areas throughout Ventura to experience more frequent flooding. Stormwater systems may be overwhelmed more frequently as more extreme rain events occur, causing localized flooding. The Multi-Jurisdictional Hazard Mitigation Plan for Ventura County identifies flooding as a medium risk, and notes that numerous areas of the City are subject to flooding during periods of high rain. The impact of the flooding includes street closures, and damage to property, vehicles, and buildings, and can also have cascading effects on power, wastewater, and storm drainage infrastructure, exacerbating public health concerns.¹⁷

Sea levels in California are expected to rise in the coming decades because of climate change. By 2030, sea level is expected to rise 2.3" (in a low modeling scenario), 5.2" (in a medium outcome scenario), and 8.0" (in a high outcome scenario).¹⁸ By 2060, sea level is expected to rise 7.4" (low), 16.1" (medium), and 25.3" (high).¹⁹ By 2100, sea level is expected to rise 17.1" (low), 36.5" (medium), and 58.1" (high).²⁰ Ventura sea level rise related hazards include storm flooding, fluvial flooding, storm wave impacts, coastal erosion, and rising tides.



Source: City of Ventura Climate Change Vulnerability Assessment (2022)

¹⁶ Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-007.

¹⁷ Ibid.

¹⁸ The Nature Conservancy. n.d.-b. Ventura County Coastal Resilience Project. <https://coastalresilience.org/project/ventura-county/>

¹⁹ Ibid.

²⁰ Ibid.

Climate Change Vulnerability

This section highlights the critical vulnerabilities across multiple hazards and sectors. Existing plans, policies, and programs that contribute to the adaptive capacity is summarized throughout. An impact score and an adaptive capacity score is identified for each asset by climate hazard, along with an overall vulnerability score consistent with the scoring methodology described in Appendix D.

Social Vulnerability and Disadvantaged Populations

These hazards and their impacts disproportionately affect the most vulnerable and marginalized populations in the city. Historical policies have caused certain populations to bear a disproportionate share of the consequences of natural hazards and climate change. Although climate hazards have the potential to affect all Ventura residents, the severity of impacts is heavily shaped by demographic factors like race, socioeconomic status, gender, housing status, and more. Moreover, sensitive populations have less capacity to adapt to climate hazards, because of long-standing structural and institutional inequities. Based on the Climate Vulnerability Assessment, populations in the City of Ventura are most vulnerable to extreme heat/warm nights, drought, wildfire, landslides, air quality, and sea level rise as shown in Table 3.

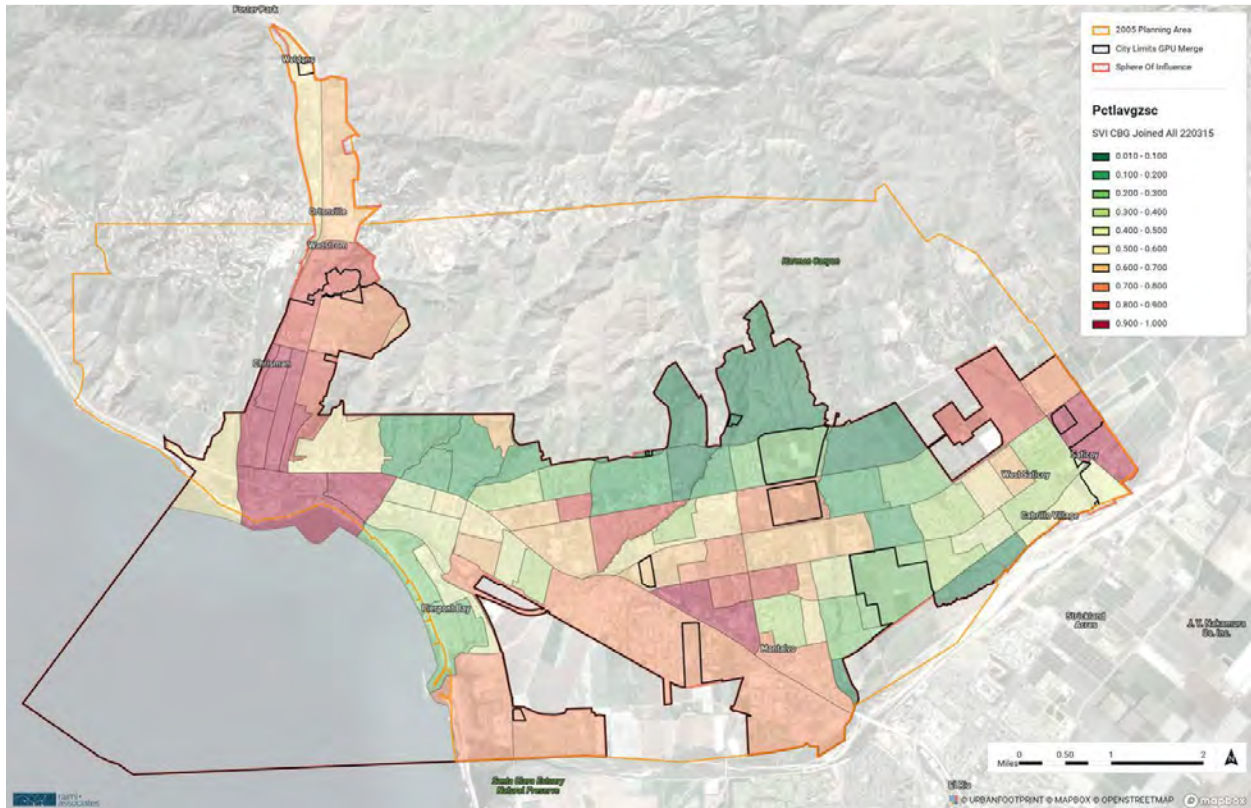
Table 3. Vulnerability Score for Populations

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Medium	4-High
Drought	Medium	Medium	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Low	4-High
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	High	Low	5-High
Sea Level Rise	High	Low	5-High

Source: City of Ventura Climate Change Vulnerability Assessment (2022)

Citywide, the sub-areas of Saticoy, Thille, and Westside have the greatest social vulnerability to climate impacts while the sub-areas of Foothill, Pierpont, and College Area have the lowest social vulnerability to climate impacts (see Figure 5). The areas with the highest social vulnerability index (SVI) scores correspond to the disadvantaged communities (DACs) identified by the GPU process. The Social Vulnerability Assessment outlines vulnerable populations in the city in more detail (Appendix C).

Figure 5. Social Vulnerability Assessment in Ventura



Source: Social Vulnerability Assessment (2022)

Natural Resources

Primary vulnerabilities for natural resources are associated with climate hazard-caused stress and physical damage to resource types within this asset group. Compounding climate hazards stress natural ecosystems past their ability to absorb individual climate hazards. Wildlife will seek out more conducive habitats during climate hazards such as extreme heat or drought which tend to be where people recreate (USDA 2018). Impacts related to habitat shifts are exacerbated in comparison with rural communities, as densely populated and isolated open space areas have limited opportunities for natural re-seeding or re-habitation from adjacent areas. Both natural resources (beaches, hillsides, rivers and barrancas, riparian and freshwater marshes, biodiversity) and managed resources (parks and agricultural lands) in the City of Ventura, are highly affected by and vulnerable to the effects of climate change. Natural and managed resources are most vulnerable to extreme heat/warm nights, drought, landslides, wildfire, and sea level rise as shown in Table 4.

Table 4. Vulnerability Score for Natural and Managed Resources

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	High	Low	4-High
Drought	High	Low	4-High
Wildfire	High	Medium	4-High
Landslides	High	Low	4-High
Riverine and Stormwater Flooding	High	Medium	3-Medium
Air Quality	Medium	Medium	3-Medium
Sea Level Rise	High	Medium	4-High

Source: City of Ventura Climate Change Vulnerability Assessment (2022)

Buildings and Facilities

Vulnerabilities within this asset category primarily concern physical exposure and damages to residential areas, commercial and industrial buildings, and educational facilities in relation to climate hazards. Buildings and facilities in the City of Ventura are most vulnerable to wildfires as shown in Table 5.

Table 5. Vulnerability Score for Buildings and Facilities

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	Low	Low	3-Medium
Drought	Low	Low	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Medium	3-Medium
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	Low	Low	3-Medium
Sea Level Rise	Medium	Medium	3-Medium

Source: City of Ventura Climate Change Vulnerability Assessment (2022)

Critical Services and Infrastructure

Overall vulnerabilities associated with this asset category involve structural preparedness and service reliability in the face of climate change. This section is concerned with the cascading impacts physical damages to buildings and facilities can have on services and infrastructure. Table 6 shows that critical services and infrastructure in the City of Ventura are most vulnerable to extreme heat/warm nights, drought, landslides, riverine and stormwater flooding, and air quality.

Table 6. Vulnerability Score for Critical Services and Infrastructure

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	High	Low	5-High
Drought	High	Medium	4-High
Wildfire	High	High	3-Medium
Landslides	Medium	Low	4- High
Riverine and Stormwater Flooding	High	Low	5-High
Air Quality	Medium	Low	4-High
Sea Level Rise	Medium	Medium	3-Medium

Source: City of Ventura Climate Change Vulnerability Assessment (2022)

Chapter 4

Our Adaptation Strategy

The City intends to implement a suite of adaptation strategies to increase the resilience of the City's community members, natural resources, managed resources, critical facilities, infrastructure, and services from the impacts associated with climate change hazards, as identified in the Climate Change Vulnerability Assessment, and summarized in Chapter 3. These strategies address assets with the highest vulnerability to climate change.

To guide the development of adaptation strategies, the following criteria were established to increase the likelihood of implementation, allow for equitable distribution of benefits, and prioritize proven and effective strategies to increasing resilience:

- Establish structural changes within governance plans and processes to facilitate implementation of adaptation actions.
- Identify needed funding, establish funding mechanisms, and allocate adequate and equitable funding to support adaptation implementation.
- Conduct meaningful and continuous engagement and education with the most impacted communities.
- Employ adaptive and flexible governance approaches by utilizing collaborative partnerships across jurisdictional boundaries and between institutional sectors to accelerate effective problem solving and implementation.
- Prioritize actions that promote equity, foster community resilience, and protect the City's most vulnerable populations. Intentionally prioritize the needs of communities that are disproportionately vulnerable to climate impacts.
- Assess feasibility to understand the best path or obstacles of implementing an action.

The following strategies and actions collectively work toward building the resilience and capacity for the community to better cope and prepare for the effects of climate change in the City of Ventura.

The strategies and actions are presented in the following sectors:

- Extreme Heat Resilience
- Wildfire Mitigation
- Debris Flow Mitigation
- Flood Mitigation
- Drought Mitigation
- Sea Level Rise Mitigation
- City Capacity and Coordination
- Community Awareness
- Emergency Response

Each measure contains at least one action that meets the adaptation criteria listed above and is identified in parenthesis in the tables below.

Table Key

Climate Hazard Addressed: The climate hazard the measures and actions address based on the Climate Vulnerability Assessment.

Responsible City Departments: The City department or entity that will lead the implementation of the action.

Cost Key:

\$ - Low Cost (e.g., municipal code updates, plan updates, changes to internal protocols or existing programs)

\$\$ - Medium (e.g., new plans and studies and innovative programs)

\$\$\$ - High (e.g., capital projects)

Performance Metrics

- Number of air quality retrofits (filters installed) for eligible homes
- Number of retrofits to city-owned facilities and infrastructure at risk to wildfire
- Number of community workshops on wildfire mitigation practices
- Number of trees planted in disadvantaged neighborhoods
- Tree canopy in disadvantaged neighborhoods
- Amount of protected coastal open space
- Number of people signed up for emergencies notifications

Extreme Heat Resilience

EH 1.1 Public Outreach and Warnings

Expand public outreach and warning systems to increase preparedness for extreme heat events.

Implementation Actions:

1. In collaboration with Ventura County Public Health, establish local early heat warning system that provides public health alerts (Education, Partnership).
2. Develop protocols to improve outreach and assistance to vulnerable populations before and during extreme heat events (Education).

Climate Hazard Addressed	Extreme Heat
Cost	\$
Responsible Departments	Fire, Office of Emergency Preparedness

EH 1.2 Cool Pavement

Explore opportunities to incorporate cool pavement practices into new streetscape or urban design.

Implementation Actions:

1. Complete an assessment that evaluates new cool pavement technology, cost/benefits, and challenges and opportunities. (Feasibility)
2. Based on the results of the assessment, consider conducting a pilot project of cool pavement application at one location in a neighborhood with a high number of socially vulnerable populations. (Feasibility)

Climate Hazard Addressed	Extreme Heat
Cost	\$\$\$
Responsible Departments	Public Works

EH 1.3 Cool Roofs

Promote the use of cool roofs to reduce the urban heat island effect.

Implementation Actions:

1. Provide under-resourced populations with incentives such as expedited permitting or reduced fees to decrease barriers associated with installing cool roofs. (Equity)
2. Include a requirement of cool roofs for new construction in the building code. (Structure Change)
3. Develop educational materials for roofing contractors and building owners regarding the benefits of cool roofs. (Education)
4. Establish a partnership with a community group such as the Ventura County Contractors association to help promote the use of cool roofs. (Partnership)

Climate Hazard Addressed	Extreme Heat
Cost	\$\$
Responsible Departments	Community Development, Public Works

EH 1.4 Resources for DACs

Provide disadvantaged communities (DACs) with resources to mitigate impacts from extreme heat and associated power outages.

Implementation Actions:

1. Increase outreach and education around Southern California Edison (SCE) programs that subsidize cooling costs and back-up power devices for low-income households. (Equity, Education)

Climate Hazard Addressed	Extreme Heat
Cost	\$\$
Responsible Departments	Community Development, Public Works

EH 1.5 Increase Tree Canopy

Increase urban tree canopy citywide to mitigate extreme heat.

Implementation Actions:

1. Conduct an urban canopy study to identify areas in Ventura that have the lowest proportions of canopy coverage and implement a tree planting program focusing on communities with high social vulnerability. (Equity, Feasibility)
2. Identify and apply for State (e.g., California RedLeaf, Affordable Housing and Sustainable Communities Program (AHSC), Urban and Community Forestry Program) and federal (e.g., USDA) tree planting project funding. (Funding)
3. Prioritize tree implementation in areas with populations most at risk to extreme heat impacts (seniors, children, outdoor workers, individuals with disabilities, transit dependent individuals, and individuals with chronic health conditions). (Equity)
4. Provide educational guidance to landowners on anticipated climate change impacts to urban forests including decreased water availability, more arid conditions, and increased non-native pests and diseases. (Education)
5. Identify the number of trees needed to mitigate extreme heat impacts in the City. (Feasibility)
6. Develop and implement a plan to plant the trees, monitor their health, and support their health and replace, as necessary. (Structural Change)

Climate Hazard Addressed	Extreme Heat
Cost	\$\$
Responsible Departments	Parks

EH 1.6 Protect Open Space

Protect and enhance the City's open space areas to maximize ecosystem services and mitigate extreme heat.

Implementation Actions:

- | | | | | | |
|--|--|---------------------------------|---------------------|-------------|------|
| <ol style="list-style-type: none"> Partner with Ventura County Resource Conservation District to conduct a study on open space areas in the City to identify areas with greatest cooling magnitude and areas to maximum preservation and enhancement efforts. (Feasibility) | <table border="0"> <tr> <td style="padding-right: 20px;">Climate Hazard Addressed</td> <td>Extreme Heat</td> </tr> <tr> <td>Cost</td> <td>\$\$</td> </tr> </table> | Climate Hazard Addressed | Extreme Heat | Cost | \$\$ |
| Climate Hazard Addressed | Extreme Heat | | | | |
| Cost | \$\$ | | | | |
| <ol style="list-style-type: none"> Identify trees, grasses, and shrubs with greatest cooling benefits and plant them in prioritized open spaces. (Structure Change) Identify opportunities to apply compost at City open spaces to improve water-holding capacity and filtration to combat extreme heat. (Feasibility) | <table border="0"> <tr> <td style="padding-right: 20px;">Responsible Departments</td> <td>Parks, Public Works</td> </tr> </table> | Responsible Departments | Parks, Public Works | | |
| Responsible Departments | Parks, Public Works | | | | |

Wildfire Mitigation

WM 2.1 Wildfire Communications

Provide streamlined communication to the public on wildfire preparedness, mitigation, and evacuation.

Implementation Actions:

- | | | | | | |
|--|---|---------------------------------|---|-------------|----|
| <ol style="list-style-type: none"> Develop a communication program and materials to educate the public on wildfire preparedness, mitigation, and evacuation. (Education) | <table border="0"> <tr> <td style="padding-right: 20px;">Climate Hazard Addressed</td> <td>Wildfires</td> </tr> <tr> <td>Cost</td> <td>\$</td> </tr> </table> | Climate Hazard Addressed | Wildfires | Cost | \$ |
| Climate Hazard Addressed | Wildfires | | | | |
| Cost | \$ | | | | |
| <ol style="list-style-type: none"> Require that wildfire mitigation, safety, and evacuation communications be provided in Spanish to support non or limited English speakers. (Equity, Education) | <table border="0"> <tr> <td style="padding-right: 20px;">Responsible Departments</td> <td>Fire and Office of Emergency Preparedness</td> </tr> </table> | Responsible Departments | Fire and Office of Emergency Preparedness | | |
| Responsible Departments | Fire and Office of Emergency Preparedness | | | | |

WM 2.2 Wildfire Community Engagement

Increase community engagement and involvement in wildfire risk reduction.

Implementation Actions:

- | | | |
|---|---------------------------------|---|
| <ol style="list-style-type: none"> Continue to conduct on-going workshops on defensible space, vegetation management, and home-hardening techniques based upon most up to date CAL FIRE management guidelines and policies for landowners in fire hazard severity zones. (Education) Provide home hardening, defensible space, and fire-safe landscaping guidance materials online and hard copies in Spanish to support non or limited English speakers. (Education, Equity) Partner with the Ventura Regional Fire Safe Council on wildfire mitigation efforts that advance key strategies outlined in the Ventura County Community Wildfire Protection Plan. Focus continued efforts on existing vegetation management activities that reduce risk in wildland urban interface (WUI) areas, developing wildfire safety education efforts for structure and property owners in the WUI areas on wildfire prevention, defensible space, fire-safe landscaping, reduction of structural ignitability, and ensuring safe evacuation through streamlined communications and protocol. (Partnership) Partner with Ventura Regional Fire Safe Council to help them secure grant funding for mitigation activities. (Partnership, Funding) | Climate Hazard Addressed | Wildfires |
| | Cost | \$ |
| | Responsible Departments | Fire and Office of Emergency Preparedness |
| | | |

WM 2.3 Low-Income Air Quality Subsidy

Develop a subsidy program to improve air quality in the homes of low-income residents to mitigate impacts from wildfire smoke.

Implementation Actions:

- | | | |
|---|---------------------------------|---|
| <ol style="list-style-type: none"> Identify funding sources for the home air quality improvement subsidy program (Funding) Develop criteria for eligible program beneficiaries. (Equity) Partner with CBOs, such as the Westside Community Council, to implement, promote the program, and provide informational material on the benefits of air improvement options. (Partnership, Education) | Climate Hazard Addressed | Wildfires |
| | Cost | \$\$ |
| | Responsible Departments | Fire and Office of Emergency Preparedness |
| | | |

WM 2.4 Defensible Space

Enforce defensible space and home hardening standards to mitigate structure ignitions from wind blow embers.

Implementation Actions:

1. Educate landowners and residents on how structures ignite, the role of embers, and which building materials, designs, and retrofits reduce wildfire risk. (Education)
2. Continue to track new and ignition-resistant construction technologies and promote increasingly fire safe building standards through ordinance updates. (Structure Change)
3. Partner with Ventura County to provide funding incentives to promote fire safe retrofits of existing structures that meet ignition-resistant building codes. (Partnership, Funding)

Climate Hazard Addressed	Wildfires
Cost	\$
Responsible Departments	Fire and Office of Emergency Preparedness

WM 2.5 Water Supply

Require adequate water supplies for fire suppression.

Implementation Actions:

1. Coordinate with Casitas Municipal Water District and Ventura Water to conduct an annual assessment of current water supplies and verify that adequate water supply systems and flows meet fire suppression needs throughout the City. (Partnership, Feasibility)

Climate Hazard Addressed	Wildfires
Cost	\$
Responsible Departments	Fire, Ventura Water

WM 2.6 Fire Hardening of City Facilities

Upgrade or retrofit City-owned facilities and infrastructure located in the fire hazard severity zone to increase resilience to power outages and wildfires.

Implementation Actions:

1. Conduct a built asset vulnerability assessment to identify which City-owned facilities and infrastructure have the highest risk to wildfire impacts. (Structure Change)
2. Identify necessary upgrades and retrofits. (Feasibility)
3. Identify funding (e.g., CAL FIRE or FEMA) to implement upgrades or retrofits. (Funding)

Climate Hazard Addressed	Wildfires
Cost	\$\$\$
Responsible Departments	Public Works, Ventura Water

WM 2.7 Reduce Fire Risk in Wildfire Urban Interface Zone

Continue to coordinate with CAL FIRE, Ventura County Fire, Ventura Regional Fire Safe Council, and neighboring jurisdictions on wildfire risk reduction activities in the Wildland Urban Interface (WUI) and open space areas in and adjacent to the City.

Implementation Actions:

- | | | |
|--|---------------------------------|-----------|
| 1. Coordinate with responsible stakeholders to develop and update annual fuels management activities and cost estimates. (Structure Change) | Climate Hazard Addressed | Wildfires |
| | Cost | \$\$ |
| 2. Engage with SCE to reduce fuels and potential ignitions adjacent to power lines. (Partnership) | Responsible Departments | Fire |
| 3. Partner with Ventura County Air Pollution Control District and Ventura County Prescribed Burn Association to continue and grow prescribed burning activities. (Partnership) | | |

WM 2.7 Housing for the Displaced

Provide community members displaced by wildfire with temporary housing options in the City.

Implementation Actions:

- | | | |
|--|---------------------------------|-------------------------------------|
| 1. Partner with Housing Authority of the City of San Buenaventura to conduct a study that estimates potential displacement impacts associated with wildfire impacts. (Partnership, Feasibility) | Climate Hazard Addressed | Wildfires |
| | Cost | \$\$\$ |
| 2. Assess current City capacity to house displaced residents including facilities, infrastructure, services, and community programs. (Feasibility) | Responsible Departments | Public Works, Community Development |
| 3. Establish a working group to develop designated temporary housing options for wildfire displaced residents to live in for up to two years after their home was destroyed or severely damaged. (Structural Change) | | |

Debris Flow Mitigation

DF 3.1 Reduce Consequences of Debris Flow

Reduce the potential for injury, property damage, and loss of life resulting from debris flow.

Implementation Actions:

- | | | |
|--|---------------------------------|--------------|
| <ol style="list-style-type: none"> Mitigate debris flow risks in high hazard areas with measures such as reconstructing retaining walls, improving drainage, installing vegetation and netting, avoiding clear cutting, and stabilizing the soil after vegetative clearing, with compost or mulch. (Structure Change) | Climate Hazard Addressed | Debris Flows |
| | Cost | \$\$\$ |
| | Responsible Departments | Public Works |
- Update and revise design standards to incorporate the most up to date available information and technology related to debris flow. (Structure Change)
 - Minimize risks from debris flows by requiring that new developments be sited outside of hazards areas, when possible, and incorporating design that minimize the potential for damage. (Structure Change)
 - Regularly inspect most at risk locations, directly following major storm or atmospheric river events (Structure Change).
 - Partner with Ventura Regional Safe Council to conduct post fire assessments for landowners in burned areas two to five years after a wildfire, to assess risk for post-wildfire post debris flow. (Partnerships, Structural Change)

Flood Mitigation

FM 4.1 Reduce Stormwater Runoff

Reduce stormwater runoff through a variety of natural and built infrastructure projects.

Implementation Actions:

- | | | |
|--|---------------------------------|--------------|
| <ol style="list-style-type: none"> Design streets to incorporate vegetation, soil, and engineered systems to slow, filter, and cleanse stormwater runoff (e.g., Incorporate green stormwater infrastructure including bioswales into roadway designs where feasible, incorporate previous pavements into sidewalks, street furniture zones, and entire roadways/portions). (Structure Change) | Climate Hazard Addressed | Flood |
| | Cost | \$\$\$ |
| | Responsible Departments | Public Works |
- Continue hillside monitoring and stabilization efforts after heavy rain events in areas at risk of landslides (e.g., install landslide monitoring equipment in Landslide Susceptibility Areas, build natural infrastructure to reduce the risk of landslides, such as hillside revegetation). (Structure Change)

FM 4.2 Multi-Family Education

Provide education and information for renters and landlords.

Implementation Actions:

- | | | |
|--|---------------------------------|----------------------------------|
| 1. Provide renters with flood insurance flyers and educate renters in the coastal zone on coastal flooding. (Education) | Climate Hazard Addressed | Flood |
| | Cost | \$\$ |
| 2. Encourage landlords to consider how to prepare their properties for flooding by providing retrofit informational resources and educate them on prioritizing low-impact stormwater best practices. (Education) | Responsible Departments | Office of Emergency Preparedness |
| 3. Create educational campaigns and target vulnerable populations to increase awareness and knowledge of how to mitigate and weather flooding. (Equity) | | |
| 4. Create evacuation procedures for vulnerable populations in partnership with Community-based organizations (CBOs) and facilities that serve identified populations. (Equity) | | |
| 5. Identify subsidy programs to retrofit existing structures and low-income households. (Equity) | | |

FM 4.3 Stormwater Quality

Improve water quality of stormwater runoff.

Implementation Actions:

- | | | |
|---|---------------------------------|--------------|
| 1. Conduct an analysis of protective stormwater needs for the Santa Clara and Ventura Rivers. (Feasibility) | Climate Hazard Addressed | Flood |
| | Cost | \$\$\$ |
| 2. Implement low-impact stormwater best practices in areas neighboring the Santa Clara and Ventura Rivers. (Structure Change) | Responsible Departments | Public Works |

FM 4.4 Low-Impact Development

Prioritize low-impact development stormwater best practices.

Implementation Actions:

- | | | |
|---|---------------------------------|--------------|
| 1. Develop or amend the community's stormwater ordinance to prioritize low-impact stormwater best practices for private realm properties. (Structure Change) | Climate Hazard Addressed | Flood |
| | Cost | \$ |
| 2. Adopt or modify the community's floodplain management ordinance so there is no-net-loss of floodplain storage through development restrictions (Structure Change) | Responsible Departments | Public Works |
| 3. Adopt or modify the community's floodplain management ordinance so that there is no-net-loss of floodplain storage through development restrictions (Structure Change) | | |

Drought Mitigation

DM 5.1 Agricultural Resilience

Increase drought resilience of agricultural operations and crops.

Implementation Actions:

- | | | | | | | | |
|---|--|---------------------------------|---------|-------------|------|--------------------------------|----------------|
| <ol style="list-style-type: none"> Partner with Farm Bureau of Ventura County to develop and physically and electronically promote educational material in multiple languages for agricultural stakeholders, promoting best practices on water conserving irrigation methods. (Partnership, Education) Partner with UC Cooperative Extension Ventura County to provide educational information on anticipated climate changes such as hardier pests, reduced water availability, new weeds, and altered growing seasons. (Partnership, Education) | <table border="0"> <tr> <td style="padding-right: 20px;">Climate Hazard Addressed</td> <td>Drought</td> </tr> <tr> <td>Cost</td> <td>\$\$</td> </tr> <tr> <td>Responsible Departments</td> <td>Communications</td> </tr> </table> | Climate Hazard Addressed | Drought | Cost | \$\$ | Responsible Departments | Communications |
| Climate Hazard Addressed | Drought | | | | | | |
| Cost | \$\$ | | | | | | |
| Responsible Departments | Communications | | | | | | |

DM 5.2 DAC Water Conservation

Provide disadvantaged communities with guidance and cost saving incentives to increase water conservation and lessen rate burdens.

Implementation Actions:

- | | | | | | | | |
|---|---|---------------------------------|---------|-------------|------|--------------------------------|---------------|
| <ol style="list-style-type: none"> Consider creating a focused water reduction education campaign targeting low-income households with high utility bill burdens, to highlight water conservation practices and incentive programs. (Equity, Education) Expand outreach to increase participation in existing rebates offered to all customers for toilets, lawn removal, hot water recirculation pumps, smart irrigation controllers, low-flow sprinkler heads, etc. (Funding) | <table border="0"> <tr> <td style="padding-right: 20px;">Climate Hazard Addressed</td> <td>Drought</td> </tr> <tr> <td>Cost</td> <td>\$\$</td> </tr> <tr> <td>Responsible Departments</td> <td>Ventura Water</td> </tr> </table> | Climate Hazard Addressed | Drought | Cost | \$\$ | Responsible Departments | Ventura Water |
| Climate Hazard Addressed | Drought | | | | | | |
| Cost | \$\$ | | | | | | |
| Responsible Departments | Ventura Water | | | | | | |

DM 5.3 Recycled Water

Increase recycled water efforts in the City.

Implementation Actions:

1. Implement proposed water reuse projects through the VenturaWaterPure project, beginning in 2023, to create a new local water supply. (Structural Change)

Climate Hazard Addressed	Drought
Cost	\$\$\$
Responsible Departments	Ventura Water, Public Works

DM 5.4 Drought Tolerant Landscaping

Promote drought-tolerant landscaping city-wide.

Implementation Actions:

1. Partner with CBOs to increase participation in the City’s water conservation gardening classes. (Partnership)
2. Promote drought-tolerant flora through distribution of best practices flyers and through online social media posts. (Education)

Climate Hazard Addressed	Drought
Cost	\$
Responsible Departments	Ventura Water

Sea Level Rise Mitigation

SLR 6.1 Reduce SLR Impacts on Socially Vulnerable Populations

Decrease the inequitable impacts of sea level rise on socially vulnerable populations.

Implementation Actions:

1. Establish annual budgets for projects within and benefiting vulnerable populations (2016, Assembly Bill 1550), including seniors, individuals with disabilities, children, low-income communities, and communities in low-lying areas. (Equity)

Climate Hazard Addressed	Sea Level Rise
Cost	\$
Responsible Departments	Public Works

SLR 6.2 Regional Sediment Management

Implement a Regional Sediment Management program.

Implementation Actions:

- | | | |
|--|---------------------------------|----------------|
| <ol style="list-style-type: none"> 1. Support development and implementation of a Regional Sediment Management (RSM) program in partnership with Ventura County and local organizations (e.g., BEACON), which includes strategies designed to allow the use of natural processes to solve engineering problems. To be most effective, the RSM programs should consider the entire watershed, account for the effects of human activities on sediment, protect and enhance coastal ecosystems, and maintain safe access to beaches for recreational purposes. (Partnership, Structural Change) 2. Implement Sediment Opportunistic Placement Programs by developing policies for the Local Coastal Programs or as part of Coastal Development Permits that can lower the cost and facilitate delivery of opportunistic sand to nearby beaches where needed. (Structural Change) | Climate Hazard Addressed | Sea Level Rise |
| | Cost | \$\$\$ |
| | Responsible Departments | Public Works |

SLR 6.3 Coastal Open Space

Improve and expand the existing coastal open space to address sea-level rise.

Implementation Actions:

- | | | |
|--|---------------------------------|------------------------------------|
| <ol style="list-style-type: none"> 1. Identify replacement opportunities or otherwise plan for how to replace recreational areas and accessways that will be lost due to inundation or damage associated with sea level rise. It might be done through the designation and zonation of lands into a Local Coastal Program. (Structure Change) 2. Plan for future coastal recreational space and parkland by protecting open space adjacent to coastal habitats, allowing the beach and habitats to migrate into these spaces (Structure Change). 3. In collaboration with Ventura County and state agencies, develop sea level rise retreat strategy with coastal restoration projects and public access that would enhance coastal ecosystems (e.g., re-establishing native coastal dune habitats, wetlands, and lagoons) and increase coastal recreational opportunities. (Partnership, Structure Change) 4. Identify subsidy programs for educating vulnerable populations regarding climate change and sea level rise, and for developing programs that guarantee vulnerable populations and disadvantaged communities' access to coastal recreational resources. (Equity) | Climate Hazard Addressed | Sea Level Rise |
| | Cost | \$\$\$ |
| | Responsible Departments | Ventura Water, Public Works, Parks |

SLR 6.4 Coastal Resilience Funding

Research external funding opportunities to implement coastal resilience and coastal restoration projects.

Implementation Actions:

- | | | |
|--|---------------------------------|----------------|
| <ol style="list-style-type: none"> 1. Research external funding opportunities, including grants to support coastal resilience, coastal restoration projects, or beach nourishment (e.g., Living Shoreline and Nature-based solution projects). Examples of grantee agencies are California Coastal Conservancy, California Ocean Protection Council, NOAA, California Division of Boating and Waterways). (Funding) 2. Implement nature-based solutions projects, which have co-benefits for the protection of transportation facilities, such as groundwater recharge, stormwater management, and flood prevention, mitigation of the urban heat island effect, neighborhood beautification, and a more pleasant environment for pedestrians and bicyclists. (Structure Change) | Climate Hazard Addressed | Sea Level Rise |
| | Cost | \$\$\$ |
| | Responsible Departments | Public Works |

SLR 6.5 Agricultural Protection Program

Establish Sea level rise strategies as part of an agricultural protection program.

Implementation Actions:

- | | | |
|--|---------------------------------|----------------|
| <ol style="list-style-type: none"> 1. In partnership with Ventura County and state agencies, establish sea level rise strategies as part of an agricultural protection program to identify, acquire, incentivize, and manage areas appropriate for new/renewed agricultural use and/or for the protection of current and/or future agricultural uses. (Partnership, Structure Change) 2. Identify and designate inland areas suitable for agricultural production to replace agricultural production areas that could be lost to sea level rise. (Feasibility) | Climate Hazard Addressed | Sea Level Rise |
| | Cost | \$\$\$ |
| | Responsible Departments | Public Works |

SLR 6.6 Phased and Trigger-Based Measures

Implement phased and trigger-based adaptation measures.

Implementation Actions:

1. In coordination with Caltrans and local public works/transportation agencies, consider phased and trigger-based adaptation measures when planning for the adaptation of transportation infrastructure to sea level rise impacts over time. Design phases to address expected amounts of sea level rise and associated impacts to coastal resources, and to minimize impacts on access and mobility as well as on environmental, recreational, and public access resources over the planning horizon. The design shall contemplate specific triggers for implementing each subsequent phase. For example, phased measures may include hard shoreline protective devices for limited periods of time, elevation, and/or relocation, if otherwise consistent with relevant Local Coastal Program and, if applicable, Coastal Act policies. (Partnerships, Structure Change).

Climate Hazard Addressed	Sea Level Rise
Cost	\$\$
Responsible Departments	Public Works

SLR 6.7 Wastewater Treatment Facility Resilience

Increase the wastewater treatment facility’s resilience to sea level rise and stronger storms.

Implementation Actions:

1. Collaborate with the Los Angeles Regional Water Quality Control Board to increase the facility’s resilience to sea level rise and stronger storms. For example, conduct feasibility studies from technical experts, retrofitting, relocating, or eliminating outfalls deemed “at risk.” (Partnership)
2. Identify, redesign, or eliminate septic systems in hazardous areas that can be potentially impacted by sea level rise. (Structure Change)

Climate Hazard Addressed	Sea Level Rise
Cost	\$\$\$
Responsible Departments	Ventura Water

SLR 6.8 Coastal Critical Facilities

Provide access to critical facilities (e.g., medical buildings) and coastal areas impacted by coastal hazards and flooding.

Implementation Actions:

1. Provide alternate routes and ensure redundancy of critical transportation routes, as possible, to allow for continued access and movement to and along the coast in instances in which sections of roadways may become temporarily impassible because of coastal hazards. (Structure Change)
2. Inform residents and visitors about alternate routes to coastal areas. (Education)

Climate Hazard Addressed	Sea Level Rise
Cost	\$\$\$
Responsible Departments	Public Works

City Capacity and Coordination

CC 7.1 CARP Measure Integration

Support the implementation of the CARP by integrating measures and actions into existing plans and programs, internal protocols, and codes.

Implementation Actions:

1. Include climate adaptation measures that involve capital projects in the capital improvement plan process, prioritizing investments in areas with high number of socially vulnerable populations. (Structure Change)
2. Integrate and regularly update best available climate science, projections, and potential impacts into relevant local plans, codes, and planning documents, including the Local Coastal Program, Municipal Code, Emergency Operations Plan, and Capital Improvement Program. (Structure Change)

Climate Hazard Addressed	All Hazards
Cost	\$
Responsible Departments	Public Works, Community Development

CC 7.2 CARP Administrative Support

Provide administrative support and dedicate staff time for grant writing and funding tracking for climate adaptation and resilience projects.

Implementation Actions:

- | | | |
|---|---------------------------------|-----------------------|
| <ol style="list-style-type: none"> 1. Work with SCE and Clean Power Alliance to identify funding and financing opportunities to help residents and businesses pay for building electrification, weatherization, and battery backups. (Funding) 2. Research external funding opportunities to implement high-cost climate adaptation implementation projects, including infrastructure developments or upgrades. (Funding) 3. Prioritize funding and financing opportunities for high socially vulnerable populations. (Equity) | Climate Hazard Addressed | All Hazards |
| | Cost | \$ |
| | Responsible Departments | Public Works, Finance |

CC 7.3 Regional Coordination

Continue to coordinate with State agencies, Central Coast Climate Collaborative, Beach Erosion Authority for Clean Oceans and Nourishment (BEACON), Ventura County, Southern California Edison, Clean Power Alliance, local businesses, and other local and regional partners to streamline regional climate adaptation planning efforts.

Implementation Actions:

- | | | |
|--|---------------------------------|-----------------------|
| <ol style="list-style-type: none"> 1. Continue to improve collaboration and information sharing between local, regional, and State entities to provide socially vulnerable populations with resources to prepare for, cope with, and recover from climate change hazards. (Partnership, Equity) 2. Attend local and regional conferences and climate collaborative meetings to stay up to date with climate science and potential impacts and align climate adaptation efforts with other neighboring jurisdictions. (Partnerships) 3. Collaborate with businesses in the City to better understand shared climate risks and identify opportunities to provide resources and guidance that advances climate resilience priorities. (Partnerships) | Climate Hazard Addressed | All Hazards |
| | Cost | \$ |
| | Responsible Departments | Public Works, Finance |

Community Awareness

CA 8.1 Community Engagement Campaign

Develop a community-wide engagement campaign to educate the public on anticipated near and long-term climate impacts, community vulnerabilities, and opportunities for adaptation.

Implementation Actions:

1. On the City’s website, develop a virtual resilience hub that provides residents with education information on Ventura specific project climate impacts, community vulnerabilities, and adaptation programming and resources including resilience hub locations and preparedness guides and trainings. (Education)
2. Partner with community-based organizations (CBOs) to provide informational materials on climate change hazard preparedness, safety, and risk reduction strategies; Specifically target vulnerable populations including seniors, children, individuals with chronic health conditions, outdoor workers, and individuals with disabilities. (Partnership Equity)
3. Partner with local schools and youth facilities to host engaging activities and presentations on projected climate change impacts. (Partnership, Education)
4. Incorporate climate adaptation outreach and engagement into the Ventura’s Block by Block program. (Education)

Climate Hazard Addressed	All Hazards
Cost	\$\$
Responsible Departments	Public Works, Community Development, PIO

Emergency Response

ER 9.1 Resilient Energy Infrastructure for Vulnerable Populations

Provide vulnerable populations with resilient resources and energy infrastructure.

Implementation Actions:

1. Partner with Clean Power Alliance and Southern California Edison and emergency management services to establish backup power and energy grid shutdown protocols that protect the most vulnerable populations (e.g., seniors, individuals with chronic health conditions, children, individuals with disabilities). (Partnership, Equity)
2. Support development of community-serving microgrids and prioritize areas with high social vulnerability. (Equity)

Climate Hazard Addressed	All Hazards
Cost	\$\$\$
Responsible Departments	Office of Emergency Preparedness

ER 9.2 Emergency Notifications

Increase community member participation in emergency notification and preparedness systems.

Implementation Actions:

1. Partner with CBOs to conduct a recruitment campaign with community events and online and physical materials to increase diversity and overall membership of Ventura CERT. (Partnerships)
2. Increase participation in emergency notification systems including VC Alert and SCE Automated System through social media campaigns and physical flyer distribution. (Structure Change)

Climate Hazard Addressed	All Hazards
Cost	\$\$
Responsible Departments	Fire, Police, Office of Emergency Preparedness

ER 9.3 CBO Partnerships

Partner with community-based organizations (CBOs) and community facilities to develop evacuation procedures specifically for vulnerable populations.

Implementation Actions:

1. Conduct an assessment to identify CBOs and community facilities that support and service vulnerable populations. (Feasibility)
2. Host focus groups with selected CBOs and community facility staff to identify evacuation needs for their service population. (Partnerships)
3. Provide CBOs with support and resources to develop climate disaster emergency response and preparedness procedures. (Partnerships)

Climate Hazard Addressed	All Hazards
Cost	\$\$
Responsible Departments	Fire, Police, Office of Emergency Preparedness

ER 9.4 Resilience Hubs

Expand the City’s cooling centers to serve as resilience hubs for community members before, during, and after climate hazard events including extreme heat events, poor air quality, and severe weather events.

Implementation Actions:

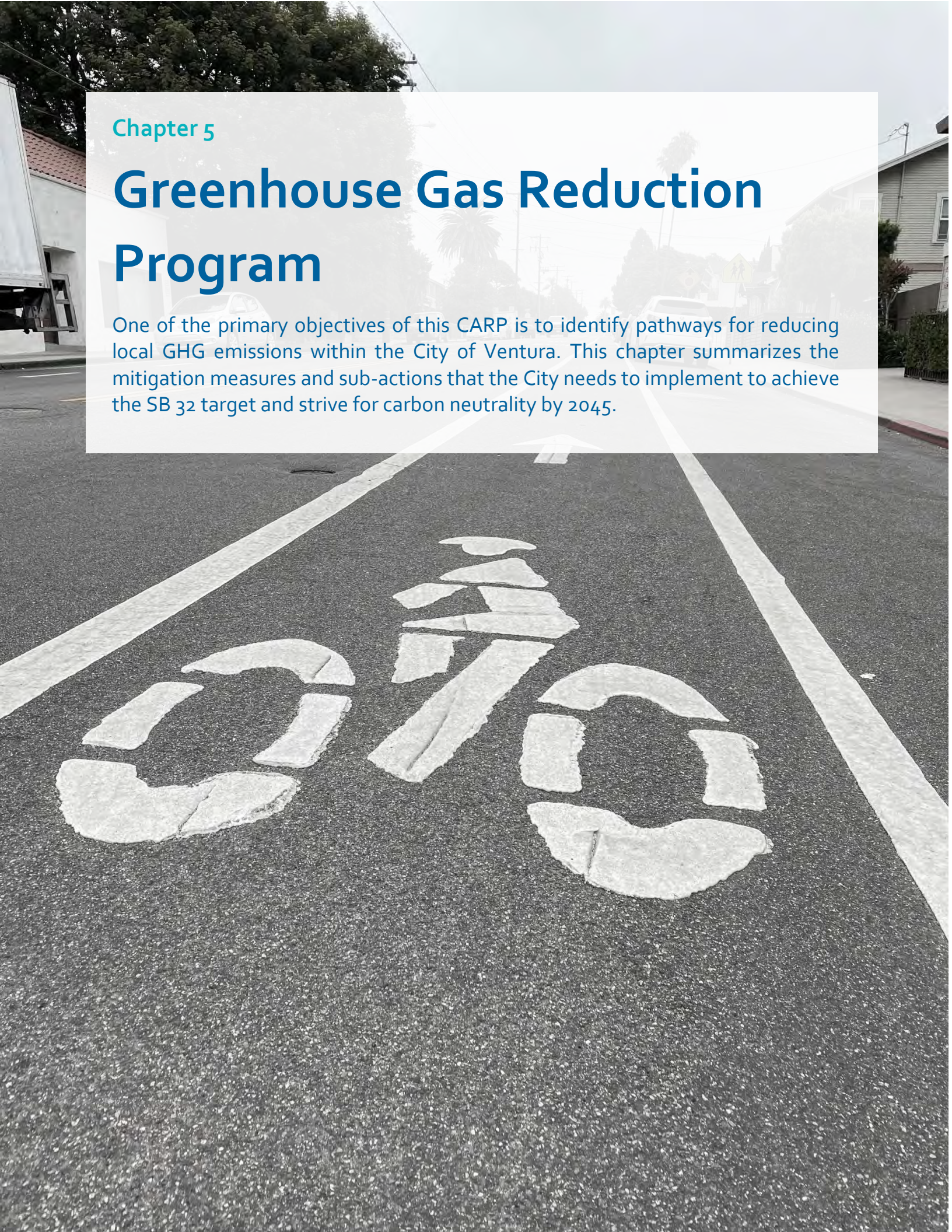
1. Conduct an assessment on the effectiveness of current City cooling center operations to evaluate current amenities and resources available and verify that the needs of vulnerable populations are met during climate hazard events. (Feasibility)

Climate Hazard Addressed	All Hazards
Cost	\$\$\$
Responsible Departments	Public Works
2. Require that the City’s resilience hubs have adequate backup power sources and battery storage to mitigate service disruptions and provide redundancy in the event of a power outage. (Structural Change)
3. Provide essential resources such as health programming and resources, food, refrigeration, charging stations, basic medical supplies, and other emergency supplies at all City resilience hubs. (Structural Change).

Chapter 5

Greenhouse Gas Reduction Program

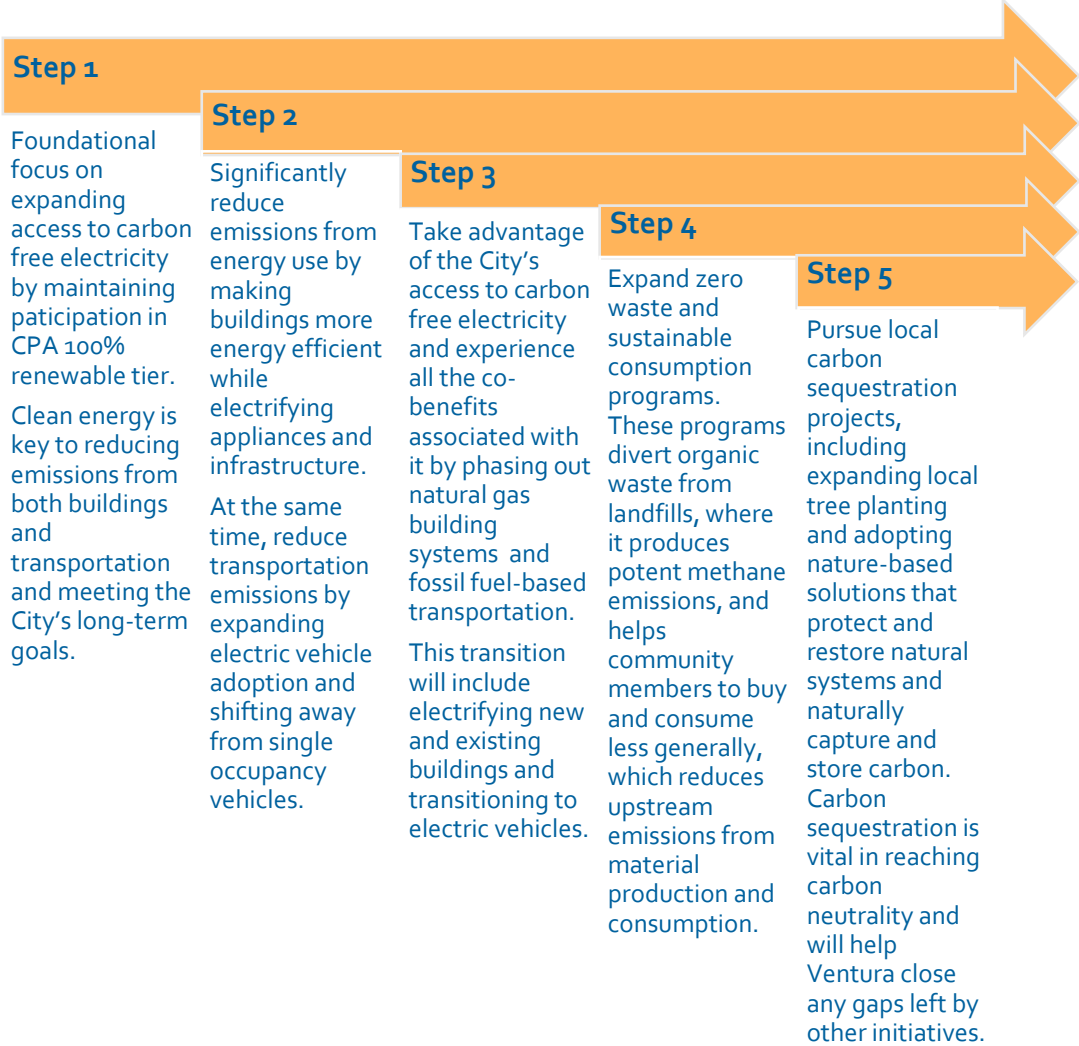
One of the primary objectives of this CARP is to identify pathways for reducing local GHG emissions within the City of Ventura. This chapter summarizes the mitigation measures and sub-actions that the City needs to implement to achieve the SB 32 target and strive for carbon neutrality by 2045.



Reduction Approach

Ventura will work to achieve carbon neutrality by 2045 by building upon the progress the City has already made and adopting new emissions reduction strategies and actions. Together, these strategies and actions: (1) provide a framework for reaching the SB 32 target of a 40% reduction below 1990 emissions level by 2030 and carbon neutrality; (2) make Ventura more resilient to future climate impacts; and (3) have important social and economic benefits, such as addressing historic inequities, creating green jobs, increasing community green spaces, and improving public health. Figure 6 outlines the City’s five step approach to reducing community GHG emissions.

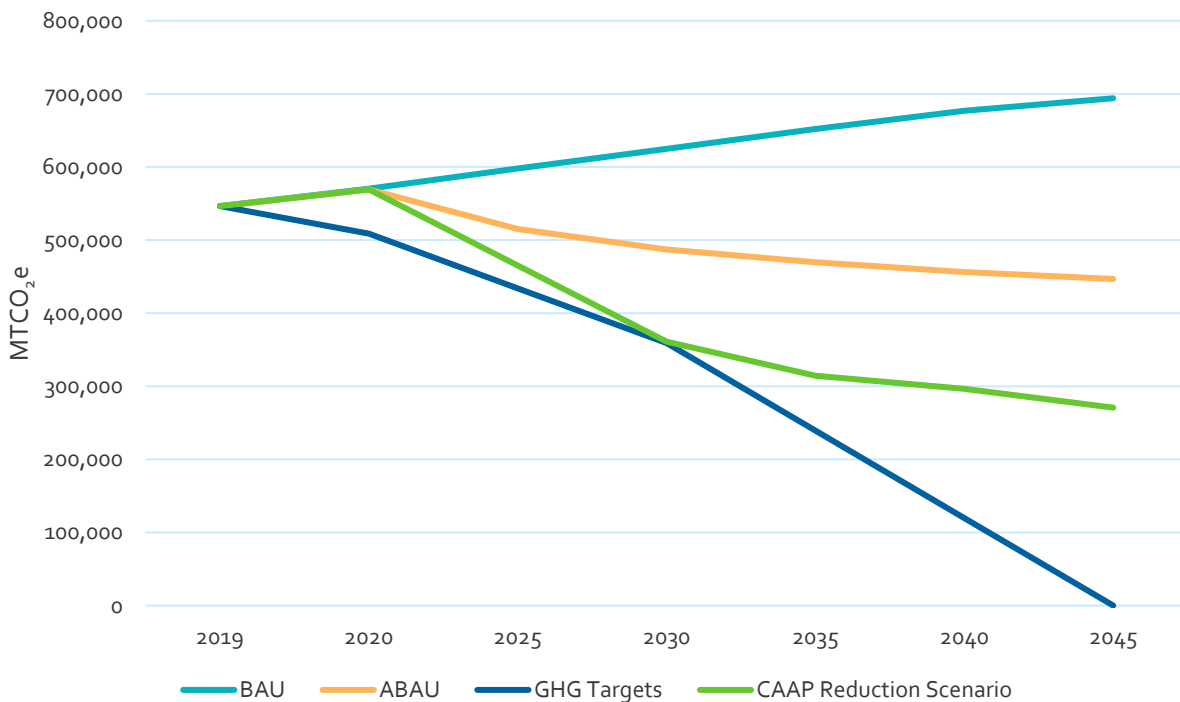
Figure 6. Approach to Reduce Greenhouse Gas Emissions



Greenhouse Gas Emissions Reduction Pathway

As illustrated in Figure 7, the City will need to proactively take local climate action to reduce and offset greenhouse gas emissions to achieve State greenhouse gas reduction targets. State and regional policies and regulations are projected to reduce 2030 BAU emissions by 22%. In addition to the reductions realized through State policies, implementing the CARP mitigation measures can achieve the SB 32 goal of a 40% reduction in mass emissions by 2030 and puts the City on the path to achieving the long-term goal of carbon neutrality by 2045. These strategies achieve a 40% mass emissions reduction compared to 1990 levels in 2030 and a 61% reduction in 2045. However, additional climate action will be needed to close the gap of 270,749 MTCO₂e to achieve carbon neutrality by 2045.

Figure 7. Greenhouse Gas Emissions Reductions from CARP Mitigation Measures



Reduction Strategies and Action Plans

To mitigate greenhouse gas emissions and adapt to a changing climate, the City intends to move forward with fifty-five mitigation strategies organized into seven sectors. Each sector includes a series of broad strategies and specific implementation actions for the City. The strategies and actions are organized into the following sectors:

- Clean Energy
- Built Environment
- Transportation
- Solid Waste
- Water and Wastewater
- Community Education and Partnerships
- City Leadership

Implementing these strategies will put Ventura on the path to carbon neutrality by 2045. This section presents the mitigation measures and implementation actions, GHG emission reduction potential, co-benefits, implementation costs, and lead City department.

GHG Reductions Key:

- Supportive – no direct emissions reductions but aid the implementation of measures with direct emissions reductions.
- Low – less than 15,000 MTCO₂e
- Medium – 16,000 – 40,000 MTCO₂e
- High – more than 40,000 MTCO₂e

Cost Key:

- \$ - less than \$100,000
- \$\$ - \$100,000-\$500,000
- \$\$\$ - \$500,000 - \$2,500,000
- \$\$\$\$ - over \$2,500,000

The following strategies and actions collectively work toward achieving the near term goal of 40% reduction in greenhouse gas emissions by 2030 and carbon neutrality by 2045.

Clean Energy

Residential and nonresidential energy use, including electricity and natural gas, account for 35% of Ventura’s greenhouse gas emissions. These emissions are driven by the burning of fossil fuel natural gas, which accounts for 59% of energy-related emissions in the city. The proportion of natural gas to overall energy use is expected to increase because the City has joined Clean Power Alliance (CPA), which supplies up to 100% carbon-free electricity to its customers. See Table 7 for the February 2022 participation rates in CPA.

Table 7. 2022 Participation Rates in CPA Tiers

CPA Tier	Residential Customers	Nonresidential Customers
Remained in SCE	5.2%	4.2%
Lean – 40% renewable	4.5%	6.2%
Clean – 50% renewable	1.1%	1.8%
Green – 100% renewable	89.2%	87.8%

Clean grid electricity, including the installation of distributed energy resources (DERs), such as local solar projects, is a keystone effort being led by the State to achieve its climate goals. Senate Bill 100’s renewable portfolio standard will require that supplied energy not only be 100% carbon-free by 2045 but also 100% generated from renewable sources like wind, solar, and local biogas.

Additionally, having access to clean electricity makes supporting the transition to electric vehicles across Ventura more beneficial. To date, the City has adopted an EV Accelerator Plan and is installing electric vehicle charging stations in public parking facilities.

Performance Metrics

- Participation rate in CPA 100% Green tier
- Number of (or size of) solar installations on commercial buildings
- Number of battery storage systems installed



Clean Energy - Alternative Energy Sources

CE 1.1 Community Solar Programs and Projects

Support SCE and CPA’s development of residential and commercial community solar and storage programs and projects.

Implementation Actions:

1. Collaborate with CBOs to expand on existing solar programs, such as Community Environmental Council’s Solarize and Grid Alternative’s low-cost renewable energy installations, by providing resources to assist in the installation of single family and multi-family solar and energy storage projects.
2. Identify sites for the possible installation of community solar.
3. Assess the feasible locations identified in the communitywide renewable energy generation analysis under CEQA.
4. Set a goal for the number of commercial energy storage projects within the city and provide regular updates on meeting the goal.
5. Work with City Council to support community solar projects.
6. Support commercial pilot projects utilizing thermal energy storage, energy storage, dispatchable storage, back-up power at critical facilities, and microgrid development. Support includes outreach for completed projects.
7. Share data as needed to develop successful projects and programs.
8. Collaborate with CBOs and Housing Authority of the city of San Buenaventura to attain and use grant funding, such as the Community Development Block Grants, to cover both labor and equipment for renewable energy and energy storage at affordable housing projects.
9. Conduct outreach to residents about subscription to community solar projects through the City’s Environmental Sustainability website, Sustainable Ventura Newsletter, social media, press releases, City Council, and staff attendance at ribbon cutting events.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience
Responsible Departments	Environmental Sustainability Division, PIO/Comms

CE 1.2 Approval Processes for Solar, Battery Storage Systems, and EV Charging

Establish a streamlined approval process for solar, battery storage system, and EV charging and reduce or eliminate permitting fees to encourage the addition of battery storage.

Implementation Actions:

1. Review current permitting procedures. Work with Ventura City Fire Department and other relevant agencies to review their policies to determine if they negatively affect local renewable integration and installation of energy storage projects. If problematic policies are identified, explore opportunities for revisions that would allow for more of these types of energy projects.
2. Determine eligibility criteria for systems that qualify for expedited permitting and provide permitting checklist.
3. Explore the potential to allow for digital signatures and online permit application submittals.
4. Shorten the inspection process to one inspection for qualifying systems.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience
Responsible Departments	Community Development, Environmental Sustainability Division

CE 1.3 Solar Reach Code for Nonresidential New Construction

Investigate and implement a reach code to establish minimum kilowatt (kW) of solar installation requirements for nonresidential new construction above a specific size.

Implementation Actions:

1. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the reach code.
2. Conduct a cost effectiveness study or utilize studies developed by the CEC.
3. Develop and draft an ordinance.
4. Submit the adopted ordinance to the California Energy Commission (CEC) and California Building Standards Commission (CBSC).

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience
Responsible Departments	Community Development, Environmental Sustainability Division

Clean Energy - Carbon Free Electricity

CE 2.1 CPA Participation

Maintain City membership in Clean Power Alliance (CPA) and continue to work to maintain a minimum of 95% of private property owner participation in CPA at the 100% Green tier.

Implementation Actions:

1. Conduct outreach to identify barriers for large users and/or sectors to participate at the 100% Green Power Tier or SCE equivalent.
2. Partner with CPA to develop and conduct a robust awareness and education campaign to boost enrollment.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO/Comms

New Construction

Buildings are the primary users of energy within the city and the main vehicle to reduce energy-related emissions. Electricity use in residential and nonresidential buildings accounts for 14% of community emissions and natural gas use accounts for 20% of community emissions. There are two main approaches to reduce emissions in buildings. The first is improved energy efficiency of new and existing buildings and the second is through the electrification of buildings. Electrification removes natural gas systems from buildings and uses electric alternatives to take advantage of the 100% carbon-free electricity provided by CPA.

The number of employees and residents in Ventura is expected to grow through 2045, and this growth will result in the construction of new residential and commercial buildings. New construction is governed by the California Building Code and must meet the California Green Building Standards (CALGreen), which include requirements for energy performance. The building code is updated every three years to reflect industry best practices and increase the sustainability of new construction. However, to avoid developing greenhouse gas-emitting buildings and infrastructure with useful lives beyond the City's emissions reduction goals, the City will make enhanced green building the standard for all new construction and major remodels. Going beyond CALGreen includes promoting all-electric new construction for both residential and nonresidential buildings by adopting a reach code.

Performance Metrics

- Number of all-electric new development projects
- Citywide natural gas use
- Number of new development projects that exceed CALGreen energy efficiency standards



Built Environment, New Construction – Improved Energy Efficiency of New Construction

BNC 1.1 Green Building Design Guidelines

Develop design guidelines for new residential and nonresidential construction that include passive design strategies (i.e., minimizing solar reflectivity, implementing cool roofs, placing trees or vegetation to maximize shading, orienting building for ideal climate conditions including daylighting) and for maximizing solar resources (e.g., photovoltaic capacity of roof space, south facing windows).

Implementation Actions:

1. Draft green design guidelines and educational materials.
2. Include green building resources in permit application packets or permit incomplete letters.
3. Promote green design guidelines to internal stakeholders including Building and Planning, and external stakeholders including developers, property owners and managers.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience
Responsible Departments	Community Development

BNC 1.2 CALGreen Tier 1 or 2 Energy Requirements for New Development

Encourage new development to meet CALGreen Tier 1 or 2 energy efficiency requirements through a combination of financial and development process incentives (e.g., expedited permitting, FAR increases, etc.).

Implementation Actions:

1. Conduct outreach to determine effective incentives and explain the benefits of enhanced building performance.
2. Develop incentive program during next zoning ordinance update.
3. Develop and distribute educational materials.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Community Development

BNC 1.3 CALGreen Tier 1 or 2 Energy Requirements for Remodels

Encourage alterations or addition at least 50% of the size of the original building to meet CALGreen Tier 1 or 2 energy efficiency requirements through a combination of financial and development process incentives (e.g., expedited permitting, FAR increases, etc.).

Implementation Actions:

1. Conduct outreach to determine effective incentives and explain the benefits of enhanced building performance.
2. Develop incentive program during next zoning ordinance update.
3. Develop and distribute educational materials.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Community Development

BNC 1.4 Energy-Use Data

Update the City’s Development Review and Building Permit forms to request voluntary energy-related data, e.g., Home Energy Rating System (HERS) ratings for homes, Title 24, Part 6 compliance percentage, LEED certification level, etc. The City should update permitting software so Development Review and Building Permit staff can input energy-related data for CARP implementation tracking.

Implementation Actions:

1. Determine appropriate energy related information to track.
2. Update Development Review and Building Permit forms.
3. Update permitting software so Development Review and Building Permit staff can input energy-related data for CARP implementation tracking.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Community Development

Built Environment, New Construction – All-Electric New Construction

BNC 2.1 Minimum Panel Capacity

Set minimum electric panel capacity standards for single family residential new construction at 200 amps.

Implementation Actions:

1. Amend building code to require a minimum panel capacity of 200 amps for low rise residential new construction.
2. File amendments with the California Building Standards Commission (CBSC).

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Community Development

BNC 2.2 Residential All-Electric New Construction

Investigate and implement a localized reach code for new residential construction to prohibit or disincentivize connection to natural gas lines.

Implementation Actions:

1. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the reach code.
2. Conduct a cost effectiveness study or utilize studies developed by the California Energy Commission (CEC).
3. Develop and draft an ordinance.
4. Submit the adopted ordinance to the CEC and California Building Standards Commission (CBSC).

GHG Reduction Potential	Medium
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Community Development

Existing Buildings

Buildings are the primary users of energy within the city and the main vehicle to reduce energy-related emissions. Electricity use in residential and nonresidential buildings accounts for 14% of community emissions and natural gas use accounts for 20% of community emissions. There are two main approaches to reduce emissions in buildings. The first is improved energy efficiency of new and existing buildings and the second is through the electrification of buildings. Electrification removes natural gas systems from buildings and uses electric alternatives to take advantage of the 100% carbon-free electricity provided by CPA.

Most building-related emissions are attributable to the existing building stock, which is much less efficient than new construction due to being built before building energy standards. Decarbonizing existing buildings is critical to meeting emissions reduction goals. There are many challenges associated with improving the performance of existing buildings including costs, rental/ownership status and split incentives, and technological constraints. However, benefits include healthier indoor air quality, reduced energy use and lower utility bills, and more resilient building systems. Improving existing buildings in Ventura would focus on electrification and promoting existing energy efficiency programs offered by utility companies.

Performance Metrics

- Number of electric panel upgrades
- Number of building electrification retrofits
- Number and type of retrofits in disadvantaged communities
- Citywide natural gas use

Built Environment, Existing Buildings – Improved Energy Efficiency of Existing Buildings

BE 1.1 Energy and Water Benchmarking

Adopt energy and water benchmarking ordinance for commercial buildings over a specified square footage.

Implementation Actions:

1. Conduct a study to determine the appropriate square footage threshold to capture additional buildings than AB 802.
2. Engage with stakeholders including City staff, nonresidential property owners and managers.
3. Draft and adopt an ordinance.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Lower utility costs
Responsible Departments	Community Development

BE 1.2 Green Building Labeling Program

Collaborate with 3C-REN, Associations of Realtors, and other similar organizations to develop, and promote the benefits of, a real estate Green Building Labeling Program that recognizes residential and nonresidential properties that are energy efficient, have good HERS score, and incorporate green building techniques.

Implementation Actions:

1. Engage with stakeholders including residential and nonresidential property owners, managers, real estate agents, leasing brokers, and Chamber of Commerce to explain the benefits of providing a Home Energy Score.
2. Develop and distribute educational materials.
3. Encourage properties to take steps to improve their Energy Score through utility energy efficiency programs and other streamline permitting process.
4. Partner with Associations of Realtors to provide information on IOU and CPA energy efficiency incentives and rebates to residential and nonresidential property sellers and buyers. Support should be provided to sellers and buyers when they are submitting rebate and incentive applications during point-of-sale transactions.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Lower utility costs, improved climate literacy
Responsible Departments	Environmental Sustainability Division

BE 1.3 Energy Efficiency Programs and Incentives

Promote existing IOU and state agency financing programs like the Residential Energy Efficiency Loan program that is designed to help homeowners and renters access competitive financing solutions for energy efficiency projects.

Implementation Actions:

1. Collaborate with property management firms to develop a Green Commercial Lease Agreement Checklist to support shared landlord-tenant agreements that facilitate financing for energy efficient retrofits to renter-occupied buildings.
2. Partner with utilities to promote and implement energy efficiency programs.
3. Track and report community participation.
4. Investigate the feasibility of developing a Qualified Low-income Home Rehabilitation Loan program to finance home repairs eliminating health and safety hazards, increasing energy efficiency, and maintaining local housing stock.
5. Investigate developing a revolving loan fund or on-bill financing to help bring down the cost of residential and nonresidential energy efficiency retrofits and renewable energy projects not covered by IOUs or CPA.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Lower utility costs
Responsible Departments	Community Development, Environmental Sustainability Division

BE 1.4 Energy and Climate Education and Incentives

Develop energy and climate education and incentive outreach materials in partnership with local contractors, energy leaders, IOUs, CPA, VCREA, and 3C-REN.

Implementation Actions:

1. Partner with utilities to develop and promote existing and new energy efficiency programs and educational materials.
2. Offer these outreach materials at City planning and building counters, during meetings, and public events within the City of Ventura.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Lower utility costs, improved climate literacy
Responsible Departments	Environmental Sustainability Division

Built Environment, Existing Buildings – Electrify Existing Buildings

BE 2.1 Existing Building Electrification Plan

Adopt a phased in electrification plan for existing buildings that promotes and as needed requires the retrofit of existing buildings to all electric starting with incentives, adopting a burnout ordinance, and the eventual adoption of a date-certain ordinance.

Implementation Actions:

- | | | |
|--|--------------------------------|---|
| 1. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the requirements. | GHG Reduction Potential | High |
| 2. Draft and adopt plan including phasing timeline of requirements starting with a burnout ordinance. | Cost | \$\$ |
| 3. Conduct CEQA analysis, as needed. | Co-Benefits | Lower utility costs, improved climate literacy |
| 4. Provide technical resources, including hosting workforce development trainings for installers and building owners/operators to discuss benefits and technical requirements of decarbonization and carbon-free energy sources. | Responsible Departments | Environmental Sustainability, Community Development |
| 5. Develop a tracking process to track natural gas and electric appliance/system installations. | | |
| 6. Provide education around cooking with electric appliances, including demonstrations from chefs and/or local restaurants. | | |
| 7. Promote the cost and environmental benefits of decarbonization and carbon-free energy sources to builders, property owners, and contractors on the City website and at the City permit counters. | | |
| 8. Work with SoCalGas to identify opportunities for natural gas infrastructure pruning to reduce the chance of stranded assets, provide potential funding, and establish an efficient transition to carbon neutral buildings. | | |

Transportation

Transportation-related emissions are the largest contributor to communitywide emissions, accounting for 48%. There are two main levers to reduce emissions associated with transportation. The first is to “clean” vehicle miles traveled (VMT) through vehicle electrification and access to carbon-free electricity from CPA. Second, is to reduce VMT through transportation demand programs and policies. Vehicle electrification can result in immediate emissions reductions because of the availability of carbon-free electricity in the city. However, EV adoption is not directly within the City’s control. Transportation demand measures (TDMs) to reduce VMT, on the other hand, take longer to implement but can generate many co-benefits in addition to reducing greenhouse gas emissions.

Performance Metrics

- Transit, walk, and bike trips account for 38% of all trips
- Transit ridership
- Number of EV registrations
- Number of EV charging installations



Transportation – Clean VMT through Electrification

TL 1.1 Affordable Housing Electric Vehicle Charging

Partner with the local Housing Authority and CBOs to increase EV charging stations and EV car adoption at affordable housing projects.

Implementation Actions:

1. Partner with Housing Authority to connect affordable housing developers, property managers, and residents with EV charger installation resources and programs, and EV purchasing resources.
2. Develop and distribute educational materials.
3. Investigate the feasibility of the Housing Authority to host an EV carshare pilot project for a multifamily housing project.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Air quality, public health
Responsible Departments	Environmental Sustainability Division

TL 1.2 EV Charging Reach Code

Investigate and implement a reach code to require all new nonresidential and multi-family housing construction to install EV charging stations.

Implementation Actions:

1. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the reach code.
2. Conduct a cost effectiveness study or utilize studies developed by the CEC.
3. Develop and draft an ordinance.
4. Submit the adopted ordinance to the California Building Standards Commission (CBSC).

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Air quality, public health
Responsible Departments	Community Development

TL 1.3 Partnerships to Encourage Electric Vehicle Charger Installation

Increase installation of private EV charging stations by promoting federal, state, SCE, CPA, and local rebates and incentive.

Implementation Actions:

- | | | | | | |
|--|--|--------------------------------|--|-------------|----|
| <ol style="list-style-type: none"> 1. Partner with utilities, VCREA and Electric Drive 805 to develop and promote existing and new EV programs and educational materials. | <table border="0"> <tr> <td style="padding-right: 20px;">GHG Reduction Potential</td> <td>Low</td> </tr> <tr> <td>Cost</td> <td>\$</td> </tr> </table> | GHG Reduction Potential | Low | Cost | \$ |
| GHG Reduction Potential | Low | | | | |
| Cost | \$ | | | | |
| <ol style="list-style-type: none"> 2. Expand public-private partnerships to support outreach efforts that will increase awareness of EV models and their benefits, through activities such as green car shows and test-drive events. | <table border="0"> <tr> <td style="padding-right: 20px;">Co-Benefits</td> <td>Air quality, public health, reduced congestion</td> </tr> </table> | Co-Benefits | Air quality, public health, reduced congestion | | |
| Co-Benefits | Air quality, public health, reduced congestion | | | | |
| <ol style="list-style-type: none"> 3. Offer these outreach materials at City planning and building counters, during meetings, public events within the City of Ventura, on city website. | <table border="0"> <tr> <td style="padding-right: 20px;">Responsible Departments</td> <td>Environmental Sustainability Division</td> </tr> </table> | Responsible Departments | Environmental Sustainability Division | | |
| Responsible Departments | Environmental Sustainability Division | | | | |
| <ol style="list-style-type: none"> 4. Collaborate with VCREA, Community Environmental Council, EV Advocates of Ventura County, Electric Drive 805, and other EV advocacy groups to identify EV infrastructure funding sources, identify and remove local barriers to EV charging station installations, and recommend consistent affordable rate structures for public charging stations. | | | | | |
| <ol style="list-style-type: none"> 5. Increase installation of private EV charging stations by promoting federal, state, SCE, CPA, and local rebates and incentives through existing communication channels such as the City, VCREA, and Electric Drive 805 websites, social media, and additional methods as identified by the City. | | | | | |

Transportation – Reduced VMT through Mode Shift

TL 2.1 TDM Program

Adopt a mandatory TDM program for new construction and develop incentives to encourage existing businesses and multifamily developments to participate.

Implementation Actions:

- | | | |
|---|--------------------------------|--|
| <ol style="list-style-type: none"> 1. Develop options for a mandatory TDM policy that includes trip reduction requirements (including penalties for noncompliance), regular monitoring and reporting, and dedicated city staff for new development. 2. Conduct focus groups with large employers, small employers, and housing developers on their opportunities and challenges of implementing a TDM program. 3. Adopt a TDM ordinance that requires employers and housing developments of a certain size to submit an emissions reduction plan that includes: <ul style="list-style-type: none"> - Site analysis - Annual vehicle ridership survey results - Emissions reduction options - Employee trip reduction program with a menu of options such as transit information, guaranteed ride home program, commuter choice program, transit pass program, carpool preferential parking, secure bike parking, vanpool program, parking charge, telecommuting, prize incentives, transportation allowance, etc. 4. Explore increasing staffing capacity or establishing a Transportation Management Authority (TMA) to administer citywide TDM and VMT reduction programs. 5. Explore incentives for existing businesses and multifamily housing to join. 6. Establish a city employee TDM program with mode shift targets for staff. 7. Establish annual reporting requirements to the City Council. | GHG Reduction Potential | Medium |
| | Cost | \$-\$\$ |
| | Co-Benefits | Air quality, public health, reduced congestion |
| | Responsible Departments | Community Development, Public Works |

TL 2.2 Improve Curb Management

Evaluate the current and best use of curb space in the city’s activity centers and repurpose space to maximize people served (i.e., for loading, bikeways, bike parking, bus lanes, EV charging, or parklets).

Implementation Actions:

1. Reevaluate the City’s micromobility ban by engaging City Council, businesses, and residents about needs and impacts.
2. Conduct a curb space use plan to identify and assess competing priorities.
3. Conduct community outreach and promote the program.

GHG Reduction Potential	Supportive
Cost	\$\$
Co-Benefits	Improved air quality
Responsible Departments	Community Development, Public Works

TL 2.3 Land Use and Transportation Coordination

Manages land use change to support greenhouse gas reduction targets by focusing development in location efficient places, creating complete communities, and increasing density. Complete, mixed-use neighborhoods allow residents to access most of their everyday needs within a short walk, bike, or transit trip.

Implementation Actions:

1. Identify appropriate transit corridors in conjunction with Gold Coast Transit, VCTC, and SCAG.
2. Determine criteria for increased density and increased density allowances.
3. Evaluate new approval and permit streamlining for new housing that exceeds inclusionary and sustainability requirements.
4. Establish additional incentives in the zoning code to facilitate affordable housing in transit-rich areas.
5. Update the zoning code to ensure a diverse use of services and amenities are allowed in each neighborhood, including childcare, healthy food, community gardens, and other amenities. Increase the types of home-based businesses allowed in residential neighborhoods
6. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the requirements.
7. Update General Plan Land Use Designations and Zoning Districts.

GHG Reduction Potential	Medium
Cost	\$
Co-Benefits	Air quality, public health, reduced congestion
Responsible Departments	Community Development, Public Works

TL 2.4 Active Transportation Plan

Prioritize, fund, and implement the Active Transportation Plan (ATP).

Implementation Actions:

1. Prioritize and implement all policy recommendations included in the ATP to improve pedestrian, bicycle networks, and increase transit ridership based on the established timeframes.
2. Align implementation with CIP funding cycles.
3. Identify additional funding sources, such as grant funding or a revised Transportation Mitigation Fee program for ATP implementation.
4. Establish tracking, reporting, and update requirements for the ATP.

GHG Reduction Potential	Medium
Cost	\$\$\$\$
Co-Benefits	Air quality, public health, reduced congestion, safety
Responsible Departments	Public Works

TL 2.5 Transit Service Levels

Expand and improve transit and shared mobility services to be more accessible, affordable, and timely.

Implementation Actions:

1. Work with Gold Coast Transit, VCTC, and Metrolink to conduct a transit service gaps analysis to determine how service can be improved.
2. Partner with transit agencies to implement service improvements.
3. Identify additional funding sources, such as a revised Transportation Mitigation Fee program or Measure O funding for improved transit service levels.
4. Conduct community outreach and promote the service improvements.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Air quality, public health, reduced congestion, safety
Responsible Departments	Public Works

TL 2.6 First Mile-Last Mile

Leverage public-private partnerships to increase transit ridership and improve transit station access by incorporating first/last mile bus, shuttle, and active transportation connections between employment hubs and regional transit stations.

Implementation Actions:

1. Work with Gold Coast Transit, VCTC, and Metrolink to improve access to transit stations / stops for active transportation modes.
2. Complete ATP projects connecting to transit stations / stops.
3. Evaluate mobility hubs to determine the financial costs, infrastructural needs, and economic feasibility to support first-last mile service.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Public Works, Community Development

TL 2.7 Transit Fares

Collaborate with transit agencies and shuttle providers to scale service levels in growing areas and leverage private sector subsidies of transit fares to support ridership.

Implementation Actions:

1. Work with private partners including businesses, employers, and housing developments to subsidize transit fares through TDM plan implementation. Consider expanding existing college subsidy program to include high school and possibly middle school students.
2. Identify additional funding sources, such as a revised Transportation Mitigation Fee program or Measure O funding for improved transit service levels.
3. Conduct community outreach and promote the service improvements.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, air quality, public health
Responsible Departments	Public Works

Solid Waste

Solid waste accounts for 4% of Ventura’s overall emissions. By consuming less materials, recycling, and composting more, the community will be able to reduce the amount of waste sent to landfill and eventually become a zero-waste city. Specifically, diverting organic material including food waste is a crucial step to meeting long-term goals, because landfilled organic materials produce methane, which is a more potent GHG than carbon dioxide. The State adopted Senate Bill 1383, the Short-Lived Climate Pollutants Act, which requires jurisdictions to divert 75% of food waste from landfills by 2025, and jurisdictions must also recover food waste that can be repurposed. Moreover, organics recycling can provide useful byproducts including compost and biogas, which can further reduce emissions and provide economic benefits.

Performance Metrics

- Communitywide waste generation
- Tons of food waste diverted from landfill
- Tons of edible food recovered and redistributed



Solid Waste – Increased Diversion from Landfill

SW 1.1 SB 1383 Compliance

Adopt an SB 1383 compliant zero-waste plan for municipal operations and the community that includes: mandatory residential and commercial recycling and collection of organics/food waste, mandatory commercial edible food recovery program, and updated trash enclosure space and access requirements based on hauler recommendations to accommodate all waste streams (e.g., recycling, trash, and organics).

Implementation Actions:

- | | | |
|--|--------------------------------|---------------------------------------|
| <ol style="list-style-type: none"> Partner with waste hauler to: <ul style="list-style-type: none"> Provide for organic waste collection from mixed waste containers are transported to a high diversion organic waste processing facility Provide quarterly route reviews to identify prohibited contaminants potentially found in containers that are collected along route. Identify contaminated waste generators in need of technical assistance Develop and distribute educational materials and in-person assistance Clearly label all new containers indicating which materials are accepted in each container, and by January 1, 2025, place or replace labels on all containers. Modify development waste plan requirements to update enclosure standards to include space for food waste receptacles. | GHG Reduction Potential | Medium |
| | Cost | \$ |
| | Co-Benefits | |
| | Responsible Departments | Environmental Sustainability Division |

SW 1.2 Single-Use Food Service Ware

Expand the City’s polystyrene ban to include single use food service ware.

Implementation Actions:

- | | | |
|---|--------------------------------|---------------------------------------|
| <ol style="list-style-type: none"> Engage stakeholders including restaurants, businesses, local shipping/delivery companies, and the Chamber of commerce on the impact, alternative products, and benefits of the ordinance. Draft and adopt ordinance. Work with waste hauler and economic development to establish monitoring and enforcement process as necessary | GHG Reduction Potential | Low |
| | Cost | \$ |
| | Co-Benefits | |
| | Responsible Departments | Environmental Sustainability Division |

SW 1.3 C&D Diversion Requirements

Require 85% of construction and demolition (C&D) debris be recycled.

Implementation Actions:

1. Research local disposal facility diversion rates to determine potential for additional diversion.
2. If possible, draft and adopt ordinance.
3. Submit the adopted ordinance to the California Building Standards Commission (CBSC).
4. Conduct community outreach about new diversion requirements.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, Community Development

SW 1.4 Sustainable Construction Materials

Explore modifications to the building code that would require certain products to be locally sourced and/or contain a percentage of recycled content.

Implementation Actions:

1. Reach out to US Green Building Council, Los Angeles (USGBC-LA) to determine appropriate materials and % recycled content.
2. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the policy.

GHG Reduction Potential	Supportive
Cost	\$\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, Community Development

SW 1.5 Lifecycle Climate Impacts and Extended Producer Responsibility

Advocate at the appropriate governmental level for goods and services to disclose lifecycle climate impacts. Advocate for more robust extended producer responsibility policies statewide.

Implementation Actions:

1. Work with the City Attorney to support advocacy efforts lead by environmental groups pursuing this issue.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, Public Works, Finance

Water and Wastewater

Water is a critical resource in California and Ventura. Regional water supplies are already being adversely affected by climate change induced drought and decreased snowpack. Ventura meets the city's demand with locally pumped groundwater, Lake Casitas and the Ventura River. Climate change may impact local hydrology and affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term. Lower rainfall and/or more intense runoff, increased evaporative losses, and warmer and shorter winter seasons can alter natural recharge of groundwater.

Water related emissions in Ventura account for less than 1% of the communitywide total emissions, because of being treated and distributed locally using clean electricity from CPA. Ecosystem and quality of life benefits that reliable clean water provide are important to protect. Thus, reducing indoor and outdoor water use through fixture upgrades and climate-appropriate landscaping for both residential and nonresidential buildings is important. However, an important trade off of water conservation and drought is that the Ventura Water Reclamation Facility will be impacted by lower flows to the facility and challenges with treating highly concentrated wastewater streams.

Performance Metrics

- Gallon per capita per day (GPCD)
- Number of WELO compliant landscape renovations
- Number of plumbing fixture upgrades



Water and Wastewater – Reduce Water Use

WW 1.1 Water Efficiency Requirements

Adopt CALGreen Tier 1 or 2 water efficiency requirements for new construction or additions of 50% the size of the original building.

Implementation Actions:

1. Develop and draft an ordinance modifying the building code to make Tier 1 or 2 water requirements mandatory for new development and remodels.
2. Submit the adopted ordinance to the California Building Standards Commission (CBSC).

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, lower utility costs
Responsible Departments	Community Development, Ventura Water

WW 1.2 Landscaping Efficiency Requirements

Modify Model Water Efficient Landscape Ordinance (MWELO) to require all landscape projects to obtain a landscape permit, decrease the size threshold to capture all landscape renovations, add prescriptive irrigation, plant lists, or water budget requirements.

Implementation Actions:

1. Engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the requirements.
2. Draft and adopt ordinance.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Resilience, lower utility costs
Responsible Departments	Community Development, Ventura Water

WW 1.3 Greywater Systems

Create a streamlined permit process for laundry-to-landscape greywater systems.

Implementation Actions:

1. Review current permitting procedures and reach out to industry experts.
2. Determine eligibility criteria for systems that qualify for expedited permitting and provide permitting checklist.
3. Explore the potential to allow for digital signatures and online permit application submittals.
4. Shorten the inspection process to one inspection for qualifying systems.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Resilience, lower utility costs
Responsible Departments	Environmental Sustainability, Community Development

WW 1.4 Alternative Water Supplies

Explore alternative water supplies including local groundwater, recycled water, etc.

Implementation Actions:

1. Identify potential sources of water including groundwater and recycled water.
2. Conduct feasibility assessment of potential sources.
3. Include water source development in water system/CIP budget and schedule.

GHG Reduction Potential	Supportive
Cost	\$-\$\$\$
Co-Benefits	Resilience
Responsible Departments	Ventura Water

Community Education and Partnerships

Continued community outreach, engagement, and education is important for the successful implementation of the CARP and the realization of Ventura's climate goals. Regular engagement with the community builds climate literacy, improves understanding of various mitigation strategies, and better equips the community to prepare for and adapt to the impacts of climate change.

Measures in this sector also highlight important partnerships that the City should develop to enhance its capacity to conduct outreach and engage a broader swath of the Ventura community. These partnerships include capitalizing on existing utility programs, regional and county climate organization efforts, and existing communications structures.

The following measures are included as part of the CARP to support the implementation of the measures in sectors above. The greenhouse gas reduction potential of the community education measures is not quantified but is stated as supportive in that implementing these measures aids in implementation of related measures and help achieve their greenhouse gas reduction potential.

Performance Metrics

- Number of annual CARP community events
- Number of people engaged annually
- Participation rates in City CARP and utility rebate programs

City of Ventura Environmental Outreach

The City of Ventura has a robust environmental outreach program that engages schools, businesses, and residents in the City of Ventura. Utilizing resources such as newsletters, social media profiles, press releases, website pages, billboards and more, the City successfully reaches tens of thousands of residents on an annual basis with its environmental messages.

The Green Schools program offers education and resources to schools in an effort to bolster their sustainability efforts. VUSD has partnered with the City for over a decade to provide classroom presentations. In 2019, Environmental Sustainability and Ventura Water offered presentations to over 8,000 students at 27 different schools.

The City's environmentally focused video content receives hundreds of thousands of views annually between the various social media platforms. Topics ranging from composting and public parks to water efficiency and energy conservation gather viewers from all demographics throughout the City and beyond city limits.

The City also has a robust Green Business Program that supports businesses in reducing energy, water, waste, and operating costs while facilitating certification through the California Green Business Network. This program reaches dozens of businesses annually and has resulted in over 80 certified green businesses in the City of Ventura.

The City partners with local organizations, such as the Community Environmental Council, VCREA, and the Central Coast Green Building Council to offer educational workshops and presentations to residents. These topics range from the Solarize program, the EAP, Green Building Speaker Series, and more.

COM 1.1 Environmental Sustainability Website and Outreach Methods

Regularly update the City’s Environmental Sustainability website, social media, and other outreach methods with greenhouse gas reduction and energy-focused resources including programs, rebates, and incentives offered by IOUs, CPA, VCREA, 3C-REN and other energy-focused organizations. Case studies and best practices highlighting successful energy improvements and greenhouse gas mitigation should also be included in the outreach materials.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.2 Community Updates on CARP and Energy Reduction Goals

Regularly update the City’s Environmental Sustainability website, Sustainable Ventura Newsletter, social media, and other outreach methods showing the community’s progress towards achieving local energy and greenhouse gas reduction and climate goals.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.3 Sustainable Ventura Newsletter

Dedicate a portion of the Sustainable Ventura Newsletter to green business operations, including programs, case studies, and opportunities to reduce energy consumption and capitalize on financing programs like Property Assessed Clean Energy (PACE) and IOU-sponsored on-bill financing.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.4 Community Workshop Series

Partner with key community stakeholders, IOUs, CPA, VCREA, and other climate and energy focused organizations to develop a quarterly workshop series to engage and educate the public on rebates and incentives, programs, partnerships, and other opportunities to enrich energy and climate education.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.5 Green Building Trainings

Support 3C-REN, AIA Ventura Chapter, Central Coast Green Building Council, and other green building organizations in developing green building trainings, sharing case studies, and offering other educational opportunities. Explore development of a Green Building Awards Competition.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.6 Energy Storage Outreach Program

Collaborate with Community Environmental Council and VCREA to develop and implement an energy storage outreach and education program. Program offerings could include hosting community energy storage workshops and developing informational materials on the benefits of and available incentives for energy storage.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.7 Home Energy Savings Do-It-Yourself Toolkit Promotion

Partner with 3C-REN, VCREA, and the Ventura County Library System to promote Home Energy Savings Do-It-Yourself Toolkits. Each kit includes tools to help measure a home's current energy use, along with helpful tips on ways to make a home more energy smart. The kits also include free items to keep like light-emitting diode (LED) lightbulbs, low-flow showerheads, and other things to help homes use less energy and water.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.8 Electric Vehicle Outreach

Partner with VCREA, Community Environmental Council, EV Advocates of Ventura County, Electric Drive 805, and other EV advocacy groups to develop and implement an EV outreach and education program. Program offerings could include hosting events like EV "lunch and learns" and developing informational materials on the benefits of EV ownership.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.9 Ventura Unified School District Engagement

Continue partnership with Ventura Unified School District (VUSD) to empower students to be leaders in reducing greenhouse gas emissions, lowering energy consumption, and utilizing EVs in their community through in-class education, internships, and other programs.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

COM 1.10 Energy Outreach Targeting

Partner with 3C-REN and Community Action of Ventura County to conduct focused homeowner and renter outreach to the city's disadvantaged and low-income communities, using Energy Atlas data and maps to guide outreach.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division, PIO

City Leadership

The ability to meet Ventura’s goals of mitigating carbon emissions and adapting to the effects of climate change will be demonstrated by City actions. The City will implement a series of actions that will both reduce carbon emissions from municipal operations and enhance resiliency. These actions include energy and water efficiency upgrades for City facilities, parks, and landscapes, sustainable new construction, the electrification of buildings and fleet vehicles, supporting electric vehicle adoption through charger installation, and the installation of resilience measures as discussed in Chapter 4: Our Adaptation Strategy. These policies will not only reduce emissions but create community benefits through leading by example.

Performance Metrics

- Number of City buildings retrofitted to eliminate natural gas use
- Percent of City fleet powered by clean energy
- Reduction in GHG emissions from City operations

Municipal Measures

CL 1.1 City Facilities Decarbonization Plan

Develop a decarbonization plan for City facilities that aligns with the CIP process.

Implementation Actions:

- | | | |
|---|--------------------------------|---------------------------------------|
| 1. Conduct an energy audit of all City facilities. | GHG Reduction Potential | Low |
| 2. Identify energy efficiency upgrades to be installed. | Cost | \$-\$\$ |
| 3. Identify potential for DERs at City facilities, including those identified in the 2012 ESS. | Co-Benefits | Resilience |
| 4. Establish a funding source and timeline to meet the goal for streetlight upgrades as described in the 2018 Public Works Strategic Plan of converting the 1,000 city-owned and maintained streetlights to LEDs by 2025 to reduce costs and improve quality. | Responsible Departments | Environmental Sustainability Division |
| 5. Investigate establishing a funding source and timeline to attain ownership of SCE owned streetlights and update those lights to LEDs. | | |
| 6. Upgrade the energy management system to better track the energy consumption of municipal facilities. | | |
| 7. Develop and implement a green revolving loan fund (RLF) to finance energy projects at municipal facilities and reinvest the money saved from lowered utility bills into future energy projects. | | |
| 8. Pursue funding opportunities to finance energy upgrade projects identified in energy audits and renewable energy feasibility assessments. | | |
| 9. Conduct feasibility analysis for installing renewable energy projects at all City-owned and operated facilities that were identified as viable solar sites in the ESS and identified as critical facilities. | | |
| 10. Develop policy to require re-roofing projects on government facilities to evaluate the feasibility of incorporating solar or “solar ready” features, including mounting posts for panels and roof penetrations for conduit and/or pipes for facilities. | | |
| 11. Align improvements timeline with CIP process including utility available incentive programs. | | |
| 12. Draft and adopt plan. | | |

CL 2.1 Public Electric Vehicle Charger Installations

Collaborate with VCREA, Community Environmental Council, EV Advocates of Ventura County, Electric Drive 805, and other EV advocacy groups to build upon the EV Infrastructure Interactive Map by identifying new preferred locations for Level 2 and DC Fast Chargers.

Implementation Actions:

1. Conduct an EV charger gap analysis to identify locations in need of additional chargers.
2. Partner with utilities, VCREA and Electric Drive 805 to develop to install, maintain, and operate publicly accessible EV chargers.
3. Update interactive map with new charger locations.

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	Air quality, public health
Responsible Departments	Environmental Sustainability Division

CL 3.1 ZEV Fleet Transition

Establish a vehicle procurement approach that favors EVs for new fleet purchases and build charging infrastructure.

Implementation Actions:

1. Set a goal to transition one eighth of the City fleet to Evs by 2030.
2. Establish a ZEV policy requiring City Departments to purchase light-duty vehicles, if available and cost effective, according to the following priority structure: (1) pure ZEVs, (2) plug-in hybrid Evs, and (3) hybrids.
3. Centralize fleet procurement authority so one staff will review all vehicle procurements and require revisions of selected vehicles if the justification for non-ZEV or hybrid options is lacking.
4. Track the California Division of Measurement Standards updates to proposed regulations for EV charging rates to ensure the charging rates are not burdensome to EV drivers.
5. Install Level 2 charging infrastructure at City public parking lots and investigate the feasibility of installing DC Fast Chargers in these lots.
6. Explore the feasibility of utilizing City owned smart charging stations to earn credit revenue by participating in the California Low Carbon Fuel Standards (LCFS) program.

GHG Reduction Potential	Low
Cost	\$\$
Co-Benefits	Air quality, public health
Responsible Departments	Public Works

CL 4.1 Sustainability Purchasing Policy

Adopt a municipal sustainable purchasing policy

Implementation Actions:

1. Work with City Manager’s office and Finance Department to develop a list of preferred purchasing options
2. Conduct outreach to all city staff about sustainable purchasing policy; include as part of new employee orientation

GHG Reduction Potential	Low
Cost	\$
Co-Benefits	
Responsible Departments	Environmental Sustainability Division

CL 5.1 CPA Leadership

Utilize the City’s seat on the CPA Board of Directors to advance programs and policies in line with best practices towards decarbonization, electrification, and equity for ratepayers.

Implementation Actions:

1. Advocate for programs and rebates to encourage adoption of Evs, energy efficiency measures, energy storage, and renewable energy systems based on other successful CCE and IOU programs.
2. Encourage programs and rebates to have special consideration for low-medium income residents.
3. Advocate for net energy metering policies that are favorable for solar customers (higher kWh purchase rates than SCE for net surplus generating customers) and the establishment of community solar programs that benefit renters or other customers that cannot install solar where they live or conduct business.
4. Advocate for development of distributed energy resources including solar, energy storage, and microgrid within Ventura County that are designed to improve regional grid resilience and reliability.

GHG Reduction Potential	Supportive
Cost	\$
Co-Benefits	Air quality, public health
Responsible Departments	Mayor or City Council

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Chapter 6

Implementing the CARP

The CARP directs City staff to develop and implement specific policies, plans, programs, and projects over the next 10 years to achieve the City's climate goals. Successful implementation of the CARP strategies will require commitment and coordination from staff throughout the City. Although the City will initiate climate action, community involvement is an essential component of the CARP implementation process, as many strategies depend on active participation by residents and businesses.



Priority Implementation Actions

Through an extensive community engagement process, the initial longlist of strategies and actions were prioritized based on their greenhouse reduction potential, co-benefits, and financial resources. These priority actions lay the foundation for future action, contribute to the elimination of greenhouse gas emissions by 2045, and make Ventura more resilient, especially those most at-risk and vulnerable to impacts of climate change.

Table 8. Priority Strategies

Number	Strategy
EH 1.5	Increase Tree Canopy. Increase urban tree canopy citywide to mitigate extreme heat.
WM 2.7	Reduce Fire Risk in WUI. Continue to coordinate with CAL FIRE, Ventura County Fire, Ventura Regional Fire Safe Council, and neighboring jurisdictions on wildfire risk reduction activities in the Wildland Urban Interface (WUI) and open space areas in and adjacent to the City.
SLR 6.4	Coastal Resilience Funding. Research external funding opportunities to implement coastal resilience and coastal restoration projects.
CA 8.1	Community Engagement Campaign. Develop a community-wide engagement campaign to educate the public on anticipated near and long-term climate impacts, community vulnerabilities, and opportunities for adaptation.
CE 2.4	CPA Participation. Maintain City membership in Clean Power Alliance (CPA) and continue to work to maintain a minimum of 95% of private property owner participation in CPA at the 100% Green tier.
BNC 2.2	Residential All-Electric New Construction. Investigate and implement a localized reach code for new residential construction to prohibit or disincentivize connection to natural gas lines.
BE 1.3	Energy Efficiency Programs and Incentives. Promote existing IOU and state agency financing programs like the Residential Energy Efficiency Loan program that is designed to help homeowners and renters access competitive financing solutions for energy efficiency projects.
TL 1.3	Partnerships to Encourage Electric Vehicle Charger Installation. Increase installation of private EV charging stations by promoting federal, state, SCE, CPA, and local rebates and incentive.
TL 2.4	Active Transportation Plan. Prioritize, fund, and implement the Active Transportation Plan (ATP).
COM 1.1	Environmental Sustainability Website and Outreach Methods. Regularly update the City’s Environmental Sustainability website, social media, and other outreach methods with greenhouse gas reduction and energy-focused resources including programs, rebates, and incentives offered by IOUs, CPA, VCREA, 3C-REN and other energy-focused organizations.

Cost Estimates and Funding Sources

Cost Effectiveness

There are many different approaches to establishing implementation cost estimates for CARP strategies. Implementation costs include both administrative and programmatic costs to the City, and equipment and services costs to residents and businesses. Costs can be expressed as relative costs to a determined baseline, up-front first costs or the direct costs of implementation, or long-term cost effectiveness, the total cost of action implementation over time accounting for cost savings over the lifetime of the intervention. These estimates differ. Table 9 shows the estimated up-front unit cost of implementing CARP strategies and the estimated greenhouse gas emissions reductions based on the modeled level of implementation needed to achieve the City’s targets. These cost estimates may change as the market adjusts to future technological adoption and advancements or additional climate measures are pursued.

Table 9. Relative Cost-Effectiveness of Greenhouse Gas Mitigation Measures

Sector	Sub-Category	Cost	GHG Reduction Potential	Relative Cost Effectiveness (GHG Reduction / Cost)
Clean Energy	Local Renewables	High	Low	Low
	Clean Energy – CPA	Low	High	High
Buildings	Existing Building Energy Efficiency	Medium	Low	Medium
	New Building Electrification	Low	Medium	Medium
	Existing Building Electrification	High	High	Low
Transportation	Electric Vehicles	Medium	Medium	Medium
	Mode Shift	High	High	High
Solid Waste	SB 1383	Low	Low	Low
Water	Water Use	Low	Low	High

Funding Opportunities

The actions in this CARP do not necessarily represent the lowest cost pathway to achieve Ventura’s GHG targets. Instead, the actions were chosen to reflect local conditions and priorities, address equity, and to create multiple benefits in addition to emissions reductions. However, implementing the CARP can also provide economic benefits across the city including expanding the local green economy, job creation, and reducing costs for Ventura residents and businesses. For example, making walking and biking safer and transit more accessible can reduce the costs of traveling around Ventura, while promoting an active lifestyle that can help improve health outcomes.

Below is a list of potential funding sources as well as available incentive programs to help reduce the cost of implementing CARP actions:

- **City's General Fund.** This is the primary source of funding for City operations and can be used for any public purpose. It is allocated as part of the overall City budget, approved by City Council. The substantial number of competing priorities for General Fund dollars requires that the City seek out other sources of funding wherever possible to increase the likelihood of successful implementation for each action.
- **Measure O Funding.** Measure O is a general sales tax measure approved in 2016. The twenty-five year measure to support public services.
- **Bonds.** Local governments can sell bonds to investors that raise capital for a specific objective. Bonds must be approved by voter and may have additional oversight or administration requirements.
- **Taxes.** Taxes generate revenue to support local, regional, and state operations. Taxes can be used either for general purposes (e.g., any city service as needed) or specific purposes (e.g., climate change mitigation) but require voter approval. Examples of taxes include:
 - Utility User Tax
 - Real Estate Transfer Tax
 - Parcel Tax
- **Revolving Loan Fund.** Ventura Water could partner with a third-party funding entity to finance energy upgrades. The third-party funding entity would be responsible for loan processing and tracking, and receive a service fee from Ventura Water, separate of the initial capital. Ventura Water would facilitate repayment of these loans to the revolving fund via the water bill and ensure a low interest rate. The City would ensure a low interest rate by establishing a fixed rate in the program contract (e.g., 1.5%), enough to grow the revolving fund but keep loans affordable for residents.
- **State and Federal Grants.** Grants are usually given without expectation of repayment, but often require either matching funds from the City and/or staff time to administer the grants. Grants often fund new and innovative programs. However, grants are also competitive and are not guaranteed source of funding. The following agencies offer climate related grants:
 - Department of Energy
 - California Energy Commission
 - Southern California Edison
 - Southern California Gas Company
 - Ventura County Air Pollution Control District
 - Electrify America
 - FTA Planning Grants
 - CARB
 - CalFire
 - FEMA
 - CDFA Healthy Soils Initiative
 - CalRecycle
- **Incentives and Rebates.** Incentives and rebates are usually monetary motivators that can help cover the cost of implementing specific programs or equipment. Many utilities have incentive

programs to help spur investment, pay for equipment, and expand various markets for newer technologies. Existing programs include:

- CPA Residential and Commercial Rebates
- 3C-Ren Home+ Rebates
- Ventura County Regional Energy Alliance
- California Water Service rebates
- CA Clean Vehicle Rebate Project
- Electric Drive 805
- Single-family Solar Affordable Solar Housing (SASH) Program
- Multifamily Affordable Solar Housing (MASH) Program
- Residential and Commercial Federal ITC for solar photovoltaics
- New local incentives programs as needed

Equitable Program Implementation

Though equity is like equality, they are not the same thing. Equality means everyone receives the same thing regardless of any other factors. Equity, on the other hand, is about ensuring that people have access to the same opportunities to thrive and succeed. A climate equity lens recognizes that people may have different starting points and may need diverse types and levels of support to adapt to climate change to achieve fairness in climate outcomes. Thus, climate equity is achieved when socioeconomic and environmental factors, such as race, income, education, or place, can no longer be used to predict the health, economic, or other wellbeing outcomes from climate change. For the purposes of the CARP, the following dimensions of equity will be considered during program implementation:

- **Procedural.** Create processes that are transparent, fair, and inclusive in developing and implementing any climate program, plan, or policy. This dimension of equity focuses on ensuring that all people are treated openly and fairly, and on increasing opportunities for engagement and ownership in decision-making in all phases of climate resilience planning and CARP implementation.
- **Structural.** Address the underlying structural and institutional systems that are the root causes of social and racial inequities. It is a dimension of equity that makes a commitment to correct past harms and prevent future unintended consequences from climate-related decision-making, such as in the CARP implementation.
- **Distributional.** Fairly distribute resources, benefits, and burdens. This dimension of equity focuses on prioritizing resources for communities that experience the greatest climate and environmental inequities, disproportionate impacts, and have the greatest unmet environmental health needs.

Achieving climate equity will require careful design and execution of policies and programs to improve outcomes for disadvantaged populations in all stages of CARP implementation. When equity is prioritized, climate strategies can address and lessen existing social, racial, and health disparities. Implementation of this CARP will be guided by two equity guardrails:

1. Many of the local benefits resulting from CARP implementation will be focused on disadvantaged communities by meeting priority community needs, improving public health, building on community assets and values, and increasing community resilience.
2. Required measures do not present an undue cost burden on those least able to afford implementation. Financial and technical assistance will be prioritized for disadvantaged communities and sensitive populations, including renters, to allow them to participate in CARP programs and fully realize all benefits.

Monitoring and Evaluation

Monitoring of the CARP's performance involves tracking the performance of individual strategies and estimating the GHG emissions reductions resulting from their implementation. The performance metrics identified for each strategy will be tracked using readily accessible data that is useful for estimating emissions reductions. Periodic re-inventorying of local government and community-wide emissions will also be needed to validate overall progress toward the City's GHG reduction targets.

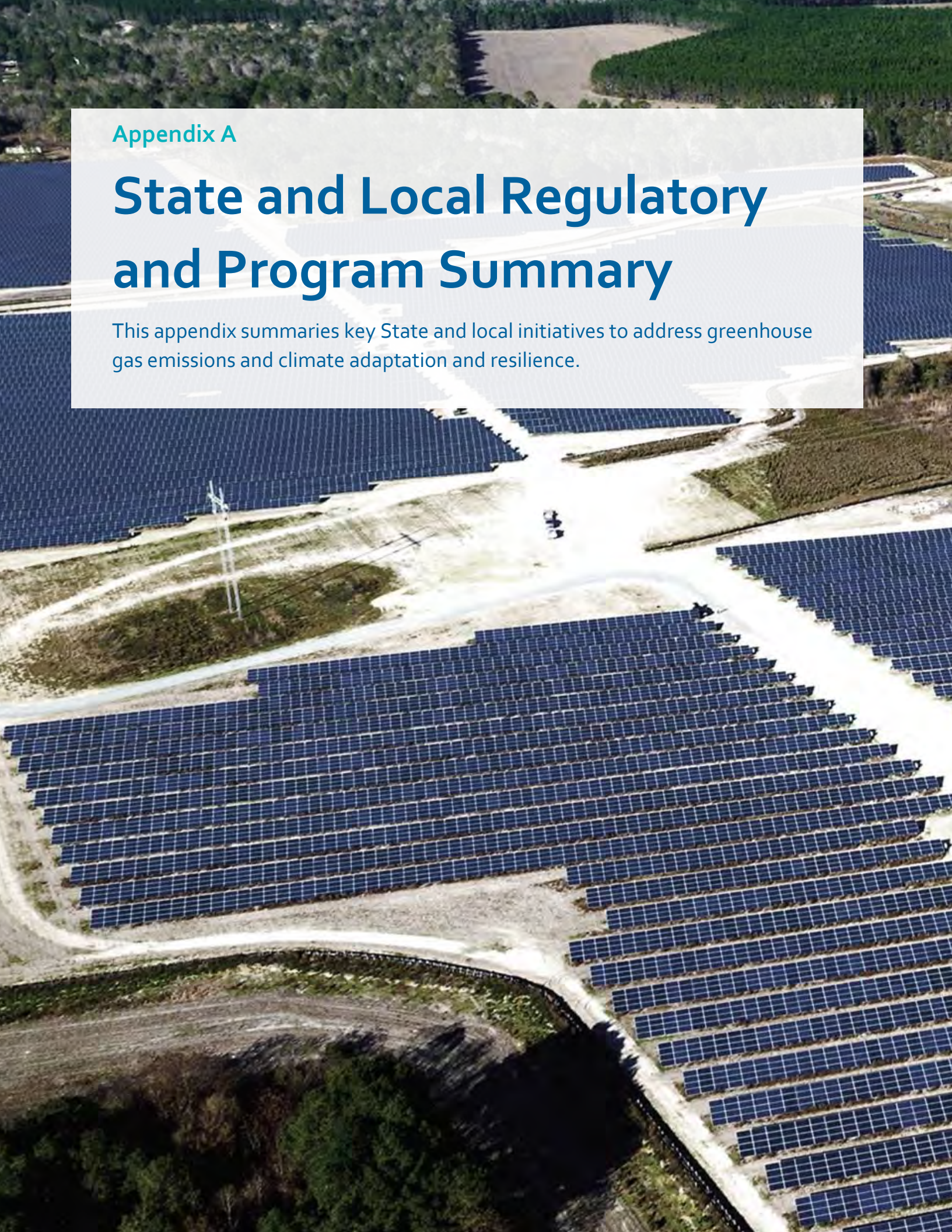
- **Implementation Checklists.** The City will develop CARP consistency checklists to ensure compliance with CARP strategies when reviewing City plans, programs, and activities including Capital Improvement Projects as well as community development projects. The checklists will help City staff and community development project applicants plan for and approve work that support the City's sustainability goals.
- **Annual CARP Progress Report.** City staff will prepare annual progress reports on CARP implementation to be presented to City Council and other stakeholders as needed. The report will evaluate the successes and challenges in meeting the City's GHG reduction targets (as they become known or apparent), provide the status of implementing actions for each reduction and resilience strategy in the CARP (e.g., initiated, ongoing, completed), assess the effectiveness of each strategy, and recommend adjustments to programs or actions as needed.
- **GHG Inventory.** Staff will update the City's community and municipal operations emissions inventory every five years. Inventory updates will encompass all inventory sectors (residential energy, commercial/industrial energy, large industrial energy, on- and off-road transportation, solid waste, wastewater, water, and municipal operations).
- **CARP Updates.** A comprehensive revision of the CARP should occur at least every five years to monitor progress of greenhouse reductions against the 2030 target and 2045 goal of carbon neutrality, to account for the impact of new legislation and state programs on greenhouse gas targets and emissions reductions, and to adjust strategies and actions as needed to reach the targets. In preparation for the 2030 update and annual reporting to the Planning Commission and City Council, staff will use greenhouse gas inventories and CARP measure implementation to track Ventura's progress in reducing emissions, VMT, waste generation, and energy use over time using readily available data.

Oversight and Accountability

Options for an ongoing structure for oversight in CARP implementation and long-term plan updates:

- Create an internal CARP Implementation Team (led by the Environmental Sustainability Division) to assist in coordinating and implementing actions across departments, identifying synergies/collaboration opportunities, and identifying funding sources.
- Develop and maintain a community-facing CARP Tracking Dashboard for transparency.
- Prepare annual updates for the Planning Commission and City Council on CARP progress, as defined above.

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An aerial photograph of a large-scale solar farm. The solar panels are arranged in neat, parallel rows across a cleared area. The surrounding landscape includes green trees, a dirt road, and a utility pole. The sky is clear and bright.

Appendix A

State and Local Regulatory and Program Summary

This appendix summarizes key State and local initiatives to address greenhouse gas emissions and climate adaptation and resilience.

State Regulatory Framework

California has established itself as a national leader on climate action. The following section describes key elements of the legislative and regulatory context in California that aids local governments in reducing their GHG emissions. This legislative framework guided the development of the CARP and GHG forecasting.

Table A-1. State Regulatory Framework

Program	Description
Climate Action Targets	
Executive Order B-55-18 (2018): Carbon neutrality by 2045	This Executive Order set a target of statewide carbon neutrality by 2045 and to maintain net negative emissions thereafter.
Senate Bill 32 (2016): Greenhouse Gas emission reduction target for 2030	This Senate Bill establishes a statewide greenhouse gas (GHG) emission reduction target of 40% below 1990 levels by 2030.
Assembly Bill 32 (2006): California Global Warming Solutions Act of 2006.	This Assembly Bill requires the California Air Resources Board (CARB) to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. It was California’s first GHG reduction target.
Climate Change Scoping Plan (2017)	The Climate Change Scoping Plan was approved by CARB in December 2008 and outlines the State’s plan to achieve the GHG reductions required in AB 32. The plan directed municipal governments to reduce their emissions by at least 15% by 2020 compared to 2008 levels or earlier. The Scoping Plan was updated in 2017 to reflect the SB 32 target of reducing emissions by 40% under 1990 levels by 2030.
Clean Energy	
Senate Bill 100 (2018): Renewable Portfolio Standard	This Senate bill requires that 100% of all electricity within California be carbon-free by 2040. Electricity providers must procure from eligible renewable energy sources, with interim goals of 40% by 2024 and 50% by 2030.
Transportation	
Senate Bill 375 (2008): Greenhouse Gas emission reduction targets for vehicles	The Sustainable Communities & Climate Protection Act of 2008 requires CARB to develop regional greenhouse gas emission reduction targets for passenger vehicles. CARB is to establish targets for 2020 and 2035 for each region covered by one of the State’s 18 metropolitan planning organizations.

Program	Description
Senate Bill 743 (2013): Transportation Impacts	Introduces a new performance metric, vehicle miles travelled (VMT), as a basis for determining significant transportation impacts under CEQA. Projects that are projected to increase VMT may mitigate their impacts through measures such as car-sharing services, unbundled parking, improved transit, and enhanced pedestrian and bicycle infrastructure.
Executive Order N-79-20 (2020): Zero Emission Vehicles	In line with the carbon neutrality goal, this Executive Order requires the elimination of new, internal combustion passenger vehicles by 2035.
Assembly Bill 2127 (2018): EV charging infrastructure	The California Energy Commission is required to prepare and biennially update a statewide assessment of the electric vehicle charging infrastructure needed to support the levels of electric vehicle adoption for the state to meet its goal of putting at least 5 million zero-emission vehicles on California roads by 2030.
Advanced Clean Truck Rule (2020): Zero emission trucks	CARB adopted this rule requiring manufacturers of heavy-duty, on-road trucks to sell an increasing number of zero-emission trucks. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 vocational truck sales, and 40% of Class 7-8 truck tractor sales.
Innovative Clean Transit (2018): Zero emission bus fleets	CARB adopted this rule requiring public transit agencies to gradually transition to 100% zero-emissions bus fleets by 2040. This regulation applies to all transit agencies that own, operate, or lease buses with GVWR above 14,000 lbs.
Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule (2018)	The U.S. Environmental Protection Agency (US EPA) and the National Highway Traffic Safety Administration (NHTSA) issued the SAFE Vehicles Rule. This rule set a vehicle fleet efficiency standard increase of 1.5% per year above 2020 standards through 2026.
Solid Waste	
Senate Bill 1383 (2016): Short-lived Climate Pollutants – Organic Waste Reductions	This Senate Bill establishes a statewide target to reduce the disposal of organic waste by 75% by 2025 to reduce methane emissions from organic material in landfills.
Assembly Bill 341 (2012) and Assembly Bill 1826 (2016): Mandatory Recycling	AB 341 requires all commercial businesses and public entities that generate 4 cubic yards or more of waste per week and all multi-family apartments with five or more units are also required to have a recycling program in place to help meet the state’s recycling goal of 75% diversion by 2020. AB 1826 requires all commercial businesses to

Program	Description
	collect yard trimmings, food scraps, and food-soiled paper for composting.
Adaptation and Resilience	
Senate Bill 379 (2015): Adaptation and Resiliency Planning	California Senate Bill (SB) 379 requires cities and counties within the state to consider and address climate change and resiliency within the Safety Element of their General Plans. The Bill requires local agencies to perform a vulnerability assessment that identifies the potential impacts to the community associated with climate change. Further, cities and counties must utilize the vulnerability assessment to develop goals and policies to facilitate climate adaptation and minimize the risks associated with climate impacts.
Disaster Mitigation Act of 2000: Hazard Mitigation Plan	FEMA’s Disaster Mitigation Act is intended to “reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.” Under this legislation, state, tribal, and local governments must develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance through the Hazard Mitigation Assistance Programs.

Environmental Action in Ventura

The City of Ventura has a strong history of taking environmental action. Residents, businesses, and community groups maintain a strong environmental ethic and work to conserve the ecological wealth of the community. While the City of Ventura has historically had a strong environmental ethic, efforts to address GHG emissions have been decentralized. The City of Ventura’s Environmental Sustainability Division was created in 2009 to bring all stakeholders to the table to create a plan for a more resilient, equitable, and energy-efficient future. Table A-2 list the plans, policies, and programs in place to enhance sustainability and become more resilient to climate hazards.

Table A-2. Program, Plans, and Policies to Reduce Greenhouse Gas Emissions

Existing Initiatives	Description
Municipal Operations	
Green Initiative	In 2007 City Council passed the “Green Initiative”, a ten-point action plan designed to reduce environmental impacts from the City’s municipal operations. The plan includes reducing energy and vehicle fuel use; developing a green purchasing policy; educating employees about green practices; and forming a Green Team to help implement these programs.
Environmental Sustainability Strategy	In 2012, the Environmental Sustainability Strategy (ESS) was developed to improve Ventura’s municipal environmental performance and reduce operating costs by improving the City’s operational efficiency and reducing resource consumption. The ESS identifies strategies and projects that reduce energy, fuel, chemical and water use; reduces solid waste and hazardous waste generation; and increases the purchase of environmentally preferable products. The ESS consolidates the efforts of individual City divisions into a single document, establishes goals and strategies, and provides a process for tracking progress over time.
Climate on the Move GHG Inventory	In 2015, the City of Ventura Environmental Sustainability Division and VCREA worked collaboratively to develop the Climate on the Move report, which included a community-level GHG emissions inventory and a CAP template for the City. Climate on the Move provides city-specific community GHG emission data from 2010 through 2012, 2020 emission forecasts, and GHG reduction target options.
Clean Energy and Buildings	
Green Business Certification Program	The City also launched their Green Business Program in 2012, to support local businesses in adopting environmentally responsible practices. Between 2012 and 2020, the City’s Green Business Program certified eighty-three businesses.
Clean Power Alliance (CPA)	In 2018 the City joined CPA, a community choice energy program, at the 100% renewable default tier; meaning that electricity customers within the City would automatically be enrolled in the new program and receive 100% renewable electricity.
Transportation	

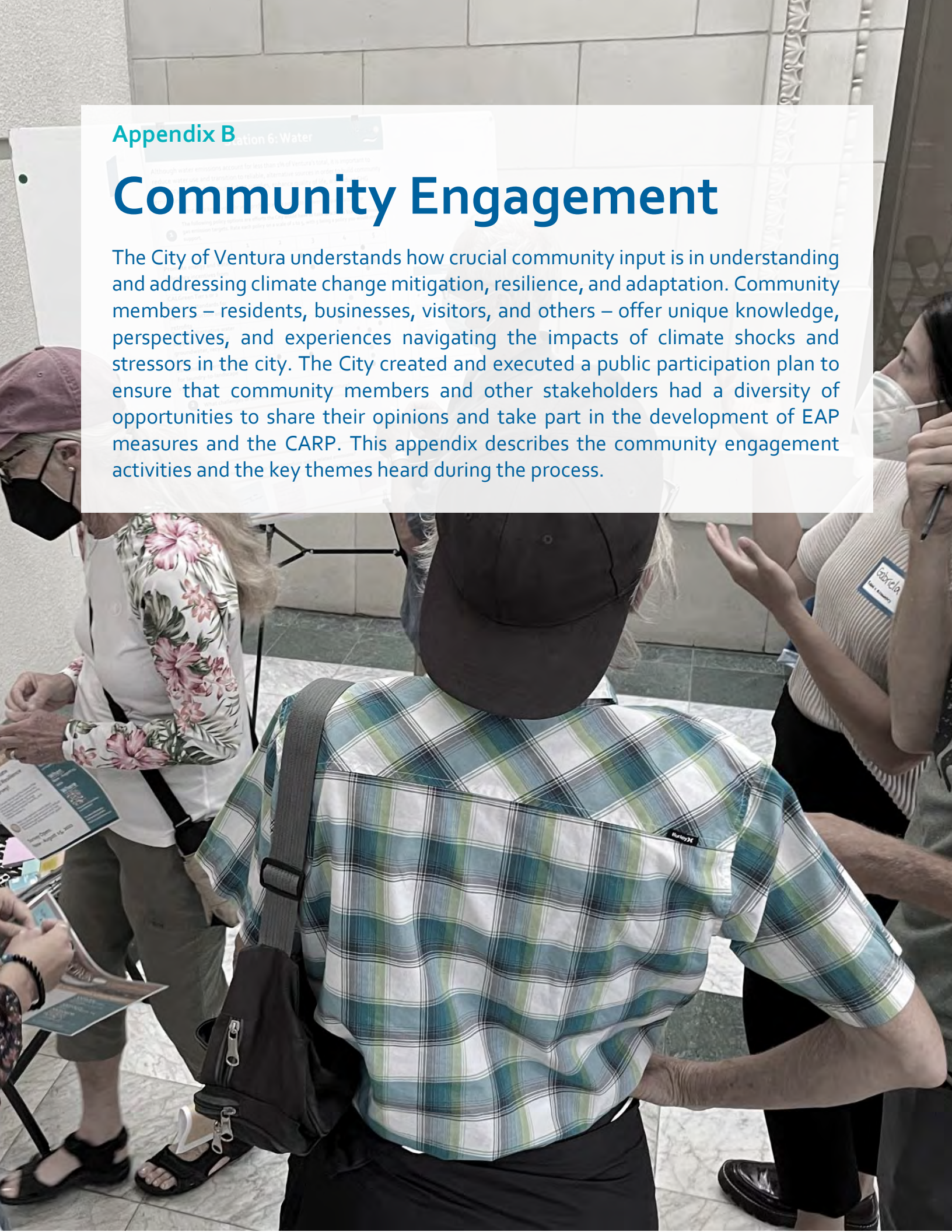
Existing Initiatives	Description
EV Accelerator Plan	In 2019 the City of Ventura Environmental Sustainability Division worked with VCREA and Community Environmental Council to create an EV Accelerator Plan for the City. The City’s Accelerator Plan was included in a larger EV Ready Blueprint for Ventura County, which creates a step-by-step plan for electrifying the Region’s transportation sector. The City’s Accelerator Plan details the infrastructure needed for EVs to be one-eighth of all registered vehicles in the City by 2030. Ventura has City chargers: 16 publicly accessible EV Chargers at 6 locations.
Active Transportation Plan (in progress)	The City is working on an Active Transportation Plan to incorporate bicycle and pedestrian mobility, Suggested Routes to School (SRTS), and Complete Streets components, in an ambitious path toward increasing mobility options for all City residents. The Plan outcomes will feed directly into the City’s General Plan update.
Water and Natural Systems	
Water Efficiency Plan (WEP)	Adopted in 2021, the Water Efficiency Plan provides a description of current conservation efforts and establishes a path to achieve greater water use efficiency. With the uncertainty of climate impacts on local water resources in the future, the WEP outlines specific measures Ventura will use to achieve efficiency and ensure the reliability of ventura’s water supply.
City Tree Master Plan	Adopted in 2020, the City Tree Master is a guide to the essentials of effective administration and management of a comprehensive Urban Forest program in the City. The benefit that street trees offer is immeasurable and considered one of the most valuable long-term assets that cities have. The City is home to over 30,000 public trees.
Adaptation and Resilience	
Ventura County Contingency Plan for Heat/Cold Weather Events	This document outlines responses to an extended heat wave or cold weather that could endanger the lives of citizens of Ventura County, especially those who are medically fragile, those living alone, and disabled individuals. Some considerations discussed include community centers as refuges from weather, creation of Voluntary Relief Centers, and proposed establishment of Cooling Centers.

Existing Initiatives	Description
Heatwave Safety	The City of Ventura webpage under emergency preparedness provides information about extreme heat and how to prepare for a heat emergency. The page includes resources for shelter from extreme heat and signs of heat-related illnesses.
Surfers Point Managed Retreat Project	This project focuses on moving infrastructure away from the beach to preserve the beach and surf break. Instead of building coastal armor such as a seawall, this project will move the parking lot, pedestrian path, and bike path away from the tideline. The project also includes planting and maintaining native vegetation within sand dunes and bioswales.
2020 Draft Urban Water Management Plan for the City of San Buenaventura	The 2020 Urban Water Management Plan for the City of San Buenaventura includes descriptions of the community’s water supply sources, projected water demands, and supply reliability during normal water years, single dry years, and five-dry years. The plan includes a discussion of the potential impacts of climate change on the system as well as reliability planning and a water shortage event contingency plan. The Urban Water Management Plan does not include strategies for mitigation and adaptation.
Coastal Resilience Ventura Project	This program uses a web-based mapping tool to help identify Ventura County’s vulnerability from coastal hazards. Vulnerable populations are identified under various climatic scenarios. Critical infrastructure in coastal zones is identified under various sea level rise and storm surge scenarios as well.
Ventura Community Wildfire Protection Plan	The County’s Community Wildfire Protection Plan (CWPP) identifies wildfire risks and clarifies priorities for funding and programs to reduce impacts of wildfire on communities at risk. Some actions include vegetation management, wildfire safety education programs, and establishment and maintenance of evacuation routes.
2005 Ventura General Plan	The 2005 City of Ventura General Plan includes actions that assess wildfires, flood hazards, air quality, water supply, and emergency response practices. General Plan policies include actions to optimize firefighting and minimize exposure to air pollution associated with point sources, project design review, land use compatibility, and compliance with the Ventura County Air Pollution Control District requirements. The General Plan also describes the water supply and system including the Casitas Municipal Water District, Ventura River surface water intake, subsurface water, and wells (Foster Park), Mound groundwater

Existing Initiatives	Description
	basin, Oxnard Plain groundwater basin (Fox Canyon Aquifer), and Santa Paula groundwater basin. The General Plan includes policies for resource conservation, policies to minimize flood hazards and mitigation for new development within flood hazard zones.
Ventura County Multi-Jurisdiction Hazard Mitigation Plan	The Ventura County Multi-Jurisdiction Hazard Mitigation Plan describes hazard mitigation policies for landslides, flooding, wildfires, sea level rise, and drought. The policies within the plan are regarding FEMA 100-year tide and sea level rise, compliance with NFIP, flood plain management, and long-term resilience to sea level rise and extreme storms for communities and critical assets adjacent to San Buenaventura Beach, Santa Clara River, Ventura River, and nearby areas of the shoreline. The plan also describes the County’s StormReady program, Ventura Water Pure Program, Hall Canyon Channel Drainage Basin Improvement Project, and wildfire awareness program.
City of Ventura Emergency Response Team (CERT) Program	The CERT program trains volunteers in basic first aid, light search and rescue, and small fire suppression, and is strongly associated with Ventura’s Fire Department. CERT volunteers may assist neighbors and other emergency personnel in times of emergency, and support evacuations along with other responsibilities.
City of Ventura Emergency Operations Plan (City of Ventura 2021)	Ventura’s Emergency Operations Plan details protocols to improve emergency preparedness, response, and recovery from natural disasters. The plan provides a system for the effective management of emergency situations and identifies lines of authority and responsibility. The plan reviews the hazards most likely to impact the City, especially those exacerbated by climate change including drought, extreme heat, wildfire, flooding, and severe winter storms.

Community Engagement

The City of Ventura understands how crucial community input is in understanding and addressing climate change mitigation, resilience, and adaptation. Community members – residents, businesses, visitors, and others – offer unique knowledge, perspectives, and experiences navigating the impacts of climate shocks and stressors in the city. The City created and executed a public participation plan to ensure that community members and other stakeholders had a diversity of opportunities to share their opinions and take part in the development of EAP measures and the CARP. This appendix describes the community engagement activities and the key themes heard during the process.



Energy Action Plan Community Engagement

The City conducted public outreach and engagement to provide residents, business owners, stakeholders, City staff, partner organizations, and individuals with the opportunity to participate in the planning process for drafting the Energy Action Plan (EAP). The goals of outreach and engagement were to:

1. Raise awareness of EAP development
2. Educate the public and other organizations about this plan
3. Provide opportunities for input at the various steps of plan development
4. Provide opportunities to influence decision-making.

Specifically, the community outreach and engagement process helped identify and refine goals, strategies, and actions for reducing energy consumption, increasing energy efficiency, and using more renewable energy. Community outreach and engagement comprised a variety of methods, including community surveys, a community workshop, tabling events, and stakeholder meetings.

Outreach Surveys

The City developed two community surveys to gather input from residents to help the City further understand community needs and preferences for the EAP.

Community Engagement Round 1 Survey

The first survey was designed to identify community priorities for energy improvements across residential and commercial sectors. The survey also asked participants about the importance of planning for climate change and resiliency through energy improvements. The survey was in both English and Spanish and was available electronically and in hard copy format. The online survey was hosted on VCREA's and the City's webpages between March and July 2018. Hard copy surveys were also distributed to residents at community meetings including the Neighborhood Community Council and Housing Authority of the City of Buena Ventura meetings, tabling events including Ventura EcoFest and Fourth of July Street Fair, social media posts, and through the City's monthly e-newsletter. Of the 316 responses received from residents and businesses, several community attitudes about energy became clear:

1. The City should prioritize climate and energy programs for both municipal operations and the community.
2. Energy planning should include strategies that are achievable, reduce emissions, improve environmental health, support the local economy, and keep the city resilient toward natural disasters and the future impacts of climate change.
3. The City should take steps to reduce resource and knowledge barriers for residents and businesses to implementing energy efficiency and renewable energy projects



Photo Taken by City of Ventura Staff

4. The commercial sector represents an opportunity for education on energy policy and financing for greening projects.
5. Commercial and residential tenants need assistance to implement energy measures in their offices and homes.

Community Engagement Round 2 Survey

The second survey was designed to gather community feedback on some specific strategy ideas for improving energy performance in residential and commercial buildings. The survey also asked respondents to identify priorities for increasing EV infrastructure and electrified public transportation. The survey was in both English and Spanish and was hosted on VCREA's and the City's webpage for ten weeks in the early summer of 2019. Similar outreach methods were used to advertise the survey, including emails to previous email respondents. Ninety residents responded to the second survey.

The responses to both surveys were incorporated into the final strategy design. Round 1 and Round 2 Survey Reports are included in Appendix E.

Community Energy Workshop

On June 8, 2019, the City hosted a Community Energy Workshop at City Hall. With approximately forty members of the public in attendance, the workshop opened with a presentation that introduced the concept of energy action planning and educated attendees about potential strategies. After the presentation, attendees split off into several breakout groups to discuss draft strategies that were featured in the Round 2 outreach survey. VCREA and Community Environmental Council staff recorded community input on strategies including solar and energy storage, citywide actions, and energy efficiency initiatives. A summary of feedback from this event is available in Appendix E.

Tabling Events

City and VCREA staff hosted EAP focused booths at the annual Ventura EcoFest and Fourth of July Street Fair in 2018 and 2019. The booths attracted hundreds of community members with EAP-related games and prizes and provided a venue to discuss EAP strategies with residents.

Contractor Lunch

To vet some strategies with the local energy contractor community, the City hosted a lunch for local contractors that work in solar, energy storage, HVAC, EV infrastructure, and other relevant tradespeople. The event featured conversations with City staff from the Building and Safety and Environmental Sustainability Divisions, and a review of draft EAP strategies. About a dozen energy professionals attended the lunch. A summary of feedback from this event is available in Appendix E.



Photo by VCREA Staff

Environmental Sustainability Division Social Media Outreach

The City utilized its Facebook and e-newsletter to publicize events relating to EAP planning efforts. Staff published articles online and posted about the Community Energy Workshop, Community Engagement Surveys, tabling events, and a free energy audit and benchmarking program for commercial businesses known as kWh Countdown.

kWh Countdown Business Engagement

The kWh Countdown program, funded through the Local Government Challenge grant, served to support EAP development by informing the development of the business-focused energy strategies. The program, which began in July 2018, provided businesses with free energy benchmarking and ASHRAE Level II audits to help business owners analyze their energy usage, save money on utility bills, identify funding sources for energy upgrades, and prioritize energy efficiency projects. In addition, effective June 2018, state law (AB 802) requires buildings larger than 50,000 square feet to conduct benchmarking and disclose their energy usage. kWh Countdown helped businesses fulfill these requirements at no cost.

The Project Team, in partnership with the City's Green Business Program, recruited businesses, and reviewed energy audits. Working closely with businesses to analyze their energy usage provided the Project Team insight into the needs and challenges of business owners trying to effectively reduce utility bills and increase overall performance, health, and safety of their business facility.



ASHRAE Level II Audit

These audits analyze how a whole building is functioning and identify projects that will provide the greatest energy reduction at the best return on investment. The audit involves interviews with facility staff, review of utility bills, and walkthrough of the facility. Data is compiled and used to complete a report describing energy efficiency measures and potential capital improvements with detailed energy calculations and financial analysis of proposed measures.

THE CITY OF VENTURA
ROUND 1 COMMUNITY ENGAGEMENT
SURVEY RESULTS AND ANALYSIS

The City of Ventura is developing an Energy Action Plan (EAP). This plan is designed to help the Ventura Community lower harmful greenhouse gas emissions. Through strategic policies and programs, the EAP aims to increase energy efficiency and local renewable energy generation. This plan benefits multiple sectors, promotes reliable energy to your home or business, and builds resilience so the community can bounce back in the event of a natural disaster.



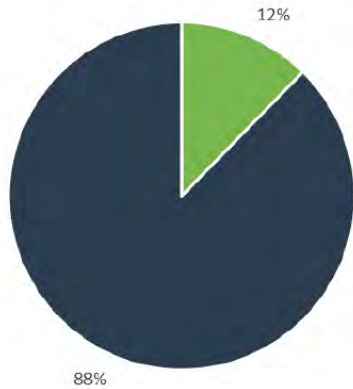
To ensure that this plan empowers and supports every Ventura community member, the EAP team has been working with residents to fully gauge how to best support and empower a resilient and sustainable Ventura for years to come. You've voiced your needs and shared your valuable experience, here are the results.

KEY TAKEAWAYS

- 316 residents shared their insight and values by responding to the survey.
- 88% of the respondents feel it's important for the City to support a clean energy economy, public health, and resilience.
- 96% of the 45 student respondents feel that it is important for their school to run on renewable energy.

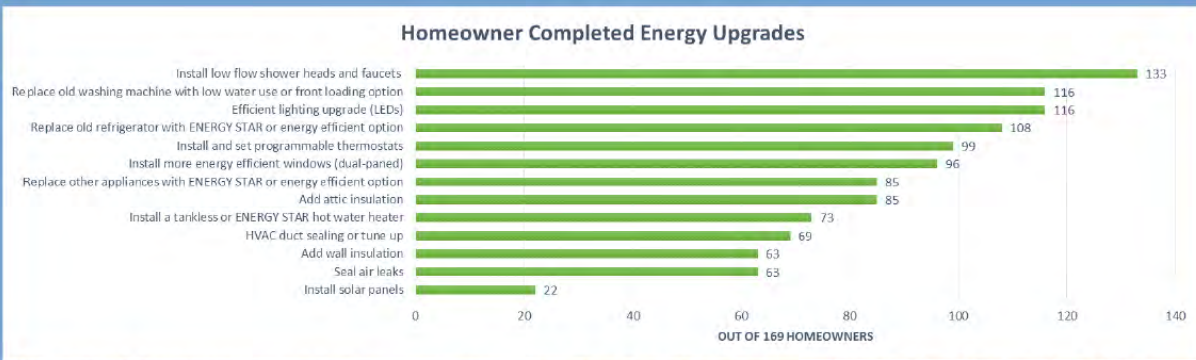
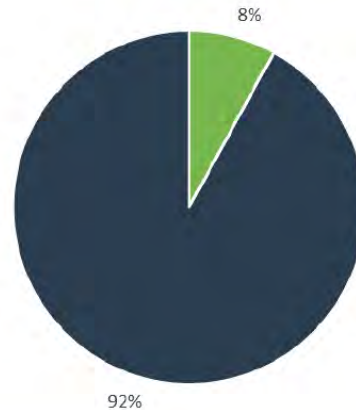
RESIDENTIAL SURVEY HIGHLIGHTS

HOMEOWNERS AND RENTERS PROVIDED VALUABLE INSIGHT TO HELP INFORM STRATEGIES THAT WILL INCREASE ENERGY EFFICIENCY AND LOCAL RENEWABLE ENERGY GENERATION.

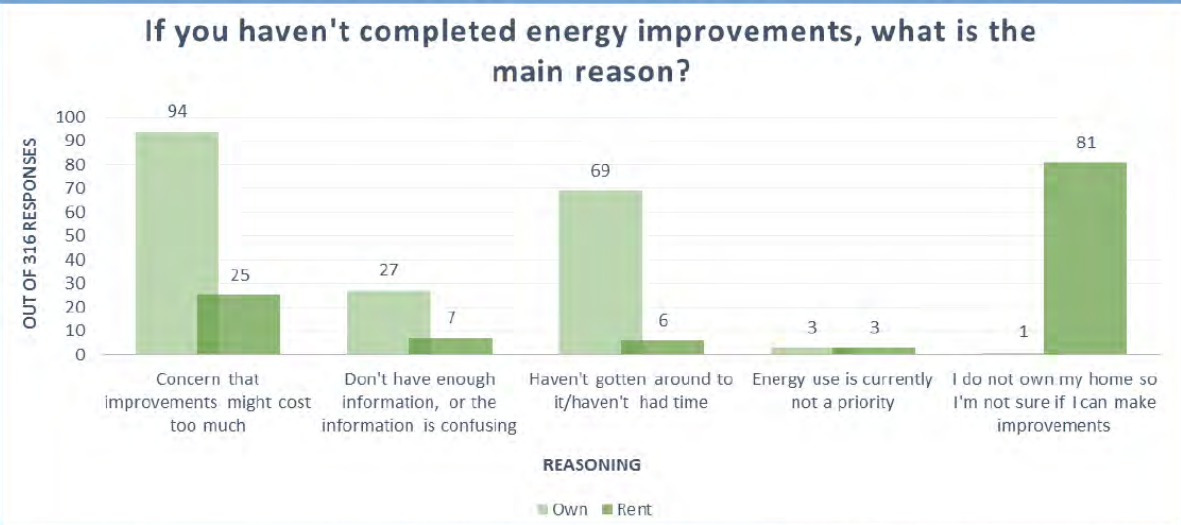


88% OF RESPONDENTS FEEL THE CITY SHOULD BE PROACTIVE IN THINKING AND PLANNING FOR CLIMATE CHANGE IMPACTS.

92% OF RESPONDENTS WOULD LIKE TO SEE THE CITY TAKE STEPS TO STRENGTHEN ENERGY RELIABILITY AND SAFETY IN THE EVENT OF AN OUTAGE OR NATURAL DISASTER.



We asked homeowners what energy upgrades they've already completed. This helps the EAP team identify hard-to-complete upgrades and strategize how to help homeowners make these improvements in a cost-effective way.

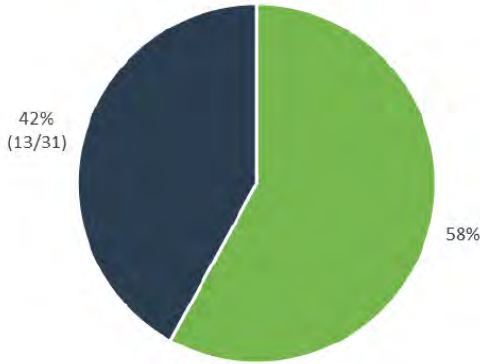


We asked homeowners and renters the reasons they have not been able to make some energy efficiency upgrades. This helps identify gaps in energy efficiency support. The EAP will address these gaps with strategies that help homeowners and renters.

COMMERCIAL SURVEY HIGHLIGHTS

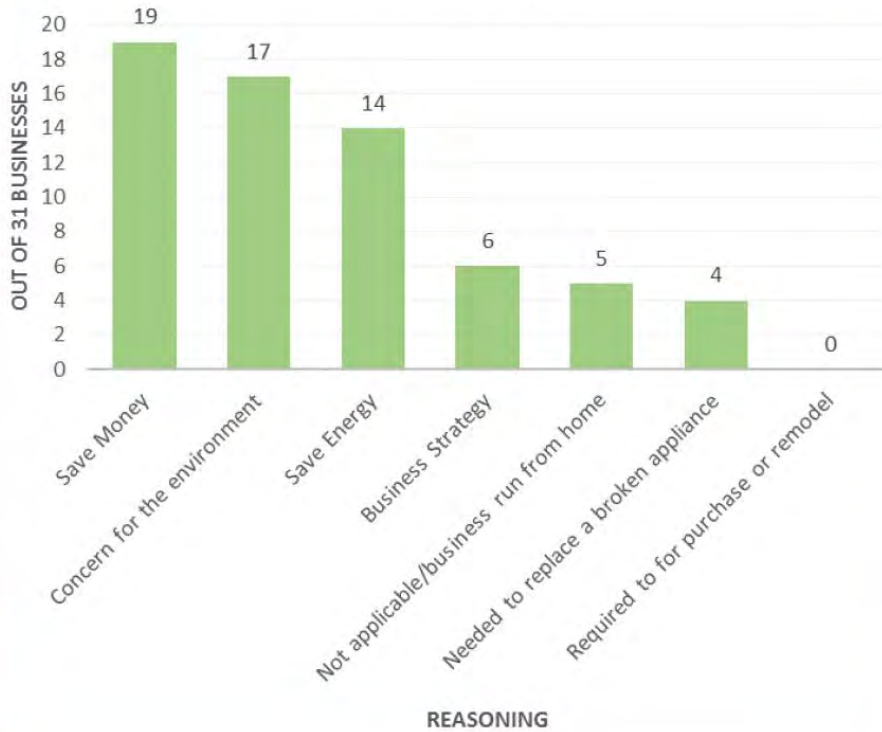
BUSINESS OWNERS AND MANAGERS SHARED THEIR EXPERIENCES TO INFORM STRATEGIES THAT WILL HELP THEM UTILIZE ENERGY EFFICIENCY UPGRADES TO SAVE MONEY AND REDUCE THEIR IMPACT.

42% OF BUSINESS OWNERS STATED THAT THEY HAVE NOT MADE ENERGY UPGRADES BECAUSE THEY RENT THEIR FACILITY AND ARE NOT SURE IF THEY CAN MAKE IMPROVEMENTS.



This highlights the necessity for commercial owner-tenant strategies that support energy efficiency improvements.

If you have completed energy improvements, what was your main motivation?



We asked business owners and managers the reasons they have completed energy efficiency upgrades. Identifying the main motivation helps the EAP team cater strategies to the needs of business owners and managers.

PHOTOGRAPHER:
CHRISTOPHER MUEGNIOT



**"THIS IS A FANTASTIC PROACTIVE WAY TO START ADDRESSING WHAT WE CAN DO AS A COMMUNITY, ESPECIALLY AFTER THE THOMAS FIRE. HEARING THESE WILD FIRES GROWING IN INTENSITY DUE TO CLIMATE CHANGE IS A SCARY THING! WAY TO GO VENTURA IN STARTING THIS IMPORTANT CONVERSATION."
-VENTURA RESIDENT**



Round 2 Community Engagement Report

CITY OF VENTURA

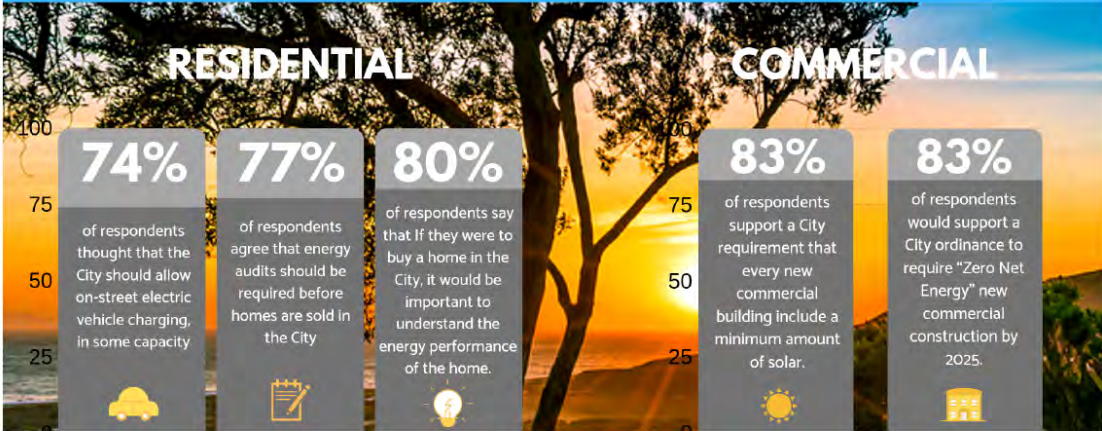
ROUND 2 COMMUNITY ENGAGEMENT

SURVEY RESULTS AND ANALYSIS

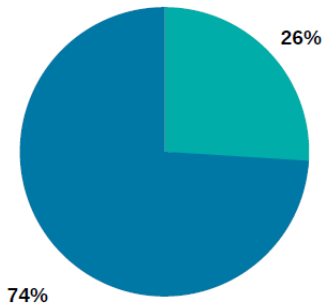
In Round 2 of our community engagement, we asked residents about which energy policies and incentives the City should consider for residential and commercial buildings. We also asked them to identify priorities for increasing electric vehicle infrastructure and electric public transportation. In total, 89 people participated in the outreach survey. The valuable feedback we received from the community will help us understand how to best support sustainable energy use and zero-emissions transportation choices in the City of Ventura.



HIGHLIGHTS FROM RESPONDENTS

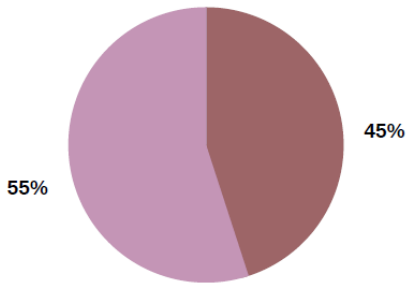
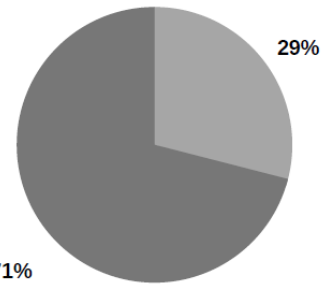


Ventura residents showed strong support for increasing the number of electric vehicle charging stations and access to electric public transportation in the city.



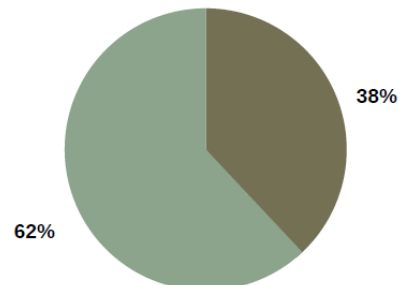
74% (66 people) think the City should allow on-street EV charging, in some capacity.

71% (63 people) feel it is important for the bus systems (Gold Coast Transit and VCTC) to transition to all-electric buses.



55% (49 people) feel there are currently not enough public electric vehicle charging stations in the City for them to consider driving an electric vehicle.

62% (55 people) feel the City should require the installation of electric vehicle charging stations at all new commercial developments.



We asked residents which energy efficiency policies the City should consider for residential properties.

77% (68 people) agree that energy audits should be required before homes are sold in the City; however, 56% (38 people) of those respondents *only* support the policy if the energy audits are free.

55%
(49 people) think the City should require “cool roof” materials in residential re-roof projects.



72%
(64 people) support the City requiring that all rental units upgrade interior lighting to LED when there are vacancies.

80% (71 people) say that, if they were to buy a home in the City, it would be important to understand the energy performance of the home. Residents were unsure; however, about what type of policy would effectively support an energy efficiency standard at the time of a home's sale. Only 42% (37 people) think homes that receive poor energy scores on audits should be required to complete energy upgrades before they are sold. Concerns around who bears the cost of upgrades and whether such policies would affect the affordability of housing in the City were cited as main concerns.



When asked about which energy policies the City should enact for commercial buildings, respondents told us this:

66%

59 people

felt the City should offer a loan program to help commercial properties upgrade their equipment to improve the efficiency of their operations.

83%

74 people

support a City requirement that every new commercial building include a minimum amount of solar.

83%

74 people

would support a City ordinance to require “Zero Net Energy” new commercial construction by 2025.



“We should go all out as much as possible to be an environmentally friendly city, and to model these sustainable practices for other cities.”

- Ventura Resident



Community
Environmental
Council



Contractor Lunch, December 17, 2019

Concepts for review from draft EAP, City of Ventura

Contractor feedback to draft EAP strategies is captured below as quotes or ratings for various ideas (Ratings for ideas are captured as “X” votes following numbers)

Residential Solar/Storage

<p>The City will review and revise City building codes, design guidelines, and zoning ordinances to remove barriers to renewable energy and battery storage projects.</p>
<p>“Check out Antelope Valley’s municipal bus electrification and battery storage project. Also, Lancaster is home to a large electric bus factory. School buses can be used to power schools during outages.”</p>
<p>“Battery storage – Suggest standardizing permits and implementing online permits. Online permitting of battery storage could result in quantification of for GHG emission reductions. “Zip Bar foam built into panels – plaster product that becomes structural component – does not pass City plan check (e.g., not allowed) for residential construction because it does not have an ICC number.”</p>
<p>The City will develop or expand on existing solar programs, such as Solarize, to provide resources to assist in the installation of residential (multi-family and single-family) solar and storage projects. Resources provided can be in the form of education, planning, contacting installers, and/or financial incentives.</p>
<p>POOR</p> <p>1</p> <p>2</p> <p>3</p> <p>4-X</p> <p>5- XXX</p> <p>GREAT</p> <p>“Solarize programs are great. Bringing more customers/case studies to the workshops would help facilitate adoption. Incentives from the City would be great and alleviate the pressure of installers to lower their costs.”</p> <p>“The City of Ventura should take the initiative to Solarize public housing buildings and to establish vehicle charging stations so residents can be encouraged to purchase Evs. These charging stations could be covered with solar roofs”</p>

Commercial Solar/Storage

<p>The City will Identify and work to remove barriers to commercial on-site renewable energy generation and energy storage by reviewing and exploring revision opportunities in development codes, design guidelines, zoning ordinances, and general plan policy.</p>
<p>“More education and focus are needed on micro-grids. Resiliency!”</p> <p>“The City should work with Amber Kinetics to establish codes for establishing flywheel storage installations”</p>
<p>The City will actively support local commercial pilot projects encompassing thermal energy storage, battery storage, customer side/dispatchable storage, backup power at critical facilities, and microgrid development.</p>
<p>POOR</p> <p>1</p> <p>2 X (“This grade is based on the fact that there doesn’t appear to be any movement on micro-grid pilots”)</p> <p>3</p> <p>4</p> <p>5- XX</p> <p>GREAT</p> <p>“I can help you include flywheel energy storage in this plan.”</p>
<p>The City will research the development of a Solar Cooperative Purchasing Program (e.g., Solarize for businesses) to reduce renewable energy development costs.</p>
<p>POOR</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5- XXX</p> <p>GREAT</p> <p>“City should look for incentives or dollars to provide the Solarize program.”</p> <p>“The City of Ventura should Solarize all public housing and make a large purchase of solar equipment and vehicle charging stations to economize”</p>

Electric Vehicles

The City will review internal permitting policies and permit prices for public and private EV charger installations and modify policies and prices to reflect best practices
<p>“Great”</p> <p>“The City should establish partially solar-powered charging station using battery storage as a demonstration project”</p>
The City will streamline permitting for residential and non-residential EV charging stations as required under California law.
<p>“Yes, Amen.”</p> <p>“Great”</p> <p>“EV permit fees – multiple permit fees add up and are expensive. Suggest Bear Valley Electrical Service has a Destination Make-Ready Rebate Pilot that provides installation rebates for up to 50 Level 2 chargers to commercial customers in addition to providing EV-TOU rate. Program combines EV permits fee with other electrical permit fees.”</p> <p>https://www.bves.com/media/managed/approvedadviceletters3/355_E_BVES_Transportation_Electrification_Pilot_Programs_Memorandum_Acco_.pdf</p>
What else should the City do to encourage EV adoption?
<p>“Promote electric bikes! Electric bikes help educate market about charging.”</p> <p>“Establish battery or flywheel substations and establish mini/neighborhood utilities.”</p> <p>“Some form of monetary incentive”</p>

Other Green Building

The City will amend City Building Code to recommend cool roof materials compliant with CALGreen Code for new construction and significant re-roofing projects.
<p>POOR</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5- XXXX</p> <p>GREAT</p> <p>“Public housing could use cool roof technology as air conditioners are prohibited in public housing units”</p>
The City will subsidize permit fees and provide front-of-line permitting for building projects pursuing LEED or other green building certifications.
POOR

<p>1</p> <p>2</p> <p>3</p> <p>4-XX</p> <p>5-XX</p> <p>GREAT</p>
<p>The City will research barriers to electrification of cooking, heating, and cooling in new and existing homes, and update City permitting practices to streamline electrification.</p>
<p>“City-run senior housing residents require a way to cool their units in the summer months as they are prohibited from using standard window mounted AC units”</p> <p>“Heat pumps – there is not an appetite for heat pumps, usually only homes without gas lines request heat pumps. Pumps can be expensive and loud if installed on the side of the house. Suggest installing heat pumps during whole house system upgrades and incentivizing heat pumps. Suggest miniplates as an option.”</p> <p>“Lack of incentives – CPA is looking at DER pilot program with incentives as well as Local Strategic Plan incentives for electrification and reach codes.”</p>
<p>What else should the City do to increase Green Building OR energy efficiency OR electrification in existing buildings?</p> <p>“Monetary incentive or reduction in permitting timelines”</p> <p>“Oversized AC units – many homes do not need big systems. Suggest contractors help address problems with oversized systems by advising to install appropriately sized systems.”</p> <p>“Incentivize Architects and Realtors to educate.”</p>

CARP Engagement Summaries

The following are summaries of the community engagement conducted to inform the development of the CARP, including:

- Community Survey on Natural Hazards and Climate Change
- Community Survey on Greenhouse Gas Reduction
- Open House series
- CAUSE focus groups

**Community Survey on Natural
Hazards and Climate Change:
Summary of Results**
November 2021



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Survey Overview

The City of Ventura is in the process of creating a Climate Action and Resilience Plan (CARP). This exciting initiative is a roadmap for how the community will reduce greenhouse gas emissions and prepare for the potential impacts of natural hazards and climate change on public health, infrastructure, ecosystems, and our economy.

The City launched a Community Survey on Natural Disasters and Climate Change (survey), which was open from August 2021 through mid-September 2021. The purpose of this survey was to gather information about community members' experiences with recent natural disasters, preparation for possible future natural disasters, and knowledge about climate change.

The survey was made available in both English and Spanish, and a total of 854 unique responses were recorded. This document summarizes the combined responses of both English- and Spanish-language participants.

Survey Methodology and Participation

The survey was developed by City of Ventura staff and the General Plan Update consultant team. In developing the survey, the team considered:

- **Understanding existing hazard preparedness and experiences with recent disasters:** The survey asks specifically about preparedness for large-scale disasters or emergencies, including earthquakes, fires, storms, or blackouts, as well as experiences with recent disasters or emergencies like the Thomas Fire, mudslides, or the 2018 heat wave.
- **Similar Surveys or Polls:** The project team reviewed similar community surveys from other jurisdictions and statistically significant findings from other polls about the topics covered in the survey. Several questions in the survey match questions found in these external tools.
- **Creating a Flexible and Useful Tool to Maximize Engagement:** The survey, in English and Spanish, was developed to measure opinions across all the above areas of interest.

The final survey instruments are attached in the Appendix A and B. Each version of the tool is organized into five sections: demographics, hazard preparedness, experiences with recent disasters, and climate change.

Sampling

This survey was completed by a non-randomized sample (often called a convenience sample) of people who live, work, go to school, or spend time in the City of Ventura.

Using a non-random sample for a survey is commonly used to understand the perspectives and experiences of a group of people ("population"). Data from non-random samples can show the range of views and experiences within a population and be used as a reference point. Data from non-random samples are typically considered more reliable (i.e., more generalizable to the larger population) when they are "triangulated" or validated through additional sources. This survey data will be considered alongside data from focus groups, community meetings, and other public input, with all this data being used to inform decision-making.

Distribution Methods

The survey was available to take online and was produced using the SurveyMonkey platform. The project team developed several outreach graphics and materials, such as social media images and flyers, which were distributed through various methods, including but not limited to:

- **Internet-Based Outreach:** City's GovDelivery listservs (All subscribers; General Plan Update subscribers); GPU Project Website; City's social media accounts (Twitter, Facebook, Instagram, etc.).
- **In-Person Outreach:** Door-to-door canvassing; outreach at pop-up events at Ventura Coast Brewing Company and local taco festival.

The survey and outreach materials were produced in both English and Spanish. To encourage the participation of typically underrepresented groups, the non-profit organization Central Coast Alliance United for A Sustainable Economy (CAUSE) conducted targeted outreach in heavily Hispanic/Latinx, multi-family neighborhoods on Ventura's Westside. CAUSE staff canvassed door-to-door and recorded survey responses with Spanish-speaking residents in person on weekday evenings. When residents did not answer, CAUSE staff left behind flyers with information about how to access the survey.

Demographic and Socioeconomic Characteristics of Survey Participants

Participants were asked several demographic questions during the survey. These questions are intended to help City staff ascertain whether survey respondents generally matched the profile of Ventura and/or whether any groups were over- or underrepresented. Key takeaways are summarized below:

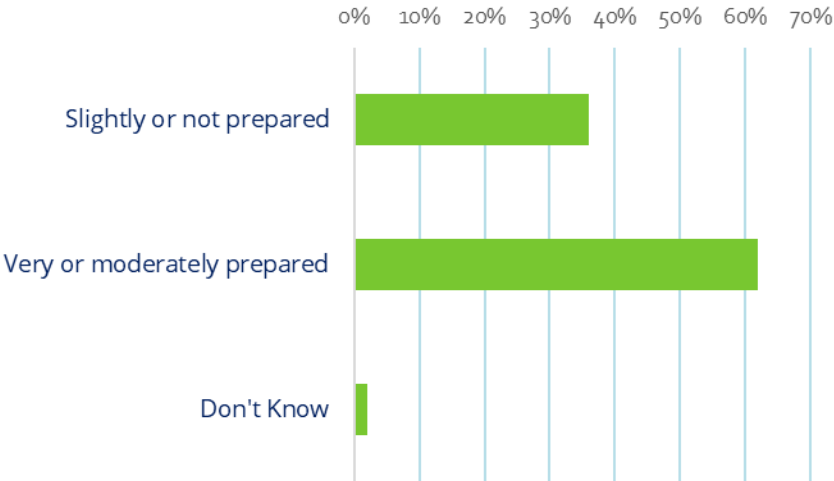
- Almost all respondents (90 percent) are residents of the City of Ventura.
- Of all residents who responded, almost half (49 percent) have lived in Ventura for 21 years or more. Residents of one year or less comprised less than four percent.
- Homeowners made up 63 percent of the respondents, and renters comprised 35 percent of the responses. The survey results overrepresented homeowners (54 percent of the city population) compared to rents (46 percent of the city population).
- Two-thirds of survey respondents identified as Non-Hispanic White or Caucasian (compared to the citywide average of 55 percent) Hispanic and Latino individuals were underrepresented (28 percent compared to the citywide average of 36 percent).
- White respondents are more likely to be homeowners (69 percent), whereas Black, Indigenous and people of color (BIPOC) respondents are more likely to be renters (56 percent).
- People aged 60 and above comprised approximately one-third (31 percent) of respondents.
- The response for most neighborhoods was proportionate to residential population size. The response rate, overrepresented residents from the Westside / The Avenue, comprising 32 percent of all respondents even though it contains 13 percent of the city's residents.

Disaster Preparedness

Survey participants were asked questions about preparedness¹ for large-scale disasters or emergencies that would leave their household isolated in their home or require their household to leave their home for at least 3 days. Natural disasters and emergencies may include earthquakes, fires, storms, or blackouts, among others.

Nearly two-thirds of survey respondents said their household was prepared for a large-scale disaster or emergency (62 percent). Over a third of respondents (36 percent), however, said their households were not too prepared at all or not at all prepared. Significant differences in feelings of preparedness exist between groups in the city. Homeowners (72 percent) and White respondents (70 percent) are more likely to feel prepared, whereas half of renters (52 percent) and BIPOC respondents (48 percent) do not feel prepared for a disaster.

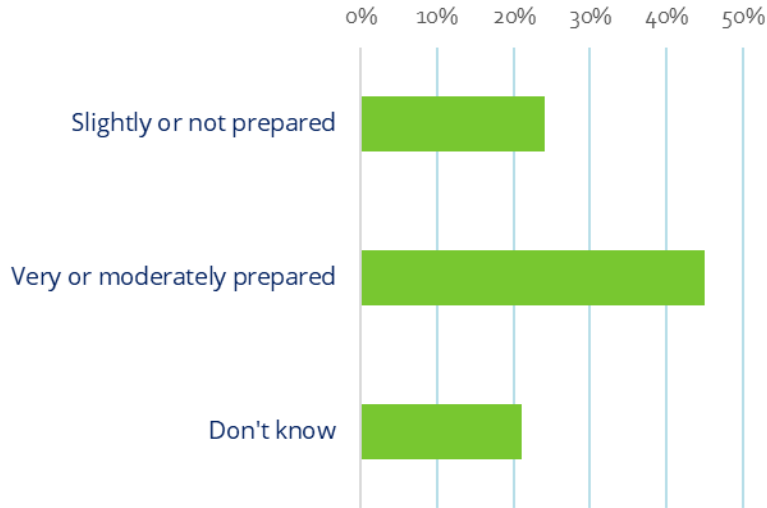
Figure 1: Household Preparedness for a Large-Scale Disaster or Emergency



¹ Preparedness refers to the steps you take to make sure you are safe before, during, and after a disaster or emergency.

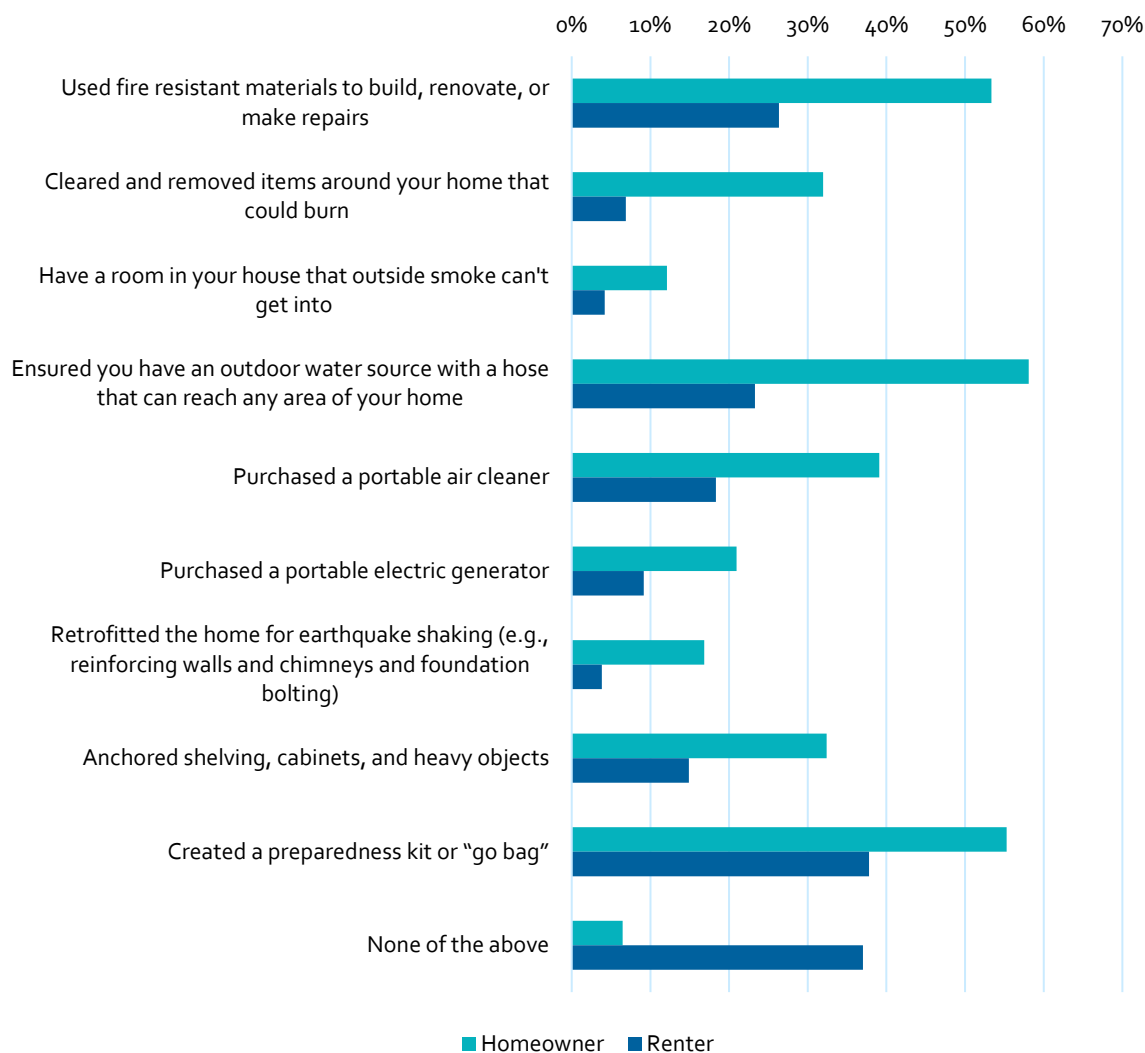
About half of survey respondents (45 percent) said the City of Ventura government is very or somewhat prepared to deal with large-scale emergencies and natural disasters. Approximately one-third said that the City government was not too prepared or not prepared, and 21 percent said they did not know. Responses varied little across different groups in the city.

Figure 2: City of Ventura Government Preparedness for a Large-Scale Disaster



Homeowners were more likely than renters to have taken steps around their homes to prepare for a possible disaster (94 percent to 63 percent). Over half of homeowners used fire resistant materials (53 percent), ensured they have an outdoor water source with a hose (58 percent), created a “go bag” (55 percent), and cleared items around their homes that could burn (32 percent). The most common action taken by renters was creating a “go bag” (38 percent).² For those who responded “other,” a common theme was that people have a supply of food and water and/or have collected important items (essentially a preparedness kit).

Figure 3: Steps Taken to Prepare for a Disaster

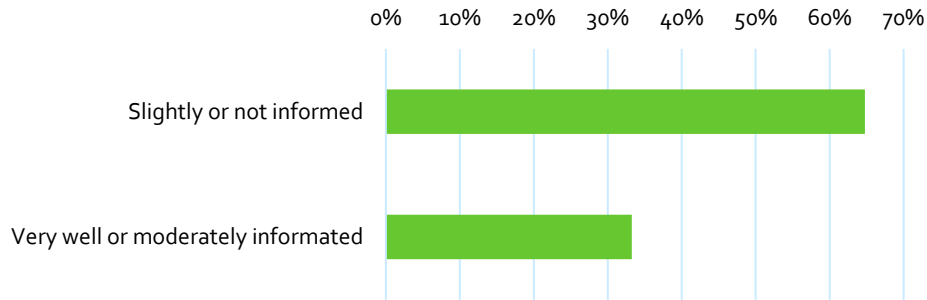


² Many of the survey questions listed would not be actions taken by an individual renter, but instead by a landlord or property owner. In some cases, these actions may have been taken but not be known by the renter.

Evacuation Routes and Planning

Respondents were asked a series of questions regarding their knowledge about evacuation routes and planning. Overall, two-thirds of respondents said they were only slightly informed or not at all informed about evacuation routes for their neighborhood. Likewise, over two-thirds of respondents said they were very concerned or somewhat concerned about the adequacy of the evacuation routes and plans for their neighborhood. Responses varied little across different groups in the city.

Figure 4: Knowledge of Evacuation Routes and Plans in Your Neighborhood



Respondents also described their concerns about their neighborhood’s evacuation plan, with several key themes emerging as summarized in Table 1.

Table 1: Key Concerns about Evacuation Routes and Planning

Key Concerns	Count
Traffic, road congestion, freeway congestion and access	129
Lack of information: themselves or others not knowing the evacuation routes and/or plans	93
Only one or very few points of ingress and egress from their neighborhood	85
Chaos and confusion hindering evacuation	19
Lack of coordination from police and city leadership	12
Lack of access due to single lane and one-way roads	10
Traffic specifically in relation to housing and population growth	10

Insurance

Respondents were asked a series of questions about insurance. A large majority (78 percent) report having homeowners or renters’ insurance for their residence. A majority (69 percent) reported that they do not have a flood insurance policy from the National Flood Insurance Program or from a private insurance company.

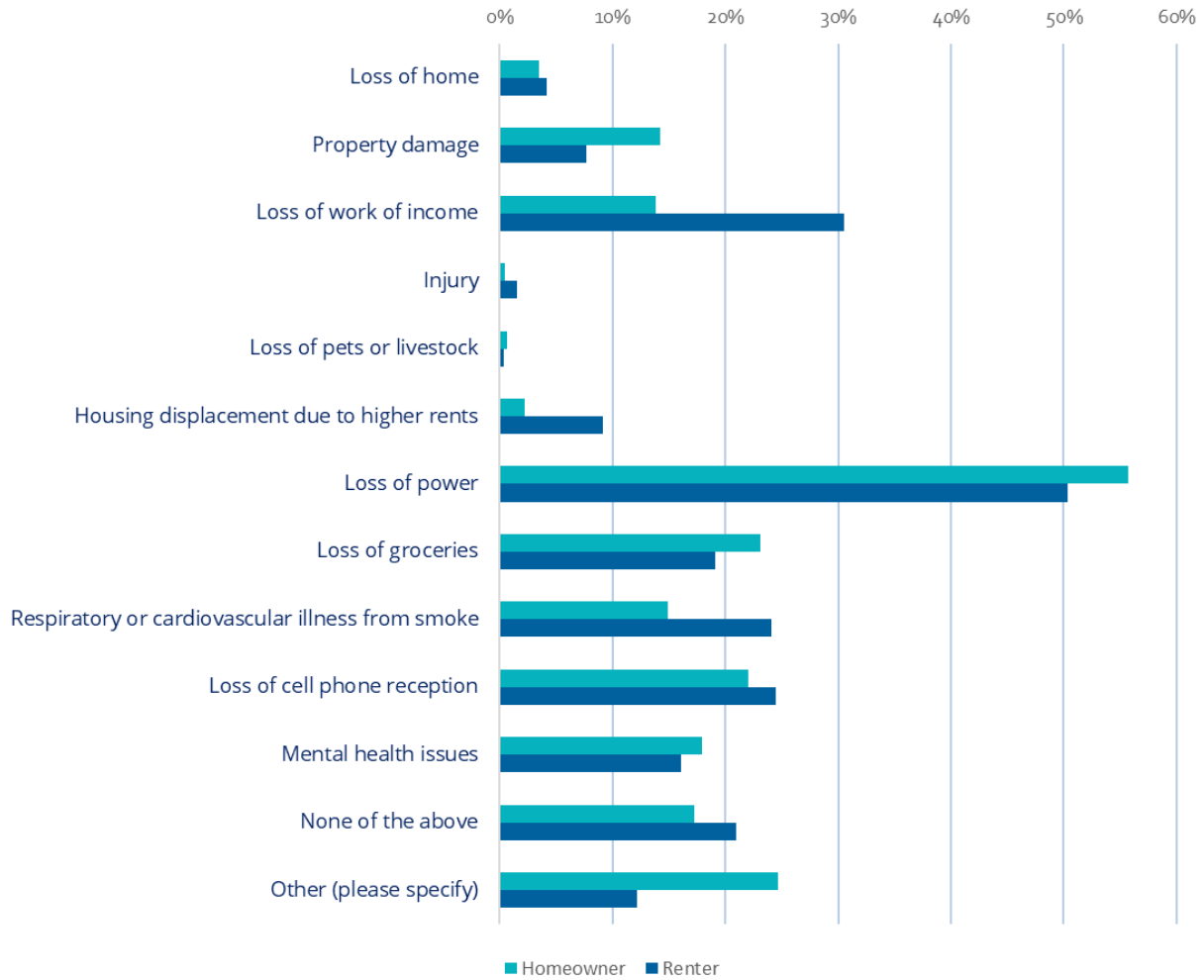
Experience with Recent Disasters

Almost three quarters of respondents have experienced disaster(s) and the other quarter have not. Some years that people reported experiencing disasters in an open-ended question include 1969, 1971, 1987, 1992, 1994, 1995 (Northridge Earthquake), 1997, 1998, and 2016. Of course, 2017 and 2018 were the top responses, as 72 percent of respondents reported experiencing the impacts of the Thomas Fire and/or the subsequent mudslides.

A majority of respondents (57 percent) reported losing power during the Thomas Fire and/or subsequent mudslides. Only a small percentage of respondents experienced losing their home, personal injury, and/or loss of pets or livestock. There are, however, differences when comparing homeowners and renters.

- Renters (who are typically lower income than homeowners) reported experiencing more impacts to their work or income. 31 percent of renters reported losing work or income due to the fire compared to only 14 percent of homeowners.
- A greater percentage of renters reported experiencing respiratory or cardiovascular illness from smoke (24 percent of renters compared to 15 percent of homeowners).
- Because they do not own their residence, renters are typically more susceptible to the impacts of housing cost increases. 9 percent of renters reported experiencing housing displacement compared to 2 percent of homeowners.

Figure 5: Impacts Experienced during the Thomas Fire and/or Subsequent Mudslides



If they selected other, respondents had the chance to elaborate on the impact they experienced. The open answers are coded according to key themes that emerged; many of the answers contained multiple themes.

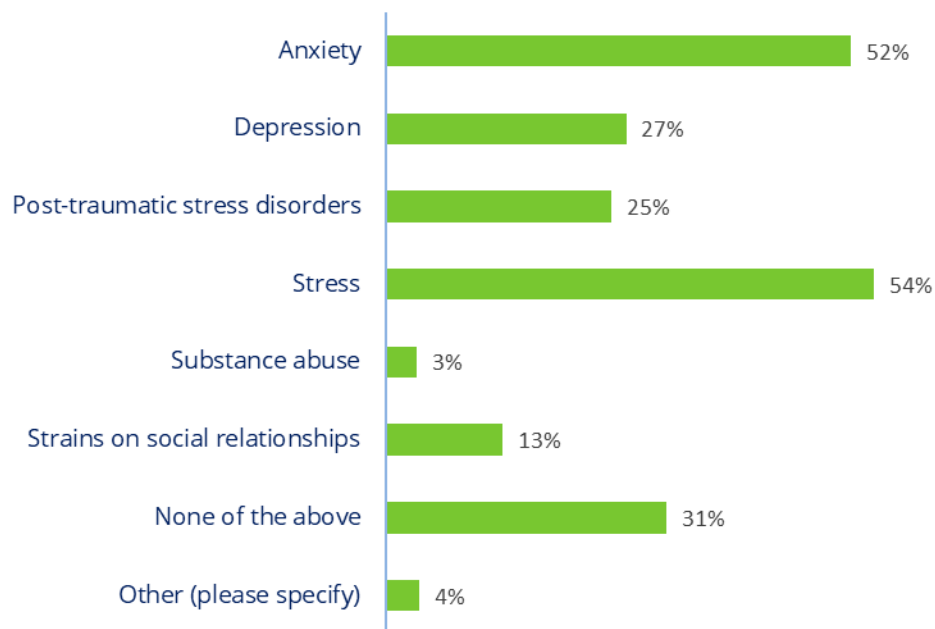
Table 2: Other Impacts Experienced during Thomas Fire and Subsequent Mudslides

Impacts	Count
Had to evacuate and/or was temporarily displaced from their home	59
Impacted by smoke, bad air quality, and ash	45
Experienced stress, trauma, or changes to their outlook on the future	15
Temporarily housed friends, family, or neighbors who had to evacuate or whose homes were damaged or destroyed	13
School closures	4

A majority of respondents reported that they or someone they knew experienced stress and anxiety (54 and 52 percent respectively) during and after the Thomas Fire. A quarter reported experiencing depression and post-traumatic stress disorders, while a third did not experience any mental health issues. Results were largely alike across groups in the city, except for the fact that a greater percentage of homeowners reported experiencing anxiety and stress than renters.

Respondents also had the chance to elaborate on their mental health experience. Though there were few entries, key themes that came up were hopelessness, stress, and existential worries. Of those who reported experiencing mental health issues, about half were able to access resources.

Figure 6: Mental Health Issues Experienced

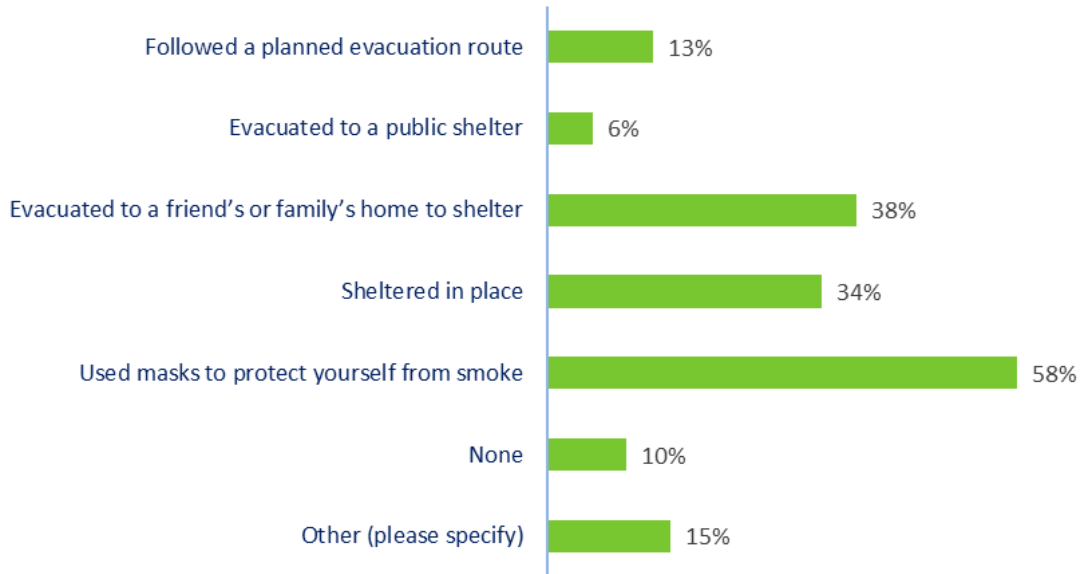


Overall, very few respondents reported receiving support from government agencies or nonprofit charities in the aftermath of the Thomas Fire. A slightly higher percentage of renters reported receiving support (13 percent compared to 5 percent of homeowners). The most-reported assistance was water and other supplies (e.g., masks, toiletries, and blankets), food or food stamps, and monetary donations. Respondents received help from organizations, such as the Red Cross, CAUSE, and their churches.

Safety Measures

To keep themselves safe during the Thomas Fire, a majority of respondents (58 percent) used masks to protect themselves from smoke. 38 percent evacuated to a friend or family’s home, and 34 percent sheltered in place. Relatively few respondents followed a planned evacuation route (13 percent) and/or evacuated to a public shelter (6 percent). Responses varied little across different groups in the city.

Figure 7: Safety Measures taken during the Thomas Fire and Subsequent Mudslides



Respondents also had the chance to elaborate on what they did to stay safe. The open answers are coded according to key themes that emerged; many of the answers contained multiple themes.

Table 3: Other Ways Respondents Stayed Safe

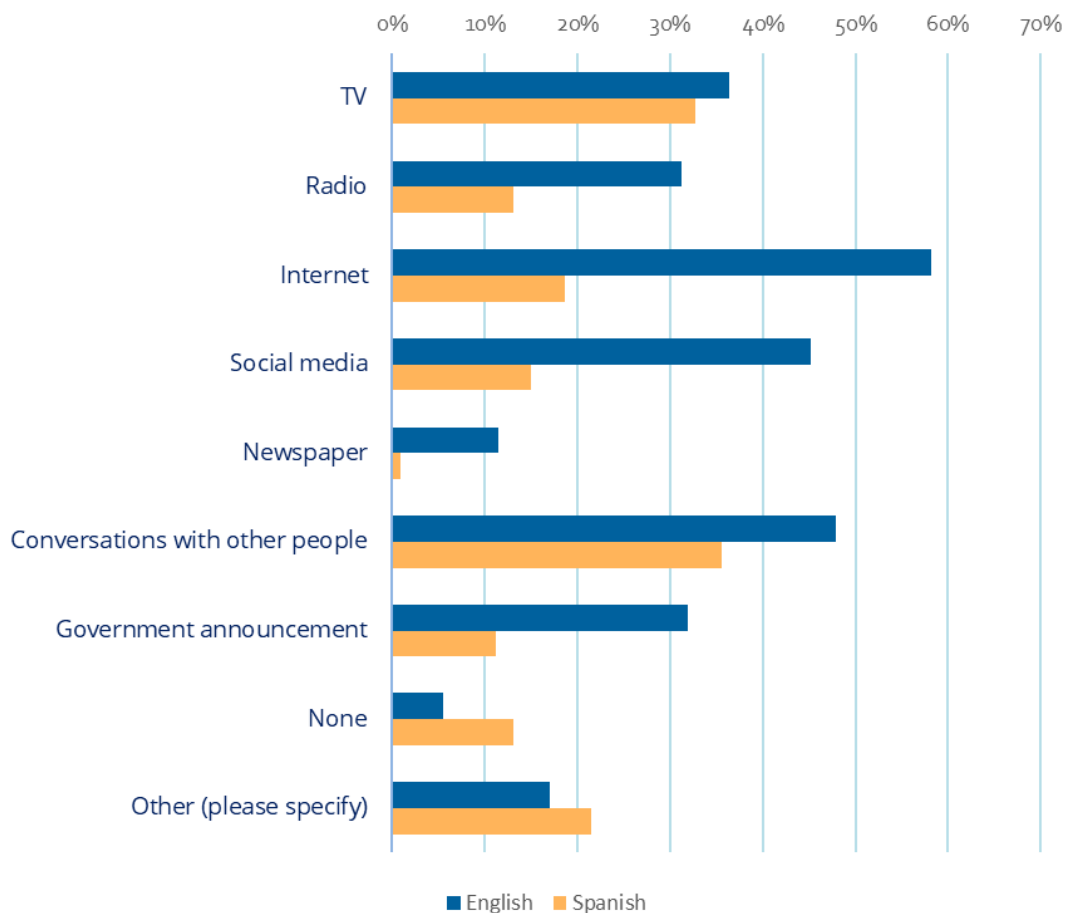
Safety Measures	Count
Evacuated to a hotel or motel, which many respondents described as extremely difficult to find one	19
N/A – were not around at the time of the fire	17
Had car packed with food, water, important items and ready to evacuate	15
Evacuated to businesses, the fairgrounds, or other parking lots and stayed in their cars	10
Purchased an air filter for their home	7

Sources of Information

Overall, the top sources of information during the Thomas Fire were the Internet (53 percent), conversations with other people (46 percent), and social media (41 percent). There were, however, differences in how English-language respondents and Spanish-language respondents answered this question.

- The main ways English-language respondents got information was from the Internet (58 percent), conversations with other people (48 percent), and social media (45 percent).
- The main ways Spanish-language respondents got information was from conversations with other people (36 percent) and TV (33 percent).
- Thirteen percent of Spanish-language respondents reported getting no information during the fires, as opposed to only 6 percent of English-language survey respondents.

Figure 8: Sources of Information Accessed during the Thomas Fire



Respondents also had the chance to elaborate on how they got information. The open answers are coded according to key themes that emerged; a few of the themes overlap with the answer options that were provided.

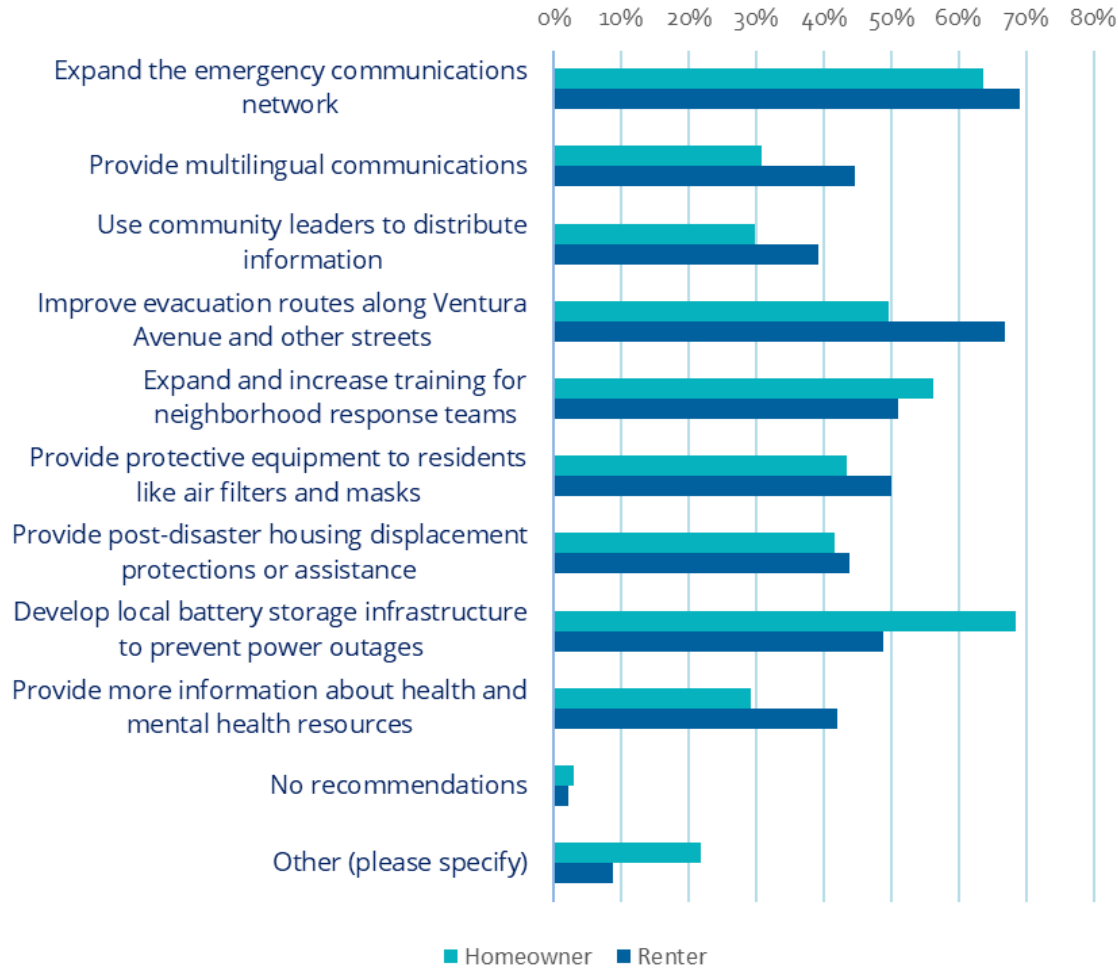
Table 4: Other Sources of Information

Source of Information	Count
Saw the fire firsthand before any other information	30
Word of mouth: conversations with friends, family, and neighbors	20
Phone alert / VC Alert	17
Heard police and/or fire department bullhorns or sirens telling them to evacuate	11

Respondents' top choices for improving the City's disaster response and preparedness were expanding the emergency communications network and developing local battery storage infrastructure to prevent power outages. Answers varied across groups in the city.

- A higher percentage of renters want the City to improve evacuation routes and provide more information about mental health resources.
- Renters also chose providing multilingual communications, in line with the correlation between renters and BIPOC and non-English speaking populations in Ventura.

Figure 9: Ways to Improve the City’s Disaster Response



Respondents also had the chance to elaborate on how the City can improve disaster response. The open answers are coded according to key themes that emerged. Many of the answers contained multiple themes and a few of the themes overlap with the answer options that were provided.

Table 5: Other Improvements the City can Make to Improve Disaster Response

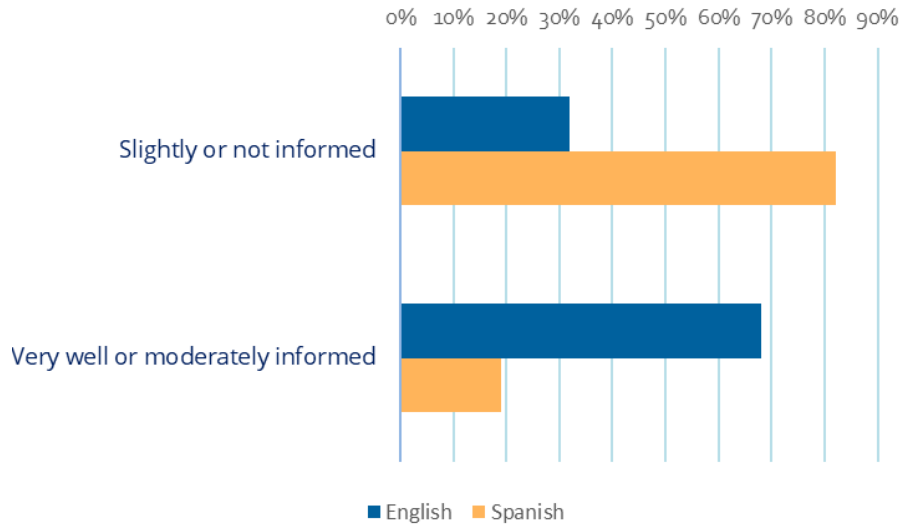
Improvements	Count
Ensure there is adequate water supply, equipment, and power for firefighting	34
Provide better information to the public about evacuation routes and training for disaster	16
Improve warning systems and information channels used during disaster events	15
Secure water resources and systems generally	14
Limit building and growth in Ventura	7
Support the fire department with more resources and/or staff	6

Climate Change

A vast majority of respondents overall (84 percent) think the climate is changing, with little variation across different groups in the city. A vast majority of respondents (89 percent) consider themselves at least slightly informed about the impacts of climate change in Ventura. There were, however, major differences in how groups across the city responded.

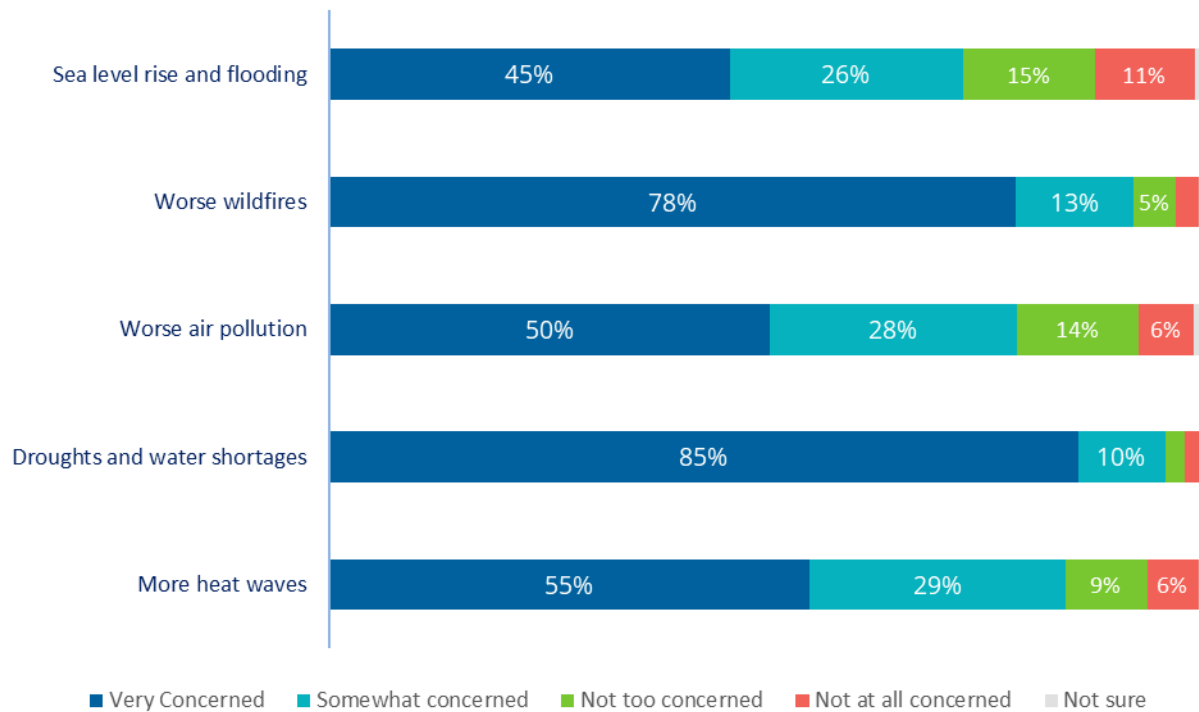
- Spanish-language respondents’ answers varied greatly from English-language respondents. Only 19 percent of Spanish-language respondents reported being very well or moderately informed, compared to 68 percent of English-language respondents.
- Likewise, only 41 percent of renters reported being very well or moderately informed, compared to 72 percent of homeowners.

Figure 10: Level of Understanding about Climate Change in Ventura



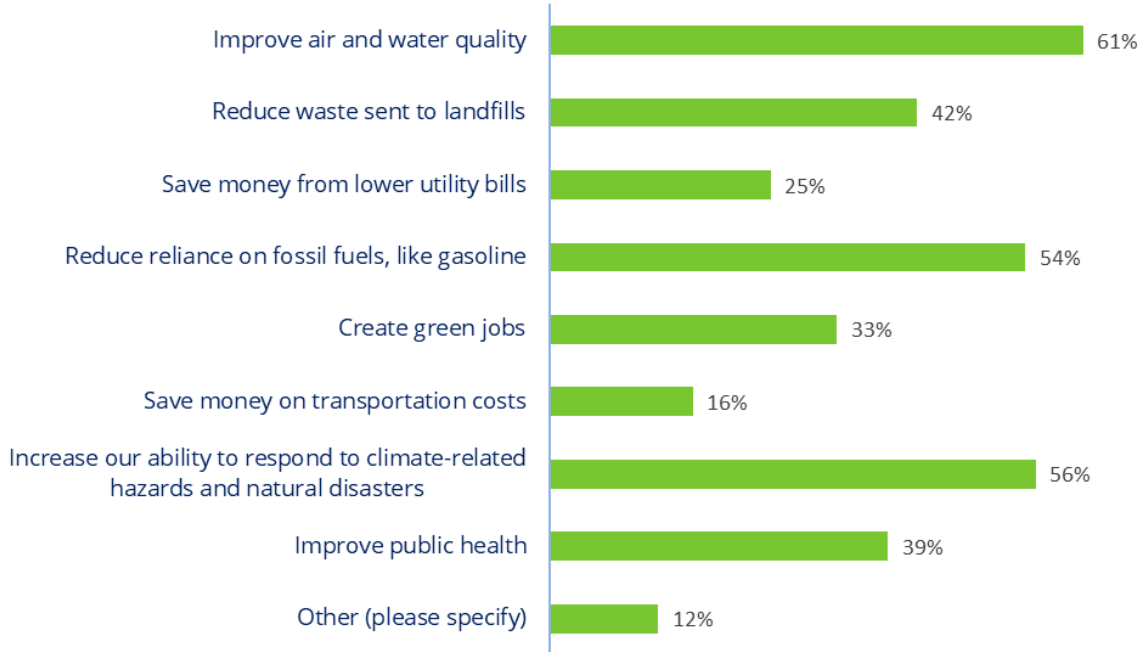
Survey respondents identified droughts and water shortages (95 percent of people reported being very or somewhat concerned) and worsening wildfires (92 percent of people reported being very or somewhat concerned) as the most pressing climate impacts. Sea level rise and flooding and worse air pollution are less of a concern to the respondents. Responses varied little across different groups in the city.

Figure 11: Most Concerning Climate Impacts



Respondents chose improving air and water quality as the most important co-benefit of natural hazard preparedness (chosen by 61 percent). Increasing our ability to respond to climate-related hazards and other natural disasters and reducing reliance on fossil fuels were also high priorities. Saving money from lower utility bills and saving money on transportation costs were lower priorities.

Table 12: Most Important Co-Benefits of Climate Preparedness



Respondents also had the opportunity to elaborate on other co-benefits of climate preparedness. The open answers are coded according to key themes that emerged, many of which had to do with water.

Table 6: Other Co-Benefits of Disaster Preparedness

Co-Benefit	Count
Stop building housing and limit population growth, which people saw as a strain on resources, putting them at risk in disasters, and negatively affecting their community fabric	17
Ensure there is a stable water supply	10
Conserve water and reduce water waste	6
Plant more trees and protect plants, wildlife, and natural habitat	6
Use desalination plants for water supply and expand the use of greywater	5

Appendix A: English Survey

Community Survey on Natural Disasters and Climate Change in the City of Ventura

Version: Web

Introduction

The City of Ventura is in the process of developing a Climate Action and Resilience Plan. This exciting initiative is a roadmap for how the community will reduce greenhouse gas emissions and prepare for the potential impacts of natural hazards and climate change on public health, infrastructure, ecosystems, and our economy.

This survey is designed to gather information about community members' opinions about experiences with recent natural disasters, preparation for possible future natural disasters, and the impacts of climate change. Your answers are anonymous, and you can also skip any questions. There are no right or wrong answers – we want to know about your perspectives and experiences.

Demographic

This section of this survey asks questions about your personal background. This information helps us understand who responded to the survey and who we still need to talk with in our community.

1. Do you live in the City of Ventura? (Check one)
 - a. Yes
 - b. No

2. How many years have you lived in the City of Ventura? (Check one)
 - a. N/A – I do not live in Ventura
 - b. Less than 1 year
 - c. 1-5 years
 - d. 6-10 years
 - e. 11-20 years
 - f. 21-40 years
 - g. 40 years or more

3. What is your age group? (Check one)
 - a. 17 years or younger
 - b. 18-29 years
 - c. 30-39 years
 - d. 40-49 years

- e. 50-59 years
 - f. 60-69 years
 - g. 70 years or older
4. With which race or ethnic group(s) do you most identify? (select all that apply)
- a. Asian or Asian American
 - b. Black or African American
 - c. Hispanic or Latino
 - d. Central and South American Indigenous
 - e. Native American or Alaska Native
 - f. Native Hawaiian or other Pacific Islander
 - g. White or Caucasian
 - h. Two or more races
 - i. Another race/ethnicity (please specify)
5. What gender do you identify with? (Select all that apply)
- a. Male
 - b. Female
 - c. Non-Binary
 - d. Transgender
 - e. Gender Non-Conforming
 - f. Other (please specify)

Hazard Preparedness

The following section asks questions about preparedness for large-scale disasters or emergencies that would leave you isolated in your home or require you leave your home for at least 3 days. This might include natural disasters such as earthquakes, fires, storms, or blackouts. Preparedness refers to the steps you take to make sure you are safe before, during, and after a disaster or emergency.

6. How well prepared do you feel your household is to handle a large-scale disaster or emergency? (Check one)
- a. Very prepared
 - b. Somewhat prepared
 - c. Not too prepared at all
 - d. Not at all prepared
 - e. Don't know
7. How prepared do you think the Ventura city government is to deal with emergencies such as natural disasters? (Check one)
- a. Very prepared
 - b. Somewhat prepared
 - c. Not too prepared at all

- d. Not at all prepared
 - e. Don't Know
8. Are there steps you, your household, your landlord, or others have taken around your home to prepare for a possible disaster? (check as many as you want)
- a. Used fire resistant materials to build, renovate, or make repairs
 - b. Cleared and removed items around your home that could burn
 - c. Have a room in your house that outside smoke can't get into
 - d. Ensured you have an outdoor water source with a hose that can reach any area of your home
 - e. Purchased a portable air cleaner
 - f. Purchased a portable electric generator
 - g. Retrofitted the home for earthquake shaking (e.g., reinforcing walls and chimneys and foundation bolting)
 - h. Anchored shelving, cabinets, and heavy objects
 - i. Created a preparedness kit or "go bag"
 - j. None of the above
 - k. Other: _____
9. How well informed are you about the evacuation routes and plans for your neighborhood? (Check one)
- a. Not at all informed
 - b. Slightly informed
 - c. Moderately informed
 - d. Very well informed
 - e. Other: _____
10. How concerned are you about the adequacy of evacuation plans for your neighborhood? (Check one)
- a. Very concerned
 - b. Somewhat concerned
 - c. Not too concerned
 - d. Not at all concerned
 - e. Don't know
11. If you are concerned about the evacuation plans for your neighborhood, what are you concerned about? (Open ended)
12. Do you have homeowners or renters' insurance for your residence? (Check one)
- a. Yes
 - b. No
 - c. I don't know
 - d. Not applicable

13. Do you have a flood insurance policy from the National Flood Insurance Program or from a private insurance company? (Check one)

- a. Yes
- b. No
- c. I don't know
- d. Not applicable

Experiences with Recent Disasters

The following sections asks questions about your experiences with recent disasters or emergencies. This might include events like the Thomas Fire, mudslides, or the 2018 heat wave.

14. Have you or your family ever experienced the impacts of a disaster? (Check one)

- a. Yes
- b. No
- c. I don't know

15. In what year did you experience the disaster?

- a. Year: _____

16. Did you experience impacts from the Thomas Fire and/or subsequent mudslides?

(Check one)

- a. Yes
- b. No
- c. I don't know

17. What impacts from the Thomas Fire and/or subsequent mudslides did you experience?

(check as many as you want)

- a. Loss of home
- b. Property damage
- c. Loss of work or income
- d. Injury
- e. Loss of pets or livestock
- f. Housing displacement due to higher rents
- g. Loss of power
- h. Loss of groceries
- i. Respiratory or cardiovascular illness from smoke
- j. Loss of cell phone reception
- k. Mental health issues
- l. None of the above
- m. Other: _____

18. During and after the Thomas Fire, did you or anyone you know experience any of the following mental health issues? (check as many as you want)
- a. Anxiety
 - b. Depression
 - c. Post-traumatic stress disorders
 - d. Stress
 - e. Substance abuse
 - f. Strains on social relationships
 - g. None of the above
 - h. Other: _____
19. If you experienced any of the above, were you able to access mental health resources? (Check one)
- a. Yes
 - b. No
 - c. I didn't experience mental health issues
20. During the Thomas Fire, what steps did you take to keep yourself safe? (check as many as you want)
- a. Followed a planned evacuation route
 - b. Evacuated to a public shelter
 - c. Evacuated to a friend's or family's home to shelter
 - d. Sheltered in place
 - e. Used masks to protect yourself from smoke
 - f. None
 - g. Other: ____
21. How did you get the information during the Thomas Fire? (check as many as you want)
- a. TV
 - b. Radio
 - c. Internet
 - d. Social media
 - e. Newspaper
 - f. Conversations with other people
 - g. Government announcement
 - h. None
 - i. Other: _____
22. Did you receive any support from government agencies or nonprofit charities?
- a. Yes
 - b. No
 - c. I don't know
23. If you received any support from government agencies or nonprofit charities, what type of support did you receive? (Open ended)

24. How can the City of Ventura and its partners improve disaster response and preparedness? (Check all that apply)
- a. Expand the emergency communications network
 - b. Provide multilingual communications
 - c. Use community leaders to distribute information
 - d. Improve evacuation routes along Ventura Avenue and other streets
 - e. Expand and increase training for neighborhood response teams
 - f. Provide protective equipment to residents like air filters and masks
 - g. Provide post-disaster housing displacement protections or assistance
 - h. Develop local battery storage infrastructure to prevent power outages
 - i. Provide more information about health and mental health resources
 - j. No recommendations
 - k. *Other:* _____

Climate Change

Recently, climate change has been getting some attention in the news. Climate change refers to the change in the usual weather found in a place. For example, this could be a change in how much rain a place usually gets in a year, or it could be a change in a place's usual temperature for a month or season.

25. Do you think the climate in Ventura is changing? (Check one)
- a. Yes
 - b. No
 - c. I don't know
26. How well informed are you about the effects of a changing climate in Ventura? (Check one)
- a. Not at all informed
 - b. Slightly informed
 - c. Moderately informed
 - d. Very well informed
27. How concerned are you about the each of the following possible impacts of climate change in Ventura? (Check one for each impact)
- a. More heat waves
 - b. Droughts and water shortages
 - c. Worse air pollution
 - d. Worse wildfires
 - e. Sea level rise and flooding
 - i. Very concerned

- ii. Somewhat concerned
- iii. Not too concerned
- iv. Not at all concerned
- v. Not Sure

28. Preparing for natural hazards can have many benefits. Which of the following are most important to you? *Choose up to three.*

- a. Improve air and water quality
- b. Reduce waste sent to landfills
- c. Save money from lower utility bills
- d. Reduce reliance on fossil fuels, like gasoline
- e. Create green jobs
- f. Save money on transportation costs
- g. Increase our ability to respond to climate-related hazards and natural disasters
- h. Improve public health
- i. Other: _____

Additional Demographics

In addition to the information provided at the beginning, this section of this survey asks additional questions about your personal background.

29. In which part of Ventura do you live? (Check one)

- a. Arundell / North Bank
- b. College Area
- c. Downtown
- d. Eastside / Juanamaria (North of Highway 126)
- e. Eastside / Saticoy (South of Highway 126)
- f. Foothills
- g. Marina
- h. Midtown
- i. Pierpont
- j. Southeast / Montalvo
- k. Thille
- l. Westside / The Avenue
- m. Other part of Ventura
- n. I do not live in Ventura

30. What best describes your annual household income level? (Check one)

- a. Less than \$20,000
- b. \$20,000 - \$44,999
- c. \$45,000 - \$84,999
- d. \$85,000 - \$99,999
- e. \$100,000 - \$199,999

- f. \$200,000 or more
31. Do you own or rent your residence? (Check one)
- a. Own
 - b. Rent
 - c. Other: _____
32. What best describes your housing unit type? (Check one)
- a. Accessory Dwelling Unit (Including granny flats, converted garages, etc.)
 - b. Apartment
 - c. Condo/townhouse
 - d. Duplex/Triplex
 - e. Mobile Home
 - f. Single-family house
 - g. Unhoused
 - h. Vehicle
 - i. Other: _____
33. Do you consider yourself a person with a disability? (Check one)
- a. Yes
 - b. No
 - c. I don't know
34. How do you connect with the City of Ventura for news and events?
- a. City website
 - b. City Council or Commission Meetings
 - c. Community Council Meetings
 - d. MyVentura or other digital City eNewsletters
 - e. Parks & Recreation guidebook (seasonal)
 - f. Facebook
 - g. Instagram
 - h. Twitter
 - i. Nextdoor
 - j. YouTube
 - k. Other
35. If you would to be notified about the following ongoing City planning projects, please check the box(es), and provide your email address.
- General Plan Update
- Active Transportation Plan
- E-mail address: _____

Introduction for the PHONE or IN PERSON

Hi, my name is ____ and I am a staff member / project team member working with the City of Ventura. We are doing a special survey about experiences with recent natural disasters, preparation for possible future natural disasters, and the impacts of climate change.

This survey should take about fifteen minutes. We appreciate your honest responses. If we ask a question that you do not want to answer, you don't need to do so. All your answers will be kept confidential. Any questions?

Appendix B: Spanish Survey

Encuesta comunitaria sobre desastres naturales y cambio climático en la ciudad de Ventura

Versión: Web

Introducción

La ciudad de Ventura está desarrollando un Plan de Acción y Resiliencia Climática. Esta interesante iniciativa es una hoja de ruta sobre cómo la comunidad reducirá las emisiones de gases de efecto invernadero y se preparará para los posibles impactos de los riesgos naturales y el cambio climático en la salud pública, las infraestructuras, los ecosistemas y nuestra economía.

Esta encuesta está diseñada para recabar información sobre las opiniones de los miembros de la comunidad acerca de las experiencias con los recientes desastres naturales, la preparación para posibles desastres naturales futuros y los impactos del cambio climático. Sus respuestas son anónimas y también puede omitir cualquier pregunta. No hay respuestas correctas o incorrectas – queremos conocer sus perspectivas y experiencias.

Demografía

En esta sección de la encuesta se hacen preguntas sobre sus datos personales. Esta información nos ayuda a entender quiénes han respondido a la encuesta y con quiénes tenemos que seguir conversando en nuestra comunidad.

1. ¿Vive usted en la ciudad de Ventura?
 - a. Sí
 - b. No

2. ¿Cuántos años lleva viviendo en la ciudad de Ventura?
 - a. N/A – No vivo en Ventura
 - b. Menos de 1 año
 - c. 1-5 años
 - d. 6-10 años
 - e. 11-20 años
 - f. 21-40 años
 - g. 40 años o más

3. ¿Cuál es su grupo de edad?
 - a. 17 años o menos
 - b. 18-29 años
 - c. 30-39 años

- d. 40-49 años
 - e. 50-59 años
 - f. 60-69 años
 - g. 70 años o más
4. ¿Con cuál raza o grupos étnicos se identifica más? (Seleccione todos los que correspondan)
- a. Asiático o Asiático Estadounidense
 - b. Negro o Afroamericano
 - c. Hispano o Latino
 - d. Indígenas de América Central y del Sur
 - e. Nativo Americano o Nativo de Alaska
 - f. Nativo de Hawái u otra Isla del Pacífico
 - g. Blanco o Caucásico
 - h. Dos o más razas
 - i. Otra raza/etnia (por favor, especifique)
5. ¿Con cuál género se identifica? (Seleccione todos los que correspondan)
- a. Masculino
 - b. Femenino
 - c. No binario
 - d. Transgénero
 - e. Género no conforme
 - f. Otro (por favor, especifique):

Preparación ante los riesgos

En la siguiente sección se plantean preguntas sobre la preparación para desastres o emergencias a gran escala que le dejarían aislado en su casa o le obligarían a abandonarla durante al menos 3 días. Esto puede incluir desastres naturales como terremotos, incendios, tormentas o apagones. La preparación se refiere a las medidas que toma para asegurarse de que está a salvo antes, durante y después de un desastre o emergencia.

6. ¿En qué medida considera que su hogar está preparado para hacer frente a un desastre o emergencia a gran escala? (Marque una)
- a. Muy preparado
 - b. Algo preparado
 - c. No está muy preparado
 - d. No está preparado en absoluto
 - e. No sabe
7. ¿En qué medida considera que el gobierno de la ciudad de Ventura está preparado para hacer frente a emergencias como los desastres naturales? (Marque una)
- a. Muy preparado

- b. Algo preparado
 - c. No está muy preparado
 - d. No está preparado en absoluto
 - e. No sabe
8. ¿Hay medidas que usted, su familia, su arrendador u otras personas han tomado en su casa para prepararse para un posible desastre? (marque todas las que quiera)
- a. Utilizó materiales resistentes al fuego para construir, renovar o hacer reparaciones
 - b. Despejó y retiró los objetos alrededor de su casa que puedan quemarse
 - c. Designó una habitación que pueda cerrarse desde el exterior para evitar la entrada de humo
 - d. Se aseguró de tener una fuente de agua exterior con una manguera que pueda llegar a cualquier zona de su casa
 - e. Compró un limpiador de aire portátil
 - f. Compró un generador eléctrico portátil
 - g. Modernizó la casa para las sacudidas sísmicas
 - h. Colocó anclajes para estanterías, armarios y objetos pesados
 - i. Creó un kit de preparación o “bolso de viaje”
 - j. Ninguno de las anteriores
 - k. Otros: _____
9. ¿En qué medida está usted informado de los planes de evacuación de su vecindario?
- a. Ninguna información
 - b. Ligeramente informado
 - c. Moderadamente informado
 - d. Muy bien informado
 - e. Otros: _____
10. ¿En qué medida le preocupa la adecuación de los planes de evacuación de su vecindario? (Marque una)
- a. Muy preocupado
 - b. Un poco preocupado
 - c. No me preocupa demasiado
 - d. No me preocupa en absoluto
 - e. No sabe
11. Si le preocupan los planes de evacuación de su vecindario, ¿qué le preocupa?
(Respuesta abierta)
12. ¿Tiene un seguro para propietarios o inquilinos para su residencia? (Marque una)
- a. Sí
 - b. No
 - c. No sabe

13. ¿Tiene una póliza de seguro contra inundaciones del Programa Nacional de Seguros contra Inundaciones o de una compañía de seguros privada? (Marque una)
- a. Sí
 - b. No
 - c. No sabe

Experiencias con desastres recientes

En las siguientes secciones se hacen preguntas sobre sus experiencias con desastres o emergencias recientes. Esto podría incluir eventos como el incendio Thomas, los deslizamientos de tierra o la ola de calor de 2018.

14. ¿Usted o su familia han sufrido alguna vez los efectos de un desastre? (Marque una)
- a. Sí
 - b. No
 - c. No sabe
15. ¿En qué año sufrió los efectos del desastre?
- a. Año: _____
16. ¿Sufrió usted el impacto del incendio Thomas y los posteriores desprendimientos de tierra? (Marque una)
- a. Sí
 - b. No
 - c. No sabe
17. ¿Qué impactos del incendio Thomas y de los posteriores desprendimientos de tierra experimentó? (marque todos los que quiera)
- a. Pérdida de la vivienda
 - b. Daños a la propiedad
 - c. Pérdida de trabajo o de ingresos
 - d. Lesión
 - e. Pérdida de animales domésticos o de ganado
 - f. Desplazamiento de la vivienda por el aumento de los alquileres
 - g. Pérdida de energía
 - h. Pérdida de comestibles
 - i. Enfermedades respiratorias o cardiovasculares causadas por el humo
 - j. Pérdida de recepción del teléfono celular
 - k. Problemas de salud mental
 - l. Ninguno de las anteriores
 - m. Otro: _____

18. Durante y después del incendio Thomas, ¿usted o alguien que conoce experimentó alguno de los siguientes problemas de salud mental? (marque todos los que quiera)
- Ansiedad
 - Depresión
 - Trastornos de estrés postraumático
 - Estrés
 - Abuso de sustancias
 - Tensiones en las relaciones sociales
 - Ninguno de las anteriores
 - Otro: _____
19. Si experimentó una de las situaciones anteriores, ¿pudo acceder a recursos de salud mental? (Marque una)
- Sí
 - No
 - No he tenido problemas de salud mental
20. Durante el incendio Thomas, ¿qué medidas tomó para mantenerse a salvo? (marque todas las que quiera)
- Siguió una ruta de evacuación planificada
 - Decidió evacuar a un refugio público
 - Decidió evacuar a casa de un amigo o familiar para refugiarse
 - Se refugió en el lugar
 - Utilizó mascarillas para protegerse del humo
 - Ninguna
 - Otra: _____
21. ¿Cómo consiguió la información durante el incendio Thomas? (marque todas las que quiera)
- TV
 - Radio
 - Internet
 - Medios Sociales
 - Periódico
 - Conversaciones con otras personas
 - Anuncio del Gobierno
 - Ninguna
 - Otros: _____
22. ¿Recibió alguna ayuda de organismos gubernamentales o de organizaciones benéficas sin ánimo de lucro?
- Sí
 - No
 - No sabe

23. Si recibió alguna ayuda de organismos gubernamentales o de organizaciones benéficas sin ánimo de lucro, ¿qué tipo de ayuda recibió? (Respuesta abierta)
24. ¿Cómo pueden la ciudad de Ventura y sus socios mejorar la respuesta y la preparación ante los desastres? (Marque todas las que correspondan)
- a. Ampliar la red de comunicaciones de emergencia
 - b. Proporcionar comunicaciones multilingües
 - c. Utilizar a los líderes de la comunidad para distribuir información
 - d. Mejorar las rutas de evacuación a lo largo de la Avenida Ventura y otras calles
 - e. Ampliar y aumentar la formación de los equipos de respuesta vecinal
 - f. Proporcionar equipos de protección a los residentes, como filtros de aire y mascarillas
 - g. Proporcionar protecciones o ayudas para el desplazamiento de la vivienda tras el desastre
 - h. Desarrollar una infraestructura local de almacenamiento de baterías para evitar los cortes de electricidad
 - i. Ninguna recomendación
 - j. Otro: _____

Cambio climático

Recientemente, el cambio climático ha recibido cierta atención en las noticias. El cambio climático se refiere al cambio en las condiciones climáticas habituales de un lugar. Por ejemplo, puede tratarse de un cambio en la cantidad de lluvia que suele recibir un lugar en un año, o puede ser un cambio en la temperatura habitual de un lugar durante un mes o una estación.

25. ¿Considera que el clima en Ventura está cambiando? (Marque una)
- a. Sí
 - b. No
 - c. No sabe
26. ¿En qué medida está informado sobre los efectos del cambio climático en Ventura? (Marque una)
- a. Ninguna información
 - b. Ligeramente informado
 - c. Moderadamente informado
 - d. Muy bien informado
27. ¿En qué medida le preocupa cada uno de los siguientes posibles impactos del cambio climático en Ventura? (Marque una opción para cada impacto)
- a. Más olas de calor
 - b. Sequías y escasez de agua

- c. Peor contaminación atmosférica
- d. Peores incendios forestales
- e. Aumento del nivel del mar e inundaciones
 - i. Muy preocupado
 - ii. Un poco preocupado
 - iii. No me preocupa demasiado
 - iv. No me preocupa en absoluto
 - v. No está seguro

28. Prepararse ante los riesgos naturales puede tener muchos beneficios. ¿Cuáles de las siguientes opciones son más importantes para usted? *Elija hasta tres.*
- a. Mejorar la calidad del aire y del agua
 - b. Reducir los residuos enviados a los vertederos
 - c. Ahorrar dinero gracias a la reducción de las facturas de los servicios públicos
 - d. Reducir la dependencia de los combustibles fósiles, como la gasolina
 - e. Crear empleos ecológicos
 - f. Ahorrar dinero en gastos de transporte
 - g. Aumentar nuestra capacidad de respuesta ante los riesgos relacionados con el clima y los desastres naturales
 - h. Mejorar la salud pública
 - i. Otros: _____

Datos demográficos adicionales

Además de la información proporcionada al principio, en esta sección de la encuesta se hacen preguntas adicionales sobre sus datos personales.

29. ¿En qué parte de Ventura vive? (Marque una)
- a. Arundell / North Bank
 - b. College Area
 - c. Downtown
 - d. Eastside / Juanamaria (Norte de la Autopista 126)
 - e. Eastside / Saticoy (Sur de la Autopista 126)
 - f. Foothills
 - g. Marina
 - h. Midtown
 - i. Pierpont
 - j. Southeast / Montalvo
 - k. Thille
 - l. Westside / The Avenue
 - m. Otra parte de Ventura
 - n. No vive en Ventura

30. ¿Cuál describe mejor el nivel de ingresos anuales de su hogar? (Marque una)
- a. Menos de \$20,000
 - b. \$20,000 - \$44,999
 - c. \$45,000 - \$84,999
 - d. \$85,000 - \$99,999
 - e. \$100,000 - \$199,999
 - f. \$200,000 o más
31. ¿Es usted propietario o alquila su residencia? (Marque una)
- a. Propiedad
 - b. Alquiler
 - c. Otro: _____
32. ¿Cuál describe mejor su tipo de vivienda? (Marque una)
- a. Unidad de vivienda accesoria (incluidos los apartamentos de acogida, los garajes transformados, etc.)
 - b. Apartamento
 - c. Condominio/Casa adosada
 - d. Dúplex / Tríplex
 - e. Casa rodante
 - f. Casa unifamiliar
 - g. Sin vivienda
 - h. Vehículo
 - i. Otro: _____
33. ¿Se considera una persona con una discapacidad? (Marque una)
- a. Sí
 - b. No
 - c. No sabe
34. ¿Cuál es su medio preferido para conectarse con la Ciudad de Ventura e informarse de noticias y eventos?
- a. Página de internet de la ciudad
 - b. Reuniones del Concejo Municipal o de la Comisión
 - c. Reuniones del Concejo Comunitario
 - d. MyVentura u otros boletines digitales de la ciudad
 - e. Guías de parques y recreación de temporada
 - f. Facebook
 - g. Instagram
 - h. Twitter
 - i. Nextdoor
 - j. YouTube
 - k. Otro

35. Si le gustaría recibir notificaciones acerca de los próximos planes y proyectos, por favor seleccione una o más opciones y provea su correo electrónico.
- a. Actualización del plan general
 - b. Planes de Transporte Activo
 - c. Correo electrónico: _____
-

Presentación por TELÉFONO o EN PERSONA

Hola, me llamo ____ y soy miembro del personal/equipo de proyecto que trabaja con la ciudad de Ventura. Estamos haciendo una encuesta especial sobre las experiencias con los desastres naturales recientes, la preparación para posibles desastres naturales futuros y los impactos del cambio climático.

Esta encuesta debería durar unos quince minutos. Agradecemos que sus respuestas sean sinceras. Si le hacemos una pregunta que no quiere responder, no es necesario que lo haga. Todas sus respuestas serán confidenciales. ¿Tiene alguna pregunta?

**Community Survey on Greenhouse
Gas Reduction in the City of
Ventura**
October 2022



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Survey Overview

The City of Ventura is in the process of creating a Climate Action and Resilience Plan (CARP). This exciting initiative is a roadmap for how the community will reduce greenhouse gas (GHG) emissions and prepare for the potential impacts of natural hazards and climate change on public health, infrastructure, ecosystems, and our economy.

The City launched a Community Survey on Greenhouse Gas Reduction in the City of Ventura (survey), which was open from late July 2022 through mid-August 2022. The purpose of this survey was to gather information about community members' opinions about policy options and behaviors to reduce greenhouse gas emissions and help us meet State reduction goals

The survey was made available in both English and Spanish, and a total of 1,071 unique responses were recorded. This document summarizes the combined responses of both English- and Spanish-language participants.

Survey Methodology and Participation

The survey was developed by City of Ventura staff and the General Plan Update consultant team. In developing the survey, the team considered:

- **Draft Greenhouse Gas Reduction Measures for the CARP:** The survey asks specifically about support for measures in the building energy, land use and transportation, water, and solid waste sectors.
- **Similar Surveys or Polls:** The project team reviewed similar community surveys from other jurisdictions and statistically significant findings from other polls about the topics covered in the survey. Several questions in the survey match questions found in these external tools.
- **Creating a Flexible and Useful Tool to Maximize Engagement:** The survey, in English and Spanish, was developed to measure opinions across all the above areas of interest.

The final survey instruments are attached in the Appendix A and B. Each version of the tool is organized into five sections: demographics, policies and behaviors and actions.

Sampling

This survey was completed by a non-randomized sample (often called a convenience sample) of people who live, work, go to school, or spend time in the City of Ventura.

Using a non-random sample for a survey is commonly used to understand the perspectives and experiences of a group of people ("population"). Data from non-random samples can show the range of views and experiences within a population and be used as a reference point. Data from non-random samples are typically considered more reliable (i.e., more generalizable to the larger population) when they are "triangulated" or validated through additional sources. This survey data will be considered alongside data from focus groups, community meetings, and other public input, with all this data being used to inform decision-making.

Distribution Methods

The survey was available to take online and was produced using the SurveyMonkey platform. The project team developed several outreach graphics and materials, such as social media images and flyers, which were distributed through various methods, including but not limited to:

- **Internet-Based Outreach:** City's GovDelivery listservs (All subscribers; General Plan Update subscribers); GPU Project Website; City's social media accounts (Twitter, Facebook, Instagram, etc.).
- **In-Person Outreach:** Door-to-door canvassing; outreach at the CARP Open House; outreach at the CARP focus groups.

The survey and outreach materials were produced in both English and Spanish. To encourage the participation of typically underrepresented groups, the non-profit organization Central Coast Alliance United for A Sustainable Economy (CAUSE) conducted targeted outreach in heavily Hispanic/Latinx, multi-family neighborhoods on Ventura's Westside. CAUSE staff canvassed door-to-door and recorded survey responses with Spanish-speaking residents in person. When residents did not answer, CAUSE staff left behind flyers with information about how to access the survey.

Demographic and Socioeconomic Characteristics of Survey Participants

Participants were asked several demographic questions during the survey. These questions are intended to help City staff ascertain whether survey respondents generally matched the profile of Ventura and/or whether any groups were over- or underrepresented. Key takeaways are summarized below:

- Almost all respondents (90 percent) are residents of the City of Ventura.
- Of all residents who responded, over half (53 percent) have lived in Ventura for 21 years or more. Residents of one year or less comprised only one percent.
- Homeowners made up 77 percent of the respondents, and renters comprised 21 percent of the responses. The survey results overrepresented homeowners (54 percent of the city population) compared to rents (46 percent of the city population).
- Almost three-quarters of survey respondents identify as Non-Hispanic White or Caucasian (compared to the citywide average of 55 percent) Hispanic and Latino individuals were underrepresented (18 percent compared to the citywide average of 36 percent).
- People aged 60 and above comprised almost half (48 percent) of respondents.
- The response for most neighborhoods was proportionate to residential population size.

Policies

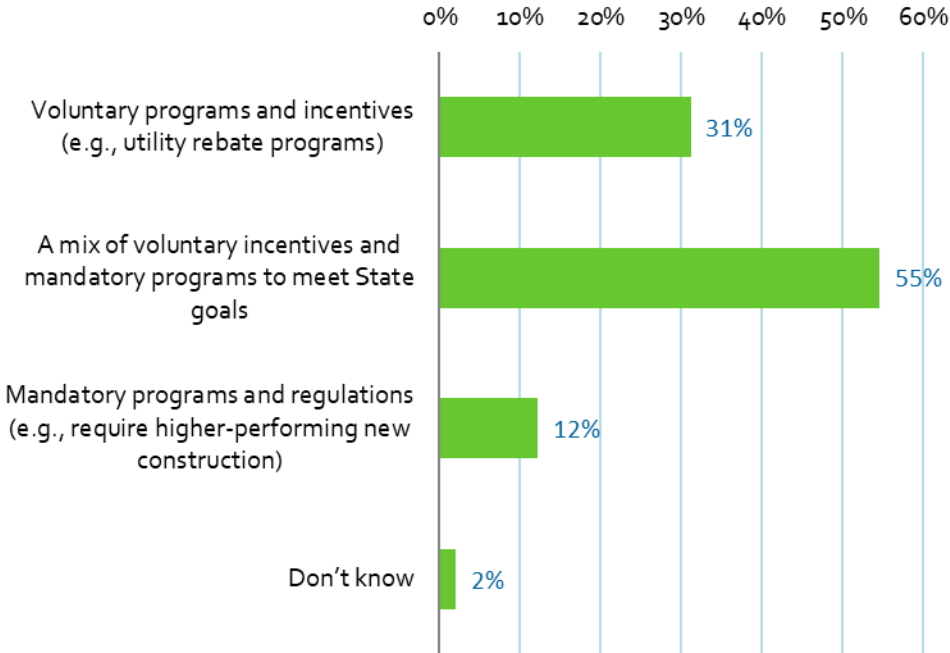
Survey participants were asked questions about their attitudes towards taking climate action. They were also asked a series of policy options to improve energy and water efficiency, reduce air pollution, and reduce greenhouse gas emissions.

Level of Action to Meet GHG Goals

A majority of respondents (81 percent) are aware that California has established GHG emissions. Nearly 60 percent of respondents believe the City should take bold action to meet or exceed those goals. The remaining 40 percent of respondents are split evenly between the City taking moderate or limited action.

However, respondents' stated desire for the City to take bold action is not consistent with their views on how the City should encourage action (Figure 1). Only 12 percent think the City should establish mandatory programs and regulations, while the rest selected the more moderate approach of mixed voluntary and mandatory programs or voluntary programs only.

Figure 1: How the City should Encourage Action to Meet State GHG Goals



Policy Options

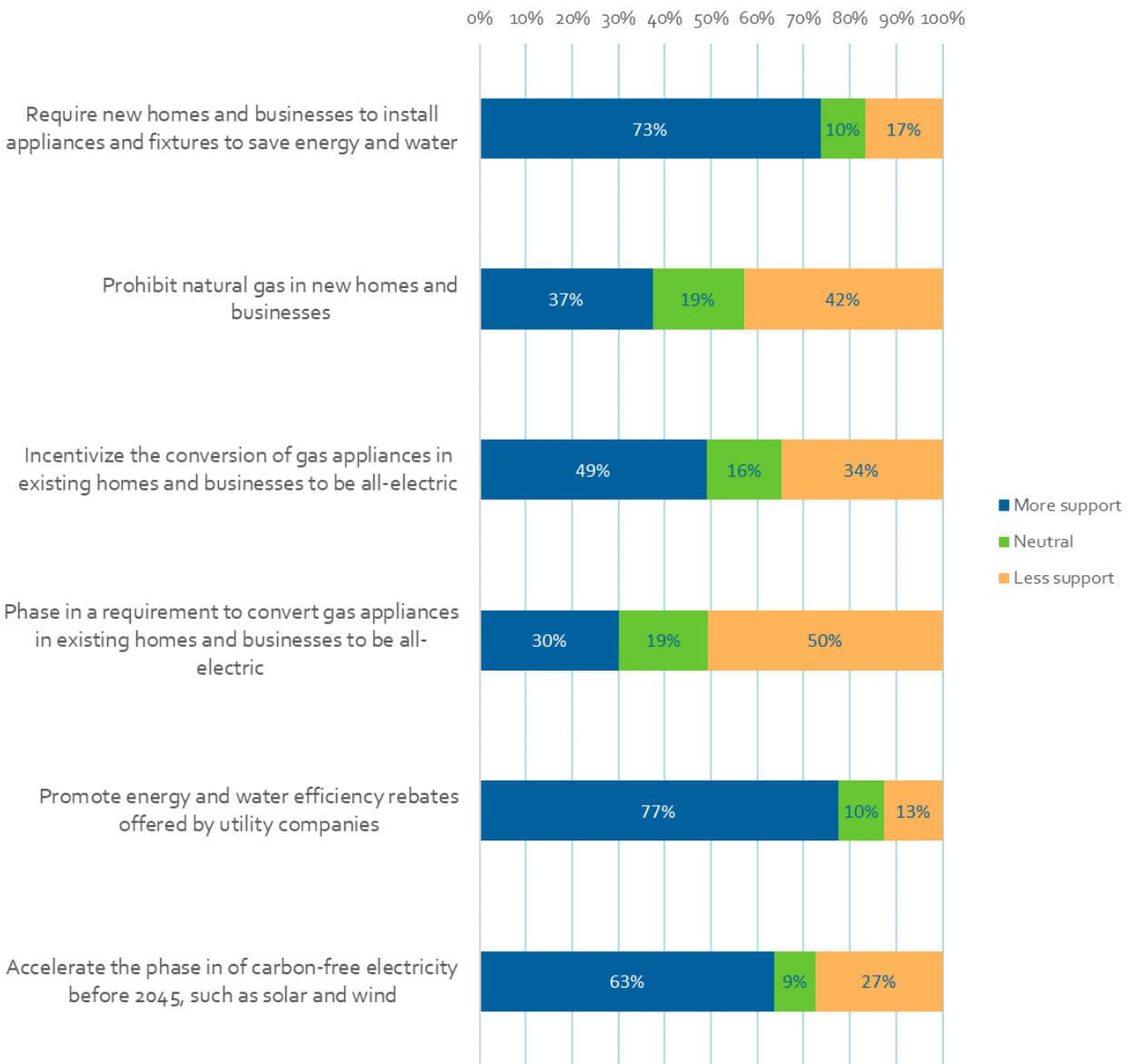
Participants were asked to rank a menu of GHG reduction measures on a scale of 1 to 5, where 1 means "Do not Support" and 5 means "Strongly Support"

Building Energy Policies

About three quarters of respondents support or strongly support promoting water and energy rebates from utilities and requiring new homes and businesses to install efficient appliances and fixtures (77 and 73 percent respectively) (Figure 2). Accelerating the phase-in of carbon-free electricity before 2045 is also supported by a majority (63 percent) of respondents. This measure is more strongly supported by renters than homeowners; 73 percent of renters are in support, compared to 61 percent of homeowners.

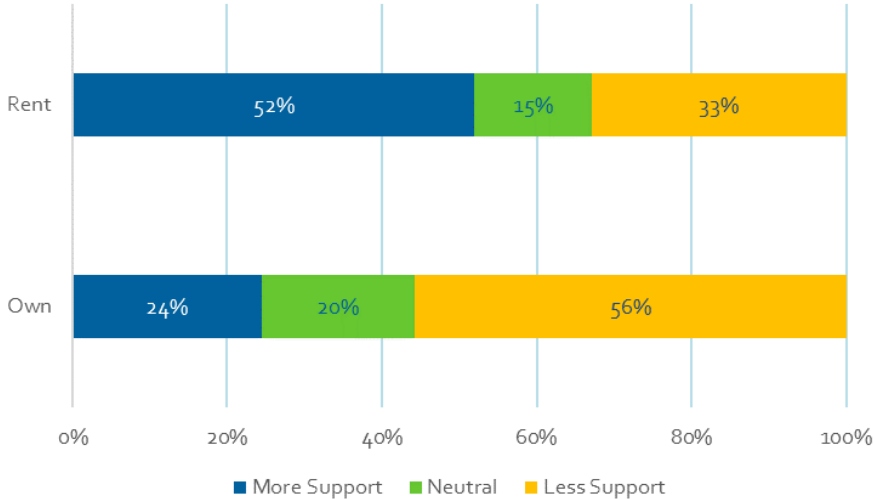
Policy options that respondents are least supportive of are phasing in requirements for converting gas appliances in existing homes and prohibiting natural gas in development (Figure 2). However, these policies also have the highest percentage of “neutral” respondents who could perhaps be swayed to one side through education.

Figure 2: Level of Support for Building Energy Policy Options



Overall respondents are more supportive of incentives than a phased-in requirement when it comes to converting gas appliances to electric in existing development. Broken down by housing tenure, renters are more supportive of both policies than homeowners. 58 percent of renters support incentives. The difference is stark when it comes to phased-in requirements; only 24 percent of homeowners are in support compared to 52 percent of renters (Figure 3).

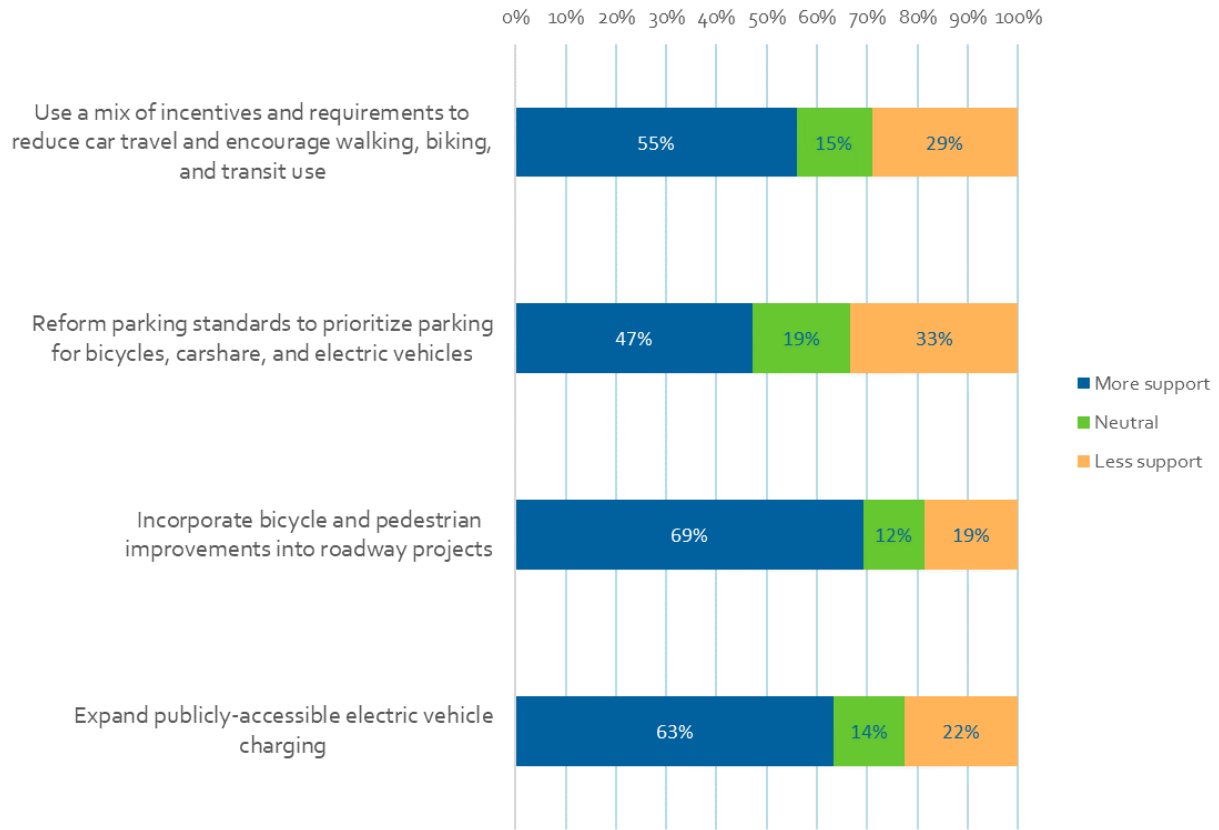
Figure 3: Support of Phased-in Requirements for Gas Appliance Conversion to Electric in Existing Buildings by Housing Tenure



Land Use and Transportation Policies

All of the land use and transportation policies included in the survey are moderately to strongly supported by the overall survey respondents (Figure 4). The most popular options are incorporating bicycle and pedestrian improvements into roadway projects (69 percent support) and expanding publicly accessible EV charging (63 percent support).

Figure 4: Level of Support for Land Use and Transportation Policy Options

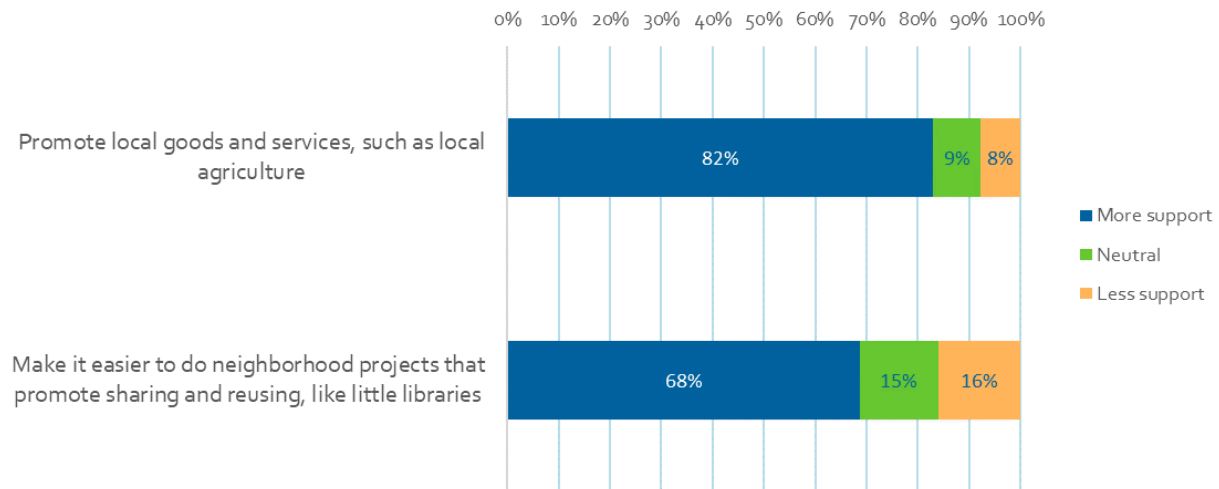


When broken down by housing tenure, respondents who are renters are slightly more supportive of all four policies than homeowners. The policy option with the greatest difference (13 percentage points) between renters and owners is reforming parking standards to prioritize parking for bicycles, carshare, and EVs.

Consumption Reduction Policies

Overall respondents are highly supportive of policies that reduce consumption emissions (Figure 5). Respondents who are renters are more supportive of policies that make it easier to do neighborhood projects that promote sharing and reusing (83 percent of renters support, compared to 65 percent of homeowners).

Figure 5: Level of Support for Consumption Reduction Policy Options



Behaviors

The last section of the survey addressed if respondents currently implement sustainable practices. Respondents could select all options that applied, as well as add their own actions in the “Other” option.

Steps Taken to be more Sustainable

Reducing Energy Use

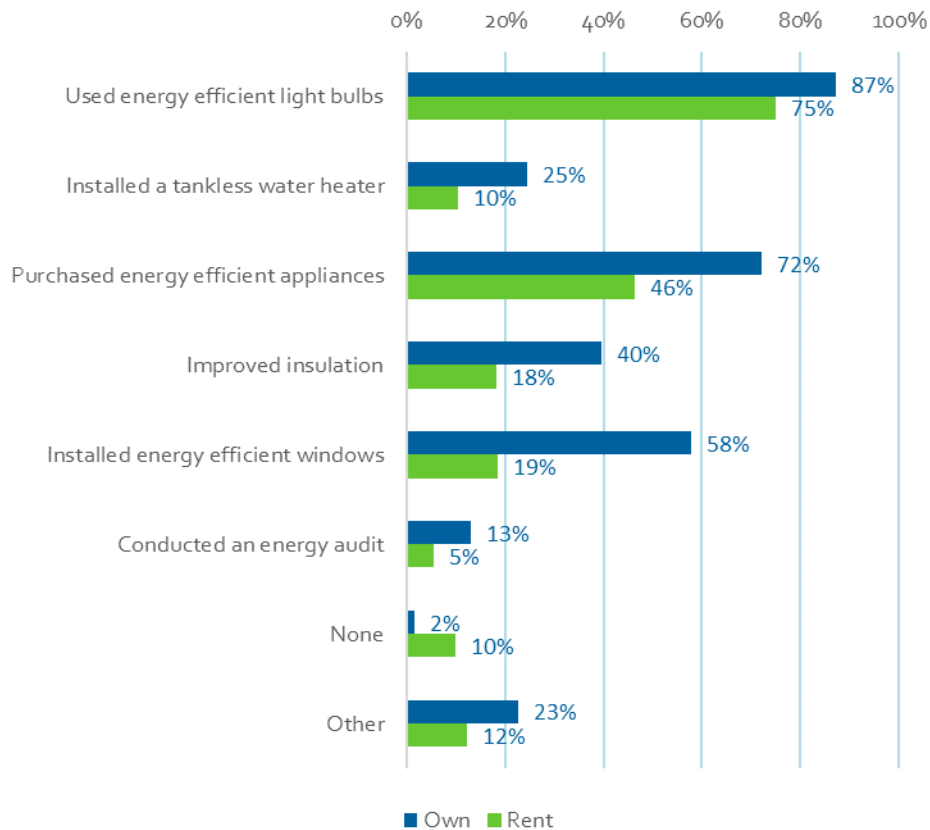
Overall, the most popular actions respondents have taken to reduce home energy use are using energy efficient light bulbs (selected by 91 percent of respondents) and purchasing energy efficient appliances (71 percent). Only a small number of respondents have installed a tankless water heater or conducted an energy audit (23 and 12 percent, respectively).

Common themes in the “Other” responses were:

- Installed or are planning to install solar panels, some with battery backup
- Turn off lights, fans, etc. off when not in use
- Purchased and drive an EV (note: not an energy conservation measure)
- Not using AC, relying more on passive cooling or fans
- Wanting to make the changes listed but being limited as a renter

Because renters have less ability to make changes to their residence, the question asked if they or their landlord have taken the steps to reduce energy use. Even so, renters reported lower implementation of all actions listed (Figure 6). The biggest disparities are in the installation of energy efficient windows, purchase of energy efficient appliances, and improving the building insulation.

Figure 6: Steps Taken Around the Home to Reduce Energy Use by Housing Tenure



Reducing Water Use

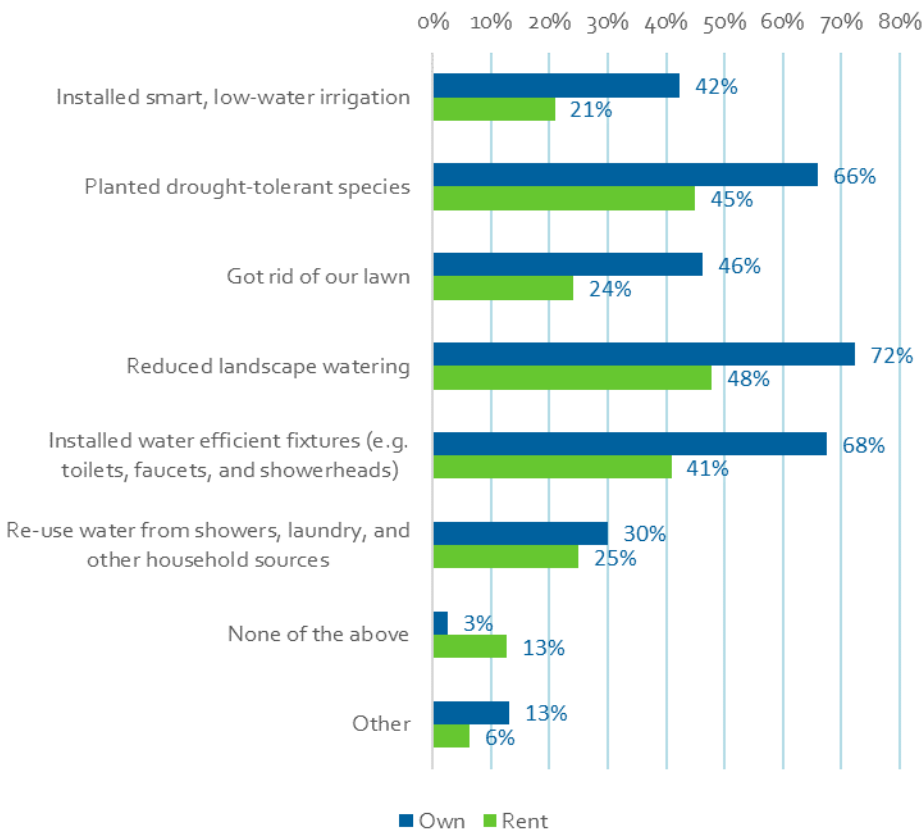
Overall, the most popular actions respondents have taken to reduce home water use are reducing landscape watering (73 percent), installing water efficient fixtures (67 percent), and planting drought-tolerant species (67 percent). Even the less popular actions have decent uptake, with a third to half of respondents implementing low water irrigation, lawn removal, and water re-use. Most of the “Other” responses are more detailed explanations of how people implement the answers in the multiple choice.

Beside the more detailed descriptions of the options in the multiple choice, common themes in the “Other” responses were:

- Shortened the length of showers, sink usage, etc.
- Reduced toilet flushing
- Installed rain barrels
- Installed circulation pumps

Because renters have less ability to make changes to their residence, the question asked if they or their landlord have taken the steps to reduce water use. Even so, renters reported lower implementation of all actions listed (Figure 7).

Figure 7: Steps Taken Around the Home to Reduce Water Use by Housing Tenure



Other Ways to be more Sustainable

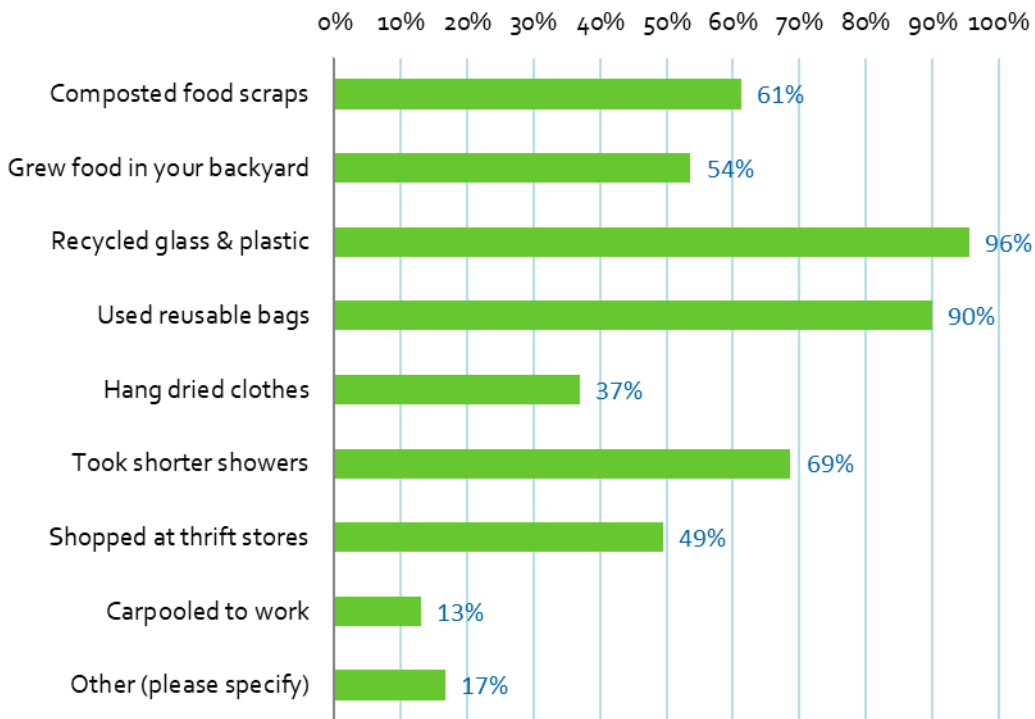
There is a wide variety of other ways households can be more sustainable. Almost all respondents recycle glass and plastic and use reusable bags (96 and 90 percent, respectively), which are ways to reduce landfilled waste. About half of respondents implement measures to reduce consumption emissions, including composting food scraps (61 percent), growing food in their backyard (54 percent), and shopping at thrift stores (49 percent).

The results were mostly consistent between homeowners and renters. However, more renters shopped at thrift stores (57 percent for renters versus 43 percent for homeowners) and carpoled to work (21 percent for renters versus only 9 percent of homeowners).

Common themes in the “Other” responses were:

- Rides a bike, walk, or other active transportation mode to work and run errands
- Uses public transportation
- Uses an EV
- Installed solar panels at home

Figure 8: Other Steps Taken to Help the Environment



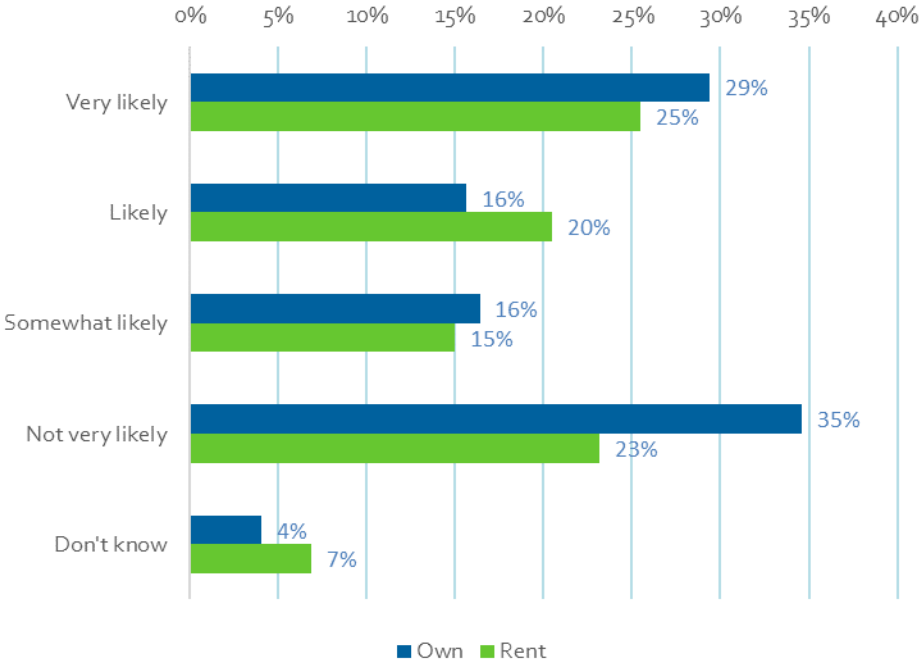
Behavior Change

Opting in to Renewable Energy

Overall, a majority of respondents (62 percent) are aware that they can opt into 100% renewable electricity through their utility. Unfortunately, this knowledge is not accessible to all groups in the City. Only 40 percent of Spanish-speaking respondents and 47 percent of renters are aware of this.

When it comes to likelihood of taking on additional cost to opt into 100% renewable electricity, respondents are pretty evenly split. 46 percent of total respondents are "Very Likely" or "Likely" to opt in, while 48 percent are only "Somewhat Likely" or "Not very Likely" to. The responses of renters versus owners are consistent with the overall result but reveal one slight difference. Fewer renters said they would be "Not very Likely" to opt in to 100% renewable energy (only 23 percent, compared to 35 percent of owners).

Figure 9: Likelihood of Opting In to 100% Renewable Electricity by Housing Tenure

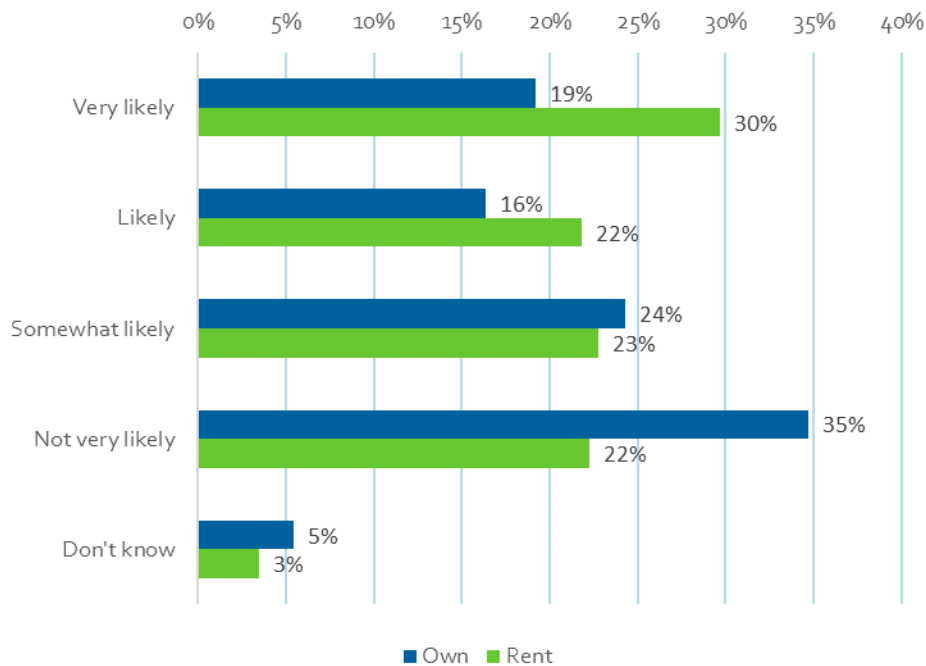


Using Modes of Transportation other than Driving

Respondents who rent their residence use modes other than driving more often than people who own their residence. 46 percent of renters reported that they use active transportation or transit every day or a few times a week, compared to only 32 percent of homeowners. On the other side of the spectrum, 27 percent of renters and 39 percent of homeowners reported that they never use a mode other than driving.

Renters reported more willingness to increase their use of active transportation and transit than homeowners, as 30 percent and 22 percent selecting “Very Likely” or “Likely” respectively (Figure 10).

Figure 10: Likelihood of Increasing Use of Active Transportation and Transit by Housing Tenure



Appendix A: English Survey

Community Survey on Greenhouse Gas Reduction in the City of Ventura

Version: Web

Draft: 7/13/2022

Introduction

The City of Ventura is in the process of developing a Climate Action and Resilience Plan. This exciting initiative is a roadmap for how the community will reduce greenhouse gas emissions and prepare for the potential impacts of natural hazards and climate change on public health, infrastructure, ecosystems, and our economy.

This survey is designed to gather information about community members' opinions about policy options and behaviors to reduce greenhouse gas emissions and help us meet State reduction goals. Your answers are anonymous, and you can also skip any questions. There are no right or wrong answers – we want to know about your perspectives and experiences.

Demographic

This section of this survey asks questions about your personal background. This information helps us understand who responded to the survey and who we still need to talk with in our community.

1. Do you live in the City of Ventura? (Check one)
 - a. Yes
 - b. No

2. In which part of Ventura do you live? (Check one)
 - a. Arundell / North Bank
 - b. College Area
 - c. Downtown
 - d. Eastside / Juanamaria (North of Highway 126)
 - e. Eastside / Saticoy (South of Highway 126)
 - f. Foothills
 - g. Marina
 - h. Midtown
 - i. Pierpont
 - j. Southeast / Montalvo
 - k. Thille
 - l. Westside / The Avenue
 - m. Other part of Ventura

- n. I do not live in Ventura
-
- 3. Do you own or rent your residence? (Check one)
 - a. Own
 - b. Rent
 - c. Other:_____
-
- 4. How many years have you lived in the City of Ventura? (Check one)
 - a. N/A – I do not live in Ventura
 - b. Less than 1 year
 - c. 1-5 years
 - d. 6-10 years
 - e. 11-20 years
 - f. 21-40 years
 - g. 40 years or more
-
- 5. What is your age group? (Check one)
 - a. 17 years or younger
 - b. 18-29 years
 - c. 30-39 years
 - d. 40-49 years
 - e. 50-59 years
 - f. 60-69 years
 - g. 70 years or older
 - h. Prefer not to answer
-
- 6. With which race or ethnic group(s) do you most identify? (select all that apply)
 - a. Asian or Asian American
 - b. Black or African American
 - c. Hispanic or Latino
 - d. Central and South American Indigenous
 - e. Native American or Alaska Native
 - f. Native Hawaiian or other Pacific Islander
 - g. White or Caucasian
 - h. Two or more races
 - i. Another race/ethnicity (please specify)
 - j. Prefer not to answer

Policies

This section describes State greenhouse gas reduction goals and a series of policy options to improve energy and water efficiency, reduce air pollution, and reduce greenhouse gas emissions.

7. Do you know the State of California established goals for reducing greenhouse gas emissions?
(Check one)
 - a. Yes
 - b. No

8. How actively should the City work to achieve State greenhouse gas reduction goals? (Check one)
 - a. Take bold action to meet or exceed goals
 - b. Take moderate action
 - c. Take limited action
 - d. Don't know

9. To meet State greenhouse gas goals, should the City encourage action through voluntary incentives, establish mandatory requirements, or support a mix of both? (Check one)
 - a. Voluntary programs and incentives (e.g., utility rebate programs)
 - b. A mix of voluntary incentives and mandatory programs to meet State goals
 - c. Mandatory programs and regulations (e.g., require higher-performing new construction)
 - d. Don't know

10. The following policy options are efforts the City would have to take to achieve State greenhouse gas emission targets. For each item, rate on a scale of 1 to 5, with 5 being a policy you would strongly support.
 - a. Require new homes and businesses to install appliances and fixtures to save energy and water
 - b. Prohibit natural gas in new homes and businesses
 - c. Incentivize the conversion of gas appliances in existing homes and businesses to be all-electric
 - d. Phase in a requirement to convert gas appliances in existing homes and businesses to be all-electric
 - e. Promote energy and water efficiency rebates offered by utility companies
 - f. Accelerate the phase in of carbon-free electricity before 2045, such as solar and wind
 - g. Use a mix of incentives and requirements to reduce car travel and encourage walking, biking, and transit use
 - h. Reform parking standards to prioritize parking for bicycles, carshare, and electric vehicles
 - i. Incorporate bicycle and pedestrian improvements into roadway projects
 - j. Expand publicly-accessible electric vehicle charging
 - k. Promote local goods and services, such as local agriculture
 - l. Make it easier to do neighborhood projects that promote sharing and reusing, like little libraries

Behaviors and Actions

The following sections asks questions about your behaviors and actions.

11. Are there steps you, your household, your landlord, or others have taken around your home to reduce energy use? (check all that apply)
 - a. Used energy efficient light bulbs
 - b. Installed a tankless water heater
 - c. Purchased energy efficient appliances
 - d. Improved insulation
 - e. Installed energy efficient windows
 - f. Conducted an energy audit
 - g. None of the above
 - h. Other: _____

12. Are there steps you, your household, your landlord, or others have taken around your home to reduce water use? (check all that apply)
 - a. Installed smart, low-water irrigation
 - b. Planted drought-tolerant species
 - c. Got rid of our lawn
 - d. Reduced landscape watering
 - e. Installed water efficient fixtures (e.g. toilets, faucets, and showerheads)
 - f. Re-use water from showers, laundry, and other household sources
 - g. None of the above
 - h. Other: _____

12. Are there other steps you and your family have taken to help the environment? (check all that apply)
 - a. Composted food scraps
 - b. Grew food in your backyard
 - c. Recycled glass & plastic
 - d. Used reusable bags
 - e. Hang dried clothes
 - f. Took shorter showers
 - g. Shopped at thrift stores
 - h. Carpoled to work
 - i. Other: _____

13. Do you know that you can opt into 100% renewable electricity through your utility? (Check one)
 - a. Yes
 - b. No

14. Building energy use accounts for nearly one-third of the City’s greenhouse gas emissions. How likely would you be to take on a modest additional cost to opt in to 100% renewable and reliable electricity from your utility to help reduce emissions and meet State greenhouse gas goals?

(Check one)

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Not very likely
- e. Don’t know

15. How often do you walk, bike, scoot, or take the train or bus instead of driving? (Check one)

- a. Every day
- b. A few times a week
- c. About once a week
- d. A few times a month
- e. Never

16. Transportation accounts for nearly half of the City’s greenhouse gas emissions. How likely would you be to increase the amount of walking, biking, scooting, and train or bus trips to help reduce emissions and meet State greenhouse gas goals? (Check one)

- a. Very likely
- b. Likely
- c. Somewhat likely
- d. Not very likely
- e. Don’t know

Thank you for participating in the survey! To learn more about the General Plan and Active Transportation, please visit <https://www.planventura.com/> and <https://www.activeplanventura.com/> for more details and sign-up for the mailing list.

Introduction for the PHONE or IN PERSON

Hi, my name is ____ and I am a staff member / project team member working with the City of Ventura. We are doing a special survey about policy options and behaviors to reduce greenhouse gas emissions.

This survey should take about fifteen minutes. We appreciate your honest responses. If we ask a question that you do not want to answer, you don’t need to do so. All your answers will be kept confidential. Any questions?

Appendix B: Spanish Survey

Encuesta comunitaria sobre la reducción de gases de efecto invernadero en la ciudad de Ventura

Versión: Web

Draft: 7/14/2022

Introducción

La ciudad de Ventura está desarrollando un Plan de Acción y Resiliencia Climática. Esta interesante iniciativa es una hoja de ruta sobre cómo la ciudad reducirá las emisiones de gases de efecto invernadero y se preparará para los posibles impactos de los riesgos naturales y el cambio climático en la salud pública, las infraestructuras, los ecosistemas y nuestra economía.

Esta encuesta está diseñada para recabar información sobre las opiniones de los miembros de la comunidad acerca de las opciones políticas y comportamientos para reducir las emisiones de gases de efecto invernadero y ayudarnos a cumplir los objetivos de reducción del Estado de California. Sus respuestas son anónimas y también puede omitir cualquier pregunta. No hay respuestas correctas o equivocadas – queremos conocer sus perspectivas y experiencias.

Demografía

En esta sección de la encuesta se hacen preguntas sobre sus datos personales. Esta información nos ayuda a entender quienes han respondido a la encuesta y con quienes tenemos que seguir conversando en nuestra comunidad.

1. ¿Vive usted en la ciudad de Ventura? (Marque uno)
 - a. Sí
 - b. No

2. ¿En qué parte de Ventura vive? (Marque uno)
 - a. Arundell / North Bank
 - b. College Area
 - c. Downtown
 - d. Eastside / Juanamaria (Norte de Highway 126)
 - e. Eastside / Saticoy (Sur de Highway 126)
 - f. Foothills
 - g. Marina
 - h. Midtown
 - i. Pierpont
 - j. Southeast / Montalvo
 - k. Thille

- l. Westside / The Avenue
 - m. Otra parte de Ventura
 - n. No vivo en Ventura
3. ¿Es usted dueño de su residencia o alquila? (Marque uno)
- a. Dueño
 - b. Alquilo
 - c. Otro: _____
4. ¿Cuántos años lleva viviendo en la ciudad de Ventura? (Marque uno)
- a. N/A – No vivo en Ventura
 - b. Menos de 1 año
 - c. 1-5 años
 - d. 6-10 años
 - e. 11-20 años
 - f. 21-40 años
 - g. 40 años o mas
5. ¿Cuál es su grupo de edad? (Marque uno)
- a. 17 años o menos
 - b. 18-29 años
 - c. 30-39 años
 - d. 40-49 años
 - e. 50-59 años
 - f. 60-69 años
 - g. 70 años o mas
 - h. Prefiero no responder
6. ¿Con cuál raza o grupo(s) étnico(s) se identifica más? (seleccione todos los que correspondan)
- a. Asiático o Asiático Estadounidense
 - b. Negro o Afroamericano
 - c. Hispano o Latino
 - d. Indígenas de América Central y del Sur
 - e. Nativo Americano o Nativo de Alaska
 - f. Nativo de Hawái u otra Isla del Pacífico
 - g. Blanco o Caucásico
 - h. Dos o más razas
 - i. Otra raza/etnia (por favor, especifique)
 - j. Prefiero no responder

Políticas

Esta sección describe los objetivos estatales para reducir de gases de efecto invernadero y una serie de opciones políticas para mejorar la eficiencia energética y del agua, reducir la contaminación atmosférica y reducir las emisiones de gases de efecto invernadero.

7. ¿Sabe que el Estado de California ha establecido objetivos para reducir las emisiones de gases de efecto invernadero? (Marque uno)
 - a. Sí
 - b. No

8. ¿En qué medida debe trabajar la Ciudad para alcanzar los objetivos estatales de reducción de gases de efecto invernadero?
 - a. Tomar medidas audaces para alcanzar o superar los objetivos
 - b. Adoptar acciones moderadas
 - c. Tomar medidas limitadas
 - d. No sé

9. Para cumplir los objetivos estatales, ¿debe la Ciudad promover acciones mediante incentivos voluntarios, establecer requisitos obligatorios o apoyar una combinación de ambos?
 - a. Incentivos y programas voluntarios (por ejemplo, programas de reembolso de servicios públicos)
 - b. Una combinación de incentivos voluntarios y programas obligatorios para cumplir los objetivos del Estado
 - c. Programas y reglamentos obligatorios (por ejemplo, exigir que construcción nueva sea de mayor rendimiento)
 - d. No sé

10. Las siguientes opciones políticas son esfuerzos que la Ciudad tendrá que realizar para alcanzar los objetivos estatales de emisiones de gases de efecto invernadero. Para cada punto, evalúe en una escala de 1 a 5, 5 siendo una política que apoyaría firmemente.
 - a. Requerir que los nuevos hogares y empresas instalen aparatos y accesorios que ahorren energía y agua
 - b. Prohibir el gas natural en los nuevos hogares y negocios
 - c. Incentivar la conversión de los aparatos de gas en los hogares y negocios existentes para que sean totalmente eléctricos
 - d. Introducir gradualmente el requisito de convertir los aparatos de gas en los hogares y negocios existentes para que sean totalmente eléctricos
 - e. Promover los reembolsos por la eficiencia energética y del agua ofrecidos por las empresas de servicios públicos
 - f. Acelerar la introducción progresiva de electricidad libre de carbono antes de 2045, como la energía solar y eólica
 - g. Utilizar una combinación de incentivos y requisitos para reducir los viajes en coche y promover los desplazamientos a pie, en bicicleta y en transporte público

- h. Reformar las normas de estacionamiento para dar prioridad al estacionamiento de bicicletas, vehículos compartidos y vehículos eléctricos
- i. Incorporar mejoras para bicicletas y peatones en los proyectos de carreteras
- j. Ampliar el acceso público a las estaciones de recarga para vehículos eléctricos Promover los bienes y servicios locales, como la agricultura local
- k. Facilitar la realización de proyectos vecinales que promueven el intercambio y la reutilización, como las pequeñas bibliotecas

Comportamientos y acciones

En la siguiente sección se hacen preguntas sobre sus comportamientos y acciones.

11. ¿Existen medidas que usted, su hogar, su casero u otras personas han tomado en su casa para reducir el uso de energía? (Marque todas las que correspondan)
- a. Utilizar bombillas de bajo consumo
 - b. Ha instalado un calentador de agua sin tanque
 - c. Ha comprado electrodomésticos de bajo consumo
 - d. Ha mejorado el aislante
 - e. Instalación de ventanas energéticamente eficientes
 - f. Realización de una auditoria energética
 - g. Ninguna de las anteriores
 - h. Otro: _____
12. ¿Existen medidas que usted, su hogar, su casero u otras personas han tomado en su casa para reducir el uso de agua? (Marque todas las que correspondan)
- a. Instalación de un sistema de riego inteligente de bajo consumo de agua
 - b. Plantado especias tolerantes a la sequia
 - c. Nos hemos deshecho del césped
 - d. Hemos reducido el riego de los jardines
 - e. Instalamos accesorios de bajo consumo de agua (por ejemplo, inodores, grifos y duchas)
 - f. Reutilizar el agua de las duchas, la lavandería y otras fuentes domesticas
 - g. Ninguna de las anteriores
 - h. Otro: _____
12. ¿Hay otras medidas que usted y su familia han tomado para ayudar al medio ambiente? (Marque todas las que correspondan)
- a. Usar los restos de alimentos como abono o compost
 - b. Cultivar alimentos en su patio trasero
 - c. Reciclar vidrio y plástico
 - d. Usar bolsas reutilizables
 - e. Colgar la ropa para secar
 - f. Tomar duchas más cortas

- g. Comprar en tiendas de segunda mano
 - h. Compartir el coche para ir al trabajo
 - i. Otro: _____
13. ¿Sabe que puede optar por la electricidad 100% renovable a través de su compañía eléctrica?
- a. Sí
 - b. No
14. El uso de energía en los edificios representa casi un tercio de las emisiones de gases de efecto invernadero de la ciudad. ¿Qué probabilidad tendría de asumir un modesto costo adicional para optar por una electricidad 100% renovable y fiable de su empresa de servicios públicos para ayudar a reducir las emisiones y cumplir los objetivos estatales de gases de efecto invernadero? (Marque una)
- a. Muy probable
 - b. Probablemente
 - c. Algo probablemente
 - d. No muy probable
 - e. No sé
15. ¿Con que frecuencia camina, anda en bicicleta, en patinete o en autobús en lugar de conducir? (Marque una)
- a. Todos los días
 - b. Unas cuantas veces a la semana
 - c. Más o menos una vez a la semana
 - d. Unas cuantas veces al mes
 - e. Nunca
16. La transportación representa casi la mitad de las emisiones de gases de efecto invernadero de la ciudad. ¿Qué probabilidad tendría de aumentar la cantidad de viajes a pie, en bicicleta, en patinete y en tren o autobús para ayudar a reducir las emisiones y cumplir los objetivos estatales de gases de efecto invernadero? (Marque una)
- a. Muy probable
 - b. Probable
 - c. Algo probable
 - d. No muy probable
 - e. No sé

Gracias por participar en la encuesta! Para saber más sobre el Plan General y el Plan de Transporte Activo, visite <https://www.planventura.com/> y <https://www.activeplanventura.com/> para obtener más detalles e inscribirse en la lista de correo.

Introducción por TELEFONO o EN PERSONA

Hola, mi nombre es ___ y soy un miembro del personal de la ciudad del Ventura / del proyecto trabajando con la ciudad de Ventura. Estamos haciendo una encuesta especial sobre opciones políticas y comportamientos para reducir las emisiones de gases de efecto invernadero.

Esta encuesta debería durar unos quince minutos. Agradecemos sus respuestas sinceras. Si le hacemos una pregunta a la que no quiere responder, no es necesario que lo haga. Todas sus respuestas serán confidenciales. ¿Tiene alguna pregunta?

Community Open Houses on Climate Change: Summary of Results

August 2022



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In-Person Open Houses

In-Person Open House Overview

The Climate Action and Resilience Plan (CARP) of Ventura comprises of a new vision for climate action, which includes quantitative goals, tracking metrics, and identification of programs/actions that reduce greenhouse gas emissions and increase resilience. The CARP is a section of the Ventura General Plan, a state-required policy document that establishes a vision for Ventura. California state law requires that a General Plan address eight core topics formally known as “elements” such as housing, economic development, and climate change.

To gain insight into the Ventura community’s perspectives on climate action, the City held three open-house style events within the months of July and August. We summarize the ideas shared below and rely on them to inform the City of Ventura Climate Adaptation and Resilience Plan. Materials were provided in English and Spanish, and Spanish-speaking staff were present to engage with residents.

The first two open houses were held in-person at the Ventura City Hall Atrium on July 13th, 2022 and July 14th, 2022. The last open house was held via Zoom on August 11th, 2022. A total of 45 people attended the in-person open houses and 35 attended the virtual event.

Links to the open house materials can be found [here](#).



Participants at the Ventura CARP Open House



Participants interacting with Open House station

Open House Stations

The open house consisted of 7 stations about different topics related to greenhouse gas mitigation and climate adaptation, with detailed descriptions about why each topic matters: Climate Change 101, Visioning for a Climate Ready Ventura, Clean Energy + Buildings, Transportation + Land Use, Solid Waste, Water, and Climate Hazards. Each station had options to record ideas and opinions via sticky notes, voting with stickers for climate-related policies and priorities, and visions. Pictures of the boards used at the In-Person Open Houses can be found in Appendix A.

Station 1: Climate Change and CARP Overview

The first station provided background on what climate change and greenhouse gas emissions are. It also included a summary of what the CARP is, with information such as its components, key terms, and project schedule. Lastly, this station contained a board illustrating the city's communitywide GHG emissions and what they mean for the CARP's emissions reduction target.

Station 2: My Vision for a Climate Ready Ventura Is...

At station 2, community members were asked to respond to the open-ended prompt: My Vision for a Climate Ready Ventura is... The following summarizes themes from the responses.

Responses related to **mobility** focused on safe, comfortable active transportation (e.g., walking and biking) and transit use including:

- Better transit and less driving
- Keep Main Street closed to traffic and improve infrastructure surrounding the area
- More “open streets” that are car-free and encourage biking and walking
- Separate bike lanes on city streets
- Implement safe routes to school, and lowered speed limits between 7am to 3pm
- Construct electric a light-rail or trolley along Main Street
- Diverse e-mobility options (scooters, bikes, etc.)

Responses related to **energy** focused on transition from natural gas to electricity and renewable energy production including:

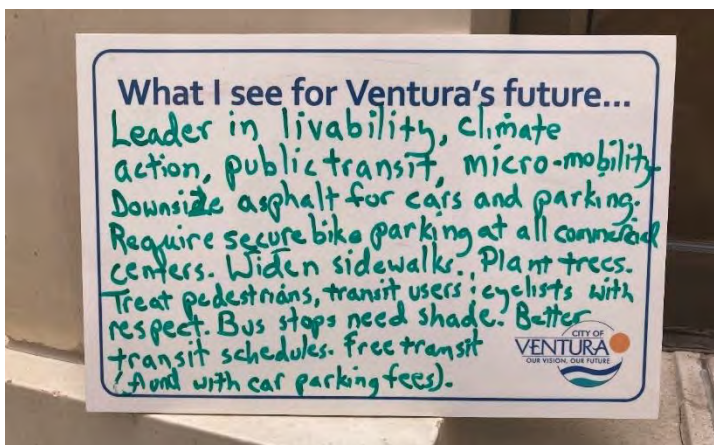
- Electrification of new buildings instead of gas in new constructions
- Distributed solar and microgrids
- Move the Southern California Gas compressor out of Ventura

Responses related to **ecology and open space** focused on trees and urban resilience measures including:

- Implement more projects that mitigate natural hazards and do not cause long-term harm like the Shoreline Retreat-Surfrider Project
- Green incentives for mature trees on residential properties
- Street medians filled with trees

Responses related to **the plan focus and framing** included:

- Environmental justice at the center of the CARP
- We should frame the plan as “Climate Saving” not just “Climate Ready” i.e. not just protecting ourselves from climate hazards
- Support local hillside nonprofits in Ventura



Residents' visions for Climate Ready Ventura

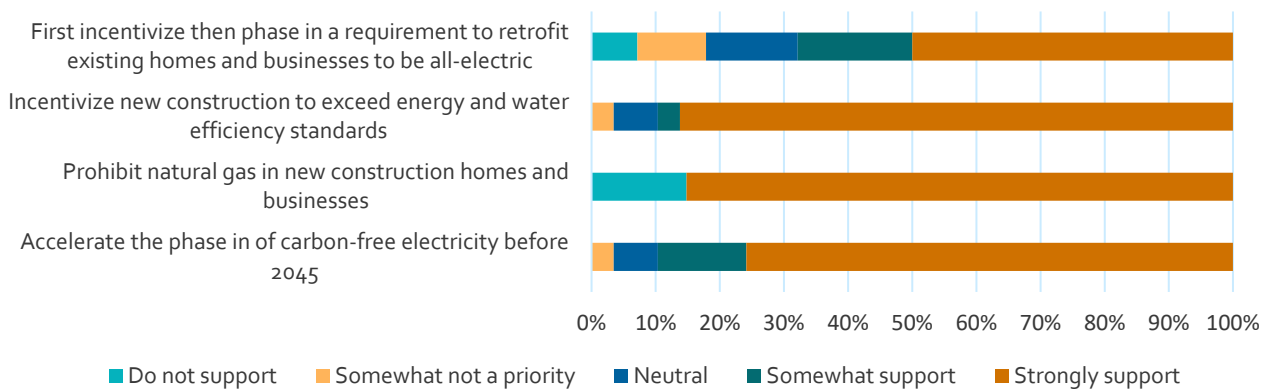
Station 3: Clean Energy + Buildings

At the Clean Energy + Building Station, participants rating a series of policy options the City would have to take to achieve State greenhouse gas emission targets on a scale of 1 (lowest rated) to 5 (highest rated), identified challenges to transitioning to efficient and/or all-electric buildings, and provided other ideas to reduce energy and building emissions.

Policy Rating

Open house participants strongly supported measures to incentivize new construction (86%) to exceed efficiency standards, prohibit natural gas in new construction (85%), and accelerate the transition to carbon free electricity (75%). Approximately 2/3 of respondents strongly supported or somewhat supported phasing in a requirement for existing homes to be all electric.

Figure 1: Ratings for Clean Energy and Building Policy Options (n = 29)



Challenges to All-Electric Buildings

Community members identified the following challenges to transition to more efficient and all-electric buildings:

- Permit timelines and upfront costs
- The need for significant grant money to help with retrofits
- The gas industry’s misinformation and lobbying- including the hold they have on the Ventura compression station

Other Ideas to Reduce Energy and Building Emissions

Community members identified the following ideas to reduce energy and building emissions, organized by topic.

Responses related to **renewable energy** focused on:

- Solar panels on city property for community use; for example, parking lots
- Add a carbon tax to properties based on their carbon footprint
- Increase dependency on solar energy

When it came to **building improvements**, participants identified the following:

- Implement a carbon budget for new buildings and permits
- Proper ventilation and discourage air conditioning use
- Restaurants getting rid of gas appliances

Ideas relevant to **urban forestry and trees** called for more shade and tree maintenance:

- Maintain existing and new trees
- Require urban forestry on rooftops of commercial
- More shade trees and reflective roofs
- Adopt a historic tree ordinance

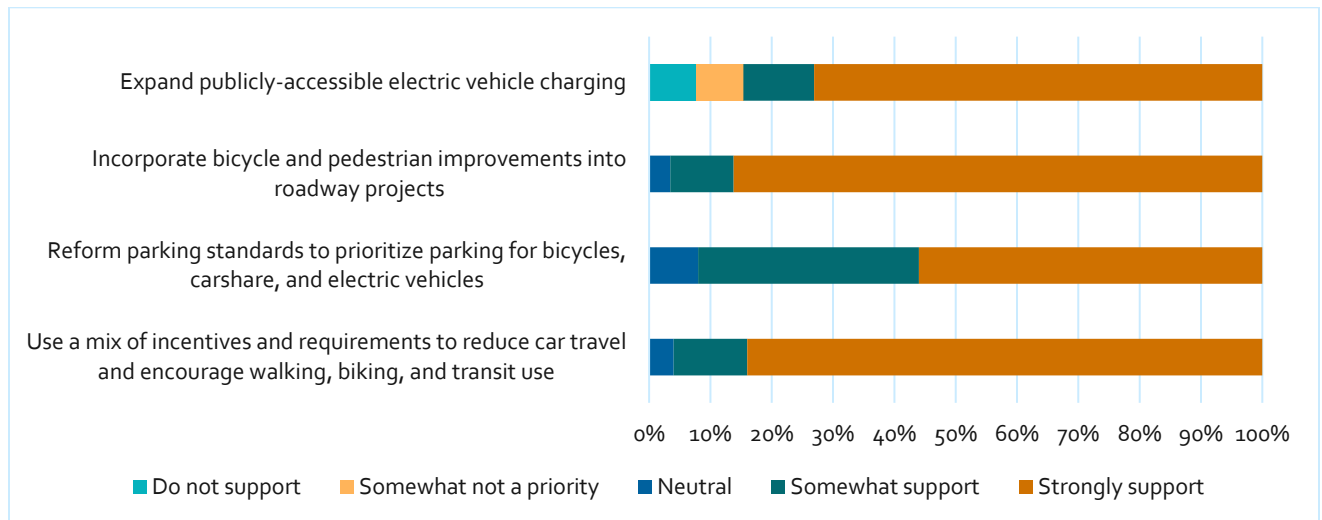
Station 4: Transportation + Land Use

At the Transportation + Land Use Station, participants rated a series of policy options the City would have to take to achieve State greenhouse gas emission targets on a scale of 1 (lowest rated) to 5 (highest rated). In consideration transportation being a major contributor of greenhouse gas emissions, participants identified challenges in shifting away from car use as a primary source of transportation, as well as ideas on reaching the goals.

Policy Rating

Open house participants strongly supported measures to incentivize active transportation across the city. The expansion of electric vehicle charging (72%), bike and pedestrian improvements to existing roads (85%), and parking standard reforms (55%) were all generally strongly supported. About 4/5 participants strongly supported the implementation of a mix of incentives that reduce car travel and encourage active transportation options.

Figure 2: Ratings for Transportation and Land Use Policy Options (n = 29)



Challenges to Active Transportation

Community members identified the following barriers exist to normalizing active transportation in Ventura:

- No e-mobility options available
- Lack of fully protected bike lanes
- The streets are not safe for cyclists or walkers. Ventura prioritizes high car speeds.
- Sidewalk widths are too narrow
- Sidewalk obstructions are in the way

Other Ideas to Reduce Transportation Related Emissions

The following are ideas shared to increase active transportation in the city and reduce transportation related emissions:

- For walkers – shade trees along all sidewalks
- Good-paying jobs within the city
- Requirement for wider sidewalks with no impediments
- Carpool parking by freeways
- Connect all bike lanes
- Grants/rebates for bike purchases (and regular use)
- More resources, education, community promoters for electric vehicle + bike use in the city
- Transit that goes up to the hills

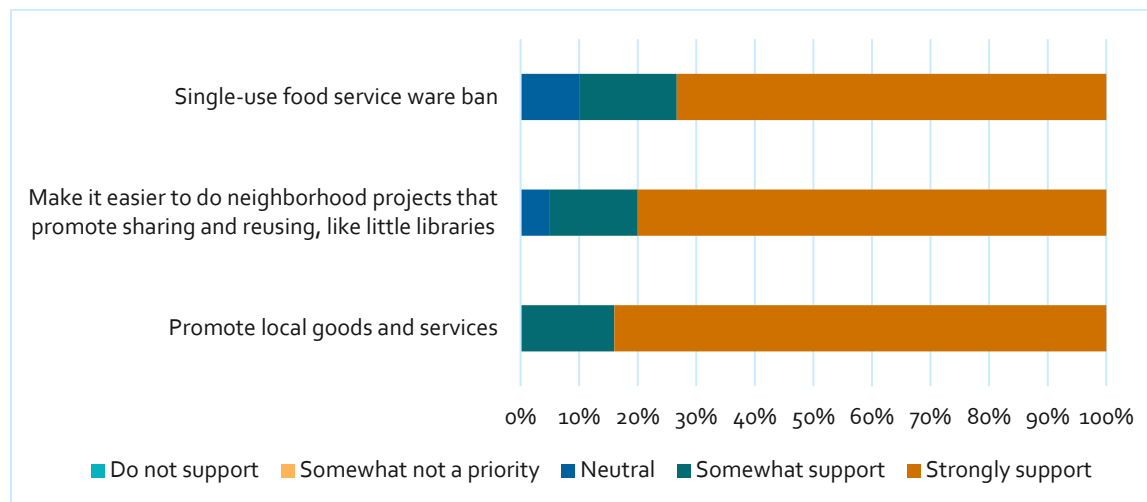
Station 5: Solid Waste

The fifth climate-related station at the open house had information about solid waste in the city. Community members rated solid waste mitigation policy options on a scale of 1 (lowest rated) to 5 (highest rated). Furthermore, participants shared barriers that exist to ensuring that solid waste originating in Ventura is reduced, as well as ideas related to solid waste reduction.

Policy Rating

Open house participants strongly supported all three measures to incentivize the practice of reusing goods and materials. The establishment of a food service ware ban (72%), projects that promote sharing and reusing (80%), and promoting local goods and services that support the reuse of goods (83%) were all of interest to open house visitors.

Figure 3: Ratings for Solid Waste Policy Options (n = 29)



Challenges to Reducing Solid Waste

Participants identified the following challenges or barriers that exist to reducing waste and using less plastic:

- Abundance of single-use products, especially bottles
- Getting folks to participate in waste-reduction practices
- Lack of place where you can reuse plastic; the Refill Shoppe in Ventura is great, but not cheap
- Recycling can come at a high cost to low-income consumers, financial and timewise

Other Ideas Related to Reducing Solid Waste

Ideas shared to reduce solid waste emissions include:

- Modeling recycling programs like those at Harrison’s, where recyclables are picked up weekly and their kitchen waste program
- A ban on single-use items should be analyzed through an equity lens- considering people who may need rely on single use plastics
- Banning single-use plastic straws or cups

Station 6: Water

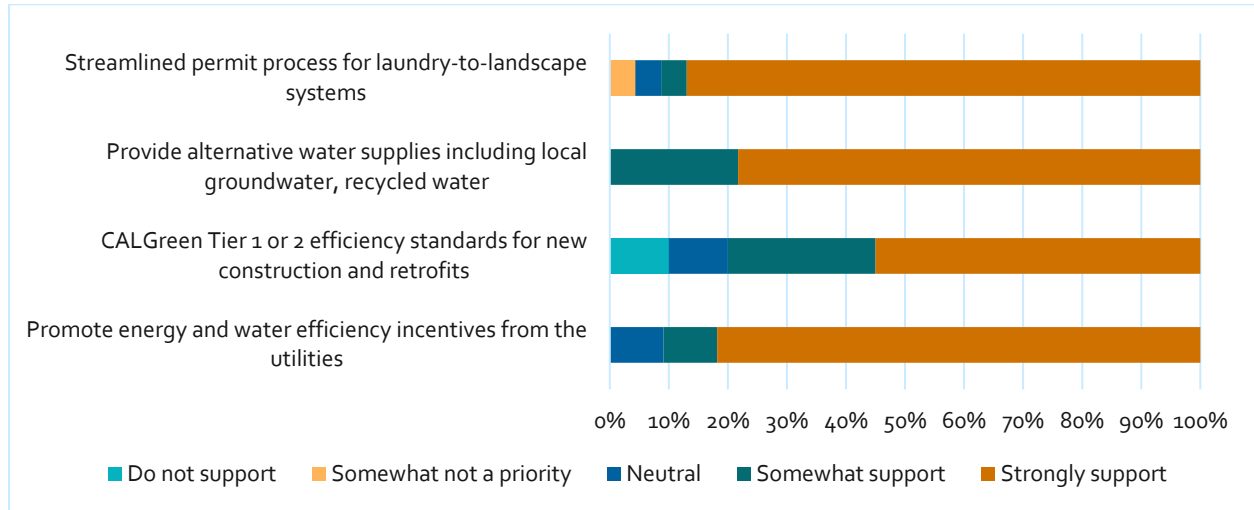
Water conservation is a major issue in the city of Ventura, as the region has a vast agricultural industry and is subject to drought conditions impacting the rest of the state of California. Participants were given the opportunity to rate policy options about water use, as well as provide insight on what challenges exist to conserving water in Ventura.

Policy Rating

Community members rated policy options that are efforts the City would have to take to achieve water conservation targets. Each policy was rated on a scale of 1 (lowest rated) to 5 (highest rated). Open house participants strongly supported all four options to conserve local water in Ventura. The establishment of

a streamlined laundry-to-landscape permit process (88%), alternative water supplies (79%), and CAL Green Trier 1 and 2 efficiency standards (55%) were all of interest to open house visitors. Furthermore, 4/5 visitors agreed that the promotion of energy and water utility incentives would be effective.

Figure 4: Ratings for Water Conservancy Policy Options (n = 29)



Challenges to Water Conservation

These are the challenges related to conserving water identified by community members:

- Disproportionate impacts on agriculture
- No enforcement of wasting water

Other Ideas Related to Conserving Water

- Return snow melt to rainwater
- Expand recycled water to irrigation for trees
- Stop outsourcing park maintenance, we need more staff to monitor landscape and water usage
- We must get water to the medians with innovative landscape design
- Encourage low water use crops
- Remove grass lawns from city property not used for recreation
- Resources dedicated to creating a “protecting water” culture (education, incentives, etc.)
- Incentivize lawn removal

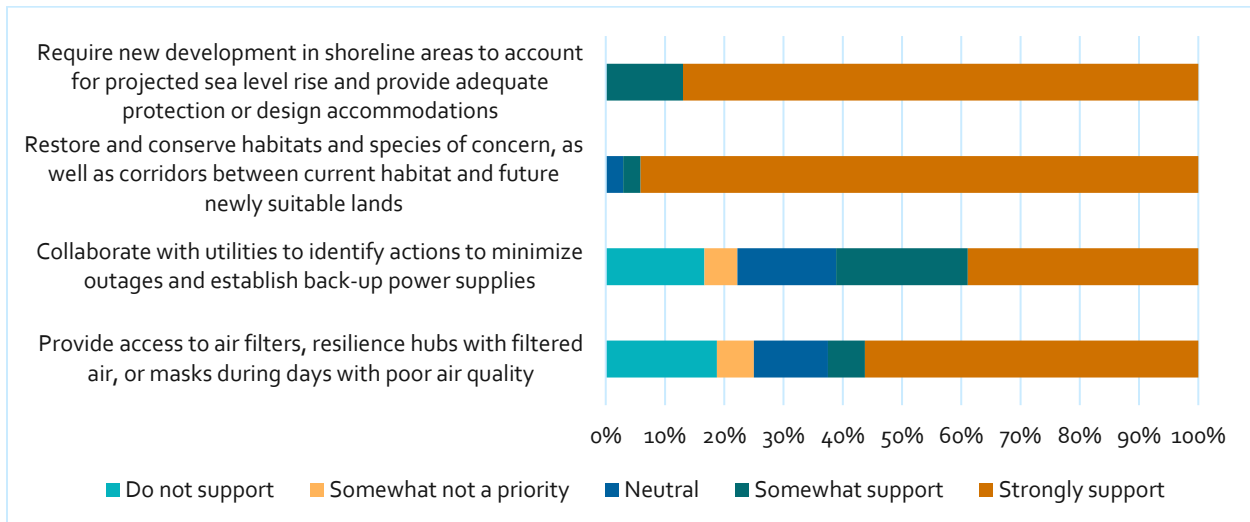
Station 7: Climate Hazards

The final open house station on Climate Hazards prompted community members to weigh in on policies that ensure that the region achieves State greenhouse gas emission targets. Furthermore, they discussed barriers in achieving these goals as well as ideas that the City should explore.

Policy Rating

Community members rated policy options that are efforts the City would have to take to mitigate the potential for climate hazards. Each policy was rated on a scale of 1 (lowest rated) to 5 (highest rated). Open house participants strongly supported policies related to strict protection measures for new shoreline developments (85%) and the restoration and conservation of natural habitats (93%).

Figure 5: Ratings for Water Conservancy Policy Options (n = 29)



Challenges to Climate Hazard Adaptation

These are the challenges related climate hazard adaptation identified by community members:

- Reliance on natural gas
- Region is susceptible to earthquakes landslides, wildfires that can cause line leaks and explosions
- There is no environmentalist on the city council

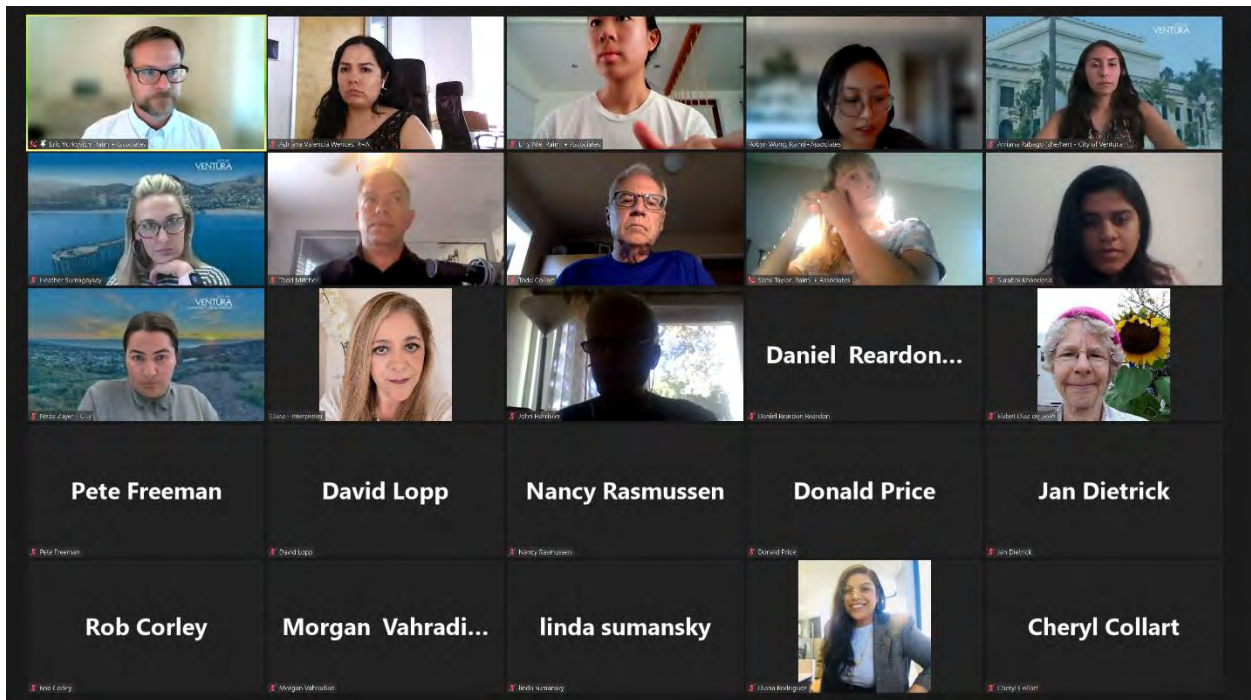
Other Ideas Related to Climate Hazard Adaptation

- Plan for moving the fairgrounds elsewhere in the county
- Redevelop land with sea level in mind
- We could create a nifty shoreline that keeps tourism vital

Virtual Open House

Virtual Open House Overview

The last open house was held via Zoom on August 11th, 2022, with 35 people in attendance. The Virtual Open House started with a brief presentation from the City and consultant team that summarized what climate change is, what the CARP is, the communitywide GHG inventory, and GHG reduction measures. The Virtual Open House interactive portion consisted of various stations like those presented at the in-person open houses a few weeks prior. Participants were asked to share ideas and barriers to a wide range of topics relevant to Climate Action and Resiliency, including transportation, water, and energy. On-demand Spanish interpretation was available for the duration of the event, and the interactive boards contained both English and Spanish text. Pictures of the interactive white boards used in the Virtual Open House can be found in Appendix B.



Participants at the Virtual CARP Open House

Station 1: Clean Energy + Buildings

Challenges to All-Electric Buildings

- Unclear permitting process for laundry-to-landscape and greywater - clients interested but lack of info
- Lack of understanding at City council level
- Need a program to help maintain enrollment in CPA 100% tier
- City needs to identify interests and lobby at the state level to get incentives and laws to allow beneficial tech

Other Ideas on All-Electric Buildings

- City should review Measure O monies to provide funding for mitigation programs
- Incentives need to be designed to support the cost differences between SFR and MF
- Greywater opportunities could provide work for former NG plumbers
- Require solar PV and solar thermal if not electric
- Mandate EV to grid bidirectional chargers - Ford F150 could serve as a battery to power your home - advocate to the CPUC

Station 2: Water

Multi-Benefit Water Strategies

- Landscaping choices that sequester carbon and are drought-friendly
- Lower Ventura River Groundwater Basin restoration and clean up

Station 3: Transportation + Land Use

Challenges to Active Transportation

- Street design really favors cars
- Walking / biking is difficult in most parts of Ventura
- Street parking takes up too much space that can be used for biking
- Need heat island mitigation measures
- Need DC chargers to support fast charging. Need to go beyond Level 2 chargers - need FAST chargers

Other Ideas Related to Transportation Emissions Mitigation

- More mass transit: it is currently not accessible enough
- Public education on sharing the road together
- Electrified postal fleet
- More funding for the Ventura Bike Hub
- Intentional communities formed around transit needs
- Minibus programs for seniors and youth
- Bike share

Station 4: Solid Waste

Ideas Related to Solid Waste

- Bagging food waste
- Food waste recycling at large events and facilities
- Use recycled plastic pallets instead of wooden pallets
- Reusable packaging/containers
- Higher cost of solid waste collection to disincentivize waste generation

Station 5: Climate Hazards

Ideas Related to Climate Hazards

- Establish cooling areas for people to take refuge
- Repave with cool pavements and plant trees
- Do not allow development of houses in the shoreline at all
- Need leadership at Council, school boards, special districts who will actively engage with the topic (and educate themselves)
- Motivating/engaging with youth will produce the big political change
- Get back to basics: Natural habitat corridors, remediation, gardens, homesteads will help create a healthy environment and connected ecosystem+ community
- Make sure there's enough funding to ensure parks, rivers, and beachfront are maintained for public benefit
- More education at community colleges to help people get into the green job market (solar install, tankless water heaters, etc.).
- Partner and City should do a public literacy campaign for all ages, and especially students
- See City of Berkeley
- Pair CARP with budget/incentives
- Public maps of where the hazard areas are

Appendix A: In-Person Open House Boards

Figure A - 1. Station 2

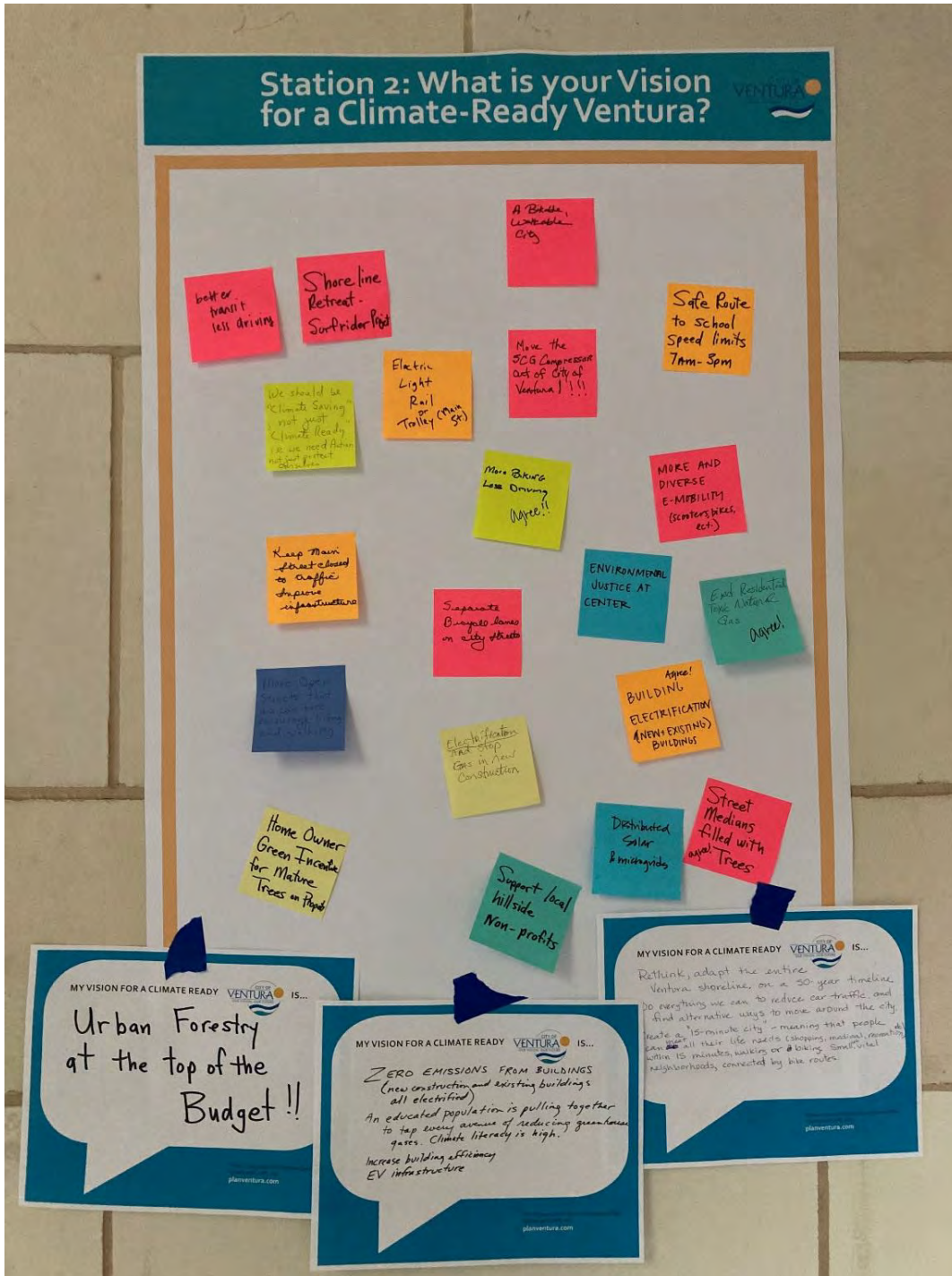
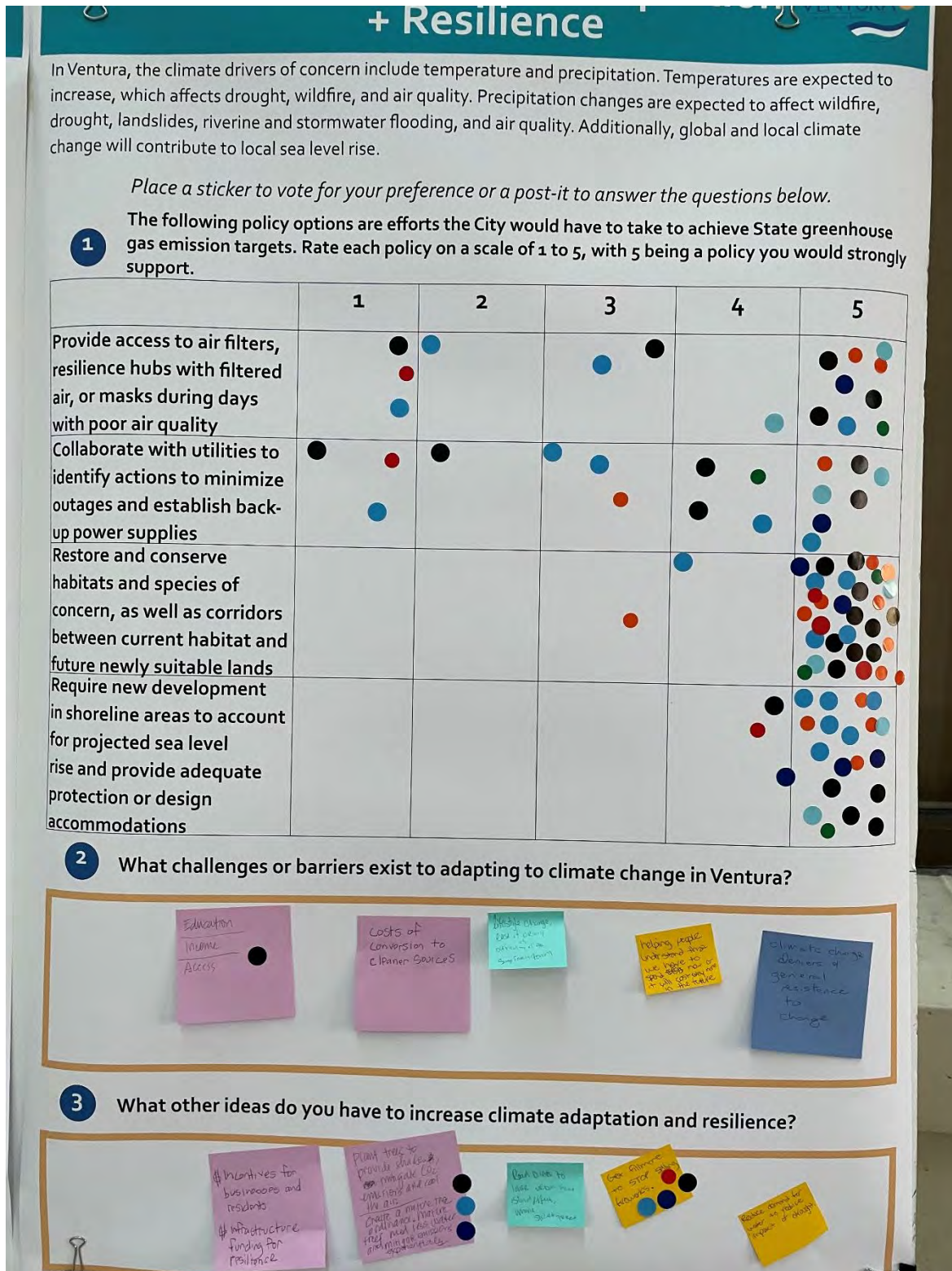


Figure A - 6. Station 7



Appendix B: Virtual Open House Boards

Figure B - 1. Clean Energy + Buildings

Clean Energy + Buildings

Energía limpia y los edificios

The energy used by buildings, including electricity and natural gas, is responsible for building sector emissions. Cleaning the energy supply through the installation of renewable sources, the removal of fossil fuel natural gas, and increased energy efficiency are the strategies to reduce building and energy emissions.

La energía utilizada por los edificios, incluida la electricidad y el gas natural, es responsable de las emisiones del sector de los edificios y construcción. La limpieza del suministro energético mediante la instalación de fuentes renovables, la eliminación del gas natural de origen fósil y el aumento de la eficiencia energética son las estrategias para reducir las emisiones de los edificios y de la energía.

Place a sticker to vote for your preference or a post-it to answer the questions below.
 The following policy options are efforts the City would have to take to achieve State greenhouse gas emission targets. Rate each policy on a scale of 1 to 5, with 5 being a policy you would strongly support.

1 *Coloca una calcomanía para votar por tu preferencia o usa un post-it para responder a las preguntas de abajo.*
 Las siguientes opciones políticas son esfuerzos que la ciudad tendría que realizar para alcanzar los objetivos estatales de emisión de gases de efecto invernadero. Califique cada política en una escala de 1 a 5, siendo 5 una política que apoyaría firmemente.

	1	2	3	4	5
Accelerate the phase in of carbon-free electricity before 2045 <i>Acelerar la introducción progresiva de electricidad libre de carbono antes de 2045</i>	●		●		●●●●
Prohibit natural gas in new construction homes and businesses <i>Prohibir el gas natural en los hogares y negocios nuevos</i>	●				●●●●●
Incentivize new construction to exceed energy and water efficiency standards <i>Incentivar las nuevas construcciones para que se superen las normas de eficiencia energética y del agua</i>	●			●	●●●●●
Incentivize then phase in a requirement to retrofit existing homes and businesses to be all-electric. <i>Incentivar y luego introducir gradualmente la obligación de adaptar las viviendas y empresas existentes para que sean totalmente eléctricas</i>	●				●●●●●

2 **What challenges or barriers exist to transition to efficient and/or all-electric buildings?**
¿Qué retos o barreras existen para la transición a edificios eficientes y/o totalmente eléctricos?

3 **What other ideas do you have to reduce energy and building emissions?**
¿Qué ideas tiene para reducir las emisiones de energía y de los edificios?

Figure B - 2. Water

Water Agua

Although water emissions account for less than 1% of Ventura's total, it is important to reduce water use and transition to reliable, alternative sources in order to build community resiliency to drought, ensure future supplies, enhance quality of life, and reduce GHG emissions.

Aunque las emisiones del agua representan menos del 1% del total de Ventura, es importante reducir el uso del agua y la transición a fuentes alternativas y fiables con el fin de aumentar la resistencia de la comunidad a la sequía, garantizar el suministro futuro, mejorar la calidad de vida y reducir las emisiones de GEI.

Place a sticker to vote for your preference or a post-it to answer the questions below.

The following policy options are efforts the City would have to take to achieve State greenhouse gas emission targets. Rate each policy on a scale of 1 to 5, with 5 being a policy you would strongly support.

1 *Coloca una calcomanía para votar por tu preferencia o use un post-it para responder a las preguntas de abajo.*
Las siguientes opciones políticas son esfuerzos que la ciudad tendría que realizar para alcanzar los objetivos estatales de emisión de gases de efecto invernadero. Califique cada política en una escala de 1 a 5, siendo 5 una política que apoyaría firmemente.

	1	2	3	4	5
Promote energy and water efficiency incentives from the utilities <i>Promover las incentivos a la eficiencia energética y del agua que ofrecen las empresas de servicios públicos</i>					
CALGreen Tier 1 or 2 efficiency standards for new construction and retrofits <i>Las normas de eficiencia CALGreen de nivel 1 o 2 para las nuevas construcciones y las adaptaciones</i>					
Provide alternative water supplies including local groundwater, recycled water <i>Proporcionar suministros de agua alternativos, incluyendo aguas subterráneas locales y agua reciclada</i>					
Streamlined permit process for laundry-to-landscape systems <i>Simplificación del proceso de autorización de los sistemas de lavandería a jardín</i>					

2 **What challenges or barriers exist to conserving water in Ventura?**
¿Qué retos o barreras existen para conservar el agua en Ventura?

3 **What other ideas do you have to reduce water related emissions?**
¿Qué ideas tiene para reducir las emisiones del agua?

Figure B - 4. Solid Waste

Solid Waste

Residuos sólidos

Most emissions related to solid waste result from decomposing organic matter. To reduce those emissions, State law Senate Bill 1383 requires organic waste, including food scraps, to be diverted from landfill. Another way to reduce emissions is to consume less, stop using single-use items, and recycle more.

La mayoría de las emisiones relacionadas con los residuos sólidos proceden de la descomposición de la materia orgánica. Para reducir esas emisiones, la ley estatal Senate Bill 1383 exige que los residuos orgánicos, incluidos los restos de comida, se desvíen del vertedero. Otra forma de reducir las emisiones es consumir menos, dejar de utilizar artículos de un solo uso y reciclar más.

Place a sticker to vote for your preference or a post-it to answer the questions below.
 The following policy options are efforts the City would have to take to achieve State greenhouse gas emission targets. Rate each policy on a scale of 1 to 5, with 5 being a policy you would strongly support.

1 Coloca una calcomanía para votar por tu preferencia o use un post-it para responder a las preguntas de abajo.
 Las siguientes opciones políticas son esfuerzos que la ciudad tendría que realizar para alcanzar los objetivos estatales de emisión de gases de efecto invernadero. Califique cada política en una escala de 1 a 5, siendo 5 una política que apoyaría firmemente.

	1	2	3	4	5
Promote local goods and services <i>Promover los bienes y servicios locales</i>					●
Make it easier to do neighborhood projects that promote sharing and reusing, like little libraries <i>Facilitar la realización de proyectos vecinales que promueven el intercambio y la reutilización, como las pequeñas bibliotecas</i>					●
Single-use food service ware ban <i>Prohibir los utensilios de un solo uso para el servicio de alimentos</i>					●

2 What challenges or barriers exist to reducing waste and using less plastic?
¿Qué retos o barreras existen para reducir los residuos y utilizar menos plástico en Ventura?

3 What other ideas do you have to reduce solid waste emissions?
¿Qué ideas tiene para reducir las emisiones de los residuos sólidos?



August 16th, 2022

Dear Raimi & Associates,

This report meets CAUSE's subconsultant agreement to hold focus groups as part of the Climate Action and Resilience Plan Engagement. CAUSE conducted Adult and Youth community focus groups on the Westside of Ventura on the dates of July 28th & 29th. The findings from those two groups focused on the City of Ventura's efforts to form a Climate Action & Resilience Plan for Ventura residents and the feedback received from both youth and adults on the obstacles of mitigating climate change locally.

The summary below of the focus groups provides insight on what community members are most concerned about and interested in when discussing climate change issues and are detailed in the full report:

1. Although the Adult and Youth focus groups were on separate days, similar themes were brought up and talked about by both groups. The main focus for these groups were **Clean Energy and Buildings** along with **Land Use/Transportation**. Key themes and responses from both groups noted that although moving towards renewable energy in homes and businesses is a great solution, it is a costly alternative that isn't always accessible or available to all in the community. An emphasis was made on renters who don't have control over when changes such as switching to electric stoves and ovens, solar panels, and electric water heaters could happen simply due to the decisions made by their landlord. Community members with lower incomes don't have the luxury to think about these options when looking for a place to live. Although they support these alternatives, their top priority is finding what works for them financially.
2. Participants also shared their struggles with different forms of transportation outside of personally owned vehicles. Alternative transportation methods such as walking, biking, using public transportation, and switching to electric vehicles were all areas of concern for the attendees. Many mentioned that time plays a big role on how they choose their transportation mode as many youth and adults stated they preferred personal vehicle use.

Participants expressed concerns over transportation safety, sharing stories of stress from taking public transportation during the COVID-19 pandemic. Participants also shared safety concerns over streets and bike lanes in need of repair and the lack of adequate bike infrastructure for those choosing to cycle on the Westside of Ventura.

3. Lastly, participants recommended various solutions to benefit the needs of their community if the city of Ventura is serious about mitigating their contribution to climate change. They suggested that the community be informed about the effects of climate change, what contributes to climate change in their own communities, and financial support for home appliances or renovations that promote clean energy but are costly.

CAUSE Climate Action & Resilience Plan Focus Groups Results

On July 28th & 29th, CAUSE held community focus groups engaging Ventura residents at the Bell Arts Factory on Ventura's Westside. The purpose of these focus groups was to gauge the level of awareness, concern, and feedback from community members on the topic climate change in Ventura and possible solutions moving forward. The focus groups included 15 English-speaking youth and young adults who participated on July 28th and 14 Spanish-speaking adults on the second day July 29th. CAUSE first presented a brief powerpoint on the meaning of climate change, what



contributes to climate change, and the different issues that contribute to climate change locally in their communities. After being briefed on the goal for these focus groups, participants were divided into two groups and given different issue areas to discuss. CAUSE staff facilitated each group with one focusing on **Clean Energy and Buildings** and the other on **Land Use/Transportation**. The facilitators switched between the two groups to make sure all participants were able to give feedback on both topics. Below are the

common themes and differences discussed, followed by the description of each focus group.

The Cost of Electric Appliances

The common theme between both Youth and Adults discussions showed agreement that a major barrier in shifting from gas powered home appliances to more energy and water efficient appliances as well as 100% renewable electricity at home is the barrier of cost and lack of affordability for many low-income families. CAUSE facilitators asked a number of questions, “What are barriers/difficulties for you and your family to choose 100% clean energy through CA Power Alliance?”, “What are barriers/difficulties for you and your family to switch to energy & water efficient appliances?”, and “How do you think the city should take into account frontline communities when creating goals around energy and gas?”.



Renters Face Additional Burdens: While both adults and youth thought the idea of going all electric in homes was a good way to reduce Ventura’s greenhouse gasses, renters faced additional barriers of costs and affordability. Participants who are renters shared that making the transition seemed particularly difficult for low-income families who are already struggling financially due to the housing crisis and high inflation. Participants also worried that costs for landlords required to upgrade their appliances would be passed down to renters via higher rent costs in a time when rent costs are alarmingly high. Many participants felt that if it was optional, they would be more inclined to keep using gas powered appliances rather than electric if it meant they would pay less monthly. The adult groups in particular went into more detail explaining that currently electricity is more expensive than gas and if their stoves, water heaters, and furnaces were upgraded to be all electric, they fear potentially paying more for the actual appliances (if homeowners) while also paying more in their monthly electricity bill.

Solutions discussed included protections like rent control to ensure any new greenhouse gas reduction policies adopted would prevent landlords from passing the cost to renters who already pay steep rents and avoid further displacement. Other suggestions for a just transition to clean energy and ways to center frontline communities are to: 1) prioritize rebates, grants and other

appliance replacement programs for low-income homeowners and landlords, 2) limiting the penalization of low-income renters and homeowners, and 3) placing a tax on the wealthiest residents and high polluting corporations and businesses which cause a higher proportion of emissions.

Other barriers that adults expressed on switching from electric to gas included the difficulty for people changing an appliance they have been using for decades and the belief and/or perception that “electric stoves don’t work” or cook in the same way as gas stoves and that “the food doesn’t taste the same.”

Lack of Information About Renewable Energy

The second barrier that was most talked about was the lack of accessible information in general about the topic of climate change, specifically what climate change is, how it affects the residents of Ventura and also the lack of availability of information in Spanish for the Latinx community. The adults expressed that if the community was better informed about the Clean Power Alliance-what it is, how it works and the benefits to our health and our environment-that more people would be willing to make the switch even if it’s a little more expensive. Adults also shared that the term “clean energy” is something they had not heard of before. They didn’t know it was related to how energy was being generated so more background needed to be discussed on where our current electricity comes from and how renewable energy is considered “clean” due to the fact that it doesn’t contribute to greenhouse gas emissions compared to coal, oil and gas. Prior to the facilitator explaining the concept, certain adults thought it was a way to have our electricity undergo a cleaning process and that’s what makes it “clean”.

Focus Group participants brought up costs again as a barrier for families who are struggling financially and suggested the need for programs that focused on low income households that would allow reimbursements for these families to make the switch to 100% renewable energy. However, all youth and adults in the focus groups were surprised and glad to hear that the Clean Power Alliance offers two other options where 50% and 40% of the energy comes from renewable sources and that those were the same cost as Edison’s rates or a little less expensive. Youth talked about the importance of knowing how much more it would be to switch to 100% renewable energy to see if a family could afford it because they were unsure of the impact of the 7-9% increase in cost for families. Lastly, adults brought up renters having additional barriers such as those renting a room or who are not on the lease not having a say on which provider and what tier to choose if part of Clean Power Alliance.

Additional Comments Re: Clean Energy & Climate Change

Youth Comments and Questions:

- Is the city doing anything to hold corporations accountable for their greenhouse gas emissions instead of just placing the responsibility on residents?
- Youth expressed and agreed that the City of Ventura needs to improve youth engagement related to climate change due to the following reasons:
 - Often youth are the voice for their parents' needs.
 - Youth and young adults are good messengers to share info with their parents and grandparents.
 - Climate change will have more of an impact on youth and young adults in their lifetimes and their kids' lives than their parents.
 - The information on climate change that is taught in school is very general and not local so it's not as engaging or personal-feels like it's not happening here.
 - Solutions talked about like wind and solar energy are too massive and there are no ways to engage locally in climate actions.
 - Frustrated that climate change decisions being made don't take youth into account just because they are not of voting age (ex: Local Measures A and B on June 2022 Primary ballot for Ventura County)

Adult Comments and Questions:

- What's going to happen to the old appliances and the additional waste it's going to create in our landfills?
- Need more information and engagement from folks that live on the Westside/Avenue, especially in Spanish to bring more awareness about this topic and any programs that come out of it.
- Find it helpful when different programs from either the government or utility companies are explained in person such as when people go knocking on doors to inform people and offer free upgrades to their homes.

Current Issues with City Land Use and Transportation

During the **Transportation** and **Land Use** discussion, groups were asked the following:

1. What are barriers/difficulties to use our personal cars less and rely on walking?
2. What are barriers/difficulties to use our personal cars less and rely on biking?
3. What are barriers/difficulties to use our personal cars less and rely on public transportation?
4. How do you think the city should take into account frontline communities when creating goals around transportation, example: have requirements related to driving less, etc?

CAUSE's goal was to understand why participants rely on personal vehicle use and what changes they would suggest to increase the use of alternatives to driving. Common barriers participants shared were time management, safety concerns, and street accessibility.

Adult Focus Group Responses:

During the Adult focus group discussion, the majority of the participants stated time was the defining factor on why personal car use was their preferred mode of transportation. When talking about walking and biking locally, most responded by stating that in the Westside of Ventura the lack of bike lanes and street space was the biggest issue. Some adults enjoy biking recreationally but feel unsafe doing so in other circumstances due to the



lack of designated bike lanes on many streets around their homes. It was also noted that many streets on and around the Westside lacked upkeep and were either too small/narrow to walk comfortably on. In general, walking and or biking was more of a recreational activity rather than a reliable form of transportation for work, social gatherings, or shopping trips because other alternatives take too long or are not practical to meet the needs for their family.



Only a few of the participants used public transportation consistently but out of the two who did, their biggest concern was safety and time. The COVID-19 pandemic and restrictions that followed caused many changes in public transportation such as limiting the number of people allowed on buses at one time, the routes available to regular commuters, and lack of bus drivers that consequently lengthened the wait times. Many participants stated that they avoided taking public transportation due to

COVID concerns and these concerns still worry them to this day. Infrequent and overcrowded buses also caused participants to have long wait times including having to wait for the next available bus, causing time conflicts with their work or other priorities.

Possible Solutions:

Participants from the Adult focus group suggested different improvements that the city could do to incentivize the use of walking, biking, or public transportation. These suggestions included:

1. Improve and maintain sidewalks and streets (Ex. cracked roads, old streets, new layouts).

2. Add accessible bike lanes or create wider streets for walking.
3. Improve and expand the city's bus routes and safety protocols.
4. Put more crosswalks on busy streets/neighborhoods.
5. Increase wages for public transportation employees to address the shortage of drivers in Ventura.
6. Lower the fares for public transportation.

Youth Focus Group Responses:

Participants in the Youth focus group had similar sentiments on walking, biking, and using public transportation in Ventura. The majority of participants stated they most often rely on rides provided by their parents or guardian in their personal car to go to school or for other activities. Many participants mentioned that walking was mainly recreational but not a daily option due to time constraints when traveling to school. Biking was often not seen as a viable option due to safety concerns such as the lack of bike friendly infrastructure and lack of bike lanes in certain neighborhoods. In addition, parents and guardians often do not allow youth to bike in certain places because of these same safety concerns. Many stated that if there were designated bike lanes in more areas of Ventura, and not just midtown or the Eastside of Ventura, their choice to use bicycles in their daily routines would increase.

Lastly, use and recommendations of public transportation varied among the youth participants. Many of the youth don't have an accessible bus route to get to school and they thought most trips were too far or would take too much time out of their day to rely on the bus. Those who do rely on public transportation had similar experiences as the adults; buses are often maxed out on capacity due to students needing it after school ends and they often have to wait for a later bus to arrive or wait for their parents to pick them up by car. Youth participants also noted that afternoon activities such as finishing practice from sports or clubs would mean they would leave school at later times. Walking, biking, or taking public transportation during later times in the evening or even at night was also a safety concern and so parents or guardians often give youth rides



Possible Solutions:

Participants from the Youth focus group suggested different improvements that the city could do to incentivize the use of walking, biking, or public transportation. Listed below are the solutions that were suggested:

1. Create more bus school routes in different parts of the city.
2. Add more public bus routes around high schools to lessen the wait times.
3. Create safe bike lanes and routes for students to get to school.
4. Have the city or school provide loaner bikes.
5. Put in more crosswalks to make walking/biking safer and more accessible.

Accessibility to Electric Vehicles

Continuing the conversation with both youth and adults on various forms of transportation, we followed up with their previous responses and asked their opinion on electric powered transportation. Within this discussion, we wanted to learn more about what the community understood and felt about electric vehicles in the city of Ventura and in their personal lives.

We first spoke about what they thought of electric vehicles such as hybrid cars or fully electric cars and if these types of vehicles are an option in their lives. When speaking to both groups, none stated they owned an electric or hybrid vehicle, many did say they either knew a friend, coworker, or even family member who owned one. The majority of adults and youth stated that owning an electric vehicle was simply out of



their budget, although they recognize the environmental benefits of owning an electric vehicle, they stated that overall owning a gas powered car was more economical. Here are the reasons that were stated as barriers to owning an electric car:

1. Too expensive to buy a new electric vehicle.
2. There are not enough charging stations around the city.
3. Paying more for electric services such as charging stations and electricity bills.
4. Many stated their electricity bills are being raised and want to avoid heavy usage at home.

Possible Solutions:

Next, we asked their thoughts on the city of Ventura's use of gas and electric powered vehicles. We wanted to know what they thought should be done or changed in heavy industries that pollute different communities. Listed below are thoughts that were stated by both groups:

1. Introduce electric buses or hybrids for public transportation.
2. Impose taxes on big industries and corporations.
3. Electric trailers (Some stated this is already being done in Europe).
4. Stipends or rebates for those who opt to buy an electric vehicle.
5. Support from the city for significant changes to electrifying the communities personal transportations methods.

Overall, the majority of participants stated that going all electric was too much of an obstacle at the moment. The price of a new electric vehicle, electricity bills, local charging accessibility, and lack of support from the city or corporations are the defining factors. Although both youth and adults recognize the importance of going electric to reduce emissions, at the moment the cost to make that change is too high.



Event Conclusion:

Our overall assessment of the focus groups CAUSE held on the dates of July 28th & 29th was that community members who attended found value in discussing and providing personal experiences about the issues of climate change in the city of Ventura. The support and roles from each staff member, Youth Fellow, and Intern contributed to productive and organized community discussions. Hosting the event in one of the most impacted neighborhoods in the city where many of the participants who attended reside was important for us to reach our participant goal and to make sure community members who are most impacted had the opportunity to give their personal feedback.

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Appendix C

Social Vulnerability Assessment Methodology

Understanding how place, demographics, and socioeconomic status contribute to climate change vulnerability may help identify avenues for policy and/or programmatic interventions. This assessment draws on existing literature on the subject to illustrate the geographic distribution of vulnerability in the City of Ventura. Specifically, this memorandum outlines an approach to assess the vulnerability of Ventura residents to extreme heat, wildfire, and sea level rise. It proposes a series of variables to include in the assessment, defines a methodology for combining them, and shows the final analysis.



Literature Review

Raimi + Associates conducted a brief literature review of climate change vulnerability to inform the City of Ventura’s Social Vulnerability Index. Overall, there are many social, economic, and environmental factors that influence community and individual vulnerability to climate impacts and their ability to adapt to climate change.

For example, outdoor workers are at greater risk of heat stroke and related illnesses from extreme heat events, lower income residents have fewer resources to repair flood or fire damage and may live in poor housing conditions, and people with limited English language proficiency are less likely to access programs that could help during or after an extreme weather event. Moreover, individual biological factors, such as age or health status, can amplify a population’s sensitivity to climate change.

Furthermore, communities of color are often burdened with multiple, overlapping factors that cumulatively impact their ability to adapt or respond to climate change. Structural and institutional racism in economic, government, and social systems has resulted and continues to result in the disproportionate distribution of climate burdens and exposures, such as a low concentration of tree canopy coverage and a high concentration of impervious surfaces. In addition, a growing body of social epidemiological research has found that repeated experiences of racism become biologically embedded in the body and results in “weathering” or premature physiological deterioration, which in turn increases a population’s sensitivity to climate hazards.

Model Indices

As part of the literature review, four indices that measure social vulnerability and disadvantage were assessed to inform the City of Ventura’s Social Vulnerability Index. All four indices are publicly available and utilize data from several verified sources of information.

Social Vulnerability Index

The Social Vulnerability Index was developed by the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) to help public health officials and local planners better prepare for and respond to emergency events, like hurricanes, disease outbreaks, or exposure to dangerous chemicals. This index includes fifteen indicators from the U.S. American Community Survey, which are organized into four domains: socioeconomic status, household composition, race/ethnicity/language, and housing/transportation. Overall index scores are calculated on a percentile rank basis by ranking census tracts in comparison to all other census tracts in the state and in the nation. The index is commonly used to identify communities that will need support before, during, or after natural disasters and public health emergencies.

CalEnviroScreen

In California, disadvantaged communities are often identified through the California Environmental Health Screening Tool (CalEnviroScreen), which is a statewide index developed by the Office of Environmental Health Hazards Assessment (OEHHA) and California’s Environmental Protection Agency (CalEPA). In 2021, OEHHA and CalEPA released version 4.0 of the tool, which includes data on 21 indicators at the census tract level that are organized into four categories: pollution exposures, environmental effects, sensitive populations, and socioeconomic factors. CalEnviroScreen’s overall index scores are calculated relative to all census tracts in California and are not on an absolute numeric basis.

Based on guidance from the Governor’s Office of Planning and Research, disadvantaged communities are identified as the top 25% scoring census tracts in comparison to all other census tracts in the state. Overall, CalEnviroScreen helps jurisdictions to identify communities disproportionately burdened by multiple sources of pollution.

Climate Change and Health Vulnerability Indicators (CCHVIs)

The CCHVIs is a data visualization platform developed by the Climate Change and Health Equity Section at the California Department of Public Health (CDPH). The platform provides data on nineteen climate change and health indicators, which are organized into three domains: environmental exposures, population sensitivity, and adaptive capacity. Although CCHVIs is not itself an index, it provides information to better understand the people and places in California that are more susceptible to adverse health impacts associated with climate change, specifically extreme heat, wildfire, sea level rise, drought, and poor air quality.

Healthy Places Index

The California Health Places Index (HPI) is a weighted index of twenty-five healthy community indicators developed by the Public Health Alliance of Southern California. Indicators are organized at the census tract level into eight domains: economic, education, transportation, social, neighborhood, clean environment, housing, and healthcare access. Indicators are standardized into z-scores and averaged for each domain, and the overall scores are calculated as the weighted sum of all domain scores. Unlike other indices that measure vulnerability, higher scores indicate greater health conditions relative to the rest of California. Overall, the HPI is a comprehensive tool for measuring health equity and is used by many public health departments across California.

Variables and Methodology

Social Vulnerability Index

Based on the results of the literature review, Raimi + Associates compiled a list of social, economic, and environmental indicators commonly associated with climate change vulnerability. This preliminary list was further refined by prioritizing cross-cutting variables that applied to at least two distinct hazards. Fifteen vulnerability indicators were chosen for this analysis. Indicators were then sorted into five distinct risk categories: demographic characteristics, socioeconomic status, race and ethnicity, housing conditions, and neighborhood conditions. Table C-1 lists the proposed risk categories, vulnerability indicators, geographic scales, and data sources of the datasets to be included in the analysis.

Two units of geography are proposed for the social vulnerability analysis:

- **Census Tract:** A statistical subdivision of a county designated by the U.S. Census Bureau. A census tract has a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people. Census tracts are often used in demographic analysis because their optimum size allows for community-level data with low margins of error.
- **Census Block Group:** A small statistical subdivision of county designated by the U.S. Census Bureau. A block group has a population size between 600 and 3,000 people. Every census tract has at least one block group, and block groups are uniquely numbered within a census tract.

Table C-1: Social Vulnerability Indicators

Risk Category	Indicator	Geographic Scale	Data Source
Demographic Characteristics	Percent Age 65 or older	Block Group	ACS 15-19, Table B01001
	Percent Age 17 or younger	Block Group	ACS 15-19, Table B01001
	Percent with Any Disability	Census Tract	ACS 15-19, Table B18101
Socioeconomic Status	Percent Age 25 or older with less than a bachelor's degree	Block Group	ACS 15-19, Table B15003
	Percent of Households Below 80% of Area Median Income	Block Group	ACS 15-19, Table B19011
	Percent Agricultural Workers ²¹	Census Tract	ACS 15-19, Table C24050
	Percent Construction Outdoor Workers	Census Tract	ACS 15-19, Table C24050
Race and Ethnicity	Percent Population of Color	Block Group	ACS 15-19, Table B03002
	Percent Linguistic Isolation (speak English less than well)	Census Tract	ACS 15-19, Table C16001
Housing Conditions	Percent Renter-Occupied Housing Units	Block Group	ACS 15-19, Table B25003
	Percent Pre-1980 Housing	Block Group	ACS 15-19, Table B25034
	Percent Mobile Homes	Block Group	ACS 15-19, Table B25024
	Percent No Vehicle Households	Block Group	ACS 15-19, Table B25044
	Percent of Households with Housing Cost Burden	Census Tract	ACS 15-19, Table B25106
Neighborhood Conditions	Percent of Households Without Broadband Internet	Block Group	ACS 15-19, Table B28002
	Percent Impervious Surface	Census Tract	MLRC National Land Cover Database (2011)
	Percent No Tree Canopy ²²	Census Tract	MLRC National Land Cover Database (2011)

²¹ Note: The ACS does not have specific estimates for the number of farmworkers. The closest employment category available is "Agriculture, Forestry, Fishing And Hunting, And Mining". Thus, this category was used as a proxy for farmworkers.

²² Percent of area in the census tract not covered by tree canopy, weighted by population

Figure C-2: Social Vulnerability Assessment with SB 1000 Disadvantaged Communities

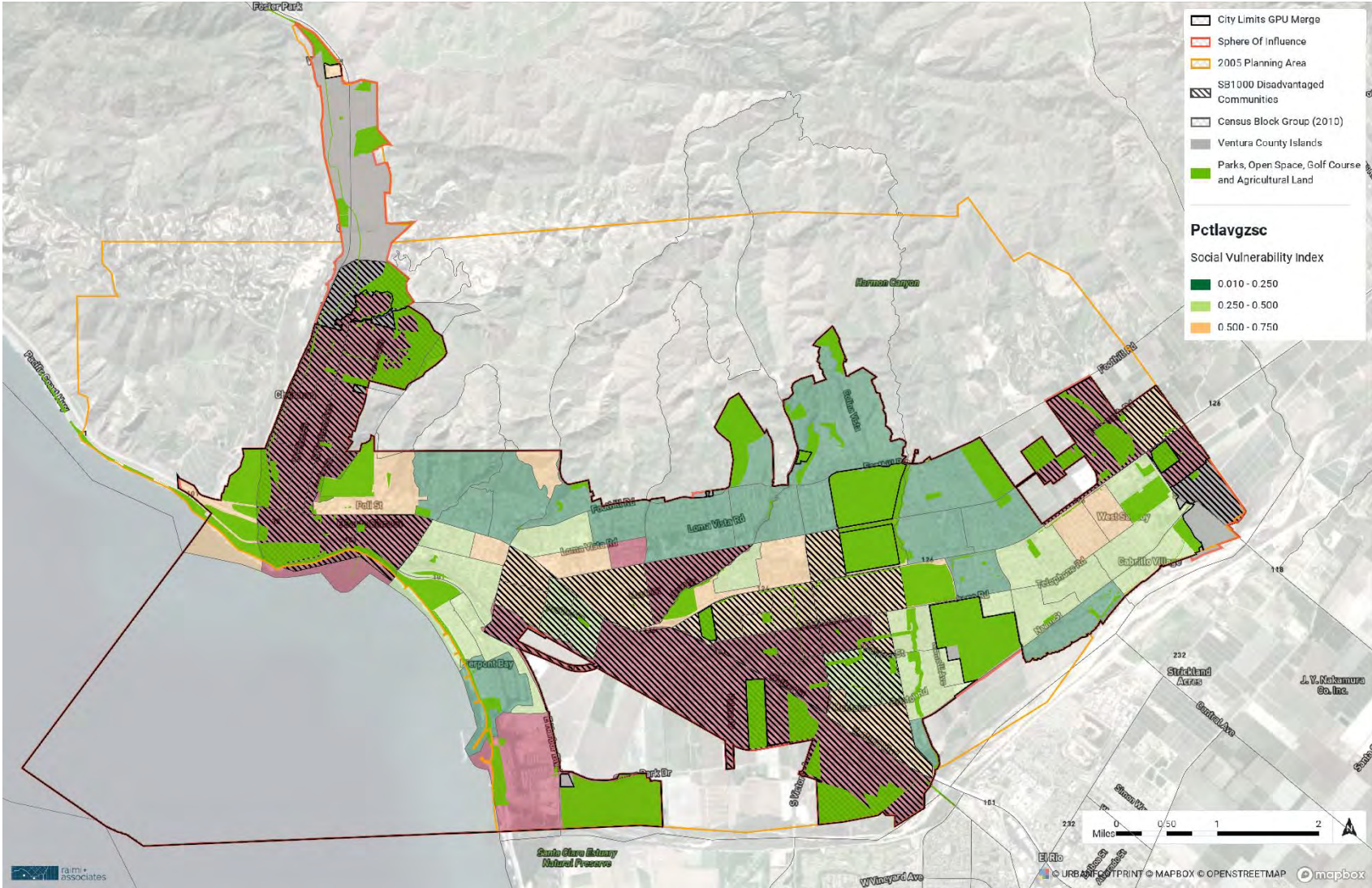


Figure C-3: Social Vulnerability Assessment with Fire Hazard Severity Zones

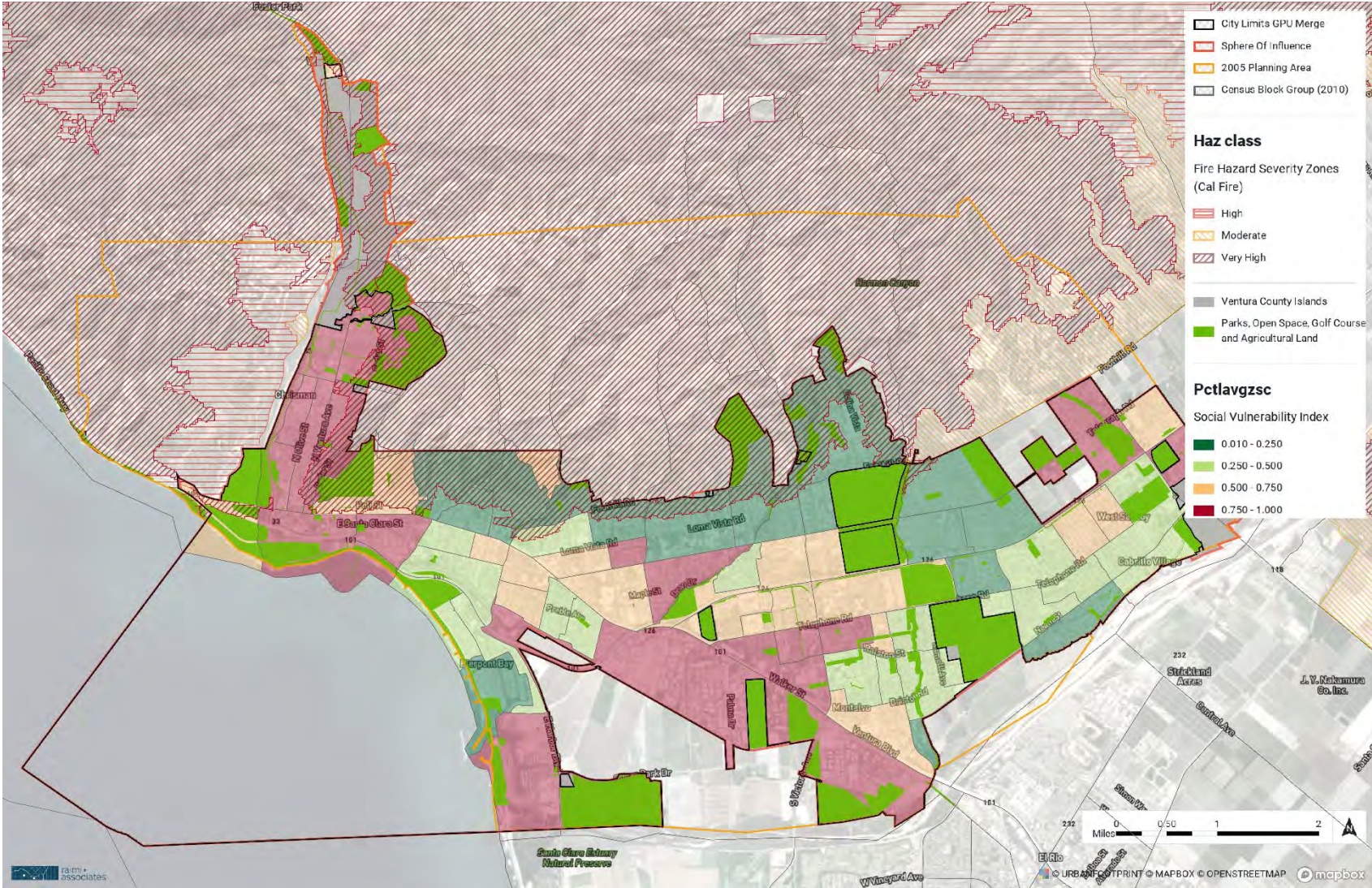


Figure C-4: Social Vulnerability Assessment with FEMA Flood Zones

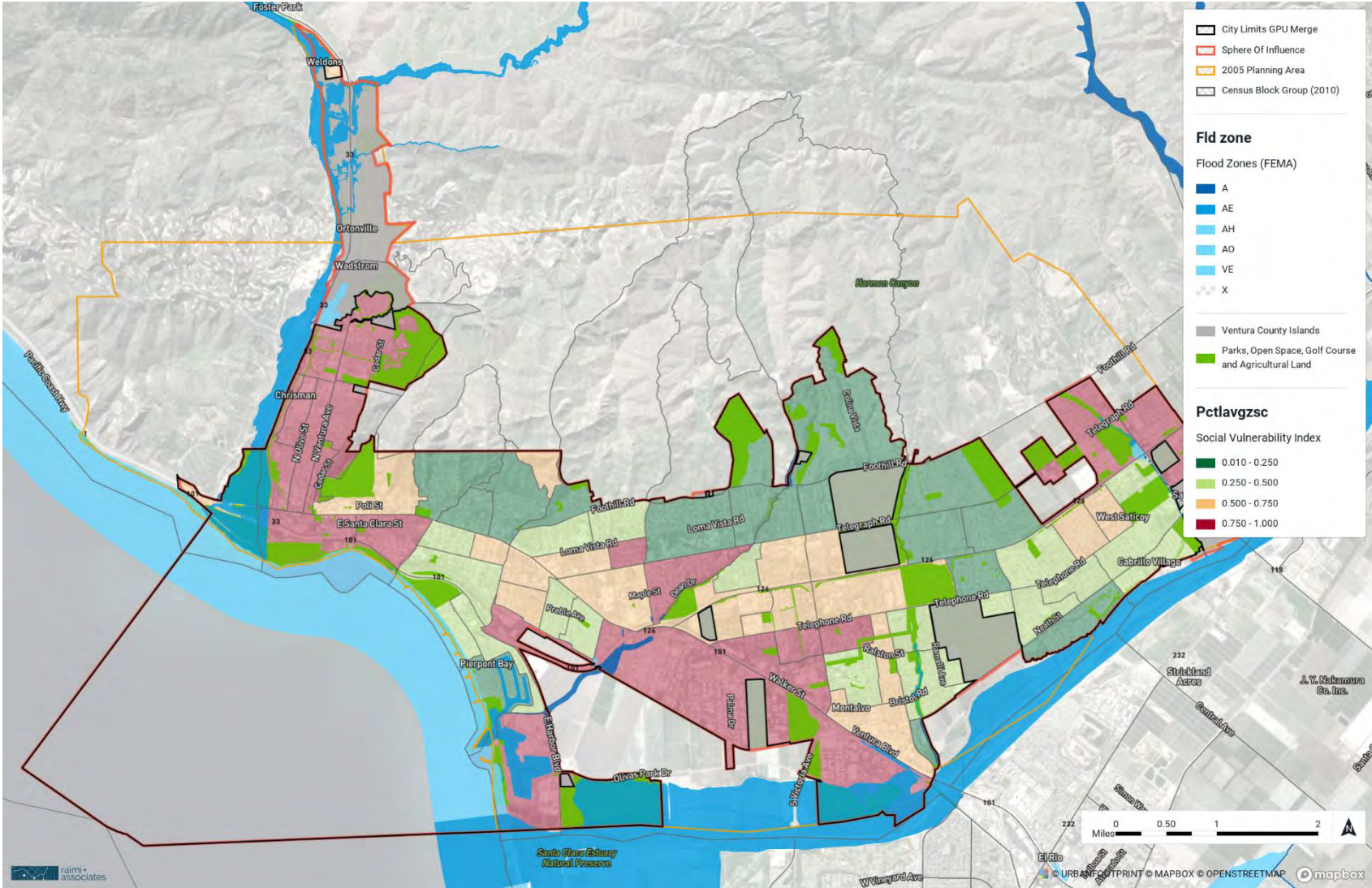
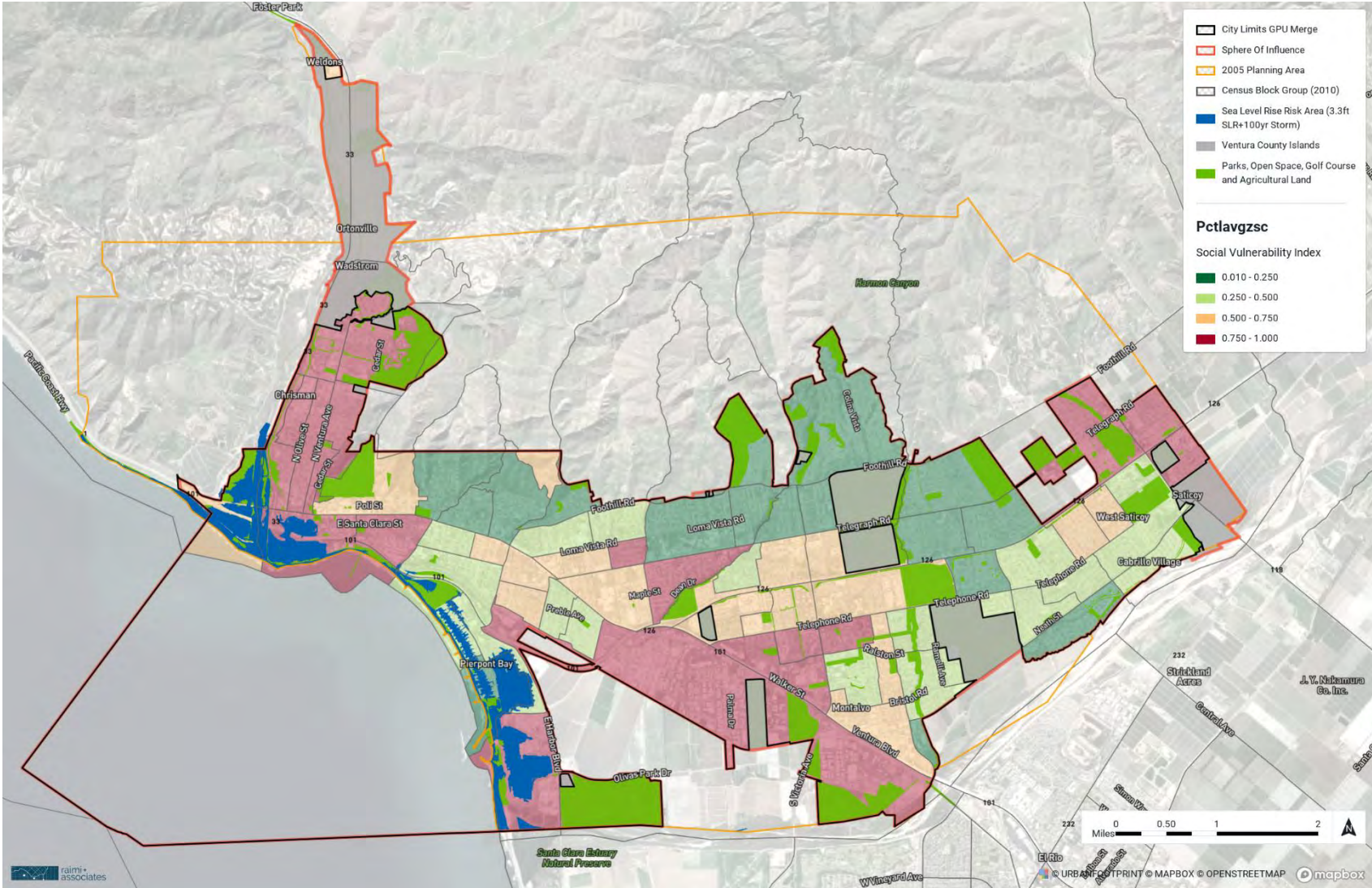


Figure C-5: Social Vulnerability Assessment with Sea Level Rise Inundation Zones



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Appendix D

Climate Change Vulnerability Assessment

This assessment evaluates how climate change may impact vulnerable community members, natural resources, buildings and facilities, and services and infrastructure in the City of Ventura. This report is consistent with Government Code § 65302 (as amended by Senate Bill (SB) 379) which requires cities, counties, and unincorporated areas across California to prepare a Climate Change Vulnerability Assessment to inform updates to the Public Safety Element of the General Plan. Understanding Ventura's vulnerabilities to climate change provides a foundation to develop required climate adaptation goals, policies, and implementation programs for the CARP and the City's Public Safety Element.



City of Ventura

Climate Change Vulnerability Assessment

July 2022

Prepared by
Rincon Consultants, Inc.

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1 Introduction

1.1 Background on Climate Change

This report evaluates how climate change may impact vulnerable community members, natural resources, buildings and facilities, and services and infrastructure in the City of Ventura. This report is consistent with Government Code § 65302 (as amended by Senate Bill (SB) 379) which requires cities, counties, and unincorporated areas across California to prepare a Climate Change Vulnerability Assessment to inform updates to the Public Safety Element of the General Plan. Understanding Ventura’s vulnerabilities to climate change provides a foundation to develop required climate adaptation goals, policies, and implementation programs for the City’s Public Safety Element. This report consists of the following:

1.2 City of Ventura Snapshot

The City of San Buenaventura is in Ventura County, California. Ventura is a coastal City set against the Pacific Ocean, undeveloped hills, and flanked by the Ventura River along its western edge and the Santa Clara River along its southern edge. The City is surrounded by the Transverse Range which are part of a large ecosystem comprised of hillsides, rivers, and seven miles of shoreline that provide rich habitat for many species. The Ventura region has been inhabited for thousands of years, initially by the Chumash, and was incorporated into a city in 1866 (County 2022).

The City borders the Pacific Ocean to the west, Oxnard to the south, Santa Paula to the east and Casitas Springs to the north. The County boundaries extend from Santa Barbara to Los Angeles along state route 101 and the City of Ventura encompasses an area of 32.09 square miles. In 2020, the City’s population was 106,276 (County 2022).

For most of the 20th Century, Ventura was economically sustained by its role in the region’s oil and agriculture industries. Today, the City of Ventura supports more diversified land uses with protected open spaces, managed parks, and extensive recreation opportunities. Beaches, museums, the harbor, the neighboring Channel Islands, and downtown areas attract over a million visitors annually. Oil and agriculture continue to provide economic stability, with diminishing importance, and County government currently remains the City’s largest employer (City 2005).

Causes of Climate Change

Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth’s surface raising global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry (NASA 2022). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years (IPCC, 2021). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2022).

1.3 Report Overview

1. **Introduction** provides a lexicon of terms used throughout the report and describes the methodology and key data sources used to prepare the Climate Change Vulnerability Assessment.
2. **Exposure to Climate Hazards** outlines climate drivers, relevant climate hazards, historical hazards events, how hazards are expected to change, and includes figures mapping climate hazards spatially across the City of Ventura.
3. **Sensitivity** identifies populations and assets most at risk to climate change.
4. **Adaptive Capacity** summarizes plans, policies, and programs that help the City of Ventura cope with climate hazard events.
5. **Vulnerability Analysis** describes potential impacts for each hazard based on sensitive community, natural, and built assets, with consideration given to their adaptive capacity. The chapter includes vulnerability scores of low, medium, or high for each population group and asset. See Vulnerability Scoring Methodology section below for more detail.
6. **Conclusion** presents the key findings of this report.

1.4 Lexicon

Several words and phrases are used throughout the plan to illustrate climate vulnerabilities within Ventura.

- **Adaptation.** The process of adjustment to actual or expected climate and its effects, either to minimize harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate (IPCC, 2012).
- **Adaptive Capacity.** Ventura’s ability to cope with and adjust to the impacts of climate change (Cal OES 2020).
- **Asset.** Referential to a resource, structure, facility, or service that is relied on by a community.
- **Cascading Impact.** Climate hazard caused impacts that compromise infrastructure or disrupt critical services (i.e., power supply or water conveyance) broadening the scope of impact past a singular subject to reliant subsystems and populations (Collins et al. 2019).
- average events occur simultaneously and increase the scope of impact or severity of the event; an additional risk brought about by increased frequency of events from climate change (Seneviratne et al. 2012).
- **Impact.** Effects on natural and human systems including effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure by interactions of climate hazards and the vulnerabilities of the effected (IPCC 2012).
- **Mitigation.** An act or sustained actions to reduce, eliminate, or avoid negative impacts or effects (Cal OES 2020).
- **Resilience.** The capacity of an entity (an individual a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (Cal OES 2020).

- **Climate Driver.** A change in the climate which acts as the main source of change for subsequent climate hazards. Climate drivers relevant to the City and discussed in this report are temperature and precipitation.
- **Climate Hazard.** A dangerous or potentially dangerous condition created by the effects of the local climate (Cal OES 2020). Climate hazards of concern for the City of Ventura are extreme heat, warm nights, chill hours, drought, wildfire, landslides, tule fog, riverine and stormwater flooding, and air quality.
- **Compounding Risk.** When two or more extreme events or
- **Sensitivities.** The degree to which a species, natural system, community, asset, or other associated system would be affected by changing climate conditions (Cal OES 2020).
- **Vulnerable Populations.** Vulnerable populations experience heightened risk and increase sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts (Cal OES 2020).
- **Vulnerability.** The propensity or predisposition to be adversely affected (IPCC 2012).

1.5 Vulnerability Assessment Methodology

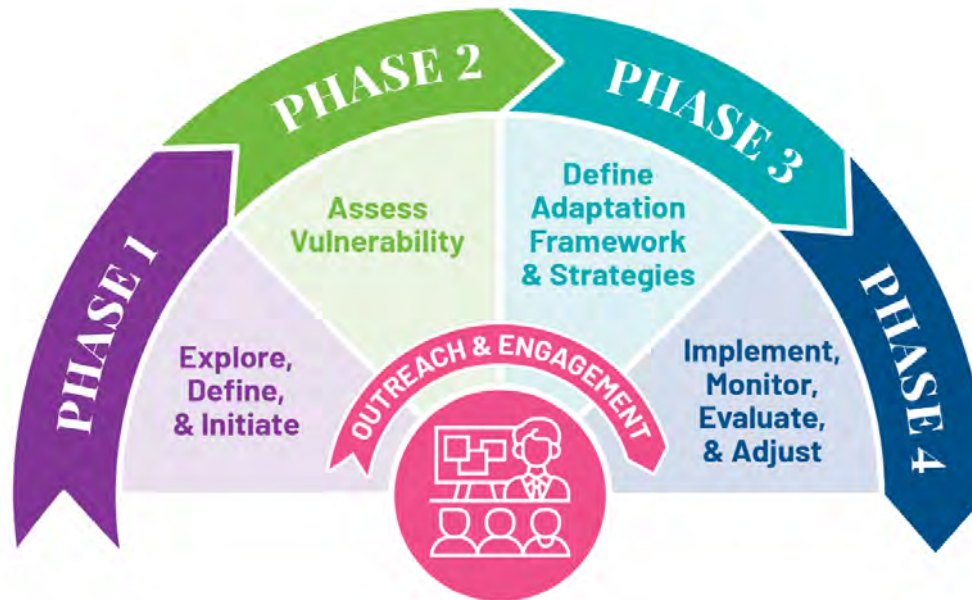
The following section details state guidance, methods, and sources used in the production of this report.

California Adaptation Planning Guide Phases

The City of Ventura Climate Change Vulnerability Assessment follows the vulnerability assessment process recommended by the California Governor’s Office of Emergency Services (Cal OES), as documented in the 2020 California Adaptation Planning Guide (Cal APG). The adaptation

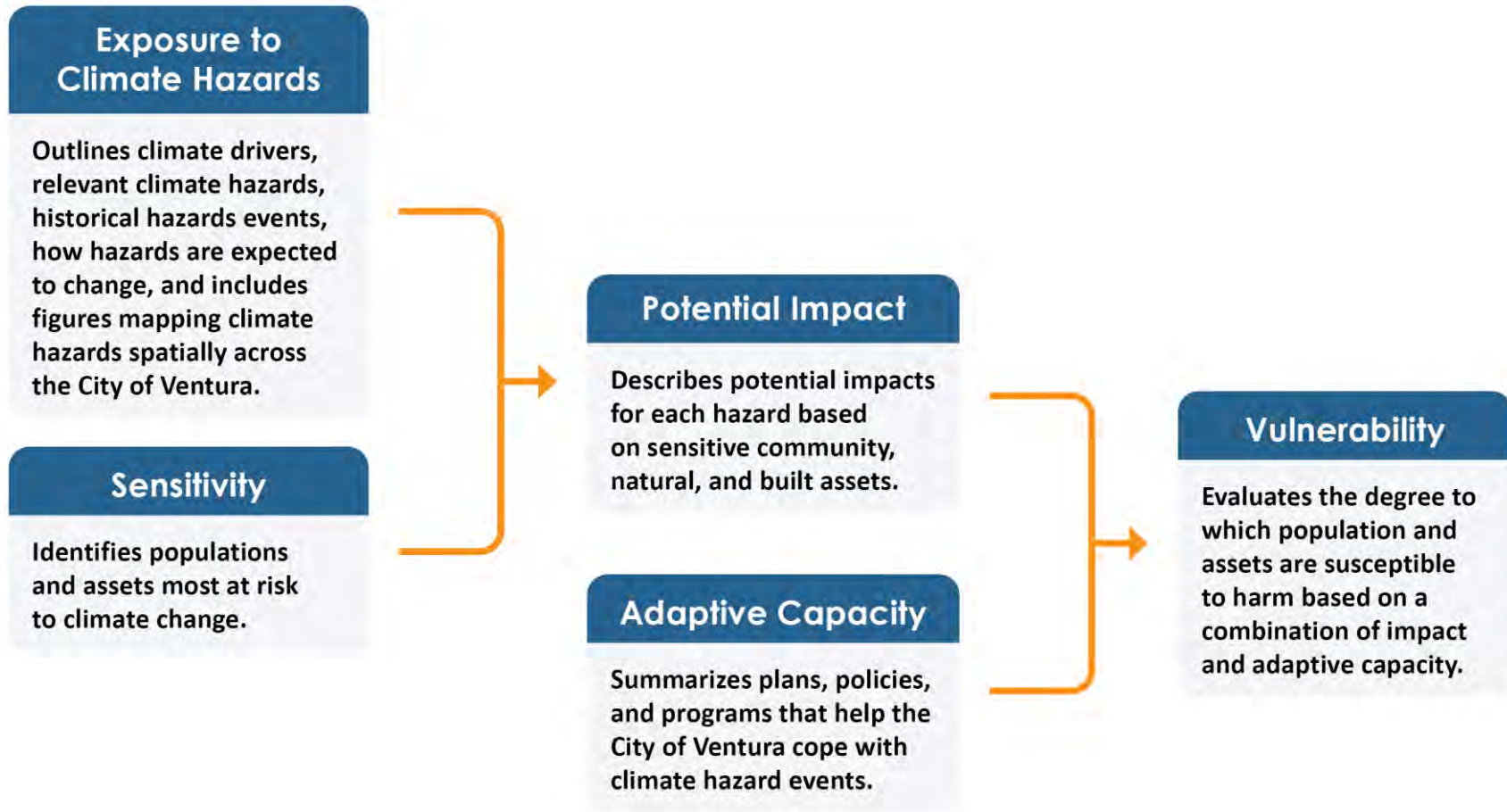
planning process outlined by the Cal APG consists of four phases, illustrated in the graphic below, with Phase 2 detailing the vulnerability assessment process (Cal OES, 2020). The City of Ventura Climate Change Vulnerability Assessment is prepared consistent with Phase 2 of the Cal APG (see Figure 1) and is composed of the following parts found in Figure 2.

Figure 1 California Adaptation Planning Phases to Assessing Vulnerability



Source: 2020 California Adaptation Planning Guide

Figure 2 Vulnerability Assessment Flow Diagram



Key Data Sources

The following data sources and tools, many of which are recommended within the Cal APG, were used in preparation of this report.

- **U.S. Census, 2015-2019 American Community Survey (ACS)** presents demographic data by census tract and was used to supplement the HPI percentile score. U.S. Census data was used to identify the percentage of the City of Ventura population that corresponds to each vulnerable group
- **Cal-Adapt** is an online tool that presents historic and modeled projections based on 10 different global climate models. The tool was developed and is maintained by the University of California with oversight from the California Energy Commission (CEC). This tool is used to present projection data related to minimum and maximum temperature, precipitation, extreme heat, warm nights, drought, and wildfire.
- **California’s Fourth Climate Change Assessment** was developed by the CEC and other State of California coordinating agencies to present up-to-date climate science, projections and potential impacts associated with climate change. The CEC and coordinating agencies developed nine regional reports to provide regional-scale climate information to support local planning and action. The Los Angeles Region Summary Report (2018) presents an overview of climate science, regional projections, specific strategies to adapt to climate impacts, and key research gaps needed to safeguard the greater Los Angeles area (including Ventura) from climate change. The Los Angeles Region Summary Report was used to understand regional changes that may affect the City of Ventura both directly and indirectly.
- **The California Healthy Places Index (HPI)** is an online mapping tool that reports on community conditions that are known to predict health outcomes and life expectancy. The tool was prepared by the Public Health Alliance of Southern California, a collaborative of local health departments in Southern California. HPI displays 25 community characteristics at various legislative boundaries, including census tracts and city and county boundaries. The community characteristics relate to the following identified Policy Action Areas: economic, education, housing, health care access, neighborhood, clean environment, transportation, and social factors. HPI applies a relative percentile score across all census tracts in California using statistical modeling techniques based on the relationship of the Policy Action Areas to life expectancy at birth. Low percentile scores reflect unhealthy conditions. HPI was used to prepare the social sensitivity index score as described in more detail below. HPI is a useful in providing both big picture and localized insights into community health. HPI was updated in the Spring of 2022 to include data averages from the U.S. Census 2015-2019 ACS.
- **The Nature Conservancy (TNC) Coastal Resilience Web Tool** is an online mapping tool showing potential impacts from sea level rise and coastal hazards designed to help communities develop and implement solutions that incorporate ecosystem-based adaptation approaches. This tool is available statewide but has detailed modelling for the Ventura area.
- **Ventura County Multi-Jurisdictional Hazard Mitigation Plan** presents information on existing processes and plans in place that address Ventura County and the City’s ability to prepare for climate change impacts and informed the adaptive capacity discussion of this report. The Multi-Jurisdictional Hazard Mitigation Plan (2022) was also used to identify recent historical events.

- **Ventura County Resilient Coastal Adaptation Project** The County of Ventura’s Resilient Coastal Adaptation Project (VC Resilient) uses best available science to develop a balanced and forward-thinking response to sea level rise. It considers various coastal hazards and has several web tools and story maps to help disseminate SLR information to the affected communities. The website contains many resources including related county ordinances, plans, projects, and tools. The associated **Ventura County Sea Level Rise Assessment** is specific to unincorporated Ventura County, however, information in the assessment pertaining to the broader Ventura region is included in this report.

Data Limitations

- The limitations of this report and analysis stem from gaps in data availability and completeness of data methods. Census data can miss portions of the population (e.g., homeless populations) and general demographic information may not accurately capture populations vulnerable to climate change (Cantwell 2021). Federal Emergency Management Agency (FEMA) 100-year and 500-year flood plains do not account for climate change projections, zones are instead based on historical information. The California Department of Forestry

and Fire Protection (CalFire) very high fire hazard severity zones are based on vegetation, fire history, and terrain but also has similar limitations, projections of future fire are not included (OSFM 2022). Extrapolating landslides and air quality hazard exposure data in the context of climate change is difficult and therefore expected exposures are likely to be underestimated.

- The data presented in **Cal-Adapt** tools are projections, or estimates, of the future. The limitation in these projections is that the long-term behavior of the atmosphere is expressed in averages – for example, average annual temperature, average monthly rainfall, or average water equivalent of mountain snowpack at a given time of year. The averages discussed often downplay the extremes by which daily weather events occur and when presented as an average, only show moderate changes within the climate. For example, what is using averages can result in an omission of the frequency of extremes. For example, in the case of like extreme weather events, atmospheric rivers may increase, while low-moderate intensity weather events decrease through the end of the century. In instances of modeled precipitation projections, an average maintains a quantification similar to historic levels which does not account for anticipated fluctuations in extremes (CEC 2021).

Vulnerability Scoring Methodology

Vulnerability scoring is a valuable step in the climate vulnerability assessment process because it identifies which assets and populations face the highest threat to climate hazards. This can aid in the prioritization of adaptation actions. The vulnerability score is a combination of the impact and adaptive capacity score and is

discussed in the Vulnerability Analysis section of this report. The impact and adaptive capacity scores are developed using a qualitative methodology outlined in the Cal APG, as seen in Table 1. Impact and adaptive capacity scores are identified for each asset and population for each climate hazard.

Table 1 Impact and Adaptive Capacity Scoring Rubric

Score	Impact	Adaptive Capacity
Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks capacity to manage changes; major changes would be required.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required.
High	Impact is highly likely based on projected exposure; consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required.

Source: Cal OES 2020

The vulnerability score is prepared by combining the two scores as demonstrated in Table 2. The range of potential impacts spans 1 through 5 with 4-5 being at highest threat.

Table 2 Vulnerability Score Matrix

Potential Impacts	High	3	4	5
	Medium	2	3	4
	Low	1	2	3
		High	Medium	Low
Adaptive Capacity				

Source: Cal OES 2020

2 Exposure to Climate Hazards

Climate change is a global phenomenon that can impact local health, natural resources, infrastructure, emergency response, and many other aspects of society. Projected changes to the climate are dependent on location. The Cal-Adapt tool provides climate data from global scale models that have been localized (downscaled) to 3.7 mile by 3.7-mile grids (CEC 2021). The data in Cal-Adapt is combined with information from the California Fourth Climate Change Assessment to model future changes in specific types of hazards within this report. Projections throughout this section are outlined by two separate Representative Concentration Pathways (RCPs) (CEC 2021).

- RCP 4.5 is a medium emissions scenario where global emissions peak by the year 2040
- RCP 8.5 is a high emissions scenario in which global emissions continue to rise through the end of the 21st century.

Additionally, projections are forecasted to mid-century (2035-2064) and end-century (2070-2099) as 30-year averages to be compared to a modeled historical baseline (1961-1990) (CEC 2021).

This section presents information on temperature and precipitation, which are characterized as climate drivers. The section then provides information on projected changes to natural hazards, including extreme heat and warm nights, drought, wildfire, landslides, riverine and stormwater flooding, air quality, and sea level rise, which result from changes to climate drivers.

2.1 Climate Drivers

In Ventura, the climate drivers of concern include temperature and precipitation. All projections are pulled from the Cal-Adapt Local Climate Change Snapshot tool and supplemented with the Los Angeles regional information found in the California Fourth Climate Change Assessment (CEC 2021, Hall et al. 2018).

Temperature

The average maximum and minimum temperatures are expected to increase in Ventura with mid-century projections showing a 3.5°F (RCP 4.5) to 4.3°F (RCP 8.5) increase in temperature maximum and minimums (CEC 2021). End-Century projections show a 4.5°F (RCP 4.5) to 7.1°F (RCP 8.5) increase in Ventura. Temperature increases affect extreme heat and warm nights, drought, wildfire, and air quality. Global temperature increases cause ocean temperatures to rise which expands ocean waters. Glaciers, ice caps, and ice sheets melt from rising temperatures which further contribute to sea level rise (Hall et al. 2018).

Precipitation

Ventura precipitation projections under RCP 8.5 demonstrate a 0.132-inch increase by mid-century and 0.289-inch increase by end-century in annual precipitation totals (CEC 2021). However, as already observed in recent decades precipitation changes are largely observed as more extreme variability with intensely wet years followed by extreme droughts (Hall et al. 2018). It is projected that the wettest day every year will increase by 25-30% by the end

of the century in some parts of the Los Angeles Region (Hall et al. 2018). There will be more dry periods punctuated by increased precipitation intensities of the largest storms or wet periods, producing little net change in precipitation totals but more extreme conditions (Hall et al. 2018). Precipitation changes are expected to affect wildfire, drought, landslides, riverine and stormwater flooding, and air quality.

2.2 Hazards

This section outlines projected changes for the following climate hazards:



Extreme Heat and Warm Nights



Drought



Wildfire



Landslides



Riverine and Stormwater Flooding




Air Quality



Sea Level Rise

Extreme Heat and Warm Nights


Extreme heat events are defined as days in which the daily maximum temperature exceeds the 98th percentile value of the historical average (CEC 2021). For Ventura, the threshold temperature is 91.9°F (CEC 2021). Increased frequency of extreme heat days can result in increased public health risks, which tend to be disproportionate for vulnerable populations such as those experiencing homelessness, outdoor workers, older adults, children, and individuals with underlying chronic diseases. These include increased likelihood of heat-related illnesses such as heat stroke, and vector-borne illnesses. Warm nights can further exacerbate the risk of heat illness because they affect the body's ability to cool after a day of heightened temperatures, which may be mitigated with at home cooling systems including fans, air conditioning, and proper insulation. Due to the cost of acquiring and utilizing these systems, disproportionate effects are experienced by those with economic disadvantages. High concentrations of impervious surfaces such as pavements and roofs coupled with minimal tree canopy and green space can increase urban heat effect. This effect can cause temperature increases in urban areas by multiple degrees and is further exacerbated during heatwaves (Hall et al. 2018). Ventura has historically experienced 4 warm nights a year and is projected to experience a mid-century total of 25 nights (RCP 8.5) and an end-century total of 26 (RCP 4.5) to 59 nights (RCP 8.5) (CEC 2021). Extreme heat can also damage roadways, overload electrical grid systems, and result in vegetation die-off or stress.




Extreme Heat

Ventura is expected to experience an increase in the number of extreme heat days, from 4 days annually to 7 days by mid-century and 9 days by end-century.


IMPACTS




**CRACKED
PAVEMENTS**



**GRID
OVERLOAD**



**HEAT RELATED
ILLNESS**



**VEGETATIVE
STRESS**

WARM NIGHTS

Ventura is expected to experience an increase in the number of warm nights, from 4 days annually to 18 nights by mid-century and 59 nights by end-century

Drought

Climate change will increase the likelihood that low-precipitation years will coincide with above-average temperature years. Warming temperatures increase seasonal dryness and the likelihood of drought due to decreased supply of moisture and increased atmospheric demand for moisture as evaporation from bare soils and evapotranspiration from plants increases. The increased moisture loss from soils and vegetation amplifies dryness during periods without precipitation. In California’s highly variable climate setting, climate models project less frequent but more extreme daily precipitation, with year-to-year precipitation becoming more volatile and the number of dry years increasing (Hall et al. 2018).

The duration of dry spells is projected to vary based on emissions scenario. Like patterns in precipitation some of the annual variability is obscured within 30-year averages. Despite this, the clear trend is for maximum lengths of dry spells to increase through the end of century (CEC 2021).

Drought can affect vulnerable populations as can suppress economic productivity throughout the Ventura region. Vulnerabilities for natural resources can include stressed vegetation and habitat depletion and populations may be more vulnerable to heat stress and dehydration (Hall et al. 2018). Additionally, sustained drought conditions can lead to dry, dusty conditions which can impact health, as discussed in the section on air quality below.

Drought

Research suggests that dry years in California are likely to occur successively, increasing risk of drought.

IMPACTS

- VEGETATIVE STRESS** (Icon: A tree with a cracked ground base)
- HABITAT LOSS** (Icon: A globe surrounded by warning signs and insects)
- WATER SCARCITY** (Icon: Wavy lines representing water levels)

PRECIPITATION DECREASE

Precipitation within Ventura is expected to increase steadily from 16.1 inches annually to 16.8 inches by mid-century, and 17.3 inches by end-century.

Wildfire

The occurrences of wildfires have increased significantly within California in frequency and intensity over the past two decades (Hall et al. 2018). For Ventura this trend is projected to follow through mid and end-century projections (CEC 2021). Wildfire events are a product of temperature increases compounded with precipitation declines creating wildfire prone conditions. Ventura County’s wildfires are influenced by Santa Ana Winds, downed power lines, and fuel availability (Hall et al. 2018). Areas in Ventura that are of significant risk to wildfire are located along the northern portion of the City. These areas are categorized as CAL FIRE very high fire hazard severity zones (VHFHSZ), shown in Figure 3. There are several critical facilities within proximity to the VHFHSZ including medical facilities, government buildings, fire stations, and the police station. Several roads and residential areas are also located within the City’s fire zone. Wildfires can create risk of injury, death, or financial hardship if personal property is damaged as well as physical damage to all other assets creating cascading risks for vulnerable populations when infrastructure is damaged or off-line. For example, individuals with chronic health conditions who rely on medical equipment for critical health care could be severely impacted by a wildfire-caused power outage. Since 2005 there have been 14 federal disaster declarations for Wildfire events in Ventura County, including the 2017 Thomas Fire which burned numerous structures and residences in the City of Ventura (County 2022).

Wildfire

Ventura is expected to experience an increase in the number of days with extreme wildfire risk, from 14 days annually to 63 days by mid-century and 113 days by end-century.

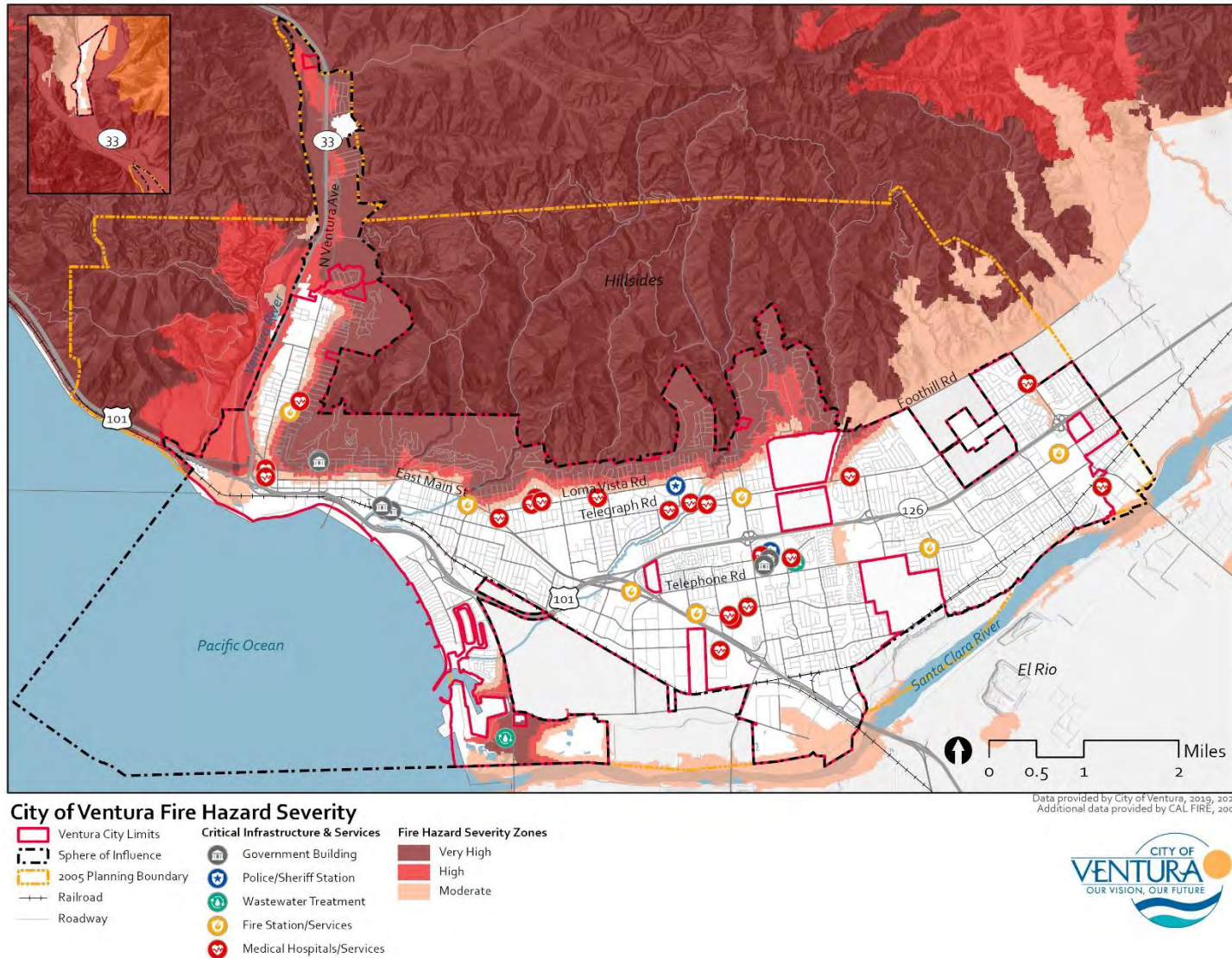
IMPACTS

- WORSENING AIR QUALITY** (Icon: Wind gusts)
- POWER DELIVERY DISRUPTION** (Icon: Lightning bolt and plug)
- STRUCTURE & PROPERTY DAMAGES** (Icon: Building with fire)
- PUBLIC HEALTH & SAFETY RISKS** (Icon: Shield with cross)
- HABITAT LOSS** (Icon: Globe with insects and warning signs)

HISTORIC WILDFIRES

Very dry air associated with Santa Ana winds was a catalyst for the Thomas Fire that devastated Ventura in December 2017.

Figure 3 Wildfire Hazard Severity Zones in the City of Ventura



Landslides

Triggered by extreme bouts of precipitation or wildfires, the susceptibility of the larger Ventura region to landslides is projected to increase as precipitation variability increases and wildfires increase in frequency, area, and severity (Hall et al. 2018). The Ventura Region is projected to experience increases to wildfire and precipitation and subsequently landslide-prone conditions (CEC 2021). Historically, landslides have occurred in the hillsides south of the Santa Clara River, and the east side of the Ventura River. Additional landslide prone regions in the City of Ventura overlap with wildfire zones (CDOC 2021). The Ventura County Multi-Jurisdictional Hazard Mitigation Plan ranks the risk for landslides as the highest of all other climate hazards for the City of Ventura. In 2017, The Thomas Fire burned over 500 homes in the City and left burn scars in the hillsides susceptible to landslides (County 2022). The susceptibility to deep-seated landslides is classified as high along most of the northern border of the City as well as along both sides of Highway 33. Specifically, the hillsides north of Poli Street/Foothill Road, and east of Ventura Avenue and Cedar Street contain several landslide prone areas and are likely to sustain future landslide activity (City 2021). The projected increase in precipitation extremes, alone and in combination with the projected increase in wildfires, creates increased overall potential for floods, mudslides, and debris flows in the City.

Landslides

Susceptibility of landslides in Ventura is projected to increase as precipitation variability increase and wildfires increase in frequency, area, and severity.

IMPACTS

- EROSION
- PROPERTY DAMAGE
- HABITAT LOSS
- HUMAN INJURY


Historical Debris Flows

Following heavy rains and winter storms, substantial debris flows have occurred in the Santa Clara River, Ventura River, as well as other local streams and culverts. Debris flows following wildland fires are particularly bad and can require removal of material from streams, streets, culverts, and beaches.

Riverine and Stormwater Flooding

Climate change may cause low-lying areas throughout Ventura to experience more frequent flooding and could increase the extent of 100-year floods, as seen in Figure 4. Stormwater systems may be overwhelmed more frequently as more extreme rain events occur, causing localized flooding which could impact properties and close streets. The Santa Clara and Ventura Rivers run through the City, as well as a series of seasonal watercourses called barrancas. FEMA regulates development along all City watercourses in the case of a 100-year flood event. While 100-year flood hazard zones for Ventura’s watercourses are relatively limited, the largest recorded flood event along the Santa Clara and Ventura rivers in 1969 exceeded the 100-year flood zone (Ventura GPU 2005). The Multi-Jurisdictional Hazard Mitigation Plan for Ventura County identifies flooding as a medium risk, and notes that numerous areas of the City are subject to flooding during periods of high rain. The impact of the flooding includes street closures, and damage to property, vehicles, and buildings (County 2022).

On record, there have been 23 flood events since 1954 that warranted Federal Disaster Declarations in Ventura County. These tend to occur in the winter and early spring following severe storms and/or wildfires and have become more frequent in recent history (County 2022). Flooding impacts cause physical damages from inundation, and can also have cascading effects on power, wastewater, and storm drainage infrastructure, exacerbating public health concerns (Hall et al. 2018).



Riverine and Stormwater Flooding

There are several FEMA 100 Year floodplains within the city limits of Ventura. Riverine and stormwater flooding is projected to increase as precipitation extremes increases.

IMPACTS





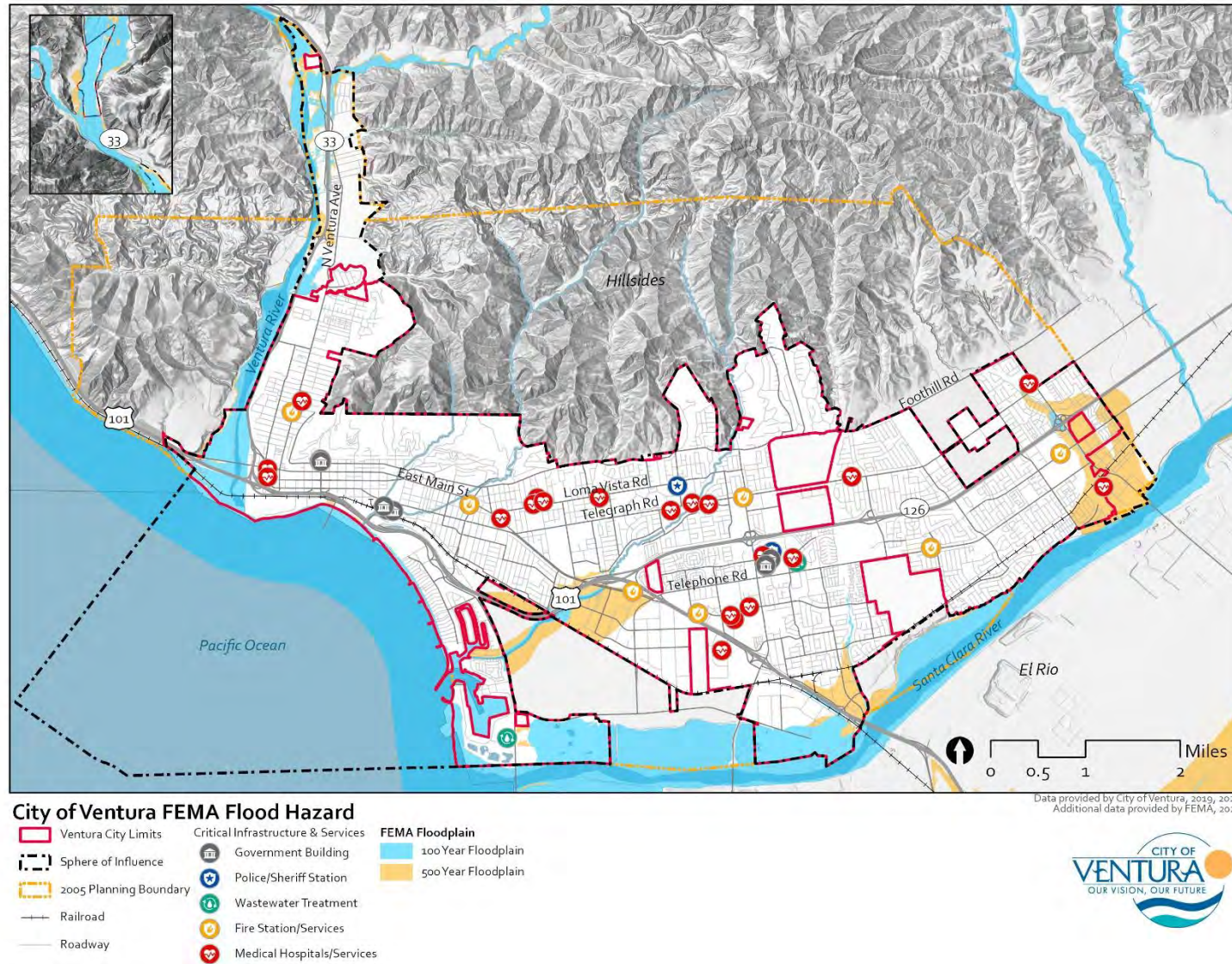
- **STRAINED EMERGENCY SERVICES**
- **PROPERTY DAMAGE**
- **HABITAT LOSS**
- **STRESSED WATER DRAINAGES**

Figure 4 100 and 500 Year Floodplain in the City of Ventura



Air Quality

Worsening air quality due to climate change can create respiratory issues for vulnerable populations and impact indoor areas without adequate air filtration systems. There are several types of air quality decline sources found below:

- **Dust.** Increased temperature leads to dry, dusty conditions also associated with drought (Hall et al. 2018).
- **Smog.** Increases in ambient temperature can lead to higher rates of smog also referred to as ozone. Ground-level ozone specifically will be experienced at higher rates leading to raised cardiovascular and respiratory morbidity and mortality rates (CDPH, 2014). Ground-level ozone has also been shown to have particularly disproportionate adverse impacts on populations experiencing homelessness and lower median income (PNAS 2021). The City of Ventura will experience increases in ozone concentrations in parallel to temperature increases.

- **Fewer Natural Filtrations.** Precipitation variability and long periods of dry spells lead to less reliable air quality for the entire region. Moisture in the air can filter pollutants and provide for overall improved conditions.
- **Wildfire Smoke.** Temperature, severe wildfire conditions, and the area burned by wildfires throughout the state has increased and will continue to increase. Higher temperatures accompanied by an increase in the incidence and extent of large wildfires will lead to increased wildfire smoke and associated toxins and air pollution (Hall et al. 2018).

Air Quality

Air quality is expected to worsen in Ventura due to extended droughts, more frequent wildfires, increased ambient temperatures, and sporadic natural filtrations of fog and wind.

IMPACTS

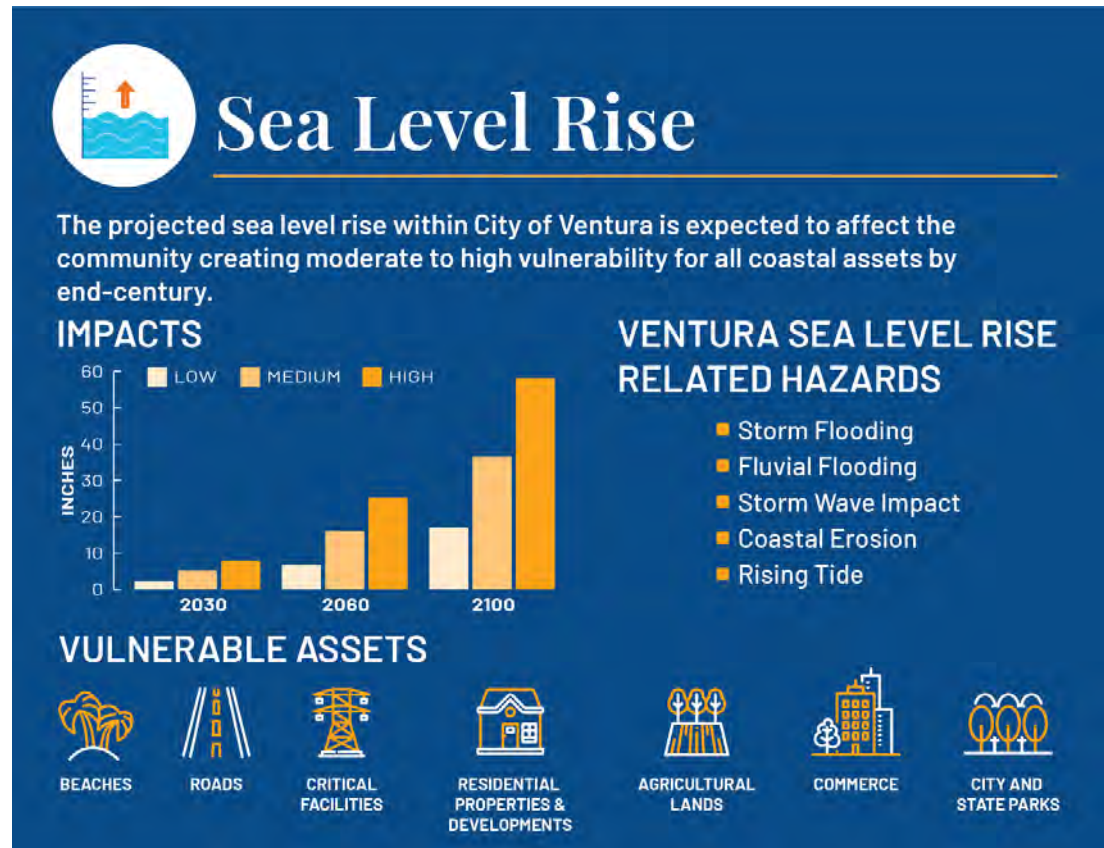
- RESPIRATORY HEALTH PROBLEMS
- VEGETATIVE STRESS

TYPES OF AIR QUALITY HAZARDS

- DUST
- SMOG
- FEWER NATURAL FILTRATIONS
- WILDFIRE SMOKE

Sea Level Rise

- Sea levels in California are expected to rise in the coming decades as a result of global greenhouse gas emissions. It is anticipated that until mid-century, the most damaging events for the California coast will be dominated by large El-Niño-driven storm events in combination with high tides and large waves. By the end of the century, as sea levels continue to rise, scientists project that even small storms will cause substantial damage and large events will have unprecedented consequences (CCC 2018). The effects of sea level rise in Ventura include regular rising tides, coastal erosion, wave impact, storm flooding, and fluvial flooding. Climate change is expected to increase the rate of sea level rise dependent on the extent of warming temperatures. The Nature Conservancy Coastal Resilience Model provides precise hazard predictions and has been used for all the coastal planning in the Ventura region. This tool is available statewide and has detailed modeling for Ventura County. The following are Coastal Resiliency projections for SLR and related hazards for the Ventura region. They are provided for the years 2030, 2060, and 2100 at low, medium, and high SLR rates (TNC n.d.)
- By 2030, sea level is expected to rise 2.3" (in a low modeling scenario), 5.2" (in a medium outcome scenario), and 8.0" (in a high outcome scenario).
- By 2060, sea level is expected to rise 7.4" (low), 16.1" (medium), and 25.3" (high).



- By 2100, sea level is expected to rise 17.1" (low), 36.5" (medium), and 58.1" (high).

The following sub-sections discuss sea level rise related hazards and their current and projected impacts on the City of Ventura.

Coastal Erosion

Large portions of the California coast are susceptible to coastal erosion. As sea levels rise, the amount of time that beaches are exposed to waves and abnormally high tides increases, furthering beach erosion and substantially altering the width of beaches (CCC n.d.) Figure 6 shows projected coastal erosion in the City of Ventura for 2030, 2060, and 2100 (TNC n.d.) Sandy beaches and dunes are at risk of erosion related to sea level rise, with low-lying beaches, such as those in the City, being at particular risk (TNC 2021). 2030 projections show erosion potential surpassing the beach line and entering the residential community along Ventura Beach. The By 2060 and 2100, estimation of erosion impacts are expected to increase with the greatest change taking place north of Sanjon Road, where erosion will impact Shoreline Drive and the neighboring commerce.

Fluvial Flooding

The City of Ventura is set between two rivers, the Santa Clara and Ventura Rivers, both of which deposit into the Pacific Ocean. Fluvial flooding during storm events is expected to worsen as ocean water levels rise (TNC n.d.) As seen in Figure 4, models project fluvial floodplains along these rivers in the event of 100-year flood. The 100-year floodplain for the Santa Clara River extends from Olivas Park Drive to West Gonzales Road, with a breakout area reaching south of West Gonzales Road between South Victoria Avenue and West 5th Street.

Storm Flooding

Climate change may cause low-lying coastal areas to experience more frequent flooding and an increase in the inland extent of 100-year coastal floods. Drainage systems that discharge close to sea level may also have similar issues and inland areas may become flooded if outfall pipes back up with saltwater (CCC n.d.) Figure 7 shows projected storm flooding in the City of Ventura for 2030, 2060, and 2100 (TNC n.d.) During winter storms, increased temporary short-term flooding in tandem with sea level rise. If coupled with high tides and large waves, significant erosion and property damage is likely to occur. In a moderate SLR scenario of 14 inches or less – likely to occur before 2050—the risk of serious flooding to life and property would increase by orders of magnitude (Hall et al. 2018). The 2030 projections show impacts to nearly all the residences and commercial areas south of East Harbor Blvd. By 2060 and 2100, projections show flooding surpassing the Ventura Freeway at the intersection of Highway 33. This level of flooding could affect roads, residential developments, the wastewater treatment facility, and medical facilities, as well as commercial and industrial areas in the City.

Storm Wave Impact

Rising sea levels will cause waves to force water further inland, especially during coastal storm events (CCC n.d.) If waves become larger and more frequent, they are expected to increase erosion of beaches, possibly damaging properties, and development. Figure 8 shows projected storm wave impact in 2030, 2060, and 2100 in the City of Ventura (TNC n.d.) In 2015, waves of up to 15 feet resulted in the evacuation and closure of the Ventura Pier, and caused 15 pylons to break, causing an extended closure while repairs were made (County 2022). In 2030, storm wave impacts are expected encroach on the communities south of Ventura Beach, and the

Marina Park and Harbor areas. By 2060 and 2100, the impacts are magnified, and are projected to extend beyond the Ventura Highway at the intersection of Highway 33. These impacts could affect residential areas, parks and open space, medical and governmental facilities, as well as commercial and industrial areas in the City.

Rising Tide

Sea level rise will cause areas not currently exposed to the tide to become inundated (CCC n.d.) Unlike flooding, inundation results in permanent wetting, often resulting in the need to either protect or move infrastructure and development. Figure 9 shows projected rising tide impacts in 2030, 2060, and 2100 in the City of Ventura (TNC n.d.) In the City of Ventura, people experiencing homelessness live on or near the beach and are therefore at a greater risk during high tide events (County 2022). Near term impacts (i.e., 2030 and 2060) from projected rising tide in the City is minimal. By 2100, the rising tides are expected to impact Seaside Wilderness Park and residential and commercial structures near Marina Park in the area known as the Ventura Keys.

Figure 5 Sea Level Rise in the City of Ventura

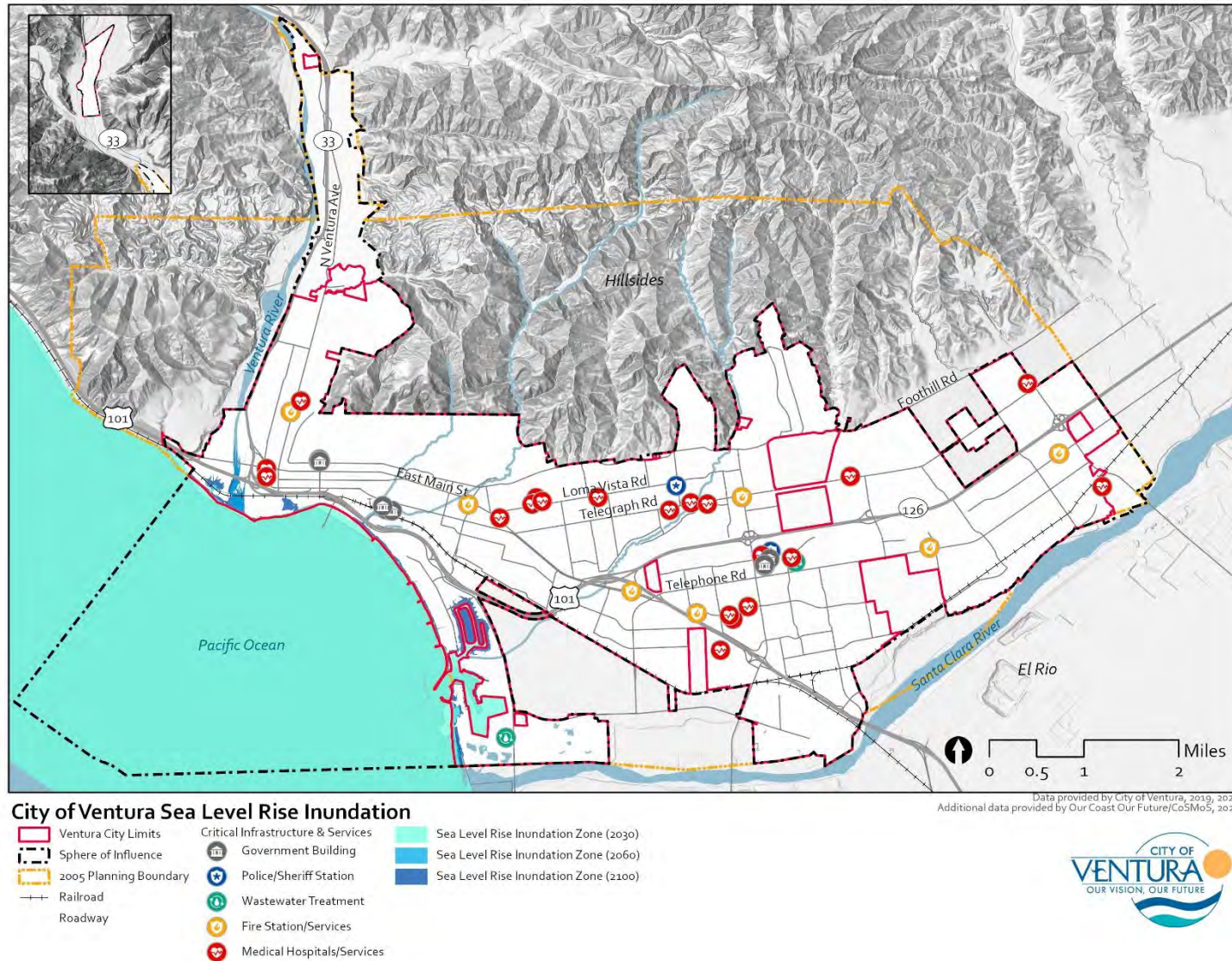


Figure 6 Coastal Erosion in the City of Ventura

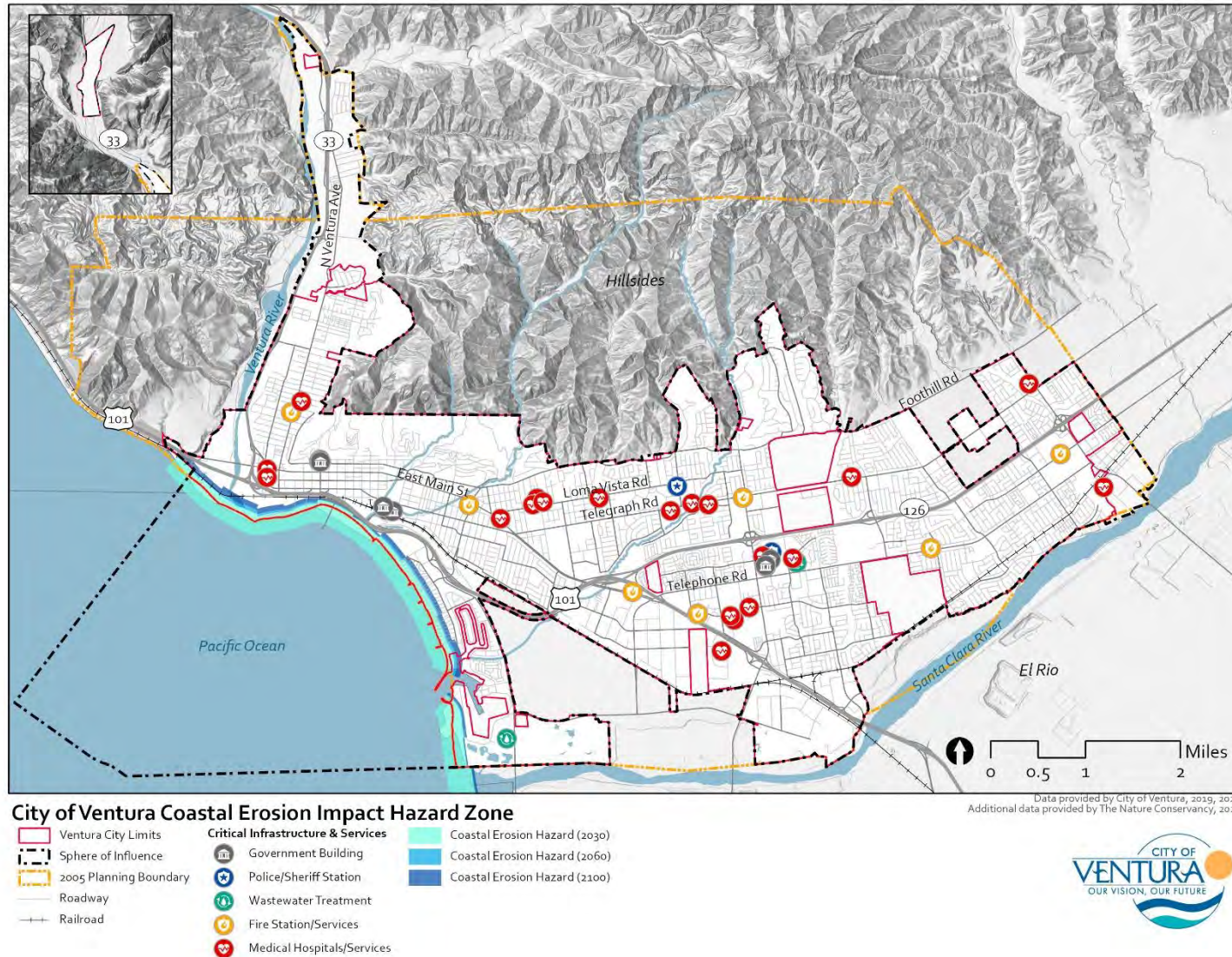


Figure 7 Coastal Storm Flooding in the City of Ventura

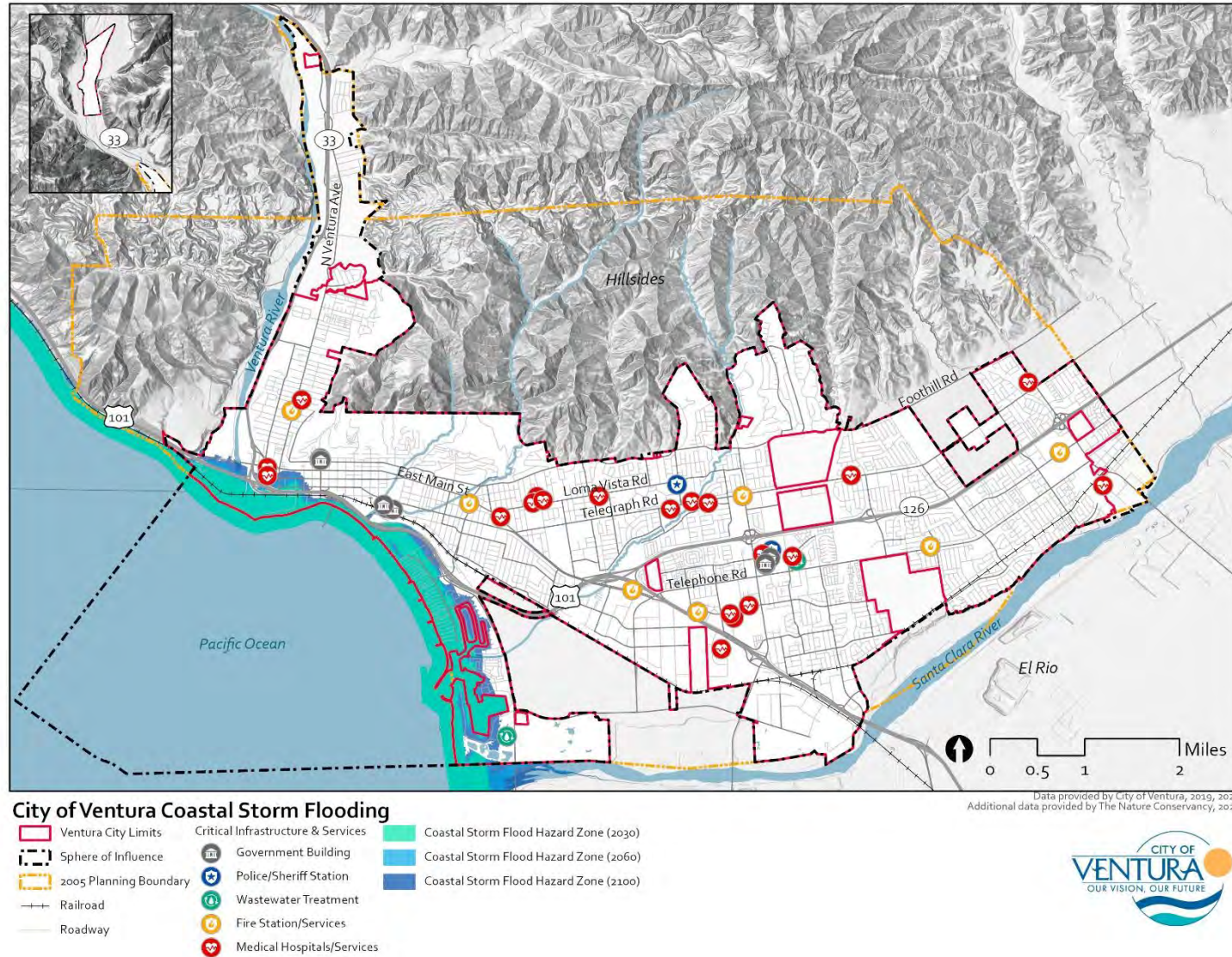
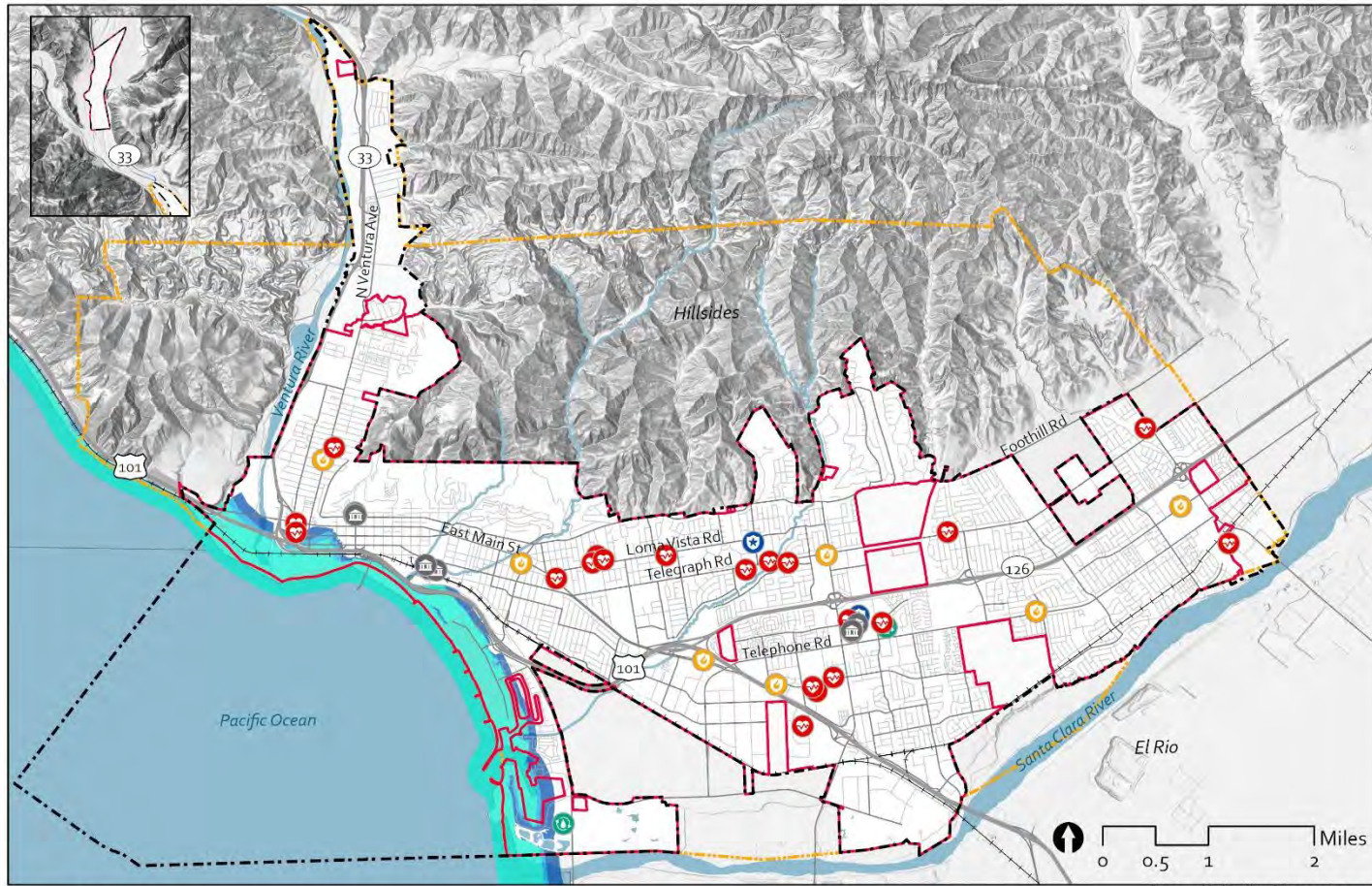


Figure 8 Storm Wave Impact in the City of Ventura



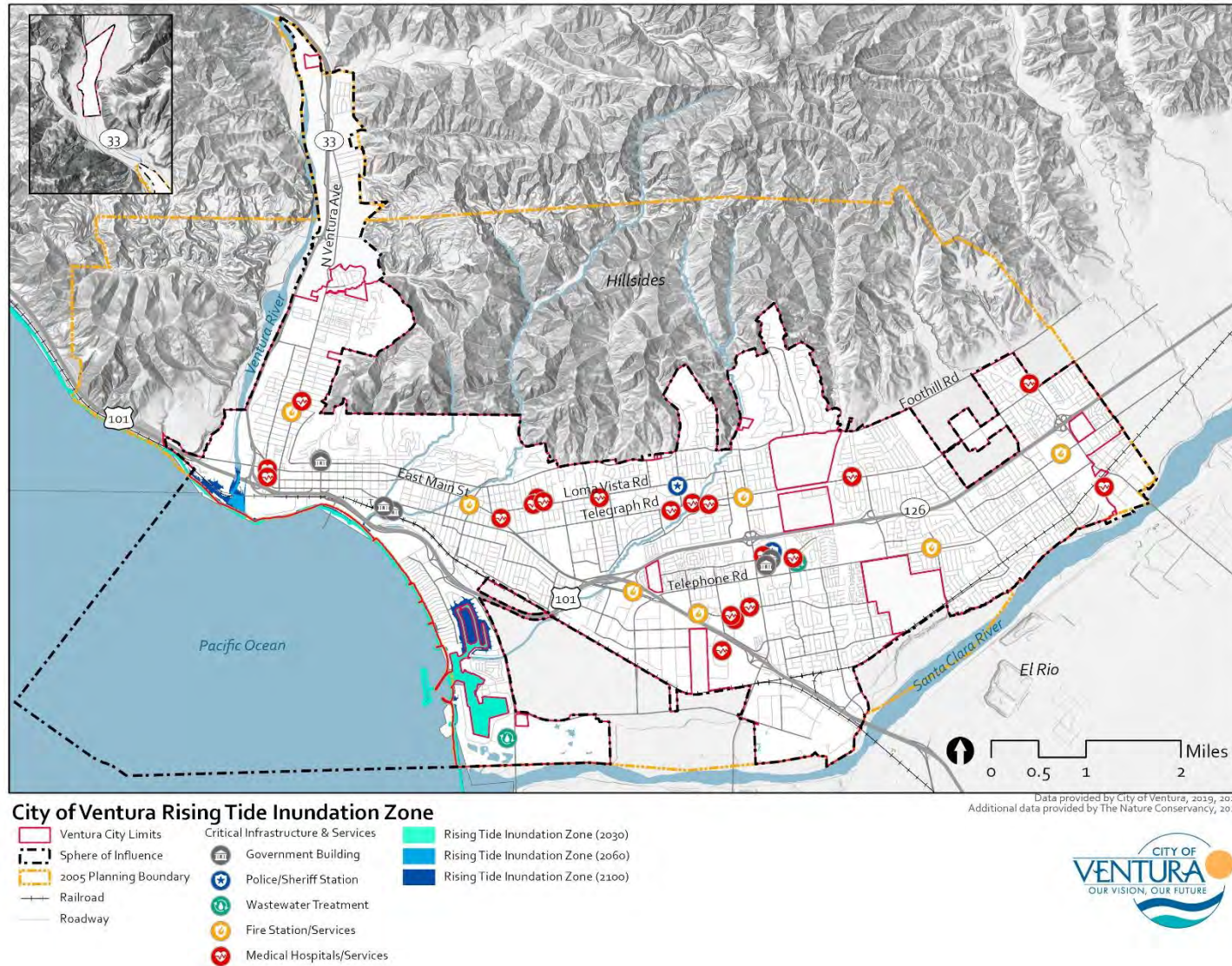
City of Ventura Coastal Storm Wave Impact Hazard Zone

Ventura City Limits	Critical Infrastructure & Services	Coastal Storm Wave Impact Hazard Zone (2030)
Sphere of Influence	Police/Sheriff Station	Coastal Storm Wave Impact Hazard Zone (2060)
2005 Planning Boundary	Wastewater Treatment	Coastal Storm Wave Impact Hazard Zone (2100)
Railroad	Fire Station/Services	
Roadway	Medical Hospitals/Services	

Data provided by City of Ventura, 2019, 2020.
Additional data provided by Our Coast Our Future/CoSMo5, 2022.



Figure 9 Rising Tide Inundation in the City of Ventura



3 Sensitivity

Populations and assets are affected by climate change depending on their sensitivity to climate hazards. This section identifies sensitive populations and assets within the City of Ventura. Potential impacts from the climate hazards of concern on sensitive populations and assets are presented in the Vulnerability Analysis section. Assets are grouped in the following manner:



Vulnerable Populations



Natural and Managed Resources



Buildings and Facilities



Infrastructure and Critical Services

3.1 Vulnerable Populations



While all people in a community will experience climate change, some may be more affected than others. For example, older adults and young children may be more at-

risk to heat illness during an extreme heat event. Several factors influence sensitivity to climate hazards including an individual's health, age, and ability, societal disadvantages, inequities in access to health care, economic opportunity, education and other resources, and inequities found in basic needs and exposure to environmental stressors (Cal OES 2020). Vulnerable populations experience heightened risk to climate change and have fewer resources to adapt and recover from climate change impacts. Following guidance from the Southern California Adaptation Planning Guide, vulnerable population groups were identified for the City (SCAG 2020). Indicators of vulnerable populations were also identified as part of the Social Vulnerability Assessment for the City of Ventura Climate Action and Resilience Plan using data gathered from U.S Census Bureau's 2-15-2019 American Community Survey (ACS). The City of Ventura has several vulnerable populations that will disproportionately experience the impacts of climate change, listed in Table 3 below.

Vulnerable populations were grouped based on potential exposure to climate hazards, access to resources to prepare, cope with, or recover from climate hazards, whether individuals face societal disadvantages, or if individuals have health conditions or health sensitivities that leave them vulnerable to climate hazards.

Table 3 Vulnerable Populations in the City of Ventura

Population	Population Description	Total Number, Percentage of Population, or Households
Renters*	Percent renter-occupied housing units	45.5%
Population of color*	All individuals that do not identify as white	45%
Seniors*	Percentage 65 years or older	16.6%
Foreign-Born-Non-Citizens	Percent of people born outside of the US that are not US citizens	47.3%
Individuals with no health insurance	Individuals aged 18 to 64 years old currently uninsured	9.7%
Individuals with disabilities*	Individuals with any of the six disability types (hearing, vision, cognitive, ambulatory, self-care, and independent living difficulty)	12.3%
Youth and Children*	Percent age 17 or younger	21.4%
Military Veterans	Individuals who have served but are not currently serving in the US Armed Forces	6,656
Linguistically isolated individuals*	Individuals 5 years and older who speak English less than very well	8.8%
Agricultural workers*	Individuals who are employed, 16 and older, and work in agriculture	2.9%
Outdoor construction workers*	Individuals who are employed, 16 and older, and work outdoors in construction	6.4%
Isolated Individuals*	Percent no vehicle households	6.5%
People experiencing homelessness	Individuals who currently lack fixed, regular, and adequate housing	531
Tribal and Indigenous communities	American Indian or Alaska Native	0.427%
Housing cost burdened*	Percent of households with housing cost burden (renter and homeowner)	39.9%
Individuals with education attainment less than 4 years of college*	Percent age 25 or older with less than a Bachelor's degree	64.9%
Mobile Homes*	Percent of mobile homes	5.2%
Pre-1980 Housing*	Percent of pre-1980 housing	70%
Low Income*	Percent of households below 80% of area median income	47.7%
Households without broadband internet*	Households without access to broadband internet	17.7%

Source: The percentages used in this table were acquired from the California Healthy Places Index 3.0 and the U.S. Census American Community Survey (ACS) 2015-2019 5-year estimates acquired from Social Explorer.

Notes:

*These indicators were identified as part of the Social Vulnerability Assessment for the City of Ventura Climate Action and Resilience Plan.

Often individuals have characteristics that make them vulnerable in a variety of ways; however, for the purpose of this report, they were grouped based on the sensitivity that increases their risk the most. Vulnerable populations are grouped below:

- **Individuals with High Outdoor Exposure.** Agricultural workers, outdoor construction workers, and people experiencing homelessness.
- **Under-Resourced Individuals.** Individuals with no health insurance, low income, renters, isolated individuals, housing cost burdened, pre-1980 housing occupants, mobile home occupants, individuals with education attainment less than 4 years of college, and individuals without broadband internet.
- **Individuals Facing Systemic Discrimination.** Populations of color, linguistically isolated, Tribal and Indigenous communities, and foreign-born-non-citizens.
- **Individuals with Chronic Health Conditions or Health Related Sensitivities.** Seniors, Youth, Individuals with disabilities, and Military Veterans.

3.2 Natural and Managed Resources



Natural and managed resources within the City of Ventura are detailed in the City's General Plan. Natural resources include coastal resources and beaches, hillsides, rivers (Ventura River, Santa Clara River) and barrancas, riparian and freshwater marshes, and the related biodiversity. Recreational resources include neighborhood, community, citywide, linear parks, and agricultural lands. The City oversees nearly 600 acres of developed park facilities (City 2005). Agriculture has been a dominant industry in Ventura for decades and can be found in

various parts of the City including Midtown, the North Bank, and at Taylor's Ranch (City 2005). These various resources provide habitat, sources of community resilience, recreation, and economic productivity to the City. These resources are spread throughout the City and face various levels of exposure to climate hazards.

3.3 Buildings and Facilities



Climate change is expected to amplify extreme weather and climate hazards in the City of Ventura. A jurisdiction's vulnerability increases when buildings and facilities are not designed, operated, and/or maintained to function effectively under extreme weather conditions or can be damaged by extreme weather conditions. The following buildings and facilities would be particularly sensitive to climate change including residential buildings and developments, and educational facilities.

3.4 Critical Infrastructure and Services



Within the City of Ventura there is a wide array of critical infrastructure and services that are vulnerable to the impacts of climate change. Assets within this category include water supply, wastewater treatment, solid and hazardous material waste and recycling, government buildings, fire services, police services, medical services, utilities and major utility corridors, communication facilities, energy services, public transportation, roadways, and active transportation routes. This asset group is sensitive to climate change as the impacts of hazards can affect the service line ability to provide resources and the infrastructure in place may not be adequately prepared to sustain increasing and compounding hazards.

4 Adaptive Capacity

Adaptive capacity is the ability to adjust to the consequences of climate change. This section summarizes the ways in which the City currently manages for the negative impacts of climate change. Types of adaptive capacity include adjustments in behavior,

resources, and technologies. The City of Ventura has actively taken steps to increase the City’s adaptive capacity. Existing policies, plans, programs, and institutions that increase the City’s resilience to climate change impacts are organized by climate hazard and listed in Table 4.

4.1 Programs, Plans, and Policies to Manage Impacts of Climate Hazards

Table 4 lists programs, plans, and policies that help communities become more resilient to an increase in climate hazards.

Table 4 Program, Plans, and Policies to Manage Impacts of Climate Hazards

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
Ventura County Contingency Plan for Heat/Cold Weather Events (County 2020)	This document outlines responses to an extended heat wave or cold weather that could endanger the lives of citizens of Ventura County, especially those who are medically fragile, those living alone, and disabled individuals. Some considerations discussed include community centers as refuges from weather, creation of Voluntary Relief Centers, and proposed establishment of Cooling Centers.	Severe weather
Heatwave Safety (City of Ventura n.d.)	The City of Ventura webpage under emergency preparedness provides information about extreme heat and how to prepare for a heat emergency. The page includes resources for shelter from extreme heat and signs of heat-related illnesses.	Severe weather
Surfers Point Managed Retreat Project (Surfrider Foundation 2022)	This project focuses on moving infrastructure away from the beach to preserve the beach and surf break. Instead of building coastal armor such as a seawall, this project will move the parking lot, pedestrian path, and bike path away from the tideline. The project also includes planting and maintaining native vegetation within sand dunes and bioswales.	Sea level rise, stormwater runoff

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
2020 Draft Urban Water Management Plan for the City of San Buenaventura (City of Ventura 2020)	The 2020 Urban Water Management Plan for the City of San Buenaventura includes descriptions of the community’s water supply sources, projected water demands, and supply reliability during normal water years, single dry years, and five-dry years. The plan includes a discussion of the potential impacts of climate change on the system as well as reliability planning and a water shortage event contingency plan. The Urban Water Management Plan does not include strategies for mitigation and adaptation.	Drought, flooding
Coastal Resilience Ventura Project (TNC n.d.)	This program uses a web-based mapping tool to help identify Ventura County’s vulnerability from coastal hazards. Vulnerable populations are identified under various climatic scenarios. Critical infrastructure in coastal zones is identified under various sea level rise and storm surge scenarios as well.	Sea level rise, severe storm
Ventura Land Trust Community Wildfire Protection Plan (Ventura Land Trust 2022)	The Ventura Land Trust’s Community Wildfire Protection Plan (CWPP) identifies wildfire risks and clarifies priorities for funding and programs to reduce impacts of wildfire on communities at risk. Some actions include vegetation management, wildfire safety education programs, and establishment and maintenance of evacuation routes.	Wildfire, air quality
Ventura Regional Fire Safe Council Home Hardening Resiliency Program (VRFSC 2020)	The Ventura Regional Fire Safe Council has implemented Wildfire Safety Liaisons to lead in facilitating educational workshops as well as free home hardening assessments in locations designated as high-risk for wildfire.	Wildfire
The 2005 City of Ventura General Plan (City 2005)	The 2005 City of Ventura General Plan includes actions that assess wildfires, flood hazards, air quality, water supply, and emergency response practices. General Plan policies include actions to optimize firefighting and minimize exposure to air pollution associated with point sources, project design review, land use compatibility, and compliance with the Ventura County Air Pollution Control District requirements. The General Plan also describes the water supply and system including the Casitas Municipal Water District, Ventura River surface water intake, subsurface water and wells (Foster Park), Mound groundwater basin, Oxnard Plain groundwater basin (Fox Canyon Aquifer), and Santa Paula groundwater basin. The General Plan includes policies for resource conservation, policies to minimize flood hazards and mitigation for new development within flood hazard zones.	Wildfire, flooding, air quality, drought
Ventura County Multi-Jurisdiction Hazard Mitigation Plan (Ventura County 2022)	The Ventura County Multi-Jurisdiction Hazard Mitigation Plan describes hazard mitigation policies for landslides, flooding, wildfires, sea level rise, and drought. The policies within the plan are regarding FEMA 100-year tide	Landslides, flooding, wildfires, sea level rise, drought, severe weather, severe storm

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
	and sea level rise, compliance with NFIP, flood plain management, and long-term resilience to sea level rise and extreme storms for communities and critical assets adjacent to San Buenaventura Beach, Santa Clara River, Ventura River, and nearby areas of the shoreline. The plan also describes the County’s StormReady program, Ventura Water Pure Program, Hall Canyon Channel Drainage Basin Improvement Project, and wildfire awareness program.	
City of Ventura Emergency Response Team (CERT) Program (City of Ventura 2020)	The CERT program trains volunteers in basic first aid, light search and rescue, and small fire suppression, and is closely associated with Ventura’s Fire Department. CERT volunteers may assist neighbors and other emergency personnel in times of emergency, and support evacuations along with other responsibilities.	Severe weather, severe storm, landslide, flooding, wildfire
City of Ventura Emergency Operations Plan (City of Ventura 2021)	Ventura’s Emergency Operations Plan details protocols to improve emergency preparedness, response, and recovery from natural disasters. The plan provides a system for the effective management of emergency situations and identifies lines of authority and responsibility. The plan reviews the hazards most likely to impact the City, especially those exacerbated by climate change including drought, extreme heat, wildfire, flooding, and severe winter storms.	Drought, extreme weather, wildfire, flooding, severe storm
City of Ventura Tree Master Plan (City 2018)	The City Tree Master Plan is a guide to effective administration and management of a comprehensive Urban Forest program in the City. Tree canopy is low in the City and this Plan discusses the climate adaptation benefits of tree canopy.	Drought, extreme heat, air quality

5 Vulnerability Analysis

This section describes the impacts each climate hazard has on community assets and services described in the Sensitivity section. Existing plans, policies, and programs that contribute to the adaptive capacity is summarized throughout. An impact score and an adaptive capacity score is identified for each asset by climate hazard, along with an overall vulnerability score consistent with the scoring methodology described in Vulnerability Assessment Methodology.



Vulnerable Populations



Natural and Managed Resources



Buildings and Facilities



Critical Infrastructure and Services

5.1 Vulnerable Populations



Individuals with High Outdoor Exposure including agricultural workers, outdoor construction workers, mobile home occupants, and people experiencing homelessness face disproportionate direct exposure to climate hazards, causing them to be extremely vulnerable to the effects of climate change.

Under-resourced individuals often do not have access or the ability to afford resources needed to prepare for, cope with, and recover from climate change impacts. Individuals who are unemployed or are low-income often face financial barriers when preparing for and recovering from climate change hazards. Individuals in these groups often live in homes that are less protected against climate hazards. Low-income individuals may not be able to take time off work to address health concerns either caused by or exacerbated by climate hazards. Individuals with educational attainment of less than 4 years of college usually have lower earning potential than those with a 4-year college degree. As defined by the U.S. Census Bureau, this population group does not include individuals who have attended trade schools, apprentice programs, or who have attained associates degrees. Individuals with 4-year degrees are half as likely to be unemployed than those who only have a high school degree (Association of Public and Land-Grant Universities n.d.). Under-resourced individuals in this group are less likely to have access to transportation, healthcare, and other basic needs. These individuals often lack the financial resources to evacuate from a climate hazard and/or find an affordable place to evacuate to.

Individuals Facing Systemic Discrimination are subject to disproportionate impacts of climate change. People of color are more likely to live in high hazard risk areas and less likely to be homeowners, which leaves them vulnerable to climate hazards. If evacuation and/or advisory notices, hazard preparedness material, or governmental guidance is not provided in languages other than English, linguistically isolated individuals, and foreign-born non-citizens may not be able to prepare for, cope with, or recover from a climate hazard (Gamble et al. 2016). The close relationship some

tribal communities have with their surrounding ecosystems and natural resources leaves these populations particularly at risk to climate change impacts because the natural systems their livelihoods are dependent on are rapidly changing (Baird 2008).

Individuals with chronic health conditions or health related sensitivities are socially and physiologically vulnerable to climate change impacts and hazards. Seniors and individuals with disabilities may have limited or reduced mobility, mental function, or communication abilities, making it difficult to evacuate during or prepare for a climate hazard event (CDPH 2020). They may also have medical needs for electricity which may be impacted during a public safety power shutoff or climate hazard event. Individuals in these groups are more likely to have pre-existing medical conditions and/or chronic illnesses that may exacerbate the risk of illnesses and medical problems from climate hazards. Children are socially and physiologically vulnerable to climate hazards with limited understandings of climate hazards and insufficient resources to independently prepare for and safely respond during a climate hazard event. Children, especially young ones, are reliant on their parental figures to ensure their health, safety, and wellbeing (CDPH 2020). Children also have vulnerable physical characteristics because they have not fully physiologically developed and are therefore more vulnerable to health effects of climate change impacts (Kenny et al. 2014). Military veterans are more likely to be low-income and experience homelessness after their service, which also makes them vulnerable to preparing for and responding to climate hazards (Olenick et al. 2015).

Potential Impacts

Extreme Heat and Warm Nights

Outdoor workers and people experiencing homelessness are at risk to health impacts from extreme heat. Outdoor workers, including construction workers and agricultural workers, are often subject to strenuous work conditions and are vulnerable during extreme heat events. People experiencing homelessness are exposed to health-related impacts associated extreme heat because they have limited access to shelter and air conditioning. The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020).

Under-resourced individuals may not be able to pay for adequate air conditioning or fans, increasing their exposure to extreme heat. Isolated individuals don't have access to a vehicle to travel to cooling centers or move to temporary shelters during extreme heat event (Cooley et al. 2012). Under-resourced individuals are less likely to receive medical care for illnesses triggered or exacerbated by extreme heat. Households without a computer or broadband internet may not receive heat advisory warnings or governmental guidance, causing them to experience health impacts from extreme heat exposure (CDPH 2017). Additionally, individuals with no health insurance may not be able to receive care in the case of extreme heat related illness.

People experiencing systemic discrimination, including populations of color, linguistically isolated, foreign-born-non-citizens, and Tribal and Indigenous communities are at risk to impacts of extreme heat. Communities of color and Indigenous communities often live in housing with insufficient protection from extreme heat events and limited or no affordable air conditioning (Gamble et al. 2016). Linguistically isolated individuals may not to be able to read heat

advisory warnings or governmental guidance, potentially causing them to experience greater exposure to extreme heat (Gamble et al. 2016). The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020). These populations may not have access to medical services to treat heat-related illnesses.

Individuals with chronic health conditions or health related sensitivities are particularly at risk to heat related illnesses during extreme heat events. Individuals with disabilities, older adults, youth, and children may have difficulty turning on air conditioning or traveling to cooling centers during extreme heat events. Extreme heat conditions can exacerbate asthma, cardiovascular disease, certain disabilities, and other respiratory and cardiovascular conditions, potentially causing heat-related illnesses such as heat stress, heat stroke and dehydrations, which can be life threatening (CDPH 2020). Children are still physiologically developing which means that they are less able to regulate their bodies during extreme heat events (Kenny et al. 2014).

Drought

Individuals with high outdoor exposure are at risk to drought conditions and associated cascading impacts. During prolonged drought conditions, people experiencing homelessness may have difficulty accessing clean and affordable drinking water (Gamble et al. 2016).

During periods of prolonged drought, under-resourced individuals are more likely to experience the cost burden associated with increased water rates (Feinstein et al. 2017). These individuals may struggle to access clean and affordable drinking water which may cause dehydration and/or exacerbate underlying health conditions and illnesses (Gamble et al. 2016).

Individuals facing systemic barriers may face discrimination and restrictive policies when seeking to access affordable and clean water supplies, which may cause dehydration and/or exacerbate underlying health conditions and illnesses (Gamble et al. 2016). Tribal communities may experience food insecurity if a drought negatively impacts local food sources (Lynn et al. 2011).

Individuals with chronic health conditions or health related sensitivities are at risk to drought conditions and associated cascading impacts. Prolonged drought conditions can lead to water scarcity and individuals may need to rely on poor quality water supplies. Individuals with chronic health conditions or health related sensitivities may experience negative health impacts if they become dehydrated. Children, youth, and older adults are especially at risk to dehydration as their bodies are not able to regulate as well (Kenny et al. 2014). Dehydration may exacerbate underlying health conditions and illnesses. (CDPH 2017).

Wildfire

Outdoor workers may be exposed to hazardous work conditions during wildfire events and may become injured from smoke inhalation or burns. People experiencing homelessness are particularly at-risk during wildfire events as they often suffer from respiratory conditions, mental illness, and chronic health conditions that may be exacerbated from physical contact with wildfire or smoke inhalation. People experiencing homeless have limited access to shelter and do not have access to transportation to evacuate from burning areas. They may also have their personal belongings destroyed or damaged during a wildfire event (CDPH 2017).

Under-resourced individuals may experience injuries or death from smoke inhalation or burns and are less likely to receive medical treatment (CDPH 2017). These individuals are more likely to live in

wildfire hazard zones and in housing with insufficient protection and thus may have their belongings, homes, and health damaged by wildfire and/or smoke. If this occurs, under-resourced individuals are likely to suffer from the cost burden associated with losses or damage. Households without a computer or internet may not receive communications and evacuations to safely evacuate from hazard areas. Isolated individuals are vulnerable during wildfires because they do not have access to a vehicle to evacuate. Renters have limited control over home hardening and improvements that may protect against fire and smoke. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble et al. 2016).

Populations experiencing system discrimination may experience disproportionate impacts during wildfires. Communities of color and Indigenous people are more likely to be in wildfire hazard zones and in housing with insufficient protection against wildfire. Linguistically isolated individuals and foreign-born-non-citizens may not be able to read wildfire or smoke advisory warnings or governmental guidance, potentially causing them to experience greater exposure to smoke and/or wildfire. Individuals in these groups may face systematic and/or cultural barriers to access resources to safely evacuate hazard areas (Gamble et al. 2016). As a result, individuals in these groups may experience injuries or death from smoke inhalation or burns (CDPH 2017).

Individuals with chronic health conditions or health related sensitivities may experience injuries or death from smoke inhalation or burns (CDPH 2017). Seniors, military veterans, and pollution burdened individuals are vulnerable to health impacts from wildfire smoke pollutants because they are more likely to have underlying respiratory and/or cardiovascular conditions and illnesses. Youth and children may experience respiratory health impacts from wildfire smoke because their respiratory systems are not fully

developed and are therefore more sensitive to stressors. Individuals with disabilities, youth and children, and seniors may have difficulty evacuating from wildfires, increasing the risk of health impacts and or death from wildfire, smoke inhalation, or fire burns (EPA 2022).

As seen in Figure 10, the communities along the East side of the Ventura River have a social vulnerability index (SVI) between 0.81-1.0 and are at high and very high risk of wildfires. Along Loma Vista Road, communities at varying social vulnerability levels are in VHFHSZ's, including those along the Northern edge of East Main Street, who have an SVI of 0.91-1.0.

Landslides

Vulnerable populations living in areas with high landslide risk may be subjected to disproportionate negative impacts during landslide and debris flow events. Communities of color and Indigenous people are more likely to be situated in wildfire scar zones or landslide prone areas. Linguistically isolated individuals and foreign-born-non-citizens may not be able to read landslide advisory warnings or governmental guidance, potentially causing missed critical evacuation information or limited ability to safely evacuate hazard areas (Gamble et al. 2016).

Riverine and Stormwater Flooding

Outdoor workers may be exposed to hazardous work conditions during riverine and/or stormwater flooding events and therefore are vulnerable to health impacts (CDPH 2020). People experiencing homelessness are disproportionately at risk to health impacts during flood events because they often live in flood hazard areas and do not have access to transportation to evacuate inundated areas. They may also have their personal belongings destroyed or damaged during a flood event (Ramin & Svoboda 2009).

Under-resourced individuals may experience injuries or death because of high velocity flooding and are less likely to receive medical treatment (CDPH 2017). Individuals in these groups may experience cost burdens if their belongings and homes are damaged from floodwater inundation. Isolated individuals have limited or no access to a vehicle to evacuate flood hazard areas. Households without a computer or internet may not receive communications and emergency alerts to safely evacuate from hazard areas (CDPH 2020). Renters have limited control over home improvements that may protect against flood damage. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble et al. 2016).

Populations that experience system discrimination are at greater risk to impacts of extreme heat. Communities of color and Indigenous groups are more likely to live in flood hazard areas and in housing with insufficient protection against riverine and stormwater flooding. Linguistically isolated individuals and foreign-born-non-citizens may not be able to have access to flood warning or governmental guidance in their language, potentially causing them to experience greater exposure to flooding. Individuals in these groups may face systematic and/or cultural barriers when seeking to access resources needed to safely evacuate hazard areas (Gamble et al. 2016).

Seniors, youth, and children are particularly at risk to injury and/or death from high velocity flooding (CDPH 2017). Riverine and stormwater flooding may also limit access to transportation systems, healthcare centers, and emergency response to those that are injured or in need of consistent medical care, such as those with chronic health conditions or illnesses. Youth, children, seniors, individuals with disabilities, and individuals with chronic health conditions or illnesses may not be able to safely evacuate floodwater hazard areas.

Many communities along the Western portion of the Santa Clara River are located in the FEMA 100- and 500-year flood plains, including communities with an SVI of 0.81-0.9, visible in Figure 11.

Air Quality

Individuals with high outdoor exposure, such as outdoor workers and people experiencing homelessness, are disproportionately vulnerable to poor air quality because they are outdoors and are therefore directly exposed to air pollutants (CDPH 2017).

Under-resourced individuals may be disproportionately impacted by poor air quality if their housing lacks sufficient air filtration, and they may not be able to afford supplemental air filtration equipment (Gamble et al. 2016). Individuals in these groups may experience the development or exacerbation of respiratory illnesses and are less likely to receive medical treatment (California Department of Public Health 2017).

Individuals experiencing system discrimination are at higher risk of negative health outcomes associated with air quality. Tribal communities and populations of color are vulnerable to health impacts associated with poor air quality because their housing may lack sufficient air filtration and they may not be able to afford supplemental air filtration equipment (Gamble et al. 2016). Linguistically isolated individuals and foreign-born-non-citizens may not have access to air quality advisory warnings or governmental guidance that are in their primary language, potentially causing them to experience greater exposure to extreme heat (CDPH 2017).

Individuals with chronic health conditions or health related sensitivities are at risk of developing or experiencing exacerbated health impacts from poor air quality. Youth and children are extremely vulnerable to health impacts from poor air quality because their respiratory system has not fully developed yet (CDPH

2017). Seniors, military veterans, and individuals with disabilities are vulnerable to health impacts from poor air quality because they are more likely to have underlying health conditions (EPA 2022).

Sea Level Rise

People who live in inundation zones may need to retrofit homes to adapt to sea level rise and associated impacts, such as mold. This activity is particularly difficult for those with limited access to resources including individuals who are unemployed, and low-income individuals. Linguistically isolated individuals may not have access to non-English versions of sea-level-rise preparedness guidance and therefore may not be able to prepare for and cope with sea-level-rise. (Cooley 2012).

The Ventura County Resilient Coastal Adaptation Project (VC Resilient Report) identifies seniors, youth and children, and low-income populations as most affected by flood hazards (County 2018). Seniors may have decreased mobility, and may not have access to emergency warning systems, and in the case of a loss of property or belongings, may lack financial resources to recover. Renters are vulnerable in the mitigation and recovery stages of hazards because they lack the authority over their residence to aptly prepare for flooding. Additionally, they are less likely to have insurance to cover their belongings in the case of a flood event (County 2018).

The figures below show the projections of SLR and related hazards in relation to the City of Ventura's citizens social vulnerability indices. Areas with an SVI of 0.81-1.0 are located along the coast in potential sea level rise and rising tide inundation areas such as along the intersection of highway 1 and highway 33, as well in the areas surrounding the Ventura Harbor, as seen in Figure 12 and Figure 16. Storm flooding has the potential to impact coastal communities, extending beyond Shoreline Drive, and reaching up to West Main

Street on the Northern end of the City and up to Outrigger Avenue on the Southern end. The impacted communities have a breadth of SVIs ranging from 0.21-1.0, as seen in Figure 13.

In Figure 14, coastal erosion projections show impacts to all coastal communities in the City, with impacted groups having SVIs ranging from 0.21-1.0. Storm wave impacts will expand beyond highway 101 in many places along the City's coastline, causing impacts to communities beyond those directly on the coast. These communities have SVIs ranging between 0.21-1.0, as shown in Figure 15.

Adaptive Capacity

The City of Ventura has plans, policies and programs in place that protect vulnerable populations from all climate hazards. The level of enforceability, implementation, and efficacy varies based on the hazard type.

Ventura only has 4 percent of land with tree canopy, which is lower than 75 percent of other California cities and towns. Tree canopy is beneficial in many ways but particularly can be essential in mitigating the effects of extreme heat events (HPI 2022). The Ventura County Contingency Plan for Heat/Cold Weather Events plan outlines responses to extended heat waves that could endanger the lives of vulnerable populations in Ventura, including seniors and individuals with disabilities. The Heatwave Safety webpage provides emergency preparedness information for the community to prepare for heat emergencies.

Plans concerning stormwater flooding and drought mainly address infrastructure resilience and water reliability. The Ventura County Sea Level Rise Assessment includes an appendix which discusses stormwater flooding impacts on vulnerable populations. Plans like the Urban Water Management Plan, the General Plan, and the City

of Ventura Emergency Response Plan serve as a baseline of water assurance planning for the general populations in response to drought events, but do not explicitly address vulnerable populations. The City of Ventura has just over 50 percent impervious surface cover and is in the 82.5th percentile in California, implying that there is more impervious cover than most other cities and towns in the states. These materials cover the ground and prevent water from soaking into soil which can exacerbate flooding and reduce groundwater reserves (HPI 2022).

Though air quality is mentioned in the City’s General Plan as well as the Wildfire Plan as a health hazard, no specific programs or actions are discussed to mitigate related harm to vulnerable populations.

The Ventura County Multi-Jurisdiction Hazard Mitigation Plan assigns a modest capacity to the City residents’ ability to adapt to climate impacts. The plan acknowledges that vulnerable populations within the City may not be able to relocate or protect their home in the case of a flood but provides no guidance on how to address vulnerable populations in the case of SLR or flooding events (County 2022). The Ven-6 action outlined in the plan aims to improve long-term resilience to all population groups in SLR and extreme storms in the areas adjacent to the beach and the rivers (County 2022).

Vulnerability Score for Vulnerable Populations

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Medium	4-High
Drought	Medium	Medium	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Low	4-High
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	High	Low	5-High
Sea Level Rise	High	Low	5-High

Vulnerable populations in the City of Ventura are most vulnerable to extreme heat/warm nights, drought, wildfire, landslides, air quality, and sea level rise.

Figure 10 Wildfire Hazard Severity Zones and Social Vulnerability in the City of Ventura

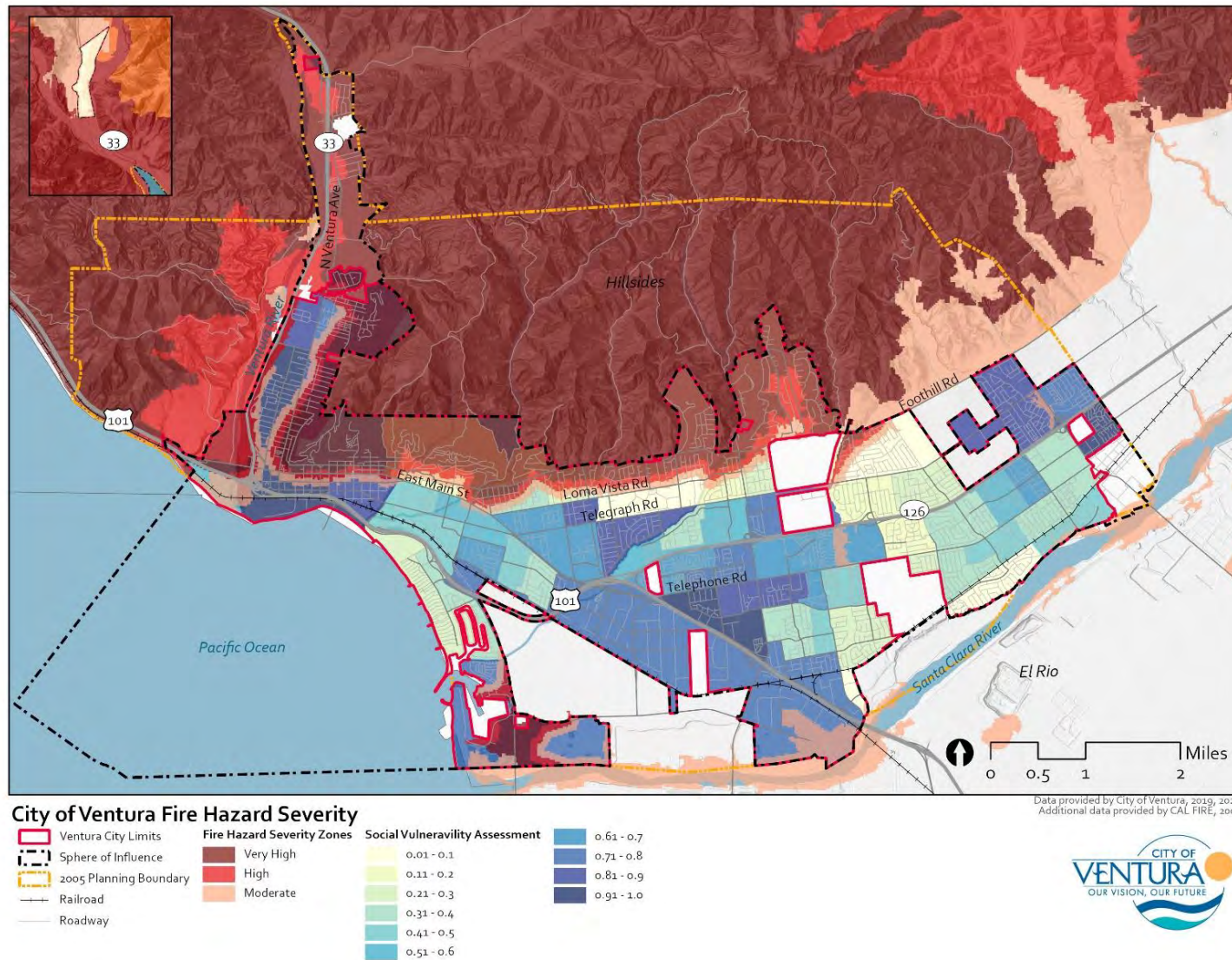


Figure 11 FEMA Flood Hazard Zones and Social Vulnerability in the City of Ventura

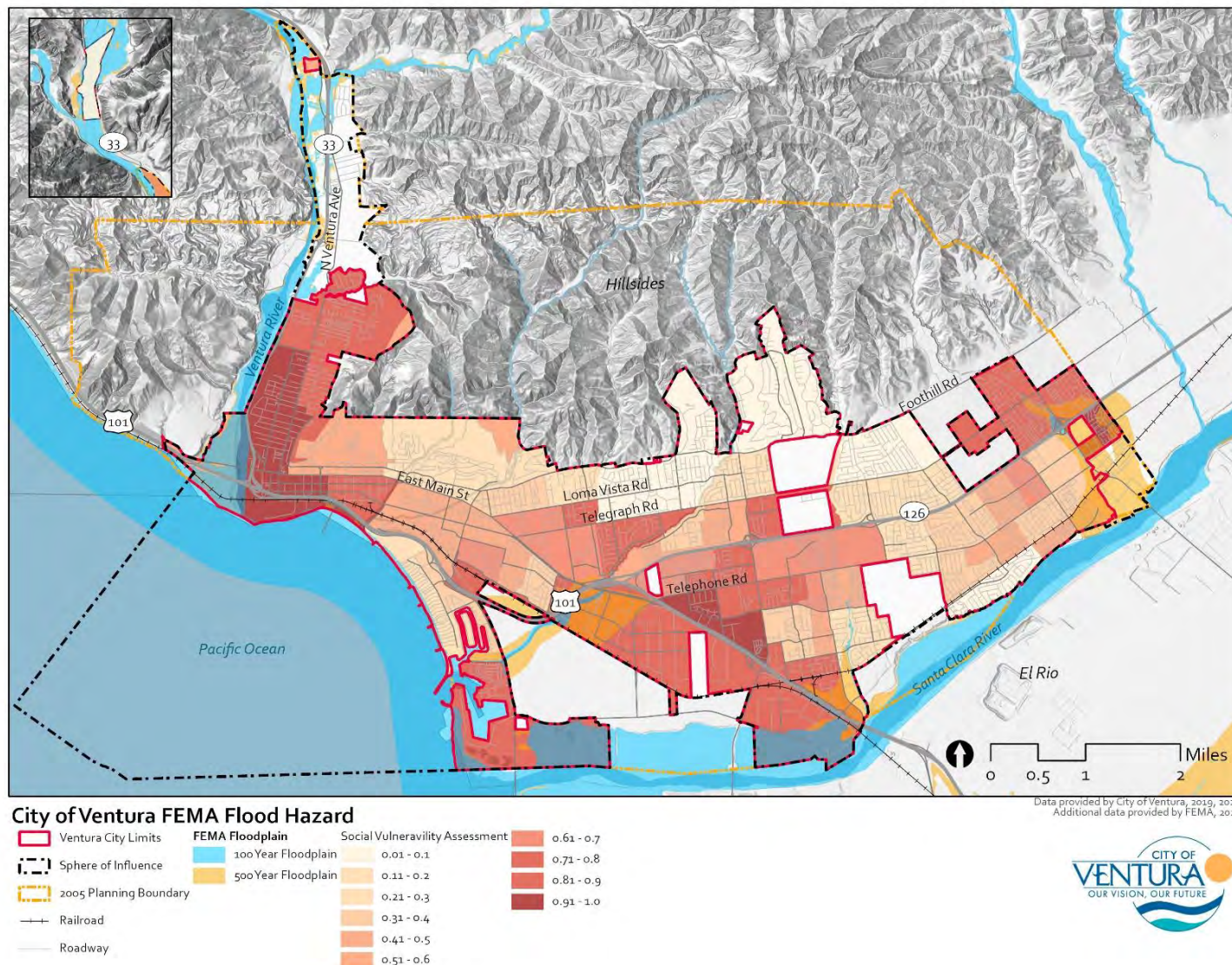


Figure 12 Sea Level Rise and Social Vulnerability in the City of Ventura

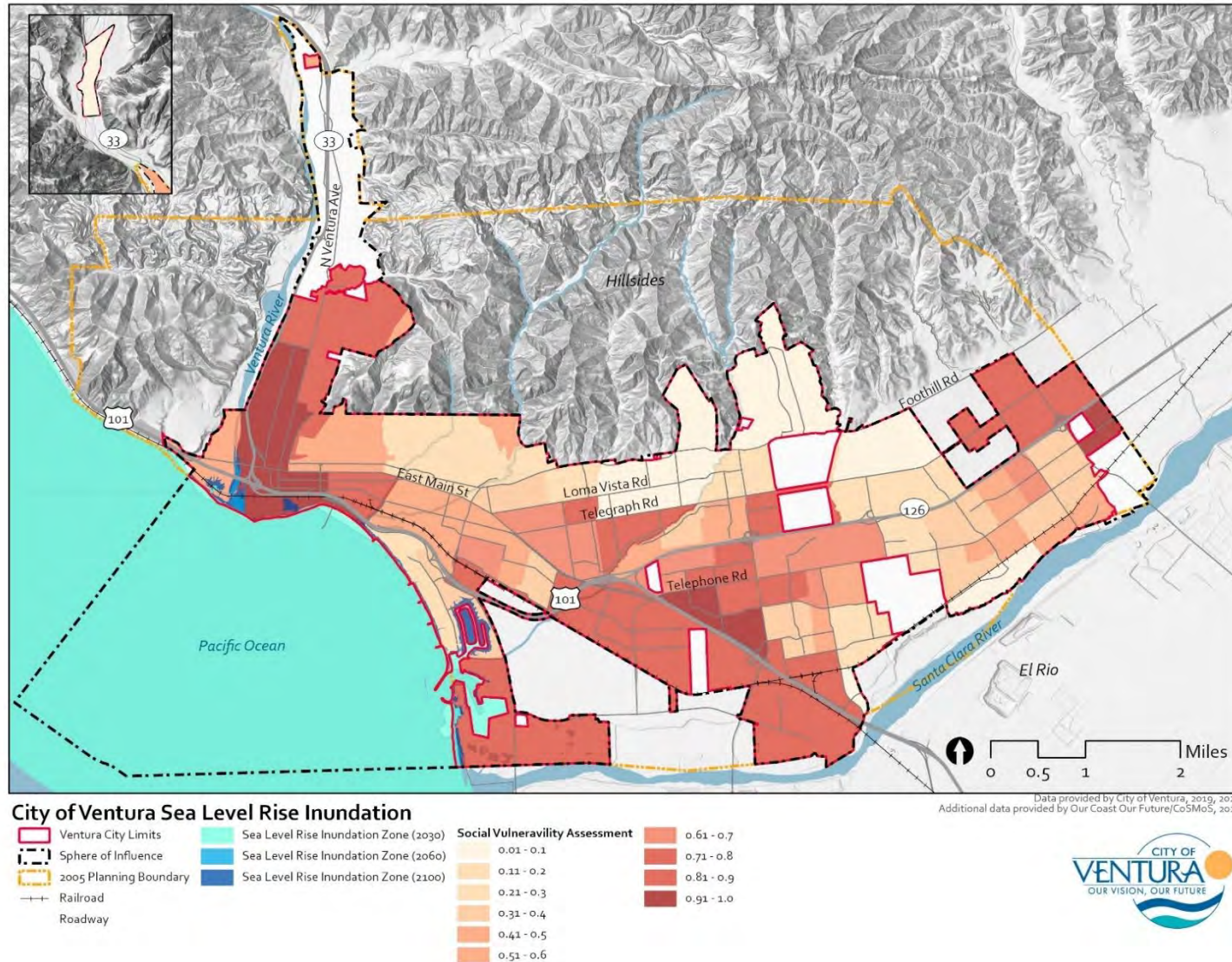


Figure 13 Coastal Storm Flooding and Social Vulnerability in the City of Ventura

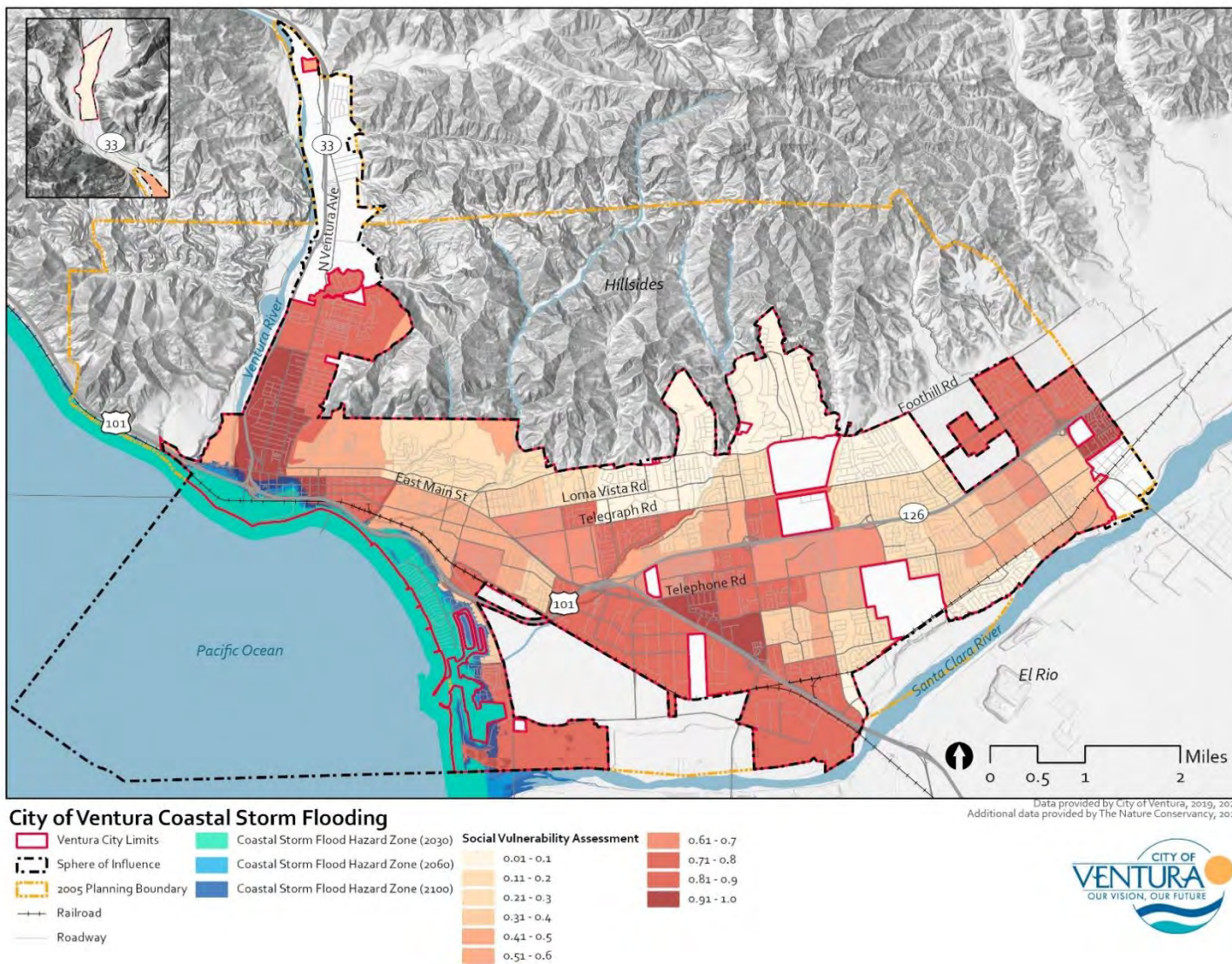


Figure 14 Coastal Erosion and Social Vulnerability in the City of Ventura

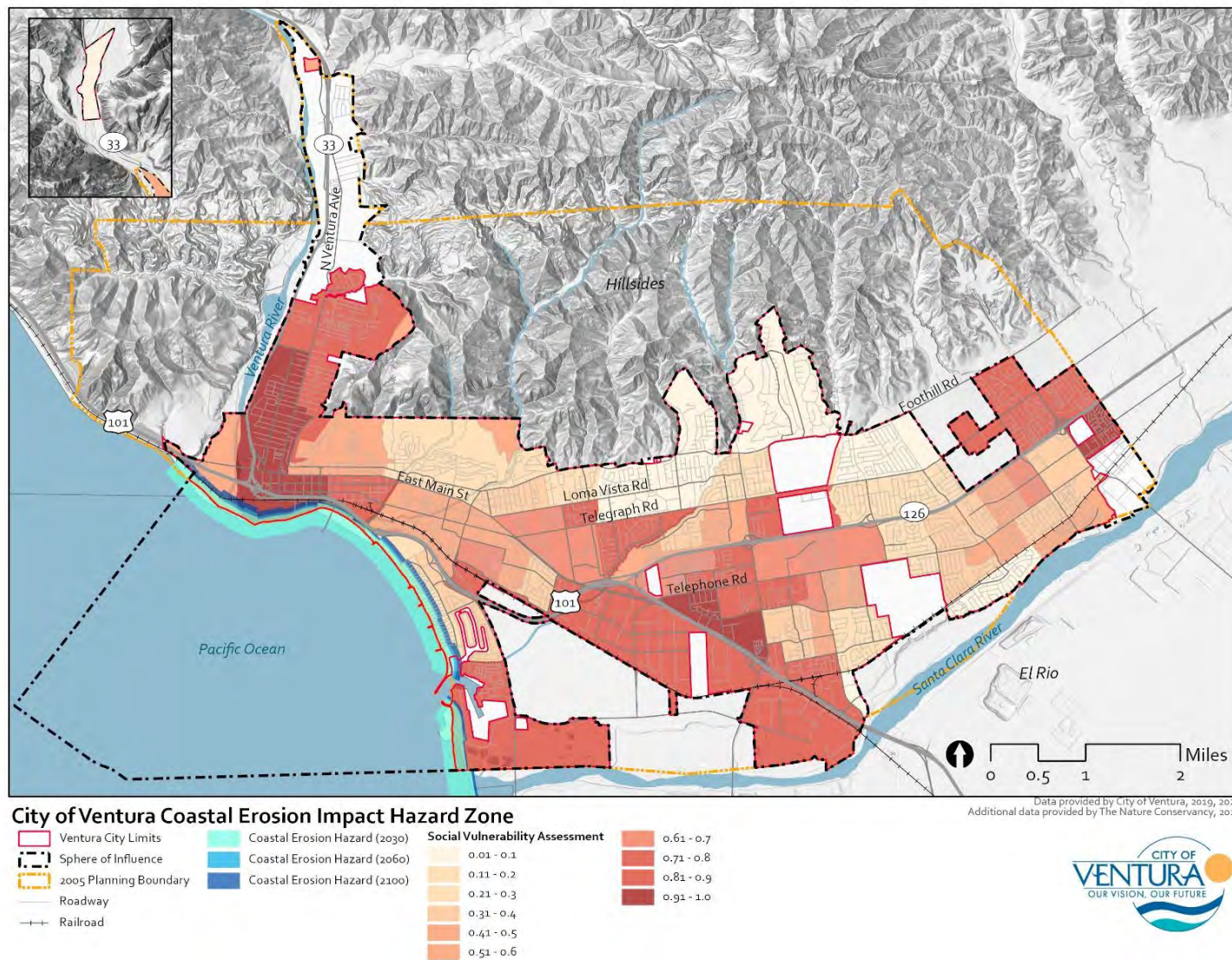


Figure 15 Coastal Storm Wave Impact and Social Vulnerability in the City of Ventura

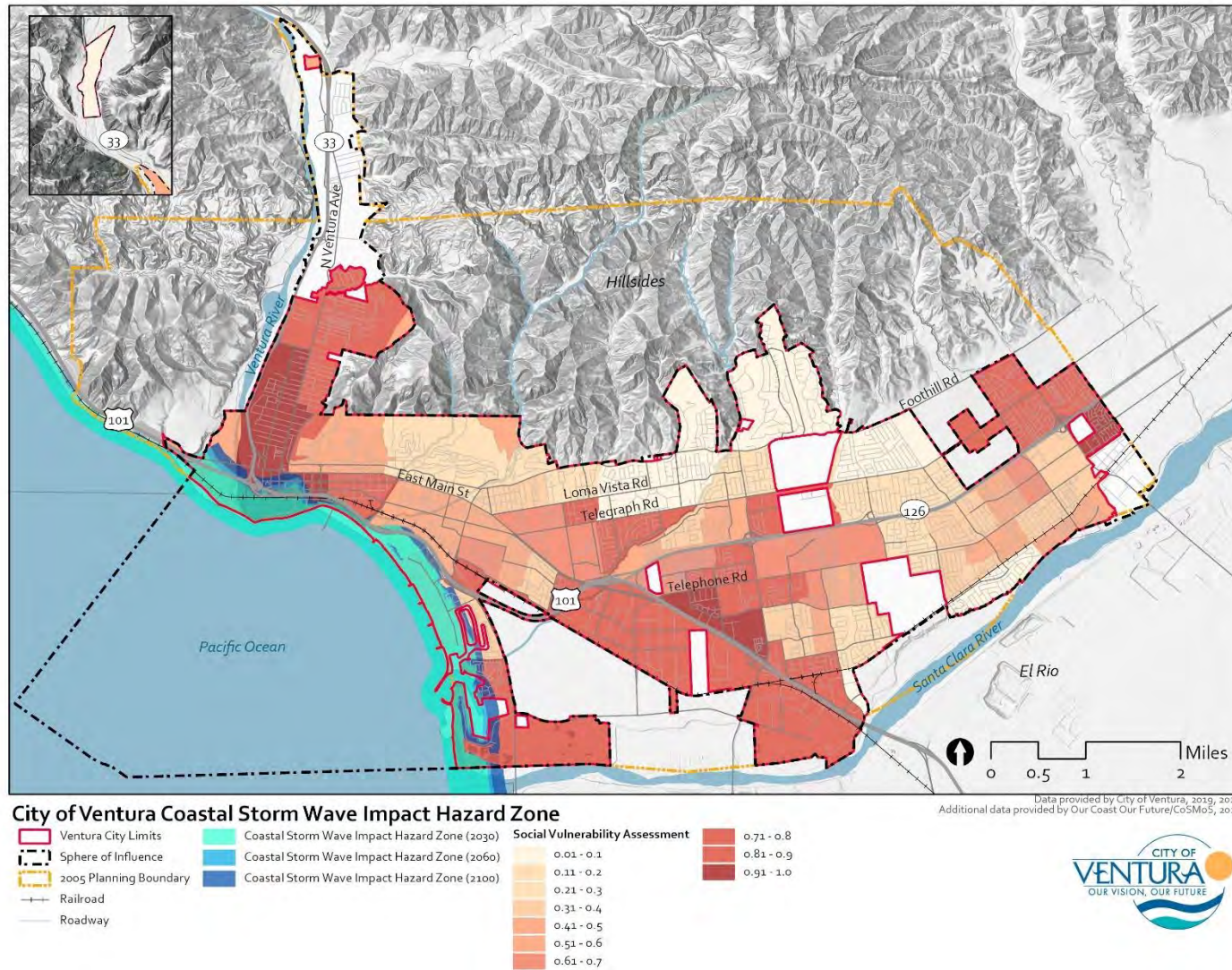
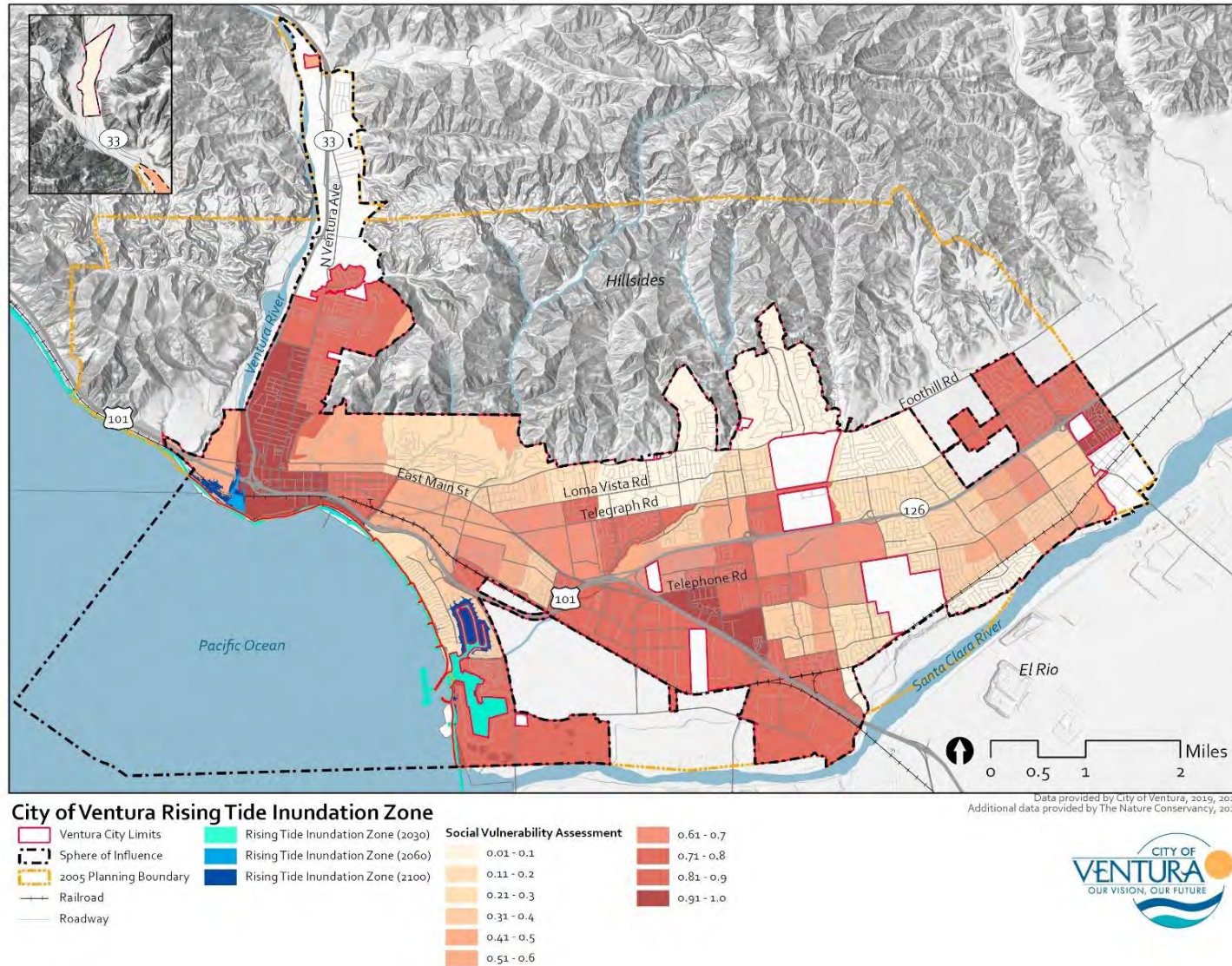


Figure 16 Rising Tide Inundation and Social Vulnerability in the City of Ventura



5.2 Natural and Managed Resources



Primary vulnerabilities for natural resources are associated with climate hazard-caused stress and physical damage to resource types within this asset group. Compounding climate hazards stress natural ecosystems past their ability to absorb individual climate hazards. Wildlife will seek out more conducive habitats during climate hazards such as extreme heat or drought which tend to be where people recreate (USDA 2018). Impacts related to habitat shifts are exacerbated in comparison with rural communities, as densely populated and isolated open space areas have limited opportunities for natural re-seeding or re-habitation from adjacent areas. Both natural resources (beaches, hillsides, rivers and barrancas, riparian and freshwater marshes, biodiversity) and managed resources (parks and agricultural lands) in the City of Ventura, are highly affected by and vulnerable to the effects of climate change.

Potential Impacts

Extreme Heat

The impacts to natural and managed resources in the City of Ventura during extreme heat and warm nights are similar to the impacts experienced by vulnerable populations. Wildlife under these conditions face heat stress and heat related illness as well as disrupted reproductive cycles, and compounding risks associated with early and extended seasonal temperature increases (Backlund 2008). Because it is seasonally warmer earlier in the year species can emerge early with no food source and potentially face an untimely cold front, which increases mortality rates. Timing of

seasonal warmth may not overlap with food sources and extreme heat may stress dependent vegetation communities and wildlife (Dale 1997, Hamerlynck 1995, Maclean 2011). Plants are more likely to experience heat stress and drying, habitat ranges may shift, and native species may be outcompeted by invasive species capable of surviving the harsh conditions. Some pests can proliferate more easily with warmer temperatures (Hamerlynck 1995), and some plants and animals ill-suited to the new warmer conditions may suffer increased mortality rates (CA, 2022). Natural resources are highly exposed to extreme heat and warm nights. Both mid- and end- of century projections depict dramatic increases in extreme heat days (CEC 2021).

Higher temperatures will decrease the snowpack in California and raise the snowline, decreasing one of the most important surface water reserves for agriculture in the state (CA 2022). Extreme heat and warm nights can result in declines in crop yields because of heat stress and anomalous warmth during periods that are typically cooler (Parker et al. 2020). Lower crop yields can increase costs and ultimately decrease agriculture profitability. Livestock operations are potentially less viable during extreme heat events as livestock may suffer from heat related illness.

Drought

Impacts from drought involve risks associated with water scarcity and availability for reliant natural resources. Drought will disrupt habitats and will decrease the resiliency of wildlife. Extended or variable drought conditions effect the amount and duration of water available in ephemeral and permanent sources, which impacts plants and wildlife dependent on those aquatic resources (Burkett 2000).

Like extreme heat and warm nights, drought is linked to declines in crop yields, increasing costs, and decreasing crop profitability.

Drought can result in regional losses of crops and can stress the statewide water supply. Crops grown in Ventura, such as fruit, nuts, vegetables, cut flowers, and livestock and poultry are dependent on high depths of water and subsequently higher water intensity needs. In Ventura County in 2020, there were 96,523 acres of irrigated cropland (VCAC 2020).

Wildfire

The largest direct impacts to natural resources are caused by wildfires. The severity and frequency of wildfires can lead to long term habitat conversions, or vegetative communities that no longer support reliant species, and the landscape provides minimal alternative habitats (Bell et al. 1999, Stephenson et al. 1999, Coop et al. 2020). As discussed with the Exposure to Climate Hazards section, extreme wildfire risk days in the City of Ventura are projected to increase through the end of the century (CEC 2021). Figure 3 depicts the delineation of VHFHSZ's which both border and fully encompassing areas with natural resources including many recreational areas and city parks.

Given the projected expansion of wildfire prone areas, larger areas of croplands may be within fire hazard severity zones in the future due to climate change. Wildfires can destroy crops and disrupt rangeland operations while wildfire smoke may stress the health of crops and livestock.

Landslides

Landslide susceptibility is limited and the likelihood of landslides occurring is determined by precipitation and wildfire occurring sequentially (CA, 2022). In the event of a landslide there is potential for loss of lands, habitat, and disruption of waterbodies in areas of debris flow. Wildlife and plants face a compounding risk when presented with landslide events. The hillsides north of Poli

Street/Foothill Road, and east of Ventura Avenue and Cedar Street contain several landslide prone areas and are likely to sustain future landslide activity (City 2021).

The majority of the City's cropland is in the foothills, where landslide potential is greatest, and are therefore at high risk of related disruption or destruction (VCAC 2020).

Riverine and Stormwater Flooding

The major impacts of flooding on natural and managed resources are the damage and destruction that occurs because of related erosion, as well as the degradation of water quality, which impacts survival rates of aquatic species and fish (Talbot 2018). One way that stormwater flooding reduces water quality is by causing algae blooms which lead to plant and wildlife health issues within wetlands and waterbodies (EPA 2022). Other impacts include damage from inundation in storm flooded areas including natural habitats and public and private land surrounding waterbodies in the City. Riverine and stormwater flooding will mostly affect sensitive species of plants and wildlife that are based in low-lying areas of the City, specifically those adjacent to the rivers and barrancas in the area. The 100-year flood hazard area for the Ventura River is confined to the area west of the levee, near the River mouth. A 100-year flood along the Santa Clara river would cause a limited area of the City just north of the river, including Olivas Park and Buenaventura Golf Courses to be impacted (City 2021).

Agricultural operations neighboring the Santa Clara river are susceptible to the impacts riverine and stormwater flooding. These operations have the potential to be disrupted during flood events, and inundation is likely to result in crop yield reductions. Agricultural worker's residences could also be damaged by floodwater inundation (VCAC 2020).

Air Quality

The direct effects of air quality declines on natural resources relates to plant and wildlife health as increased air pollutants is correlated to increased stress and mortality rates. Impacts from air quality can further impact natural resources since air quality declines correspond with other hazards (such as wildfire and extreme heat events), which compounds risks.

The direct impacts of air quality on crop yield and livestock health within the City of Ventura are of concern as livestock are dependent on clean air for overall health, and smoke damage may render crops unsaleable.

Sea Level Rise

The extent to which coastal inundation affects habitats, wildlife, and plants is significant in the City of Ventura. The Ventura Sea Level Rise Vulnerability Assessment outlines several coastal resources that will be vulnerable to SLR through the end of the century throughout Ventura County. Coastal sand dunes, beaches estuarine ecosystems, and various coastal recreation areas are the most vulnerable to sea level rise and potentially at risk of flooding and coastal erosion. Ventura's beaches draw many visitors annually and brings a significant economic benefit to the City. Under existing projections, the beaches are subject to coastal erosion and flooding, which will render many unusable at high tide (County 2018)

Though most agricultural land in the City in the foothills, some plots near the Santa Clara river are susceptible to the impacts of SLR related hazards (VCAC 2020).

Adaptive Capacity

There are no explicit plans, programs, or policies directly increasing the adaptive capacity of the City of Ventura's natural resources to the climate hazard of extreme heat, drought, or landslides.

The Coastal Resilience Ventura Project provides data with projections of SLR- related hazards which highlights natural and managed resources that will be impacts in the coming decades.

Related to wildfire, there are existing programs and plans outlined in the Ventura Land Trust Community Wildfire Protection Plan. The plan identifies natural and managed resources that are susceptible to wildfire and plans for vegetation management as a mitigation effort. Indirect planning, such as emergency notification and alert systems, exists within the 2020 Urban Water Management Plan, the 2005 City of Ventura General Plan, the 2022 Ventura County Multi-Jurisdictional Hazard Mitigation Plan, and the 2021 City of Ventura Emergency Response Plan to provide awareness of natural and managed resources impacts around climate hazards.

Phase 1 of the Surfers Point Managed Retreat Project has been completed which is an effort to relocate bike trails, parking lots, and other beach access amenities away from the shoreline in SLR and coastal erosion areas.

Vulnerability Score for Natural and Managed Resources

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	High	Low	4-High
Drought	High	Low	4-High
Wildfire	High	Medium	4-High
Landslides	High	Low	4-High
Riverine and Stormwater Flooding	High	Medium	3-Medium
Air Quality	Medium	Medium	3-Medium
Sea Level Rise	High	Medium	4-High

Natural and managed resources in the City of Ventura are most vulnerable to extreme heat/warm nights, drought, landslides, wildfire, and sea level rise.

5.3 Buildings and Facilities



Vulnerabilities within this asset category primarily concern physical exposure and damages to residential areas, commercial and industrial buildings, and educational facilities in relation to climate hazards. Impacts associated with operations of critical services are discussed under the Critical Infrastructure and Services section.

Potential Impacts

Extreme Heat and Warm Nights

Extreme heat could impact occupants of buildings and facilities that are not adequately weatherized for increased temperatures.

Drought

Drought will have minimal impact on the physical structures of buildings and facilities across the City of Ventura.

Wildfire

The structures and buildings that occupy wildfire hazard zones are at risk of structural damage from wildfires. There are several residential areas in the City's wildfire hazard zones shown in Figure 3.

Landslides

Landslide susceptibility for the City of Ventura overlaps with sloped wildfire hazard zones (CDOC 2021). Impacts to buildings and facilities as outlined in the multi-jurisdiction hazard mitigation plan encompass many residential neighborhoods as well as some commercial developments.

Riverine and Stormwater Flooding

There is some risk of riverine and stormwater flooding to the physical structures outlined under this asset category. The location of floodplains in Figure 4 show only a slight risk of impact based on current flood conditions, primarily to residences neighboring the Santa Clara and Ventura Rivers.

Air Quality

The impact of reduced air quality will have a similar effect as extreme heat on buildings and facilities. The ability to filter air will greatly affect the subsystems, services, and populations that are reliant on the buildings and facilities, but the direct impact on structures is low.

Sea Level Rise

Physical damages to buildings and facilities brought about by coastal flooding are mainly related to structural damages--residential properties, coastal commercial industry, and some industrial facilities (County 2018).

The Ventura Sea Level Rise Vulnerability Assessment found that losses to residential land made up 95% of all land use vulnerabilities --primarily concentrated in oceanfront neighborhoods comprised primarily of single-family residences (County 2018).

Adaptive Capacity

The City of Ventura has minimal existing adaptive capacity to increase the weatherization of buildings and facilities throughout the City. This means that risks related to climate hazards including wildfire, landslides, riverine and stormwater flooding, and air quality are significant.

The Multi-Jurisdiction Hazard Mitigation Plan provides some actions to retrofit, purchase, or relocate structures located in hazard areas, with priority on those that have experienced repetitive loss or are in high-risk areas (County 2022).

The 2005 Ventura City General Plan acknowledges several concerns in the City’s ability to provide swift and successful response in the

case of a wildfire that may impact buildings and facilities: lack of fire protection systems in older structures, lengthy response times to far reaching areas in the City, insufficient staffing levels, and a need for a reliable and sustainable source of revenue for fire response (City 2005).

Vulnerability Score for Buildings and Facilities

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	Low	Low	3-Medium
Drought	Low	Low	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Medium	3-Medium
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	Low	Low	3-Medium
Sea Level Rise	High	Medium	4-High

Buildings and facilities in the City of Ventura are most vulnerable to wildfires and sea level rise.

5.4 Critical Infrastructure and Services



Overall vulnerabilities associated with this asset category involve structural preparedness and service reliability in the face of climate change. This section is mainly concerned with the cascading impacts physical damages to buildings and facilities can have on services and infrastructure.

Potential Impacts

Extreme Heat and Warm Nights

As temperatures increase, roadways, active transportation routes, and railroads are vulnerable to damages through sustained heat such as buckled railroad ties and cracked surfaces (Hall et al. 2018). Additional impacts from extreme heat are associated with increased emergency service calls which could strain medical services. Electrical infrastructure may become overwhelmed by demand and result in blackouts, or energy providers may conduct power safety shutoffs to avoid impacts to electrical facilities. Power outages have significant impacts on communication networks, water conveyance, and vulnerable populations, and are a cascading impact of extreme heat events, which place additional strain on infrastructure and critical services.

Drought

Drought can impact water reliability and water infrastructure. All emergency services depend on water, particularly firefighters, who rely on adequate water supply for fire suppression. Water providers within the City will encounter increased difficulty as drought decreases general service reliability. Drought impacts can create

service strain for emergency and medical services. Cracked pavements from drought compounded with extreme heat affects roadways and transportation routes.

Wildfire

There are some critical facilities, such as the police station, several medical facilities, fire stations, and government buildings, located in the high and moderate fire hazard severity zones as shown in Figure 3 that are at risk of damage and destruction caused by wildfires. Additionally, utility lines have the potential to be damaged in high-risk locations, resulting in oil and gas leaks and power outages. Utility lines under certain high wind conditions can also trigger wildfires through downed power lines (Hall et al. 2018). Power safety shut offs in response to wildfire risk can affect service reliability of power. Increased frequency of wildfires can place strain on fire and emergency services. Evacuation routes could be disrupted during a wildfire event limiting emergency responders and ability for people to evacuate as well. Post-wildfire there are additional issues of displacement and needs for temporary shelters for uprooted communities.

Landslides

The Thomas Fire burned over 500 homes in the City and left burn scars in the hillsides susceptible to landslides (County 2022). Landslides risk is high along most of the northern border of the City as well as along both sides of Highway 33, which leaves critical facilities and services, including the police station, several medical facilities, fire stations, and government buildings vulnerable.

Riverine and Stormwater Flooding

Impervious surfaces can impede the absorption of water and increase stormwater flooding in areas of the City. There is risk of

damage from increased extreme precipitation events including erosion, washouts, and sinkholes. Storm drainage and flood protection services for the City may be impacted by these events. In flood events, water quality decreases, which may lead to cascading impacts such as limited availability for fire suppression.

Air Quality

Higher incidence of unsafe air quality caused by increased smog, dust and wildfire smoke can create general strain on existing critical services and infrastructure through increased rates of hospitalization and emergency and medical services (CDPH 2020).

Sea Level Rise

The SLR-related hazards that the City of Ventura is expected to experience are significant. Critical services and infrastructure including critical transportation, coastal highways, and infrastructure corridors are vulnerable to sea level rise and related hazards. The Pacific Coast Highway is the most vulnerable road on the coast (County 2018). SLR will likely impact the City's wastewater treatment facility, located on the northern bank of the Santa Clara River. Additionally, coastal medical facilities and government buildings may be impacted by rising sea level and related hazards.

Adaptive Capacity

The relevant existing plans, policies, and programs for the City of Ventura are mainly multi-hazard based. All multi-hazard plans, programs and systems are designed to address service and infrastructure failings and contingencies. Existing planning cover wildfires, drought, landslides, flooding, severe weather and storms, and sea level rise. Relevant plans and systems in place are found below:

- Ventura County Multi-Jurisdictional Hazard Mitigation Plan
- City of Ventura Emergency Response Plan
- City of Ventura Emergency Response Team (CERT) Program
- City of Ventura 2005 General Plan Public Safety Element

The Multi-Jurisdiction Hazard Mitigation Plan includes action Ven-21 which highlights City fire facilities and develops plans to retrofit fire facilities in accordance with local regulations and industry standards (County 2022).

Cascading risks of services and power dependencies are addressed in relation to the aforementioned hazards throughout these plans and programs.

Vulnerability Score for Critical Services and Infrastructure

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat/Warm Nights	High	Low	5-High
Drought	High	Medium	4-High
Wildfire	High	High	3-Medium
Landslides	Medium	Low	4- High
Riverine and Stormwater Flooding	High	Low	5-High
Air Quality	Medium	Low	4-High
Sea Level Rise	High	Medium	4-High

Critical services and infrastructure in the City of Ventura are most vulnerable to extreme heat/warm nights, drought, landslides, riverine and stormwater flooding, air quality, and sea level rise.

6 Conclusion

This report evaluates how climate change may impact vulnerable community members, natural resources, critical facilities, buildings, services, and infrastructure in the City of Ventura. The report provides a list of vulnerable population groups and assets for which adaptation policies and programs should be developed and implemented to increase community resilience. Vulnerability is based on the combination of potential impacts and adaptive capacity, as identified in the Vulnerability Analysis section of the report.

A list of asset categories and related vulnerability scores is provided on the next page. Highly vulnerable assets are discussed below:

- All sensitive population groups identified are highly vulnerable to many climate hazards including extreme heat, air quality, wildfires, flooding, landslides, and sea level rise.
- Natural and managed resources are highly vulnerable to extreme heat, drought, wildfire, flooding, landslides, and sea level rise.
- Buildings and facilities in the City are highly vulnerable to wildfire and sea level rise. Buildings and facilities located in inundation zones are at risk of structural damage from sea level rise.
- Critical infrastructure and services are highly vulnerable to extreme heat, flooding, landslides, air quality, and sea level rise. Several facilities are in the wildfire hazard severity zones of the City. These buildings and facilities are at risk of structural damage from wildfire. Infrastructure and dependent populations experience additional cascading impacts around power outages from downed utility lines, power safety shut offs

and grid overload. All forms of power outages can affect how critical services are able to perform their needed functions during a hazard.

This report establishes a foundation for identifying adaptation policies and programs that can increase resilience in the City of Ventura. The City of Ventura Safety Element will include policies and programs to increase the resilience of the population groups and asset categories with the highest vulnerability to climate change.

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Vulnerable Populations			
Extreme Heat	High	Medium	4-High
Drought	Medium	Medium	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Low	4-High
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	High	Low	5-High
Sea Level Rise	High	Low	5-High
Natural and Managed Resources			
Extreme Heat/Warm Nights	High	Low	4-High
Drought	High	Medium	4-High
Wildfire	High	Medium	4-High
Landslides	Low	Low	4-High
Riverine and Stormwater Flooding	High	Medium	3-Medium
Air Quality	Medium	Medium	3- Medium
Sea Level Rise	High	Medium	4-High
Buildings and Facilities			
Extreme Heat/Warm Nights	Low	Low	3-Medium
Drought	Low	Low	3-Medium
Wildfire	High	Medium	4-High
Landslides	Medium	Medium	3-Medium
Riverine and Stormwater Flooding	Medium	Medium	3-Medium
Air Quality	Low	Low	3-Medium
Sea Level Rise	High	Medium	4-High
Critical Services and Infrastructure			
Extreme Heat/Warm Nights	High	Low	5-High
Drought	High	Medium	4-High
Wildfire	High	High	3-Medium
Landslides	Medium	Low	4- High
Riverine and Stormwater Flooding	High	Low	5-High
Air Quality	Medium	Low	4-High
Sea Level Rise	High	Medium	4-High

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Appendix E

Greenhouse Gas Forecast and Reductions Analysis Methodology

This appendix provides more details on the greenhouse gas (GHG) emissions forecast and emissions reduction analysis.



Greenhouse Gas Emissions Forecast

A GHG emissions forecast estimates future GHG emission changes by accounting for projected community growth as defined by Palmdale's General Plan Update. The forecast is built off the 2017 communitywide GHG emissions forecast and thus includes the same sectors and facilities.

Calculating the difference between the GHG emissions forecast and GHG emissions reduction targets set by a jurisdiction determines the gap in GHG emissions that needs to be closed through the implementation of local GHG reduction policies as outlined in the CARP. Two forecast scenarios were developed for Ventura out to horizon year 2045:

- **Business-as-usual scenario (BAU):** Provides a forecast of how future GHG emissions would change if consumption trends continued as they did in 2019 and growth were to occur as projected in the City's General Plan, absent any regulations that would reduce local emissions.
- **Legislative adjusted scenario (ABAU):** Provides a forecast of how currently adopted legislation would reduce GHG emissions from the business-as-usual scenario. The legislative adjusted scenario represents the state's contribution to reducing local GHG emissions to meet state goals.

The adjusted forecast incorporates the impact of state regulations that provide GHG emission reduction potential to offer a more accurate picture of future GHG emissions growth and the responsibility of the City for GHG emissions reduction. The state legislation included in the adjusted forecast result in GHG emissions reduction related to transportation, building efficiency and renewable electricity.

The following State policies were included in the ABAU forecast:

- **Transportation:** Major regulations incorporated into the CARB's 2021 transportation modeling used for forecast development include the Advanced Clean Truck Rule, SAFE Vehicle Rules and Actions, and Innovative Clean Transit Rule.²³
- **Title 24:** The California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings is updated triennially to allow consideration and possible incorporation of new energy-efficient technologies and methods. The SB 32 Scoping Plan calls for the continuation of ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction.
- **Renewable Portfolio Standard (SB 100):** The RPS requires utilities to increase procurement from eligible renewable energy resources to 50% of total procurement by 2026, 60% of total procurement by 2030, and GHG-free sources to 100% of total procurement by 2045. The GHG emission reduction from SB 100 are accounted for by reducing the GHG emissions associated with each unit of energy in line with the increasing stringent RPS requirements. In 2045, all retail electricity is assumed to be completely carbon neutral.

The City of Ventura CARP includes the following GHG emissions targets:

- Reduce GHG emissions to 40% below 1990 levels by 2030 (SB 32 target year)

²³ California Air Resources Board. (2021). EMFAC2021 Volume III Technical Document Version 1.0.1. Accessed from: https://ww2.arb.ca.gov/sites/default/files/2021-08/emfac2021_technical_documentation_april2021.pdf.

- Achieve carbon neutrality by 2045 (EO B-55-18 target year)

The equivalent 1990 GHG emission levels are derived by comparing the State’s GHG emissions from relevant sources from given year to the statewide GHG emission in 1990, using relevant GHG emission sectors. This assumes that GHG emissions in the City of Ventura have generally scaled with the State’s GHG emissions, as vehicle fuel economy standards, waste reduction policies, and increased renewable energy procurement would have similar effects in the City as they did statewide. For the state minimum targets presented here, the State’s GHG emissions in 2005 were compared to 1990, with the agricultural GHG emission sector excluded. This showed that 2005 State GHG emissions levels were approximately 15% less than 1990 levels, and as such the City’s 2005 GHG emission levels are also assumed to be 15% less than 1990 levels.

The above GHG reduction analysis presented in the CARP shows that Ventura can reduce its fair share of emissions and achieve the SB 32 target of a 40% reduction by 2030. As a result, Ventura’s CARP can be considered a Qualified Plan under CEQA. The concept of having a “qualified” CAP means that a climate action plan meets the criteria specified in CEQA Guidelines Section 15183.5(b) for a plan for the reduction of greenhouse gas emissions, such that a “qualified” CAP may then be used for the specific purpose of streamlining the analysis of GHG emissions in subsequent projects. Local governments have discretion on what levels or targets are established in a “qualified” CAP, provided they address adopted policies and are based on substantial evidence.

GHG Reduction Estimates

The table below shows the detailed greenhouse gas reductions that the City can achieve by implementing the mitigation strategies and actions in the CAP. It also shows the participation assumptions and level of effort needed to achieve the associated reductions for each strategy based on the GHG reduction model. For example, to achieve the GHG reductions associated with the electrification strategy, 35% of existing residential and nonresidential buildings within the city have transitioned to all-electric in 2035 and 56% by 2045 and the annual number of dwelling units or buildings transitioning is 1,225 units and 65 nonresidential buildings.

Table E-1. Projected GHG Reduction Results

Strategy	Assumptions	Cumulative Participation Rate 2035	Cumulative Participation Rate 2045	Annual Participation	GHG Reductions 2030	GHG Reductions 2045
Buildings + Energy						
Existing Building Electrification	Phased-in: voluntary until 2035, mandatory after (assume 2.5% annual participation then 5% participation)	35%	62%	1,347 dwelling units 78 nonresidential buildings	33,158	70,256
Residential New Construction Reach Code	Mandatory: assume 100% participation	100%	100%	N/A	876	983
Energy Efficiency Retrofits	Voluntary: assume 2.5% annual participation	13%	21%	480 dwelling units 28 nonresidential buildings	9,256	21,378
Nonresidential and Multi-family Building Retrocommissioning	Voluntary: assume 2.5% annual participation rate	13%	21%	480 dwelling units 28 nonresidential buildings	2,612	6,175
Clean Power Alliance	Assume 50%-100% RE	RPS	100% carbon free	94% of customers	46,876	0
Local Solar Installations	Voluntary: assume 2.5% annual participation	5%	9%	200 dwelling units 52 nonresidential buildings	0	0

Transportation + Land Use						
EV Adoption	Assume adoption rate in line with Ventura County	5% of households	11% of households	510 vehicles	7,356	14,878
Mode Split	Mandatory: TDM program for employers	Carpool: 15% Transit: 6% Walk/Bike: 7%	Carpool: 18% Transit: 10% Walk/Bike: 10%	N/A	21,748	58,602
Materials + Consumption						
Organics Diversion	Mandatory: SB 1383 compliance	75% reduction	75% reduction	N/A	3,885	3,723
Natural Systems + Water Resources						
Tree Planting	Voluntary	N/A	N/A	400 trees	156	368
Water Efficiency	Voluntary: assume 2.5% annual participation	28%	48%	1,200 dwelling units 63 nonresidential buildings	237	0
Total Reductions (MTCO _{2e})					126,161	176,364
Forecasted ABAU emissions					487,135	446,803
Remaining ABAU emissions					360,974	270,439
1990 % Reduction					-40%	-55%

GHG Reduction Calculator Data Sources

Emissions forecast: Raimi + Associates. (Updated 2022). Based on City of Ventura provided 2019 GHG Communitywide Inventory.

Demographic data: California Department of Finance, SCAG, and US Census Bureau adjusted by Raimi + Associates to align with the Ventura General Plan Update Demographic estimates

- Housing units: 3x RHNA for City of Ventura
- Jobs growth: 1:1 with housing

Clean Energy

Avg. DC system size (kW): NREL PVWatts Calculator default value: <https://pvwatts.nrel.gov/pvwatts.php>

Annual kWh generated by PV: NREL PVWatts Calculator default value: <https://pvwatts.nrel.gov/pvwatts.php>

% homes using natural gas: California Residential Building Electrification Market Assessment https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

Avg. Building size: California Residential Building Electrification Market Assessment https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

Avg. appliance efficiencies: https://rael.berkeley.edu/wp-content/uploads/2017/07/Raghavan-Wei-Kammen-WaterHeating_-ENergyPolicy-2017.pdf

Energy savings of retrocommissioning and solar installation: CEC Options for Energy Efficiency in Existing Buildings

Energy Savings of nonresidential retrofits: Advanced Energy Retrofit Guides https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf, https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf

Energy Savings of residential retrofits: CEC Large Scale Residential Retrofit Program <https://ww2.energy.ca.gov/2017publications/CEC-500-2017-009/CEC-500-2017-009.pdf>.

EPIC emissions factor: 75% carbon neutral electricity estimated as 25% of current emissions factor for electricity

Buildings

Commercial building assumptions: A Look at the U.S. Commercial Building Stock: Results from EIA's 2012 Commercial Buildings Energy Consumption Survey (CBECS) <https://www.eia.gov/consumption/commercial/reports/>

SCE emissions factor: Raimi + Associates. 2017 Communitywide GHG Emissions Inventory. (Updated 2022).

SoCalGas emissions factor: Raimi + Associates. 2017 Communitywide GHG Emissions Inventory. (Updated 2022).

Transportation

EV Fuel assumptions: Hybrid and Plug-In Electric Vehicle Emissions Data Sources and Assumptions https://afdc.energy.gov/vehicles/electric_emissions.html

Number and Types of EVs in Los Angeles County: California Plug-In Electric Vehicle Infrastructure Projections: 2017-2025 <https://www.nrel.gov/docs/fy18osti/70893.pdf>

VMT per trip: Ventura County 2016 EMFAC model

Current mode split: US Census Bureau.

VMT: Forecasted to increase by service population demographic data.

Mode split estimates: CAPCOA Quantifying Greenhouse Gas Mitigation Measures

Waste

Tonnage data: CalRecycle

Sequestration

Annual CO₂ accumulation per Tree: CAPCOA Quantifying Greenhouse Gas Mitigation Measures

CALIFORNIA NATURAL RESOURCES AGENCY



FINAL STATEMENT OF REASONS FOR REGULATORY ACTION

**Amendments to the State CEQA Guidelines
Addressing Analysis and Mitigation of Greenhouse Gas
Emissions Pursuant to SB97**

December 2009

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**CALIFORNIA NATURAL RESOURCES AGENCY
FINAL STATEMENT OF REASONS FOR REGULATORY ACTION**

December 2009

INTRODUCTION

The California Natural Resources Agency (“the Resources Agency”) has adopted certain amendments and additions to certain guidelines implementing the California Environmental Quality Act (Public Resources Code section 21000 *et seq.*) (“CEQA”). Specifically, these amendments implement the Legislature’s directive in Public Resources Code section 21083.05 (enacted as part of SB97 (Chapter 185, Statutes 2007)). That section directs the Resources Agency to “certify and adopt guidelines prepared and developed by the Office of Planning and Research” “for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions[.]” (Pub. Resources Code, § 21083.05(a)-(b).)

CEQA generally requires public agencies to review the environmental impacts of proposed projects, and, if those impacts may be significant, to consider feasible alternatives and mitigation measures that would substantially reduce significant adverse environmental effects. Section 21083 of the Public Resources Code requires the adoption of guidelines to provide public agencies and members of the public with guidance about the procedures and criteria for implementing CEQA. The guidelines required by section 21083 of the Public Resources Code are promulgated in the California Code of Regulations, title 14, sections 15000-15387 (the “Guidelines” or “State CEQA Guidelines”). Public agencies, project proponents, and third parties who wish to enforce the requirements of CEQA, rely on the Guidelines to provide a comprehensive guide on compliance with CEQA. Subdivision (f) of section 21083 requires the Resources Agency, in consultation with the Office of Planning and Research (“OPR”), to certify, adopt and amend the Guidelines at least once every two years.

Section 21083.05, as noted above, requires the promulgation of Guidelines specifically addressing analysis and mitigation of the effects of greenhouse gas emissions. The Resources Agency has adopted the following changes to the Guidelines (“Amendments”) to implement that directive:

Add sections: 15064.4, 15183.5 and 15364.5.

Amend sections: 15064, 15064.7, 15065, 15086, 15093, 15125, 15126.2,
 15126.4, 15130, 15150, 15183, Appendix F and Appendix G.

In addition to guidelines implementing SB97, some of the amendments listed above are non-substantive corrections.

The Resources Agency considered reasonable alternatives to the Amendments. The Resources Agency has determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 and to update the Guidelines to reflect recent case law. Thus, the Amendments add no additional substantive requirements; rather, the Guidelines merely assist lead agencies in complying with CEQA's existing requirements. The Resources Agency rejected the no action alternative because it would not respond to the Legislature's directive in SB97. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts are due to existing requirements of CEQA and not the Amendments.

The Resources Agency also initially determined that the Amendments would not have a significant adverse economic impact on business. The Resources Agency has determined that this action would have no impacts on project proponents. However, the Resources Agency is aware that certain of the statutory changes enacted by the Legislature and judicial decisions, described in greater detail below, that are reflected in the Amendments could have an economic impact on project proponents, including businesses. Among other things, project proponents could incur additional costs in assisting lead agencies to comply with CEQA's requirement for analysis of greenhouse gas emissions. However, the Amendments to the Guidelines merely reflect these legislative and judicial requirements, and the Resources Agency knows of no less costly alternative. The Amendments clarify and update the Guidelines to be consistent with legislative enactments that have modified CEQA, and recent case law interpreting it, but does not impose any new requirements. Therefore, the Amendments would not have a significant, adverse economic impact on business.

Some comments were submitted during the public comment period and during the public hearings on the Proposed Amendments suggesting that the adverse economic impacts could result. For example, some suggested that the addition of forestry resources to the Appendix G checklist may increase the regulatory burden on the agricultural industry. Others suggested that application of the Guidelines to renewable energy projects or those implementing AB32 may be counterproductive. Despite those suggestions, no evidence was presented to the Resources Agency supporting those claims. Moreover, those comments did not provide any rationale challenging the Resources Agency's position that the Proposed Amendments implement existing requirements. Therefore, having considered all of the comments submitted on the Proposed Amendments, the Resources Agency concludes that its initial determination that the proposed action will not have a significant adverse economic impact remains correct.

The Amendments do not duplicate or conflict with any federal statutes or regulations. CEQA is similar in some respects to the National Environmental Policy Act ("NEPA"), 42 U.S.C. sections 4321-4343. Federal agencies are subject to NEPA, which

requires environmental review of federal actions. State and local agencies are subject to CEQA, which requires environmental review before state and local agencies may approve or decide to undertake discretionary actions and projects in California. Although both NEPA and CEQA require an analysis of environmental impacts, the substantive and procedural requirements of the two statutes differ. Most significantly, CEQA requirements for feasible mitigation of environmental impacts exceed NEPA's mitigation provisions. A state or local agency must complete a CEQA review even for those projects for which NEPA review is also applicable, although Guidelines sections 15220-15229 allow state, local and federal agencies to coordinate review when projects are subject to both CEQA and NEPA. Because state and local agencies are subject to CEQA unless exemptions apply, and because CEQA and NEPA are not identical, guidelines for CEQA are necessary to interpret and make specific provisions of SB97 and do not duplicate the Code of Federal Regulations.

FINAL STATEMENT OF REASONS

The Administrative Procedure Act requires that an agency prepare a final statement of reasons supporting its proposed regulation. The final statement of reasons updates the information contained in the initial statement of reasons, contains final determinations as to the economic impact of the regulations, and provides summaries and responses to all comments regarding the proposed action. The initial statement of reasons, as updated and revised, are contained in full in this final statement of reasons. The summaries and responses to comments are included in the Natural Resources Agency's file of this rulemaking proceeding.

Below is a brief background on the science relating to the effects of greenhouse gas emissions, as well as the various initiatives that California is implementing to reduce those emissions. Following that background, OPR's public engagement process and the Natural Resources Agency's rulemaking process is briefly described. Next, this Final Statement of Reasons explains the purpose and necessity of each proposed change to the Guidelines. Finally, Thematic Responses, addressing the major themes that were raised in public comments, are provided.

BACKGROUND ON THE EFFECTS OF GREENHOUSE GAS EMISSIONS AND CALIFORNIA'S EFFORTS TO REDUCE THOSE EMISSIONS

This section provides a brief background on the potential effects of greenhouse gas emissions and California's efforts to reduce those emissions.

What Are Greenhouse Gases?

Certain gases in Earth's atmosphere naturally trap solar energy to maintain global average temperatures within a range suitable for terrestrial life. Those gases – which primarily include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons,

perfluorocarbons and sulfur hexafluoride – act as a greenhouse on a global scale. (Health and Safety Code, § 38505(g).) Thus, those heat-trapping gases are known as greenhouse gases (“GHG”).

The Legislature defined “greenhouse gases” to include the six gases mentioned above in California’s Global Warming Solutions Act. (Health & Saf. Code, § 38500 et seq.) Similarly, the U.S. EPA has found that those same six gases could be regulated under the authority of the Clean Air Act. According to the U.S. EPA:

(1) These six greenhouse gas share common properties regarding their climate effects; (2) these six greenhouse gases have been estimated to be the primary cause of human-induced climate change, are the best understood drivers of climate change, and are expected to remain the key driver of future climate change; (3) these six greenhouse gases are the common focus of climate change science research and policy analyses and discussions; [and] (4) using the combined mix of these gases as the definition (versus an individual gas-by-gas approach) is consistent with the science, because risks and impacts associated with greenhouse gas-induced climate change are not assessed on an individual gas approach....

(EPA, Endangerment Finding, 74 Fed. Reg. 66496, 66517 (December 15, 2009).) The United Nations Framework Convention on Climate Change also addresses these six gases. (*Id.* at p. 66519.)

What Causes Greenhouse Gas Emissions?

The incremental contributions of GHGs from innumerable direct and indirect sources result in elevated atmospheric GHG levels. (EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904 (April 24, 2009) (“cumulative emissions are responsible for the cumulative change in the stock of concentrations in the atmosphere”); see also 74 Fed. Reg. 66496, 66538 (same in Final Endangerment Finding).) Some GHG emissions occur through natural processes such as plant decomposition and wildfires. One large source of GHG emissions, for example, is wildfire on forestlands and rangelands, which release carbon as a result of material being burned. (California Board of Forestry and Fire Protection, *2008 Strategic Plan and Report to the CARB on Meeting AB32 Forestry Sector Targets* (October, 2008), at p. 2.)

Human activities, such as motor vehicle use, energy production and land development, also result in both direct and indirect emissions that contribute to highly elevated concentrations of GHGs in the atmosphere. (California Energy Commission, *Inventory of California Emissions and Sinks: 1990 to 2004* (2006).)¹ Transportation

¹ Multiple statewide emission inventories covering the same period of time may vary. This is largely due to inventories characterizing an emission source by sectors (e.g. agriculture, cement, transportation, etc.) which may not be treated the same depending on the methodology used and access to information. Thus,

alone is estimated to account for nearly 40 percent of California's GHG emissions. (California Air Resources Board, *Climate Change Proposed Scoping Plan* (2008), at p. 11 ("Scoping Plan"); California Energy Commission 2007, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF ("2007 IEPR") at p. 18, Figure 1-2.) Emissions attributable to transportation result largely from development that increases, rather than decreases, vehicle miles traveled: low density, unbalanced land uses separating jobs and housing, and a focus on single-occupancy vehicle travel. (California Energy Commission, *The Role of Land Use In Meeting California's Energy and Climate Change Goals*. (2007) at p. 9.) In approaching regulation of GHG emissions in California, for example, the California Air Resources Board ("ARB") proposes to regulate various economic sectors that are known to emit GHGs, including electric power, transportation, industrial sources, landfills, commercial and residential sectors, agriculture and forestry. (Scoping Plan, Appendix F.) With a growing population and economy, California's total GHG emissions continue to increase. As explained below, this rapid rate of increase in GHG emissions is causing a change in the composition of atmospheric gases that may cause life threatening adverse environmental consequences.

What Effects May Result from Increased Greenhouse Gas Emissions?

Several measurable effects, including, among others, an increase in global average temperatures have been attributed to increases in GHG emissions resulting from human activity. (Intergovernmental Panel on Climate Change, *Working Group 1 Report: The Physical Science Basis* (2001), at p. 101.) Evidence further indicates that a warmer planet may in turn lead to changes in rainfall patterns, a retreat of polar icecaps, a rise in sea level, and changes in ecosystems supporting human, animal and plant life. (U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*, April 17, 2009 ("Technical Support Document"), at pp. ES-1 to ES-3.) Climate change is not the only effect of increased GHG emissions. Impacts to human health and ocean acidification are also attributed to increasing concentrations of GHGs in the Earth's atmosphere. (*Id.* at p. 57.)

Globally elevated concentrations of GHGs have been observed to induce a range of associated effects. For example, the effects of atmospheric warming include, but are not limited to, increased likelihood of more frequent and intense natural disasters, increased drought, and harm to agriculture, wildlife, and ecological systems. (Technical Support Document at pp. ES-1, ES-6.) According to a report prepared for the California Climate Change Center:

Climate change is likely to affect the abundance, production, distribution, and quality of ecosystem services throughout the State of California

two statewide emissions inventories may be different depending on the agency that created them or its intended application. The CARB is in the process of updating its statewide data and methodologies to be consistent with international and national guidelines. The typical emissions inventory covers 1990 to 2004.

including the delivery of abundant and clean water supplies to support human consumption and wildlife, climate stabilization through carbon sequestration, the supply of fish for commercial and recreational sport fishing. For example, as described in this report, areas of the state suitable for forage production to support cattle grazing in natural areas could shift as some parts of the state become too dry to support forage and others become wetter. The ability of the State's forests to sequester carbon and support climate stabilization could be hindered as productivity decreases and fires increase. And increased water temperatures in streams due to a decrease in provision of fresh water could seriously reduce salmon reproduction and subsequently reduce the number of salmon available for commercial and recreational harvest. Also, areas of the state suitable for forage production to support cattle grazing in natural areas could shift as some parts of the state become too dry to support forage and others become wetter. All of these ecosystem services have economic value and that value and its distribution is likely to change under a changing climate.

(Rebecca Shaw, et al., for the California Climate Change Center, *The Impact of Climate Change on California's Ecosystem Services*, March 2009, CEC-500-2009-025-D, at p. 1.)

The effects of increased GHG concentrations are already being felt in California. For example, global atmospheric changes are causing sea levels to rise. An increase of approximately 8 inches has been recorded at the Golden Gate Bridge over the past 100 years. Such sea level rise threatens low coastal areas with inundation and increased erosion. (Scoping Plan, at p. 10.)

While sea levels continue to rise, the Sierra snowpack has been shrinking. Average annual runoff from spring snowmelt has decreased 10% in the last 100 years. Because snow in the Sierra acts as a reservoir, holding winter water for use later in the year, reduced snowpack creates greater potential for summer droughts and reduced hydroelectricity generation. (Office of Environmental Health and Hazard Assessment, April, 2009, *Indicators of Climate Change in California*, at p. 76.) Climate change is also thought to account for changes in the timing of California's major precipitation events. As explained in a report prepared for the California Climate Change Center:

reservoirs were designed to store only a fraction of the state's entire yearly precipitation, under the assumption that the annual mountain snowpack would melt at roughly the same time every year. During anomalously high rain or snowmelt events, reservoirs must not only store water, but also discharge excess water to avoid flooding. Water must sometimes be discharged in anticipation of large events to reduce flood risk. The dual functions of storage and flood management require reservoir managers to carefully balance factors such as precipitation, snowmelt timing, reservoir storage capacity, and demand. Even if future precipitation remains

unchanged, shifts in snowmelt timing can affect California's water supply during the warm season due to reservoir storage capacity constraints.

(Sarah Kapnick and Alex Hall, for the California Climate Change Center, *Observed Changes in the Sierra Nevada Snowpack: Potential Causes and Concerns*, March 2009, CEC-500-2009-016-D, at p. 1.)

Climate change is also expected to increase the number and intensity of forest fires. (Technical Support Document, at p. 91; see *also* Indicators of Climate Change (2009) at p. 131.) A generally warmer climate is associated with a longer summer season, which in turn dries vegetation and fuels making ignition easier and hastens wildfire spread. (*Ibid*; see also A. L. Westerling, for the California Climate Change Center, *Climate Change, Growth and California Wildfire*, March 2009, CEC-500-2009-046-D, at pp. 1-2.) Not only do wildfires release additional carbon and increase air pollutants, but they also cause indirect effects. For example, wildfires reduce vegetative cover leading to increased water runoff, which has affected watersheds and dampens the effectiveness of California's water works infrastructure. This will degrade California's water quality and challenge water treatment operations to provide safe drinking water. Adverse health impacts from heat-related illnesses are expected with hotter temperatures, and, due to poorer air quality, lung disease, asthma, and other respiratory and circulatory problems will be exacerbated. (California Climate Action Team, Executive Summary Report to Governor Schwarzenegger and the California Legislature (2006) at pp. xii to xiii, 27.); see also Technical Support Document, at pp. ES-4, 69-71.)

Why is California Involved in Greenhouse Gas Regulation?

California is vulnerable to the effects of global warming, and, despite its global nature, action to curb GHG emissions is needed on a statewide level. The legislative findings in Assembly Bill 32 (Chapter 448, Statutes 2006) ("AB32"), for example, state:

... 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.

... Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

(Health & Safety Code, § 38501(a), (b).) The Legislature further declared: “action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.” (*Id.* at subd. (d).) As the world’s fifteenth largest emitter of GHGs from human activity and natural sources, California is uniquely positioned to act to reduce GHGs. (Scoping Plan, at pp. 11.)

Reducing greenhouse gas emissions is a necessary response to the threats posed by climate change. Efforts to reduce emissions may result in other significant benefits as well. Governor Schwarzenegger laid out the case for action to reduce greenhouse gas emissions in Executive Order S-3-05:

... California-based companies and companies with significant activities in California have taken leadership roles by reducing greenhouse gas (GHG) emissions, including carbon dioxide, methane, nitrous oxide and hydrofluorocarbons, related to their operations and developing products that will reduce GHG emissions; ...

... [C]ompanies that have reduced GHG emissions by 25 percent to 70 percent have lowered operating costs and increased profits by billions of dollars; ...

... [T]echnologies that reduce greenhouse gas emissions are increasingly in demand in the worldwide marketplace, and California companies investing in these technologies are well-positioned to profit from this demand, thereby boosting California's economy, creating more jobs and providing increased tax revenue; ...

... [M]any of the technologies that reduce greenhouse gas emissions also generate operating cost savings to consumers who spend a portion of the savings across a variety of sectors of the economy; this increased spending creates jobs and an overall benefit to the statewide economy.

Thus, the Governor, Legislature and private sector have concluded that action to reduce greenhouse gas emissions is necessary and beneficial for the State.

What is California Doing to Reduce its Greenhouse Gas Emissions?

Action to curb greenhouse gas emissions is taking place on many fronts. As described above, the private sector has already taken important steps to increase efficiency and lower costs associated with such emissions. Many local governments have also adopted, or are currently developing, various plans and programs designed to reduce community-wide GHG emissions. (Office of Planning and Research, *The California Planner’s Book of Lists* (January 2009) (“Book of Lists”), at pp. 92-100; see also Scoping Plan, at p. 26.) Due to its potential vulnerability to the effects of GHG

emissions, and the wide variety of GHG emissions sources within its borders, California has enacted several laws and programs designed to reduce the State's GHG emissions. Several major legislative initiatives are described below.

AB32 – The Global Warming Solutions Act

Assembly Bill 32 (Chapter 448, Statutes 2006) is a key piece of California's effort to reduce its GHG emissions. AB32 requires the California Air Resources Board ("ARB") to establish regulations designed to reduce California's GHG emissions to 1990 levels by 2020. (Health & Safety Code, § 38550.) On December 11, 2008, ARB adopted its Scoping Plan, setting forth a framework for future regulatory action on how California will achieve that goal through sector-by-sector regulation. (ARB, Resolution No. 08-47; see also Health & Safety Code, § 38561.) ARB must adopt, no later than January 1, 2012, rules and regulations to implement the GHG emissions reductions envisioned in the Scoping Plan. (Health & Safety Code, § 38562.)

The AB32 Scoping Plan outlines a set of actions designed to reduce overall GHG emissions in California to 1990 levels by 2020. The Scoping Plan presents GHG emission reduction strategies that combine regulatory approaches, voluntary measures, fees, policies, and programs. Reduction strategies are expected to evolve as technologies develop and progress toward the State's goal is monitored. Thus, the Scoping Plan sets forth the outline of California's strategy to reduce GHG emissions on a statewide basis.

SB375

As noted above, nearly 40 percent of California's GHG emissions come from the State's transportation sector. (Chapter 728, Statutes 2007, § 1(a).) Technology innovation and lower-carbon fuels alone will not reduce transportation-related emissions sufficiently for California to reach the reduction goals set out in AB32. (*Id.* at § 1(c).) Therefore, in SB375, California enacted several measures to reduce vehicular emissions through land-use planning.

Specifically, SB375 requires ARB to develop "greenhouse gas emission reduction targets for the automobile and light truck sector" for each metropolitan planning organization (MPO). (Gov. Code, § 65080(b)(2)(A).) Once that target is set, each MPO must develop a sustainable communities strategy (SCS), as part of its regional transportation plan, that will set forth a development pattern that will achieve the reduction target approved by the ARB. (*Id.* at subd. (b)(2)(B).) The MPO's transportation planning activities must be consistent with the adopted SCS. (*Id.* at subd. (b).) While an SCS does not supersede a local government's land use authority, SB375 created an exemption from CEQA for local transit-oriented residential projects that are consistent with the applicable SCS as an incentive. (*Id.* at subd. (b)(2)(J); Pub. Resources Code, § 21155.1.)

CEQA and SB97

While AB32 and SB375 target specific types of emissions from specific sectors, the California Environmental Quality Act (“CEQA”) regulates nearly all governmental activities and approvals. CEQA generally requires that a lead agency analyze the potential adverse environmental impacts of their decisions, and, if those impacts are determined to be significant, to avoid those impacts through mitigation or project alternatives. As awareness of the causes and effects of GHG emissions has increased, those effects began to be addressed in environmental analyses on a project-level basis. Federal courts, moreover, have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Uncertainty developed, however, among public agencies regarding how GHG emissions should be analyzed in environmental documents prepared pursuant to CEQA.

To provide greater certainty to lead agencies, Governor Schwarzenegger signed Senate Bill 97 (Chapter 148, Statutes 2007). (Governor Schwarzenegger’s Signing Message, SB 97.) That statute, among other things, constitutes the Legislature’s recognition that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. Pursuant to SB97, OPR developed, and the Resources Agency will adopt, amendments to the State CEQA Guidelines to address analysis and mitigation of the potential effects of GHG emissions in CEQA documents and processes. As new information or criteria established by ARB in the AB 32 process becomes available, OPR and the Resources Agency will periodically update the CEQA Guidelines to account for that new information. This rulemaking package responds to the Legislature’s directive in SB97.

Questions concerning the relationship between AB32, SB375 and CEQA were raised in public comments on the Proposed Amendments. The Resources Agency developed responses to those questions in the Responses to Comments, which are appended to this Final Statement of Reasons. Further discussion of the relationship between AB32, SB375 and CEQA is provided in the Thematic Responses at the end of this Final Statement of Reasons.

BACKGROUND ON THE DEVELOPMENT OF THE PROPOSED AMENDMENTS

OPR developed the Proposed Amendments pursuant to Public Resources Code section 21083.05, which states in part:

On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption.

In developing the Proposed Amendments, OPR actively sought the input, advice, and assistance of numerous interested parties and stakeholder groups. (Letter from OPR Director, Cynthia Bryant, to Secretary for the Natural Resources Agency, Mike Chrisman, April 13, 2009.) Specifically, OPR met with representatives of numerous agencies and organizations to discuss the perspectives of the business community, the environmental community, local governments, non-governmental organizations, state agencies, public health officials, CEQA practitioners and legal experts. In addition, OPR took advantage of numerous regional and statewide conferences to raise awareness about CEQA and GHG emissions among diverse audiences and to seek their input. These activities satisfy the provisions of Government Code section 11346.45 which require early public involvement in complex proposals.

After publishing a preliminary draft, on January 8, 2009, OPR continued to conduct extensive public outreach, including two public workshops, to receive input on the Preliminary Amendments. Both public workshops were well attended, drawing over two hundred participants representing various California business interests, environmental organizations, local governments, attorneys and consultants. In addition to oral comments at its workshops, OPR received over eighty written comment letters.

Some comments suggested additional amendments to the CEQA Guidelines. Other comments sought clarification of the language in the preliminary amendments. OPR incorporated those suggestions and clarifications to the extent possible and appropriate into its April 13, 2009, submittal to the Resources Agency. Some suggestions were not appropriate for inclusion, however, due to conflict with existing statutory authority and/or case law. For example, some comments submitted to OPR during its public workshops indicated that the Guidelines should be addressed to “Climate Change” rather than just the effects of GHG emissions. The focus in the Guidelines on GHG emissions is appropriate for at least three reasons.

First, the Legislative authorization for the Proposed Amendments refers specifically to guidelines on the “mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions.” (Pub. Resources Code, § 21083.05.) Had the Legislature intended the Guidelines to address climate change or global warming specifically, it presumably would have so indicated. Second, the precise “effect” of GHG emissions from a project is a factual matter for the lead agency to determine. Such effects may include “climate change,” “global warming” and other changes in the physical environment (increased ocean acidity or sea-level rise, for example). (EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886 (April 24, 2009), Technical Support Document, at pp. ES-2 to ES-3; see further discussion at pages 4-5, above.) Thus, rather than limit analysis to a particular effect, the proposed Guidelines on GHG emissions are consistent with the treatment of air pollutants in the existing Appendix G, which focus largely on the concentration of pollutants. (See, e.g., existing State CEQA Guidelines, Appendix G, III.d.) Third, the focus in a cumulative impacts analysis is “whether any additional effect caused by the proposed project should be considered significant given the existing cumulative effect.” (*CBE, supra*, 103 Cal. App. 4th at 118.)

Thus, the Proposed Amendments appropriately focus on a project's potential incremental contribution of GHGs rather than on the potential effect itself (i.e., climate change). Notably, however, the Proposed Amendments expressly incorporate the fair argument standard. (See, e.g., proposed Section 15064.4(b)(3).) Thus, if there is any substantial evidence supporting a fair argument that a project's GHG emissions may result in any adverse impacts, including climate change, the lead agency must resolve that concern in an EIR.

THE NATURAL RESOURCES AGENCY'S RULEMAKING PROCESS

The Natural Resources Agency commenced the rulemaking process on the Amendments on July 3, 2009, by publishing its Notice of Proposed Action in the California Regulatory Notice Register. (2009 No. 27-Z.) In addition, the Notice of Proposed Action was mailed to over 640 interested parties, and notices were e-mailed to those parties that requested electronic notification. The Natural Resources Agency also posted the Notice, Proposed Text and Initial Statement of Reasons on its website, and invited public comments on the proposed amendments between July 3, 2009, and August 20, 2009. Public hearings were held on August 18, 2009, and August 20, 2009, in Los Angeles and Sacramento, respectively, at which verbal and written comments and presentations were accepted. To ensure that all interested parties were able to provide written comments if they so chose, the Natural Resources Agency extended the public comment period to August 27, 2009. The Natural Resources Agency received over 80 comment letters on the proposed amendments.

Following review of all public comments received during the public review period and at the public hearings, the Natural Resources Agency determined that further revisions to the proposed text were appropriate. It, therefore, mailed a Notice of Proposed Changes to all hearing attendees and all persons that requested notice. Electronic notices were e-mailed to those requesting such notification. The Notice of Proposed Changes, Revised Text of the proposed amendments, comment letters, and all prior rulemaking documents were posted on the Natural Resources Agency's website. Since all revisions to the proposed amendments were sufficiently related to the originally noticed text, public comment was invited between October 23, 2009, and November 10, 2009. The Natural Resources Agency received over 20 comment letters on the revisions to the proposed amendments.

Following the close of the second public comment period, the Natural Resources Agency reviewed and considered all written comments. The Secretary for Natural Resources determined that, other than two non-substantive, clarifying changes in sections 15126.2(a) and 15126.4(c), described below, no further revisions to the proposed amendments was necessary. Secretary Mike Chrisman adopted the amendments described in this Final Statement of Reasons in December 2009.

Throughout the rulemaking process, staff of the Natural Resources Agency met with all interested parties requesting in person meetings. It also attended and presented at various conferences hosted by, among others, the California Chapter of

the American Planning Association, the California State Bar's Environmental Law Conference, County Counsels Association of California, several county bar association meetings and local government forums to provide updates on the proposed amendments and to ensure widespread participation in the Natural Resources Agency's rulemaking process.

Copies of all relevant rulemaking documents, including hearing transcripts, notices, and agendas, are included in the record of proceedings.

ADOPTED AMENDMENTS

Analysis of GHG emissions in a CEQA document presents unique challenges to lead agencies. Such analysis must be consistent with existing CEQA principles, however. Therefore, the Amendments comprise relatively modest changes to various portions of the existing CEQA Guidelines. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis. Other modifications clarify existing law that may apply both to analysis of GHG emissions as well as more traditional CEQA analyses. The incremental approach in the Amendments is consistent with Public Resources Code section 21083(f), which directs OPR and the Resources Agency to regularly review the Guidelines and propose amendments as necessary.

The Legislature expressly left development of the Guidelines to the discretion of OPR and the Resources Agency. That discretion is governed by the Government Code, which requires that any administrative regulations be consistent, and not conflict, with existing statutory authority. (Gov. Code, § 11342.2.) Thus, the Resources Agency intends, as did OPR, the Amendments to incorporate existing law, and where necessary "to implement, interpret, make specific or otherwise carry out the provisions of the statute." (*Ibid.*) In addition, the Guidelines must be "reasonably necessary" to carry out a legislative directive. (*Ibid.*) Because the determination of "reasonable necessity" implicates an agency's expertise, courts will defer to an agency's findings of necessity unless the action is arbitrary, capricious or without reasonable basis. (*Communities for a Better Environment v. California Resources Agency* (2002) 103 Cal.App.4th 98, 109 ("CBE").)

The Amendments include changes to or additions of fourteen sections of the existing Guidelines, as well as changes to Appendices F (Energy Conservation) and G (Environmental Checklist Form). The Amendments are discussed below.

SECTION 15064. DETERMINING THE SIGNIFICANCE OF THE ENVIRONMENTAL EFFECTS CAUSED BY A PROJECT.

Specific Purposes of the Amendment

Amendments are proposed to two subdivisions of the existing section 15064. The first, to subdivision (f)(5), is a grammatical correction that qualifies as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).) The second set of amendments is to subdivision (h)(3). The latter amendments are described in detail below.

Cumulative Impacts

Existing subdivision (h)(3) allows an agency to find that a project’s potential cumulative impacts are less than significant due to compliance with requirements in a plan or mitigation program. (*CBE, supra*, 103 Cal.App.4th at 111 (“a lead agency’s use of existing environmental standards in determining the significance of a project’s environmental impacts is an effective means of promoting consistency in significance determinations and integrating CEQA environmental review activities with other environmental program planning and regulation”).) In effect, that section creates a rebuttable presumption that compliance with certain plans and regulations reduces a project’s potential incremental contribution to a cumulative effect to a level that is not cumulatively considerable.

The existing Guidelines text includes several criteria that define which plans or programs may create such a presumption. To satisfy those criteria, a plan or program must: (1) have been previously approved, (2) contain specific requirements that avoid or substantially lessen the cumulative problem within a defined geographic area, and (3) be either specified in law or approved by a public agency with jurisdiction over affected resources. These criteria ensure that the presumption applies only where plans or programs have undergone public scrutiny and include binding requirements to address a cumulative problem. The existing text lists three types of plans as examples that may be relied upon for a cumulative analysis. The word “e.g.” in the existing text indicates, however, that the list is not exclusive. The Third District Court of Appeal upheld what is now section 15064(h)(3) in the *CBE* decision. (*CBE, supra*, 103 Cal.App.4th at 115-116.)

Use of Plans and Regulations in a Cumulative Impacts Analysis

The Proposed Amendments include two changes to subdivision (h)(3). First, the Amendments would add several plans and regulations to the list of examples. The Proposed Amendments would add “habitat conservation plan, natural community conservation plan, [and] plans or regulations for the reduction of greenhouse gas emissions” to the list of plans and programs that may be considered in a cumulative

impacts analysis. As explained below, the Resources Agency finds that the added plans and regulations satisfy the criteria in the existing text.

“Habitat conservation plans” are defined in the federal Endangered Species Act, and typically include specific requirements to protect listed species within a defined geographic area. (16 U.S.C. § 1539.) Though a habitat conservation plan (“HCP”) may be prepared to address the impacts of one particular project, HCPs may also be, and often have been, prepared to address the impacts of cumulative development within a defined area. (Fish and Wildlife Service and National Marine Fisheries Service, *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (November 4, 1996), at pp. 1-6 to 1-7, 1-14 to 1-15.) Most HCPs, other than “low effect HCPs,” will also likely need to undergo environmental review under the National Environmental Policy Act. (*Id.* at Ch. 5.) In such cases, an applicable HCP may appropriately be used in a cumulative impacts analysis as described in subdivision (h)(3).

“Natural community conservation plans” (“NCCPs”) are defined in the California Natural Community Conservation Planning Act. (Fish & G. Code, §§ 2800 et seq.) The purpose of an NCCP is to conserve natural communities at the ecosystem scale while accommodating compatible land uses. An NCCP includes, among others, measures to avoid or minimize impacts to natural communities, conservation obligations, and compliance monitoring. An NCCP is adopted by the Department of Fish and Game as well as local agencies with land use authority in a defined area. As discretionary acts of public agencies, NCCPs must undergo environmental review pursuant to CEQA. Thus, NCCPs satisfy the criteria in existing subdivision (h)(3).

The Legislature recognized local GHG planning efforts in Health & Safety Code section 38561(c) by directing the California Air Resources Board (ARB) to consider such programs in developing its Scoping Plan. Greenhouse gas emission reduction plans are not currently specified in law. However, the ARB’s Climate Change Scoping Plan includes a recommended reduction target for local governments and community-level emissions of 15 percent by 2020. (California Air Resources Board, *Climate Change Proposed Scoping Plan* (2008), at p. 27 (“Scoping Plan”).) The Scoping Plan also recognized the important role local greenhouse gas reduction plans would play in achieving statewide reductions. The Scoping Plan itself suggests elements that such plans should include. (Scoping Plan, Appendix C, at p. C-49.)

Independent of the Scoping Plan, many local governments have adopted, or are currently developing, various plans and programs designed to curb GHG emissions. (Office of Planning and Research, *The California Planner’s Book of Lists* (January 2009) (“Book of Lists”), at pp. 92-100; see also Scoping Plan, at p. 26.) Other public agencies, such as school districts and public universities, may also adopt greenhouse gas reduction plans to govern their own activities. Provided that such plans contain specific requirements with respect to resources that are within the agency’s jurisdiction to avoid or substantially lessen the agency’s contributions to GHG emissions, both from its own projects and from private projects it has approved or will approve, such plans may be appropriately relied on in a cumulative impacts analysis. Additional guidance regarding

the characteristics of greenhouse gas reduction plans that may be used in this context is provided in the proposed Section 15183.5, and is explained in greater detail below. Thus, greenhouse gas reduction plans satisfying such criteria would satisfy the criteria in existing subdivision (h)(3).

Finally, requirements addressing a cumulative problem may also take the form of regulations. AB 32, for example, requires ARB to adopt regulations that achieve the maximum technologically feasible and cost effective GHG reductions to reach the adopted state-wide emissions limit. (Health & Safety Code, § 38560.) Pursuant to Health and Safety Code section 38560(b), ARB will adopt a first set of regulations by January 1, 2010. Thus, a lead agency may consider whether ARB's GHG reduction regulations satisfy the criteria in existing subdivision (h)(3).

While section 15064(h)(3) creates a presumption that, where a plan, program or regulation governs a project's GHG emissions, and the project complies with those requirements, those emissions are not cumulatively considerable. That presumption is rebuttable, however. The Proposed Amendments do not alter the standard, reflected in the existing Guidelines, that if substantial evidence supports a fair argument that, despite compliance with the requirements in a plan or program, a project may have a significant effect on the environment, then an EIR must be prepared.

Demonstrating How the Plan, Program or Regulation Addresses Cumulative Impacts

In addition to augmenting the list of plans, programs and regulations that give rise to the presumption that a project's contribution is not cumulatively considerable, the Amendments also contain explanatory language designed to ensure that the plan or regulation relied on in a cumulative impacts analysis actually addresses the cumulative effect of concern for the particular project under consideration. This language is necessary to avoid misapplication of subdivision (h)(3). For example, shortly after ARB identified early action items, some lead agencies determined that a project's contribution of GHG emissions was not cumulatively considerable because the project was not inconsistent with the early action items. (See, e.g., Tentative Ruling, San Bernardino County Superior Court Case Nos. 810232, 800607 (ruling that consistency with CAT Strategies alone does not provide sufficient information about the potential impacts of a project); see also California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, March 2006, at pp. 39-63.) Such an analysis, however, would fail to account for emissions that are not addressed by the early action items. Because those early action items largely addressed industrial-type emissions, consistency with the early action items would have little relevance for a residential subdivision project. Likewise, consistency with plans that are purely aspirational (i.e., those that include only unenforceable goals without mandatory reduction measures), and provide no assurance that emissions within the area governed by the plan will actually address the cumulative problem, may not achieve the level of protection necessary to give rise to this subdivision's presumption. Thus, by requiring that lead agencies draw a link between the project and the specific provisions of a binding plan or regulation, section 15064(h)(3) would ensure that

cumulative effects of the project are actually addressed by the plan or regulation in question.

Demonstrating that compliance with a plan addresses a cumulative problem is already impliedly required by CEQA. For example, an initial study must include sufficient information to support its conclusions. (State CEQA Guidelines, § 15063(d)(3).) Similarly, section 15128 requires a lead agency to explain briefly the reasons that an impact is determined to be less than significant and therefore was not analyzed in an EIR. The added sentence, therefore, reflects existing law and is necessary to ensure that plans are not misapplied in a CEQA analysis.

Policy Goals

Inclusion of additional plans and programs to the list of examples supports two policy goals. First, an expanded list promotes integration of various regulatory mechanisms to reduce duplication. (See, e.g., Pub. Resources Code, § 21003(a) (state policy is that “[l]ocal agencies integrate the requirements of [CEQA] with planning and environmental review procedures otherwise required by law or by local practice ...”), (f) (“[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment”).) Second, the addition of GHG emissions reduction plans and regulations for the reduction of GHG emissions reflects the view of both the OPR and the Resources Agency that the effects of GHG emissions resulting from individual projects are best addressed and mitigated at a programmatic level.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Guidelines must address the determination of whether the “possible effects of a project are individually limited but cumulatively considerable.” (*Id.* at § 21083(b)(2).) Due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis. (See, e.g., EPA, Draft Endangerment Finding, 74 Fed. Reg. 18886, 18904 (April 24, 2009) (“cumulative emissions are responsible for the cumulative change in the stock of concentrations in the atmosphere”); California Air Pollution Control Officers Association, *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act* (January 2008) (“CAPCOA White Paper”), at p. 35 (“GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective”).) Existing section 15064(h) governs the analysis of cumulative effects in an initial study. The proposed amendments to section 15064(h)(3), on determining the significance of cumulative impacts in an initial study, are therefore necessary to carry out this legislative directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and that the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, *Environmental Assessment Documents Containing a Discussion of Climate Change* (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).)² Thus, the Amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

² Federal court decisions interpreting NEPA is persuasive authority in CEQA cases. (*Western Placer Citizens for an Ag. & Rur. Env. v. County of Placer* (2006) 144 Cal.App. 4th 890, 902.)

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15064.4. DETERMINING THE SIGNIFICANCE OF IMPACTS FROM GREENHOUSE GAS EMISSIONS

Specific Purposes of the Amendment

A key component of environmental analysis under CEQA is the determination of significance. (Pub. Resources Code § 21002; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1106-07.) Guidelines on the analysis of GHG emissions must, therefore, include provisions on the determination of significance of those emissions.

New section 15064.4, on the determination of significance of GHG emissions, reflects the existing CEQA principle that there is no iron-clad definition of “significance.” (State CEQA Guidelines, § 15064(b); *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1380-81 (“*Berkeley Jets*”).) Accordingly, lead agencies must use their best efforts to investigate and disclose all that they reasonably can regarding a project’s potential adverse impacts. (*Ibid*; see also State CEQA Guidelines, § 15144.) Section 15064.4 is designed to assist lead agencies in performing that required investigation. In particular, it provides that lead agencies should quantify GHG emissions where quantification is possible and will assist in the determination of significance, or perform a qualitative analysis, or both as appropriate in the context of the particular project, in order to determine the amount, types and sources of GHG emissions resulting from the project. Regardless of the type of analysis performed, the analysis must be based “to the extent possible on scientific and factual data.” In addition, lead agencies should also consider several factors. The specific provisions of section 15064.4 are discussed below.

Quantitative Analysis

Subdivision (a) of section 15064.4 states that lead agencies should calculate or estimate the GHG emissions resulting from the proposed project. This directive reflects the holding in the *Berkeley Jets* case, which required a Port Commission to quantify emissions of toxic air contaminants even in the absence of a universally accepted methodology for doing so. (*Berkeley Jets, supra*, 91 Cal.App.4th at p. 1370 (“The fact that a single methodology does not currently exist that would provide the Port with a precise, or ‘universally accepted,’ quantification of the human health risk from TAC exposure does not excuse the preparation of any health risk assessment—it requires the Port to do the necessary work to educate itself about the different methodologies that are available”) (emphasis in original).) That case also required quantitative analysis of single-event noise, even though the applicable thresholds were expressed as cumulative noise levels. (*Id.* at 1382.) Quantification was required in that context in order to identify existing noise levels, the number of additional flights, the frequency of those flights, the degree to which the increased flights would cause increased noise levels at a given location, and ultimately, the community’s reaction to that noise. (*Ibid.*) In other words, quantification would assist the lead agency in determining whether the increased noise would be potentially significant. (*Ibid.* (“CEQA requires that the Port

and the inquiring public obtain the technical information needed to assess whether the ADP will merely inconvenience the Airport's nearby residents or damn them to a somnambulate-like existence"); see also *Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1109 ("in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect").)

With the foregoing principles in mind, the quantification called for in proposed section 15064.4(a)(1) is reasonably necessary to ensure an adequate analysis of GHG emissions using available data and tools, in accordance with Public Resources Code Section 21083.05. Even where a lead agency finds that no numeric threshold of significance applies to a proposed project, the holdings in the *Berkeley Jets* and *Protect the Historic Amador Waterways* cases, described above, require quantification of emissions if such quantification will assist in determining the significance of those emissions. OPR and the Resources Agency find that quantification will, in many cases, assist in the determination of significance, as explained below. (State CEQA Guidelines, § 15142 ("An EIR shall be prepared using an interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the consideration of qualitative as well as quantitative factors").)

First, quantification of GHG emissions is possible for a wide range of projects using currently available tools. Modeling capabilities have improved to allow quantification of emissions from various sources and at various geographic scales. (Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change Through the California Environmental Quality Act Review*, Attachment 2: Technical Resources/Modeling Tools to Estimate GHG Emissions (June 2008); CAPCOA White Paper, at pp. 59-78.) Moreover, one of the models that can be used in a GHG analysis, URBEMIS, is already widely used in CEQA air quality analyses. (CAPCOA White Paper, at p. 59.) Second, quantification informs the qualitative factors listed in proposed section 15064.4(b). Third, quantification indicates to the lead agency, and the public, whether emissions reductions are possible, and if so, from which sources. Thus, if quantification reveals that a substantial portion of a project's emissions result from energy use, a lead agency may consider whether design changes could reduce the project's energy demand.

Proposed section 15064.4(a)(1) also reflects existing case law that reserves for lead agencies the precise methodology to be used in a CEQA analysis. (See, e.g., *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 371-373.) As indicated above, a wide variety of models exist that could be used in a GHG analysis. (CAPCOA White Paper, at pp. 59-78.) Further, not every model will be appropriate for every project. For example, URBEMIS may be an appropriate tool to analyze a typical residential subdivision or commercial use project, but some public utilities projects, such as waste-water treatment plants, may require more specialized models to accurately estimate emissions. (*Id.* at pp. 60-65.) The requirement to

disclose any limitations in the model or methodology chosen also reflects the standard for adequacy of EIRs in existing State CEQA Guidelines section 15151.

Qualitative and Performance Standard Based Analysis

As explained in greater detail below in the Thematic Responses, CEQA does not require quantification of emissions in every instance. If the lead agency determines that quantification is not possible, would not yield information that would assist in analyzing the project's impacts and determining the significance of the GHG emissions, or is not appropriate in the context of the particular project, section 15064.4(a) would allow the lead agency to consider qualitative factors or performance standards. Consideration of qualitative factors is appropriate for several reasons. First, CEQA directs lead agencies to consider qualitative factors. (Pub. Resources Code, § 21001(g) (CEQA's purpose includes to: "require governmental agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs and to consider alternatives to proposed actions affecting the environment".) Second, existing section 15064.7 of the State CEQA Guidelines indicate that thresholds of significance may be qualitative, which implies that a determination of significance without a threshold could also evaluate qualitative factors. Third, the existing CEQA Guidelines state that the determination of significance requires a lead agency to use its judgment based on *all* relevant information. (State CEQA Guidelines, § 15064(b); see also *id.* at §§ 15064.7 (thresholds may be qualitative), 15142 (analysis should be interdisciplinary and both qualitative and quantitative).)

Subdivision (a) would also allow a lead agency to rely on performance-based standards to assist in the determination of significance. Just as with quantification, the purpose of engaging in a qualitative or performance standard based analysis is to develop information relevant to a significance determination. Several examples exist of the types of performance standards that might appropriately be used in determining the significance of greenhouse gas emissions. Proposed section 15183.5(b)(1)(D), for example, contemplates that a plan for the reduction of greenhouse gas emissions may contain performance based standards. Where such standards are developed as part of such a plan, a lead agency would have evidence indicating that compliance with such standards would indicate that the impact of greenhouse gas emissions would be less than significant. Further, in adopting SB375, the Legislature acknowledged that regional transportation plans, and the environmental impact reports prepared to analyze those plans, may contain performance standards that would apply to transit priority projects. (See, e.g., Public Resources Code, § 21155.2.) Other potential examples include the Bay Area Air Quality Management District's proposed Best Management Practices for Construction Greenhouse Gas Emissions (calling for use of alternative fuels, local building materials and recycling), and the California Public Utilities Commission's Performance Standard for Power Plans (requiring emissions no greater than a combined cycle gas turbine plant). Compliance with such standards may be relevant to the significance determination, when considered in conjunction with the

project's total projected emissions. Section 15064.4(a) was revised in response to comments to clarify that lead agencies may rely on quantitative or qualitative analyses, or both, in part to emphasize that qualitative analyses and performance standards may be useful supplements to a quantitative analysis.

Similar to use of a significance threshold, a lead agency must exercise care to ensure that performance standards do not replace a full analysis of all potential emissions. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109 (“in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect”).) For example, while a Platinum LEED® rating could assist a lead agency in determining whether emissions related to a building’s energy use may be significant, that performance standard may not reveal sufficient information to evaluate transportation-related emissions associated with that proposed project.

As indicated above, even a qualitative analysis must be based to the extent possible on scientific and factual data. Further, the type of analysis that is required will depend on the context of a particular project. Given the multitude of different project types and sizes, and different agencies subject to CEQA, the CEQA Guidelines, which are general by necessity, cannot specify precisely when a quantitative analysis may be required or a qualitative analysis may be appropriate. The following hypothetical examples may illustrate, however, how section 15064.4(a) could operate:

Project 1: a small habitat restoration project is proposed in a remote part of California. Workers would drive to the site where they would camp for the duration of the project. Some gas-powered tools and machinery may be required. Cleared brush would either be burned or would decay naturally.

Project 2: a large commercial development is proposed in an suburban context. Heavy-duty machinery would be required in various construction phases spanning many months. Following construction, the development would rely on electricity, water and wastewater services from the local utilities. Natural gas burners would be used on site. The development would employ several hundred workers and attract thousands of customers daily. A traffic study has been prepared for the project. The local air quality management district’s guidance document recommends that projects of similar size and character should use of URBEMIS, or another similar model, to estimate the air quality impacts of the development.

In the context of Project 2 a quantitative analysis would likely be appropriate. The URBEMIS model, which would likely be used to analyze other emissions, could also be used to estimate emissions from both project-related transportation and on-site indirect emissions (landscaping, hot-water heaters, etc.) Modeling is typically done for projects of like size and character. Other models are readily available to estimate emissions associated with utility use. In the context of Project 2, a lead agency may

find it difficult to demonstrate a good faith effort through a purely qualitative analysis. (See, e.g., *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370.)

In the context of Project 1, however, a qualitative analysis would likely be appropriate. Project 1's emissions are not easily modeled, and the Project is small in scale. While it may be technically possible, quantification of the emissions may not reveal any additional information that indicates the significance of those emissions or how they may be reduced that could not be provided in a qualitative assessment of emissions sources. (See, e.g., Public Resources Code, § 21003(f) ("public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment").)

Factors Potentially Indicating Significance

The qualitative factors listed in the proposed section 15064.4(b) are intended to assist lead agencies in collecting and considering information relevant to a project's incremental contribution of GHG emissions and the overall context of such emissions. Notably, while subdivision (b) provides a list of factors that should be considered by public agencies in determining the significance of a project's GHG emissions, other factors can and should be considered as appropriate.

Determine Whether Emissions Will Increase or Decrease

The first factor in subdivision (b), for example, asks lead agencies to consider whether the project will result in an increase or decrease in different types of GHG emissions relative to the existing environmental setting. All project components, including construction and operation, equipment and energy use, and development phases must be considered in this analysis. (State CEQA Guidelines, § 15378 (project includes "the whole of the action").) For example, a mass transit project may involve GHG emissions during its construction phase, but substantial evidence may also indicate that it will cause existing commuters to switch from single-occupant vehicles to mass transit use. Operation of such a project may ultimately result in a decrease in GHG emissions. Such analysis, provided that it is supported with substantial evidence and fully accounts for all project emissions, may support a lead agency's determination that GHG emissions associated with a project are not cumulatively considerable.

This section's reference to the "existing environmental setting" reflects existing law requiring that impacts be compared to the environment as it currently exists. (State CEQA Guidelines, § 15125.) This clarification is necessary to avoid a comparison of the project against a "business as usual" scenario as defined by ARB in the Scoping Plan. Such an approach would confuse "business as usual" projections used in ARB's Scoping Plan with CEQA's separate requirement of analyzing project effects in

comparison to the environmental baseline. (*Compare* Scoping Plan, at p. 9 (“The foundation of the Proposed Scoping Plan’s strategy is a set of measures that will cut greenhouse gas emissions by nearly 30 percent by the year 2020 as compared to business as usual”) *with Fat v. County of Sacramento* (2002) 97 Cal.App.4th 1270, 1278 (existing environmental conditions normally constitute the baseline for environmental analysis); see also *Center for Bio. Diversity v. City of Desert Hot Springs*, Riverside Sup. Ct. Case No. RIC464585 (August 6, 2008) (rejecting argument that a large subdivision project would have a “beneficial impact on CO2 emissions” because the homes would be more energy efficient and located near relatively uncongested freeways).) Business as usual may be relevant, however, in the discussion of the “no project alternative” in an EIR. (State CEQA Guidelines, § 15126.6(e)(2) (no project alternative should describe what would reasonably be expected to occur in the future in the absence of the project).)

Notably, section 15064.4(b)(1) is not intended to imply a zero net emissions threshold of significance. As case law makes clear, there is no “one molecule rule” in CEQA. (CBE, *supra*, 103 Cal.App.4th at 120.)

Thresholds of Significance

The second factor in subdivision (b) asks whether a project exceeds a threshold of significance for GHG emissions. Section 21000(d) of the Public Resources Code expressly directs public agencies to identify whether there are any critical thresholds for health and safety to identify those areas where the capacity of the environment is limited. A threshold is an “identifiable quantitative, qualitative or performance level” at which impacts are normally less than significant. (State CEQA Guidelines, § 15064.7(a); see also *Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1107.) Lead agencies may rely on thresholds developed by other agencies that have particular expertise in the subject matter under consideration. (See, e.g., State CEQA Guidelines, Appendix G, Sample Question III (“[w]here available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make” a significance determination).) For example, a lead agency may look to standards included in a Basin Plan to assist in the determination of whether water quality impacts are significant. (*Protect the Historic Amador Waterways*, *supra*, 116 Cal.App.4th at 1107 (“[s]uch thresholds can be drawn from existing environmental standards, such as other statutes or regulations”).)

Several agencies have developed, or are in the process of developing, thresholds of significance for GHG emissions.³ For example, thresholds are currently being developed, or have already been adopted by the Bay Area Air Quality Management District for operations and construction,⁴ the City of Davis for residential

³ Reference to these thresholds and proposed thresholds does not reflect an endorsement of those thresholds; rather, they are cited solely for the purpose of demonstrating that agencies are developing such thresholds.

⁴ BAAQMD CEQA Guidelines Update: work in progress - <http://www.baaqmd.gov/pln/ceqa/index.htm>.

developments,⁵ and the South Coast Air Quality Management District for industrial projects.⁶ Regardless of the threshold chosen, however, this section does not alter the pre-existing rule under CEQA that if substantial evidence supports a fair argument that a project may result in significant impacts, despite compliance with a threshold, an EIR must be prepared. (*Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 342.) Further, “in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect.” (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109.)

Consistent with the above, if relying on a threshold developed by another agency, lead agencies must exercise caution in selecting a threshold to ensure that the threshold is appropriately applied. For CEQA purposes, a threshold identifies a level below which an environmental impact will normally be less than significant. (State CEQA Guidelines, § 15064.7(a).) Some agencies have adopted “thresholds” pursuant to other laws that may not be applicable in the CEQA context. ARB has adopted several thresholds pursuant to AB32, for example, to address specific purposes that are unrelated to CEQA. For example, the *de minimis* threshold governs the level at which emissions will be regulated by ARB’s AB32 regulations. (Health & Safety Code, § 38561(e); Scoping Plan, at pp. 96-97.) CEQA does not permit use of a *de minimis* threshold, however. (*CBE, supra*, 103 Cal.App.4th at p. 121.) Additionally, the Reporting Threshold is the level at which emissions from large industrial sources are required to be reported. (Scoping Plan, at pp. 108-109; see also CARB Board Resolution 07-54 (2007).) Again, this reporting threshold reflects a policy decision regarding regulation by the ARB, but does not address the level at which environmental harm may occur, and does not satisfy a lead agency’s duties under CEQA related to review of projects which may result in significant adverse environmental impacts.

Consistency with a Plan or Regulation

Finally, the third factor in subdivision (b) directs consideration of the extent to which a project complies with a plan or regulation to reduce GHG emissions. That section further states, however, that to be used for the purpose of determining significance, a plan must contain specific requirements that result in reductions of GHG emissions to a less than significant level. This clarification is necessary because of the wide variety of climate action plans and GHG reduction plans that are currently being adopted by public agencies. ARB, for example, recently adopted its statewide Scoping Plan. That plan may not be appropriate for use in determining the significance of individual projects, however, because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping

⁵ City of Davis (2009) Greenhouse Gas Emission Threshold and Standards for New Residential Development; Accessed 5/27/09, http://cityofdavis.org/pgs/sustainability/pdfs/15_4.21.09_GHG%20Standards.pdf

⁶ SCAQMD (2008) Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, Accessed 5/27/09 <http://www.aqmd.gov/hb/2008/December/081231a.htm>.

Plan. (Scoping Plan, at p. 9.) Regulations that will require actual reductions of GHG emissions may not be adopted until 2012. (*Ibid.*) Once those regulations are adopted and being implemented, they may, if appropriate, be used to assist in the determination of significance, similar to the current use of air quality, water quality and other similar environmental regulations. (*CBE, supra*, 103 Cal. App. 4th at 111 (“a lead agency’s use of existing environmental standards in determining the significance of a project’s environmental impacts is an effective means of promoting consistency in significance determinations and integrating CEQA environmental review activities with other environmental program planning and regulation”).)

In addition to the regulations that will be developed to implement the Scoping Plan, this factor would also allow lead agencies to consider plans that are developed to reduce GHG emissions on a regional or local level. (Scoping Plan, at p. 26.) The proposed section 15064.4(b)(3) is intended to be read in conjunction with the section 15064(h)(3), as proposed to be amended, and proposed section 15183.5. Those sections each indicate that local and regional plans may be developed to reduce GHG emissions. If such plans reduce community-wide emissions to a level that is less than significant, a later project that complies with the requirements in such a plan may be found to have a less than significant impact.

Notably, CEQA does not provide a specific definition of “comply” in the context of determining a project’s consistency with a particular plan. Some guidance may be gleaned, however, from case law interpreting the requirement that a local government’s activities be consistent with its General Plan. In that context, a “zoning ordinance [for example] is consistent with the city’s general plan where, considering all of its aspects, the ordinance furthers the objectives and policies of the general plan and does not obstruct their attainment.” (*City of Irvine v. Irvine Citizens Against Overdevelopment* (1994) 25 Cal. App. 4th 868, 879.) Reading section 15064.4 together with 15064(h)(3), however, to demonstrate consistency with an existing GHG reduction plan, a lead agency would have to show that the plan actually addresses the emissions that would result from the project. Thus, for example, a subdivision project could not demonstrate “consistency” with the ARB’s Early Action Measures because those measures do not address emissions resulting from a typical housing subdivision. (ARB, Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration, October 2007; see also State CEQA Guidelines, §§ 15063(d)(3) (initial study must be supported with information to support conclusions), 15128 (determination in an EIR that an impact is less than significant must be briefly explained).)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) A key component of environmental analysis under CEQA is the determination of significance. (*Id.* at § 21002; *Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at

1106-07.) The new section 15064.4, on determining the significance of impacts of GHG emissions, is therefore necessary to carry out this legislative directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the Amendments were proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).)⁷ Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

⁷ Federal court decisions interpreting NEPA is persuasive authority in CEQA cases. (*Western Placer Citizens for an Ag. & Rur. Env. v. County of Placer* (2006) 144 Cal.App. 4th 890, 902.)

SECTION 15064.7. THRESHOLDS OF SIGNIFICANCE

Specific Purposes of the Amendment

Proposed subdivision (c) of section 15064.7 would allow a lead agency to adopt a threshold developed by another agency, or recommended by experts, provided that such threshold is supported with substantial evidence. This proposed regulation is reasonably necessary because many lead agencies perform general governmental functions, and may lack the specific expertise necessary to develop their own thresholds of significance for GHG emissions. Such agencies may rely on thresholds developed by other agencies with specialized expertise (such as an air quality management district) in conducting their CEQA analyses. (OPR, Thresholds of Significance: Criteria for Defining Environmental Significance, September 1994, at p. 7.) In fact, Appendix G of the State CEQA Guidelines expressly encourages lead agencies to rely on thresholds established by local air quality management districts. (State CEQA Guidelines, Appendix G, Question III.)

Several local and regional air districts are in the process of developing thresholds for GHG emissions. As noted above, for example, thresholds are currently being developed, or have already been adopted by the Bay Area Air Quality Management District for operations and construction, the City of Davis for residential developments, and the South Coast Air Quality Management District for industrial projects. Lead agencies within the jurisdiction of an air district, or other agency, that adopts a GHG emissions threshold may adopt such a threshold as its own. In adopting any threshold of significance, including one developed by an expert or agency with specialized expertise, the lead agency must support the threshold with substantial evidence in the administrative record. (State CEQA Guidelines, § 15064.7(b).)

Independent experts may also develop such thresholds for use by public agencies. For example, the California Air Pollution Control Officers Association has published a White Paper on developing thresholds of significance for GHG emissions. (CAPCOA White Paper, at pp. 31-58.) A lead agency could potentially use CAPCOA's suggestions in developing its own thresholds. Because any threshold must be supported with substantial evidence, and must be adopted through a public process, any threshold recommended by an expert that is ultimately adopted will undergo sufficient scrutiny to ensure its legitimacy. (State CEQA Guidelines, § 15064.7(b).)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) Defining "significance" is a critical step in the lead agency's impact analysis and therefore needs to be addressed as part of the Proposed Action. Section 21000(d) of the Public Resources Code encourages the development of thresholds. These sections together

require OPR and the Resources Agency to develop and adopt regulations governing the adoption of thresholds of significance for GHG emissions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for determining the significance of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15065. MANDATORY FINDINGS OF SIGNIFICANCE

Specific Purposes of the Amendment

The amendment to section 15065(b)(1) would change the word “preliminary” to “public.” The purpose of this amendment is to make section 15065 consistent with section 21064.5 of the Public Resources Code. The latter provision defines a mitigated negative declaration to be a negative declaration where mitigation measures are added to a project “before the proposed negative declaration and initial study are released for *public* review[.]” (State CEQA Guidelines, § 15070(b)(1).) In contrast, existing CEQA Guidelines section 15065(b)(1), dealing with mandatory findings of significance, would require a commitment to mitigation prior to “preliminary” review. “Preliminary Review,” as that term is used in section 15060, refers to a period following receipt of an application during which a lead agency determines whether an exemption applies to the project or whether an EIR would clearly be prepared. Read literally, existing section 15065 would require a commitment to mitigation before an initial study is even conducted. Because the statutory definition of mitigated negative declaration contemplates that mitigation measures may be developed during the preparation of the initial study prior to public review, the change in 15065 from “preliminary” to “public” is appropriate.

Necessity

Section 21083 of the Public Resources Code directs OPR to develop, and the Resources Agency to adopt, guidelines on the implementation of CEQA. The Amendment is necessary to ensure that those guidelines are consistent with relevant statutory definitions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency’s Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency’s determination that the Amendments would make the existing Guidelines easier to follow as a result of greater internal consistency. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific existing statutory CEQA provisions and/or case law interpreting CEQA. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater consistency within the Guidelines, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15086. CONSULTATION CONCERNING DRAFT EIR

The revision to this section is a non-substantive correction to this section's reference to the California Air Resources Board. This revision, therefore, qualifies as a "change without regulatory effect" pursuant to section 100(a)(4) of the Office of Administrative Law's regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).)

SECTION 15093. STATEMENT OF OVERRIDING CONSIDERATIONS

Specific Purposes of the Amendment

Section 21081(b) of the Public Resources Code provides that a lead agency may approve or carry out a project with significant and unavoidable impacts only after the lead agency makes a finding that “specific overriding economic, legal, social, technical or other benefits of the project outweigh the significant effects on the environment.” The State CEQA Guidelines describes the factors that a lead agency must weigh in determining whether to approve a project with adverse environmental effects:

CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian. An agency shall prepare a statement of overriding considerations as described in Section 15093 to reflect the ultimate balancing of competing public objectives when the agency decides to approve a project that will cause one or more significant effects on the environment.

(State CEQA Guidelines, § 15021(d).) The California Supreme Court has further observed that “an agency’s decision that the specific benefits a project offers outweigh any environmental effects that cannot feasibly be mitigated ... lies at the core of the lead agency’s discretionary responsibility under CEQA....” (*City of Marina v. Board of Trustees of Cal. State Univ* (2006) 39 Cal.4th 341, 368.)

In the context of GHG emissions, some projects may cause adverse environmental impacts but still provide an overall benefit of reducing GHG emissions on a statewide or regional level. For example, a city may make a policy choice to allow increased housing density within a jobs-rich region in order to reduce region-wide GHG emissions from vehicles and transportation. (See, e.g., 2007 IEPR, at p. 210.) Though the introduction of new housing within the jurisdiction may result in near-term or local adverse impacts related to GHG emissions, doing so may assist the region as a whole in meeting region-wide reduction targets. Thus, subdivision (a) of section 15093 was revised to expressly allow a lead agency to consider this type of environmental benefit of a project in making a statement of overriding considerations.

The revision to section 15093(a) accomplishes two objectives. First, it reminds lead agencies and the public that even a project that appears environmentally beneficial may itself cause adverse environmental impacts, and such impacts must undergo full CEQA review, and, if applicable, a statement of overriding considerations. Second, it discourages purely local interests from dominating consideration of a project by expressly allowing a lead agency to consider region- and statewide benefits of a project. Further, “economic, legal, social, technical and other benefits” could be interpreted to refer to local benefits. This addition would ensure that lead agencies may consider

regional and statewide benefits in considering a project's adverse impacts. Finally, the proposed addition makes clear, consistent with section 15021(d) of the existing State CEQA Guidelines, that the lead agency may consider environmental benefits to balance a project's significant adverse environmental effects that remain even after the adoption of all available feasible mitigation measures.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) If a lead agency determines that a project's GHG emissions will result in significant and unavoidable impacts, a lead agency may only approve the project if it makes specified findings. (*Id.* at § 21081(b).) This amendment is necessary to ensure that a lead agency considers state-wide and regional benefits of a project in addition to purely local benefits. Because consideration of state-wide and region-wide benefits may also apply to impacts unrelated to GHG emissions, the amendment was worded broadly to address any significant environmental impact.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and/or make specific statutory CEQA provisions and case law interpreting CEQA for making statements of overriding considerations. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California.

SECTION 15125. ENVIRONMENTAL SETTING

Specific Purposes of the Amendment

Section 15125 reflects existing law requiring examination of project impacts in relation to the existing environment. Subsection (d) states that lead agencies should consider whether the proposed project is inconsistent with applicable local and regional plans. That subsection provides a non-exclusive list of plans for potential consideration. The Amendments would add specific plans, regional blueprint plans and greenhouse gas reduction plans to subdivision (d). The added plans are necessary to ensure that GHG emissions analyses in such plans are addressed.

Specific Plans

Specific Plans address a defined geographic area within the area covered by a General Plan. (Gov. Code, § 65450 (“After the legislative body has adopted a general plan, the planning agency may, or if so directed by the legislative body, shall, prepare specific plans for the systematic implementation of the general plan for all or part of the area covered by the general plan”).) Specific Plans must contain “[s]tandards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable.” (*Id.* at § 65451(a)(3).) Thus, given that so many local governments are addressing GHG emissions in their policy documents, and that Specific Plans must contain standards and criteria, it is likely that Specific Plans may address GHG emissions, and consistency with adopted Specific Plans should be considered in EIRs.

Regional Blueprint Plans

Regional Blueprint Plans are being developed in many of California’s Metropolitan Planning Organizations through grants provided by the California Department of Transportation. While originally designed to address transportation efficiencies, Regional Blueprint Plans typically involve smart growth planning with an aim to reducing vehicle miles traveled at a regional level. As a result, Regional Blueprint Plans can provide information regarding the region’s existing transportation setting and identify methods to reduce region-wide transportation-related impacts. (Scoping Plan, Appendix C, at pp. C-74-C-84.) Land use decisions impact many sectors responsible for GHG emissions, including transportation, electricity, water, waste, and others. However, the primary impact of land use development on GHG emissions relates to vehicle use. (Land Use Subcommittee of the Climate Action Team, *LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation* (2008), at p. 13.) Blueprint Plans highlight this relationship between land use and transportation and how this relationship may impact a local community’s and region’s GHG emissions. Analysis of GHG reduction is not required by Blueprint grants but it is recommended. Therefore, Blueprint Plans provide an indication of the GHG emissions potentially created or reduced by the plan. (LUSCAT (2009), at p. 30.) Given the large percentage of GHG emissions that result from transportation in

California, a project's consistency with a Regional Blueprint Plan can provide information indicating whether the project could have significant environmental impacts related to GHG emissions. (*Ibid.*) Regional Blueprint Plans may, therefore, provide evidence to assist the lead agency in determining whether a project may tend to increase or decrease GHG emissions relative to the existing baseline. Thus, where such a plan has been developed and adopted by an MPO, lead agencies may find it useful to evaluate the project's consistency with that Blueprint Plan.

Plans for the Reduction of Greenhouse Gas Emissions

The Amendments would add plans for the reduction of greenhouse gas emissions to the list of plans in section 15125(d). Many local and regional plans now include policies relating to, and analyses of, GHG emissions. (OPR, Book of Lists, at pp. 92-100; Scoping Plan, at p. 26.) Many such plans include detailed information on the jurisdiction's inventory of GHG emissions and measures to reduce such emissions. (*Ibid.*) Such plans may also include prescriptions for specific mitigation measures to address GHG emissions. (Scoping Plan, Appendix C, at p. C-49.) Where such a plan has been developed and adopted within the relevant jurisdiction, a project's inconsistency with that plan could be an indication of potential adverse environmental impacts.

Notably, while section 15125(d) requires an EIR to discuss any inconsistencies of a project with the listed plans, it does not mandate a finding of significance resulting from any identified inconsistencies. The plans simply provide information regarding the project's existing setting and inconsistency may be an indication of potentially significant impacts. The determination of significance is to be made by the lead agency.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines addressing the mitigation of GHG emissions and the effects of the GHG emissions. (Pub. Resources Code, § 21083.05.) As indicated above, one potential indicator of a project's potential GHG emissions impacts is whether the project is consistent with applicable plans that have addressed that impact. Thus, the addition of plans that may address GHG emissions to the list of plans in the existing section 15125 is reasonably necessary to ensure that such analysis occurs.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to

implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analyzing the effects of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental information where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15126.2. CONSIDERATION AND DISCUSSION OF SIGNIFICANT ENVIRONMENTAL EFFECTS.

Amendments are proposed to two subdivisions of the existing section 15126.2. The first, to subdivision (c), adds a cross-reference to the Public Resources Code and another section of the State CEQA Guidelines. This revision, therefore, qualifies as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).) The second change, made in response to public comments, adds a sentence to the end of existing subdivision (a). That change is described in greater detail below.

Specific Purposes of the Amendment

Several comments submitted as part of the Natural Resources Agency’s SB97 rulemaking process urged it to develop guidance addressing the analysis of the impacts of climate change on a project. These comments similarly suggested that such guidance was appropriate in light of the release of the draft California Climate Adaptation Strategy (Adaptation Strategy), developed pursuant to Executive Order S-13-2008. In considering such comments, it is important to understand several key differences between the Adaptation Strategy and the California Environmental Quality Act. First, the Adaptation Strategy is a policy statement that contains recommendations; it is not a binding regulatory document. Second, the Adaptation Strategy focuses on how the State can plan for the effects of climate change. CEQA’s focus, on the other hand, is the analysis of a particular project’s greenhouse gas emissions on the environment, and mitigation of those emissions if impacts from those emissions are significant. Given these differences, CEQA should not be viewed as the tool to implement the Adaptation Strategy; rather, as indicated in the Strategy’s key recommendations, advanced programmatic planning is the primary method to implement the Adaptation Strategies.

There is some overlap between CEQA and the Adaptation Strategy, however. As explained in both the Initial Statement of Reasons and in the Adaptation Strategy, section 15126.2 may require the analysis of the effects of a changing climate under certain circumstances. (Initial Statement of Reasons, at pp. 68-69.) In particular, Section 15126.2 already requires an analysis of placing a project in a potentially hazardous location. Further, several questions in the Appendix G checklist already ask about wildfire and flooding risks. Many comments on the proposed amendments asked for additional guidance, however.

Having reviewed all of the comments addressing the effects of climate change, the Natural Resources Agency revised the proposed amendments to include a new sentence in Section 15126.2 clarifying the type of analysis that would be required. Existing section 15126.2(a) provides an example of a potential hazard requiring analysis: placing a subdivision on a fault line. The new sentence adds further examples, as follows:

Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

According to the Office of Planning and Research, at least sixty lead agencies already require this type of analysis. (California Governor's Office of Planning and Research, State Clearinghouse, The California Planners' Book of Lists (January, 2009), at p. 109.) This addition is reasonably necessary to guide lead agencies as to the scope of analysis of a changing climate that is appropriate under CEQA.

As revised, section 15126.2 would provide that a lead agency should analyze the effects of bringing development to an area that is susceptible to hazards such as flooding and wildfire, both as such hazards currently exist or may occur in the future. Several limitations apply to the analysis of future hazards, however. For example, such an analysis may not be relevant if the potential hazard would likely occur sometime after the projected life of the project (i.e., if sea-level projections only project changes 50 years in the future, a five-year project may not be affected by such changes). Additionally, the degree of analysis should correspond to the probability of the potential hazard. (State CEQA Guidelines, § 15143 ("significant effects should be discussed with emphasis in proportion to their severity and probability of occurrence").) Thus, for example, where there is a great degree of certainty that sea-levels may rise between 3 and 6 feet at a specific location within 30 years, and the project would involve placing a wastewater treatment plant with a 50 year life at 2 feet above current sea level, the potential effects that may result from inundation of that plant should be addressed. On the other extreme, while there may be consensus that temperatures may rise, but the magnitude of the increase is not known with any degree of certainty, effects associated with temperature rise would not need to be examined. (State CEQA Guidelines, § 15145 ("If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact").) Lead agencies are not required to generate their own original research on potential future changes; however, where specific information is currently available, the analysis should address that information. (State CEQA Guidelines, § 15144 (environmental analysis "necessarily involves some degree of forecasting. While seeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can").)

The decision in *Baird v. County of Contra Costa* (1995) 32 Cal.App.4th 1464, does not preclude this analysis. In that case, the First District Court of Appeal held that a county was not required to prepare an EIR due solely to pre-existing soil contamination that the project would not change in any way. (Id. at 1468.) No evidence supported the petitioner's claim that the project would "expose or exacerbate" the pre-existing contamination, which was located several hundred to several thousand feet from the project site. (Id. at n. 1.) Moreover, the project would have no other significant effects on the environment, and other statutes exist to protect residents from contaminated soils. Thus, the question confronting that court was whether pre-existing contamination near the project was, by itself, enough to require preparation of an EIR. It held that, in those circumstances, an EIR was not required. That court also acknowledged, however, that where there is a potential for ultimately changing the environment, an EIR could be required. (Id. at p. 1469.) Thus, unlike the circumstances in the *Baird* case, the analysis required in section 15126.2(a) would occur if an EIR was otherwise required. Similarly, the addition to that section contemplates hazards which the presence of a project could exacerbate (i.e., potential upset of hazardous materials in a flood, increased need for firefighting services, etc.).

This revision was described in the Natural Resources Agency's Notice of Proposed Changes and the public was invited to present comments on that change. The Natural Resources Agency determined that the change was sufficiently related to the original proposal described in the Notice of Proposed Action, so a fifteen day comment period was appropriate. It is sufficiently related because the Notice of Proposed Action explained that the rulemaking activity was intended to address the directive in SB97 to provide guidelines on the analysis of the "effects of greenhouse gas emissions." As explained in the Initial Statement of Reasons, the Natural Resources Agency initially chose not to provide specific guidance on the analysis of the effects of placing development in an area subject to the effects of climate change because the Agency interpreted existing section 15126.2(a) to already require that analysis under certain circumstances. As indicated above, however, many comments on the proposed amendments suggested revisions to section 15126.2(a) to provide additional guidance. The areas susceptible to hazards include those that may result from a changing climate. Thus, the change is sufficiently related that a reasonable person would be put on notice that such a change could occur as a result of the rulemaking activity described in the Notice of Proposed Action.

Finally, following review of comments on this revision, the Natural Resources Agency clarified that this analysis applies only to "potentially significant" effects of locating developing in areas susceptible to hazards. Because this revision clarifies the last sentence in section 15126.2(a), consistent with the Public Resources Code, and does not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines addressing the analysis of the effects of GHG emissions. (Pub. Resources Code, § 21083.05.) As explained above, the effects of GHG emissions include flooding, sea-level rise and wildfires. Thus, the addition of a clarifying sentence to existing section 15126.2(a), requiring analysis of the effects of placing developing in hazardous locations, is reasonably necessary to ensure that such analysis occurs with respect to areas subject to potential hazards resulting from climate change.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analyzing the effects of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to

investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the analysis that may be required of the potential effects of climate change on a project, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15126.4. CONSIDERATION AND DISCUSSION OF MITIGATION MEASURES PROPOSED TO MINIMIZE SIGNIFICANT EFFECTS.

Specific Purposes of the Amendment

Section 21083.05 of the Public Resources Code expressly requires OPR and the Resources Agency to develop regulations on the “mitigation of greenhouse gas emissions.” The goals of this legislative mandate are to (1) reduce GHG emissions and (2) to provide consistency in the development of GHG emissions reduction measures. There is no indication, however, that the Legislature intended to alter any existing laws governing mitigation under CEQA. The Amendments, therefore, interpret and make specific existing CEQA law and regulations for mitigation of significant impacts resulting from GHG emissions.

Existing section 15126.4 provides guidance on CEQA’s general mitigation requirements. To emphasize that mitigation of GHG emissions is subject to those existing CEQA requirements, OPR and the Natural Resources Agency added a new subdivision (c) to the existing section 15126.4. The Amendments identify five general methods of mitigation that may be tailored to the specific circumstances surrounding a specific project. In response to public comments, the Natural Resources Agency provided additional guidance, described below, in the lead-in sentences introducing those five broad categories of mitigation.

Mitigation of Greenhouse Gas Emissions

Comments submitted on the Amendments indicated general concerns that mitigation for GHG emissions may not be effective or reliable. To further clarify the existing mitigation requirements that would apply to measures to reduce greenhouse gas emissions, the Natural Resources Agency revised the lead-in sentences in subdivision (c). Specifically, the Natural Resources Agency added that all mitigation must be supported with substantial evidence and be capable of monitoring or reporting. This addition reflects the requirement in Public Resources Code that a lead agency’s findings on mitigation be supported with substantial evidence and that it must adopt a mitigation monitoring and reporting program along with the project if mitigation measures are required. (Public Resources Code, §§ 21081(a)(1), 21081.6.)

In response to comments, the Natural Resources Agency had originally also proposed to add a sentence indicating that only emissions reductions that were not required by some other law or contract could qualify as mitigation. In response to comments on that proposed revision, that sentence is no longer proposed to be added to the lead-in section; rather, subdivision (c)(3) will be clarified, as described below.

Mitigation Identified in an Existing Plan

The first type of mitigation of GHG emissions that may be considered includes measures identified in an existing plan. As indicated above, many agencies are

beginning to address GHG emissions at a planning level. (OPR, Book of Lists, at pp. 92-100.) Some of those GHG reduction plans include specific measures that may be applied on a project-by-project basis. (*Ibid*; see also Scoping Plan, Appendix C, at p. C-49.) Proposed subdivision (c)(1), therefore, would encourage lead agencies to look to adopted plans for sources of mitigation measures that could be applied to specific projects.

Project Design Features

The second type of measure that a lead agency should consider is project design features that will reduce project emissions. Various project design features could be used to reduce GHG emissions from a wide variety of projects. The CAPCOA White Paper provides examples of various project design features that may reduce emissions from commercial and residential buildings. (CAPCOA White Paper, at pp. B-13 to B-18.) For example, according to the California Energy Commission, “[r]esearch shows that increasing a community’s density and its accessibility to jobs centers are the two most significant factors for reducing vehicle miles traveled,” which is an important component of reducing statewide emissions. (California Energy Commission 2007, *2007 Integrated Energy Policy Report*, CEC-100-2007-008-CMF (“2007 IEPR”), at p. 12; see also CEC, *The Role of Land Use in Meeting California’s Energy and Climate Goals* (2007) at p. 20.) This subdivision also refers specifically to measures identified in Appendix F, which include a variety of measures designed to reduce energy use. By encouraging lead agencies to consider changes to the project itself, this subdivision further encourages the realization of co-benefits such as reduced energy costs for project occupants, increased amenities for non-vehicular transportation, and others. Thus, project design can reduce GHG emissions directly through efficiency and indirectly through resource conservation and recycling. (Green Building Sector Subgroup of the Climate Action Team, Scoping Plan Measure Development and Cost Analysis (2008) at p. 6 to 9.)

Off-Site Measures

The third type of measures addressing GHG emissions is off-site measures including offsets. Proposed subdivision (c)(3) recognizes the availability of various off-site mitigation measures. Such measures could include, among others, the purchase of carbon offsets, community energy conservation projects, and off-site forestry projects. (See, e.g., South Coast Air Quality Management District, SoCal Climate Solutions Exchange (June 2008), at pp.1; Rodeo Refinery Settlement Agreement, BAAQMD Carbon Offset Fund; Recommendations of the ETAAC, Final Report (February 2008) at pp. 9-5; ARB, Staff Report: Proposed Adoption of California Climate Action Registry Forestry Greenhouse Gas Protocols for Voluntary Purposes (October 17, 2007), at p. 15 (“[t]he three protocols together – the sector, project, and certification protocols – are a cohesive and comprehensive set of methodologies for forest carbon accounting, and furthermore contain all the elements necessary to generate high quality carbon credits”); see also Scoping Plan, Appendix C, at pp. C-21 to C-23.) Off-site mitigation may be appropriate under various circumstances. For example, such mitigation may be

appropriate where a project is incapable of design modifications that would sufficiently reduce GHG emissions within the project boundaries. In that case, a lead agency could consider whether emissions reductions may be achieved through such measures as energy-efficiency upgrades within the community or reforestation programs.

The reference to “offsets” in subdivision(c)(3) generated several comments during the public review period. The offsets concept is familiar in other aspects of air quality regulation. The Federal Clean Air Act, for example, provides that increases in emissions from new or modified sources in a nonattainment area must be offset by reductions in existing emissions within the nonattainment area. (See, e.g., 42 U.S.C. § 7503(a)(1)(A).) California laws also apply to offsets and emissions credits. (See, e.g., Health & Saf. Code, § 39607.5.) Those other laws generally require that emissions offsets must be “surplus” or “additional”. Comments on the proposed amendments suggested that to be used for CEQA mitigation purposes, offsets should also be “additional.” Thus, the Natural Resources Agency further refined the revisions it publicized on October 23, 2009, by deleting the lead-in sentence stating that “Reductions in emissions that are not otherwise required may constitute mitigation pursuant to this subdivision,” and amending subdivision (c)(3) to state that mitigation may include “Off-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions[.]”

Moving this concept from the general provisions on mitigation of greenhouse gas emissions to the provision on offsets does not materially alter the rights or conditions in the originally proposed text because the “not otherwise required” concept would only make sense in the context of offsets. Because this revision clarifies section 15126.4(c)(3), consistent with the Public Resources Code and cases interpreting it, and does not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Sequestration

The fourth type of GHG emissions mitigation measure is sequestration. Indeed, one way to reduce a project’s GHG emissions is to sequester project-related GHG emissions and thereby prevent them from being released into the atmosphere. At present, the most readily available, and accountable, way to sequester GHGs is forest management. California forests have a “unique capacity to remove [carbon dioxide, a GHG,] from the air and store it long-term as carbon.” (Scoping Plan, Appendix C, at p. C-165.) Forest sequestration functions are, therefore, a key part of the ARB’s Scoping Plan and reduction effort. (Scoping Plan, at pp. 64-65.)

The California Climate Action Team has also identified several forest-related sequestration strategies, including, reforestation, conservation forest management, conservation (i.e., avoided development), urban forestry, and fuels management and biomass. (ARB, Staff Report: Proposed Adoption of California Climate Action Registry

Forestry Greenhouse Gas Protocols for Voluntary Purposes (October 17, 2007), at pp. 6-7.) ARB has adopted Forest Protocols for large forestry projects. (ARB, Resolution 07-44 (adopting California Climate Action Registry Forestry Sector Protocol (September 2007), Forest Project Protocol (September 2007) and Forest Verification Protocol (May 2007).) ARB has also adopted Urban Forest Protocols for urban forestry projects. (California Climate Action Registry, Urban Forest Project Reporting Protocol and Verification Protocol (August 2008) (ARB adopted on September 25, 2008).) Such projects could be located on the project site or off-site. (Urban Forest Project Reporting Protocol, at pp. 4-5.) The protocols include methods of measuring the ability of various forestry projects to store capture and store carbon.

Consistent with section 15126.4(a), a lead agency must support its choice of, and its determination of the effectiveness of, any reduction measures with substantial evidence. Substantial evidence in the record must demonstrate that any mitigation program or measure is will result in actual emissions reductions. As a practical matter, where a mitigation program or measure is consistent with protocols adopted or approved by an agency with regulatory authority to develop such a program, a lead agency will more easily be able to demonstrate that off-site mitigation will actually result in emissions reductions. Examples of such protocols include the forestry protocols described above. Where a mitigation proposal cannot be verified with an existing protocol, a greater evidentiary showing may be required.

Measures to be Implemented on a Project-by-Project Basis

Finally, the fifth type of measure that could reduce GHG emissions at a planning level is the development of binding measures to be implemented on a project-specific basis. As explained in greater detail in the discussion of proposed section 15183.5, below, ARB's Scoping Plan strongly encourages local agencies to develop plans to reduce GHG emissions throughout the community. In addition, the CEC's Power Plant Siting Committee is assessing the impacts of GHG emission from proposed new power plants and how they can be mitigated. Comments received during the CEC's informational proceedings warranted a lengthy discussion on the practical application of a programmatic approach to mitigating GHG emissions from new power plants. (CEC, *Committee Guidance on Fulfilling California Environmental Quality Act Responsibilities for Greenhouse Gas Impacts in Power Plant Siting Applications* (2009) at p. 26 to 28.) Existing State CEQA Guidelines sections 15168(b)(4) and 15168(c)(3) recognize that programmatic documents provide an opportunity to develop mitigation plans that will apply on a project-specific basis. Proposed subdivision (c)(5) recognizes that, for a planning level decision, appropriate mitigation of GHG emissions may include the development of a program to be implemented on a project-by-project basis. (State CEQA Guidelines, § 15126.4(a)(2) (“[i]n the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation or project design”).)

This type of mitigation is subject to the limits of existing law, however. Thus, proposed subdivision (c)(5) should not be interpreted to allow deferral of mitigation.

Rather, it is subject to the rule in existing section 15126.4(a)(1)(B) that such measures “may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way.” (See also *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal. App. 4th 645, 670-71.)

Suggestions Rejected

During its public involvement process, OPR received comments on its preliminary draft of the proposed amendments related to mitigation. Some comments suggested provisions that were not included in these Proposed Amendments. Several comments, for example, suggested that the Guidelines provide a specific “hierarchy” of mitigation requiring lead agencies to mitigate GHG emissions on-site where possible, and to allow consideration and use of off-site mitigation only if on-site mitigation is impossible or insufficient. OPR and the Resources Agency recognize that there may be circumstances in which requiring on-site mitigation may result in various co-benefits for the project and local community, and that monitoring the implementation of such measures may be easier. However, CEQA leaves the determination of the precise method of mitigation to the discretion of lead agencies. (State CEQA Guidelines, § 15126.4(a)(1)(B); see also *San Franciscans Upholding the Downtown Plan v. City & Co. of San Francisco* (2002) 102 Cal. App. 4th 656, 697.)

Several comments also suggested that mitigation for GHG emissions must be “real, permanent, quantifiable, verifiable, and enforceable.” The Proposed Amendments do not include such standards, however, for several reasons. The proposed standard appears to have been derived from section 38562(d) of the Health and Safety Code, which prescribes requirements for regulations to be promulgated to implement AB32. AB32 is a separate statutory scheme, and, as noted above, there is no indication that the legislature intended to alter standards for mitigation under CEQA. Similarly, standards for mitigation under CEQA already exist and are set out in section 15126.4(a). Specifically, mitigation must be fully enforceable, which implies that the measure is also real and verifiable. Additionally, substantial evidence in the record must support an agency’s conclusion that mitigation will be effective, and in the context of an EIR, courts will defer to an agency’s determination of a measure’s effectiveness. (*Environmental Council of Sacramento v. City of Sacramento* (2006) 147 Cal.App.4th 1018, 1041 (mitigation ratio is supportable even at less than 1:1 given the project’s circumstances); *Ass’n of Irrigated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1398 (lead agency has discretion to resolve dispute regarding the effectiveness of an EIR’s mitigation measures).) No existing law requires CEQA mitigation to be quantifiable. Rather, mitigation need only be “roughly proportional” to the impact being mitigated. (State CEQA Guidelines, § 15126.4(a)(4)(B); see also *id.* at § 15142.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the mitigation of GHG emissions. (Pub. Resources Code, § 21083.05.) The proposed subdivision (c) sets out types of mitigation of GHG emissions that a lead agency may consider. Thus, that subdivision is reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the proposed action and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the proposed action. This conclusion is based on the Resources Agency's determination that the proposed action is necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the proposed action adds no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The proposed action interprets and makes specific statutory CEQA provisions and/or case law interpreting CEQA for mitigating the impacts of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th

Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the proposed action does not add any substantive requirements, it will not result in an adverse impact on businesses in California. On the contrary, by providing greater certainty to lead agencies regarding the determination of significance of GHG emissions, the cost of environmental analysis, and potential litigation, may be reduced.

SECTION 15130. DISCUSSION OF CUMULATIVE IMPACTS

Specific Purposes of the Amendment

The Proposed Amendments include two revisions to the existing section 15130 of the State CEQA Guidelines. The two proposed amendments are described below.

Section 15130(b)(1)(B)

Section 21083(b) of the Public Resources Code requires that an EIR be prepared if the “possible effects of a project are individually limited but cumulatively considerable.” That section further defines “cumulatively considerable” to mean that “the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.”

In determining whether a project may have significant cumulative impacts, a lead agency must engage in a two-step process. First, it must determine the extent of the cumulative problem. To do so, a lead agency must examine the “effects of past projects, the effects of other current projects, and the effects of probable future projects.” Once it does so, the lead agency then determines whether the project’s incremental contribution to that problem is cumulatively considerable. Section 21100(e) further provides that “[p]reviously approved land use documents, including but not limited to, general plans, specific plans, and local coastal plans, may be used in a cumulative impact analysis.”

The existing Guideline section 15130(b) addresses the first step of the process. It offers two options for estimating the effects resulting from past, present and reasonably foreseeable projects. A lead agency may either rely on a list of such projects, or a summary of projections to estimate cumulative impacts. Existing section 15130(b)(1)(B) allows a lead agency to rely on projections in a land use document or certified environmental document that addresses the cumulative impact under consideration.

The proposed amendments would clarify that plans providing such projections need not be limited to land use plans, so long as the plan evaluates the relevant cumulative effect. The proposed amendments would also allow a lead agency to rely on information provided in regional modeling programs. The best projections of the cumulative effect of GHG emissions may be available in up-to-date models such as the International Council for Local Environmental Initiative’s Local Government GHG Protocol⁸ and the California Climate Action Reserve’s Registry general,⁹ industry¹⁰ and

⁸ ICLEI (2008) Local Government Operations Protocol; Accessed 6/08/09, <http://www.icleiusa.org/action-center/tools/lgo-protocol-1>

⁹ California Climate Action Registry (2009) General Reporting Protocol: Accessed 6/08/09, http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

project type protocols.¹¹ Such projections may also be supplied in plans that are not strictly “land use” plans. For example, regional transportation plans in certain areas will ultimately include sustainable community strategies which will include projections a region’s GHG emissions and related cumulative effects. (Gov Code, § 65080(b)(2).) Finally, some agencies are beginning to develop GHG reduction plans or climate action plans that may also include such projections. (ARB, Scoping Plan, Appendix C, at p. C-49; OPR, Book of Lists, at pp. 92-100.)

The proposed amendments are consistent with section 21083 of the Public Resources Code and CEQA case law. Section 21083 requires consideration of “the effects of past projects, the effects of other current projects, and the effects of probable future projects.” Projections in the listed types of plans and models may include inventories of existing emissions and projected future emissions. Section 21100 of the Public Resources Code provides that land use plans “may” be used in a cumulative impacts analysis, but that section does not purport to limit the types of plans that can be used in a cumulative impacts analysis to land use plans. Finally, case law has supported reliance on projections provided by industry, for example, to satisfy the requirement for a discussion of impacts caused by closely related projects. (*Ass’n of Irrigated Residents, supra*, 107 Cal. App. 4th at 1404.)

While models may provide the most up to date information, lead agencies should still look first to information provided in adopted or certified environmental documents. First, such information has already gone through a public and agency review process. Second, to the extent the model provides information that is not provided in the prior environmental document, the relationship of the model and applicable plans must be explained, along with any changes in circumstances.

Section 15130(d)

The Office of Planning and Research had originally proposed the addition of certain plans to section 15130(d). That section states that previously approved land use plans may be used in a cumulative impacts analysis. Those additions were inadvertently excluded from the proposed amendments that were made available for public review on July 3, 2009. Therefore, the revisions were added to revisions that were made publicly available on October 23, 2009.

The added plans include regional transportation plans and plans for the reduction of greenhouse gas emissions. This change is sufficiently related to the proposal that was originally published. Those plans were proposed for addition to other sections of the proposed amendments, for example, and comments were submitted regarding the use of such plans in cumulative impacts analysis. Plans for the reduction of greenhouse gas emissions were described under section 15064(h)(3), above. Regional

¹⁰ California Climate Action Registry (2005) Industry Specific Protocols: Accessed 06/08/09, <http://www.climateregistry.org/tools/protocols/industry-specific-protocols.html>

¹¹ California Climate Action Registry (2007) Project Protocols: Accessed 06/08/09, <http://www.climateregistry.org/tools/protocols/project-protocols.html>

transportation plans may contain information regarding transportation-related greenhouse gas emissions that may be useful in a cumulative impacts analysis. As explained above, regional transportation plans in certain areas will ultimately include sustainable community strategies which will include projections a region's GHG emissions and related cumulative effects. (Gov Code, § 65080(b)(2).) Thus, these additions are reasonably necessary to ensure that public agencies perform a cumulative impacts analysis of greenhouse gas emissions as required by Public Resources Code section 21083.05. The additions are also consistent with Public Resources Code section 21100(e) which provides that previously adopted land use plans may be used in a cumulative impacts analysis.

Section 15130(f)

The Natural Resources Agency originally proposed to add subdivision (f) to section 15130 to clarify that sections 21083 and 21083.05 of the Public Resources Code do not require a detailed analysis of GHG emissions solely due to the emissions of other projects. (State CEQA Guidelines, § 15130(a)(1); *Santa Monica Chamber of Commerce v. City of Santa Monica* (2002) 101 Cal.App.4th 786, 799.) Rather, proposed subdivision (f) would have provided that a detailed analysis is required when evidence shows that the incremental contribution of the project's GHG emissions is cumulatively considerable when added to other cumulative projects. (*CBE, supra*, 103 Cal.App.4th at 119-120.) In essence, the proposed addition would be a restatement of law as applied to GHG emissions. Analysis of GHG emissions as a cumulative impact is consistent with case law arising under the National Environmental Policy Act. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Other portions of these proposed Guidelines address how lead agencies may determine whether a project's emissions are cumulatively considerable. (See, e.g., Proposed Sections 1506(h)(3) and 15064.4.)

Public comments noted, however, that the new subdivision merely restated the law, and was capable of misinterpretation. The Natural Resources Agency, therefore, determined that because other provisions of the Amendments address the analysis of greenhouse gas emissions as a cumulative impact, and because the reasoning of those is fully explained in the Initial Statement of Reasons, subdivision (f) should not be added to the CEQA Guidelines. The deletion was reflected in the revisions that were made available for further public review and comment on October 23, 2009.

Necessity

Sections 21083 and 21083.05 of the Public Resources Code respectively require that an EIR analyze cumulative impacts and that the effects of GHG emissions be analyzed in CEQA documents. The Amendments include guidance to assist lead agencies to evaluate the cumulative impacts of GHG emissions where an EIR is required. Thus, the Amendments are reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the

amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15150. INCORPORATION BY REFERENCE

Specific Purposes of the Amendment

The existing CEQA Guidelines allow lead agencies to incorporate information from other documents by reference. (State CEQA Guidelines, § 15150.) Doing so permits a lead agency to avoid repetitious analysis of general matters and to reduce paperwork. (Pub. Resources Code § 21003 (it is state policy that “persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical, and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment”).) Existing Guidelines section 15150(f) provides that “[i]ncorporation by reference is most appropriate for including long, descriptive, or technical materials that provide general background but do not contribute directly to the analysis of the problem at hand.”

The key requirements for documents that may be incorporation by reference are set forth in the statutory definition of “EIR.” (Pub. Resources Code, § 21061.) Those requirements include:

- The incorporated information is a matter of public record or is generally available to the public; and
- The incorporated information is reasonably available for inspection at a public place or public building.

Descriptions of global, statewide and regional GHG emissions are particularly well-suited to incorporation by reference. Such descriptions can be technical and lengthy. (Public Policy Institute of California, *Climate Policy at the Local Level: A Survey of California’s Cities and Counties* (November 2008), at pp. 24-32 (describing barriers and constraints to adoption of climate action plans and policies).) General descriptions may also remain current enough to be used in several successive environmental documents. In fact, OPR has found that many agencies are addressing GHG emissions in programmatic documents that could be incorporated by reference into later documents. (OPR, *Book of Lists*, at pp. 92-100.) Thus, the Resources Agency and OPR find that addition of subdivision (e)(4) is reasonably necessary to effectuate the legislative directive that public agencies conduct environmental review in the most efficient manner possible.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Legislature has further directed that resources be conserved wherever possible in the analysis of environment impacts. (*Id.* at § 21003.) Thus, the amendment to add GHG

analyses to the list of documents that may be incorporated by reference is reasonably necessary to implement the Legislature's directive.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the proposed action adds no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15183. PROJECTS CONSISTENT WITH A COMMUNITY PLAN OR ZONING

Specific Purposes of the Amendment

Section 21083.3 of the Public Resources Code provides that projects that are consistent with a General Plan, Community Plan or Zoning may not need to analyze cumulative effects that have already been analyzed in an EIR on the prior planning or zoning action. The exemption may apply, for example, where “uniformly applied development policies or standards” will substantially mitigate a cumulative effect. (Pub. Resources Code, § 21083.3(d).) The statute does not define what types of development policies or standards may be used in this context. It does provide, however, that such standards or policies must have been adopted by the lead agency with a finding, supported with substantial evidence, that the policy or standard will substantially mitigate the environmental effect under consideration. (*Ibid.*) Existing Guidelines section 15183 provides several non-exclusive examples of policies and standards that might apply in the context of section 21083.3, including grading ordinances and floodplain protection ordinances.

The inclusion of “[r]equirements for reducing greenhouse gas emissions, as set forth in adopted land use plans, policies or regulations” among the list of examples of “uniformly applied development policies or standards” is consistent with the direction in section 21083.3. First, the text provides that such requirements would be “adopted” by the lead agency. Second, they would be “development policies or standards” because the requirements would be contained in an adopted “land use plan, policy or regulation.” Finally, such requirements could substantially mitigate the effects of GHG emissions by “reducing greenhouse gas emissions” in the adopting jurisdiction. (Proposed Section 15183.5(b) would provide elements that may be included in a GHG emissions reduction plan that might be used in the context of section 15183.)

One comment submitted during OPR’s public involvement process questioned whether such requirements relating to reductions in GHG emissions would be kept current. (See, e.g., Letter from Joyce Dillard to OPR, January 26, 2009.) Section 21083.3 specifically provides, however, that such requirements would not apply in this context if “substantial new information shows that the policies or standards will not substantially mitigate the environmental effect.” (Pub. Resources Code, § 21083.3(d).) Therefore, lead agencies have an incentive to ensure that their policies remain current.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The addition to section 15183 is reasonably necessary to carry out the legislature’s intent that projects that are consistent with General Plans, Community Plans and Zoning benefit from streamlined CEQA review. Several jurisdictions are beginning to include requirements for reducing GHG emissions in their general plans. (OPR, Book of Lists,

at pp. 92-100; Scoping Plan, Appendix C, at p. C-49.) The addition is also reasonably necessary to effectuate the legislature's intent that OPR and the Resources Agency provide guidance on how to analyze GHG emissions.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Resources Agency rejected the no action alternative because it would not achieve the objectives of the proposed revisions. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Murieltans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to

SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15183.5. TIERING AND STREAMLINING THE ANALYSIS OF GREENHOUSE GAS EMISSIONS

Specific Purposes of the Amendment

In adopting SB375, the Legislature found that “[n]ew provisions of CEQA should be enacted so that the statute encourages ... local governments to make land use decisions that will help the state achieve its climate goals under AB 32[.]” (Statutes 2008, Ch. 728, § 1(f).) ARB’s Scoping Plan similarly recognizes the important role that local governments play in reducing the State’s GHG emissions. (ARB, Scoping Plan, at p. 26.) In particular, local government “[d]ecisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors.” (*Ibid.*) Decision-making on urban growth and land use planning begins with local general plans. (Gov. Code, § 65030.1 (“The Legislature ... finds that decisions involving the future growth of the state, most of which are made and will continue to be made at the local level, should be guided by an effective planning process, including the local general plan, and should proceed within the framework of officially approved statewide goals and policies directed to land use, population growth and distribution, development, open space, resource preservation and utilization, air and water quality, and other related physical, social and economic development factors”).)

GHG emissions may be best analyzed and mitigated at a programmatic level. “For local government lead agencies, adoption of general plan policies and certification of general plan EIRs that analyze broad jurisdiction-wide impacts of GHG emissions can be part of an effective strategy for addressing cumulative impacts and for streamlining later project-specific CEQA reviews.” (OPR, Technical Advisory: CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review, June 19, 2008, at p. 8.) Other lead agencies may also address GHG emissions programmatically in long range development plans, facilities master plans, and other long-range planning documents.

This emphasis on long-range planning is consistent with state policy expressed in CEQA. The Legislature has clearly stated its preference that lead agencies tier environmental documents wherever feasible. (Pub. Resources Code, § 21093(b).) Specifically:

The Legislature finds and declares that tiering of environmental impact reports will promote construction of needed housing and other development projects by (1) streamlining regulatory procedures, (2) avoiding repetitive discussions of the same issues in successive environmental impact reports, and (3) ensuring that environmental impact reports prepared for later projects which are consistent with a previously approved policy, plan, program, or ordinance concentrate upon environmental effects which may be mitigated or avoided in connection with the decision on each later project. The Legislature further finds and

declares that tiering is appropriate when it helps a public agency to focus upon the issues ripe for decision at each level of environmental review and in order to exclude duplicative analysis of environmental effects examined in previous environmental impact reports.

(Pub. Resources Code, § 21093(a).) The Amendments, therefore, include the addition of a new section 15183.5 to address both tiering and streamlining of GHG analyses, as well as the proper use of GHG reduction plans in CEQA analyses. Explanation of the rationale of each new subdivision is provided below.

Existing Methods of Streamlining and Tiering

Because GHG emissions raise a cumulative concern, analysis of such emissions in a long-range planning document lends itself to tiering and use in later project-specific environmental review. (Pub. Resources Code, § 21093.) The Legislature has created several tiering and streamlining methods, reflected in various provisions of the existing State CEQA Guidelines, that can reduce duplication in the analysis of GHG emissions. Subdivision (a) clarifies that existing provisions in the State CEQA Guidelines regarding tiering and streamlining may be applied to the analysis of GHG emissions.

Greenhouse Gas Emissions Reduction Plans

Many jurisdictions are beginning to address GHG emissions reductions in “climate action plans” and “gas emissions reduction plans.” (OPR, Book of Lists, at pp. 92-100; see also, Scoping Plan, Appendix C, at p. C-49.) ARB’s Scoping Plan specifically encourages local governments to develop such plans, and has created a local government operations protocol to assist in that effort. (Scoping Plan, at p. 26.) A community-wide emissions protocol is also under development.

Some comments raised during OPR’s public involvement process expressed concern that due to a lack of legislative criteria for such plans, existing provisions in the CEQA Guidelines regarding cumulative impacts may be misused. (See, e.g., Letter from Center for Biological Diversity, et al., to OPR, February 2, 2009, at p. 2.) For example, without specific guidance, a lead agency could erroneously rely on a plan with purely aspirational intent to determine that a later project’s cumulative impact is less than significant pursuant to section 15064(h)(3). The proposed subdivision (b) provides criteria to assist lead agencies in determining whether an existing greenhouse gas reduction plan is an appropriate document to use in a cumulative impacts analysis under CEQA.

The existing CEQA Guidelines allow lead agencies to rely on plans for cumulative analysis where the plan has been adopted in a public review process and contains specific requirements to avoid or substantially lessen a cumulative problem. (State CEQA Guidelines, § 15064(h)(3).) The criteria set out in proposed subdivision (b)(1) are designed to ensure that a greenhouse gas reduction plan would satisfy the

requirements described in sections 15064(h)(3) and 15130(d), for the reasons described below.

Criteria (A) and (C) are necessary to define the scope of GHG emissions within the defined geographic area and the incremental contribution of activities that will occur within that area to those emissions. (State CEQA Guidelines, § 15064(h)(3) (plan addresses cumulative impacts “within the geographic area in which the project is located”).) Criterion (B) establishes a benchmark to assist the lead agency in determining whether the plan provisions will avoid or substantially lessen cumulative effects of the area’s GHG emissions. (*Ibid.* (plan “provides specific requirements that will avoid or substantially lessen the cumulative problem”).) Criteria (D) and (E) are necessary to demonstrate that the plan will actually avoid or substantially lessen the cumulative effects of those emissions. (*Ibid.*) Finally, criterion (F) reflects the requirement in sections 15064(h)(3) and 15130(d) that the plan be adopted through a public review process, as well as case law requiring that mitigation plans themselves undergo environmental review. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal. App. 4th 1026, 1053 (mitigation “programs may offer the best solution to environmental planning challenges, by providing some certainty to developers while adequately protecting the environment” but “in order to provide a lawful substitute for the ‘traditional’ method of mitigating CEQA impacts, that is, a project-by-project analysis, the fee program must be evaluated under CEQA”).) Notably, the criteria provided in subdivision (b) are largely consistent with the elements that ARB recommends be included in a greenhouse gas reduction plan. (ARB, Scoping Plan, Appendix C, at p. C-49.)

Subdivision (b)(2) describes the uses and limitations of plans for the reduction of greenhouse gas emissions in a cumulative impacts analysis for later projects. Specifically, it provides a safeguard to ensure that the later activity was actually addressed in the plan for the reduction of greenhouse gas emissions, and that any applicable requirements of the plan are incorporated into the later project. This requirement is similar the requirement in case law that a lead agency determine that a particular threshold appropriately addresses the impact of concern. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109 (“in preparing an EIR, the agency must consider and resolve every fair argument that can be made about the possible significant environmental effects of a project, irrespective of whether an established threshold of significance has been met with respect to any given effect”).) Finally, subdivision (b)(2) makes specific the requirement that, while the existence of an applicable plan for the reduction of greenhouse gas emissions may create a presumption that compliance with that plan will reduce the incremental contribution of later activities to a less than cumulatively considerable level, the existence of substantial evidence supporting a fair argument to the contrary may still require preparation of an EIR.

Special Situations

Subdivision (c) provides necessary clarification of the partial exemption provided in sections 21155.2 and 21159.28 of the Public Resources Code, enacted as part of SB375 (see description above). The limitation on analysis of global warming applies only to the effects caused by GHG emissions from cars and light duty trucks. That limitation should be read in conjunction with section 21083.05 of the Public Resources Code and State CEQA Guideline sections 15064.4 and 15126.4 which require analysis of all sources of GHG emissions and mitigation if those emissions are significant. Thus, projects that qualify for the limitation in sections 21155.2 and 21159.28 must still analyze emissions resulting from, as applicable, energy use, land conversion, and other direct and indirect sources of emissions. This clarification is reasonably necessary to effectuate the legislative directive in section 21083.3 that OPR and Resources develop guidelines on the analysis of GHG emissions and to avoid confusion regarding the streamlining provisions provided by SB375.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) The Legislature has also directed that EIRs be tiered wherever possible, and that duplication be minimized. (*Id.* at §§ 21003, 21093, 21094.) Section 15183.5, which provides guidance on tiering and streamlining of GHG emissions analyses, is therefore reasonably necessary to carry out these directives.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the Amendments are proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent

of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the Amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the amendments to this section are intended to reduce the costs of environmental review on lead agencies and project applicants by encouraging the use of existing environmental analysis where available. (Pub. Resources Code, § 21003(d) (use information in existing EIRs in order to reduce duplication), (f) (environmental review should proceed in the most efficient manner possible).)

SECTION 15364.5. GREENHOUSE GAS

Specific Purposes of the Amendment

The Legislature has not included a definition of “greenhouse gases” in CEQA, though it did include a definition in AB32. (Health & Saf. Code, § 38505(g).) Thus, new section 15364.5 adds a definition of greenhouse gases. The specified gases are consistent with existing law as they are defined to include those identified by the Legislature in section 38505(g) of the Health and Safety Code.

Notably, the definition in AB32 states that GHG “includes all of the following...” In so stating, the Legislature implies that other gases may also be considered GHGs. The ARB’s Scoping Plan also acknowledges that other gases contribute to climate change. (Scoping Plan, at p. 11.) In fact, the EPA’s Endangerment Finding explained that several other gases share attributes with GHGs but would not be appropriate for regulation under the Clean Air Act at this time. (EPA Endangerment Finding, at pp. 18896-98.) Therefore, similar to the statutory definition of GHGs in AB32, the definition in the Amendments is not exclusive to the six primary GHGs. The purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects. This approach is consistent with the Supreme Court’s directive that CEQA be interpreted to provide the fullest possible protection to the environment. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 390.)

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) Section 15364.5 is necessary to make specific the instruction to analyze GHG emissions because it states which gases are considered to be “greenhouse gases” and should be included in the analysis.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency’s Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency’s determination that the Amendments are necessary to implement the Legislature’s directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action

alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Murieltans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the Amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the addition of this section is intended to reduce the costs of environmental review on lead agencies and project applicants by assisting lead agencies in determining which gases should be included in an analysis.

APPENDIX F. ENERGY CONSERVATION

Specific Purposes of the Amendment

CEQA's requirement to analyze and mitigate energy impacts of a project is substantive, and is not merely procedural. (*People v. County of Kern* (1976) 62 Cal.App.3d 761, 774.) Despite the requirement, lead agencies have not consistently included such analysis in their EIRs. (Remy et al., Guide to CEQA, 11th Ed. 2007, at pp. 1007-1008, n. 34.) The following revisions to Appendix F are, therefore, reasonably necessary to ensure that lead agencies comply with the substantive directive in section 21100(b)(3).

Introduction

The revisions to the introduction section include a cross-reference to section 21100(b)(3) of the Public Resources Code to direct lead agencies to the statutory directive underlying Appendix F. This section also includes an addition to make clear that energy impacts that have already been analyzed may not need to be repeated in later EIRs. This sentence is consistent with the Legislative intent in CEQA that information in existing environmental review be used to "reduce delay and duplication in preparation of subsequent environmental impact reports." (Pub. Resources Code, § 21003(d).)

EIR Contents

The amendments to Appendix F revise the section on EIR Contents to clarify that lead agencies "shall" analyze energy conservation in their EIRs. The word "shall" indicates that the duty is mandatory, and makes Appendix F consistent with Public Resources Code section 21100(b)(3). While Appendix F is revised to make clear that an energy analysis is mandatory, the amendments to this section would also make clear that the energy analysis is limited to effects that are applicable to the project.

"Lifecycle"

The amendments to Appendix F remove the term "lifecycle." No existing regulatory definition of "lifecycle" exists. In fact, comments received during OPR's public workshop process indicate a wide variety of interpretations of that term. (Letter from Terry Rivasplata et al. to OPR, February 2, 2009, at pp. 5, 12 and Attachment; Letter from Center for Biological Diversity et al. to OPR, February 2, 2009, at pp. 17.) Thus, retention of the term "lifecycle" in Appendix F could create confusion among lead agencies regarding what Appendix F requires.

Moreover, even if a standard definition of the term "lifecycle" existed, requiring such an analysis may not be consistent with CEQA. As a general matter, the term could refer to emissions beyond those that could be considered "indirect effects" of a project as that term is defined in section 15358 of the State CEQA Guidelines.

Depending on the circumstances of a particular project, an example of such emissions could be those resulting from the manufacture of building materials. (CAPCOA White Paper, at pp. 50-51.) CEQA only requires analysis of impacts that are directly or indirectly attributable to the project under consideration. (State CEQA Guidelines, § 15064(d).) In some instances, materials may be manufactured for many different projects as a result of general market demand, regardless of whether one particular project proceeds. Thus, such emissions may not be “caused by” the project under consideration. Similarly, in this scenario, a lead agency may not be able to require mitigation for emissions that result from the manufacturing process. Mitigation can only be required for emissions that are actually caused by the project. (State CEQA Guidelines, § 15126.4(a)(4).) Conversely, other projects may spur the manufacture of certain materials, and in such cases, consideration of the indirect effects of a project resulting from the manufacture of its components may be appropriate. A lead agency must determine whether certain effects are indirect effects of a project, and where substantial evidence supports a fair argument that such effects are attributable to a project, that evidence must be considered. However, to avoid potential confusion regarding the scope of indirect effects that must be analyzed, the term “lifecycle” has been removed from Appendix F.

Types of Energy Use

The amendments to Appendix F clarify that project design may achieve energy savings through measures related to water use and solid waste disposal. (California Energy Commission, Water Supply-Related Electricity Demand in California, CEC 500-2007-114 (November 2007), at p. 3 (reporting that water related energy use, including water movement, treatment and heating, annually accounts for approximately 20 percent of California’s electricity consumption); Scoping Plan, Appendix C, at pp. C-158 to C-160.) The addition of these potential sources of energy reductions is consistent with the direction in section 21100(b)(3) to identify mitigation measures to reduce inefficient consumption of energy.

Grammar and Syntax

Finally, several minor revisions to Appendix F were made to improve grammar and syntax. Such revisions qualify as a “change without regulatory effect” pursuant to section 100(a)(4) of the Office of Administrative Law’s regulations governing the rulemaking process. (Cal. Code Regs., tit. 1, § 100(a)(4).)

Necessity

The Legislature directed OPR and the Natural Resources Agency to develop guidelines on the analysis and mitigation of GHG emissions. (Pub. Resources Code, § 21083.05.) Since a significant source of GHG emissions results from energy use (consumption), these Amendments appropriately addressed energy use and conservation as a subject for CEQA analysis. Additionally, the legislature requires that lead agencies analyze energy use in their EIRs. (*Id.* at § 21100(b)(3).) The

amendments to Appendix F are, therefore, necessary to ensure that lead agencies implement these directives.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA's requirements for analysis and mitigation of energy use. Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California.

APPENDIX G. INITIAL STUDY CHECKLIST

Specific Purposes of the Amendment

The Amendments include revisions to several portions of Appendix G, which contains a sample environmental checklist that lead agencies may use to satisfy the requirement to prepare an initial study. The amendments and their necessity are described below.

Note Regarding Use of the Checklist

The amendments would add a note to the beginning of Appendix G to clarify the checklist contained therein is only a sample that may be modified as necessary to suit the lead agency and to address the particular circumstances of the project under consideration. The addition is necessary for two reasons. First, several lead agencies have expressed concern that the checklist does not reflect the circumstances existing in that particular agency. (See, e.g., Letter from Napa County – Department of Conservation, Development, and Planning to OPR, January 26, 2009; Letter from County of San Bernardino - Land Use Services Department to OPR, February 2, 2009.) Second, the Third District Court of Appeal recently issued an opinion that clarified that all substantial evidence regarding potential impacts of a project must be considered, even if the particular potential impact is not listed in Appendix G. (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at 1109.) Thus, the note emphasizes that Appendix G does not mandate a particular form that must be used for an Initial Study; rather, it provides merely an example.

Forest Resources

The amendments would add several questions addressing forest resources in the section on Agricultural Resources. Forestry questions are appropriately addressed in the Appendix G checklist for several reasons. First, forests and forest resources are directly linked to both GHG emissions and efforts to reduce those emissions. For example, conversion of forests to non-forest uses may result in direct emissions of GHG emissions. (See, e.g., California Energy Commission Baseline GHG Emissions for Forest, Range, and Agricultural Lands in California (March, 2004) at p. 19.) Such conversion would also remove existing carbon stock (i.e., carbon stored in vegetation), as well as a significant carbon sink (i.e., rather than emitting GHGs, forests remove GHGs from the atmosphere). (Scoping Plan, Appendix C, at p. C-168.) Thus, such conversions are an indication of potential GHG emissions. Changes in forest land or timberland zoning may also ultimately lead to conversions, which could result in GHG emissions, aesthetic impacts, impacts to biological resources and water quality impacts, among others. Thus, these additions are reasonably necessary to ensure that lead agencies consider the full range of potential impacts in their initial studies. In the same way that an EIR must address conversion of prime agricultural land or wetlands as part of a project (addressing the whole of the action requires analyzing land clearance in advance of project development), so should it analyze forest removal.

During OPR's public involvement process, some commenters suggested that conversion of forest or timber lands to agricultural uses should not be addressed in the Initial Study checklist. (Letter from California Farm Bureau Federation to OPR, February 2, 2009; Letter from County of Napa, Conservation, Development and Planning Department, to OPR, January 26, 2009.) As explained above, the purpose of the Amendments is to implement the Legislative directive to develop Guidelines on the analysis and mitigation of GHG emissions. Although some agricultural uses also provide carbon sequestration values, most agricultural uses do not provide as much sequestration as forest resources. (Climate Action Team, *Carbon Sequestration* (2009), Chapter 3.3.8 at p. 3.21; California Energy Commission, *Baseline GHG Emissions for Forest, Range, and Agricultural Lands in California* (2004), at p. 2.) Therefore, such a project could result in a net increase in GHG emissions, among other potential impacts. Thus, such potential impacts are appropriately addressed in the Initial Study checklist. See the Thematic Responses, below, for additional discussion of this issue.

Greenhouse Gas Emissions

The additions also include two questions related to GHG emissions. These questions are necessary to satisfy the Legislative directive in section 21083.05 that the effects of GHG emissions be analyzed under CEQA. The questions are intended to provoke a full analysis of such emissions where appropriate. More detailed guidance on the context of such an analysis is provided in other sections throughout the Guidelines. Despite the detailed provisions in the Guidelines themselves, questions related to GHG emissions should also appear in the checklist because some lead agencies will not seriously consider an environmental issue unless it is specifically mentioned in the checklist. (*Protect the Historic Amador Waterways, supra*, 116 Cal. App. 4th at 1110.)

Transportation

The Amendments make four primary changes to the questions involving transportation and traffic.

First, question (a) changes the focus from an increase in traffic at a given location to the effect of a project on the overall circulation system in the project area. This change is appropriate because an increase in traffic, by itself, is not necessarily an indicator of a potentially significant *environmental* impact. (Ronald Miliam, AICP, *Transportation Impact Analysis Gets a Failing Grade When it Comes to Climate Change and Smart Growth*; see also Land Use Subcommittee of the Climate Action Team LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation Report (May, 2008) at pp. 31, 36.) Similarly, even if some projects may result in a deterioration of vehicular level of service – that is, delay experienced by drivers – the overall effectiveness of the circulation system as a whole may be improved. (*Ibid.*) Such projects could include restriping to provide bicycle lanes or creating dedicated bus lanes. Even in such cases, however, any potential adverse air

quality or other impacts would still have to be addressed as provided in other sections of the checklist. Finally, the change to question (a) also recognizes that the lead agency has discretion to choose its own metric of analysis of impacts to intersections, streets, highways and freeways. (Pub. Resources Code, § 21081.2(e); *Eureka Citizens for Responsible Gov't v. City of Eureka*, *supra*, 147 Cal.App.4th at 371-373 (lead agency has discretion to choose its methodology).) Thus, “level of service” may or may not be the applicable measure of effectiveness of the circulation system.

Second, the revision to question (b) clarifies the role of a congestion management program in a CEQA analysis. Specifically, it clarifies that a congestion management program contains many elements in addition to a level of service designation. (Gov. Code § 65088 et seq.) The clarification is also necessary to address any projects within an “in-fill opportunity zone” that may be exempted from level of service requirements. (*Id.* at § 65088.4.)

Third, the amendments eliminate the existing question (f) regarding parking capacity. Case law recognizes that parking impacts are not necessarily environmental impacts. (*San Franciscans Upholding the Downtown Plan v. City and County of San Francisco*, *supra*, 102 Cal.App.4th at 697.) The focus of the Initial Study checklist should be on direct impacts of a project. Therefore, the question related to parking is not relevant in the initial study checklist. As noted above, however, if there is substantial evidence indicating adverse indirect environmental impacts from a project related to parking capacity, the lead agency must address such potential impacts regardless of whether the checklist contains parking questions. (*Ibid.*) Additional discussion of this issue is included in the Thematic Responses, below.

Finally, the amendments revise existing question (g), now question (f), to address the performance and safety of certain modes of alternative transportation. These revisions were made in response to comments received on the Amendments. While the primary objective of the Amendments is to provide guidance on the analysis and mitigation of greenhouse gas emissions, this revision was determined to be necessary to support the use of alternative transportation.

Necessity

The Legislature directed OPR and the Resources Agency to develop guidelines on the analysis of GHG emissions. (Pub. Resources Code, § 21083.05.) An initial study may be used to assist in the determination of whether a project may have a significant effect on the environment. (*Protect the Historic Amador Waterways*, *supra*, 116 Cal. App. 4th at 1110.) Appendix G of the State CEQA Guidelines is intended to provide a sample of an initial study that lead agencies may use. (*Ibid.*) Amendment of Appendix G to include questions that will assist a lead agency in determining whether a project may result in significant impacts related to GHG emissions is, therefore, necessary to carry out the Legislature’s directive in section 21083.05 of the Public Resources Code.

Reasonable Alternatives to the Regulation, Including Alternatives that Would Lessen Any Adverse Impact on Small Business, and the Resources Agency's Reasons for Rejecting Those Alternatives

The Natural Resources Agency considered reasonable alternatives to the Amendments and determined that no reasonable alternative would be more effective in carrying out the purpose for which the action is proposed or would be as effective as, and less burdensome to affected private persons than, the Amendments. This conclusion is based on the Natural Resources Agency's determination that the Amendments are necessary to implement the Legislature's directive in SB97 in a manner consistent with existing statutes and case law, and the Amendments add no new substantive requirements. The Natural Resources Agency rejected the no action alternative because it would not achieve the objectives of the Amendments. There are no alternatives available that would lessen any adverse impacts on small businesses, as any impacts would result from the implementation of existing law.

Evidence Supporting an Initial Determination That the Action Will Not Have a Significant Adverse Economic Impact on Business

The Amendments interpret and make specific statutory CEQA provisions and/or case law interpreting CEQA for analysis and mitigation of GHG emissions that may result from proposed projects. Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating GHG emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, Riverside Co. Sup. Ct. Case No. RIC463320 (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, Sacramento Sup. Ct. Case No. 07CS00967 (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-1371 and State CEQA Guidelines section 15144 as requiring a lead agency to "meaningfully attempt to quantify the Project's potential impacts on GHG emissions and determine their significance" or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative).) Finally, federal courts have interpreted the National Environmental Policy Act ("NEPA") to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Because the Amendments do not add any substantive requirements, they will not result in an adverse impact on businesses in California. On the contrary, the

amendments to Appendix G are intended to reduce the costs of environmental review on lead agencies and project applicants by assisting lead agencies in determining which topics should be addressed in an Initial Study.

NON-SUBSTANTIAL CHANGES

On October 23, 2009, the Natural Resources Agency made available for public review certain changes to its originally proposed amendments. Those changes were described in the Notice of Proposed Changes. In response to comments on those changes, the Natural Resources Agency has made two non-substantial changes. Because those changes clarify the text that was made available for public review, and do not alter the requirements, rights, responsibilities, conditions, or prescriptions contained in the originally proposed text, the revisions are nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.) Those revisions are described below.

Section 15126.2(a)

As explained in the Notice of Proposed Changes, the revisions to the proposed text included a clarifying sentence in section 15126.2 indicating that an environmental impact report should analyze the effect of placing a project in areas susceptible to hazardous conditions. That revision specifically lists types of areas (including floodplains, coastlines and wildfire risk areas) that may be most impacted by the effects of a changing climate. The revision would also clarify that analysis of such hazards is appropriate where such areas are specified in authoritative hazard maps, risk assessments or land use plans.

The Natural Resources Agency further revised section 15126.2(a) in response to comments. That section was revised as follows:

Similarly, the EIR should evaluate **the any potentially significant** impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

This change does not alter the rights, responsibilities, conditions, or prescriptions contained in the originally proposed text because the Public Resources Code already provides that an EIR is only required for those impacts that are potentially significant. (Public Resources Code, § 21002.1(a).) Because this revision clarifies the last sentence in section 15126.2(a), consistent with the Public Resources Code, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

Section 15126.4(c)

The Natural Resources Agency also further revised text related to mitigation that was made publicly available as described in the October 23, 2009, Notice of Proposed Changes in response to comments on that text. The revision clarifies that the qualification that measures to mitigate greenhouse gas emissions must not otherwise be required applies in the context of offsets and is not intended to contradict case law recognizing that changes in a project that are required to comply with existing environmental standards may qualify as mitigation. Thus, section 15126.4(c) was revised as follows:

(c) Mitigation Measures Related to Greenhouse Gas Emissions.

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. ~~Reductions in emissions that are not otherwise required may constitute mitigation pursuant to this subdivision.~~ Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

(1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

(2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;

(3) Off-site measures, including offsets **that are not otherwise required**, to mitigate a project's emissions;

(4) Measures that sequester greenhouse gases;

(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.

This change does not alter the rights, responsibilities, conditions, or prescriptions contained in the originally proposed text because the Public Resources Code already provides that to be considered mitigation, a measure must be tied to impacts resulting from the project. Section 21002 of the Public Resources Code, the source of the

requirement to mitigate, states that “public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]” Similarly, section 21081(a)(1) specifies a finding by the lead agency in adopting a project that “[c]hanges or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.” Both statutory provisions expressly link the changes to be made (i.e., the “mitigation measures”) to the significant effects of the project. Because this revision clarifies section 15126.4(c), consistent with the Public Resources Code, this revision is nonsubstantial and need not be circulated for additional public review. (Government Code, § 11346.8(c); Cal. Code Regs., tit. 1, § 40.)

THEMATIC RESPONSES

Several themes emerged in the comments submitted on the Natural Resources Agency’s proposed amendments to the CEQA Guidelines addressing greenhouse gas emissions. While the Natural Resources Agency has responded individually to each comment it received, the following provides general responses to several issues that were raised repeatedly in the comments.

Quantitative versus Qualitative Analysis

Many comments focused on section 15064.4’s recognition of lead agency discretion in determining whether to analyze a project’s greenhouse gas emissions using either qualitative or quantitative methods, or both. Some comments suggested that a qualitative analysis would not satisfy CEQA’s informational mandates. Other comments indicated that qualitative analysis is consistent with CEQA, and may be particularly appropriate in the context of a negative declaration. Other comments asked for examples of how performance standards could be used in such an analysis. As explained in the Initial Statement of Reasons, the Natural Resources Agency finds that CEQA leaves to lead agencies the choice of the most appropriate methodology to analyze a project’s impacts, and that rule should continue to apply in the context of greenhouse gas emissions. The reasoning supporting this determination is set forth below.

First, nothing in CEQA prohibits use of a qualitative analysis or requires the use of a quantitative analysis. As explained in the Initial Statement of Reasons, CEQA directs lead agencies to consider qualitative factors. (Initial Statement of Reasons, at p. 19; Public Resources Code, § 21001(f).) Further, the existing CEQA Guidelines recognize that thresholds of significance, which are used in the determination of significance, may be expressed as quantitative, qualitative or performance-based standards. (State CEQA Guidelines, § 15064.7.) Moreover, even where quantification is technically or theoretically possible, “CEQA does not require a lead agency to conduct every test or perform all research, study, and experimentation recommended or demanded by commentors.” (State CEQA Guidelines, § 15204(a); see also *Ass’n of*

Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383, 1396-1398; *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1996) 27 Cal.App.4th 713, 728.)¹²

Second, the comments do not appropriately distinguish between the determination of significance and the informational standards governing the preparation of environmental documents. The purpose of section 15064.4 is to assist the lead agency in determining whether a project's greenhouse gas emissions may be significant, which would require preparation of an EIR, and if an EIR is prepared, to determine whether such emissions are significant, which would require the imposition of feasible mitigation or alternatives. The existing CEQA Guidelines contain several provisions governing the informational standards that apply to various environmental documents. Conclusions in an initial study, for example, must be "briefly explained to indicate that there is some evidence to support" the conclusion. (State CEQA Guidelines, § 15063(d) (emphasis added).) Similarly, if an EIR is prepared, a determination that an impact is not significant must be explained in a "statement briefly indicating the reasons that various possible significant effects of a project" are in fact not significant. (State CEQA Guidelines, § 15128 (emphasis added).) If the impact is determined to be significant, the impact "should be discussed with emphasis in proportion to their severity and probability of occurrence." (State CEQA Guidelines, § 15143.) The explanation of significance in an EIR must be "prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences" and must demonstrate "adequacy, completeness, and a good faith effort at full disclosure." (State CEQA Guidelines, § 15151.) In sum, while proposed section 15064.4(a) reflects the requirement that a lead agency base its significance determination on substantial evidence, whether quantitative, qualitative or both, it does not, as some comments appear to fear, alter the rules governing the sufficiency of information in an environmental document.

Third, the discretion recognized in section 15064.4 is not unfettered. A lead agency's analysis, whether quantitative or qualitative, would be governed by the standards in the first portion of section 15064.4. The first sentence applies to the context of greenhouse gas emissions the general CEQA rule that the determination of significance calls for a careful judgment by the lead agency. (Proposed § 15064.4(a) ("[t]he determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064").) The second sentence sets forth the requirement that the lead agency make a good-faith effort to describe, calculate or estimate the amount of greenhouse gas emissions

¹² Notably, as administrative regulations, the development of the proposed regulations is governed by the Administrative Procedures Act. Government Code section 11340.1(a) states the Legislature's intent that administrative regulations substitute "performance standards for prescriptive standards wherever performance standards can be reasonably expected to be as effective and less burdensome, and that this substitution shall be considered during the course of the agency rulemaking process." Thus, absent authority in CEQA that would prohibit a qualitative analysis, section 15064.4 appropriately recognizes a lead agency's discretion to determine what type of analysis is most appropriate to determine the significance of a project's greenhouse gas emissions.

resulting from a project. That sentence has been further revised, as explained in greater detail below, to provide that the description, calculation or estimation is to be based “to the extent possible on scientific and factual data.” The third sentence advises that the exercise of discretion must be made “in the context of a particular project.” Thus, as provided in existing section 15146, the degree of specificity required in the analysis will correspond to the degree of specificity involved in the underlying project. In other words, even a qualitative analysis must demonstrate a good-faith effort to disclose the amount and significance of greenhouse gas emissions resulting from a project.

Fourth, the discretion recognized in proposed section 15064.4 would not enable a lead agency to ignore evidence submitted to it as part of the environmental review process. For example, if a lead agency proposes to adopt a negative declaration based on a qualitative analysis of the project’s greenhouse gas emissions, and a quantitative analysis is submitted to that lead agency supporting a fair argument that the project’s emissions may be significant, an EIR would have to be prepared. The same holds true if a lead agency proposes to adopt a negative declaration based on a quantitative analysis, and qualitative evidence supports a fair argument that the project’s emissions may be significant. (*Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1382; *Oro Fino Gold Mining Corp. v. County of El Dorado* (1990) 225 Cal. App. 3d 872, 881-882 (citizens’ personal observations about the significance of noise impacts on their community constituted substantial evidence that the impact may be significant and should be assessed in an EIR, even though the noise levels did not exceed general planning standards).) Similarly, even if an EIR is prepared, a lead agency would have to consider and resolve conflicts in the evidence in the record. (State CEQA Guidelines, § 15151 (“EIR should summarize the main points of disagreement among the experts”); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109.)

Finally, regarding performance standards, several examples exist of the types of performance standards that might appropriately be used in determining the significance of greenhouse gas emissions. Proposed section 15183.5(b)(1)(D), for example, contemplates that a plan for the reduction of greenhouse gas emissions may contain performance based standards. Where such standards are developed as part of such a plan, a lead agency would have evidence indicating that compliance with such standards would indicate that the impact of greenhouse gas emissions would be less than significant. Further, in adopting SB375, the Legislature acknowledged that regional transportation plans, and the environmental impact reports prepared to analyze those plans, may contain performance standards that would apply to transit priority projects. (See, e.g., Public Resources Code, § 21155.2.) Other potential examples¹³ include the Bay Area Air Quality Management District’s proposed Best Management Practices for Construction Greenhouse Gas Emissions (calling for use of alternative fuels, local building materials and recycling), and the California Public Utilities Commission’s Performance Standard for Power Plans (requiring emissions no greater

¹³ The Natural Resources Agency does not necessarily endorse the use of these performance standards. Lead agencies must determine whether a particular standard is appropriate based on the substantial evidence supporting it and the context of the particular project.

than a combined cycle gas turbine plant). As with either a qualitative or quantitative analysis, reliance on performance standards must be supported with “scientific or factual data” indicating that compliance with the standard will ensure that impacts of greenhouse gas emissions are less than significant.

In sum, the proposed section 15064.4(a) appropriately reflects the standards in CEQA governing the determination of significance and the discretion CEQA leaves to lead agencies to determine how to analyze impacts. Mandating that lead agencies must quantify emissions whenever quantification is possible would be a departure from the CEQA statute.

Existing Environmental Setting

Several comments focused on the phrase “existing environmental setting” in section 15064.4(b)(1). Some comments urged, for example, that only “net” emissions should be considered. Comments from energy producers suggested that the phrase “existing environmental system” should encompass the entire energy system, which extends beyond California’s borders. Some comments suggested that section 15064.4 should include a lifecycle analysis.

Section 15064.4(b)(1) advises lead agencies to consider the extent to which a project would increase or decrease greenhouse gas emissions compared to the existing environmental setting. In performing this analysis, a lead agency must account for all project phases, including construction and operation, as well as indirect and cumulative impacts. (State CEQA Guidelines, §§ 15063(a) (“[a]ll phases of project planning, implementation, and operation must be considered in the initial study...”), 15064(h) (addressing cumulative impacts), 15126 (“[a]ll phases of a project must be considered when evaluating its impact on the environment: planning, acquisition, development, and operation”), 15358(a)(2) (defining “effects” to include indirect effects), 15378.) The “setting” to be described varies depending on the project and the potential environmental resources that it may affect. In *Friends of the Eel River v. Sonoma County Water Agency* (2003) 108 Cal. App. 4th 859, for example, the lead agency failed to adequately describe the environmental setting by limiting its discussion primarily to the southern portions of its water system. Framing the setting narrowly resulted in impacts to the northern portion of the water system being ignored. Finding that section 15125 is to be construed broadly to ensure the fullest protection to the environment, the court in that case held that the lead agency was required to disclose that increased use of the southern portion of the water system would require greater diversions from the northern portion, and to analyze the impacts on species in the northern portion of the system. (*Id.* at pp. 873-875.) In the context of power generation, to the extent that a project may cause changes in greenhouse gas emissions in an existing power system, and substantial evidence substantiates such changes, those changes may be considered pursuant to section 15064.4(b)(1).

Similarly, if an agency has performed an analysis that demonstrates that a particular process for waste treatment does not result in an increase in greenhouse gas emissions compared to biogenic emissions that already occurs in the atmosphere, that evidence may support a conclusion that the project would not cause an increase in greenhouse gas emissions. Thus, to the extent a lead agency does not consider biogenic emissions to be new emissions, and its analysis is supported with substantial evidence, the text in section 15064.4(b)(1) would be broad enough to encompass those emissions, subject to the limitation that such analysis could not be used in a way that would mask the effects of emissions associated with the project. For example, if the emissions occurring in the short-term will have impacts that differ from emissions occurring in the future, those differences may need to be analyzed.

Finally, some comments suggested that the Guidelines should authorize a “net” or “lifecycle” analysis for projects that operate within a closed system. Nothing in section 15064.4 precludes such analysis where such analysis complies with the provision of section 15064, and where substantial evidence supports the ultimate conclusions and findings. However, since a “net” analysis may only be appropriate or possible in limited cases, the Natural Resources Agency deliberately chose to draft section 15064.4 broadly. Additionally, in some situations, a true “net” analysis may not be technically feasible or scientifically possible, and determination of an appropriate baseline for determining a “net” effect may be difficult.

As explained below, the Natural Resources Agency has deliberately avoided the term “lifecycle,” however, to the extent an agency equates “lifecycle” with what occurs in the existing environmental setting, section 15064.4 authorizes lead agencies to consider such evidence.

Thresholds of Significance

Some comments expressed concern that the proposed amendments did not establish a statewide threshold of significance. Others suggested that most lead agencies are not qualified to establish their own thresholds, and if they do adopt thresholds, they should be required to adopt the most stringent threshold possible.

The CEQA Guidelines do not establish thresholds of significance for other potential environmental impacts, and SB97 did not authorize the development of a statewide threshold as part of this CEQA Guidelines update. Rather, the proposed amendments recognize a lead agency’s existing authority to develop, adopt and apply their own thresholds of significance or those developed by other agencies or experts. As set forth in the existing section 15064.7, a threshold is “an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” Because a threshold would be used in the determination of significance,

the threshold would need to be supported with substantial evidence. (State CEQA Guidelines, § 15064.7(b).)

As explained in a recent decision of the Third District Court of Appeal, “[p]ublic agencies are ... encouraged to develop thresholds of significance for use in determining whether a project may have significant environmental effects.” (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108.) Nothing in CEQA requires that thresholds be developed by experts or expert agencies; however, “thresholds can be drawn from existing environmental standards, such as other statutes or regulations.” (*Id.* at p. 1107.) Regardless of who develops the threshold, if an agency adopts a threshold, it must be supported with substantial evidence. (State CEQA Guidelines, § 15064.7(b).) Additionally, “thresholds cannot be used to determine automatically whether a given effect will or will not be significant[;]” “[i]nstead, thresholds of significance can be used only as a measure of whether a certain environmental effect “will normally be determined to be significant” or “normally will be determined to be less than significant” by the agency. (Guidelines, § 15064.7, subd. (a), italics added.)” (*Protect the Historic Amador Waterways, supra*, 116 Cal.App.4th at pp. 1108-1109.) Proposed subdivision (c) of section 15064.7 recognizes the principles described above by expressly recognizing that experts and expert agencies may be developing thresholds that other public agencies may find useful in their own CEQA analyses, but requiring, as a safeguard, that any such threshold be supported with substantial evidence.

Notably, nothing in either AB32 or SB97 requires a finding of significance for any particular level of increase in greenhouse gas emissions. AB32, and regulations implementing that statute, will require reductions in emissions from certain sectors in the economy, but do not preclude new emissions. Moreover, as explained in the Initial Statement of Reasons, the proposed amendments do not establish a zero emissions threshold of significance because “there is no ‘one molecule rule’ in CEQA. (*CBE, supra*, 103 Cal.App.4th at 120.)” (Initial Statement of Reasons, at p. 20.)

Some comments suggested that any numeric thresholds that are developed should not be set at such a low level that adverse economic impacts would result. While economic issues are appropriate in the determination of feasibility of mitigation and alternatives, it is not appropriate in the determination of significance (see, e.g., Public Resources Code, § 21002), so a threshold should not be designed with economic impacts in mind. Moreover, even a “high” threshold would not relieve agencies of the requirement to consider any evidence indicating that a project may have a significant effect despite falling below a threshold. (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109; *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 342.)

Mitigation Hierarchy

CEQA's substantive mandate requires that "public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]" (Public Resources Code, § 21002.) The statute defines feasible to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." (Public Resources Code, § 21061.1.) The Legislature further provided that a lead agency may use its lawful discretion to mitigate significant impacts to the extent provided by other laws:

In mitigating or avoiding a significant effect of a project on the environment, a public agency may exercise only those express or implied powers provided by law other than this division. However, a public agency may use discretionary powers provided by such other law for the purpose of mitigating or avoiding a significant effect on the environment subject to the express or implied constraints or limitations that may be provided by law.

(Public Resources Code, § 21004.) Cities and counties may rely on their constitutional police powers, for example, while the ability of other agencies to require mitigation may be limited by the scope of their statutory authority. Mitigation is also subject to constitutional limitations; i.e., there must be a nexus between the mitigation measure and the impact it addresses, and the mitigation must be roughly proportional to the impact of the project. (*Nollan v. California Coastal Comm'n* (1987) 483 U.S. 825; *Dolan v. City of Tigard* (1994) 512 U.S. 374; State CEQA Guidelines, § 15126.4(a)(4).)

CEQA itself imposes very few limitations on a lead agency's discretion to impose mitigation. For example, agencies may not mitigate the effects of a housing project by reducing the proposed number of units if other feasible mitigation measures are available. (Public Resources Code, § 21159.26.) Similarly, the Legislature has prescribed specific types of mitigation in only very limited circumstances; i.e., impacts to archeological resources and oak woodlands. (Public Resources Code, §§ 21083.2, 21083.4.)

SB 97 specifically called for guidelines addressing the mitigation of greenhouse gas emissions. In doing so, however, the Legislature did not alter a lead agency's discretion, authority or limitations on the imposition of mitigation where the impacts of a project's greenhouse gas emissions are significant. Thus, as explained in the Initial Statement of Reasons, the existing CEQA rules apply to the mitigation of greenhouse gas emissions.

Within the scope of a lead agency's existing authority, the CEQA Guidelines already contain provisions that recognize a lead agency's obligation to balance various factors in determining how or whether to carry out a project. (State CEQA Guidelines, § 15021(d).) Further, the Guidelines already require that "[w]here several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified." (State CEQA Guidelines, § 15126.4(a)(1)(B).)

Additionally, public agencies are directed to adopt their own implementing procedures, consistent with CEQA and the State CEQA Guidelines, which could set forth the types of mitigation that a particular agency finds to be most appropriate for projects subject to its approval. (State CEQA Guidelines, § 15022.) The Natural Resources Agency cannot, however, state in the State CEQA Guidelines that all lead agencies have the authority to prioritize types of mitigation measures, or to establish any particular priority order for them. Each lead agency must determine the scope of its own authority based on its own statutory or constitutional authorization.

Reliability and Effectiveness of Mitigation

Some comments expressed concern about the reliability and efficacy of some mitigation strategies. In response to such comments, the Natural Resources Agency further revised section 15126.4(c) to expressly require that any measures, in addition to being feasible, must be supported with substantial evidence and be capable of monitoring or reporting. (See Revised Section 15126.4(c) (October 23, 2009).) This addition reflects the requirements in Public Resources Code section 21081.5 that findings regarding mitigation be supported with substantial evidence and the monitoring or reporting requirement in section 21081.6.

The text of proposed section 15126.4(c), addressing mitigation of greenhouse gas emissions, also requires that mitigation measures be effective. The first sentence of that section requires that mitigation be “feasible.” Further, the statute defines “feasible” to mean “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.” (Public Resources Code, § 21061.1 (emphasis added); see also State CEQA Guidelines § 15364 (adding “legal” factors to the definition of feasibility).) A recent decision of the Third District Court of Appeal confronting questions regarding the effectiveness of a mitigation measure explained: “concerns about whether a specific mitigation measure ‘will actually work as advertised,’ whether it ‘can ... be carried out,’ and whether its ‘success ... is uncertain’ go to the feasibility of the mitigation measure[.]” (*California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal. App. 4th 603, 622-623.) Thus, by requiring that lead agencies consider feasible mitigation of greenhouse gas emissions, section 15126.4(c) already requires that such measures be effective.

Off-site Mitigation and Offsets

Relatively little authority addresses the question of how close of a causal connection must exist between off-site emissions reductions and project implementation in order to be adequate mitigation under CEQA. CEQA requires lead agencies to mitigate or avoid the significant effects of proposed projects where it is feasible to do so. While the CEQA statute does not define mitigation, the State CEQA Guidelines define mitigation to include:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

(State CEQA Guidelines, § 15370.) As subdivision (e) implies, off-site measures may constitute mitigation under CEQA, and such measures have been upheld as adequate mitigation in CEQA case law. (See, e.g., *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal. App. 4th 603, 619-626.)

Whether on-site or off-site, to be considered mitigation, the measure must be tied to impacts resulting from the project. Section 21002 of the Public Resources Code, the source of the requirement to mitigate, states that “public agencies should not approve projects as proposed if there are ... feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]” Similarly, section 21081(a)(1) specifies a finding by the lead agency in adopting a project that “[c]hanges or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.” Both statutory provisions expressly link the changes to be made (i.e., the “mitigation measures”) to the significant effects of the project. Courts have similarly required a link between the mitigation measure and the adverse impacts of the project. (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal. App. 4th 99, 128-131 (EIR must discuss “the history of water pumping on [the off-site mitigation] property and its feasibility for providing an actual offset for increased pumping on the [project] property”).) The text of sections 21002 and 21081, and case law requiring a “nexus” between a measure and a project impact, together indicate that “but for” causation is a necessary element of mitigation. In other words, mitigation should normally be an activity that occurs in order to minimize a particular significant effect. Or, stated another way and in the context of greenhouse gas emissions, emissions reductions that would occur without a project would not normally qualify as mitigation.

Notably, this interpretation of the CEQA statute and case law is consistent with the Legislature’s directive in AB32 that reductions relied on as part of a market-based compliance mechanism must be “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission

reduction that otherwise would occur.” (Health and Safety Code, § 38562(d)(2).) While AB32 and CEQA are separate statutes, the additionality concept may be applied analytically in the latter as follows: greenhouse gas emission reductions that are otherwise required by law or regulation would appropriately be considered part of the existing baseline. Pursuant to section 15064.4(b)(1), a new project’s emissions should be compared against that existing baseline.

Thus, in light of the above, and in response to concerns raised in the comments, the Natural Resources Agency has revised section 15126.4(c)(3) to state that mitigation includes: “Off-site measures, including offsets that are not otherwise required, to mitigate a project’s emissions[.]” This provision is intended to be read in conjunction with the statutory mandate in Public Resources Code sections 21002 and 21081 that mitigation be tied to the effects of a project.

This provision would not limit the ability of a lead agency to create, or rely on the creation of, a mechanism, such as an offset bank, created prospectively in anticipation of future projects that will later rely on offsets created by those emissions reductions. The Initial Statement of Reasons referred, for example, to community energy conservation projects. (Initial Statement of Reasons, at p. 38.) Such a program could, for example, identify voluntary energy efficiency retrofits that would not occur absent implementation of the program, and then fund the retrofits through the sale of offsets that would occur as a result of the retrofit. Emissions reductions that occur as a result of a regulation requiring such reduction, on the other hand, would not constitute mitigation.

Some comments opined that offsets are highly uncertain and of questionable legitimacy. The Initial Statement of Reasons, however, cites several sources discussing examples of offsets being used in a CEQA context. Further, the ARB Scoping Plan describes offsets as way to “provide regulated entities a source of low-cost emission reductions, and ... encourage the spread of clean, efficient technology within and outside California.” (Scoping Plan, Appendix C, at p. C-21.) The Natural Resources Agency finds that the offset concept is consistent with the existing CEQA Guidelines’ definition of “mitigation,” which includes “[r]ectifying the impact by repairing, rehabilitating, or restoring the impacted environment” and “[c]ompensating for the impact by replacing or providing substitute resources or environments.” (State CEQA Guidelines, §§ 15370(c), (e).)

While the proposed amendments recognize offsets as a potential mitigation strategy, they do not imply that offsets are appropriate in every instance. The efficacy of any proposed mitigation measure is a matter for the lead agency to determine based on the substantial evidence before it. Use of the word “feasible” in proposed Section 15126.4(c) requires the lead agency to find that any measure, including offsets, would be “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” (State CEQA Guidelines, § 15364.)

Thus, the Natural Resources Agency finds that by expressly requiring that any mitigation measure be feasible, supported with substantial evidence, and capable of monitoring or reporting, section 15126.4(c) adequately addresses the concern stated in the comment that offsets may be of questionable legitimacy.

Use of Plans for the Reduction of Greenhouse Gas Emissions in a Cumulative Impacts Analysis

Section 15183.5 was developed to address tiering and streamlining the analysis of greenhouse gas emissions. Subdivision (a) highlights existing tiering and streamlining mechanisms in CEQA that may be used to address the analysis and mitigation of greenhouse gas emissions. Those mechanisms are often used for general plans and other long range planning documents. Subdivision (a) therefore recognizes that lead agencies may choose to include a programmatic analysis of greenhouse gas emissions in those long range plans. That subdivision did not create any new tiering or streamlining provisions; rather, it cross-references existing mechanisms. Each mechanism has its own benefits and drawbacks, and the use of any analysis of greenhouse gas emissions contained in such a document would be governed by the specific provisions cited in subdivision (a).

Subdivision (b), on the other hand, acknowledges that, in addition to the long range documents mentioned in subdivision (a), some agencies are voluntarily developing stand-alone plans focused specifically on the reduction of greenhouse gas emissions. Subdivision (b) is not a tiering mechanism. Tiering is governed by section 15152 of the existing CEQA Guidelines. The purpose of section 15183.5(b) is much narrower. Because climate action plans and greenhouse gas reduction plans are voluntary, and not subject to any legislative criteria or requirements, subdivision (b) was developed “to assist lead agencies in determining whether an existing greenhouse gas reduction plan is an appropriate document to use in a cumulative impacts analysis under CEQA.” (Initial Statement of Reasons, at p. 54.) Specifically, a project that is consistent with a plan that satisfies the criteria in subdivision (b) may benefit from the presumption created in sections 15064(h)(3) and 15130(d) that the project’s cumulative impacts are less than significant due to compliance with the plan. Subdivision (b) does not create or authorize any plans; rather, it provides a tool to determine whether a plan for the reduction of greenhouse gas emissions may be used in a cumulative impacts analysis as provided in section 15064(h)(3) or 15130(d). Section 15183.5(b) does not require that public agencies develop plans for the reduction of greenhouse gas emissions, nor does it prohibit public agencies from developing individual ordinances and regulations to address individual sources of greenhouse gas emissions.

As an example, if a general plan EIR analyzed and mitigated greenhouse gas emissions, a lead agency would likely use the specific streamlining provision applicable to general plan EIRs in section 15183, and not the more general provision in 15183.5(b). A stand alone “climate action plan” that was not analyzed in a program EIR, master EIR, or other mechanism identified in 15183.5(a) may still be used in a

cumulative impacts analysis pursuant to sections 15064(h)(3) or 15130(d), but only if that climate action plan contains the elements listed in section 15183.5(b)(1).

Some comments suggested that section 15183.5(b) should identify specific types of plans to which it would apply. That section was developed precisely because plans for the reduction of greenhouse gas emissions are not specified in law and are so varied. They have been variously titled “climate action plans”, “sustainability plans”, “greenhouse gas reduction plans”, etc. Contents of such plans also vary widely. Thus, the Natural Resources Agency cannot specifically identify which plans satisfy the criteria in subdivision (b). That determination must be made by the individual lead agency based on whether the specific plan under consideration satisfies each of the criteria in subdivision (b)(1).

Notably, public agencies are required to develop their own procedures to implement CEQA. (State CEQA Guidelines, § 15022.) If a lead agency determines that it does not have a plan for the reduction of greenhouse gas emissions that contains the criteria set forth in section 15183.5(b), but its collective policies, ordinances and other requirements nevertheless ensure that the incremental contribution of individual projects is not cumulatively considerable, and substantial evidence supports that determination, it could include such an explanation and support in its own implementing procedures.

Some comments questioned how a Sustainable Communities Strategy or Alternative Planning Strategy should be treated in light of section 15183.5. SB375 encourages programmatic analysis and planning for greenhouse gas emissions from cars and light-duty trucks, and provides specific CEQA streamlining benefits for certain types of projects that are consistent with a Sustainable Communities Strategy (SCS) or an Alternative Planning Strategy (APS). Given the specificity of those statutory provisions, sections 21155 through 21155.3 and 21159.28 of the Public Resources Code in particular, the Office of Planning and Research and the Natural Resources Agency did not find that additional guidance on those provisions was necessary at this time. Proposed section 15183.5(c), however, clarifies that while certain projects consistent with an SCS or APS may not need to analyze greenhouse gas emissions from cars and light-duty trucks, emissions from other sources still may require analysis and mitigation. As SB97 requires the CEQA Guidelines to be updated every two years to incorporate new information, additional guidance regarding the relationship between CEQA and SB375 may be developed as necessary. (See also the discussion of AB32, SB375 and CEQA, above.)

Definition of Greenhouse Gas Emissions

Several comments objected to the definition of greenhouse gas emissions in the Guidelines. Some suggested that it should be strictly limited to the gases identified in AB32. Other thought it should include all potential greenhouse gas emissions. Still others wanted to exclude biogenic emissions from the definition.

As explained in the Initial Statement of Reasons, the definition of greenhouse gases in AB32 states that GHG “includes all of the following...” (Health and Safety Code, § 38505(g).) The Legislature thus implied that other gases may also be considered GHGs. Further, the ARB Scoping Plan also acknowledged that other gases contribute to climate change. (Scoping Plan, at p. 11.) Consistent with the definition in the Health and Safety Code, the proposed definition in the Proposed Amendments is not exclusive to the six primary GHGs. The purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects. This approach is consistent with the Supreme Court’s directive that CEQA be interpreted to provide the fullest possible protection to the environment. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 390.)

While the definition could not be strictly limited to the six gases identified in AB32, the Natural Resources Agency concluded that specific mention of other potential greenhouse gases was also not appropriate. Notably, the federal Environmental Protection Agency limited its proposed endangerment finding to those same six listed gases. It did so because the six gases are well studied, and have been the focus of climate change research. (Federal Register, v. 74, 18886, 18895 (April 24, 2009).) It is not necessary to list each of the known potential greenhouse gases because the proposed definition in section 15364.5 is written broadly, stating that the greenhouse gas emissions “are not limited to” the listed examples. As further explained in the Initial Statement of Reasons, the “purpose of a more expansive definition is to ensure that lead agencies do not exclude from consideration GHGs that are not listed, so long as substantial evidence indicates that such non-listed gases may result in significant adverse effects.” (Initial Statement of Reasons, at p. 58.) Because the CEQA Guidelines must be updated periodically to reflect developments relating to greenhouse gas emissions, the Natural Resources Agency may expand the definition of greenhouse gas emissions if necessary to reflect the most current science and practice.

The Natural Resources Agency also concluded that the definition of greenhouse gas emissions should not differentiate between biogenic and anthropogenic emissions. SB97 does not distinguish between the sources of greenhouse gas emissions. Notably, neither AB32 nor the Air Resources Board’s Scoping Plan distinguishes between biogenic and anthropogenic sources of greenhouse gas emissions. On the contrary, the Scoping Plan identifies methane from, among other sources, organic wastes decomposing in landfills as a source of emissions that should be controlled. (Scoping Plan, at pp. 62-63.)

Forestry

Some comments objected to the inclusion of questions related to forest resources in the Appendix G questions in the section on agricultural resources.

SB97 called for guidance on the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions. (Public Resources Code, § 21083.05.) As explained in the Initial Statement of Reasons, forest conversions may result in direct greenhouse gas emissions. Further, such conversions remove existing forest stock and the potential for further carbon sequestration. (Initial Statement of Reasons, at p. 63.) Sequestration is recognized as a key mitigation strategy in the Air Resources Board's Scoping Plan. (Scoping Plan, Appendix C, at p. C-168.)

The addition of questions related to forestry does not target the establishment of agricultural operations. The questions ask about *any* conversion of forests, not just conversions to other agricultural operations. Moreover, analysis of impacts to forestry resources is already required. The Legislature has declared that "forest resources and timberlands of the state are among the most valuable of the natural resources of the state" and that such resources "furnish high-quality timber, recreational opportunities, and aesthetic enjoyment while providing watershed protection and maintaining fisheries and wildlife." (Public Resources Code, § 4512(a)-(b).) Because CEQA defines "environment" to include "land, air, water, minerals, flora, fauna, noise, [and] objects of historic or aesthetic significance" (Public Resources Code, section 21060.5), and because forest resources have been declared to be "the most valuable of the natural resources of the state," projects affecting such resources must be analyzed, whether or not specific questions relating to forestry resources appear in Appendix G. (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1109.) In effect, suggestions that the Appendix G questions be limited to conversions to "non-agricultural uses" ask the Natural Resources Agency to adopt changes that are inconsistent with CEQA, which it cannot do.

Questions related to greenhouse gas emissions in Appendix G are not sufficient to address impacts related to forestry resources. As explained in the Initial Statement of Reasons, not only do forest conversions result in greenhouse gas emissions, but may also "remove existing carbon stock (i.e., carbon stored in vegetation), as well as a significant carbon sink (i.e., rather than emitting GHGs, forests remove GHGs from the atmosphere)." (Initial Statement of Reasons, at p. 63.) Further, conversions may lead to "aesthetic impacts, impacts to biological resources and water quality impacts, among others." The questions related to greenhouse gas emissions would not address such impacts. Thus, the addition of forestry questions to Appendix G is appropriate both pursuant to SB97 and the Natural Resources Agency's general authority to update the CEQA Guidelines pursuant to Public Resources Code section 21083(f).

"Level of Service" and Transportation Impact Analysis

The Natural Resources Agency acknowledges the concern expressed by some comments that the use of level of service metrics in CEQA analysis has led to an auto-centric focus. The Office of Planning and Research and the Natural Resources Agency have participated in extensive outreach with stakeholder groups to revise question (a) in the transportation section of Appendix G to accomplish the following goals:

- Assess traffic impacts on intersections, streets, highways and freeways as well as impacts to pedestrian, non-vehicular and mass-transit circulation
- Recognize a lead agency's discretion to choose methodology, including LOS, to assess traffic impacts
- Harmonize existing requirements in congestion management programs, general plans, ordinances, and elsewhere

In response to public comments submitted on proposed amendments, the Natural Resources Agency further refined question (a) to shift the focus from the capacity of the circulation system to consistency with applicable plans, policies that establish objective measures of effectiveness.

Some comments advocated leaving the existing text in question (a) of the transportation section of Appendix G intact. As explained in the Initial Statement of Reasons,

[Q]uestion (a) changes the focus from an increase in traffic at a given location to the effect of a project on the overall circulation system in the project area. This change is appropriate because an increase in traffic, by itself, is not necessarily an indicator of a potentially significant environmental impact. (Ronald Miliam, AICP, *Transportation Impact Analysis Gets a Failing Grade When it Comes to Climate Change and Smart Growth*; see also Land Use Subcommittee of the Climate Action Team LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use, and Transportation Report (May, 2008) at pp. 31, 36.) Similarly, even if some projects may result in a deterioration of vehicular level of service – that is, delay experienced by drivers – the overall effectiveness of the circulation system as a whole may be improved. (*Ibid.*) Such projects could include restriping to provide bicycle lanes or creating dedicated bus lanes. Even in such cases, however, any potential adverse air quality or other impacts would still have to be addressed as provided in other sections of the checklist. Finally, the change to question (a) also recognizes that the lead agency has discretion to choose its own metric of analysis of impacts to intersections, streets, highways and freeways. (Pub. Resources Code, § 21081.2(e); *Eureka Citizens for Responsible Gov't v. City of Eureka, supra*, 147 Cal.App.4th at 371-373 (lead agency has discretion to choose its methodology).) Thus, “level of service” may or may not be the applicable measure of effectiveness of the circulation system.

(Initial Statement of Reasons, at pp. 64-65.) Further, evidence presented to the Natural Resources Agency indicates that “mitigation” of traffic congestion may lead to even greater environmental impacts than might result from congestion itself. (See, e.g.,

Cervero, Robert. (July, 2001). *Road Expansion, Urban Growth, and Induced Travel: A Path Analysis*. Journal of the American Planning Association, Vol. 69 No. 2. American Planning Association (confirming “induced demand” phenomenon associated with capacity improvements.)

While the terms “volume to capacity ratio” and “congestion at intersections” no longer appear in question (a), nothing precludes a lead agency from including such measures of effectiveness in its own general plan or policies addressing its circulation system. Though the Office of Planning and Research originally recommended specifying “vehicle miles traveled” as a question in Appendix G, it later revised its recommendation to allow lead agencies to choose their own measures of effectiveness. (Letter from OPR Director, Cynthia Bryant, to Secretary for the Natural Resources Agency, Mike Chrisman, April 13, 2009.) Thus, as revised, question (a) accommodates lead agency selection of methodology, including, as appropriate, vehicle miles traveled, levels of service, or other measures of effectiveness.

Other comments objected to any mention of the phrase “level of service” in question (b) of the transportation section of the Appendix G checklist. That question, as revised, would ask whether a project would conflict with the provisions of a congestion management program. The Government Code, beginning at section 65088, requires Congestion Management Agencies, in urbanized areas, to adopt Congestion Management Programs covering that agency’s cities and county, and in consultation with local governments, transportation planning agencies, and air quality management districts. A CMP must, pursuant to statute, contain level of service standards for certain designated roadways. A CMP must also include a land use analysis program to assess the impact of land use decisions on the regional transportation system. A CMA may require that land use analysis to occur through the CEQA process. Thus, level of service standards cannot be deleted from the Appendix G checklist altogether. The proposed amendments did, however, amend question (b) to put level of service standards in the broader context of the entire CMP, which should also contain travel demand measures and other standards affecting the circulation system as a whole. Beyond this amendment, however, the Natural Resources Agency cannot remove level of service standards entirely from the Appendix G checklist.

Notably, the primary purpose of the proposed amendments is to update the CEQA Guidelines on the analysis and mitigation of greenhouse gas emissions. While certain changes to Appendix G were proposed pursuant to the Natural Resources Agency’s general authority to update the CEQA Guidelines, those changes were modest and were intended to address certain misapplications of CEQA in a way that hinders the type of development necessary to reduction of greenhouse gas emissions. Transportation planning and impact analysis continues to evolve, as new multimodal methods of analysis and guidelines on the integration of all modes of transportation and users into the circulation system are being developed. Additional updates to Appendix G may be appropriate in the future to address those developments.

Parking

As explained in the Initial Statement of Reasons, the Natural Resources Agency concluded that the question related to parking adequacy should be deleted from the Appendix G checklist in part as a result of the decision in *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656. The court in that case distinguished the social impact of inadequate parking from actual adverse environmental impacts. In particular, that court explained:

[T]here is no statutory or case authority requiring an EIR to identify specific measures to provide additional parking spaces in order to meet an anticipated shortfall in parking availability. The social inconvenience of having to hunt for scarce parking spaces is not an environmental impact; the secondary effect of scarce parking on traffic and air quality *is*. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. An EIR need only address the *secondary physical* impacts that could be triggered by a social impact.

(*Id.* at p. 698 (emphasis in original).) The Natural Resources Agency is aware of no authority requiring an analysis of parking adequacy as part of a project's environmental review. Rather, the Agency concurs with the court in the *San Franciscans* case that inadequate parking is a social impact that may, depending on the project and its setting, result in secondary effects. Consistent with existing CEQA Guidelines section 15131(a), deletion of the parking adequacy question from Appendix G checklist will ensure that the "focus of the analysis shall be on the physical changes." Specifically, the Appendix G checklist contains questions asking about possible project impacts to air quality and traffic.

Some comments pointed to examples of potential adverse impacts that could result from parking shortages, such as double-parking and slower circulation speeds, and referred specifically to a study of "cruising" behavior by Donald Shoup that noted that cruising could result in emissions of carbon dioxide. The relationship between parking adequacy and air quality is not as clear or direct as some comments imply. Mr. Shoup, for example, submitted comments to the Natural Resources Agency supporting the deletion of the parking question. (See, Letter from Donald Shoup, Professor of Urban Planning, University of California, Los Angeles, October 26, 2009.) In those comments, Mr. Shoup opines that cruising results not from the number of parking spaces associated with a project, but rather from the price associated with those parking spaces. (*Ibid.*) The Natural Resources Agency also has evidence before it demonstrating that providing parking actually causes greater emissions due to induced demand. The California Air Pollution Control Officers Association CEQA White Paper, for example, suggests reducing available parking as a way to reduce greenhouse gas emissions. (Greg Tholen, et al. (January, 2008). CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. California Air Pollution Control Officers Association, at Appendix B, pp. 8-9.)

Moreover, parking analyses do not typically address either air quality or traffic impacts; rather, such analyses often focus on the number of parking spaces necessary to satisfy peak demand, which is often established by a local agency as a parking ratio (i.e., one space per 250 square feet of office space). (See, e.g., Shoup, Donald. (1999). In Lieu of Required Parking. Journal of Planning Education and Research, Vol. 18 No. 4. Association of Collegiate Schools of Planning, at p. 309.) Thus, the question in Appendix G related to parking adequacy does not necessarily lead to the development of information addressing actual environmental impacts.

In sum, nothing in the CEQA statute, or cases interpreting that statute, require an analysis of parking demand. Further, parking supply is not a reasonable proxy for direct physical impacts associated with a project because parking supply may in some circumstances adversely affect air quality and traffic while in other circumstances, it may create air quality and traffic benefits. Thus, maintaining the parking question in the general Appendix G checklist is not necessary to effectuate the purposes of the CEQA statute.

The Natural Resources Agency acknowledges, however, that parking supply may lead to social impacts that agencies may wish to regulate. Cities and counties can, and do, include parking related policies in their municipal ordinances and general plans. (See, e.g., Office of Planning and Research, General Plan Guidelines, at pp. 59-60.) To the extent an agency has developed parking related policies in a general plan, zoning ordinance, or other regulation, consistency with those policies could be analyzed as a potential land use impact. Public agencies must, moreover, develop their own procedures to implement CEQA, and so may include parking-related questions in their own checklist if appropriate in their own circumstances. (State CEQA Guidelines, §§ 15022, 15063(f).)

AB32, SB375 and CEQA

Many comments suggested various links between CEQA, AB32 and SB375. While there is some overlap between the statutes, each contains its own requirements and serves its own purposes. While recognizing the role of regulatory programs in addressing cumulative impacts analysis in CEQA, the Proposed Amendments deliberately avoided linking the determination of significance under CEQA to compliance with AB32. The following addresses the CEQA effect of compliance with AB32 and SB375.

The Effect of Consistency with the Scoping Plan and the Regulations Implementing AB32

The Initial Statement of Reasons explained that the Scoping Plan “may not be appropriate for use in determining the significance of individual projects ... because it is conceptual at this stage and relies on the future development of regulations to

implement the strategies identified in the Scoping Plan.” (Initial Statement of Reasons, at p. 14.) Compliance with the regulations implementing the Scoping Plan, on the other hand, might be relevant in determining the significance of a project’s emissions, if the particular regulation or regulations specifically addresses the emissions from the project. (*Ibid.*) Compliance with regulations is specifically addressed in section 15064(h)(3) and 15064.4(b)(3).

Specifically, both sections provide that a lead agency may consider compliance with such regulations, and if relying on regulations to determine that an impact is less than significant, the lead agency must explain how that particular regulation addresses the impact of the project. Both sections also recognize that a lead agency must still consider whether any evidence supports a fair argument that a project may still have a significant impact despite compliance with the regulation.

The Effect of Consistency with Plans for the Reduction of Greenhouse Gas Emissions, Sustainable Communities Strategies and Alternative Planning Strategies.

Several comments questioned whether the references in the Proposed Amendments to “greenhouse gas reduction plans” were intended to include a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS).

SB375 created both the SCS and APS as strategies to be adopted by metropolitan planning organizations for the purpose of achieving greenhouse gas emissions reductions targets established by the California Air Resources Board. SB375 inserted specific provisions into CEQA governing the review of projects that are consistent with an APS or SCS. (See, e.g., Public Resources Code, §§ 21155-21155.3, 21159.28.) Because of the specificity of those provisions, the Office of Planning and Research and the Natural Resources Agency determined that no further guidance was needed in the Proposed Amendments to address the use of an SCS or APS.

As explained in the Initial Statement of Reasons, however, OPR and the Natural Resources Agency observed that many jurisdictions were adopting plans specifically for the purpose of addressing and reducing greenhouse gas emissions. (Initial Statement of Reasons, at pp. 12-13.) Those plans may be titled Climate Action Plans, Greenhouse Gas Reduction Plans, Sustainability Plans, etc. While recognizing the great variety of such plans, as well as the lack of legislative or other direction regarding the content of such plans, OPR and the Natural Resources Agency proposed the addition of a new Guidelines section 15183.5(b) to establish criteria for those plans if they are to be used in a CEQA cumulative impacts analysis as provided in sections 15064(h)(3) and 15130(d). The proposed amendments to section 15064(h)(3) and addition of section 15183.5(b) were not intended to limit or affect the use of an APS or SCS as provided in the Public Resources Code.

SB375 included provisions that would exempt certain types of projects from CEQA, and would apply the substantial evidence standard of review to other types of projects reviewed under a Sustainable Communities Environmental Assessment. Some

comments raised concerns that the proposed amendments, and section 15064(h)(3) in particular, may conflict with those provisions of SB375. The last sentence of Section 15064(h)(3), which acknowledges the application of the fair argument standard in the determination of whether to prepare an EIR, complies with existing law. (*CBE, supra*, 103 Cal.App.4th at 115-116.) SB375's specific statutory provisions, and not section 15064(h)(3), would control for a project that satisfies the conditions in those provisions. Thus, there is no conflict between the existing language in Section 15064(h)(3) and SB375.

Comments were also raised about the application of section 15125(d), which requires a discussion of a project's consistency with applicable regional plans, to an APS or SCS. One comment suggested that, for CEQA purposes, an SCS and APS are interchangeable. The Natural Resources Agency disagrees. An Alternative Planning Strategy is not a land use plan with which land use consistency should be analyzed under CEQA. (Government Code, § 65080(b)(2)(H)(v).) For that reason, the Natural Resources Agency deliberately did not propose to add "Alternative Planning Strategy" to the list of plans to be considered in an environmental setting pursuant to section 15125. There is no similar statement precluding analysis of consistency with a Sustainable Communities Strategy, however. Thus, the reference to a "regional transportation plan" in the existing section 15125(d) remains appropriate. As explained above, and the Initial Statement of Reasons, the reference to "plans for the reduction of greenhouse gas emissions" is intended to cover a broad range of plans that may be adopted by state and local agencies. The specific statutory provisions governing an Alternative Planning Strategy or Sustainable Communities Strategy would, however, control.

Similarly, some comments expressed concern regarding the application of the new Appendix G question asking about a project's consistency with applicable plans for the reduction of greenhouse gas emissions. That Appendix G question, as revised, asks whether a project would: "Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?" (Emphasis added.) In response to comments, the Natural Resources Agency replaced the word "any" with the word "an" to clarify that only a plan determined to be applicable by the lead agency, and not any plan developed by any person or entity, should be considered in determining whether a project would result in a significant impact relating to greenhouse gas emissions. Government Code section 65080(b)(2)(H)(v) states: an "alternative planning strategy shall not constitute a land use plan, policy, or regulation, and the inconsistency of a project with an alternative planning strategy shall not be a consideration in determining whether a project may have an environmental effect" for CEQA purposes. By operation of that Government Code Section 65080(b)(2)(H)(v), an alternative planning strategy would not constitute "an applicable plan" for purposes of the Appendix G question. Notably, as explained in the Initial Statement of Reasons, the Appendix G checklist is meant to provide a sample checklist of questions designed to provoke thoughtful consideration of general environmental concerns. (Initial Statement of Reasons, at p. 63.) Because it is provided as a sample only, the Office of Planning and Research and the Natural Resources Agency found that it would not be possible to

identify with specificity each plan that or may not apply to a particular jurisdiction or project.

Lead agencies, however, have discretion to revise the checklist in a way that is most appropriate for their own jurisdiction. If an individual agency in a region where an APS was prepared finds it necessary or desirable to restate Government Code Section 65080(b)(2)(H)(v) in its own checklist, it may do so. Further, while inconsistency with an APS is not, by itself, an indication of a potentially significant impact, other project characteristics would need to be considered as indicated in Section 15064.4 and other provisions of the CEQA Guidelines. Because Government Code Section 65080(b)(2)(H)(v) already provides that an APS is not a land use plan for CEQA purposes, and the Appendix G question asks only about “an applicable plan,” the question need not specify an exception for an APS.

The Effect of Compliance with Regulations Implementing AB32 or Other Laws Intended to Reduce Greenhouse Gas Emissions

Some comments urged that lead agencies should be able to rely on sector-wide reductions in emissions that may result from implementation of AB32 and other regulations in mitigating an individual project’s impacts. Those comments appeared to conflate the requirement that a lead agency consider cumulative impacts (i.e., the impacts resulting from a project’s emissions when added to other past, present and reasonably foreseeable future emissions) with the requirement that a lead agency mitigate the significant effects of a project. The proposed amendments contain several provisions addressing the analysis of greenhouse gas emissions as a cumulative effect. For example, Section 15064(h)(3) and 15130(d) would encourage lead agencies to use existing plans for the reduction of greenhouse gas emissions in cumulative impacts analysis. Additionally, Section 15130(b)(1)(B) is proposed for amendment to allow lead agencies to use projections of emissions contained in certain plans and models. Thus, the proposed amendments would allow a lead agency to consider a project in the context of other emissions resulting from the same or other sectors.

To the extent comments suggested that reductions in emissions resulting from implementation of AB32 elsewhere can mitigate the significant effects of a separate project under CEQA, the Natural Resources Agency disagrees. (See discussion below on off-site mitigation.)

A project’s compliance with regulations or requirements implementing AB32 or other laws and policies is not irrelevant. Section 15064.4(b)(3) would allow a lead agency to consider compliance with requirements and regulations in the determination of significance of a project’s greenhouse gas emissions. Lead agencies should note, however, that compliance with one requirement, affecting only one source of a project’s emissions, may not necessarily support a conclusion that all of the project’s emissions are less than significant.

Projects That Implement AB32 or Otherwise Assist in Achieving the State's Emissions Reductions Goals

Finally, some comments noted that projects implementing AB32, or that would somehow assist the State in achieving a low-carbon future, should not be considered significant under CEQA, and that requiring such projects to mitigate their emissions would frustrate implementation of AB32. CEQA requires analysis and mitigation of a project's significant adverse environmental impacts, even if that project may be considered environmentally beneficial overall. As the Third District Court of Appeal recently explained:

“[I]t cannot be assumed that activities intended to protect or preserve the environment are immune from environmental review. [Citations.]”
There may be environmental costs to an environmentally beneficial project, which must be considered and assessed.

(*Cal. Farm Bureau Fed. v. Cal. Wildlife Cons. Bd.* (2006) 143 Cal. App. 4th 173, 196.) Nothing in SB97 altered this rule. Thus, lead agencies must consider whether the greenhouse gas emissions resulting from beneficial projects may be significant, and if so, whether any feasible measures exist to mitigate those emissions. If such emissions are found to be significant and unavoidable, proposed amendments to section 15093 would expressly allow lead agencies to consider the region-wide and statewide environmental benefits of a project in determining whether project benefits outweigh its adverse environmental impacts.

“Adaptation” and Analysis of the Effects of Climate Change on a Project

Several comments submitted as part of the Natural Resources Agency's SB97 rulemaking process urged it to incorporate the California Climate Adaptation Strategy (Adaptation Strategy) into the CEQA Guidelines. In considering such comments, it is important to understand several key differences between the Adaptation Strategy and the California Environmental Quality Act. First, the Adaptation Strategy is a policy statement that contains recommendations; it is not a binding regulatory document. Second, the Adaptation Strategy focuses on how the State can plan for the effects of climate change. CEQA's focus, on the other hand, is the analysis of a particular project's greenhouse gas emissions on the environment, and mitigation of those emissions if impacts from those emissions are significant. Given these differences, CEQA should not be viewed as the tool to implement the Adaptation Strategy; rather, as indicated in the Strategy's key recommendations, advanced programmatic planning is the primary method to implement the Adaptation Strategies.

There is some overlap between CEQA and the Adaptation Strategy, however. As explained in both the Initial Statement of Reasons and in the Adaptation Strategy, section 15126.2 may require the analysis of the effects of a changing climate under certain circumstances. (Initial Statement of Reasons, at pp. 68-69.) In particular,

Section 15126.2 already requires an analysis of placing a project in a potentially hazardous location. Further, several questions in the Appendix G checklist already ask about wildfire and flooding risks. Many comments on the proposed amendments asked for additional guidance, however.

Having reviewed all of the comments addressing the effects of climate change, the Natural Resources Agency revised the proposed amendments to include a new sentence in Section 15126.2 clarifying the type of analysis that would be required. Existing section 15126.2(a) provides an example of a potential hazard requiring analysis: placing a subdivision on a fault line. The new sentence adds further examples, as follows:

Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas.

According to the Office of Planning and Research, at least sixty lead agencies already require this type of analysis. (California Governor's Office of Planning and Research, State Clearinghouse, The California Planners' Book of Lists (January, 2009), at p. 109.) This addition is reasonably necessary to guide lead agencies as to the scope of analysis of a changing climate that is appropriate under CEQA.

As revised, section 15126.2 would provide that a lead agency should analyze the effects of bringing development to an area that is susceptible to hazards such as flooding and wildfire, both as such hazards currently exist or may occur in the future. Several limitations apply to the analysis of future hazards, however. For example, such an analysis may not be relevant if the potential hazard would likely occur sometime after the projected life of the project (i.e., if sea-level projections only project changes 50 years in the future, a five-year project may not be affected by such changes). Additionally, the degree of analysis should correspond to the probability of the potential hazard. (State CEQA Guidelines, § 15143 ("significant effects should be discussed with emphasis in proportion to their severity and probability of occurrence").) Thus, for example, where there is a great degree of certainty that sea-levels may rise between 3 and 6 feet at a specific location within 30 years, and the project would involve placing a wastewater treatment plant with a 50 year life at 2 feet above current sea level, the potential effects that may result from inundation of that plant should be addressed. On the other extreme, while there may be consensus that temperatures may rise, but the magnitude of the increase is not known with any degree of certainty, effects associated with temperature rise would not need to be examined. (State CEQA Guidelines, § 15145 ("If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact").) Lead agencies are not required to generate their own original research on potential future changes; however, where specific information is currently available, the analysis should address that information. (State CEQA

Guidelines, § 15144 (environmental analysis “necessarily involves some degree of forecasting. While seeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can”).)

The decision in *Baird v. County of Contra Costa* (1995) 32 Cal.App.4th 1464, does not preclude this analysis. In that case, the First District Court of Appeal held that a county was not required to prepare an EIR due solely to pre-existing soil contamination that the project would not change in any way. (*Id.* at 1468.) No evidence supported the petitioner’s claim that the project would “expose or exacerbate” the pre-existing contamination, which was located several hundred to several thousand feet from the project site. (*Id.* at n. 1.) Moreover, the project would have no other significant effects on the environment, and other statutes exist to protect residents from contaminated soils. Thus, the question confronting that court was whether pre-existing contamination near the project was, by itself, enough to require preparation of an EIR. It held that, in those circumstances, an EIR was not required. That court also acknowledged, however, that where there is a potential for ultimately changing the environment, an EIR could be required. (*Id.* at p. 1469.) Thus, unlike the circumstances in the *Baird* case, the analysis required in section 15126.2(a) would occur if an EIR was otherwise required. Similarly, the addition to that section contemplates hazards which the presence of a project could exacerbate (i.e., potential upset of hazardous materials in a flood, increased need for firefighting services, etc.).

Finally, while the revision in section 15126.2 is consistent with the general objective of the Adaptation Strategy and is consistent with the limits of CEQA, not all issues addressed in the Adaptation Strategy are necessarily appropriate in a CEQA analysis. Thus, the revision in section 15126.2 should not be read as implementation of the entire Adaptation Strategy. Unlike hazards that can be mapped, other issues in the Adaptation Strategy, such as the health risks associated with higher temperatures, are not capable of an analysis that links a project to an ultimate impact. Habitat modification and changes in agriculture and forestry resulting from climate change similarly do not appear to be issues that can be addressed on a project-by-project basis in CEQA documents. Water supply variability is an issue that has already been addressed in depth in recent CEQA cases. (See, e.g., *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 434-435 (“If the uncertainties inherent in long-term land use and water planning make it impossible to confidently identify the future water sources, an EIR may satisfy CEQA if it acknowledges the degree of uncertainty involved, discusses the reasonably foreseeable alternatives—including alternative water sources and the option of curtailing the development if sufficient water is not available for later phases—and discloses the significant foreseeable environmental effects of each alternative, as well as mitigation measures to minimize each adverse impact.”).) Further, legislation has been developed to ensure that lead agencies identify adequate water supplies to serve projects many years in the future under variable water conditions. (See, e.g., Water Code, § 10910 *et seq.*; Government Code, § 66473.7.) Thus, the analysis called for in section 15126.2(a) should be directed primarily at hazards, and not all aspects of the Adaptation Strategy.

Additional Changes

Several comments suggested revisions or requested clarification of issues that were not addressed in this rulemaking package. The Initial Statement of Reasons explained:

[T]he Proposed Amendments suggest relatively modest changes to various portions of the existing CEQA Guidelines. Modifications address those issues where analysis of GHG emissions may differ in some respects from more traditional CEQA analysis. Other modifications are suggested to clarify existing law that may apply both to analysis of GHG emissions as well as more traditional CEQA analyses. The incremental approach in the Proposed Amendments is consistent with Public Resources Code section 21083(f), which directs OPR and the Resources Agency to regularly review the Guidelines and propose amendments as necessary.

(Initial Statement of Reasons, at p. 9.) Additionally, Public Resources Code section 21083.05(c) requires that the CEQA Guidelines be updated periodically “to incorporate new information or criteria established by the State Air Resources Board pursuant to” AB32. Therefore, the CEQA Guidelines will continually be updated to reflect evolving information and practice and to address developments regarding analysis of greenhouse gas emissions in the courts.

Determination Regarding Impacts on Local Government and School Districts

The Natural Resources Agency has determined that the Amendments to the State CEQA Guidelines do not impose additional requirements or costs on local government or school districts. Among other things, Public Resources Code section 21083.05 (reflected in amendments to State CEQA Guidelines sections 15064.4, 15064.7(c), 15126.4(c), 15130, 15183.5, 15364.5, and Appendix G) clarifies that CEQA requires analysis of a project’s greenhouse gas emissions. Public Resources Code sections 21002 and 21004 (reflected in State CEQA Guidelines section 15126.4) require a lead agency to impose feasible mitigation where a project will cause significant adverse environmental impacts. Public Resources Code sections 21003 and 21093 (reflected in the amendments to State CEQA Guidelines sections 15064, 15125, 15130, 15150 and 15183, and new State CEQA Guidelines sections 15064.4 and 15183.5) encourage lead agencies to tier environmental impact reports wherever possible and to use existing analyses to reduce duplication and expense. The decision in *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370, 1382 (reflected in proposed State CEQA Guidelines section 15064.4), requires that potential adverse impacts be quantified where it is possible to do so and quantification will assist in the determination of significance of the impact.

The Amendments to the State CEQA Guidelines described above merely reflect existing legislative requirements and judicial decision interpreting those requirements. Therefore, this rulemaking activity does not itself impose any costs on local government or school districts.

Determination Regarding Potential Economic Impacts Directly Affecting Business

The Natural Resources Agency has determined that the Amendments will not have a significant, statewide adverse economic impact directly affecting business. The guidelines required by sections 21083 and 21083.05 of the Public Resources Code are promulgated in the California Code of Regulations, title 14, sections 15000-15387 (the "State CEQA Guidelines"). The Natural Resources Agency has determined that most of the amendments will have no impacts on business.

CEQA applies to activities of public agencies, including projects that are funded, proposed, or approved by public agencies. Thus, the amendments to the State CEQA Guidelines would apply to public agencies, and not directly to businesses. The Natural Resources Agency is aware, however, that certain requirements reflected in the amendments that have been enacted by the Legislature and developed in case law interpreting CEQA could have an indirect economic impact on business. Among other things, project proponents could incur additional costs in assisting lead agencies to comply with the requirement to quantify greenhouse gas emissions, if possible, as part of an analysis of the effects of such emissions. Project proponents may also incur costs in implementing mitigation measures to reduce such emissions. However, the amendments to the Guidelines merely reflect existing requirements. (See, e.g., Pub. Resources Code, §§ 21004 ("a public agency may use discretionary powers ... for the purpose of mitigating or avoiding a significant effect on the environment"), 21083.05 (requiring the development of guidelines on the analysis and mitigation of greenhouse gas emissions "as required by this division"); *Berkeley Keep Jets Over the Bay Com. v. Board of Port Comm.* (2001) 91 Cal.App.4th 1344, 1370, 1382 (potential hazardous emissions and noise impacts must be quantified where it is possible to do so and quantification will assist in the determination of significance of the impact).)

Many lead agencies, and some trial courts, have already determined that CEQA requires analysis and mitigation of GHG emissions independent of the SB97 CEQA Guidelines amendments. The Office of Planning and Research, for example, has cataloged over 1,000 examples of CEQA documents, prepared between July 2006 and June 2009, analyzing and mitigating greenhouse gas emissions. (Office of Planning and Research, Environmental Assessment Documents Containing a Discussion of Climate Change (Revised June 1, 2009).) Further, several trial courts have found that existing CEQA law requires analysis and mitigation of GHG emissions. (See, e.g., *Muriettans for Smart Growth v. City of Murrieta et al.*, *Riverside Co. Sup. Ct. Case No. RIC463320* (November 21, 2007); *Env. Council of Sac. et al v. Cal. Dept. of Trans.*, *Sacramento Sup. Ct. Case No. 07CS00967* (July 15, 2008) (citing *Berkeley Keep Jets Over the Bay Committee v. Board of Commissions* (2001) 91 Cal.App. 4th 1344, 1370-

1371 and State CEQA Guidelines section 15144 as requiring a lead agency to “meaningfully attempt to quantify the Project’s potential impacts on GHG emissions and determine their significance” or at least to explain what steps were undertaken to investigate the issue before concluding that the impact would be speculative.) Finally, federal courts have interpreted the National Environmental Policy Act (“NEPA”) to require an analysis of potential impacts of GHG emissions. (See, e.g., *Ctr. for Biological Diversity v. Nat’l Highway Traffic Safety Ad.*, 538 F.3d 1172, 1215-1217 (9th Cir. 2008).) Thus, the amendments to the CEQA Guidelines developed pursuant to SB97 do not create new requirements; rather, they interpret and clarify existing CEQA law.

Additionally, some of amendments included in this rulemaking activity may tend to reduce costs associated with environmental analysis of greenhouse gas emissions. For example, the amendments to the Guidelines encourage tiering and streamlining of existing environmental analyses to the extent possible in order to reduce duplication. Such tiering and streamlining mechanisms are also consistent with existing law. (See, e.g., Pub. Resources Code, § 21093 (lead agencies shall tier environmental impact reports wherever possible).)

The amendments update the State CEQA Guidelines to be consistent with legislative enactments and judicial decisions that have modified CEQA, but do not themselves impose any new requirements. Therefore, the amendments do not have a significant, adverse economic impact directly affecting business.

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CALIFORNIA'S FOURTH
CLIMATE CHANGE
ASSESSMENT



California's Changing Climate 2018

A Summary of Key Findings from California's
Fourth Climate Change Assessment

Coordinating Agencies:

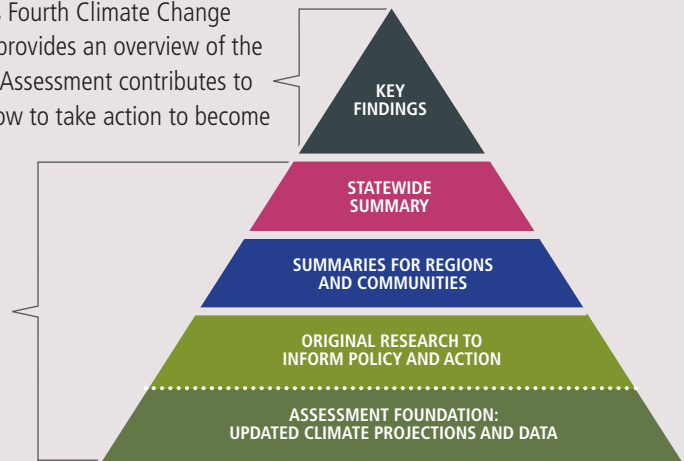


Introduction to California's Fourth Climate Change Assessment

California is a global leader in using, investing in, and advancing research to set proactive climate change policy, and its Climate Change Assessments provide the scientific foundation for understanding climate-related vulnerability at the local scale and informing resilience actions. The Climate Change Assessments directly inform State policies, plans, programs, and guidance to promote effective and integrated action to safeguard California from climate change.

This capstone report presents key findings from California's Fourth Climate Change Assessment (also referred to as the Fourth Assessment). It provides an overview of the state of climate science while pointing out how the Fourth Assessment contributes to better understanding the impacts of climate change and how to take action to become more resilient.

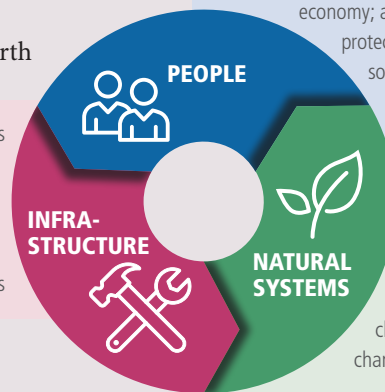
To find out more about the other components of the Fourth Assessment, please visit: www.ClimateAssessment.ca.gov



CALIFORNIA'S CLIMATE CHANGE POLICY AND THE FOURTH ASSESSMENT

While California is leading efforts to reduce greenhouse gas emissions, the State must also proactively address current and future impacts of climate change. The Fourth Assessment is part of California's comprehensive strategy to take action based on cutting-edge climate research. The Fourth Assessment addresses critical information gaps that decision-makers at the state, regional, and local levels need addressed in order to protect California's people, infrastructure, natural systems, working lands, and waters.

Built infrastructure systems can withstand changing conditions and shocks, including changes in climate conditions, while continuing to provide critical services



People and communities can respond to changing average conditions, shocks, and stresses in a manner that minimizes risks to public health, safety, and the economy; and maximizes equity and protection of the most vulnerable so that they both survive climate-related events and thrive despite and after these events.

Natural systems adjust and maintain desirable ecosystem characteristics in the face of change.

The Fourth Assessment provides critical information that will enable more ambitious efforts to support a climate-resilient California.

Why Study Climate Change in California?

California is one of the most “climate-challenged” regions of North America; its historical climate is extremely variable, and climate change is making extreme conditions more frequent and severe. California’s temperatures are already warming, heat waves are more frequent, and precipitation continues to be highly variable. Since its Third Climate Change Assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012-2016, an almost non-existent Sierra Nevada winter snowpack in 2014-2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures.

California and the world need to rapidly reduce climate pollution to avoid the worst effects of climate change. We must also prepare for the continued acceleration of climate impacts in the future. The Fourth Assessment has prepared information needed to reach these goals.

The Fourth Assessment includes 33 State-funded research projects and contributions from 11 externally-funded researchers. The State-funded projects include the development of cutting-edge climate projections for California. The projections use a broader range of climate models, emission scenarios, and simulations than previous assessments, and included:

- The development and use of a new technique that provides spatial climate data that can be used at the local to regional level.
- Improved understanding of additional climate variables, including relative humidity and wind speed, and extremes like drought, heat waves, and heavy precipitation events.
- More extensive simulations of wildfire to help visualize increases in area burned.
- A more detailed set of sea-level rise projections that incorporate recent research on ice sheet collapse in West Antarctica.

These projections are critical tools necessary to understand and plan for climate impacts. They also inform research into critical actions for resilience.

CATALYZING ACTION THROUGH NEW ONLINE RESOURCES

The Fourth Assessment supported the development and expansion of new and existing resources to directly support climate action. Examples include:

cal-adapt

www.Cal-Adapt.org

Cal-Adapt is the State’s portal for the climate projections produced for the Fourth Assessment, enabling data downloading and visualizations of climate scenarios at the local level and wildfire projections for the entire state.

°CHAT

www.Cal-Heat.org

Cal-Heat is a new tool funded by the Fourth Assessment to inform local public health officials’ initiatives to protect the public during climate-exacerbated extreme heat events.



COASTAL STORM MODELING SYSTEM (COSMOS)

The CoSMoS model, partly funded by the Fourth Assessment, provides information about the complex interplay of coastal dynamics and climate change for California’s coast.

View updated CoSMoS results on these websites:

- Hazard Exposure Reporting and Analytics (HERA)
<https://www.usgs.gov/apps/hera/>
- Our Coast Our Future Flood Map
www.OurCoastOurFuture.org

The full suite of Fourth Assessment projects and other tools can be found at: www.ClimateAssessment.ca.gov

How is California’s climate projected to change?

The Fourth Assessment produced updated climate projections that provide state-of-the-art understanding of different possible climate futures for California. The science is highly certain that California (and the world) will continue to warm and experience greater impacts from climate change in the future. While the Intergovernmental Panel on Climate Change and the National Climate Assessment have released descriptions of scientific consensus on climate change for the world and the United States, respectively, the Fourth Assessment summarizes the current understanding of climate impacts and adaptation options in California. The greater detail provided by the Fourth Assessment supports efforts by individuals, businesses and communities to prepare for and reduce the impacts of climate change.

	CLIMATE IMPACT	DIRECTION	SCIENTIFIC CONFIDENCE FOR FUTURE CHANGE
	TEMPERATURE	WARMING ↗	Very High
	SEA LEVELS	RISING ↗	Very High
	SNOWPACK	DECLINING ↘	Very High
	HEAVY PRECIPITATION EVENTS	INCREASING ↗	Medium-High
	DROUGHT	INCREASING ↗	Medium-High
	AREA BURNED BY WILDFIRE	INCREASING ↗	Medium High

While most of these trends have been generally understood and expected since before California’s First Climate Change Assessment in 2006, the Fourth Assessment provides new quantitative tools to understand and address these impacts. The updated results from the suite of Fourth Assessment models and analyses demonstrate the importance of achieving global reductions in greenhouse gas emissions.¹

¹ The phrase “if greenhouse gas emissions continue at current rates” refers to the Representative Concentration Pathway (RCP) 8.5. The phrase “if greenhouse gas emissions are reduced at a moderate rate” refers to RCP4.5. The RCP4.5 emissions level represents reduced emissions, but those reductions are not sufficient to achieve the targets called for in the Paris Agreement. However, the RCP4.5 emissions scenario was used in many of the Fourth Assessment’s studies.

If greenhouse gas emissions...	are reduced at a moderate rate...	then California will experience average daily high temperatures that are warmer than the historical average by...	2.5°F from 2006 to 2039.	4.4°F from 2040 to 2069.	5.6°F from 2070 to 2100.
	continue at current rates...		2.7°F from 2006 to 2039.	5.8°F from 2040 to 2069.	8.8°F from 2070 to 2100.

While the averages of daily maximum temperatures over an entire year are easily understood, in many ways this indicator obscures the risks from extreme weather events due to changing climate. For example, the number of extreme heat days will increase exponentially in many areas.

Projections developed for the Fourth Assessment do not show a consensus in the overall trend in yearly precipitation, but they do have increasing variability in precipitation. However, across all the simulations, higher temperatures lead to dryer conditions because of increasing evaporation and plant stress. With increased numbers of dry days, several of the models indicated an increased occurrence of dry years and strings of dry years resulting in more frequent and more intense droughts. At the same time that most of the simulations had more dry days, there was also a tendency for increased precipitation on very wet days, so that the risk of floods caused by large storms will increase, sometimes occurring in bursts over several weeks.

The Paris Agreement brought, for the first time, all nations of the world together around the common cause of limiting global average temperature warming to 2°C [3.6°F] or less (1.5°C [2.7°F]) above pre-industrial levels. A Fourth Assessment study reports estimated climate impacts to California assuming global compliance with the Paris goals, finding that impacts in California would be substantially reduced. However, California still needs to prepare, at a minimum, for significant unavoidable impacts that would occur even if global average temperature rise is limited to 1.5°C, and adopt precautionary adaptation policy to protect against impacts from higher emissions scenarios.

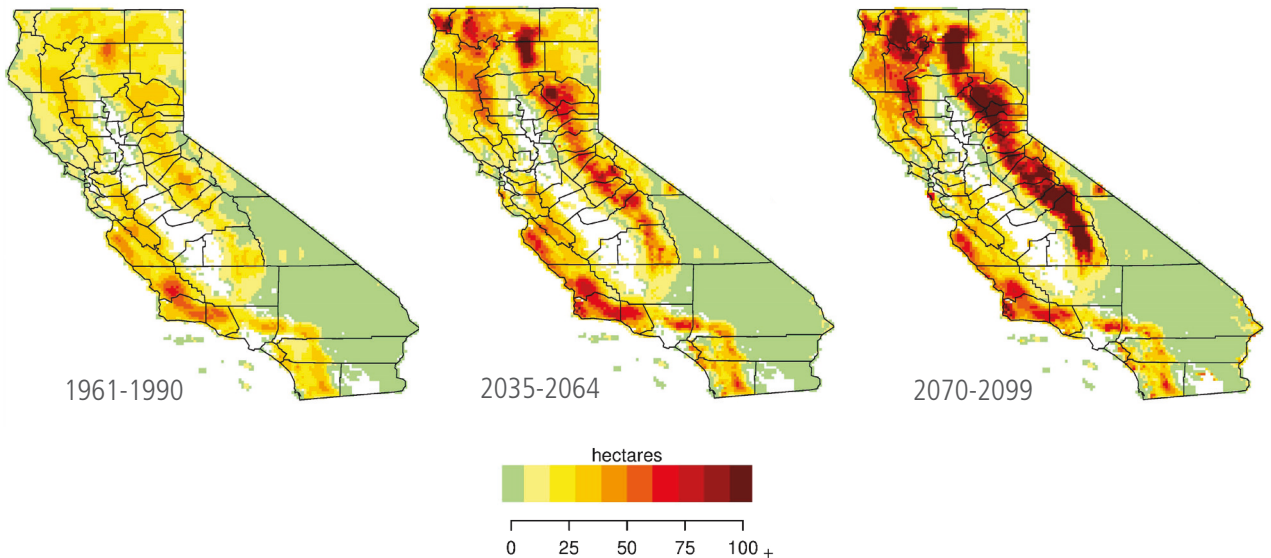
By 2050, the average water supply from snowpack is projected to decline to 2/3 from historical levels. If emissions reductions do not occur, water from snowpack could fall to less than 1/3 of historical levels by 2100.

EXTREME HEAT DAYS PER YEAR IN DOWNTOWN FRESNO (Days exceeding 106.6°F)		
1961 – 2005 4	2050 – 2099 26 if greenhouse gas emissions are reduced at a moderate rate	2050 – 2099 43 if greenhouse gas emissions continue at current rates



Sea-level rise is virtually certain to increase beyond the 6 inches that much of California experienced in the past century, but there are important questions involving how fast and how extreme the rates of sea-level rise will be. The Fourth Assessment's projections underscore the dependence of sea levels upon greenhouse gas emissions and the associated melt and ice-loss from Greenland and Antarctica. If emissions continue at current rates, Fourth Assessment model results indicate that total sea-level rise by 2100 is expected to be 54 inches, almost twice the rise that would occur if greenhouse gas emissions are lowered to reduce risk.

Increasing acreage burned by wildfire is associated with increasing air temperatures. One Fourth Assessment model suggests large wildfires (greater than 25,000 acres) could become 50% more frequent by the end of century if emissions are not reduced. The model produces more years with extremely high areas burned, even compared to the historically destructive wildfires of 2017 and 2018.



This image shows the modeled area burned by wildfires from current time (modeled as 1961-1990), for mid-century (2035-2064), and for late century (2070-2099). By the end of the century, California could experience wildfires that burn up to a maximum of 178% more acres per year than current averages.



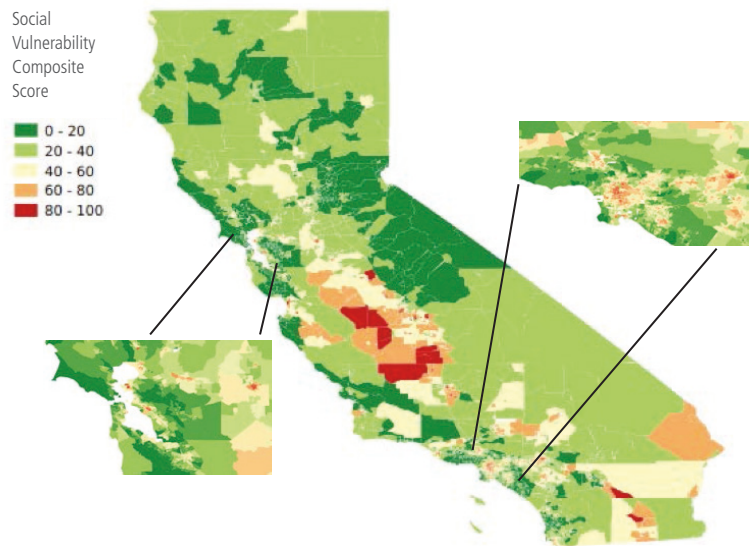
Impacts of Climate Change on People

While the impacts of climate change vary over time and place, each community will also experience these impacts in unique ways that will depend on social, economic, and demographic factors. The Fourth Assessment makes new strides at the intersection of social and physical sciences to understand how climate change will affect Californians – and how Californians can adapt and safeguard their communities from climate change.

PUBLIC HEALTH

Climate change will affect California's diverse people and communities differently, depending on their location and existing vulnerabilities. While research shows that all Californians will likely endure more illness and be at greater risk of early death because of climate change, vulnerable populations that already experience the greatest adverse health impacts will be disproportionately affected.

Heat waves, the natural disaster responsible for the most deaths in California over the last 30 years, are an example of the current and future risk climate change poses to people. The 2006 heat wave killed over 600 people, resulted in 16,000 emergency department visits, and led to nearly \$5.4 billion in damages. The human cost of these events is already immense, but research suggests that mortality risk for those 65 or older could increase ten-fold by the 2090s because of climate change. Studies show that while air conditioning can reduce mortality and illness from heat, increased electrical demand for cooling due to hotter conditions could also drive up emissions. However, the state is rapidly moving to cleaner electricity generation. Greenhouse gas emissions from electricity generation in 2016 were about 37% lower than emissions in 1990.



A Fourth Assessment study produced this map of social vulnerability to heat by using 18 health, social, and environmental factors associated with heat vulnerability. The map highlights the relative heat vulnerability of 8,046 census tracts by synthesizing vulnerability indicators to render a clearer picture of overall heat vulnerability. In more detail, Map A illustrates the Bay Area and Map B shows greater Los Angeles area.

IMPACT FROM CLIMATE CHANGE: Heat-Health Events (HHEs), which predict heat risk to local vulnerable populations, will worsen drastically throughout the state by mid-century. The Central Valley is projected to experience average HHEs that are up to two weeks long, and HHEs could occur four to ten times more often in the North Sierra region.

ACTION FOR RESILIENCE: The Fourth Assessment supported the development of a prototype heat warning system known as the California Heat Assessment Tool (CHAT), which was designed to provide information about heat events most likely to result in adverse health outcomes. It will support public health departments taking action to reduce heat-related morbidity and mortality outcomes.

A new study found that deep greenhouse gas emission reductions (80% below 1990 levels) in California could significantly improve health outcomes, and cost savings would be comparable to the cost of achieving those reductions by 2050. These savings are achieved because shifting from polluting technologies to clean technology improves air quality, saves lives, and improves overall public health.

In addition to heat, direct climate impacts like wildfire, drought, and coastal and inland flooding will negatively affect public health. However, there are also additional indirect effects of climate change on human health: wildfire smoke leads to increased respiratory illness, warmer temperatures lead to the spread of mosquito-borne diseases like Zika, and increased disasters lead to greater stress and mental trauma.

CLIMATE JUSTICE

The Fourth Assessment includes a report on climate justice in California, a new addition to the assessment process. Climate justice is the concept that no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation, and is a critical component of California's climate strategy.



Vulnerable communities include field workers, such as this person being given a protective N95 face mask who was exposed to poor air quality during the California wildfires in the fall/early winter of 2017/2018. Photo: CAUSE

This Fourth Assessment report highlights the importance of adaptation efforts to minimize climate impacts to disadvantaged communities, as well as case studies of innovative programs to increase the resiliency of vulnerable populations in California. The report identifies areas for additional research needed to improve climate adaptation for vulnerable populations and to promote climate justice in California. These include better tools, indices, maps, and metrics for identifying and quantifying resilience in vulnerable communities, research into achieving a just transition to a low carbon economy, and methods for ensuring community involvement in climate adaptation planning.

TRIBAL AND INDIGENOUS COMMUNITIES

For the first time, the Fourth Assessment includes a Tribal and Indigenous Communities Summary Report. Tribes and Indigenous communities in California face unique challenges under a changing climate. Tribes maintain cultural lifeways and rely on traditional resources (like salmon fisheries) for both social and



An example of how tribes use Traditional Ecological Knowledge can be seen in the use of prescribed burns. These are commonly deployed within a centuries-old cultural context to manage meadows, forests, and other areas within tribal lands.

economic purposes. For many tribes in California, seasonal movement and camps were a part of living with the environment. Today, these nomadic options are not available or are limited. This is the result of Euro-American and U.S. policy and actions and underpins several climate vulnerabilities. Tribes with reservations, Rancherias, or allotments are vulnerable to climate change in a specific way: tribal lands are essentially locked into fixed geographic locations and land status. Only relatively few tribal members are still able to engage in their cultural traditions as livelihoods.

Traditional Ecological Knowledge (TEK)-based methods are gaining a revitalized position within a larger statewide toolset to build resilience against climate change by tribal and non-tribal stakeholders alike. The importance of maintaining TEK is not isolated to environmental and ecological improvements. These ancient, traditional practices are closely linked to climate resilience across tribal cultural health, identity, and continuity. Cultural practices and traditional land management are also linked to improving physical and mental health among tribal members. These TEK techniques are increasingly incorporated by non-tribal land and resource managers as part of wildfire prevention and ecosystem management.



Impacts of Climate Change on Infrastructure

The Fourth Assessment provides in-depth assessments that support proactive steps to protect California’s energy, transportation, and water infrastructure systems and the communities they serve. These systems face increasing risks from climate change as temperatures warm, sea levels rise, and other climate impacts worsen. These systems are interconnected, and disruption in one part can impact other connected parts with both direct and indirect economic effects.

ENERGY

Energy resources can be considered from both supply and demand perspectives. Fourth Assessment studies found infrastructure that supplies energy along the coast – particularly docks, terminals, and refineries – will increasingly be exposed to coastal flooding. Meanwhile, electrical power lines, rails, and roads are primarily at risk from increasing wildfire. Costs and impacts of wildfire to electricity transmission and distribution systems are expected to grow as climate change impacts increase.

IMPACT FROM CLIMATE CHANGE: Annual demand for residential electricity is projected to increase in inland and Southern California, with more moderate increases in cool coastal areas. Increases in peak hourly demand during the hot months of the year could be more pronounced. Even though reduced use of natural gas in warmer winter months will offset some of the total demand for energy, it will be critical to be able to meet higher peak loads while protecting infrastructure from climate impacts.

ACTION FOR RESILIENCE: Studies found that flexible adaptation pathways that allow for implementation of adaptation actions over time enable utilities to protect services to customers most effectively. The California Public Utilities Commission recently began a process to consider strategies and guidance for climate adaptation for electric and natural gas utilities, which will be informed by the Fourth Assessment.

IMPACT FROM CLIMATE CHANGE: Emerging findings for California show that direct climate impact costs by the middle of this century are dominated by human mortality, damages to coastal properties, and the potential for droughts and damaging floods. The costs have been estimated at tens of billions of dollars. The impacts after the middle of this century will be much lower if global greenhouse gas emissions are reduced substantially.

ACTION FOR RESILIENCE: California’s Fourth Climate Assessment contributes information and tools that are needed from local to statewide levels to design and implement adaptation measures to lower economic impacts. In addition, the Climate-Safe Infrastructure Working Group, created in response to Assembly Bill 2800 (Quirk), is releasing recommendations that build on the Fourth Assessment findings to inform a robust, comprehensive, and equitable approach to building for the future.



Solar panels produce energy at the California Department of Water Resources Pearblossom Pumping Plant in Pearblossom, California. The Fourth Assessment considered climate risk to the electricity system in the context of the growth of renewable energy supply. Photo credit: Florence Low/California Department of Water Resources 2017.

TRANSPORTATION

California's roads, railroads, pipelines, waterways, ports, and airports are critical for the movement of people and goods. They will be significantly affected by climate change. A growing threat to California's transportation system is wildfire, which can also have cascading effects like landslides and mudslides that occur after rain falls on newly burned areas.

Increasing temperatures are also expected to increase road construction costs between 3 and 9%. Adapting roadway materials to withstand higher temperatures is needed to avoid potential costs of over \$1 billion by 2070. 115 miles of railroad could be at risk of coastal flooding by 2040, with an additional 285 miles at risk by 2100.



The combination of the Thomas wildfire (281,893 acres) and a subsequent intense rainstorm caused heavy mud and debris flows in the towns of Carpinteria and Montecito, resulting in 21 fatalities, destroying at least 1,063 structures, causing over \$2.176 billion in damages, and closing Highway 101 for two weeks.

IMPACT FROM CLIMATE CHANGE: Miles of highway at risk of flooding in a 100-year storm event will triple from current levels to 370 miles by 2100. Under that scenario, over 3,750 additional miles of highway will be exposed to temporary flooding.

ACTION FOR RESILIENCE: Based in part on its work with the Climate-Safe Infrastructure Working Group, Caltrans will update its Highway Design Manual to include the latest climate-informed data on precipitation and heat. Caltrans will also complete climate vulnerability assessments and develop climate adaptation strategies for each of its 12 districts.

Airports in major urban areas including San Francisco (SFO), Oakland, and San Diego will be susceptible to major flooding from a combination of sea-level rise and storm surge by 2040-2080, depending on location, without implementation of protective measures. SFO is already at risk of flooding from storm surge.

WATER INFRASTRUCTURE

The impacts of climate change on California's water infrastructure and management are especially profound and are causing shifts in the water cycle, greater risks to engineered systems, and threats to ecosystems and water quality. The complex network that stores and distributes water throughout the state was designed for historical hydrologic conditions that are now changing. The Fourth Assessment contributes critical knowledge to understand these new risks and to improve management.

Modeling of reservoir operations show that Shasta and Oroville reservoirs, the two largest in the state, will have roughly one-third less water stored annually by the end of the century under current management practices. This reduced storage could limit water supplies and thus lower resilience to droughts. Changes in seasonal precipitation combined with the effects of sea level rise in the Delta may compound water supply reliability for

cities and farms that depend on imported water from the State Water Project and Central Valley Project, as exports from the Delta in future droughts could be reduced by as much as 50% more than during historical droughts. The Fourth Assessment also found that water rights administration and oversight practices from past droughts are ill-suited to the growing challenges for water management from climate change.

As temperatures increase, more precipitation will fall as rain rather than snow. With potentially larger storms, existing flood management practices and infrastructure will be challenged to meet the higher flows. Advances in monitoring systems, forecasts, and coordination, coupled with continuing modifications and repairs to flood management infrastructure, will enable more time to prepare for future large floods while increasing options to improve and maintain supply reliability.



The Shasta Dam is one of California's two largest, with a storage capacity of 4.55 million acre feet. Photo credit: Apaliwal 2009.

IMPACT FROM CLIMATE CHANGE: Current management practices for water supply and flood management in California may need to be revised for a changing climate. This is in part because such practices were designed for historical climatic conditions, which are changing and will continue to change during the rest of this century and beyond. As one example, the reduction in the Sierra Nevada snowpack, which provides natural water storage, has significant implications for California's water management system.

ACTION FOR RESILIENCE: Promising adaptation options such as the use of probabilistic hydrological forecasts, better measurements of the snowpack, and other improved ways to manage water can reduce these negative impacts. Increased groundwater storage is another promising option, which may include taking advantage of increased winter runoff to flood agricultural and natural areas to recharge aquifers. Institutional, regulatory, legal, and other barriers may need to be overcome to implement science-based solutions.

In addition to illuminating impacts from climate change to California's water infrastructure, the Fourth Assessment also presents potential solutions from around the state. One study shows how creative approaches from local water districts better prepared them for California's drought. While small water systems throughout the state currently struggle to incorporate climate change into their planning and management practices, the State could help disadvantaged communities most impacted by climate change by providing funding, technical assistance, and assistance consolidating these water providers.

Land subsidence and sea-level rise will impede the function of levees in the Sacramento-San Joaquin Delta, and by 2050-2080 some Delta levees may no longer meet federal standards.



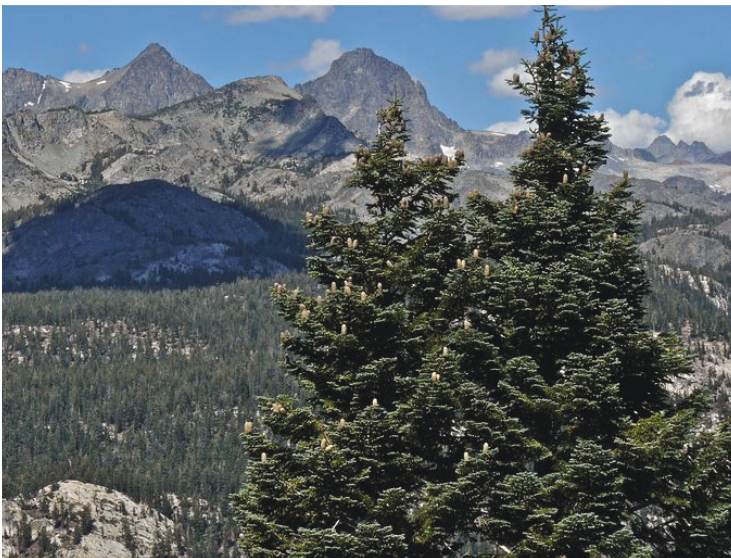
Impacts of Climate Change on Natural and Working Lands and Waters

Natural and working lands and waters include forests, rangelands, farmland, riparian areas, and California's ocean and coast. These lands contribute to the natural infrastructure of the state. They harbor the species and ecosystems of California, and are increasingly at risk of disruption due to climate change.

FORESTS

California's forests cover almost one-third of the state and provide important ecosystem services including water capture and filtration, wildlife habitat, recreation opportunities, and timber products. Climate change poses increased risk of wildfire and potential for insect infestations. California's forests have the potential to remove and store carbon from the atmosphere, and are an important element of the State's programs to reduce carbon in the atmosphere. However, more research is needed to understand the relationship between forest management practices to reduce wildfire risk and the effect on carbon storage. A Fourth Assessment study found that fuel treatments lowered the biomass stored in a forest, but that more of the remaining biomass survived a fire than in an untreated forest area. The study also developed a new method to track how much biomass is stored in living trees on large scales.

California's forests contain over 60 species of trees including red fir (*Abies magnifica*) and extends from coastal regions to high elevations in the Sierra Nevada and other mountain ranges. Photo: Jean Pawek



ACTION FOR RESILIENCE: A Fourth Assessment review of forest health literature provides further scientific backing to the State's Forest Carbon Plan to increase forest restoration and treatment such as prescribed fire to an average of 35,000 acres a year by 2020. Additionally, intensive thinning in highly productive forests reduced tree evapotranspiration, suggesting that forest thinning could result in increased base flows of up to 10% for dry years and 5% for all years.

This review found prescribed fire a suitable tool to lower extreme fire risk. However, under extreme fire weather conditions, fires may simply jump or burn through treated areas. With regards to sequestering carbon, a key question in California forests is whether fuel treatment data such as fire intensity, stand age, and extent of treatment can be used to predict the reduction of carbon lost in a subsequent wildfire.

A Fourth Assessment wildfire model suggests a 77% increase in mean and up to a 178% increase in maximum area burned by wildfires (compared to 1961-1990) by 2050, but the actual impacts could be substantially more severe because external factors such as wind are not yet incorporated. By the end of the century, if greenhouse gas emissions continue to rise, extreme wildfires burning over about 25,000 acres is projected to increase by nearly 50%. Reducing tree density and restoring beneficial, controlled fire can improve resilience of California's forests to wildfire. In the areas that have the highest fire risk, wildfire insurance is estimated to rise by 18% by 2055, and the fraction of property insured would decrease.

RANGELANDS

Conservation of California's grasslands, chaparral, and oak woodlands and improved management of their soils has strong potential to improve soil water-holding capacity, increase stream flows and aquifer recharge, reduce flooding and erosion, and reduce climate-related water deficits. Increasing organic matter in soils by 3% by applying compost could increase the soil's water holding capacity by up to 4.7 million acre-feet across all working lands in California, with hydrologic benefits greatest in locations with enough precipitation to fill increases in soil storage capacity.



Many of California's rangelands consist of nonnative grasses and oak woodlands including these blue oaks (*Quercus douglasii*) or chaparral. Photo: Neal Kramer

ACTION FOR RESILIENCE: Field experiments and modeling show that a single application of compost to rangelands in California can increase soil organic carbon sequestration for up to 30 years and enhance net primary productivity. The resulting increase in soil organic matter and increased vegetation also supports infiltration of water during storm events, contributing to recharge of aquifers. A lifecycle assessment of California's largest organic waste streams — food waste, yard waste, and cattle manure — showed that composting these feedstocks and applying the compost to California rangelands has lower net greenhouse gas emissions than other waste management approaches.

BIODIVERSITY AND HABITATS

California is a globally ranked biodiversity hotspot: only 25 regions in the world have as many species. These species live in the state's natural vegetation types: forests, chaparral, riparian areas, riverside and wetlands, as well as in its working landscapes, which include rangelands and agricultural lands. Under current emissions levels, between 45 to 56% of the natural vegetation in California becomes climatically stressed by 2100. The recent tree die-off during the drought of 2012-2016 shows how projected impacts are already having drastic effects.

Corridors can provide a means for plants and animals to migrate to more suitable areas as the climate changes. A Fourth Assessment study provides a framework for climate-wise corridor design and implementation for terrestrial plants and wildlife. It recommends starting with designs based on land use and land cover, to capture the connectivity needs of the majority of species. Corridors should be prioritized that connect habitat patches to sites where the future climate will be similar to the current climate in the habitat patch and incorporate climate refugia.

AGRICULTURE

California produces over half of the nation's specialty crops, including fruits, vegetables, nuts, flowers, and nursery crops. Many of these crops, including fruit and nut trees, are particularly vulnerable to climate change impacts such as altered temperatures and stress from warmth and dryness. Climate change impacts to California agriculture will add to ongoing challenges from conversion of agricultural land to urban areas and regulatory challenges. California agriculture is projected to experience lower crop yields due to extreme heat waves, heat stress and increased water needs of crops and livestock (particularly during dry and warm years), and changes in pest and disease threats. Many of these impacts can be lessened through on-farm management practices, technological advances, and incorporation of climate change risks in decision-making. A Fourth Assessment study suggests that climate-related crop losses will be less than impacts associated with the loss of water supply and conversion of agricultural lands to other uses.

An analysis of crops, dairies, and beef cattle in California based on historical and projected climate conditions suggests that agriculture will continue to thrive through 2050, although with a reduction of 5 to 15% in gross crop revenues, assuming reductions in irrigation water. When proper growing conditions exist, farms may rely on the production of higher value crops to cope with rising opportunity costs of water and land. The high demand for specialty crops means that production of these crops will continue, while field and grain crops may face more important decreases in irrigated area and associated loss of agricultural jobs.

California's agriculture produces a high diversity of crops, and depends on water that is frequently imported from other parts of the state or western US.

Photo:Patrick Huber

IMPACT FROM CLIMATE CHANGE: A secondary, but large, effect of droughts is the increased extraction of groundwater from aquifers in the Central Valley, primarily for agricultural uses. The pumping can lead to subsidence of ground levels, which around the San Joaquin-Sacramento Delta has been measured at over three-quarters of an inch per year. This subsidence impacts the canals that deliver water across the region.

ACTION FOR RESILIENCE: Flooding of some types of agricultural fields during wet years can provide some additional groundwater recharge, which can be used to support agriculture through longer droughts. This could be an important adaptation option considering the loss of snowpack forecasted for the rest of this century. California's Sustainable Groundwater Management Act will also reduce groundwater overdraft, and guidance for incorporating climate change projections will increase resilience.

IMPACT FROM CLIMATE CHANGE: Agricultural production could face climate-related water shortages of up to 16% in certain regions. Regardless of whether California receives more or less annual precipitation in the future, the state will be dryer because hotter conditions will increase the loss of soil moisture.

ACTION FOR RESILIENCE: Increasing soil organic matter by 3% by applying a ¼ inch of compost could increase the soil water holding capacity by up to 4.7 million acre-feet if applied to all working lands in California.





Impacts of Climate Change on the Ocean and Coast

California's iconic shoreline is integral to the state's identity, but climate change is rapidly changing the ocean and coast. The coastal region, which stretches over 1,200 miles of shoreline, is an economic powerhouse that contributed \$41.1 billion to the state's GDP, provided \$19.3 billion in wages and salaries, and supplied 502,073 jobs in 2013. Rising sea levels, warming ocean waters, increasing acidity, and decreasing dissolved oxygen levels will have effects that ripple far beyond the three-quarters of Californians who live in coastal counties. The Fourth Assessment included a Coast and Ocean Summary Report for the first time; this report synthesizes the latest research – touched on below – about the challenges facing our coast and ocean because of climate change and what actions we can take to increase their resilience.

OCEAN WARMING

California has recently experienced unprecedented events along its coasts including a historic marine heat wave, record harmful algal blooms, fisheries closures, and a significant loss of northern kelp forests. These events increase concern that coastal and marine ecosystems are being transformed, degraded, or lost due to climate change impacts, particularly sea-level rise, ocean acidification, and warming. From 1900 to 2016, California's coastal oceans warmed by 1.26 °F. "The Blob," a very warm patch of ocean water off the coast of California from 2013-2016, demonstrated that anomalously warm ocean temperatures can produce unprecedented events, including the mass abandonment of sea lion pups and California's record-setting drought.

RISING SEA LEVELS

Building resilience to sea-level rise in California requires approaches tailored to communities' needs, climate impacts, and many other factors. Options to protect communities and ecosystems include combinations of armoring, natural infrastructure, and hybrid approaches. Decision-makers need tools to evaluate the economic and environmental costs and benefits of alternative strategies with more complete information. The Fourth Assessment contributed to this need



The CoSMoS tool permits assessment of flood risk for all parts of California. This image shows the San Diego Harbor with a 4.9 foot sea level rise and with or without a 100-Year storm.

IMPACT FROM CLIMATE CHANGE: A new model estimates that, under mid to high sea-level rise scenarios, 31 to 67% of Southern California beaches may completely erode by 2100 without large-scale human interventions. Damages in the state's major population areas could reach nearly \$17.9 billion from inundation of residential and commercial buildings under 20 inches of sea-level rise, which is close to the 95th percentile of potential sea-level rise by the middle of this century. A 100-year coastal flood, on top of this level of sea-level rise, would almost double the costs.

ACTION FOR RESILIENCE: A Fourth Assessment study developed technical guidance on design and implementation of natural infrastructure for adaptation to sea-level rise, such as the use of vegetated dunes, marsh sills, and native oyster reefs. This research included case studies on existing natural shoreline infrastructure projects at five sites spanning from Humboldt to Los Angeles counties that show promising approaches to increase resilience to sea-level rise and other benefits.



This site in Ventura County showed severe coastal erosion in 1990. A managed retreat of infrastructure from the waterline provided adequate space for restoration using cobble, sand, and dune plantings. To learn more about this project and other case studies, see the brochure “Case Studies of Natural Shoreline Infrastructure in Coastal California” that was prepared as part of the Fourth Assessment.

A Fourth Assessment study found that sea-level rise has become the dominant concern for coastal managers, and most also face funding and financing barriers.

by supporting the expansion of CoSMoS – a tool that can simulate sea-level rise in combination with storm events and other coastal dynamics – to include Southern California.

Coastal protection strategies can include the restoration of tidal marshes, judiciously-placed coastal armoring, and beach renourishment for highly accessed urban locations (e.g., adding large volumes of sand, an expensive solution lasting only 1-2 years). However, by 2050, with increasing sea-level rise and coastal storms, localities may begin to consider retreat strategies.

The restoration of marine plants and seaweeds in coastal environments is a tactic that could increase dissolved oxygen levels, at least for local areas. Ocean and coastal vegetation including marshes also sequester carbon, and quantifying the locations and contributions that marine plants can make to reducing carbon dioxide in local waters is needed. Other actions include reducing nutrient runoff from sewage disposal and excess agricultural fertilizer.

OCEAN CONDITIONS

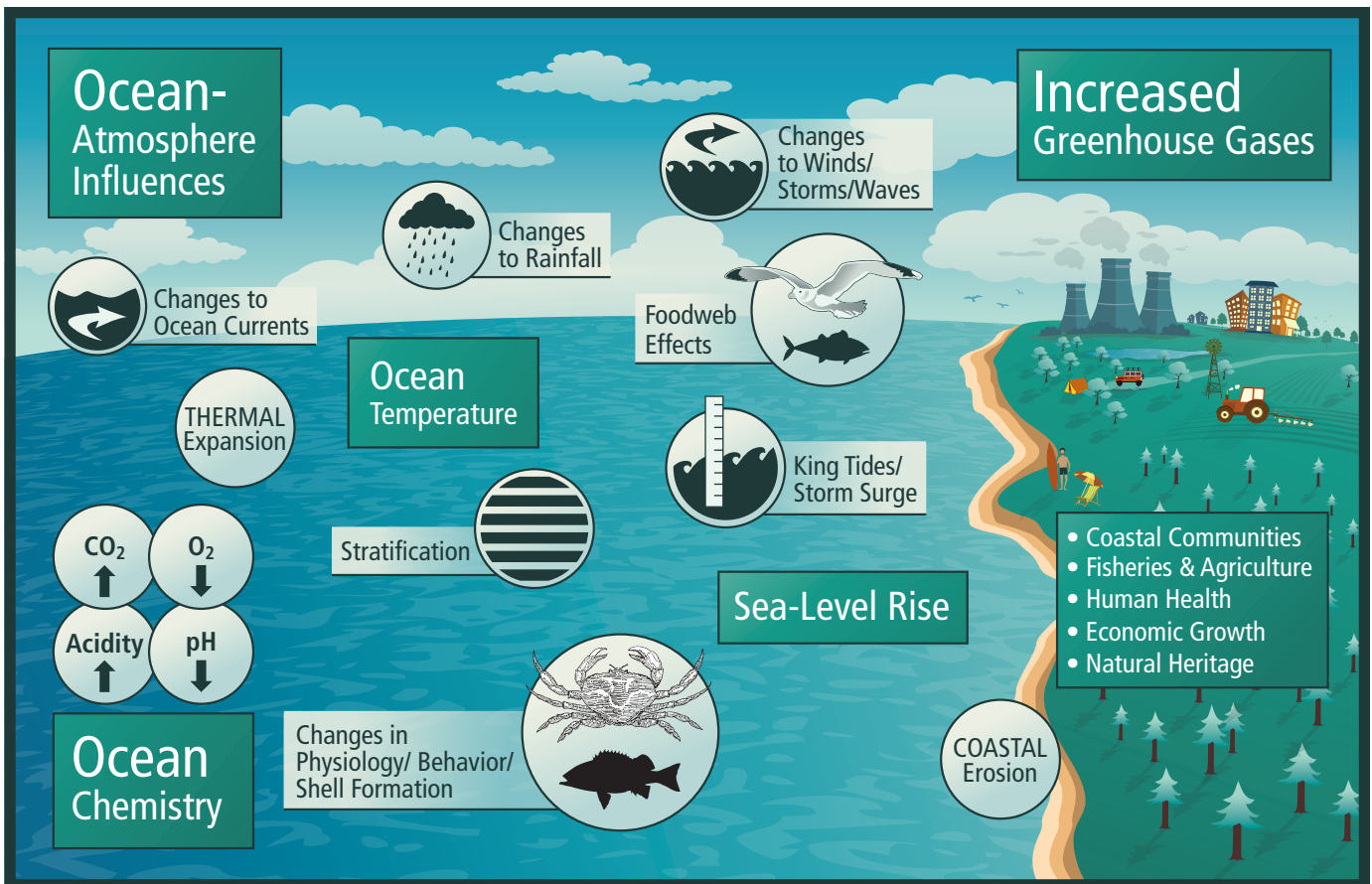
The ocean has been absorbing atmospheric carbon dioxide, which diminishes the amount of greenhouse gases in the atmosphere and slows the rate of climate warming but causes the ocean to become more acidic. However, its capacity to do so will decrease. Improving our understanding of the overlapping effects of rising

temperature, ocean acidification, and identifying potential survival thresholds for species or ecosystems will allow us to make better-informed decisions and improve management options to reduce future losses and impacts.

Ocean warming, ocean chemistry changes, sea-level rise, and other greenhouse gas-driven changes to California's ocean and coast – those already occurring and projected – will have significant consequences for California's coastal economy, communities, ecosystems, culture, and heritage. Reducing greenhouse gas emissions is the most effective long-term solution to man-made climate change and ocean acidification.

IMPACT FROM CLIMATE CHANGE: Climate extremes and ocean acidification are already impacting shellfish in California. Acidification affects shell-building species by decreasing the carbonate ions available in the water that they need to build their shells, causing larvae to essentially dissolve at certain acidities.

ACTION FOR RESILIENCE: A Fourth Assessment study found a species of mussel can be an important "indicator species" for California to help us understand the biological and chemical processes altering ocean waters, potentially pointing the way to strategies that are more effective for mitigating the harmful effects of acidification.



Climate change can affect many parts of the ocean ecosystem including what species can live in the ocean, foodwebs, winds and storms, ocean currents, sea level rise, and ocean chemistry, particularly the acidity of the water and the level of dissolved oxygen held in the water.

Building Capacity to Address Local Impacts

For climate adaptation to be effective there is a need for action from all levels of government. Adaptation planning and actions at the community level will need regional and local context. The sector-specific analyses and advanced projections developed as part of the Fourth Assessment are key to increasing resilience against natural disasters and enabling effective local action.

EMERGENCY MANAGEMENT AND DISASTER PREVENTION

Climate change is making major disasters more frequent and destructive, and emergency managers are starting to ensure their capacity matches growing challenges. A Fourth Assessment study found that \$1.7 billion of critical facilities for emergency response, like dispatch centers and fire stations, are at risk to wildfire or flood damage by 2100, and researchers developed a tool to assess emergency infrastructure vulnerability.

IMPACT FROM CLIMATE CHANGE: In the City of Los Angeles, eight days of power disruption due to a prolonged heat wave would pose critical threats to lifeline systems such as treated water, supplies, and access to air conditioning.

ACTION FOR RESILIENCE: Integrated maps of interconnected emergency services systems can help make practitioners more aware of the importance of cascading events and geographically-connected impacts (teleconnections) and can support effective efforts to prevent or otherwise mitigate them.

Another Fourth Assessment study shows that interconnected systems are vulnerable to disasters in ways that may be beyond the traditional jurisdictional scope of local emergency managers. Maps of interconnected lifeline systems will be needed to recognize and prepare for cascading effects of climate impacts.

Proactive planning for future urban growth will be particularly important to avoid loss of life and property in the future. Avoiding residential growth in areas at high risk of wildfire and other forms of “climate-smart development” will be critical to reducing vulnerability to climate change. Future research is needed on the interplay between climate risk and development patterns.

LOCAL AND REGIONAL GOVERNMENTS

In order to address the impacts of climate change, California’s local and regional governments must build institutional capacity to ensure the resilience of individuals, communities, natural systems, and infrastructure. The Fourth Assessment explores the social aspects of preparing people and communities to grapple with and adapt to the imminent impacts of climate change, particularly in light of the high cost of natural disasters and other climate change-related events.

In addition to the social aspects of preparing communities for the impacts of natural disasters and recovery, local governments must identify strategies to deal with the financial burden estimated to be in the tens of billions of dollars. Given the potentially high cost of inaction, climate adaptation is a highly cost-effective option for governments to pursue.

A Fourth Assessment study found that models that can quantify risks to people’s assets can help engage stakeholders who may be reluctant to participate in discussions of climate vulnerability and adaptation by allowing them to see how their communities will experience the impacts of extreme climate-related events.

While California’s three prior climate change assessments were focused on developing climate models and assessing climate change impacts, the Fourth Assessment prioritized an additional focus: identifying actions for successful climate change adaptation across different sectors and regions.

IMPACT FROM CLIMATE CHANGE: A Fourth Assessment study found that funding and financing challenges are among the top barriers to adaptation, with these challenges exacerbated by a number of organizational barriers such as limited local government staff and lack of technical capacity, agency leadership, and stakeholder partnerships.

ACTION FOR RESILIENCE: As part of the Fourth Assessment, the Adaptation Capability Advancement Toolkit, termed Adapt-CA, was created to help local governments overcome common organizational barriers and advance their capability to implement climate change adaptation measures. The Toolkit can help local governments assess their existing

capabilities for climate adaptation and identify concrete actions to advance their capabilities for more effective planning and implementation of climate change adaptation activities.

View the Adaptation Capability Advancement Toolkit (Adapt-CA) at:

www.arccalifornia.org/adapt-ca

The Alliance of Regional Collaboratives for Climate Adaptation represents networks across California that are building resilience to regional impacts. It hosts the Adapt-CA Toolkit.

To support action at the local scale, the Fourth Assessment includes reports for 9 regions of the state. These summary reports were included for the first time as part of the State's assessment process in part because the vast majority of adaptation planning and implementation will happen at the local and regional scales. Each of these regional reports provides a summary of relevant climate impacts, adaptation solutions, and local initiatives. As previously mentioned, the Fourth Assessment also includes three summary reports on climate justice, tribal and indigenous communities, and the coast and ocean. Like the regional summary reports, each of these 3 reports was designed to catalyze discussions, planning, and actions to understand and address climate vulnerability.

The map on this page shows the regions and the icon for all 12 summary reports.



The Fourth Assessment produced nine regional reports and three topical reports to provide greater detail for the public on the climate change risks and potential adaptation strategies for California.

These reports, the statewide summary report, 44 technical research reports, and other resources are available on the Fourth Assessment website:

www.ClimateAssessment.ca.gov

Acknowledgments

Multiple sources of funding, dozens of state agencies, and hundreds of researchers from public universities, federal agencies, and the private sector – not to mention a wide range of stakeholders – made California’s Fourth Climate Change Assessment possible. There is not enough space here to list every person who contributed to the Fourth Assessment, but additional acknowledgments can be found at www.ClimateAssessment.ca.gov.

Thank you to everyone who contributed to the Fourth Assessment!

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**Guidelines for Energy Project
Applications Requiring CEQA Compliance:
*Pre-filing and Proponent's Environmental Assessments***

November 2019

Version 1.0

Energy Division
Infrastructure Permitting and CEQA Unit
California Public Utilities Commission



Guidelines for Energy Project Applications Requiring CEQA Compliance:

Pre-filing and Proponent’s Environmental Assessments

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Foreword

November 12, 2019

To: Applicants Filing Proponent’s Environmental Assessments for Energy Infrastructure Projects at the California Public Utilities Commission (CPUC or Commission)

From: Merideth Sterkel (Program Manager, Infrastructure Planning and Permitting) and Mary Jo Borak and Lon Maier, Supervisors, Infrastructure Permitting and California Environmental Quality Act, Energy Division, CPUC

Subject: Introducing revisions to the Pre-filing Guidelines for Energy Infrastructure Projects and a Unified and Updated Electric and Gas PEA Checklist

We are pleased to release a 2019 revision to the California Environmental Quality Act (CEQA) Proponent’s Environmental Assessments (PEA) Checklist. This substantially revised document is now entitled “Guidelines for Energy Project Applications Requiring CEQA Compliance: Pre-filing and Proponent’s Environmental Assessments” (Guidelines). Future updates to this document will be made as determined necessary. The CPUC’s Rules of Practice and Procedure Sections 2.4 provide that all applications to the CPUC for authority to undertake projects that are not statutorily or categorically exempt from CEQA requirements shall include an Applicant-prepared PEA.

Updates Overview

Prior versions of the Working Draft PEA Checklist were published in 2008 and 2012. For this 2019 update, extensive revisions were made to all sections based on our experience with the prior checklist versions. All electric and natural gas projects are now addressed in a single PEA Checklist, and the following updates were made:

- **CEQA Statute and Guidelines 2019 Updates:** The PEA Checklist is updated pursuant to the 2019 CEQA Statutes and Guidelines, including new energy and wildfire resource areas.
- **Pre-filing Consultation Guidelines:** Pre-filing guidelines are now provided since the pre-filing and PEA development processes are intertwined.
- **Unified PEA Checklist for Energy Projects:** All electric and natural gas projects are now addressed in a single PEA Checklist.
- **Additional CEQA Impact Questions:** Questions are included for the following PEA Checklist sections: 5.4, Biological Resources; 5.6, Energy; 5.9, Hazards, Hazardous Materials, and Public Safety; 5.16, Recreation; 5.17, Transportation; and 5.19, Utilities and Service Systems.
- **CPUC Draft Environmental Measures:** Draft measures are provided in PEA Checklist Attachment 4 for Aesthetics, Air Quality, Cultural Resources, Greenhouse Gas Emissions, Utilities and Service Systems and Wildfire.

Purpose of the Guidelines Document

The purpose and objective of the PEA Checklist included within this Guidelines document has not changed, which is to provide project Proponents (Applicants) with detailed guidance about information our CEQA Unit Staff expect in sufficient PEAs. The document details the information Applicants must provide the CPUC to complete environmental reviews that satisfy CEQA requirements. Specifically, the Pre-filing Consultation Guidelines and PEA Checklist, together, are intended to achieve the following objectives:

1. Provide useful guidance to Applicants, CPUC staff, and outside consultants regarding the type and detail of information needed to quickly and efficiently deem an application complete;

2. Ensure PEAs provide reviewers with a detailed project description and associated information sufficient to deem an application complete, avoid lengthy review periods and numerous data requests for the purpose of augmenting a PEA, and avoid unnecessary PEA production costs;
3. Increase the level of consistency between PEAs submitted and provide for more consistent review by CPUC CEQA Unit Staff and outside consultants; and
4. Promote transparency and reduce the potential for conflicts between utility and CPUC Staff about the types, scope, and thoroughness of data expected for data adequacy purposes.

The Guidelines document provides detailed instructions to Applicants for use during the Pre-filing process and PEA development. The document is intended to fully inform Applicants and focus the role of outside consultants, thus, enabling Applicants to submit more complete, useful, and immediately data-adequate PEAs.

Benefits of High Quality and Complete PEAs

CPUC CEQA Unit Staff seek to complete the environmental review process required under CEQA as quickly and efficiently as possible. Table 1 shows the average duration in months of CPUC applications that require CEQA documents. While there are tensions between speed and quality in all project management, the achievement of expeditious environmental reviews can result in lower project costs to ratepayers. Our staff have reviewed the timelines for 108 past CPUC applications that required review pursuant to CEQA and determined that the average length of time from application filing to PEA deemed complete is four months, regardless of the type of CEQA document. The goal for our agency is to deem PEAs complete within 30 days. The faster PEAs are deemed complete, the sooner staff can prepare the CEQA document. With each delay to PEA completeness, the fundamental project purpose and need and baseline circumstances may shift, requiring refreshing of the data. The Guidelines document will improve the initial accuracy of PEAs and reduce the time required to deem PEAs complete. Once an application is formally filed, the Applicant will receive a notification letter from CPUC CEQA Unit Staff when the PEA is deemed complete.

Table 1. Average Duration in Months of CPUC Applications that Require CEQA Documents (1996–2019)

	I: Application Filed to PEA Deemed Complete	II: PEA Deemed Complete to Draft Environmental Document Circulated	III: Draft Environmental Document to Final Released	IV: Final Released to Proposed Decision	V: Proposed Decision to Final Decision (with Certification of CEQA Document)	I-V: Overall Duration ⁽¹⁾
Environmental Impact Report (EIR; n=49)	5	13	7	5	2	29
Initial Study/ Mitigated Negative Declaration (IS/MND; n=56)	4	8	3	4	1	19
All Document Types (n=108)	4	8	4	5	2	23
Range: All Document Types	1-9	5-18	2-10	1-7	1-2	12-38

Note:

(1) The overall duration is not a sum of the average durations for each step. The overall duration was calculated using “n,” the number of applications with data available for the date of application filing and final decision date. Not all projects had data available for each step. The data include several instances where the CEQA document was developed in conjunction with a NEPA document, e.g., an EIR/Environmental Impact Statement or IS/MND/Environmental Assessment/Finding of No Significant Impact was prepared instead of an EIR or MND, respectively. The above data is not inclusive of projects that had averages and ranges that are statistically abnormal.

Lessons Learned about the PEA Process

In the past, Applicants have filed PEAs using the checklist to ensure the correct information was provided but have not followed the format and organization of the PEA checklist and sometimes chose not to engage in Pre-filing activities with our staff. To achieve the objectives and benefits listed above, Applicants will file all future PEAs in the same organizational format as the updated checklist and adhere to the Pre-filing Consultation Guidelines in coordination with CPUC CEQA Unit Staff.

The Guidelines document describes the level effort required for the assessments necessary to not only finalize a CEQA document but ensure its legal defensibility. While final design and survey information is preferred, the PEA may incorporate preliminary design and survey data as appropriate and in consultation with CEQA Unit Staff during Pre-filing. We recognize that projects are fact specific, and deviations from the Pre-filing Consultation Guidelines and PEA Checklist are inevitable but providing concise and accurate information as soon as possible is paramount. Any deviations from these Guidelines must include clear justification and should be discussed and submitted during the Pre-filing Consultation process to avoid subsequent delays.

The PEA Checklist is written with the assumption that an Environmental Impact Report will be prepared, however, a Mitigated Negative Declaration or other form of CEQA document (e.g., exemption) may be appropriate. This determination, however, must be made in consultation with CPUC CEQA Unit Staff during Pre-filing and prior to submittal of the Draft PEA.

Future Modifications and Improvements

Like the predecessor PEA checklists, this is a working document that will be modified over time based on experience and changes to the CEQA Statute and Guidelines. To meet the above stated objectives and maintain consistency with CEQA. We expect Applicants, their consultants, CPUC consultants, and the CPUC to engage in a regular and ongoing dialogue about specific improvements to the CEQA process overall, and these Guidelines in particular.

We look forward to working with Applicants during the Pre-filing Consultation process to ensure that the level of effort that goes into preparing PEAs can be effectively and efficiently transferred into the CEQA document prepared by CPUC Staff and consultants. Applicants are invited to debrief with our staff about the efficacy of these Guidelines.

Merideth Sterkel

/s/

Program Manager, Infrastructure Planning and Permitting
California Public Utilities Commission

Mary Jo Borak

/s/

Supervisor, Infrastructure Permitting and CEQA Unit
California Public Utilities Commission

Lonn Maier

/s/

Supervisor, Infrastructure Permitting and CEQA Unit
California Public Utilities Commission

Pre-Filing Consultation Guidelines

The following Pre-filing Consultation Guidelines apply to all PEAs filed with applications to the CPUC and outline a process for Applicants to engage with CPUC CEQA Unit Staff about upcoming projects that will require environmental review pursuant to CEQA. The CPUC is typically the Lead Agency for large projects by investor-owned gas and electric utilities. The CPUC's CEQA Unit Staff are experienced with developing robust CEQA documents for long, linear energy projects. The PEA Checklist, starting in the next section, is based upon that experience.

Pre-filing Consultation Process

During Pre-filing Consultation, Applicants and CPUC Staff meet to discuss the upcoming application. Successful projects will commence Pre-filing Consultation no less than six months prior to application filing at the CPUC. When the application is formally filed at the CPUC, the Application and the PEA are submitted to the CPUC Docket Office.

1. Meetings with CPUC Staff

To initiate Pre-filing Consultation, Applicants will request and attend a meeting with CPUC CEQA Unit Staff at least six months prior to application filing.

- a. Applicants can request a Pre-Filing Consultation meeting via email or letter. Initial contact via telephone may occur, but staff request written documentation of Pre-filing Consultation commencement.
- b. For the initial meeting, Applicants will provide staff with a summary of the proposed project including maps and basic GIS data at least one week prior to the meeting.
- c. Applicants will receive initial feedback on the scope of the proposed project and PEA. Staff will work with Applicants to establish a schedule for subsequent Pre-filing meetings and milestones.

2. Consultant Resources

CPUC CEQA Unit Staff will initiate the consultant contract immediately following the initial Pre-filing Consultation meeting. CPUC's consultant contract resources will be executed prior to Applicant filing of the Draft PEA. The consultant contract is critical to the Pre-filing Consultation process. Applicants are encouraged to request updates about the status of the contract. The CPUC may use its on-call consulting resources contract for these purposes. If CEQA Unit Staff determine that their on-call consulting resources are not appropriate due to the anticipated project scope, staff may initiate a request for proposals process to engage consulting resources, and the resulting contracting process will be completed and consultant contract in place prior to Draft PEA filing.

3. Draft PEA Provided Prior to PEA Filing

A complete Draft PEA will be filed at least three months prior to application filing. CPUC CEQA Unit Staff and the CPUC consultant team will review and provide comments on the Draft PEA to the Applicant early in the three-month period to allow time for Applicant revisions to the PEA.

4. Project Site Visits

One or more site visits will be scheduled with CPUC CEQA Unit Staff and their consultant at the time of Draft PEA filing (or prior). Appropriate federal, state, and local agencies will also be engaged at this time.

5. Consultation with Public Agencies

The Applicant and CPUC CEQA Unit Staff will jointly reach out and conduct consultation meetings with public agencies and other interested parties in the project area. CPUC CEQA Unit Staff may also choose to conduct separate consultation meetings if needed.

If a federal agency will be a co-lead pursuant to the National Environmental Policy Act and coordinating with the CPUC during the environmental review process, the Applicant and CPUC CEQA Unit Staff will ensure that the agency has the opportunity to comment on the Draft PEA and participate jointly with the CPUC throughout the application review process. Applicant and Commission CEQA Unit Staff coordination with the federal agency (if applicable) will likely need to occur more than six months in advance of application filing.

6. Alternatives Development

PEAs will be drafted with the assumption that an Environmental Impact Report (EIR) will be prepared. Applicants will include a reasonable range of alternatives in the PEA (even though a Mitigated Negative Declaration [MND] may ultimately be prepared), including sufficient information about each alternative. In some situations, CPUC CEQA Unit Staff and project Applicants may agree during Pre-filing Consultation that an MND is likely and a reasonable range of alternatives is not required for the PEA. This determination, however, must be made in consultation with CEQA Unit Staff during Pre-filing and is not final. The type of document to be prepared may change based on public scoping results and other findings during the environmental review process.

CEQA Unit Staff will provide feedback on the range of alternatives prior to Draft PEA filing (if possible) based on their review of the Draft PEA. It is critical that Applicants receive feedback from CEQA Unit Staff about the range of alternatives prior to filing the PEA. Applicants will ensure that each alternative is described and evaluated in the PEA with an equal level of detail as the proposed project unless otherwise instructed in writing by CEQA Unit Staff.

7. Format of PEA Submittal

Each PEA submittal will include the completed PEA Checklist tables. Each PEA submittal will be formatted and organized as shown in the Example PEA Table of Contents provided in the PEA Checklist unless otherwise directed by CPUC CEQA Unit Staff in writing prior to application filing. The example PEA Table of Contents is modeled after typical CPUC EIRs.

8. Transmission and Distribution System Information

A key component of CEQA projects analyzed during CPUC environmental reviews is the context of the project within the larger transmission and distribution system. Detailed descriptions of the regional transmission system, including GIS data, to which the proposed project would interconnect are required. The required level of detail about interconnecting systems is project specific and will be specified by CEQA Unit Staff in writing during Pre-filing Consultation. Detailed distribution system information may also be required.

9. Data and Technical Adequacy

Applicants will focus PEA development efforts on providing thorough, up-to-date data and technical reports required for CPUC CEQA Unit Staff to complete the environmental document and alternatives analysis.

The Applicant-drafted PEA Executive Summary, Introduction, Project Description, Description of Alternatives, and other chapters typically found in past CPUC EIRs and Initial Study/MNDs will be *thorough*—emulate the level of detail provided in typical CPUC EIRs. The setting sections provided for

PEA Chapter 5, Environmental Analysis, will also be thorough. Applicants will ensure that the PEA text, graphics, and file formats can be efficiently converted into CPUC's CEQA document with minimal revision, reformatting, and redevelopment by CPUC Staff and consultants.

The impact analyses and determinations provided for Chapter 5, Environmental Analysis, and Chapter 6, Comparison of Alternatives, need not be as thorough as those to be prepared by the CPUC for its CEQA document. These two sections are expected to be revised and redeveloped by CPUC Staff and consultants. Other sections of the CEQA document will only be revised and redeveloped by CPUC Staff and consultants if determined to be necessary after PEA filing.

10. Applicant Proposed Measures

The Pre-filing Consultation process can support the development Applicant Proposed Measures (APMs); measures that Applicants incorporate into the PEA project description to avoid or reduce what otherwise may be considered significant impacts. APMs that use phrases, such as, "as practicable," "as needed," or other conditional language will be superseded by Mitigation Measures if required to avoid or reduce a potentially significant impact. CPUC CEQA Unit Staff and their consultant team may review and provide comments on the Draft PEA APMs during Pre-filing Consultation.

Applicants will carefully consider each CPUC Draft Environmental Measure identified in Chapter 5 of this PEA Checklist. The measures may be applied to the proposed project if appropriate and may be subject to modification by the CPUC during its environmental review.¹

11. PEA Checklist Deviations

CPUC CEQA Unit Staff understand that the PEA Checklist requires Applicants to develop a significant quantity of information. There are times when it is appropriate to deviate from the PEA Checklist. Deviations to the Pre-Filing Consultation Guidelines or the PEA Checklist contents may be approved by the CPUC's CEQA Unit Staff. Staff approval will be in writing and will occur prior to Applicant filing of the Draft PEA. Note that any deviations approved in writing by staff during the Pre-filing period may be reversed or modified after application and PEA filing and at any time throughout the environmental review period at the discretion of CPUC CEQA Unit Staff.

12. Submittal of Confidential Information

CPUC Staff are available during Pre-filing Consultation to discuss concerns that Applicants may have about confidentiality. However, the CEQA process requires public disclosure about projects, and such disclosure can often appear to conflict with Applicant requests for confidentiality. CPUC CEQA Unit Staff will rely on CPUC adopted confidentiality procedures to resolve confidentiality concerns. Applicants that expect aspects of a PEA filing to be confidential must follow CPUC confidentiality procedures. Applicants may mark information as confidential if allowed pursuant to General Order 66 or latest applicable Commission rule (e.g., see Public Records Act Proceeding Rulemaking (R.14-11-001)).

13. Additional CEQA Impact Questions

Additional CEQA Impact Questions that are specific to the types of projects evaluated by the Commission's CEQA Unit are identified in the PEA Checklist to be considered in addition to the checklist items in CEQA Guidelines Appendix G.

The next section of this Guidelines document provides the PEA Checklist for all energy project applications that require CEQA compliance.

¹ At this time, the CPUC environmental measures are in draft format, see PEA Checklist Attachment 4. They may be formally incorporated into Chapter 5 of future versions of the PEA Checklist.

Proponent's Environmental Assessment (PEA) Checklist

The PEA Checklist provides project Applicants (e.g., projects involving electric transmission lines, electric substations or switching stations, natural gas transmission pipelines, and underground natural gas storage facilities) with detailed guidance regarding the level of detail CPUC CEQA Unit Staff expect to deem PEAs complete. Applicants will prepare their PEAs using the same section headers and numbering as provided in the PEA Checklist. Applicants will also provide supporting data that is specific to each item within the PEA Checklist. As noted in the Pre-Filing Consultation Guidelines, the PEA Checklist is written with the assumption that an EIR will be prepared. PEA contents may not need to support the development of an EIR, but this determination can only be made in consultation with CPUC CEQA Unit Staff as described in the Pre-Filing Consultation Guidelines.

Formatting and Basic PEA Data Needs, Including GIS Data

1. Provide **editable and fully functional source files** in electronic format for all PDF files, hardcopies, maps, images, and diagrams. Files will be provided in their original file format as well as the output file format. All Excel and other spreadsheet files or modeling files will include all underlying formulas/modeling details. All modeling files must be fully functional.
2. Details about the types of **GIS data and maps** to be submitted are provided in Attachment 1. GIS data not specified in this checklist may also be requested depending on the Proposed Project and alternatives.
3. The Applicant is responsible for ensuring that all project features, including project components and temporary and permanent work areas, are included within all **survey boundaries** (e.g., biological and cultural resources).
4. Excel spreadsheets with **emissions calculations** will be provided that are complete with all project assumptions, values, and formulas used to prepare emissions calculations in the PEA. Accompanying PDF files with the same information will be provided as Appendix B to the PEA (see List of Appendices below).
5. Applicants will provide in an Excel spreadsheet a comprehensive **mailing list** that includes the names and addresses of all affected landowners and residents, including unit numbers for multi-unit properties for both the proposed project and alternatives.
 - a. An affected resident or landowner is defined as one whose place of residence or property is:
 - i. Crossed by or abuts any component of the proposed project or an alternative including any permanent or temporary disturbance area (either above or below ground) and any extra work area (e.g., staging or parking area); or
 - ii. Located within approximately 1,000 feet² of the edge of any construction work area.
 - b. Include in the following information for each resident in a spreadsheet, at minimum: parcel APN number, owner name and mailing address, and parcel physical address. If individual occupant names, facility names, or business names are available, also provide these names and addresses in the spreadsheet. A sample mailing list format is provided in Table 2.

² Notice to all property owners within 300 feet of a Proposed Project is required at the time of application filing under GO 131-D. Commission notices of CEQA document preparation may be mailed to residents and property owners greater than 300 feet from a Proposed Project to ensure adequate notification (e.g., 1,000 feet) and the extent of notification will be determined on a project specific basis. Appropriate notice expectations will be discussed during Pre-filing (e.g., with respect to visual impact areas and other types of impacts specific to the Proposed Project and its study area).

Table 2. Sample Project Mailing List

Category	Company/ Agency	Name	Mailing Address	Phone Number	Email	APN	Source
State Agency	California Resources Agency	John Doe	1234 California Street City, CA 98765	(333) 456-7899	john DOE@email.com	123-456-789	County Assessor
Individual	n/a	Jane Doe	222 Main Street City, CA 97531	(909) 876-5432	jane DOE@email.com	101-202-303	Public meeting on Month, Day 2019

6. **PEA Organization:** This PEA Checklist is organized to include each of the chapters and sections found in typical CPUC EIRs. The following sections will serve as the outline for all Draft PEAs submitted during Pre-filing and all PEAs filed with the CPUC Docket Office. PEAs will include each chapter and section identified (in matching numerical order) unless otherwise directed by CPUC CEQA Unit Staff in writing prior to filing.

Cover

A single sheet with the following information:	Applicant Notes, Comments
Title "Proponent's Environmental Assessment" and filing date	
Proponent Name (the Applicant)	
Name of the proposed project ³	
Technical subheading summarizing the type of project and its major components, in one sentence or about 40 words, for example: A new 1,120 MVA, 500/115kV substation, 10 miles of new singled-circuit 500kV transmission lines, 25 miles of new and replaced double-circuit 115kV power lines, and upgrades at three existing substations are proposed.	
Location of the proposed project (all counties and municipalities or map figure for the cover that shows the areas crossed)	
Proceeding for which the PEA was prepared and CPUC Docket number (if known) or simply leave a blank where the Docket number would go	
Primary Contact's name, address, telephone number, and email address for both the project Applicant(s) and entities that prepared the PEA	
See example PEA cover in Figure 1.	

³ If approved by the California Independent System Operator (CAISO), the project name listed will match the name specified in the CAISO approval. If multiple names apply, list all versions.

Figure 1. Example PEA Cover



Proponent's Environmental Assessment for California Utility Company's Evergreen Electric Substation and Transmission Line Project

May 1, 2019 (PEA filing date)

A new 230 kV substation, 10 miles of new single-circuit 230kV transmission lines, and upgrades at two existing substations are proposed.

The Proposed Project would be located primarily in __ County but would also cross __ and __ counties and areas within the City of __.

Application A.19-05-01 to the California Public Utilities Commission

*Prepared by California Environmental
Consulting
1234 Avenue
City, CA Zip Code
Primary Contact's Name
Position
Phone Number
Email*

*Prepared for California Utility Company
1234 Avenue
City, CA Zip Code
Primary Contact's Name
Position
Phone Number
Email*

Table of Contents

Sections

Order	The format of the PEA will be organized as follows:	Applicant Notes, Comments
--	Cover	
--	Table of Contents, List of Tables, List of Figures, List of Appendices	
1	Executive Summary	
2	Introduction	
3	Proposed Project Description	
4	Description of Alternatives	
5	Environmental Analysis	
5.1	Aesthetics	
5.2	Agriculture and Forestry	
5.3	Air Quality	
5.4	Biological Resources	
5.5	Cultural Resources	
5.6	Energy	
5.7	Geology, Soils, and Paleontological Resources	
5.8	Greenhouse Gas Emissions	
5.9	Hazards, Hazardous Materials, and Public Safety	
5.10	Hydrology and Water Quality	
5.11	Land Use and Planning	
5.12	Mineral Resources	
5.13	Noise	
5.14	Population and Housing	
5.15	Public Services	
5.16	Recreation	
5.17	Transportation	
5.18	Tribal Cultural Resources	
5.19	Utilities and Service Systems	
5.20	Wildfire	
5.21	Mandatory Findings of Significance	
6	Comparison of Alternatives	

7	Cumulative Impacts and Other CEQA Considerations	
8	List of Preparers	
9	References ⁴	
--	Appendices	

Required PEA Appendices and Supporting Materials

Order	Title	Applicant Notes, Comments
Appendix A	Detailed Maps and Design Drawings	
Appendix B	Emissions Calculations	
Appendix C	Biological Resources Technical Reports (see Attachment 2)	
Appendix D	Cultural Resources Studies (see Attachment 3)	
Appendix E	Detailed Tribal Consultation Report ⁵	
Appendix F	Environmental Data Resources Report, Phase I Environmental Site Assessment, or similar hazardous materials report	
Appendix G	Agency Consultation and Public Outreach Report and Records of Correspondence	
Appendix H	Construction Fire Prevention Plan ⁶	

Potentially Required⁷ Appendices and Supporting Materials

Order	Title	Applicant Notes, Comments
Appendix I	Noise Technical Studies	
Appendix J	Traffic Studies	
Appendix K	Geotechnical Investigations (may preliminary at time of PEA filing)	
Appendix L	Hazardous Substance Control and Emergency Response Plan / Hazardous Waste and Spill Prevention Plan	

⁴ References will be organized by section but contained in a single chapter called, "References."

⁵ Include summary and timing of all correspondence to and from any Tribes and the State Historic Preservation Office/Native American Heritage Commission, including Sacred Lands File search results, and full description of any issues identified by Tribes in their interactions with the Applicant.

⁶ The Construction Fire Prevention Plan will be provided to federal, state, and local fire agencies for review and comment as applicable to where components of the proposed project would be located. CPUC will approve the final Construction Fire Prevention Plan. Record of the request for review and comment and any comments received from these agencies will be provided to CPUC CEQA Unit Staff.

⁷ Anticipated Appendix and study requirements should be discussed with CPUC CEQA Unit Staff during Pre-filing.

Appendix M	Erosion and Sedimentation Control Best Management Practice Plan / Draft Storm Water Pollution Prevention Plan (may be preliminary at time of PEA filing)	
Appendix N	FAA Notice and Criteria Tool Results	
Appendix O	Revegetation or Site Restoration Plan	
Appendix P	Health and Safety Plan	
Appendix Q	Existing Easements ⁸	
Appendix R	Blasting Plan (may be preliminary at time of PEA filing)	
Appendix S	Traffic Control/Management Plan (may be preliminary at time of PEA filing)	
Appendix T	Worker Environmental Awareness Program (may preliminary at time of PEA filing)	
Appendix U	Helicopter Use and Safety Plan (may be preliminary at time of PEA filing)	
Appendix V	Electric and Magnetic Fields Management Plan (may be part of the Application rather than the PEA)	

⁸ Easements should be provided military lands, conservation easements, or other lands where the real estate agreement specifies the range of activities that can be conducted

1 Executive Summary

This section will include, but is not limited to, the following:	PEA Section and Page Number ⁹	Applicant Notes, Comments
1.1: Proposed Project Summary. Provide a summary of the proposed project and its underlying purpose and basic objectives.		
1.2: Land Ownership and Right-of-Way Requirements. Provide a summary of the existing and proposed land ownership and rights-of-way for the proposed project.		
1.3: Areas of Controversy. Identify areas of anticipated controversy and public concern regarding the project.		
1.4: Summary of Impacts <ul style="list-style-type: none"> a) Identify all impacts expected by the Applicant to be potentially significant. Identify and discuss Applicant Proposed Measures here and provide a reference to the full listing of Applicant Proposed Measures provided in the table described in Section 3.11 of this PEA Checklist. b) Identify any significant and unavoidable impacts that may occur. 		
1.5: Summary of Alternatives. Summarize alternatives that were considered by the Applicant and the process and criteria that were used to select the proposed project.		
1.6: Pre-filing Consultation and Public Outreach Summary. Briefly summarize Pre-filing consultation and public outreach efforts that occurred and identify any significant outcomes that were incorporated into the proposed project.		
1.7: Conclusions. Provide a summary of the major PEA conclusions.		
1.8: Remaining Issues. Describe any major issues that must still be resolved.		

⁹ The *PEA Section and Page Number* column and *Applicant Notes, Comments* column are intended to be filled out and provided with PEA submittals. The PEA Checklist is provided in Word to all Applicants to allow column resizing as appropriate to reduce PEA checklist length when completed for submittal. Landscape formatting may also be appropriate for completed PEA Checklist tables.

2 Introduction

2.1 Project Background

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>2.1.1: Purpose and Need</p> <ul style="list-style-type: none"> a) Explain why the proposed project is needed. b) Describe localities the proposed project would serve and how the project would fit into the local and regional utility system. c) If the proposed project was identified by the California Independent System Operator (CAISO), thoroughly describe the CAISO's consideration of the proposed project and provide the following information: <ul style="list-style-type: none"> i. Include references to all CAISO Transmission Planning Processes that considered the proposed project. ii. Explain if the proposed project is considered an economic, reliability, or policy-driven project or a combination thereof. iii. Identify whether and how the Participating Transmission Owner recommended the project in response to a CAISO identified need, if applicable. iv. Identify if the CAISO approved the original scope of the project or an alternative and the rationale for their approval either for the original scope or an alternative. v. Identify how and whether the proposed project would exceed, combine, or modify in any way the CAISO identified project need. vi. If the Applicant was selected as part of a competitive bid process, identify the factors that contributed to the selection and CAISO's requirements for in-service date. d) If the project was not considered by the CAISO, explain why. 		
<p>(Natural Gas Storage Only)</p> <ul style="list-style-type: none"> e) Provide storage capacity or storage capacity increase in billion cubic feet. If the project does not increase capacity, make this statement. f) Describe how existing storage facilities will work in conjunction with the proposed project. Describe the purchasing process (injection, etc.) and transportation arrangements this facility will have with its customers. 		
<p>2.1.2: Project Objectives</p> <ul style="list-style-type: none"> a) Identify and describe the basic project objectives.¹⁰ The objectives will include reasons for constructing the project based on its 		

¹⁰ Tangential project goals should not be included as basic project objectives, such as, minimizing environmental impacts, using existing ROWs and disturbed land to the maximum extent feasible, ensuring safety during construction and operation, building on property already controlled by the Applicant/existing site control. Goals of this type do not describe the underlying purpose or basic objectives but, rather, are good general practices for all projects.

<p>purpose and need (i.e., address a specific reliability issue). The description of the project objectives will be sufficiently detailed to permit CPUC to independently evaluate the project need and benefits to accurately consider them in light of the potential environmental impacts. The basic project objectives will be used to guide the alternatives screening process, when applicable.</p> <p>b) Explain how implementing the project will achieve the basic project objectives and underlying purpose and need.</p> <p>c) Discuss the reasons why attainment of each basic objective is necessary or desirable.</p>		
<p>2.1.3: Project Applicant(s). Identify the project Applicant(s) and ownership of each component of the proposed project. Describe each Applicant’s utility services and their local and regional service territories.</p>		

2.2 Pre-filing Consultation and Public Outreach¹¹

<p>This section will include, but is not limited to, the following:</p>	<p>PEA Section and Page Number</p>	<p>Applicant Notes, Comments</p>
<p>2.2.1: Pre-filing Consultation and Public Outreach</p> <p>a) Describe all Pre-filing consultation and public outreach that occurred, such as, but not limited to:</p> <ul style="list-style-type: none"> i. CAISO ii. Public agencies with jurisdiction over project areas or resources that may occur in the project area iii. Native American tribes affiliated with the project area iv. Private landowners and homeowner associations v. Developers for large housing or commercial projects near the project area vi. Other utility owners and operators vii. Federal, state, and local fire management agencies <p>b) Provide meeting dates, attendees, and discussion summaries, including any preliminary concerns and how they were addressed and any project alternatives that were suggested.</p> <p>c) Clearly identify any significant outcomes of consultation that were incorporated into the proposed project.</p> <p>d) Clearly identify any developments that could coincide or conflict with project activities (i.e., developments within or adjacent to a proposed ROW).</p>		
<p>2.2.2: Records of Consultation and Public Outreach. Provide contact information, notification materials, meeting dates and materials, meeting notes, and records of communication organized by entity as an Appendix to the PEA (Appendix G).</p>		

¹¹ CPUC CEQA Unit Staff request that consultation and public outreach that occurs during the Pre-filing period and throughout environmental review include the assigned CPUC Staff person and CPUC consultant.

2.3 Environmental Review Process

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
2.3.1: Environmental Review Process. Provide a summary of the anticipated environmental review process and schedule.		
2.3.2: CEQA Review a) Explain why CPUC is the appropriate CEQA Lead agency. b) Identify other state agencies and any federal agencies that may have discretionary permitting authority over any aspect of the proposed project. c) Identify all potential involvement by federal, state, and local agencies not expected to have discretionary permitting authority (i.e., ministerial actions). d) Summarize the results of any preliminary outreach with these agencies as well as future plans for outreach.		
2.3.3: NEPA Review (if applicable). If review according to the National Environmental Policy Act (NEPA) is expected, explain the portions of the project that will require the NEPA review process. Discuss which agency is anticipated to be the NEPA Lead agency if discretionary approval by more than one federal agency is required.		
2.3.4: Pre-filing CEQA and NEPA Coordination. Describe the results of Pre-filing coordination with CEQA and NEPA review agencies (refer to CPUC’s Pre-Filing Consultation Guidelines). Identify major outcomes of the Pre-filing coordination process and how the information was incorporated into the PEA, including suggestions on the type of environmental documents and joint or separate processes based on discussions with agency staff.		

2.4 Document Organization

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
2.4: PEA Organization. Summarize the contents of the PEA and provide an annotated list of its sections.		

3 Proposed Project Description¹²

3.1 Project Overview

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.1: Project Overview</p> <ul style="list-style-type: none"> a) Provide a concise summary of the proposed project and components in a few paragraphs. b) Described the geographical location of the proposed project (i.e., county, city, etc.). c) Provide an overview map of the proposed project location. 		

3.2 Existing and Proposed System

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.2.1: Existing System</p> <ul style="list-style-type: none"> a) Identify and describe the existing utility system that would be modified by the proposed project, including connected facilities to provide context. Include detailed information about substations, transmission lines, distribution lines, compressor stations, metering stations, valve stations, nearby renewable generation and energy storage facilities, telecommunications facilities, control systems, SCADA systems, etc. b) Provide information on users and the area served by the existing system features. c) Explain how the proposed project would fit into the existing local and regional systems. d) Provide a schematic diagram of the existing system features. e) Provide detailed maps and associated GIS data for existing facilities that would be modified by the proposed project. 		
<p>3.2.2: Proposed Project System</p> <ul style="list-style-type: none"> a) Describe the whole of the proposed project by component, including all new facilities and any modifications, upgrades, or expansions to existing facilities and any interrelated activities that are part of the whole of the action. b) Clearly identify system features that would be added, modified, removed, disconnected and left in place, etc. c) Identify the expected capacities of the proposed facilities, highlighting any changes from the existing system. If the project would not change existing capacities, make this statement. For electrical projects, provide the anticipated capacity increase in amps or megawatts or in the typical units for the types of facilities proposed. For gas projects, provide the total volume of gas to be 		

¹² Applicant review of the Administrative Draft Project Description or sections of the Administrative Draft Project Description prepared for the CEQA document may be requested by CPUC CEQA Unit Staff to ensure technical accuracy.

<p>delivered by the proposed facilities, anticipated system capacity increase (typically in million cubic feet per day), expected customers, delivery points and corresponding volumes, and the anticipated maximum allowable operating pressure(s).</p> <p>d) Describe the initial buildout and eventual full buildout of the proposed project facilities. For example, if an electrical substation or gas compressor station would be installed to accommodate additional demand in the future, then include the designs for both the initial construction based on current demand and the design for all infrastructure that could ultimately be installed within the planned footprint of an electric substation or compressor station.</p> <p>e) Explain whether the electric line or gas pipeline will create a second system tie or loop for reliability.</p> <p>f) Provide information on users and the area served by the proposed system features, highlighting any differences from the existing system.</p> <p>g) Provide a schematic diagram of the proposed system features.</p> <p>h) Provide detailed maps and associated GIS data for proposed facilities that would be installed, modified, or relocated by the proposed project.</p>		
<p>3.2.3: System Reliability. Explain whether the electric line or gas pipeline will create a second system tie or loop for reliability. Clearly explain and show how the proposed project relates to and supports the existing utility systems.</p>		
<p>3.2.4: Planning Area. Describe the system planning area served or to be served by the project. Clearly define the Applicant’s term for the planning area (e.g., Electrical Needs Area or Distribution Planning Area).</p>		

3.3 Project Components

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
Required for all Project Types		
3.3.1: Preliminary Design and Engineering		
<p>a) Provide preliminary design and engineering information for all above-ground and below-ground facilities for the proposed project. The approximate locations, maximum dimensions of facilities, and limits of areas that would be needed to construction and operate the facilities should be clearly defined.¹³</p> <p>b) Provide preliminary design drawings for project features and explain the level of completeness (i.e., percentage).</p> <p>c) Provide detailed project maps (approximately 1:3,000 scale) and associated GIS data of all facility locations and boundaries with attributes and spatial geometry that corresponds to information in the Project Description.</p>		

¹³ Refer to Attachment 1 for mapping and GIS data requirements for the project layout and design.

<p>3.3.2: Segments, Components, and Phases</p> <ul style="list-style-type: none"> a) Define all project segments, components, and phases for the proposed project. b) Provide the length/area of each segment or component, and the timing of each development phase. c) Provide an overview map showing each segment and provide associated GIS data (may be combined with other mapping efforts). 		
<p>3.3.3: Existing Facilities</p> <ul style="list-style-type: none"> a) Identify the types of existing facilities that would be removed or modified by the proposed project (i.e., conductor/cable, poles/towers, substations, switching stations, gas storage facilities, gas pipelines, service buildings, communication systems, etc.). b) Describe the existing facilities by project segment and/or component, and provide information regarding existing dimensions, areas/footprints, quantities, locations, spans, etc. c) Distinguish between above-ground and below-ground facilities and provide both depth and height ranges for each type of facility. For poles/towers, provide the installation method (i.e., foundation type or direct bury), and maximum above-ground heights and below-ground depths. d) Explain what would happen to the existing facilities. Would they be replaced, completely removed, modified, or abandoned? Explain why. e) Identify the names, types, materials, and capacity/volumes ranges (i.e., minimum and maximum) of existing facilities that would be installed or modified by the proposed project. f) Provide diagrams with dimensions representing existing facilities to provide context on how the proposed facilities would be different. g) Briefly describe the surface colors, textures, light reflectivity, and any lighting of existing facilities. 		
<p>3.3.4: Proposed Facilities</p> <ul style="list-style-type: none"> a) Identify the types of proposed facilities to be installed or modified by the proposed project (e.g., conductor/cable, poles/towers, substations, switching stations, gas storage facilities, gas pipelines, service buildings, communication systems). b) Describe the proposed facilities by project segment and/or component, and provide information regarding maximum dimensions, areas/footprints, quantities, locations, spans, etc. c) Distinguish between above-ground and below-ground facilities and provide both depth and height ranges for each type of facility. For poles/towers, provide the installation method (i.e., foundation type or direct bury), and maximum above-ground heights and below-ground depths. 		

<ul style="list-style-type: none"> d) Identify where facilities would be different (e.g., where unique or larger poles would be located, large guy supports or snub poles). e) Provide details about civil engineering requirements (i.e., permanent roads, foundations, pads, drainage systems, detention basins, spill containment, etc.). f) Distinguish between permanent facilities and any temporary facilities (i.e., poles, shoo-fly lines, mobile substations, mobile compressors, transformers, capacitors, switch racks, compressors, valves, driveways, and lighting). g) Identify the names, types, materials, and capacity/volumes ranges (i.e., minimum and maximum) of proposed facilities that would be installed or modified by the proposed project. h) Provide diagrams with dimensions representing existing facilities. i) Briefly describe the surface colors, textures, light reflectivity, and any lighting of proposed facilities. 		
3.3.5: Other Potentially Required Facilities		
<ul style="list-style-type: none"> a) Identify and describe in detail any other actions or facilities that may be required to complete the project. For example, consider the following questions: <ul style="list-style-type: none"> i. Could the project require the relocation (temporary or permanent), modification, or replacement of unconnected utilities or other types of infrastructure by the Applicant or any other entity? ii. Could the project require aviation lighting and/or marking? iii. Could the project require additional civil engineering requirements to address site conditions or slope stabilization issues, such as pads and retaining walls, etc.? b) Provide the location of each facility and a description of the facility. 		
3.3.6: Future Expansions and Equipment Lifespans		
<ul style="list-style-type: none"> a) Provide detailed information about the current and reasonably foreseeable plans for expansion and future phases of development. b) Provide the expected usable life of all facilities. c) Describe all reasonably foreseeable consequences of the proposed project (e.g., future ability to upgrade gas compressor station to match added pipeline capacity). 		
Required for Certain Project Types		
3.3.7: Below-ground Conductor/Cable Installations (as Applicable)		
<ul style="list-style-type: none"> a) Describe the type of line to be installed (e.g., single circuit cross-linked polyethylene-insulated solid-dielectric, copper-conductor cables). b) Describe the type of casing the cable would be installed in (e.g., concrete-encased duct bank system) and provide the dimensions of the casing. 		

<p>c) Describe the types of infrastructure would likely be installed within the duct bank (e.g., transmission, fiber optics, etc.).</p>		
<p>3.3.8: Electric Substations and Switching Stations (as Applicable)</p> <p>a) Provide the number of transformer banks that will be added at initial and full buildout of the substation. Identify the transformer voltage and number of each transformer type.</p> <p>b) Identify any gas insulated switchgear that will be installed within the substation.</p> <p>c) Describe any operation and maintenance facilities, telecommunications equipment, and SCADA equipment that would be installed within the substation.</p>		
<p>3.3.9: Gas Pipelines (as Applicable). For each segment:</p> <p>a) Identify pipe diameter, number and length of exposed sections, classes and types of pipe to be installed, pressure of pipe, and cathodic protection for each linear segment.</p> <p>b) Describe new and existing inspection facilities (e.g., pig launcher sites).</p> <p>c) Describe system cross ties and laterals/taps.</p> <p>d) Identify the spacing between each valve station.</p> <p>e) Describe the compressor station, if needed, for any new or existing pipeline.</p> <p>f) Describe all pipelines and interconnections with existing and proposed facilities:</p> <ul style="list-style-type: none"> i. Number of interconnections and locations and sizes; ii. All below-ground and above-ground installations; and iii. All remote facility locations for metering, telemetry, control. 		
<p>3.3.10: Gas Storage Facilities – Background and Resource Information (as Applicable)</p> <p>a) Provide detailed background information on the natural gas formation contributing to the existing or proposed natural gas facility, including the following:</p> <ul style="list-style-type: none"> i. Description of overlying stratigraphy, especially caps ii. Description of production, injection, and intervening strata iii. Types of rock iv. Description of types of rocks in formation, including permeability or fractures v. Thickness of strata <p>b) Provide a graphic and/or table showing formation thicknesses.</p> <p>c) Identify and describe any potential gas migration pathways, such as faults, permeable contacts, abandoned wells, underground water or other pipelines.</p> <p>d) Provide a summary and detailed cross-section diagrams of the geologic formations and structures of the oil/gas field or area.</p> <p>e) Provide the first well drilling and production history, abandonment procedures, inspections, etc.</p> <p>f) Describe production zones, including depth, types of formations, and characteristics of field/area.</p>		

<p>g) Describe the existing and proposed storage capacity and limiting factors, such as injection or withdrawal capacities.</p> <p>h) Describe existing simulation studies that were used to predict the reservoir pressure response under gas injection and withdrawal operations, and simulation studies for how the system would change as proposed. Provide the studies as a PEA Appendix.</p> <p>i) Provide the history of the oil/gas field or area.</p>		
<p>3.3.11: Gas Storage Facilities – Well-Head Sites (as Applicable). Describe the location, depth, size and completion information for all existing, abandoned, proposed production and injection, monitoring, and test wells.</p>		
<p>3.3.12: Gas Storage Facilities – Production and Injection (as Applicable)</p> <p>a) Provide the proposed storage capacity of production and injection wells.</p> <p>b) Provide production and injection pressures, depths, and rates.</p> <p>c) Provide production and injection cycles by day, week, and year.</p> <p>d) Describe existing and proposed withdrawal/production wells (i.e., size, depth, formations, etc.).</p> <p>e) Describe existing and proposed cushion gas requirements.</p> <p>f) Describe any cushion gas injection—formation the well is completed in (cushion gas formation), and injection information.</p>		
<p>3.3.13: Gas Storage Facilities – Electrical Energy (as Applicable). Describe all existing and proposed electric lines, telecommunications facilities, and other utilities/facilities (e.g., administrative offices, service buildings, and non-hazardous storage), and chemical storage associated with the proposed project.</p>		
<p>3.3.14: Telecommunication Lines (as Applicable)</p> <p>a) Identify the type of cable that is proposed and length in linear miles by segment.</p> <p>b) Identify any antenna and node facilities that are part of the project.</p> <p>c) For below-ground telecommunication lines, provide the depth of cable and type of conduit.</p> <p>d) For above-ground telecommunication lines, provide:</p> <ul style="list-style-type: none"> i. Types of poles that will be installed (if new poles are required) ii. Where existing poles will be used iii. Any additional infrastructure (e.g., guy wires) or pole changes required to support the additional cable on existing poles 		

3.4 Land Ownership, Rights-of-Way, and Easements

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.4.1: Land Ownership. Describe existing land ownership where each project component would be located. State whether the proposed</p>		

project would be located on property(ies) owned by the Applicant or if additional property would be required.		
<p>3.4.2: Existing Rights-of-Way or Easements</p> <p>a) Identify and describe existing rights-of-way (ROWs) or easements where project components would be located. Provide the approximately lengths and widths in each project area.</p> <p>b) Clearly state if project facilities would be replaced, modified, or relocated within existing ROWs or easements.</p>		
<p>3.4.3: New or Modified Rights-of-Way or Easements</p> <p>a) Describe new permanent or modified ROWs or easements that would be required. Provide the approximately lengths and widths in each project area.</p> <p>b) Describe how any new permanent or modified ROWs or easements would be acquired.</p> <p>c) Provide site plans identifying all properties/parcels and partial properties/parcels that may require acquisition and the anticipated ROWs or easements. Provide associated GIS data.</p> <p>d) Describe any development restrictions within new ROWs or easements, e.g., building clearances and height restrictions, etc.</p> <p>e) Describe any relocation or demolition of commercial or residential property/structures that may be necessary.</p>		
<p>3.4.4: Temporary Rights-of-Way or Easements</p> <p>f) Describe temporary ROWs or easements that would be required to access project areas, including ROWs or easements for temporary construction areas (i.e., staging areas or landing zones).</p> <p>g) Explain where temporary construction areas would be located with existing ROWs or easements for the project or otherwise available to the Applicant without a temporary ROW or easement.</p> <p>h) Describe how any temporary ROWs or easements would be acquired.</p>		

3.5 Construction

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.5.1 Construction Access (All Projects)		
<p>3.5.1.1: Existing Access Roads</p> <p>a) Provide the lengths, widths, ownership details (both public and private roads), and surface characteristics (i.e., paved, graveled, bare soil) of existing access roads that would be used during construction. Provide the area of existing roads that would be used (see example in Table 3 below).</p> <p>b) Describe any road modifications or stabilization that would be required prior to construction, including on the adjacent road</p>		

shoulders or slopes. Identify any roads that would be expanded and provide the proposed width increases. c) Describe any procedures to address incidental road damage cause by project activities following construction. d) Provide detailed maps and associated GIS data for all existing access roads.		
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Table 3. Access Roads

Type of Road	Description	Area Proposed Project
Existing Dirt Road	Typically double track. May have been graded previously. No other preparation required, although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	_____ acres
New Permanent	Would be xx feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	_____ acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	_____ acres

<p>3.5.1.2: New Access Roads</p> a) Identify any new access roads that would be developed for project construction purposes, such as where any blading, grading, or gravel placement could occur to provide equipment access outside of a designated workspace. ¹⁴ b) Provide lengths, widths, and development methods for new access roads. c) Identify any temporary or permanent gates that would be installed. d) Clearly identify any roads that would be temporary and fully restored following construction. Otherwise it will be assumed the new access road is a permanent feature. e) Provide detailed maps and associated GIS data for all new access roads.		
<p>3.5.1.3: Overland Access Routes</p> a) Identify any overland access routes that would be used during construction, such as where vehicles and equipment would travel over existing vegetation and where blading, grading, or gravel placement would occur. b) Provide lengths and widths for new access roads. c) Provide detailed maps and associated GIS data for all overland access routes.		
<p>3.5.1.4: Watercourse Crossings</p> a) Identify all temporary watercourse crossings that would be required during construction. Provide specific methods and procedures for temporary watercourse crossings.		

¹⁴ Temporary roads that would not require these activities should be considered an overland route.

<ul style="list-style-type: none"> b) Describe any bridges or culverts that replacement or installation of would be required for construction access. c) Provide details about the location, design and construction methods. 		
<p>3.5.1.5: Helicopter Access. If helicopters would be used during construction:</p> <ul style="list-style-type: none"> a) Describe the types and quantities of helicopters that would be used during construction (e.g., light, medium, heavy, or sky crane), and a description of the activities that each helicopter would be used for. b) Identify areas for helicopter takeoff and landing. c) Describe helicopter refueling procedures and locations. d) Describe flight paths, payloads, and expected hours and durations of helicopter operation. e) Describe any safety procedures or requirements unique to helicopter operations, such as but not limited to obtaining a Congested Area Plan from the Federal Aviation Administration (FAA). 		
<p>3.5.2 Staging Areas (All Projects)</p>		
<p>3.5.2.1: Staging Area Locations</p> <ul style="list-style-type: none"> a) Identify the locations of all staging area(s). Provide a map and GIS data for each.¹⁵ b) Provide the size (in acres) for each staging area and the total staging area requirements for the project. 		
<p>3.5.2.2: Staging Area Preparation</p> <ul style="list-style-type: none"> a) Describe any site preparation required, if known, or generally describe what might be required (i.e., vegetation removal, new access road, installation of rock base, etc.). b) Describe what the staging area would be used for (i.e., material and equipment storage, field office, reporting location for workers, parking area for vehicles and equipment, etc.). c) Describe how the staging area would be secured. Would a fence be installed? If so, describe the type and extent of the fencing. d) Describe how power to the site would be provided if required (i.e., tap into existing distribution, use of diesel generators, etc.). e) Describe any temporary lightning facilities for the site. f) Describe any grading activities and/or slope stabilization issues. 		

¹⁵ While not all potential local site staging areas will be known prior to selection of a contractor, it is expected that approximate area and likely locations of staging areas be disclosed. The identification of extra or optional staging areas should be considered to reduce the risk of changes after project approval that could necessitate further CEQA review.

3.5.3 Construction Work Areas (All Projects)		
3.5.3.1: Construction Work Areas		
<p>a) Describe known work areas that may be required for specific construction activities (e.g., pole assembly, hillside construction)¹⁶</p> <p>b) Describe the types of activities that would be performed at each work area. Work areas may include but are not necessarily limited to:</p> <ul style="list-style-type: none"> i. Helicopter landing zones and touchdown areas ii. Vehicle and equipment parking, passing, or turnaround areas iii. Railroad, bridge, or watercourse crossings iv. Temporary work pads for facility installation, modification, or removal v. Excavations and associated equipment work areas vi. Temporary guard structures vii. Pull-and-tension/stringing sites viii. Jack and bore pits, drilling areas and pull-back areas for horizontal directional drills ix. Retaining walls 		
3.5.3.2 Work Area Disturbance		
<p>a) Provide the dimensions of each work area including the maximum area that would be disturbed during construction (e.g., 100 feet by 200 feet) (see example in Table 4 below).</p> <p>b) Provide a table with temporary and permanent disturbance at each work area (in square feet or acres), and the total area of temporary and permanent disturbance for the entire project (in acres).</p>		
3.5.3.3: Temporary Power. Identify how power would be provided at work area (i.e., tap into existing distribution, use of diesel generators, etc.). Provide the disturbance area for any temporary power lines.		
3.5.4 Site Preparation (All Projects)		
3.5.4.1: Surveying and Staking. Describe initial surveying and staking procedures for site preparation and access.		
3.5.4.2: Utilities		
<p>a) Describe the process for identifying any underground utilities prior to construction (i.e., underground service alerts, etc.).</p> <p>b) Describe the process for relocating any existing overhead or underground utilities that aren't directly connected to the project system.</p> <p>c) Describe the process for installing any temporary power or other utility lines for construction.</p>		

¹⁶ Understanding that each specific work area may not be determined until the final work plan is submitted by the construction contractor, estimate total area likely to be disturbed.

Table 4. Work Areas

Proposed Project (approximate metrics)	
Pole Diameter:	
• Wood	_____ inches
• Self-Supporting Steel	_____ inches
Lattice Tower Base Dimension:	
• Self-Supporting Lattice Structure	_____ feet
Auger Hole Depth:	
• Wood	_____ to _____ feet
• Self-Supporting Steel	_____ to _____ feet
Permanent Footprint per Pole/Tower:	
• Wood	_____ sq. feet
• Self-Supporting Steel	_____ sq. feet
• Self-Supporting Steel Tower	_____ sq. feet
Number of Poles/Towers:	
• Wood	_____
• Self-Supporting Steel	_____
• Self-Supporting Steel Tower	_____
Average Work Area around Pole/Towers (e.g., for old pole removal and new pole installation):	
• Tangent structure work areas	_____ sq. feet
• Dead End / Angle structure work areas	_____ sq. feet
Total Permanent Footprint for Poles/Towers	
	Approximately _____ acres

<p>3.5.4.3: Vegetation Clearing</p> <p>a) Describe what types of vegetation clearing may be required (e.g., tree removal, brush removal, flammable fuels removal) and why (e.g., to provide access, etc.).</p> <p>b) Provide calculations of temporary and permanent disturbance of each vegetation community and include all areas of vegetation removal in the GIS database. Distinguish between disturbance that would occur in previously developed areas (i.e., paved, graveled, or otherwise urbanized), and naturally vegetated areas.</p> <p>c) Describe how each type of vegetation removal would be accomplished.</p> <p>d) Describe the types of equipment that would be used for vegetation removal.</p>		
<p>3.5.4.4: Tree Trimming Removal</p> <p>a) For electrical projects, distinguish between tree trimming as required under CPUC General Order 95-D and tree removal.</p> <p>b) Identify the types, locations, approximate numbers, and sizes of trees that may need to be removed or trimmed substantially.</p> <p>c) Identify potentially protected trees that may be removed or substantially trimmed, such as but not limited to riparian trees, oaks trees, Joshua trees, or palm trees.</p>		

<p>d) Describe the types of equipment that would typically be used for tree removal.</p>		
<p>3.5.4.5: Work Area Stabilization. Describe the processes to stabilize temporary work areas and access roads including the materials that would be used (e.g., gravel).</p>		
<p>3.5.4.6: Grading</p> <p>a) Describe any earth moving or substantial grading activities (i.e., grading below a 6-inch depth) that would be required and identify locations where it would occur.</p> <p>b) Provide estimated volumes of grading (in cubic yards) including total cut, total fill, cut that would be reused, cut that would be hauled away, and clean fill that would be hauled to the site.</p>		
<p>3.5.5 Transmission Line Construction (Above Ground)</p>		
<p>3.5.5.1: Poles/Towers</p> <p>a) Describe the process and equipment for removing poles, towers, and associated foundations for the proposed project (where applicable). Describe how they would be disconnected, demolished, and removed from the site. Describe backfilling procedures and where the material would be obtained.</p> <p>b) Describe the process and equipment for installing or otherwise modifying poles and towers for the proposed project. Describe how they would be put into place and connected to the system. Identify any special construction methods (e.g., helicopter installation) at specific locations or specific types of poles/towers.</p> <p>c) Describe how foundations, if any, would be installed. Provide a description of the construction method(s), approximate average depth and diameter of excavation, approximate volume of soil to be excavated, approximate volume of concrete or other backfill required, etc. for foundations. Describe what would be done with soil removed from a hole/foundation site.</p> <p>d) Describe how the poles/towers and associated hardware would be delivered to the site and assembled.</p> <p>e) Describe any pole topping procedures that would occur, identify specific locations and reasons, and describe how each facility would be modified. Describe any special methods that would be required to top poles that may be difficult to access.</p>		
<p>3.5.5.2: Aboveground and Underground Conductor/Cable</p> <p>a) Provide a process-based description of how new conductor/cable would be installed and how old conductor/cable would be removed, if applicable.</p> <p>b) Identify where conductor/cable stringing/installation activities would occur.</p> <p>c) Provide a diagram of the general sequencing and equipment that would be used.</p> <p>d) Describe the conductor/cable splicing process.</p>		

<p>e) Provide the general or average distance between pull-and-tension sites. Describe the approximate dimensions and where pull-and-tension sites would generally be required (as indicated by the designated work areas), such as the approximate distance to pole/tower height ratio, at set distances, or at significant direction changes. Describe the equipment that would be required at these sites.</p> <p>f) For underground conductor/cable installations, describe all specialized construction methods that would be used for installing underground conductor or cable. If vaults are required, provide their dimensions and location/spacing along the alignment. Provide a detailed description for how the vaults would be delivered to the site and installed.</p> <p>g) Describe any safety precautions or areas where special methodology would be required (e.g., crossing roadways, stream crossing).</p>		
<p>3.5.5.3: Telecommunications. Identify the procedures for installation of proposed telecommunication cables and associated infrastructure.</p>		
<p>3.5.5.4: Guard Structures. Identify the types of guard structures that would be used at crossings of utility lines, roads, railroads, highways, etc. Describe the different types of guard structures or methods that may be used (i.e., buried poles and netting, poles secured to a weighted object, bucket trucks, etc.). Describe any pole installation and removal procedures associated with guard structures. Describe guard structure installation and removal process and duration that guard structures would remain in place.</p>		
<p>3.5.5.5: Blasting</p> <p>a) Describe any blasting that may be required to construct the project.</p> <p>b) If blasting may be required, provide a Blasting Plan that identifies the blasting locations; types and amounts of blasting agent to be used at each location; estimated impact radii; and, noise estimates. The Blasting Plan should be provided as an Appendix to the PEA.</p> <p>c) Provide a map identifying the locations where blasting may be required with estimated impact radii. Provide associated GIS data.</p>		
<p>3.5.6 Transmission Line Construction (Below Ground)</p>		
<p>3.5.6.1: Trenching</p> <p>a) Describe the approximate dimensions of the trench (e.g., depth, width).</p> <p>b) Provide the total approximate volume of material to be removed from the trench, the amount to be used as backfill, and any amount to subsequently be removed/disposed of offsite in cubic yards.</p> <p>c) Describe the methods used for making the trench (e.g., saw cutter to cut the pavement, backhoe to remove, etc.).</p> <p>d) Provide off-site disposal location, if known, or describe possible option(s).</p> <p>e) Describe if dewatering would be anticipated and if so, how the trench would be dewatered, the anticipated flows of the water,</p>		

<p>whether there would be treatment, and how the water would be disposed of.</p> <ul style="list-style-type: none"> f) Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants that could be exposed from trenching operations. g) If a pre-existing hazardous waste were encountered, describe the process of removal and disposal. h) Describe the state of the ground surface after backfilling the trench. i) Describe standard Best Management Practices to be implemented. 		
<p>3.5.6.2: Trenchless Techniques (Microtunnel, Jack and Bore, Horizontal Directional Drilling)</p>		
<ul style="list-style-type: none"> a) Identify any locations/features for which the Applicant expects to use a trenchless (i.e., microtunneling, jack and bore, horizontal directional drilling) crossing method and which method is planned for each crossing. b) Describe the methodology of the trenchless technique. c) Provide the approximate location and dimensions of the sending and receiving pits. d) Describe the methodology of excavating and shoring the pits. e) Provide the total volume of material to be removed from the pits, the amount to be used as backfill, and the amount subsequently to be removed/disposed of offsite in cubic yards. f) Describe process for safe handling of drilling mud and bore lubricants. g) Describe the process for detecting and avoiding “fracturing-out” during horizontal directional drilling operations. h) Describe the process for avoiding contact between drilling mud/lubricants and stream beds. i) If engineered fill would be used as backfill, indicate the type of engineered backfill and the amount that would be typically used (e.g., the top 2 feet would be filled with thermal-select backfill). j) Describe if dewatering is anticipated and, if so, how the pits would be dewatered, the anticipated flows of the water, whether there would there be treatment, and how the water would be disposed of. k) Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants. Describe the process of disposing of any pre-existing hazardous waste that is encountered during excavation. l) Describe any standard BMPs that would be implemented for trenchless construction. 		
<p>3.5.7 Substation, Switching Stations, Gas Compressor Stations</p>		
<p>3.5.7.1: Installation or Facility Modification. Describe the process and equipment for removing, installing, or modifying any substations, switching stations, or compressor stations including:</p> <ul style="list-style-type: none"> a) Transformers/ electric components b) Gas components c) Control and operation buildings d) Driveways 		

<ul style="list-style-type: none"> e) Fences f) Gates g) Communication systems (SCADA) h) Grounding systems 		
<p>3.5.7.2: Civil Works. Describe the process and equipment required to construct any slope stabilization, drainage, retention basins, and spill containment required for the facility.</p>		
<p>3.5.8 Gas Pipelines</p>		
<p>3.5.8.1: Gas Pipeline Construction. Describe the process for proposed pipeline construction including site development, trenching and trenchless techniques, pipe installation, and backfilling.</p>		
<p>3.5.8.2: Water Crossings. Describe water feature crossings that will occur during trenching, the method of trenching through stream crossings, and the process for avoiding impacts to the water features required for pipeline construction. Identify all locations where the pipeline will cross water features. Cite to any associated geotechnical or hydrological investigations completed and provide a full copy of each report as an Appendix to the PEA.¹⁷</p>		
<p>3.5.8.3: Gas Pipeline Other Requirements</p> <ul style="list-style-type: none"> a) Describe hydrostatic testing process including pressures, timing, source of flushing water, discharge of water. b) Describe energy dissipation basin, and the size and length of segments to be tested. c) Describe pig launching locations and any inline inspection techniques used during or immediately post construction. 		
<p>3.5.9 Gas Storage Facilities</p>		
<p>3.5.9.1: Gas Storage Construction</p> <ul style="list-style-type: none"> a) Describe the process for constructing the gas storage facility including constructing well pads and drilling wells. b) Describe the specific construction equipment that would be used, such as the type of drill rig (i.e., size, diesel, electric, etc.), depth of drilling, well-drilling schedule and equipment. 		
<p>3.5.9.2: Drilling Muds and Fluids. Describe the use of any drilling muds, fluids, and other drilling materials. Provided estimated types and quantities.</p>		
<p>3.5.10 Public Safety and Traffic Control (All Projects)</p>		
<p>3.5.10.1: Public Safety</p> <ul style="list-style-type: none"> a) Describe specific public safety considerations during construction and best management practices to appropriately manage public safety. Clearly state when and where they each safety measure would be applied. 		

¹⁷ If a geotechnical study is not available at the time of PEA filing, provide the best information available.

<p>b) Identify procedures for managing work sites in urban areas, covering open excavations securely, installing barriers, installing guard structures, etc.</p> <p>c) Identify specific project areas where public access may be restricted for safety purposes and provide the approximate durations and timing of restricted access at each location.</p>		
3.5.10.2: Traffic Control		
<p>a) Describe traffic control procedures that would be implemented during construction.</p> <p>b) Identify the locations, process, and timing for closing any sidewalks, lanes, roads, trails, paths, or driveways to manage public access.</p> <p>c) Identify temporary detour routes and locations.</p> <p>d) Provide a preliminary Traffic Control Plan(s) for the project.</p>		
<p>3.5.10.3: Security. Describe any security measures, such as fencing, lighting, alarms, etc. that may be required. State if security personnel will be stationed at project areas and anticipated duration of security.</p>		
<p>3.5.10.4: Livestock. Describe any livestock fencing or guards that may be necessary to prevent livestock from entering project areas. State if the fencing would be electrified and if so, how it would be powered.</p>		
3.5.11 Dust, Erosion, and Runoff Controls (All Projects)		
<p>3.5.11.1: Dust. Describe specific best management practices that would be implemented to manage fugitive dust.</p>		
<p>3.5.11.2: Erosion. Describe specific best management practices that would be implemented to manage erosion.</p>		
<p>3.5.11.3: Runoff. Describe specific best management practices that would be implemented to manage stormwater runoff and sediment.</p>		
3.5.12 Water Use and Dewatering (All Projects)		
<p>3.5.12.1: Water Use. Describe the estimated volumes of water that would be used by construction activity (e.g., dust control, compaction, etc.). State if recycled or reclaimed water would be used and provide estimated volumes. Identify the anticipated sources where the water would be acquired or purchased. Identify if the source of water is groundwater and the quantity of groundwater that could be used.</p>		
<p>3.5.12.2: Dewatering</p> <p>a) Describe dewatering procedures during construction, including pumping, storing, testing, permitted discharging, and disposal requirements that would be followed.</p> <p>b) Describe the types of equipment and workspace considerations to be used to dewater, store, transport, or discharge extracted water.</p>		
3.5.13 Hazardous Materials and Management (All Projects)		
3.5.13.1: Hazardous Materials		
<p>a) Describe the types, uses, and volumes of all hazardous materials that would be used during construction.</p> <p>b) State if herbicides or pesticides may be used during construction.</p>		

<p>c) If a pre-existing hazardous waste were encountered, describe the process of removal and disposal.</p>		
<p>3.5.13.2: Hazardous Materials Management</p>		
<p>a) Identify specific best management practices that would be followed for transporting, storing, and handling hazardous materials. b) Identify specific best management practices that would be followed in the event of an incidental leak or spill of hazardous materials. c) Provide a Hazardous Substance Control and Emergency Response Plan / Hazardous Waste and Spill Prevention Plan as an Appendix to the PEA, if appropriate.</p>		
<p>3.5.14 Waste Generation and Management (All Projects)</p>		
<p>3.5.14.1: Solid Waste</p>		
<p>a) Describe solid waste streams from existing and proposed facilities during construction. b) Identify procedures to be implemented to manage solid waste, including collection, containment, storage, treatment, and disposal. c) Provide estimated total volumes of solid waste by construction activity or project component. d) Describe the recycling potential of solid waste materials and provide estimated volumes of recyclable materials by construction activity or project component. e) Identify the locations of appropriate disposal and recycling facilities where solid wastes would be transported.</p>		
<p>3.5.14.2: Liquid Waste</p>		
<p>a) Describe liquid waste streams during construction (i.e., sanitary waste, drilling fluids, contaminated water, etc.) b) Describe procedures to be implemented to manage liquid waste, including collection, containment, storage, treatment, and disposal. c) Provide estimated volumes of liquid waste generated by construction activity or project component. d) Identify the locations of appropriate disposal facilities where liquid wastes would be transported.</p>		
<p>3.5.14.3: Hazardous Waste</p>		
<p>a) Describe potentially hazardous waste streams during construction and procedures to be implemented to manage hazardous wastes, including collection, containment, storage, treatment, and disposal. b) If large volumes of hazardous waste are anticipated, such as from a pre-existing contaminant in the soil that must be collected and disposed of, provide estimated volumes of hazardous waste that would be generated by construction activity or project component. c) Identify the locations of appropriate disposal facilities where hazardous wastes would be transported.</p>		
<p>3.5.15 Fire Prevention and Response (All Projects)</p>		
<p>3.5.15.1: Fire Prevention and Response Procedures. Describe fire prevention and response procedures that would be implemented during</p>		

construction. Provide a Construction Fire Prevention Plan or specific procedures as an Appendix to the PEA.		
3.5.15.2: Fire Breaks. Identify any fire breaks (i.e., vegetation clearance) requirements around specific project activities (i.e., hot work). Ensure that such clearance buffers are included in the limits of the defined work areas, and the vegetation removal in that area is attributed to Fire Prevention and Response (refer to 3.5.4.3: Vegetation Clearing).		

3.6 Construction Workforce, Equipment, Traffic, and Schedule

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.6.1: Construction Workforce</p> <p>a) Provide the estimated number of construction crew members. In the absence of project-specific data, provide estimates based on past projects of a similar size and type.</p> <p>b) Describe the crew deployment. Would crews work concurrently (i.e., multiple crews at different sites); would they be phased? How many crews could be working at the same time and where?</p> <p>c) Describe the different types of activities to be undertaken during construction, the number of crew members for each activity (i.e. trenching, grading, etc.), and number and types of equipment expected to be used for the activity. Include a written description of the activity. See example in Table 5.</p>		
<p>3.6.2: Construction Equipment. Provide a tabular list of the types of equipment expected to be used during construction of the proposed project including the horsepower. Define the equipment that would be used by each phase as shown in the example table below (Table 5).</p>		

Table 5. Construction Equipment and Workforce

Work Activity				Activity Production				
Equipment Description	Estimated Horse-power	Probable Fuel Type	Equipment Quantity	Estimated Workforce	Estimated Start Date	Estimated End Date	Duration of Use (Hrs./Day)	Estimated Production
Survey				4	January 2020	December 2020		358 Miles
1-Ton Truck, 4x4	300	Diesel	2		January 2020	December 2020	10	1 Mile/Day
Staging Yards				5	DOP			
1-Ton Truck, 4x4	300	Diesel	1		Duration of Project		4	
R/T Forklift	350	Diesel	1				5	
Boom/Crane Truck	350	Diesel	1				5	
Water Truck	300	Diesel	2				10	
Jet A Fuel Truck	300	Diesel	1				4	
Truck, Semi-Tractor	500	Diesel	1				6	
Road Work				6	January 2020	March 2020		426 Miles
1-Ton Truck, 4x4	300	Diesel	2		January 2020	March 2020	5	
Backhoe/Front Loader	350	Diesel	1		January 2020	March 2020	7	
Track Type Dozer	350	Diesel	1		January 2020	March 2020	7	
Motor Grader	350	Diesel	1		January 2020	March 2020	5	
Water Truck	300	Diesel	2		January 2020	March 2020	10	
Drum Type Compactor	250	Diesel	1		January 2020	March 2020	5	
Excavator	300	Diesel	1		January 2020	February 2020	7	
Lowboy Truck/Trailer	500	Diesel	1		January 2020	February 2020	4	

<p>3.6.3: Construction Traffic</p> <p>a) Describe how the construction crews and their equipment would be transported to and from the proposed project site.</p> <p>b) Provide vehicle type, number of vehicles, and estimated hours of operation per day, week, and month for each construction activity and phase.</p> <p>c) Provide estimated vehicle trips and vehicles miles traveled (VMT) for each construction activity and phase. Provide separate values for construction crews commuting, haul trips, and other types of construction traffic.</p>		
<p>3.6.4: Construction Schedule</p> <p>a) Provide the proposed construction schedule (e.g., month and year) for each segment or project component, and for each construction activity and phase.</p> <p>b) Provide and explain the sequencing of construction activities, and if they would or would not occur concurrently.</p> <p>c) Provide the total duration of each construction activity and phase in days or weeks.</p> <p>d) Identify seasonal considerations that may affect the construction schedule, such as weather or anticipated wildlife restrictions, etc. The proposed construction should account for such factors.</p>		
<p>3.6.5: Work Schedule</p> <p>a) Describe the anticipated work schedule, including the days of the week and hours of the day when work would occur. Clearly state if work would occur at night or on weekends and identify when and where this could occur.</p> <p>b) Provide the estimated number of days or weeks that construction activities would occur at each type of work area. For example, construction at a stationary facility or staging area may occur for the entire duration of construction, but construction at individual work areas along a linear project would be limited to a few hours, days or weeks, and only a fraction of the total construction period.</p>		

3.7 Post-Construction

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.7.1: Configuring and Testing. Describe the process and duration for post-construction configuring and testing of facilities. Describe the number of personnel and types of equipment that would be involved.</p>		
<p>3.7.2: Landscaping. Describe any landscaping that would be installed. Provide a conceptual landscape plan that identifies the locations and types of plantings that will be used. Identify whether plantings will include container plants or seeds. Include any water required for landscaping in the description of water use above.</p>		

3.7.3 Demobilization and Site Restoration		
3.7.3.1: Demobilization. Describe the process for demobilization after construction activities, but prior to leaving the work site. For example, describe final processes for removing stationary equipment and materials, etc.		
3.7.3.2: Site Restoration. Describe how cleanup and post-construction restoration would be performed (i.e., personnel, equipment, and methods) on all project ROWs, sites, and extra work areas. Things to consider include, but are not limited to, restoration of the following: a) Restoring natural drainage patterns b) Recontouring disturbed soil c) Removing construction debris d) Vegetation e) Permanent and semi-permanent erosion control measures f) Restoration of all disturbed areas and access roads, including restoration of any public trails that are used as access, as well as any damaged sidewalks, agricultural infrastructure, or landscaping, etc. g) Road repaving and striping, including proposed timing of road restoration for underground construction within public roadways		

3.8 Operation and Maintenance

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
3.8.1: Regulations and Standards a) Identify and describe all regulations and standards applicable to operation and maintenance of project facilities. b) Provide a copy of any applicable Wildfire Management Plan and describe any special procedures for wildfire management.		
3.8.2: System Controls and Operation Staff a) Describe the systems and methods that the Applicant would use for monitoring and control of project facilities (e.g., on-site control rooms, remote facilities, standard monitoring and protection equipment, pressure sensors, automatic shut-off valves, and site and equipment specific for monitoring and control such as at natural gas well pads). b) If new full-time staff would be required for operation and/or maintenance, provide the number of positions and purpose.		
3.8.3: Inspection Programs a) Describe the existing and proposed inspection programs for each project component, including the type, frequency, and timing of scheduled inspections (i.e., aerial inspection, ground inspection, pipeline inline inspections). b) Describe any enhanced inspections, such as within any High Fire Threat Districts consistent with applicable Wildfire Management Plan requirements.		

<p>c) Describe the inspection processes, such as the methods, number of crew members, and how access would occur (i.e., walk, vehicle, all-terrain vehicle, helicopter, drone, etc.). If new access would be required, describe any restoration that would be provided for the access roads.</p>		
<p>3.8.4: Maintenance Programs</p> <p>a) Describe the existing and proposed maintenance programs for each project component.</p> <p>b) Describe scheduled maintenance or facility replacement after the designated lifespan of the equipment.</p> <p>c) Identify typical parts and materials that require regular maintenance and describe the repair procedures.</p> <p>d) Describe any access road maintenance that would occur.</p> <p>e) Describe maintenance for surface or color treatment.</p> <p>f) Describe cathodic protection maintenance that would occur.</p> <p>g) Describe ongoing landscaping maintenance that would occur.</p>		
<p>3.8.5: Vegetation Management Programs</p> <p>a) Describe vegetation management programs within and surrounding project facilities. Distinguish between any different types of vegetation management.</p> <p>b) Describe any enhanced vegetation management, such as within any High Fire Threat Districts consistent with any applicable Wildfire Management Plan requirements. Identify the areas where enhanced vegetation management would be conducted.</p>		

3.9 Decommissioning

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.9.1: Decommissioning. Provide detailed information about the current and reasonably foreseeable plans for the disposal, recycling, or future abandonment of all project facilities.</p>		

3.10 Anticipated Permits and Approvals

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.10.1: Anticipated Permits and Approvals. Identify all necessary federal, state, regional, and local permits that may be required for the project. For each permit, list the responsible agency and district/office representative with contact information, type of permit or approval, and status of each permit with date filed or planned to file. For example:</p> <p>a) Federal Permits and Approvals</p> <ul style="list-style-type: none"> i. U.S. Fish and Wildlife Service ii. U.S. Army Corps of Engineers iii. Federal Aviation Administration iv. U.S. Forest Service 		

<ul style="list-style-type: none"> v. U.S. Department of Transportation – Office of Pipeline Safety vi. U.S. Environmental Protection Agency (Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act) <p>b) State and Regional Permits</p> <ul style="list-style-type: none"> i. California Department of Fish and Wildlife ii. California Department of Transportation iii. California State Lands Commission iv. California Coastal Commission v. State Historic Preservation Office, Native American Heritage Commission vi. State Water Resources Control Board vii. California Division of Oil, Gas and Geothermal Resources viii. Regional Air Quality Management District ix. Regional Water Quality Control Board (National Pollutant Discharge Elimination System General Industrial Storm Water Discharge Permit) x. Habitat Conservation Plan Authority (if applicable) <p>See also Table 6 of example permitting requirements and processes.</p>		
<p>3.10.2: Rights-of-Way or Easement Applications. Demonstrate that applications for ROWs or other proposed land use have been or soon will be filed with federal, state, or other land-managing agencies that have jurisdiction over land that would be affected by the project (if any). Discuss permitting plans and timeframes and provide the contact information at the federal agency(ies) approached.</p>		

3.11 Applicant Proposed Measures

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.11 Applicant Proposed Measures</p> <ul style="list-style-type: none"> a) Provide a table with the full text of any Applicant Proposed Measure. Where applicable, provide a copy of Applicant procedures, plans, and standards referenced in the Applicant Proposed Measures. b) Within Chapter 5, describe the basis for selecting a particular Applicant Proposed Measure and how the Applicant Proposed Measure would reduce the impacts of the project.¹⁸ c) Carefully consider each CPUC Draft Environmental Measure identified in Chapter 5 of this PEA Checklist. The CPUC Draft Environmental Measures will be applied to the proposed project where applicable. 		

¹⁸ Applicant Proposed Measures that use phrases, such as, “as practicable” or other conditional language are not acceptable and will be superseded by Mitigation Measures if required to avoid or reduce a potentially significant impact.

Table 6. Example Permitting Requirements and Processes

Note: In addition to the CPCN or PTC, the applicant may also be required to secure resource agency permits for the project.

Disclaimer: Below is a general list of permits required for transmission projects. Permit requirements for individual projects may vary slightly depending on project conditions.

Agency	Permit	Regulation	Protected Resource	Trigger	Application Process	Timing
<i>Federal</i>						
Army Corps of Engineers	404 Permit	Clean Water Act	Waters of the United States (including wetlands)	Placement of dredge or fill material into waters of the U.S., including wetlands. If project impacts less than 0.5 acres a nationwide permit (NWP) is typically issued	NWP: prepare a preconstruction notification (PCN) along with the draft Corps's application (Engineer Form 4345). Information in the PCN includes, but is not limited to: results of wetland delineation including areas of waters of the U.S.; temporary and permanent impacts to waters of the U.S. and discussion of avoidance; construction techniques, timeline, and equipment that would be used; special status species that potentially occur in the project area, and discussion of mitigation (if applicable) to replace wetlands	NWP: takes approximately nine months from the date of application submittal (depending on level of impacts and level of consultation required by other agencies). Initial review is 30 days after which application is deemed complete or additional information is requested.
				If project would impact more than 0.5 acres a regional or individual permit may be required.	Regional or Individual Permit: Same requirements as NWP as well as preparation and submittal of 404(b)(1) Alternatives analysis which identifies the Least Environmentally Damaging Practicable Alternative (LEDPA). Public notice also required	Regional or Individual Permit: An additional three to six months may be required on top of the nine months expected for an NWP. A 30 day public notice is also required to inform the public about the project before the Corps issues the permit.
USFWS	Section 7 Consultation	Federal Endangered Species Act	Federally Listed Species	Potential impact to a federally listed threatened or endangered species	Biological Assessment (BA) prepared and submitted to Corps. BA contains information on each species and describes potential for "take" of species and/or habitat.	The timeline for processing and receiving a formal Biological Opinion (BO) from USFWS can be six months to a year from when the Corps has initiated consultation and depending on the level of impact to listed species. The typical timeline for issuance of a BO is no less than 135 days after acceptance of the BA as complete.
US Department of Agriculture, Forest Service	Special Use Authorization	National Forest Management Act/NEPA	National Forest lands	Use of federal lands managed by the USDA Forest Service for a transmission line. Typically constitutes a Major Federal Action which in turn triggers NEPA analysis.	Special Use Authorization Application: prepare a special use application for consideration by the Forest Service. Prior to submitting a proposal, applicant is required to arrange a preapplication meeting at the local Forest Service office. Application typically includes project plan, operating plans, liability insurance, licenses/registrations and other documents. If it is determined that NEPA is required either an EA or EIS would be prepared. The NEPA document may be prepared jointly with the CEQA document.	Review of Special Use Authorization applications is often dependent upon what level of NEPA analysis is required. An EA is typically 9-12 months, and EIS is generally 18 months. NEPA process may occur concurrently with CEQA process.
US Department of the Interior, Bureau of Land Management	Right-of-Way Grant	Federal Land Policy and Management Act/NEPA	Federal Lands	Use of federal lands managed by the BLM for a transmission line. Typically constitutes a Major Federal Action which in turn triggers NEPA analysis.	Right-of-Way Application: Contact the BLM office with management responsibility. Obtain an application form "Application for Transportation and Utility Systems and Facilities on Federal Lands". Arrange a pre-application meeting with a BLM Realty Specialist or appropriate staff member. Submit completed application to the appropriate BLM office. If it is determined that NEPA is required either an EA or EIS would be prepared. The NEPA document may be prepared jointly with the CEQA document.	BLM attempts to review completed applications within 60 days of submittal. Full timing is often dependent upon what level of NEPA analysis is required. An EA is typically 9-12 months, and EIS is generally 18 months. NEPA process may occur concurrently with CEQA process.

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Agency	Permit	Regulation	Protected Resource	Trigger	Application Process	Timing
<i>State (continued)</i>						
State Historic Preservation Officer (SHPO)	Section 106 National Historic Preservation Act (NHPA)	National Historic Preservation Act	Cultural and/or historical resources	Required if there are potential impacts to cultural and/or historical resources that are listed or eligible for listing on the National Register of Historic Places.	Information on cultural and historical resources gathered during the draft CEQA document preparation is included in a 106 Technical Report and submitted to the Corps along with the Area of Potential Effect (APE) map. The information is then evaluated by the Corps' cultural resources evaluator for potential adverse effects within the APE. Depending upon the level of potential adverse effect, the Corps then forwards its finding to SHPO for concurrence or begins the process for a Memorandum of Agreement (MOA). Native American consultation is also mandatory for the 106 process but can begin during preparation of the environmental document. All letters and correspondence for the Native American consultation must be provided to the Corps. Consultation with federally-recognized tribes may require a more extensive consultation.	Once SHPO has received the Corps' determination, it has approximately 60 days to agree or request additional information. However, SHPO has recently become more involved in projects and this timeframe is only an estimate and if a potential adverse effect to cultural or historical resources could occur, the SHPO process can take up to a year or more. Depending on the level of impacts to cultural resources, the Corps may determine no effect and issue the permit before receiving concurrence from SHPO.
California State Lands Commission (CSLC)	Right of Way Lease Agreement	Division 6 of the California Public Resources Code	California Sovereign Lands	May be triggered if the transmission line crosses state lands under the jurisdiction of the CSLC, which includes the beds of 1) more than 120 rivers, streams and sloughs; 2) nearly 40 non-tidal navigable lakes, such as Lake Tahoe and Clear Lake; 3) the tidal navigable bays and lagoons; and 4) the tide and submerged lands adjacent to the entire coast and offshore islands of the State from the mean high tide line to three nautical miles offshore.	Leases or permits may be issued to qualified applicants and the Commission shall have broad discretion in all aspects of leasing including category of lease or permit and which use, method or amount of rental is most appropriate, whether competitive bidding should be used in awarding a lease, what term should apply, how rental should be adjusted during the term, whether bonding and insurance should be required and in what amounts, whether an applicant is qualified based on what it deems to be in the best interest of the State.	Most coordination should be done concurrently with the CEQA process to ensure that any CSLC-required issues are addressed under CEQA. Once a final route/alternative is selected, the lease process may take two to three months for final Commission approval.
<i>Local / Other</i>						
Air Quality Management District or Air Pollution Control District	Permit to Construct	Federal Clean Air Act	Air Quality	Depends on the air district involved; may not be required for most transmission projects. Some air districts have a trigger level based on disturbed acreage.	Application forms need to be prepared and submitted to the local AQMD or APCD	Typically 30 to 90 days after submittal of a complete application.

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¹⁹ Permitting is project specific. This table is provided for discussion purposes.

3.12 Project Description Graphics, Mapbook, and GIS Requirements

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>3.12.1: Graphics. Provide diagrams of the following as applicable:</p> <ul style="list-style-type: none"> a) All pole, tower, pipe, vault, conduit, and retaining wall types b) For poles, provide typical drawings with approximate diameter at the base and tip; for towers, estimate the width at base and top. c) A typical detail for any proposed underground duct banks and vaults d) All substation, switchyard, building, and facility layouts e) Trenching, drilling, pole installation, pipe installation, vault installation, roadway construction, facility removal, helicopter uses, conductor installation, traffic control, and other construction activities where a diagram would assist the reader in visualizing the work area and construction approach f) Typical profile views of proposed aboveground facilities and existing facilities to be modified within the existing and proposed ROW (e.g., typical cross-section of existing and proposed facilities by project segment). g) Photos of representative existing and proposed structures 		
<p>3.12.2: Mapbook. Provide a detailed mapbook on an aerial imagery basemap at a scale between 1:3000 and 1:6000 (or as appropriate and legible) that show mileposts, roadways, and all project components and work areas including:</p> <ul style="list-style-type: none"> a) All proposed above-ground and underground structure/facility locations (e.g., poles, conductor, substations, compressor stations, telecommunication lines, vaults, duct bank, lighting, markers, etc.) b) All existing structures/facilities that would be modified or removed c) Identify by milepost where existing ROW will be used and where new ROW or land acquisition will be required. d) All permanent work areas including permanent facility access e) All access roads including, existing, temporary, and new permanent access f) All temporary work areas including staging, material storage, field offices, material laydown, temporary work areas for above ground (e.g., pole installation) and underground facility construction (e.g., trenching and duct banks), helicopter landing zones, pull and tension sites, guard structures, shoo flies etc. g) Areas where special construction methods (e.g., jack and bore, HDD, blasting, retaining walls etc.) may need to be employed 		

<ul style="list-style-type: none"> h) Areas where vegetation removal may occur i) Areas to be heavily graded and where slope stabilization measures would be employed including any retaining walls 		
<p>3.12.3: GIS Data. Provide GIS data for all features and ROW shown on the detailed mapbook.</p>		
<p>3.12.4: GIS Requirements. Provide the following information for each pole/tower that would be installed and for each pole/tower that would be removed:</p> <ul style="list-style-type: none"> a) Unique ID number and type of pole (e.g., wood, steel, etc.) or tower (e.g., self-supporting lattice) both in a table and in the attributes of the GIS data provided b) Identify pole/tower heights and conductor sizes in the attributes of the GIS data provided. 		
<p>3.12.5: Natural Gas Facilities GIS Data. For natural gas facilities, provide GIS data for system cross ties and all laterals/taps, valve stations, and new and existing inspection facilities (e.g., pig launcher sites).</p>		

4 Description of Alternatives

All Applicants will assume that alternatives will be required for the environmental analysis and that an EIR will be prepared unless otherwise instructed by CPUC CEQA Unit Staff in writing prior to application filing. See PEA Requirements at the beginning of this checklist document. The consideration and discussion of alternatives will adhere to CEQA Guidelines Section 15126.6. The description of alternatives will be provided in this chapter of the PEA, and the comparison of each alternative to the proposed project is provided in PEA Chapter 6. The amount of detail required for the description of various alternatives to the proposed project and what may be considered a reasonable range of alternatives will be discussed with CPUC during Pre-filing.

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>4.1 Alternatives Considered. Identify alternatives to the proposed project.²⁰ Include the following:</p> <ul style="list-style-type: none"> a) All alternatives to the proposed project that were suggested, considered, or studied by the CAISO or by CAISO stakeholders b) Alternatives suggested by the public or agencies during public outreach efforts conducted by the Applicant c) Reduced footprint alternatives, including, e.g., smaller diameter pipelines and space for fewer electric transformers d) Project phasing options (e.g., evaluate the full build out for environmental clearance but consider an initial, smaller buildout that would only be expanded [in phases] if needed) e) Alternative facility and construction activity sites (e.g., substation, compressor station, drilling sites, well-head sites, staging areas) f) Renewable, energy conservation, energy efficiency, demand response, distributed energy resources, and energy storage alternatives g) Alternatives that would avoid or limit the construction of new transmission-voltage facilities or new gas transmission pipelines h) Other technological alternatives (e.g., conductor type) i) Route alternatives and route variations j) Alternative engineering or technological approaches (e.g., alternative types of facilities, or materials, or configurations) k) Assign an identification label and brief, descriptive title to each alternative described in this PEA chapter (e.g., Alternative A: No Project; Alternative B: Reduced Footprint 500/115-kV Substation; Alternative C: Ringo Hills 16-inch Pipeline Alignment; Alternative D1: Lincoln Street Route Variation; etc.). Each alternative will be easily identifiable by reading the brief title. <p>Provide a description of each alternative. The description of each alternative will discuss to what extent it would be potentially feasible,</p>		

²⁰ Reduced footprint alternatives; siting alternatives; renewable, energy conservation, energy efficiency, demand response, distributed energy resources, and energy storage alternatives; and non-wires alternatives (electric projects only) are typically required. For linear projects, route alternatives and route variations are typically required as well.

<p>meet the project’s underlying purpose, meet most of the basic project objectives, and avoid or reduce one or more potentially significant impacts. If the Applicant believes that an alternative is infeasible or the implementation is remote and speculative (CEQA Guidelines Section 15126.6(f)(3), clearly explain why.</p> <p>If significant environmental effects are possible without mitigation, alternatives will be provided in the PEA that are capable of avoiding or reducing any potentially significant environmental effects, even if the alternative(s) substantially impede the attainment of some project objectives or are costlier.²¹</p>		
<p>4.2 No Project Alternative. Include a thorough description of the No Project Alternative. The No Project Alternative needs to describe the range of actions that are reasonably foreseeable if the proposed project is not approved. The No Project Alternative will be described to meet the requirements of CEQA Guidelines Section 15126.6(e).</p>		
<p>4.3 Rejected Alternatives. Provide a detailed discussion of all alternatives considered by the Applicant that were not selected by the Applicant for a full description in the PEA and analysis in PEA Chapter 5. The detailed discussion will include the following:</p> <ul style="list-style-type: none"> a) Description of the alternative and its components b) Map of any alternative sites or routes c) Discussion about the extent to which the alternative would meet the underlying purpose of the project and its basic objectives d) Discussion about the feasibility of implementing the alternative e) Discussion of whether the alternative would reduce or avoid any significant environmental impacts of the proposed project f) Discussion of any new significant impacts that could occur from implementation of the alternative g) Description of why the alternative was rejected h) Any comments from the public or agencies about the alternative during PEA preparation 		
<p>For Natural Gas Storage Projects:</p>		
<p>4.4 Natural Gas Storage Alternatives. In addition to the requirements included above, alternatives to be considered for proposed natural gas storage projects include the following, where applicable:</p> <ul style="list-style-type: none"> a) Alternative reservoir locations considered for gas storage including other field locations and other potential storage areas b) Alternative pipelines, road, and utility siting c) Alternative suction gas requirements, and injection/withdrawal options 		

²¹ CPUC CEQA Unit Staff will determine whether an alternative could *substantially* reduce one or more potentially significant impacts of the proposed project (CEQA Guidelines Section 15125.5). Applicants are strongly advised to provide more rather than less alternatives for CPUC’s consideration or as determined during Pre-filing.

5 Environmental Analysis

Include a description of the environmental setting, regulatory setting, and impact analysis for each resource area. The resource areas addressed will include each environmental factor (resource area) identified in the most recent adopted version of the CEQA Guidelines Appendix G checklist and any additional relevant resource areas and impact questions that are defined in this PEA checklist.

1. Environmental Setting
 - a. For each resource area, the PEA will include a detailed description of the natural and built environment in the vicinity of the proposed project area (e.g., topography, land use patterns, biological environment, etc.) as applicable to the resource area. Both regional and local environmental setting information will be provided.
 - b. All setting information provided will relate in some way to the impacts of the proposed project discussed in the PEA's impacts analysis, however CPUC's impacts analysis may be more thorough, which may necessitate additional setting information than the Applicant might otherwise provide.
2. Regulatory Setting
 - a. Organized by federal, State, regional, and local sections
 - b. Describe the policy or regulation and briefly explain why it is applicable to the proposed project.
 - i. Identify in the setting all laws, regulations, and policies that would be applicable for CPUC's exclusive jurisdiction over the siting and design of electric and gas facilities. Public utilities under CPUC's jurisdiction are expected to consult with local agencies regarding land use matters. Local laws, regulations, and policies will be considered for the consideration of potential impacts during CPUC's CEQA review (e.g., encroachment, grading, erosion control, scenic corridors, overhead line undergrounding, tree removal, fire protection, permanent and temporary noise limits, zoning requirements, general plan polices, and all local and regional laws, regulations, and policies).
3. Impact Questions
 - a. Includes all impact questions in the current version of CEQA Guidelines, Appendix G.
 - b. Additional impact questions that are frequently relevant to utility projects are provided in Attachment 4, CPUC Draft Environmental Measures.
4. Impact Analyses
 - a. Discussion organized by CEQA Guidelines, Appendix G impact items and any Additional CEQA Impact Questions in the PEA Checklist. Assess all potential environmental impacts and make determinations, such as, No Impact, Less than Significant, Less than Significant with Mitigation, Significant and Unavoidable, or Beneficial Impact with respect to construction, operations, and maintenance activities.
 - b. The impact analyses provided in PEA Chapter 5, Environmental Analysis, need not be as thorough as those to be prepared by CPUC for the CEQA environmental document. A preliminary determination will be provided but with only brief justification unless otherwise directed by CPUC Staff in writing during Pre-filing.
5. CPUC Draft Environmental Measures
 - a. CPUC Draft Environmental Measures are provided for some of the resource areas in Attachment 4, CPUC Draft Environmental Measures. The measures may be applied to the proposed project as written or modified by the CPUC during its environmental review if the measure would avoid or reduce a potentially significant impact.

- b. The CPUC Draft Environmental Measures should be discussed with the CPUC’s CEQA Unit Staff during Pre-filing, especially with respect to the development of Applicant Proposed Measures.
- c. In general, impact avoidance is preferred to the reduction of potentially significant impacts.

Additional requirements specific to each resource area are identified in the following sections.

5.1 Aesthetics

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.1.1 Environmental Setting		
5.1.1.1: Landscape Setting. Briefly described the regional and local landscape setting.		
5.1.1.2: Scenic Resources. Identify and describe any vistas, scenic highways, national scenic areas, or other scenic resources within and surrounding the project area (approximately 5-mile buffer but may be greater if necessary). Scenic resources may also include but are not limited to historic structures, trees, or other resources that contribute to the scenic values where the project would be located.		
<p>5.1.1.3: Viewshed Analysis</p> <ul style="list-style-type: none"> a) Conduct a viewshed analysis for the project area (approximately 5-mile buffer but may be greater if necessary). b) Describe the project viewshed, including important visibility characteristics for the project site, such as viewing distance, viewing angle, and intervening topography, vegetation, or structures. c) Provide a supporting map (or maps) showing project area, landscape units, topography (i.e., hillshade), and the results of the viewshed analysis. Provide associated GIS data. 		
5.1.1.4: Landscape Units. Identify and describe landscape units (geographic zones) within and surrounding the project area (approximately 5-mile buffer but may be greater if necessary) that categorizes different landscape types and visual characteristics, with consideration to topography, vegetation, and existing land uses. Landscape units should be developed based on the existing landscape characteristics rather than the project’s features or segments.		
5.1.1.5: Viewers and Viewer Sensitivity. Identify and described the types of viewers expected within the viewshed and landscape units. Describe visual sensitivity to general visual change based on viewing conditions, use of the area, feedback from the public about the project, and landscape characteristics.		

<p>5.1.1.6: Representative Viewpoints</p> <p>a) Identify representative viewpoints from publicly accessible locations (up to approximately 5-mile buffer but may be greater if appropriate). The number and location of the viewpoints must represent a range of views of the project site from major roads, highways, trails, parks, vistas, landmarks, and other scenic resources near the project site. Multiple viewpoints should be included where the project site would be visible from sensitive scenic resources to provide context on different viewing distances, perspectives, and directions.</p> <p>b) Provide the following information for each viewpoint:</p> <ul style="list-style-type: none"> i. Number, title, and brief description of the location ii. Types of viewers iii. Viewing direction(s) and distance(s) to the nearest proposed project features iv. Description of the existing visual conditions and visibility of the project site as seen from the viewpoint and shown in the representative photographs <p>c) Provide a supporting map (or maps) showing project features and representative viewpoints with arrows indicating the viewing direction(s). Provide associated GIS data (may be combined with GIS data request below for representative photographs).</p>		
<p>5.1.1.7: Representative Photographs</p> <p>a) Provide high resolution photographs taken from the representative viewpoints in the directions of all proposed project features.²² Multiple photographs should be provided where project features may be visible in different viewing directions from the same location.</p> <p>b) Provide the following information for each photograph:</p> <ul style="list-style-type: none"> i. Capture time and date ii. Camera body and lens model iii. Lens focal length and camera height when taken <p>c) Provide GIS data associated with each photograph location that includes coordinates (<1 meter resolution), elevations, and viewing directions, as well as the associated viewpoint.</p>		
<p>5.1.1.8: Visual Resource Management Areas</p> <p>a) Identify any visual resource management areas within and surrounding the project area (approximately 5-mile buffer).</p> <p>b) Describe any project areas within visual resource management areas.</p>		

²² All representative photographs should be taken using a digital single-lens reflex camera with standard 50-millimeter lens equivalent, which represents an approximately 40-degree horizontal view angle. The precise photograph coordinates and elevations should be collected using a high accuracy GPS unit.

c) Provide a supporting map (or maps) showing project features and visual resource management areas. Provide associated GIS data.		
5.1.2 Regulatory Setting		
5.1.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding aesthetics and visual resource management.		
5.1.3 Impact Questions		
5.1.3.1: Impact Questions. The impact questions include all aesthetic impact questions in the current version of CEQA Guidelines, Appendix G.		
5.1.3.2: Additional CEQA Impact Questions: None.		
5.1.4 Impact Analysis		
5.1.4.1: Visual Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
The following information will be included in the PEA or a technical Appendix to support the aesthetic impact analysis:		
5.1.4.2: Analysis of Selected Viewpoints. Identify the methodology and assumptions that were applied in selecting key observation points for visual simulation. It is recommended that viewpoints are selected where viewers may be sensitive to visual change (public views) and in areas that are visually sensitive, or heavily trafficked or visited. ²³		
<p>5.1.4.3: Visual Simulation</p> <p>a) Identify methodology and assumptions for completing the visual simulations. The simulations should include photorealistic 3-D models of project features and any land changes within the KOP view. The visual simulations should depict conditions:</p> <ul style="list-style-type: none"> i. Immediately following construction, and ii. After vegetation establishment in all areas of temporary impact to illustrate the visual impact from vegetation removal. <p>b) Provide high resolution images for the visual simulations.</p>		
<p>5.1.4.4: Analysis of Visual Change</p> <p>a) Identify the methodology and assumptions for completing the visual change analysis.²⁴ The methodology should be consistent with applicable visual resource management criteria.</p> <p>b) Provide a description of the visual change for each selected viewpoint. Describe any conditions that would change over time, such as vegetation growth.</p>		

²³ The KOP selection process should be discussed with CPUC during Pre-filing

²⁴ The visual impact assessment methodology should be discussed with CPUC during Pre-filing

c) Describe the effects of visual change that would result in the entire project area, as indicated by the selected viewpoints that were simulated and analyzed.		
5.1.4.5: Lighting and Marking. Identify all new sources of permanent lighting. Identify any proposed structures or lines that could require FAA notification. Identify any structures or line segments that could require lighting and marking based on flight patterns and FAA or military requirements. Provide supporting documentation in an Appendix (e.g., FAA notice and criteria tool results).		
5.1.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.2 Agriculture and Forestry Resources

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.2.1 Environmental Setting		
5.2.1.1: Agricultural Resources and GIS		
a) Identify all agricultural resources that occur within the project area including: <ul style="list-style-type: none"> i. Areas designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ii. Areas under Williamson Act contracts and provide information on the status of the Williamson Act contract iii. Any areas zoned for agricultural use in local plans iv. Areas subject to active agricultural use b) Provide GIS data for agricultural resources within the proposed project area.		
5.2.1.2: Forestry Resources and GIS		
a) Identify all forestry resources within the project area including: <ul style="list-style-type: none"> i. Forest land as defined in Public Resources Code 12220(g)25 ii. Timberland as defined in Public Resource Code section 4526 iii. Timberland zoned Timberland Production as defined in Government Code section 51104(g) b) Provide GIS data for all forestry resources within the proposed project area.		
5.2.2 Regulatory Setting		
5.2.2: Agriculture and Forestry Regulations. Identify all federal, state, and local policies for protection of agricultural and forestry resources that apply to the proposed project.		

²⁵ Forest land is defined in Public Resources Code as, “land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.”

5.2.3 Impact Questions		
5.2.3.1: Agriculture and Forestry Impact Questions. The impact questions include all agriculture and forestry impact questions in the current version of CEQA Guidelines, Appendix G.		
5.2.3.2: Additional CEQA Impact Questions: None.		
5.2.4 Impact Analyses		
5.2.4.1: Agriculture and Forestry Impacts. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
Incorporate the following discussions into the analysis of impacts:		
5.2.4.2: Prime Farmland Soil Impacts. Calculate the acreage of Prime Farmland soils that would be affected by construction and operation and maintenance.		
5.2.4.3. Williamson Act Impacts. Describe the approach to resolve potential conflicts with Williamson Act contract (if applicable)		
5.2.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.3 Air Quality

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.3.1 Environmental Setting		
5.3.1.1: Air Quality Plans Identify and describe all applicable air quality plans and attainment areas. Identify the air basin(s) for the project area. If the project is located in more than one attainment area and/or air basin, provide the extent in each attainment area and air basin.		
5.3.1.2: Air Quality. Describe existing air quality in the project area. a) Identify existing air quality exceedance of National Ambient Air Quality Standards and California Ambient Air Quality Standards in the air basin. b) Provide the number of days that air quality in the area exceeds state and federal air standards for each criteria pollutant that where air quality standards are exceeded. c) Provide air quality data from the nearest representative air monitoring station(s).		
5.3.1.3: Sensitive Receptor Locations. Identify the location and types of each sensitive receptor locations ²⁶ within 1,000 feet of the project area. Provide GIS data for sensitive receptor locations.		

²⁶ Sensitive Receptor locations may include hospitals, schools, and day care centers, and such other locations as the air district board or California Air Resources Board may determine (California Health and Safety Code § 42705.5(a)(5)).

5.3.2 Regulatory Setting		
5.3.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding aesthetics and visual resource management.		
5.3.2.2: Air Permits. Identify and list all necessary air permits.		
5.3.3 Impact Questions		
5.3.3.1: Impact Questions. The impact questions include all air quality impact questions in the current version of CEQA Guidelines, Appendix G.		
5.3.3.2: Additional CEQA Impact Questions: None.		
5.3.4 Impact Analysis		
5.3.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
The following information will be presented in the PEA or a technical Appendix to support the air quality impact analysis:		
<p>5.3.4.2: Air Quality Emissions Modeling. Model project emissions using the most recent version of CalEEMod and/or a current version of other applicable modeling program. Provide all model input and output data sheets in Microsoft Excel format to allow CPUC to evaluate whether project data was entered into the modeling program accurately. The assumptions used in the air quality modeling must be consistent with all PEA information about the project’s schedule, workforce, and equipment. The following information will be addressed in the emissions modeling, Air Quality Appendix, and PEA:</p> <ul style="list-style-type: none"> a) Quantify the expected emissions of criteria pollutants from all project-related sources. Quantify emissions for both construction and operation (e.g., compressor equipment). b) Identify manufacturer’s specifications for all proposed new emission sources. For proposed new, additional, or modified compressor units, include the horsepower, type, and energy source. c) Describe any emission control systems that are included in the air quality analysis (e.g., installation of filters, use of EPA Tier II, III, or IV equipment, use of electric engines, etc.). d) When multiple air basins may be affected by the project, model air emissions within each air basin and provide a narrative (supported by calculations) that clearly describes the assumptions around the project activities considered for each air basin. Provide modeled emissions by attainment area or air basin (supported by calculations). 		

5.3.4.3: Air Quality Emissions Summary. Provide a table summarizing the air quality emissions for the project and applicable thresholds for each applicable attainment area. Include a summary of uncontrolled emissions (prior to application of any APMs) and controlled emissions (after application of APMs). Clearly identify the assumptions that were applied in the controlled emissions estimates.		
5.3.4.4: Health Risk Assessment. Complete a Health Risk Assessment when air quality emissions have the potential to lead to human health impacts ²⁷ . If health impacts are not anticipated from project emissions, the analysis should clearly describe why emissions would not lead to health impacts.		
5.3.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.4 Biological Resources

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.4.1 Environmental Setting		
5.4.1.1: Biological Resources Technical Report. Provide a Biological Resources Technical Report as an Appendix to the PEA that includes all information specified in Attachment 2.		
The following biological resources information will be presented in the PEA:		
5.4.1.2: Survey Area (Local Setting). Identify and describe the biological resources survey area as documented in the Biological Resources Technical Report. All temporary and permanent project areas must be within the survey area.		
5.4.1.3: Vegetation Communities and Land Cover <ul style="list-style-type: none"> a) Identify, describe, and quantify vegetation communities and land cover types within the biological resources survey area. b) Clearly identify any sensitive natural vegetation communities that meet the definition of a biological resource under CEQA (i.e., rare, designated, or otherwise protected), such as, but not limited to, riparian habitat. c) Provide a supporting map (or maps) showing project features and vegetation communities and land cover type. 		

²⁷ Refer to Office of Environmental Health Hazard Assessment (OEHHA) most recent guidance for preparation of Health Risk Assessments to determine whether a Health Risk Assessment is required for the project. The need for an HRA should also be discussed with CPUC during Pre-filing.

<p>5.4.1.4: Aquatic Features</p> <ul style="list-style-type: none"> a) Identify, describe, and quantify aquatic features within the biological resources survey area that may provide potentially suitable aquatic habitat for rare and special-status species. b) Identify and quantify potentially jurisdictional aquatic features and delineated wetlands, according to the Wetland Delineation Report and Biological Resources Technical Report. c) Provide a supporting map (or maps) showing project features and aquatic resources. 		
<p>5.4.1.5: Habitat Assessment. Identify rare and special-status species with potential to occur in the project region (approximately a 5-mile buffer but may be larger if necessary). For each species, provide the following information:</p> <ul style="list-style-type: none"> a) Common and scientific name b) Status and/or rank c) Habitat characteristics (i.e., vegetation communities, elevations, seasonal changes, etc.) d) Blooming characteristics for plants e) Breeding and other dispersal (range) behavior for wildlife f) Potential to occur within the survey area (i.e., Present, High Potential, Moderate Potential, Low Potential, or Not Expected), with justification based on the results of the records search, survey findings, and presence of potentially suitable habitat g) Specific types and locations of potentially suitable habitat that correspond to the vegetation communities and land cover and aquatic features 		
<p>5.4.1.6: Critical Habitat</p> <ul style="list-style-type: none"> a) Identify and describe any critical habitat for rare or special-status species within and surrounding the project area (approximately a 5-mile buffer). b) Provide a supporting map (or maps) showing project features and critical habitat. 		
<p>5.4.1.7: Native Wildlife Corridors and Nursery Sites</p> <ul style="list-style-type: none"> a) Identify and describe regional and local wildlife corridors within and surrounding the project area (approximately a 5-mile buffer), including but not limited to, landscape and aquatic features that connect suitable habitat in regions otherwise fragmented by terrain, changes in vegetation, or human development. b) Identify and describe regional and local native wildlife nursery sites within and surrounding the project area (approximately a 5-mile buffer), as identified through the records search, surveys, and habitat assessment. 		

c) Provide a supporting map (or maps) showing project features, native wildlife corridors, and native nursery sites.		
5.4.1.8: Biological Resource Management Areas		
<p>a) Identify any biological resource management areas (i.e., conservation or mitigation areas, HCP or NCCP boundaries, etc.) within and surrounding the project area (approximately 5-mile buffer).</p> <p>b) Identify and quantify any project areas within biological resource management areas.</p> <p>c) Provide a supporting map (or maps) showing project features and biological resource management areas.</p>		
5.4.2 Regulatory Setting		
5.4.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding biological resources.		
5.4.2.2: Habitat Conservation Plan. Provide a copy of any relevant Habitat Conservation Plan.		
5.4.3 Impact Questions		
<p>5.4.3.1: Impact Questions. The impact questions include all biological resource impact questions in the current version of CEQA Guidelines, Appendix G.</p> <p>5.4.3.2: Additional CEQA Impact Question: Would the project create a substantial collision or electrocution risk for birds or bats?</p>		
5.4.4 Impact Analysis		
5.4.4.1: Impact Analysis Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for Biological Resources and any additional impact questions listed above.		
The following information will be included in the impact analysis:		
<p>5.4.4.2: Quantify Habitat Impacts. Provide the area of impact in acres by each habitat type. Quantify temporary and permanent impacts. For all temporary impacts provide the following:</p> <p>a) Description of the restoration and revegetation approach</p> <p>b) Vegetation species that would be planted within the area of temporary disturbance</p> <p>c) Procedures to reduce invasive weed encroachment within areas of temporary disturbance</p> <p>d) Expected timeframe for restoration of the site</p>		
5.4.4.3: Special-Status Species Impacts. Identify anticipated impacts on special-status species. Identify any take permits that are anticipated for the project. If an existing habitat conservation plan (HCP) or natural communities conservation plan (NCCP) would be used for the project, provide current accounting of take coverage included in the HCP/NCCP		

to demonstrate that there is sufficient habitat coverage remaining under the existing permit.		
<p>5.4.4.4: Wetland Impacts. Quantify the area (in acres) of temporary and permanent impacts on wetlands. Include the following details:</p> <ul style="list-style-type: none"> a) Provide a table identifying all wetlands, by milepost and length, crossed by the project and the total acreage of each wetland type that would be affected by construction. b) Discuss construction and restoration methods proposed for crossing wetlands. c) If wetlands would be filled or permanently lost, describe proposed measures to compensate for permanent wetland losses. d) If forested wetlands would be affected, describe proposed measures to restore forested wetlands following construction. 		
<p>5.4.4.5: Avian Impacts. Describe avian obstructions and risk of electrocution from the project. Describe any standards that will be implemented as part of the project to reduce the risk of collision and electrocution.</p>		
5.4.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.5 Cultural Resources²⁸

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.5.1 Environmental Setting		
<p>5.5.1.1: Cultural Resource Reports. Provide a cultural resource inventory and evaluation report that addresses the technical requirement provided in Attachment 3.</p>		
<p>5.5.1.2: Cultural Resources Summary. Summarize cultural resource survey and inventory results and survey methods. Do not provide any confidential cultural resource information within the PEA chapter.</p>		
<p>5.5.1.3: Cultural Resource Survey Boundaries. Provide a map with mileposts showing the boundaries of all survey areas in the report. Provide the GIS data for the survey area. Provide confidential GIS data for the resource locations and boundaries separately under confidential cover.</p>		
5.5.2 Regulatory Setting		
<p>5.5.2.1: Regulatory Setting. Identify applicable federal and state regulations for protection of cultural resources.</p>		

²⁸ For a description and evaluation of cultural resources specific to Tribes, see Section 5.18, Tribal Cultural Resources.

5.5.3 Impact Questions		
5.5.3.1: Impact Questions. The impact questions include all cultural resource impact questions in the current version of CEQA Guidelines, Appendix G.		
5.5.3.2: Additional CEQA Impact Questions: None.		
5.5.4 Impact Analysis		
5.5.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis		
5.5.4.2: Human Remains. Describe the potential for encountering human remains or grave goods during the trenching or any other phase of construction. Describe the procedures that would be used if human remains are encountered.		
5.5.4.3: Resource Avoidance. Describe avoidance procedures that would be implemented to avoid known resources.		
5.5.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.6 Energy

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.6.1 Environmental Setting		
5.6.1.1: Existing Energy Use. Identify energy use of existing infrastructure if the proposed project would replace or upgrade an existing facility.		
5.6.2 Regulatory Setting		
5.6.2.1: Regulatory Setting. Identify applicable federal, state, or local regulations or policies applicable to energy use for the proposed project.		
5.6.3 Impact Questions		
5.6.3.1: Impact Questions: The impact questions include all energy impact questions in the current version of CEQA Guidelines, Appendix G.		
5.6.3.2: Additional CEQA Impact Question: Would the project add capacity for the purpose of serving a non-renewable energy resource?		

5.6.4 Impact Analysis		
5.6.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.6.4.2: Nonrenewable Energy. Identify renewable and non-renewable energy projects that may interconnected to or be supplied by the proposed project.		
5.6.4.3: Fuels and Energy Use a) Provide an estimation of the amount of fuels (gasoline, diesel, helicopter fuel, etc.) that would be used during construction and operation and maintenance of the project. Fuel estimates should be consistent with Air Quality calculations supporting the PEA. b) Provide the following information on energy use: i. Total energy requirements of the project by fuel type and end use ii. Energy conservation equipment and design features iii. Identification of energy supplies that would serve the project		
5.6.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.7 Geology, Soils, and Paleontological Resources

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.7.1 Environmental Setting		
5.7.1.1: Regional and Local Geologic Setting. Briefly describe the regional and local physiography, topography, and geologic setting in the project area.		
5.7.1.2: Seismic Hazards a) Provide the following information on potential seismic hazards in the project area: i. Identify and describe regional and local seismic risk including any active faults within and surrounding the project area (will be a 10-mile buffer unless otherwise instructed in writing by CEQA Unit Staff during Pre-filing) ii. Identify any areas that are prone to seismic-induced landslides iii. Provide the liquefaction potential for the project area b) Provide a supporting map (or maps) showing project features and major faults, areas of landslide risk, and areas at high risk of liquefaction. Provide GIS data for all faults, landslides, and areas of high liquefaction potential.		

<p>5.7.1.3: Geologic Units. Identify and describe the types of geologic units in the project area. Include the following information for each geologic unit:</p> <ul style="list-style-type: none"> a) Summarize the geologic units within the project area. b) Identify any previous landslides in the area and any areas that are at risk of landslide. c) Identify any unstable geologic units. d) Provide a supporting map (or maps) showing project features and geologic units. Clearly identify any areas with potentially hazardous geologic conditions. Provide associated GIS data. 		
<p>5.7.1.4: Soils. Identify and describe the types of soils in the project area.</p> <ul style="list-style-type: none"> a) Summarize the soils within the project area. b) Clearly identify any soils types that could be unstable (e.g., at risk of lateral spreading, subsidence, liquefaction, or collapse). c) Provide information on erosion susceptibility for each soil type that occurs in the project area. d) Provide a supporting map (or maps) showing project features and soils. Provide associated GIS data. 		
<p>5.7.1.5: Paleontological Report. Provide a paleontological report that includes the following:</p> <ul style="list-style-type: none"> a) Information on any documented fossil collection localities within the project area and a 500-foot buffer. b) A paleontological resource sensitivity analysis based on published geological mapping and the resource sensitivity of each rock type. c) Supporting maps and GIS data. 		
<p>5.7.2 Regulatory Setting</p>		
<p>5.7.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding geology, soils, and paleontological resources.</p>		
<p>5.7.3 Impact Questions</p>		
<p>5.7.3.1: Impact Questions. The impact questions include all geology, soils, and paleontological resource impact questions in the current version of CEQA Guidelines, Appendix G.</p> <p>5.7.3.2: Additional CEQA Impact Questions: None.</p>		
<p>5.7.4 Impact Analysis</p>		
<p>5.7.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.</p>		
<p>Include the following information in the impact analysis:</p>		

5.7.4.2: Geotechnical Requirements. Identify any geotechnical requirements that would be implemented to address effects from unstable geologic units or soils. Describe how the recommendation would be applied (i.e., when and where).		
5.7.4.3: Paleontological Resources. Identify the potential to disturb paleontological resources based on the depth of proposed excavation and paleontological sensitivity of geologic units within the project area.		
5.7.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.8 Greenhouse Gas Emissions

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.8.1 Environmental Setting		
5.8.1.1: GHG Setting. Provide a description of the setting for greenhouse gases (GHGs). The setting should consider any GHG emissions from existing infrastructure that would be upgraded or replaced by the proposed project.		
5.8.2 Regulatory Setting		
5.8.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for greenhouse gases.		
5.8.3 Impact Questions		
5.8.3.1 Impact Questions. The impact questions include all greenhouse gas impact questions in the current version of CEQA Guidelines, Appendix G.		
5.8.3.2: Additional CEQA Impact Questions: None.		
5.8.4 Impact Analysis		
5.8.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.8.4.2: GHG Emissions. Provide a quantitative assessment of GHG emissions for construction and operation and maintenance of the proposed project. Provide model results and all model files. Modeling will be conducted using the latest version of the emissions model at the time of application filing (e.g., most recent version of CalEEMod). GHG emissions will be provided for the following conditions: <ul style="list-style-type: none"> a) Uncontrolled emissions (before APMs are applied) b) Controlled emissions considering application of APMs <ul style="list-style-type: none"> i. Based on the modeled GHG emissions, quantify the project’s contribution to and analyze the project’s effect on 		

<p>climate change. Identify and provide justification for the timeframe considered in the analysis.</p> <p>ii. Discuss any programs already in place to reduce GHG emissions on a system-wide level. This includes the Applicant’s voluntary compliance with the EPA SF6 reduction program, reductions from energy efficiency, demand response, LTPP, etc.</p> <p>iii. For any significant impacts, identify potential strategies that could be employed by the project to reduce GHGs during construction or operation and maintenance consistent with OPR Advisory on CEQA and Climate Change.</p>		
Natural Gas Storage		
5.8.4.3: Natural Gas Storage Accident Conditions. In addition to the requirements above, identify the potential GHG emissions that could result in the event of a gas leak.		
5.8.4.4: Monitoring and Contingency Plan. Provide a comprehensive monitoring plan that would be implemented during project operation to monitor for gas leaks. The plan should identify a monitoring schedule, description of monitoring activities, and actions to be implemented if gas leaks are observed.		
5.8.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.9 Hazards, Hazardous Materials, and Public Safety²⁹

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.9.1 Environmental Setting		
5.9.1.1: Hazardous Materials Report. Provide a Phase I Environmental Site Assessment or similar hazards report for the proposed project area. Describe any known hazardous materials locations within the project area and the status of the site.		
5.9.1.2: Airport Land Use Plan. Identify any airport land use plan(s) within the project area.		
5.9.1.3: Fire Hazard. Identify if the project occurs within federal, state, or local fire responsibility areas and identify the fire hazard severity rating for all project areas, including temporary work areas and access roads.		
5.9.1.4: Metallic Objects. For electrical projects, identify any metallic pipelines or cables within 25 feet of the project.		

²⁹ For fire risk specific to state responsibility areas or lands classified as very high fire hazard severity zones, see Section 5.20, Wildfire.

<p>5.9.1.5: Pipeline History (for Natural Gas Projects). Provide a narrative describing the history of the pipeline system(s) to which the project would connect, list of previous owner and operators, and detailed summary of the pipeline systems’ safety and inspection history.</p>		
<p>5.9.2 Regulatory Setting</p>		
<p>5.9.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for hazards, hazardous materials, and public safety.</p>		
<p>5.9.2.2: Touch Thresholds. Identify applicable standards for protection of workers and the public from shock hazards.</p>		
<p>5.9.3 Impact Questions</p>		
<p>5.9.3.1: Impact Questions. The impact questions include all hazards and hazardous materials impact questions in the current version of CEQA Guidelines, Appendix G.</p> <p>5.9.3.2: Additional CEQA Impact Questions:</p> <ul style="list-style-type: none"> a) Would the project create a significant hazard to air traffic from the installation of new power lines and structures? b) Would the project create a significant hazard to the public or environment through the transport of heavy materials using helicopters? c) Would the project expose people to a significant risk of injury or death involving unexploded ordnance? d) Would the project expose workers or the public to excessive shock hazards? 		
<p>5.9.4 Impact Analysis</p>		
<p>5.9.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines Appendix G for this resource area and any additional impact questions listed above.</p>		
<p>Include the following information in the impact analysis:</p>		
<p>5.9.4.2: Hazardous Materials. Identify the hazardous materials (i.e., chemicals, solvents, lubricants, and fuels) that would be used during construction and operation of the project. Estimate the quantity of each hazardous material that would be stored on site during construction and operation.</p>		
<p>5.9.4.3: Air Traffic Hazards. If the project involves construction of above-ground structures (including structure replacement) within the airport land use plan area, provide a discussion of how the project would or would not conflict with height restrictions identified in the airport land use plan and how the project would comply with any FAA or military requirements for the above ground facilities.</p>		
<p>5.9.4.4: Accident or Upset Conditions. Describe how the project facilities would be designed, constructed, operated, and maintained to</p>		

minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes.		
5.9.4.5: Shock Hazard. For electricity projects, identify infrastructure that may be susceptible to induced current from the proposed project. Describe strategies (e.g., cathodic protection) that the project would employ to reduce shock hazards and avoid electrocution of workers or the public.		
For Natural Gas and Gas Storage:		
5.9.4.6: Health and Safety Plan. Include in the Health and Safety Plan, plans for addressing gas leaks, fires, etc. Identify sensitive receptors, methods of evacuation, and protection measures. The Plan will be provided as an Appendix to the PEA.		
5.9.4.7: Health Risk Assessment. Provide a Health Risk Assessment including risk from potential gas leaks, fires, etc. Identify sensitive receptors that would be affected and potential impacts on them if there is a gas release. ³⁰		
5.9.4.8: Gas Migration. Describe potential for and effects of gas migration through natural and manmade pathways. a) Provide Applicant Proposed Measures for avoiding gas emissions at the surface from gas migration pathways. b) Provide Applicant Proposed Measures for avoiding emissions of mercaptan and/or other odorizing agents.		
5.9.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.10 Hydrology and Water Quality

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.10.1 Environmental Setting		
5.10.1.1: Waterbodies. Identify by milepost all ephemeral, intermittent, and perennial surface waterbodies crossed by the project. For each, list its water quality classification, if applicable.		
5.10.1.2: Water Quality. Identify any downstream waters that are on the state 303(d) list and identify whether a total maximum daily load (TMDL) has been adopted or the date for adoption of a TMDL. Identify existing sources of impairment for downstream waters. Describe any management plans that are in place for downstream waters.		
5.10.1.3: Groundwater Basin. Identify all known EPA and state groundwater basins and aquifers crossed by the project.		

³⁰Refer to the requirements for Health Risk Assessments in Section 5.3.4.4.

<p>5.10.1.4: Groundwater Wells and Springs. Identify the locations of all known public and private groundwater supply wells and springs within 150 feet of the project area.</p>		
<p>5.10.1.5: Groundwater Management. Identify the groundwater management status of any groundwater resources in the project area and any groundwater resources that may be used by the project. Describe if groundwater resources in the basin have been adjudicated. Identify any sustainable groundwater management plan that has been adopted for groundwater resources in the project area or describe the status of groundwater management planning in the area.</p>		
<p>5.10.2 Regulatory Setting</p>		
<p>5.10.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding hydrologic and water quality.</p>		
<p>5.10.3 Impact Questions</p>		
<p>5.10.3.1: Impact Questions. The impact questions include all hydrology and water quality impact questions in the current version of CEQA Guidelines, Appendix G.</p> <p>5.10.3.2: Additional CEQA Impact Questions: None.</p>		
<p>5.10.4 Impact Analysis</p>		
<p>5.10.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in the current version of CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.</p>		
<p>Include the following information in the impact analysis:</p>		
<p>5.10.4.2: Hydrostatic Testing. Identify all potential sources of hydrostatic test water, quantity of water required, withdrawal methods, treatment of discharge, and any waste products generated.</p>		
<p>5.10.4.3: Water Quality Impacts. Describe impacts to surface water quality, including the potential for accelerated soil erosion, downstream sedimentation, and reduced surface water quality.</p>		
<p>5.10.4.4: Impermeable Surfaces. Describe increased run-off and impacts on groundwater recharge due to construction of impermeable surfaces. Provide the acreage of new impermeable surfaces that will be created as a result of the project.</p>		
<p>5.10.4.5: Waterbody Crossings. Identify by milepost all waterbody crossings. Provide the following information for crossing:</p> <ul style="list-style-type: none"> a) Identify whether the waterbody has contaminated waters or sediments. b) Describe the waterbody crossing method and any approaches to avoid the waterbody. c) Describe typical additional work area and staging area requirements at waterbody and wetland crossings. 		

d) Describe any dewatering or water diversion that will be required during construction near the waterbody. Identify treatment methods for any dewatering.		
e) Describe any proposed restoration methods for work near or within the waterbody.		
5.10.4.6: Groundwater Impacts. If water would be obtained from groundwater supplies, evaluate the project’s consistency with any applicable sustainable groundwater management plan.		
5.10.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.11 Land Use and Planning

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.11.1 Environmental Setting		
5.11.1.1: Land Use. Provide a description of land uses within the area traversed by the project route as designated in the local General Plan (e.g., residential, commercial, agricultural, open space, etc.).		
5.11.1.2: Special Land Uses. Identify by milepost and segment all special land uses within the project area including: a) All land administered by federal, state, or local agencies, or private conservation organizations b) Any designated coastal zone management areas c) Any designated or proposed candidate National or State Wild and Scenic Rivers crossed by the project d) Any national landmarks		
5.11.1.3: Habitat Conservation Plan. Provide a copy of any Habitat Conservation Plan applicable to the project area or proposed project. Also required for Section 5.4, Biological Resources.		
5.11.2 Regulatory Setting		
5.11.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for land use and planning.		
5.11.3 Impact Questions		
5.11.3.1: Impact Questions. The impact questions include all land use questions in the current version of CEQA Guidelines, Appendix G.		
5.11.3.2: Additional CEQA Impact Questions: None.		
5.11.4 Impact Analysis		
5.11.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		

5.11.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.12 Mineral Resources

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.12.1 Environmental Setting		
5.12.1.1: Mineral Resources. Provide information on the following mineral resources within 0.5 mile of the proposed project area: a) Known mineral resources b) Active mining claims c) Active mines d) Resource recovery sites		
5.12.2 Regulatory Setting		
5.12.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for minerals.		
5.12.3 Impact Questions		
5.12.3.1: Impact Questions. The impact questions include all mineral resource impact questions in the current version of CEQA Guidelines, Appendix G. 5.12.3.2: Additional CEQA Impact Questions: None.		
5.12.4 Impact Analysis		
5.12.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
5.12.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.13 Noise

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.13.1 Environmental Setting		
5.13.1.1: Noise Sensitive Land Uses. Identify all noise sensitive land uses within 1,000 feet of the proposed project. Provide GIS data for sensitive receptors within 1,000 feet of the project.		
5.13.1.2: Noise Setting. Provide the existing noise levels (Lmax, Lmin, Leq, and Ldn sound level and other applicable noise parameters) at noise sensitive areas near the proposed project. All noise measurement data and the methodology for collecting the data will be provided in a noise study as an Appendix to the PEA.		

5.13.2 Regulatory Setting		
5.13.2.1: Regulatory Setting. Identify applicable state, and local laws, policies, and standards for noise.		
5.13.3 Impact Questions		
5.13.3.1 Impact Questions. The impact questions include all noise questions in the current version of CEQA Guidelines, Appendix G.		
5.13.3.2: Additional CEQA Impact Questions: None.		
5.13.4 Impact Analysis		
5.13.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.13.4.2: Noise Levels		
<ul style="list-style-type: none"> a) Identify noise levels for each piece of equipment that could be used during construction. b) Provide a table that identifies each phase of construction, the equipment used in each construction phase, and the length of each phase at any single location (see example in Table 7 below). c) Estimate cumulative equipment noise levels for each phase of construction. d) Include phases of operation if noise levels during operation have the potential to frequently exceed pre-project existing conditions. e) Identify manufacturer’s specifications for equipment and describe approaches to reduce impacts from noise. 		

Table 7. Construction Noise Levels

Equipment Required	Equipment Noise Levels (Leq; 50 feet)	Phase Noise Level (Leq; 50 feet)	Phase Duration at Each Location	Receptor Nearest to Construction Phase	Noise Level at Nearest Receptor (Leq)	Exceeds Noise Standard at Nearest Receptor?	Distance to Not Exceed Standard
Site Preparation/Grading							
Dozer	78 dBA	82 dBA	5 days	Residence on Main Street; 100 feet from Substation Site	76 dBA	Yes	112 feet
Gradall	79 dBA						
Dump Truck	73 dBA						
Construct Tower Foundation							
Auger Rig	77 dBA	82 dBA	11 days	School on Education Avenue; 130 feet from Tower A12	73 dBA	No	N/A
Dump Truck	73 dBA						
Excavator	77 dBA						
Concrete Truck	75 dBA						

For Natural Gas:		
5.13.4.3: Compressor Station Noise. Provide site plans of compressor stations or other noisy, permanent equipment, showing the location of the nearest noise sensitive areas within 1 mile of the proposed ROW. If new compressor station sites are proposed, measure or estimate the existing ambient sound environment based on current land uses and		

activities. For existing compressor stations (operated at full load), include the results of a sound level survey at the site property line and nearby noise-sensitive areas. Include a plot plan that identifies the locations and duration of noise measurements.		
5.13.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.14 Population and Housing

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.14.1 Environmental Setting		
5.14.1.1: Population Estimates. Identify population trends for the areas (county, city, town, census designated place) where the project would take place.		
5.14.1.2: Housing Estimates. Identify housing estimates and projections in areas where the project would take place.		
5.14.1.3: Approved Housing Developments a) Provide the following information for all housing development projects within 1 mile of the proposed project that have been recently approved or may be approved around the PEA and application filing date: <ul style="list-style-type: none"> i. Project name ii. Location iii. Number of units and estimated population increase iv. Approval date and construction status v. Contact information for developer (provided in the public outreach Appendix) b) Ensure that the project information provided above is consistent with the PEA analysis of cumulative project impacts.		
5.14.2 Regulatory Setting		
5.14.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations that apply to the project.		
5.14.3 Impact Questions		
5.14.3.1: Impact Questions. The impact questions include all population and housing impact questions in the current version of CEQA Guidelines, Appendix G.		
5.14.3.2: Additional CEQA Impact Questions: None.		
5.14.4 Impact Analysis		
5.14.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		

Include the following information in the impact analysis:		
5.14.4.2: Impacts to Housing. Identify if any existing or proposed homes occur within the footprint of any proposed project elements or right-of-way. Describe housing impacts (e.g., demolition and relocation of residents) that may occur as a result of the proposed project.		
5.14.4.3: Workforce Impacts. Describe on-site manpower requirements, including the number of construction personnel who currently reside within the impact area, who would commute daily to the site from outside the impact area or would relocate temporarily within the impact area. Chapter 4 of this document can be referenced as applicable. Identify any permanent employment opportunities that would be create by the project and the workforce conditions in the area that the jobs would be created.		
5.14.4.4: Population Growth Inducing. Provide information on the project’s growth inducing impacts, if any. The information will include, but is not necessarily limited to, the following: a) Any economic or population growth in the surrounding environment that will directly or indirectly result from the project b) Any obstacles to population growth that the project would remove c) Any other activities directly or indirectly encouraged or facilitated by the project that would cause population growth leading to a significant effect on the environment, either individually or cumulatively		
5.14.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.15 Public Services

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.15.1 Environmental Setting		
5.15.1.1 Service Providers a) Identify the following service providers that serve the project area and provide a map showing the service facilities that could serve the project: i. Police ii. Fire (identify service providers within local and state responsibility areas) iii. Schools iv. Parks v. Hospitals		

b) Provide the documented performance objectives and data on existing emergency response times for service providers in the area (e.g., police or fire department response times).		
5.15.2 Regulatory Setting		
5.15.2.1 Regulatory Setting. Identify any applicable federal, state or local laws or regulations for public services that apply to the project.		
5.15.3 Impact Questions		
5.15.3.1: Impact Questions. The impact questions include all public services impact questions in the current version of CEQA Guidelines, Appendix G.		
5.15.3.2: Additional CEQA Impact Questions: None.		
5.15.4 Impact Analysis		
5.15.4.1 Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.15.4.2: Emergency Response Times		
<ul style="list-style-type: none"> a) Describe whether the project would impede ingress and egress of emergency vehicles during construction and operation. b) Include an analysis of impacts on emergency response times during project construction and operation, including impacts during any temporary road closures. Describe approaches to address impacts on emergency response times. 		
5.15.4.3: Displaced Population. If the project would create permanent employment or displace people, evaluate the impact of the new employment or relocated people on governmental facilities and services and describe plans to reduce the impact on public services.		
5.15.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.16 Recreation

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.16.1 Environmental Setting		
5.16.1.1: Recreational Setting		
<ul style="list-style-type: none"> a) Describe the regional and local recreation setting in the project area including: <ul style="list-style-type: none"> i. Any recreational facilities or areas within and surrounding the project area (approximately 0.5-mile buffer) including the recreational uses of each facility or area 		

<ul style="list-style-type: none"> ii. Any available data on use of the recreational facilities including volume of use b) Provide a map (or maps) showing project features and recreational facilities and provide associated GIS data. 		
5.16.2 Regulatory Setting		
5.16.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding recreation.		
5.16.3 Impact Questions		
5.16.3.1: Impact Questions. The impact questions include all recreation impact questions in the current version of CEQA Guidelines, Appendix G.		
5.16.3.2: Additional CEQA Impact Questions: <ul style="list-style-type: none"> a) Would the project reduce or prevent access to a designated recreation facility or area? b) Would the project substantially change the character of a recreational area by reducing the scenic, biological, cultural, geologic, or other important characteristics that contribute to the value of recreational facilities or areas? c) Would the project damage recreational trails or facilities? 		
5.16.4 Impact Analysis		
5.16.4.1: Impact Analysis: Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
5.16.4.2: Impact Details. Clearly identify the maximum extent of each impact, and when and where the impacts would or would not occur. Organize the impact assessment by project phase, project component, and/or geographic area, as necessary.		
5.16.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.17 Transportation

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.17.1 Environmental Setting		
5.17.1.1: Circulation System. Briefly describe the regional and local circulation system in the project area, including modes of transportation, types of roadways, and other facilities that contribute to the circulation system.		
5.17.1.2: Existing Roadways and Circulation <ul style="list-style-type: none"> a) Identify and describe existing roadways that may be used to access the project site and transport materials during 		

<p>construction or are otherwise adjacent to or crossed by linear project features. Provide the following information for each road:</p> <ul style="list-style-type: none"> i. Name of the road ii. Jurisdiction or ownership (i.e., State, County, City, private, etc.) iii. Number of lanes in both directions of travel iv. Existing traffic volume (if publicly available data is unavailable or significantly outdated, then it may be necessary to collect existing traffic counts for road segments where large volumes of construction traffic would be routed or where lane or road closures would occur) v. Closest project feature name and distance <p>b) Provide a supporting map (or maps) showing project features and the existing roadway network identifying each road described above. Provide associated GIS data. The GIS data should include all connected road segments within at least 5 miles of the project.</p>		
<p>5.17.1.3: Transit and Rail Services</p> <ul style="list-style-type: none"> a) Identify and describe transit and rail service providers in the region. b) Identify any rail or transit lines within 1,000 feet of the project area. c) Identify specific transit stops, and stations within 0.5 mile of the project. Provide the frequency of transit service. d) Provide a supporting map (or maps) showing project features and transit and rail services within 0.5 mile of the project area. Provide associated GIS data. 		
<p>5.17.1.4: Bicycle Facilities</p> <ul style="list-style-type: none"> a) Identify and describe any bicycle plans for the region. b) Identify specific bicycle facilities within 1,000 feet of the project area. c) Provide a supporting map (or maps) showing project features and bicycle facilities. Provide associated GIS data. 		
<p>5.17.1.5: Pedestrian Facilities</p> <ul style="list-style-type: none"> a) Identify and describe important pedestrian facilities near the project area that contribute to the circulation system, such as important walkways. b) Identify specific pedestrian facilities that would be near the project, including on the road segments identified per 5.17.1.2. c) Provide a supporting map (or maps) showing project features and important pedestrian facilities. Provide associated GIS data. 		

<p>5.17.1.6: Vehicle Miles Traveled (VMT). Provide the average VMT for the county(s) where the project is located.</p>		
<p>5.17.2 Regulatory Setting</p>		
<p>5.17.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards regarding transportation.</p>		
<p>5.17.3 Impact Questions</p>		
<p>5.17.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G.</p> <p>5.17.3.2: Additional CEQA Impact Questions:</p> <p>a) Would the project create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations?</p> <p>b) Would the project interfere with walking or bicycling accessibility?</p> <p>c) Would the project substantially delay public transit?</p>		
<p>5.17.4 Impact Analysis</p>		
<p>5.17.4.1: Impact Analysis. Provide an impact analysis for each significance criteria identified in Appendix G of the CEQA Guidelines for transportation and any additional impact questions listed above³¹.</p>		
<p>Include the following information in the impact analysis:</p>		
<p>5.17.4.2: Vehicle Miles Traveled (VMT)</p> <p>a) Identify whether the project is within 0.5 mile of a major transit stop or a high-quality transit corridor.</p> <p>b) Identify the number of vehicle daily trips that would be generated by the project during construction and operation by light duty (e.g., worker vehicles) and heavy-duty vehicles (e.g., trucks). Provide the frequency of trip generation during operation.</p> <p>c) Quantify VMT generation for both project construction and operation.</p> <p>d) Provide an excel file with the VMT assumptions and model calculations, including all formulas and values.</p> <p>e) Evaluate the project VMT relative to the average VMT for the area in which the project is located.</p>		
<p>5.17.4.3: Traffic Impact Analysis. Provide a traffic impact study. The traffic impact study should be prepared in accordance with guidance from the relevant local jurisdiction or Caltrans, where appropriate.</p>		
<p>5.17.4.4: Hazards. Identify any traffic hazards that could result from construction and operation of the project. Identify any lane closures and traffic management that would be required to construct the project.</p>		

³¹ Discuss with CPUC during Pre-filing whether a traffic study is needed.

5.17.4.5: Accessibility. Identify any closures of bicycle lanes, pedestrian walkways, or transit stops during construction or operation of the project.		
5.17.4.6: Transit Delay. Identify any transit lines that could be delayed by construction and operation of the project. Provide the maximum extent of the delay in minutes and the duration of the delay.		
5.17.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.18 Tribal Cultural Resources³²

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.18.1 Environmental Setting		
5.18.1.1: Outreach to Tribes. Provide a list of all tribes that are on the Native American Heritage Commission (NAHC) list of tribes that are affiliated with the project area. Provide a discussion of outreach to Native American tribes, including tribes notified, responses received from tribes, and information of potential tribal cultural resources provided by tribes. Any information of potential locations of tribal cultural resources should be submitted in an Appendix under clearly marked confidential cover. Provide copies of all correspondence with tribes in an Appendix.		
5.18.1.2: Tribal Cultural Resources. Describe tribal cultural resources (TCRs) that are within the project area. a) Summarize the results of attempts to identify possible TCRs using publicly available documentary resources. The identification of TCRs using documentary sources should include review of archaeological site records and should begin during the preparation of the records search report (see Attachment 3). During the inventory phase, a formal site record would be prepared for any resource identified unless tribes object. b) Summarize attempts to identify TCRs by speaking directly with tribal representatives.		
5.18.1.3: Ethnographic Study. The ethnographic study should document the history of Native American use of the area and oral history of the area.		
5.18.2 Regulatory Setting		
5.18.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations for tribal cultural resources that apply to the project.		

³² For a description of historical resources and requirements for cultural resources that are not tribal cultural resources, refer to Section 5.5 Cultural Resources.

5.18.3 Impact Questions		
5.18.3.1: Impact Questions. The impact questions include all tribal cultural resources impact questions in the current version of CEQA Guidelines, Appendix G.		
5.18.3.2: Additional CEQA Impact Questions: None.		
5.18.4 Impact Analysis		
5.18.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.18.4.2: Information Provided by Tribes. Include an analysis of any impacts that were identified by the tribes during the Applicant’s outreach.		
5.18.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.19 Utilities and Service Systems

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.19.1 Environmental Setting		
5.19.1.1: Utility Providers. Identify existing utility providers and the associated infrastructure that serves the project area.		
5.19.1.2: Utility Lines. Describe existing utility infrastructure (e.g., water, gas, sewer, electrical, stormwater, telecommunications, etc.) that occurs in the project ROW. Provide GIS data and/or as-built engineering drawings to support the description of existing utilities and their locations.		
5.19.1.3: Approved Utility Projects. Identify utility projects that have been approved for construction within the project ROW but that have not yet been constructed. ³³		
5.19.1.4: Water Supplies. Identify water suppliers and the water source (e.g., aqueduct, well, recycled water, etc.). For each potential water supplier, provide data on the existing water capacity, supply, and demand.		
5.19.1.5: Landfills and Recycling. Identify local landfills that can accept construction waste and may service the project. Provide documentation of landfill capacity and estimated closure date. Identify any recycling centers in the area and opportunities for construction and demolition waste recycling.		

³³ Note that this project information should be consistent with the cumulative project description included in Chapter 7.

5.19.2 Regulatory Setting		
5.19.2.1: Regulatory Setting. Identify any applicable federal, state or local laws or regulations for utilities that apply to the project.		
5.19.3 Impact Questions		
5.19.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G.		
5.19.3.2: Additional CEQA Impact Question: Would the project increase the rate of corrosion of adjacent utility lines as a result of alternating current impacts?		
5.19.4 Impact Analysis		
5.19.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.19.4.2: Utility Relocation. Identify any project conflicts with existing utility lines. If the project may require relocation of existing utilities, identify potential relocation areas and analyze the impacts of relocating the utilities. Provide a map showing the relocated utility lines and GIS data for all relocations.		
5.19.4.3: Waste		
<ul style="list-style-type: none"> a) Identify the waste generated by construction, operation, and demolition of the project. b) Describe how treated wood poles would be disposed of after removal, if applicable. c) Provide estimates for the total amount of waste materials to be generated by waste type and how much of it would be disposed of, reused, or recycled. 		
5.19.4.4: Water Supply		
<ul style="list-style-type: none"> a) Estimate the amount of water required for project construction and operation. Provide the potential water supply source(s). b) Evaluate the ability of the water supplier to meet the project demand under a multiple dry year scenario. c) Provide a discussion as to whether the proposed project meets the criteria for consideration as a project subject to Water Supply Assessment Requirements under Water Code Section 10912. d) If determined to be necessary under Water Code Section 10912, submit a Water Supply Assessment to support conclusions that the proposed water source can meet the project’s anticipated water demand, even in multiple dry year scenarios. Water Supply Assessments should be approved by 		

the water supplier and consider normal, single-dry, and multiple-dry year conditions.		
5.19.4.5: Cathodic Protection. Analyze the potential for existing utilities to experience corrosion due to proximity to the proposed project. Identify cathodic protection measures that could be implemented to reduce corrosion issues and where the measures may be applied.		
5.19.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.20 Wildfire

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
5.20.1 Environmental Setting		
5.20.1.1: High Fire Risk Areas and State Responsibility Areas a) Identify areas of high fire risk or State Responsibility Areas (SRAs) within the project area. Provide GIS data for the Wildland Urban Interface (WUI) and Fire Hazard Severity Zones (FHSZ) mapping along the project alignment. Include areas mapped by CPUC as moderate and high fire threat districts as well as areas mapped by CalFire. b) Identify any areas the utility has independently identified as High FHSZ known to occur within the proposed project vicinity.		
5.20.1.2: Fire Occurrence. Identify all recent (within the last 10 years) large fires that have occurred within the project vicinity. For each fire, identify the following: a) Name of the fire b) Location of fire c) Ignition source and location of ignition d) Amount of land burned e) Boundary of fire area in GIS		
5.20.1.3: Fire Risk. Provide the following information for assessment of baseline fire risk in the area: a) Provide fuel modeling using Scott Burgan fuel models, or other model of similar quality. b) Provide values of wind direction and speed, relative humidity, and temperature for representative weather stations along the alignment for the previous 10 years, gathered hourly. c) Digital elevation models for the topography in the project region showing the relationship between terrain and wind patterns, as well as localized topography to show the effects of terrain on wind flow, and on a more local area to show effect of slope on fire spread.		

d) Describe vegetation fuels within the project vicinity and provide data in map format for the project vicinity. USDA Fire Effects Information System or similar data source should be consulted to determine high-risk vegetation types. Provide the mapped vegetation fuels data in GIS format.		
5.20.1.4: Values at Risk. Identify values at risk along the proposed alignment. Values at risk may include: Structures, improvements, rare habitat, other values at risk, (including utility-owned infrastructure) within 1000 feet of the project. Provide some indication as to its vulnerability (wood structures vs. all steel features). Communities and/or populations near the project should be identified with their proximity to the project defined.		
5.20.1.5: Evacuation Routes. Identify all evacuation routes that are adjacent to or within the project area. Identify any roads that lack a secondary point of access or exit (e.g., cul-de-sacs).		
5.20.2 Regulatory Setting		
5.20.2.1: Regulatory Setting. Identify applicable federal, state, and local laws, policies, and standards for wildfire.		
5.20.2.2: CPUC Standards. Identify any CPUC standards that apply to wildfire management of the new facilities.		
5.20.3 Impact Questions		
5.20.3.1: Impact Questions. All impact questions for this resource area in the current version of CEQA Guidelines, Appendix G.		
5.20.3.2: Additional CEQA Impact Questions: None.		
5.20.4 Impact Analysis		
5.20.4.1: Impact Analysis. Provide an impact analysis for each checklist item identified in CEQA Guidelines, Appendix G for this resource area and any additional impact questions listed above.		
Include the following information in the impact analysis:		
5.20.4.2: Fire Behavior Modeling. For any new electrical lines, provide modeling to support the analysis of wildfire risk.		
5.20.4.3: Wildfire Management. Describe approaches that would be implemented during operation and maintenance to manage wildfire risk in the area. Provide a copy of any Wildfire Management Plan.		
5.20.5 CPUC Draft Environmental Measures		
Refer to Attachment 4, CPUC Draft Environmental Measures.		

5.21 Mandatory Findings of Significance³⁴

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>5.21.1: Impact Assessment for Mandatory Findings of Significance. Provide an impact analysis for each of the mandatory findings of significance provided in Appendix G of the CEQA Guidelines. The impact analysis can reference relevant information and conclusion from the biological resources, cultural resources, air quality, hazards, and cumulative sections of the PEA, where applicable.</p>		

6 Comparison of Alternatives

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>6.1: Alternatives Comparison</p> <ul style="list-style-type: none"> a) Compare the ability of each alternative described in Chapter 4 against the proposed project in terms of its ability to avoid or reduce a potentially significant impact. The alternatives addressed in this section will each be: <ul style="list-style-type: none"> i. Potentially feasible ii. Meet the underlying purpose of the proposed project iii. Meet most of the basic project objectives, and iv. Avoid or reduce one or more potentially significant impacts. b) The relative effect of the various potentially significant impacts may be compared using the following or similar descriptors and an accompanying analysis: <ul style="list-style-type: none"> i. Short-term versus long-term impacts ii. Localized versus widespread impacts iii. Ability to fully mitigate impacts c) Impacts that the Applicant believes would be less than significant with mitigation may also be included in the analysis, but only if the steps listed above fail to distinguish among the remaining few alternatives. 		
<p>6.2: Alternatives Ranking. Provide a detailed table that summarizes the Applicant's comparison results and ranks the alternatives in order of environmental superiority.³⁵</p>		

³⁴ PEAs need only include a Mandatory Findings of Significance section if CPUC CEQA Unit Staff determine that a Mitigated Negative Declaration may be the appropriate type of document to prepare for the project, as determined through Pre-filing consultation. If no such determination has been made, then a Mandatory Findings of Significance section and the requirements below are not required.

³⁵ If the proposed project does not rank #1 on the list, the Applicant should provide the rationale for selecting the proposed project.

7 Cumulative and Other CEQA Considerations

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
7.1 Cumulative Impacts		
<p>7.1.1: List of Cumulative Projects</p> <p>a) Provide a detailed table listing past, present, and reasonably foreseeable future projects within and surrounding the project area (approximately 2-mile buffer)³⁶. The following information should be provided for each project in the table:</p> <ul style="list-style-type: none"> i. Project name and type ii. Brief description of the project location(s) and associated actions iii. Distance to and name of the nearest project component iv. Project status and anticipated construction schedule v. Source of the project information and date last checked (for each individual project), including links to any public websites where the information was obtained so it can be reviewed and updated (the project information should be current when the PEA is filed) <p>b) Provide a supporting map (or maps) showing project features and cumulative project locations and/or linear features. Provide associated GIS data.</p>		
<p>7.1.2: Geographic Scope. Define the geographic scope of analysis for each resource topic. The geographic scope of analysis for each resource topic should consider the extent to which impacts can be cumulative. For example, the geographic scope for cumulative noise impacts would be more limited in scale than the geographic scope for biological resource impacts because noise attenuates rapidly with distance. Explain why the geographic scope is appropriate for each resource.</p>		
<p>7.1.3: Cumulative Impact Analysis. Provide an analysis of cumulative impacts for each resource topic included in Chapter 5. Evaluate whether the proposed project impacts are cumulatively considerable³⁷ for any significant cumulative impacts.</p>		
7.2 Growth-Inducing Impacts		
<p>7.2.1: Growth-Inducing Impacts. Provide an evaluation of the following potential growth-inducing impacts:</p>		

³⁶ Information on cumulative projects may be obtained from federal, state, and local agencies with jurisdiction over planning, transportation, and/or resource management in the area. Other projects the Applicant is involved in or aware of in the area should be included.

³⁷ "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

<p>a) Would the proposed project foster any economic or population growth, either directly or indirectly, in the surrounding environment?</p> <p>b) Would the proposed project cause any increase in population that could further tax existing community service facilities (i.e., schools, hospitals, fire, police, etc.)?</p> <p>c) Would the proposed project remove any obstacles to population growth?</p> <p>d) Would the proposed project encourage and facilitate other activities that would cause population growth that could significantly affect the environment, either individually or cumulatively?</p>		
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8 List of Preparers

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>8.1: List of Preparers. Provide a list of persons, their organizations, and their qualifications for all authors and reviewers of each section of the PEA.</p>		

9 References

This section will include, but is not limited to, the following:	PEA Section and Page Number	Applicant Notes, Comments
<p>9.1: Reference List</p> <p>a) Organize all references cited in the PEA by section within a single chapter called “References.”</p> <p>b) Within the References chapter, organize all of the Chapter 5 references under subheadings for each resource area section.</p>		
<p>9.2: Electronic References</p> <p>a) Provide complete electronic copies of all references cited in the PEA that cannot be readily obtained for free on the Internet. This includes any company-specific documentation (e.g., standards, policies, and other documents).</p> <p>b) If the reference can be obtained on the Internet, the Internet address will be provided.</p>		

PEA Checklist Attachments

Attachment 1: GIS Data Requirements

This Attachment includes specific requirements and format of GIS data that is intended to be applicable to all PEAs. The specific GIS data requirements may be updated on a project-specific basis during Pre-filing coordination with CPUC's CEQA Unit Staff.

1. GIS data will be provided in an appropriate format (i.e., point, line, polygon, raster) and scale to adequately verify assumptions in the PEA and supporting materials and determine the level of environmental impacts. At a minimum, all GIS data layers will include the following metadata properties:
 - a. The source (e.g., report reference), date, title, and preparer (name or company)
 - b. Description of the contents and any limitations of the data
 - c. Reference scale and accuracy of the data
 - d. Complete attributes that correspond to the detailed mapbook, project description, and figures presented in the PEA and/or supporting application materials, including unique IDs, labels, geometry, and other appropriate project details
2. Where precise boundaries of project features may change (e.g., staging areas and temporary construction work areas), the Applicant will provide GIS data layers with representative boundaries to evaluate potential environmental impacts as a worst-case scenario.
3. Provide GIS data for:
 - a. All proposed and alternative project facilities including but not limited to existing and proposed/alternative ROWs; substations and switching stations; pole/tower locations; conduit; vaults, pipelines; valves; compressor stations; metering stations; valve stations, gas wellheads; other project buildings, facilities, and components (both temporary and permanent); telecommunication and distribution lines modifications or upgrades related to the project; marker ball and lighting locations; and mileposts, facility perimeters, and other demarcations or segments as applicable
 - b. All proposed areas required for construction and construction planning, including all proposed and alternative disturbance areas (both permanent and temporary); access roads; geotechnical work areas; extra work areas (e.g., staging areas, parking areas, lay-down areas, work areas at and around specific pole/tower sites, pull and tension sites, helicopter landing areas); airport landing areas; underground installation areas (e.g. trenches, vaults, underground work areas); horizontal directional drilling, jack and bore, or tunnel areas; blasting areas; and any areas where special construction methods may need to be employed
 - c. Within the PEA checklist there are also specific requirements for environmental resources within Chapter 5. All environmental resource GIS data must meet the minimum mapping standards specified in this Attachment.

Attachment 2: Biological Resource Technical Report Standards

Definitions

The following biological resources will be considered within the scope of the PEA and the Biological Resources Technical Report:

Sensitive Vegetation Communities and Habitats

- a) Sensitive vegetation communities/habitats identified in local or regional plans, policies, or regulations, or designated by CDFW³⁸ or USFWS
- b) Areas that provide habitat for locally unique biotic species/communities (e.g., oak woodlands, grasslands, and forests)
- c) Habitat that contains or supports rare, endangered, or threatened wildlife or plant species as defined by CDFW and USFWS
- d) Habitat that supports CDFW Species of Special Concern
- e) Areas that provide habitat for rare or endangered species and that meet the definition in CEQA Guidelines Section 15380
- f) Existing game and wildlife refuges and reserves
- g) Lakes, wetlands, estuaries, lagoons, streams, and rivers
- h) Riparian corridors

Special-Status Species

- a) Species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR § 17.12 [listed plants], 17.11 [listed animals] and various notices in the Federal Register [proposed species])
- b) Species that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR § 40, February 28, 1996)
- c) Species listed or proposed for listing by the State of California as threatened or endangered under the California ESA (14 CCR § 670.5)
- d) Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.)
- e) Species that meet the definitions of rare and endangered under CEQA. CEQA Guidelines Section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if not on one of the official lists.
- f) Plants considered by the California Native Plant Society (CNPS) to be “rare, threatened or endangered in California” (California Rare Plant Rank 1A, 1B, 2A, and 2B) as well as California Rare Plant Rank 3 and 4 plant species
- g) Species designated by CDFW as Fully Protected or as a Species of Special Concern
- h) Species protected under the Federal Bald and Golden Eagle Protection Act
- i) Birds of Conservation Concern or Watch List species
- j) Bats considered by the Western Bat Working Group to be “high” or “medium” priority (Western Bat Working Group 2015)

³⁸ CDFW’s Rarity Ranking follows NatureServe’s Heritage Methodology (Faber-Langendoen, et al. 2016) in which communities are given a G (global) and S (state) rank based on their degree of imperilment (as measured by rarity, trends, and threats). Communities with a Rarity Ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) are considered sensitive by CDFW.

Biological Resource Technical Report Minimum Requirements

Report Contents

The Biological Resource Technical Report will include the following information at a minimum.

- a) **Preliminary Agency Consultation.** Describe any pre-survey contact with agencies. Describe any agency approvals that were required for biologists or agency protocols that were applied to the survey effort. Provide copies of correspondence and meeting notes with the names and contact information for agency staff and the dates of consultation as an appendix to the Biological Resources Technical Report.
- b) **Records Search.** Provide the results of all database and literature searches for biological resources within and surrounding the project area. Identify all sources reviewed (e.g., CNDDDB, CNPS, USFWS, etc.).
- c) **Biological Resource Survey Method.** Identify agency survey requirements and protocols applicable to each biological survey that was conducted. Identify the areas where each survey occurred. Identify any limitations for the surveys (e.g., survey timing or climatic conditions) that could affect the survey results.
- d) **Vegetation Communities and Land Cover.** Identify all vegetation communities or land cover types (e.g., disturbed or developed) within the biological survey area. The biological survey area should include a 1,000-foot buffer from project facilities to support CPUC's evaluation of indirect effects.
- e) **Aquatic Resources.** Identify any wetlands, streams, lakes, reservoirs, estuarine, or other aquatic resources within the biological survey area. Provide a wetland delineation and all data sheets including National Wetlands Inventory maps (or the appropriate state wetland maps, if National Wetlands Inventory maps are not available) that show all proposed facilities and include milepost locations for proposed pipeline routes. Provide a copy of agency verification of the wetland delineation if the delineation has been verified by the U.S. Army Corps of Engineers or CDFW. If the delineation has not been verified, describe the process and timing for obtaining agency verification.
- f) **Habitat Assessments.** Evaluate the potential for suitable habitat in the biological survey area for each species identified in the database and literature search.
- g) **Native Wildlife Corridors and Nursery Sites.** Identify any wildlife corridors or nursery sites that occur within the biological survey area.
- h) **Survey Results.** Describe all survey results and include a copy of any focused (e.g., rare plant, protocol special-status wildlife) biological resources survey reports.

Mapping and GIS Data

Provide detailed maps (at approximately 1:3,000 scale or similar), and all associated GIS data for the Biological Resources Technical Report and any supporting biological survey reports, including:

- a) Biological survey area for each survey that was conducted
- b) Vegetation communities and land cover types
- c) Aquatic resource delineation
- d) Special-status plant locations
- e) Special-status wildlife locations
- f) Avian point count locations
- g) Critical habitat
- h) California Coastal Commission or Bay Conservation and Development Commission jurisdictional areas

Attachment 3: Cultural Resource Technical Report Standards

Cultural Resource Inventory Report

Provide a cultural resource inventory report that includes archaeological, unique archaeological, and built-environment resources within all areas that could be affected by the proposed project including areas of indirect effect. The inventory report will include the results of both a literature search and pedestrian survey. The contents will address the requirements in *Archaeological Resource Management Reports: Recommended Contents and Guidelines*. The methodology and results of the inventory should be sufficient to provide the reader with an understanding of the nature, character, and composition of newly discovered and previously identified cultural resources so that the required recommendations about the resource(s) CRHR eligibility are clearly understood. No information regarding the location of the cultural resources will be included in these descriptions. The required Department of Parks and Recreation (DPR) 523 forms, including location information and photographs of the resources, are to be included in a removable confidential appendix to the report.³⁹

The inventory report will meet the following requirements:

- a) The report should clearly discuss the methods used to identify unique archaeological resources (e.g., how the determination was made about the resources' eligibility).
- b) The report should identify large resources such as districts and landscapes where resources indicate their presence, even if federal agencies disagree. It is understood that often only a few contributing elements may be in the project area, and that the boundaries of the large resource may need to be revisited as part of future projects. It is acknowledged that boundaries of districts and landscapes can be difficult to define and there is not always good recorded data on these resources.
- c) In the case of archaeological resources, the report should discuss whether each one is also a unique archaeological resource and explain why or why not.
- d) Descriptions of resources should include spatial relationships to other nearby resources, raw materials sources, and natural features such as water sources and mountains.
- e) The evidence that indicates a particular function or age for a resource should be explicitly described with a clear explanation, not simply asserted.

Cultural Resource Evaluation Report

Provide a cultural resource evaluation report. The report contents required by the state of California are outlined in the *Archaeological Resource Management Reports: Recommended Contents and Guidelines*. The evaluation report should also include:

- a) Resource descriptions and evaluations together, and not in separate volumes or report sections. This will facilitate understanding of each resource.
- b) An evaluation of each potential or eligible California Register of Historical Resources (CRHR) resource within the public archaeology laboratory (PAL) for all seven aspects of integrity⁴⁰ using specific examples for each resource. This evaluation needs to be included in the evaluation

³⁹ Any aspect of the PEA and associated data that Applicants believe to be confidential will be provided in full but may be marked confidential if allowed pursuant to General Order 66 or latest applicable Commission rule (e.g., see Public Records Act Proceeding R.14-11-001).

⁴⁰ The seven aspects of integrity are location, design, setting, materials, workmanship, feeling, and association, as defined in “*Types of Historical Resources and Criteria for Listing in the California Register of Historical Resources*” [14 CCR 4852(c)].

- report for all resources that could be affected by the project even if the resources were not previously evaluated. Previous evaluations should be reviewed to address change over time.
- c) An evaluation of each potential or eligible CRHR resource within the PAL under all four criteria using specific examples for each resource. This evaluation needs to be included in the evaluation report for all resources that could be affected by the project even if the resources were not previously evaluated. The cultural resources professional should make their own recommendation regarding eligibility, which does not need to agree with previous recommendations for CRHR or NRHP, as long as it is clearly explained.
 - d) For **prehistoric archaeological resources**, Criteria 1, 2 and 341 should be explicitly considered. Research efforts to search for important events and persons related to the resource must be described. This evaluation needs to be included in the evaluation report for all resources that could be affected by the project even if the resources were not previously evaluated. The cultural resources professional should make their own recommendation, which does not need to agree with previous recommendations for CRHR or NRHP eligibility, as long as it is clearly explained.
 - e) While **potential unique archaeological resources** could be identified in the records search report or inventory report, the justification for each individual resource to be considered a resource under CEQA should be presented in this report.
 - f) If surface information collected during survey is sufficient to make an eligibility recommendation, this reasoning should be outlined explicitly for each resource. This is particularly the case for resources that are believed to have buried subsurface components.
 - g) If archaeological testing or additional historical research was required in order to evaluate a resource, the evaluation report will be explicit about why the work was required, the results for each resource, and the subsequent eligibility recommendation.
 - h) For large projects with multiple similar resources where the eligibility justifications for similar resources are essentially identical, it is acceptable to discuss these resources as a group. However, eligibility justifications for each individual resource is preferred, so if the grouping strategy is used, the criteria used to group resources must be clearly justified.
 - i) Large resources such as districts and landscapes may be challenging to fully evaluate in the context of a single project. CPUC encourages the identification and evaluation of these resources with the understanding that often only a few contributing elements may be located within the project area, and that the boundaries of the large resource may need to be revisited as part of future projects. It is understood that a full evaluation of the resource may be beyond the scope of one project. Regardless, the potential for the project to affect any resources within a district or landscape must be defined.

⁴¹ Criteria for Designation on the California Register are as follows (defined in http://ohp.parks.ca.gov/?page_id=21238):

- Criterion 1: Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Criterion 2: Associated with the lives of persons important to local, California or national history.
- Criterion 3: Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
- Criterion 4: Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Attachment 4: CPUC Draft Environmental Measures

About this Attachment: The following CPUC Draft Environmental Measures are provided for consideration during PEA development. They should be discussed with the CPUC's CEQA Unit Staff during Pre-filing, especially with respect to the development of Applicant Proposed Measures. The CPUC Draft Environmental Measures may form the basis for mitigation measures in the CEQA document if appropriate to the analysis of potentially significant impacts. These and other CPUC Draft Environmental Measures may be formally incorporated into Chapter 5 of future versions of the PEA Checklist.

5.1 Aesthetics

Aesthetics Impact Reduction During Construction

All project sites will be maintained in a clean and orderly state. Construction staging areas will be sited away from public view where possible. Nighttime lighting will be directed away from residential areas and have shields to prevent light spillover effects. Upon completion of project construction, project staging and temporary work areas will be returned to pre-project conditions, including re-grading of the site and re-vegetation or re-paving of disturbed areas to match pre-existing contours and conditions.

5.3 Air Quality

Dust Control During Construction

The Applicant shall implement measures to control fugitive dust in compliance with all local air district(s) standards. Dust control measures shall include the following at a minimum:

- All exposed surfaces with the potential of dust-generating shall be watered or covered with coarse rock to reduce the potential for airborne dust from leaving the site.
- The simultaneous occurrence of more than two ground disturbing construction phases on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- Cover all haul trucks entering/leaving the site and trim their loads as necessary.
- Use wet power vacuum street sweepers to sweep all paved access road, parking areas, staging areas, and public roads adjacent to project sites on a daily basis (at minimum) during construction. The use of dry power sweeping is prohibited.
- All trucks and equipment, including their tires, shall be washed off prior to leaving project sites.
- Apply gravel or non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at project sites.
- Water and/or cover soil stockpiles daily.
- Vegetative ground cover shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- All vehicle speeds shall be limited to fifteen (15) miles per hour or less on unpaved areas.
- Implement dust monitoring in compliance with the standards of the local air district.
- Halt construction during any periods when wind speeds are in excess of 50 mph.

5.5 Cultural Resources

Human Remains (Construction and Maintenance)

Avoidance and protection of inadvertent discoveries that contain human remains shall be the preferred protection strategy with complete avoidance of such resources ensured by redesigning the project. If human remains are discovered during construction or maintenance activities, all work shall be diverted from the area of the discovery, and the CPUC shall be informed immediately. The Applicant shall contact the County Coroner to determine whether or not the remains are Native American. If the remains are determined to be Native American, the Coroner will contact the Native American Heritage Commission (NAHC). The NAHC will then identify the person or persons it believes to be the most likely descendant of the deceased Native American, who in turn would make recommendations for the appropriate means of treating the human remains and any associated funerary objects.

If the remains are on federal land, the remains shall be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). If the remains are not on federal land, the remains shall be treated in accordance with Health and Safety Code Section 7050.5, CEQA Section 15064.5(e), and Public Resources Code Section 5097.98.

5.8 Greenhouse Gas Emissions

Greenhouse Gas Emissions Reduction During Construction

The following measures shall be implemented to minimize greenhouse gas emissions from all construction sites:

- If suitable park-and-ride facilities are available in the project vicinity, construction workers shall be encouraged to carpool to the job site.
- The Applicant shall develop a carpool program to the job site.
- On road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals.
- Demolition debris shall be recycled for reuse to the extent feasible.
- The contractor shall use line power instead of diesel generators at all construction sites where line power is available.
- The contractor shall maintain construction equipment per manufacturing specifications.

5.19 Utilities and Service Systems

Notify Utilities with Facilities Above and Below Ground

The Applicant shall notify all utility companies with utilities located within or crossing the project ROW to locate and mark existing underground utilities along the entire length of the project at least 14 days prior to construction. No subsurface work shall be conducted that would conflict with (i.e., directly impact or compromise the integrity of) a buried utility. In the event of a conflict, areas of subsurface excavation or pole installation shall be realigned vertically and/or horizontally, as appropriate, to avoid other utilities and provide adequate operational and safety buffering. In instances where separation between third-party utilities and underground excavations is less than 5 feet, the Applicant shall submit the intended construction methodology to the owner of the third-party utility for review and approval at least 30 days prior to construction. Construction methods shall be adjusted as necessary to assure that the integrity of existing utility lines is not compromised.

5.20 Wildfire

Construction Fire Prevention Plan

A project-specific Construction Fire Prevention Plan for both construction and operation of the project shall be submitted for review prior to initiation of construction. A draft copy of the Plan shall be provided to the CPUC and state and local fire agencies at least 90 days before the start of any construction activities in areas designated as Very High or High Fire Hazard Severity Zones. Plan reviewers shall also include

federal, state, or local agencies with jurisdiction over areas where the project is located. The final Plan shall be approved by the CPUC at least 30 days prior to the initiation of construction activities. The Plan shall be fully implemented throughout the construction period and include the following at a minimum:

- The purpose and applicability of the Plan
- Responsibilities and duties
- Preparedness training and drills
- Procedures for fire reporting, response, and prevention that include:
 - Identification of daily site-specific risk conditions
 - The tools and equipment needed on vehicles and to be on hand at sites
 - Reiteration of fire prevention and safety considerations during tailboard meetings
 - Daily monitoring of the red-flag warning system with appropriate restrictions on types and levels of permissible activity
- Coordination procedures with federal and local fire officials
- Crew training, including fire safety practices and restrictions
- Method(s) for verifying that all Plan protocols and requirements are being followed

A project Fire Marshal or similar qualified position shall be established to enforce all provisions of the Construction Fire Prevention Plan as well as perform other duties related to fire detection, prevention, and suppression for the project. Construction activities shall be monitored to ensure implementation and effectiveness of the Plan.

Fire Prevention Practices (Construction and Maintenance)

The Applicant shall implement ongoing fire patrols during the fire season as defined each year by local, state, and federal fire agencies. These dates vary from year to year, generally occurring from late spring through dry winter periods. During Red Flag Warning events, as issued daily by the National Weather Service, all construction/maintenance activities shall cease, with an exception for transmission line testing, repairs, unfinished work, or other specific activities which may be allowed if the facility/equipment poses a greater fire risk if left in its current state.

All construction/maintenance crews and inspectors shall be provided with radio and cellular telephone access that is operational in all work areas and access routes to allow for immediate reporting of fires. Communication pathways and equipment shall be tested and confirmed operational each day prior to initiating construction/maintenance activities at each work site. All fires shall be reported to the fire agencies with jurisdiction in the area immediately upon discovery of the ignition.

All construction/maintenance personnel shall be trained in fire-safe actions, initial attack firefighting, and fire reporting. All construction/maintenance personnel shall be trained and equipped to extinguish small fires in order to prevent them from growing into more serious threats. All construction/maintenance personnel shall carry at all times a laminated card and be provided a hard hat sticker that list pertinent telephone numbers for reporting fires and defining immediate steps to take if a fire starts. Information on laminated contact cards and hard hat stickers shall be updated and redistributed to all construction/maintenance personnel and outdated cards and hard hat stickers shall be destroyed prior to the initiation of construction/maintenance activities on the day the information change goes into effect.

Construction/maintenance personnel shall have fire suppression equipment on all construction vehicles. Construction/maintenance personnel shall be required to park vehicles away from dry vegetation. Water tanks and/or water trucks shall be sited or available at active project sites for fire protection during construction. The Applicant shall coordinate with applicable local fire departments prior to construction/maintenance activities to determine the appropriate amounts of fire equipment to be carried on vehicles and, should a fire occur, to coordinate fire suppression activities.



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AR6 Synthesis Report: Climate Change 2023

The IPCC finalized the Synthesis Report for the Sixth Assessment Report during the Panel's 58th Session held in Interlaken, Switzerland from 13 - 19 March 2023.

[READ THE REPORT](#)

[CORE WRITING TEAM](#)

Report

AR6 Synthesis Report (SYR)

Disclaimer: The approved Summary for Policymakers and adopted Longer Report remain subject to final copy editing and layout.

Read the report here

- Summary for Policymakers
- Longer Report
- Headline statements
- Figures from the Summary for Policymakers

- Presentation made during the press conference

The Synthesis Report is based on the content of the three Working Groups Assessment Reports: *WGI – The Physical Science Basis*, *WGII – Impacts, Adaptation and Vulnerability*, *WGIII – Mitigation of Climate Change*, and the three Special Reports: *Global Warming of 1.5°C*, *Climate Change and Land*, *The Ocean and Cryosphere in a Changing Climate*.

Artwork credits

Core Writing Team

The Core Writing Team (CWT) is the group of authors preparing the Synthesis Report. The list of the Core Writing Team members and Review Editors can be found [here](#).

The IPCC Bureau at its 58th Session in May 2020 selected the members of Core Writing Team from the author teams of the three IPCC Working Group and the three Special Reports, reflecting the balance in geographical distribution, gender, and representative of a range of expertise.

The CWT also includes the Chair, the IPCC Vice-Chairs, the Working Group Co-Chairs, the heads of the Working Group and Synthesis Report Technical Support Units, and the Secretary of the IPCC.

Core Writing Team meetings

- **AR6 SYR Core Writing Team Meeting 1**, (25 – 29 January 2021, *virtual meeting*)
 - **AR6 SYR Core Writing Team Meeting 2** (16-20 August 2021, *virtual meeting*)
 - **AR6 SYR Core Writing Team Meeting 3** (25-28 April 2022, *Dublin, Ireland*)
 - **AR6 SYR Core Writing Team Meeting 4**
(10-12 March 2023, Interlaken, Switzerland)
-

Background

The Panel at its 41st Session held in Nairobi, Kenya from 24 to 27 February 2015 agreed that it would continue to prepare comprehensive assessment reports every five to seven years and that the scoping of the Synthesis Report – SYR – as well as attention to cross-cutting issues should start at an early stage (IPCC-XLI/4). Consistent with decision IPCC/XLI-4, a preliminary Scoping meeting for the Sixth Assessment Report (AR6) Synthesis Report (SYR) was held during the AR6 Scoping Meeting in Addis Ababa, Ethiopia, from 1 to 5 May 2017. The Panel at its 46th Session held from 6 to 10 September 2017 in Montreal, Canada, took note of document IPCC-XLVI/Doc.6 which was produced during the scoping meeting.

A dedicated Scoping meeting for the AR6 Synthesis Report was held in Singapore from 21 to 23 October 2019, the outcome of which is included in the AR6 SYR Scoping document IPCC-LII/Doc.10 submitted to the 52nd session of the Panel. It is explained in more detail in the information document IPCC-LII/INF.12.

The Panel at its 52nd Session held in Paris, France from 24 to 28 February 2020 agreed to the outline of the AR6 SYR as is contained in Annex 1 to Decision IPCC-LII-10.

The Synthesis Report Outline

The SYR outline agreed at the 52nd Panel Session of the IPCC consists of an introduction and three main sections arranged by

timeframes. The first section, ‘Current Status and Trends’, covers the historical and present period. The second section, ‘Long-term Climate and Development Futures’, addresses projected futures up to 2100 and beyond. The final section is ‘Near-term Responses in a Changing Climate’, considers current international policy timeframes, and the time interval between now and 2030-2040.

This structure, substantially different to what was adopted for AR5 SYR, enables a holistic framing that integrates across the Working Groups, better enabling the SYR to cover different aspects of climate change.

Quick links

[AR6 Chair’s Vision Paper](#)

[IPCC Calendar](#)

Approved outlines

- [AR6 Synthesis Report outline](#)
- [Working Group I – The Physical Science Basis](#)
- [Working Group II– Impacts, Adaptation, and Vulnerability](#)
- [Working Group III– Mitigation of Climate Change](#)

Authors and Review editors

- [AR6 Synthesis Report Core Writing Team](#)
- [Working Group I](#)

- Working Group II
 - Working Group III
-
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2018 Report: Indicators of Climate Change in California

May 9, 2018



Indicators are scientifically-based measurements that track trends in various aspects of climate change. The report presents 36 indicators that show how climate change is affecting California. The report is intended to promote scientific analysis to inform decision-making on mitigating and adapting to climate change and to serve as a resource for decision makers, scientists, educators, and the public.

The report's 36 indicators are grouped into four categories:

- Human-influenced (anthropogenic) drivers of climate change, such as greenhouse gas emissions
- Changes in the state's climate
- Impacts of climate change on physical systems, such as oceans, lakes and snowpack
- Impacts of climate change on biological systems – humans, vegetation and wildlife

You can [download the full report or the report summary](#). Additionally, individual indicators can be accessed by category from the "[Explore the indicators](#)" page.

INDICATORS OF CLIMATE CHANGE IN CALIFORNIA



CLIMATE CHANGE DRIVERS

Greenhouse gas emissions
Atmospheric greenhouse gas concentrations
Atmospheric black carbon concentrations
Acidification of coastal waters



CHANGES IN CLIMATE

Annual air temperature
Extreme heat events
Winter chill
Cooling and heating degree days
Precipitation
Drought



IMPACTS OF CLIMATE CHANGE ON PHYSICAL SYSTEMS

Snowmelt runoff
Snow-water content
Glacier change
Lake water temperature
Coastal ocean temperature
Sea level rise
Dissolved oxygen in coastal waters



IMPACTS OF CLIMATE CHANGE ON BIOLOGICAL SYSTEMS

On humans

Vector-borne diseases
Heat-related mortality and morbidity

On vegetation

Forest tree mortality
Wildfires
Ponderosa pine forest retreat
Vegetation distribution shifts
Changes in forests and woodlands
Subalpine forest density
Fruit and nut maturation time

On wildlife

Spring flight of Central Valley butterflies
Migratory bird arrivals
Bird wintering ranges
Small mammal and avian range shifts
Effects of ocean acidification on marine organisms (*Type III**)
Nudibranch range shifts
Copepod populations
Sacramento fall-run Chinook salmon abundance
Cassin's auklet breeding success
California sea lion pup demography

* A "Type III" indicator is conceptual; no ongoing monitoring or data collection is in place in California.

Downloads

 [2018 Report: Indicators of Climate Change in California](#) May 9, 2018

 [2018 Report Summary: Indicators of Climate Change in California](#) May 9, 2018

Related Notices

- ▶ [Impacts of climate change in California significant and increasingly stark, new report says: Pioneering efforts to reduce climate change drivers are working, but climate adaptation and mitigation efforts must continue](#)
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2016 2040 RTPSCS

THE **2016-2040** REGIONAL TRANSPORTATION PLAN/
SUSTAINABLE COMMUNITIES STRATEGY
A Plan for Mobility, Accessibility, Sustainability and a High Quality of Life

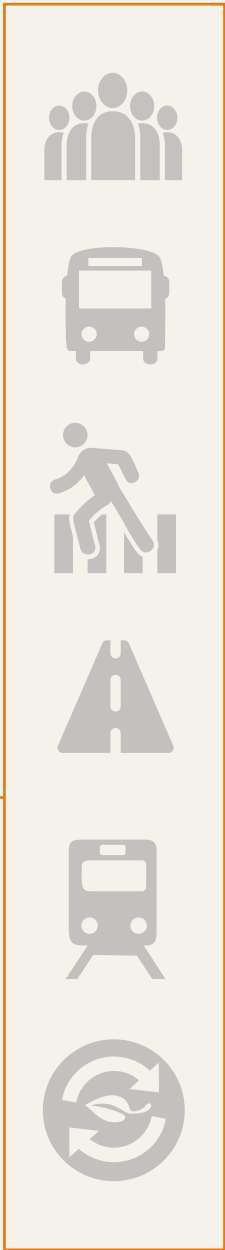
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ADOPTED APRIL 2016

SOUTHERN CALIFORNIA
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LEADERSHIP | VISION | PROGRESS

Leadership, vision and progress which promote economic growth, personal well-being and livable communities for all Southern Californians.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS WILL ACCOMPLISH THIS MISSION BY:

- Developing long-range regional plans and strategies that provide for efficient movement of people, goods and information; enhance economic growth and international trade; and improve the environment and quality of life
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- Using an inclusive decision-making process that resolves conflicts and encourages trust
- Creating an educational and work environment that cultivates creativity, initiative and opportunity

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RESOLUTION NO. 16-578-2

A RESOLUTION OF THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS APPROVING THE 2016-2040 REGIONAL TRANSPORTATION PLAN/ SUSTAINABLE COMMUNITIES STRATEGY (2016 RTP/SCS); RELATED CONFORMITY DETERMINATION; AND RELATED CONSISTENCY AMENDMENT #15-12 TO THE 2015 FEDERAL TRANSPORTATION IMPROVEMENT PROGRAM (FTIP)

WHEREAS, the Southern California Association of Governments (SCAG) is a Joint Powers Agency established pursuant to California Government Code Section 6502 et seq.; and

WHEREAS, SCAG is the designated Metropolitan Planning Organization (MPO) for the counties of Los Angeles, Riverside, San Bernardino, Ventura, Orange, and Imperial, pursuant to Title 23, United States Code Section 134(d); and

WHEREAS, SCAG is responsible for maintaining a continuing, cooperative, and comprehensive transportation planning process which involves the preparation and update every four years of a Regional Transportation Plan (RTP) pursuant to Title 23, United States Code Section 134 et seq., Title 49, United States Code Section 5303 et seq., and Title 23, Code of Federal Regulations Section 450 et seq.; and

WHEREAS, SCAG is the multi-county designated transportation planning agency under state law, and as such, is responsible for preparing and adopting the FTIP (regional transportation improvement program, under

state law) every two years pursuant to Government Code §§ 14527 and 65082, and Public Utilities Code §130301 et seq.; and

WHEREAS, pursuant to Senate Bill (SB) 375 (Steinberg, 2008) as codified in Government Code §65080(b) et seq., SCAG must also prepare a Sustainable Communities Strategy (SCS) that will be incorporated into the RTP and demonstrates how the region will meet its greenhouse gas (GHG) reduction targets as set forth by the California Air Resources Board (ARB); and

WHEREAS, ARB set the per capita GHG emission reduction targets from automobiles and light trucks for the SCAG region at 8% below 2005 per capita emissions levels by 2020 and 13% below 2005 per capita emissions levels by 2035; and

WHEREAS, pursuant to Government Code §65080(b)(2)(B), the SCS must: (1) identify the general location of uses, residential densities, and building intensities within the region; (2) identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the regional transportation plan taking into account net migration into the region, population growth, household formation and employment growth; (3) identify areas within the region sufficient to house an eight-year projection of the regional housing need for the region pursuant to Government Code Section 65584; (4) identify a transportation network to service the transportation needs of the region; (5) gather and consider the best practically available scientific information regarding resource

areas and farmland in the region as defined in subdivisions (1) and (b) of the Government Code Sections 65080 and 65581; and (6) consider the statutory housing goals specified in Sections 65580 and 65581, (7) set forth a forecasted development pattern for the region which when integrated with the transportation network, and other transportation measures and policies, will reduce the GHG emissions from automobiles and light trucks to achieve the GHG reduction targets, and (8) allow the RTP to comply with air quality conformity requirements under the federal Clean Air Act; and

WHEREAS, through the conduct of a continuing, comprehensive and coordinated transportation planning process in conformance with all applicable federal and state requirement, SCAG developed and prepared its latest RTP/SCS, the Final 2016-2040 RTP/SCS ("2016 RTP/SCS"); and

WHEREAS, the 2016 RTP/SCS sets forth the long-range regional plan, policies and strategies for transportation improvements and regional growth throughout the SCAG region through the horizon year of 2040; and

WHEREAS, the 2016 RTP/SCS includes a regional growth forecast that was developed by working with local jurisdictions using the most recent land use plans and policies and planning assumptions; and

WHEREAS, the 2016 RTP/SCS includes a financially constrained plan and a strategic plan. The constrained plan includes transportation projects that have committed, available or reasonably available

revenue sources, and thus are probable for implementation. The strategic plan is an illustrative list of additional transportation investments that the region would pursue if additional funding and regional commitment were secured; and such investments are potential candidates for inclusion in the constrained RTP/SCS through future amendments or updates. The strategic plan is provided for information purposes only and is not part of the financially constrained and conforming Final 2016 RTP/SCS; and

WHEREAS, the 2016 RTP/SCS includes a financial plan identifying the revenues committed, available or reasonably available to support the SCAG region's surface transportation investments. The financial plan was developed following basic principles including incorporation of county and local financial planning documents in the region where available, and utilization of published data sources to evaluate historical trends and augment local forecasts as needed; and

WHEREAS, the 2016 RTP/SCS includes a sustainable communities strategy which sets forth a forecasted development pattern for the region, which, when integrated with the transportation network, and other transportations measures and policies, if implemented, will reduce the GHG emissions from automobiles and light trucks to achieve the regional GHG targets set by ARB for the SCAG region; and

WHEREAS, the 2016 RTP/SCS must be consistent with all applicable provisions of federal and state law including:

- (1) The Moving Ahead for Progress in the 21st Century Act (MAP-21, PL 112-141) and the metropolitan planning regulations at 23 U.S.C. §134 et seq., as was amended by the Fixing America's Surface Transportation Act (P.L. 114-94, December 4, 2015);
- (2) The metropolitan planning regulations at 23 C.F.R. Part 450, Subpart C;
- (3) California Government Code §65080 et seq.; Public Utilities Code §130058 and 130059; and Public Utilities Code §44243.5;
- (4) §§174 and 176(c) and (d) of the federal Clean Air Act [(42 U.S.C. §§7504 and 7506(c) and (d))] and Environmental Protection Agency (EPA) Transportation Conformity Rule, 40 C.F.R. Parts 51 and 93;
- (5) Title VI of the 1964 Civil Rights Act and the Title VI assurance executed by the State pursuant to 23 U.S.C. §324;
- (6) The Department of Transportation's Final Environmental Justice Strategy (60 Fed. Reg. 33896; June 29, 1995) enacted pursuant to Executive Order 12898, which seeks to avoid disproportionately high and adverse impacts on minority and low-income populations with respect to human health and the environment;
- (7) Title II of the 1990 Americans with Disabilities Act (42 U.S.C. §§12101 et seq.) and accompanying regulations at 49 C.F.R. §27, 37, and 38; and
- (8) SB 375 (Steinberg, 2008) as codified in California Government Code §65080(b) et seq.;

WHEREAS, SCAG is further required to comply with the California Environmental Quality Act (CEQA) (Cal. Pub. Res. Code § 21000 et seq.) in preparing the 2016 RTP/SCS; and

WHEREAS, SCAG prepared a program environmental impact report (PEIR) for the 2016 RTP/SCS. The PEIR serves as a programmatic document that conducts a region-wide assessment of potential significant environmental effects of the 2016 RTP/SCS; and

WHEREAS, in non-attainment and maintenance areas for transportation-related criteria pollutants, the MPO, as well as the Federal Highways Administration (FHWA) and Federal Transit Administration (FTA), must make a conformity determination on any updated or amended RTP in accordance with the federal Clean Air Act to ensure that federally supported highway and transit project activities conform to the purpose of the State Implementation Plan (SIP); and

WHEREAS, transportation conformity is based upon a positive conformity finding with respect to the following tests: (1) regional emissions analysis, (2) timely implementation of Transportation Control Measures, (3) financial constraint, and (4) interagency consultation and public involvement; and

WHEREAS, on April 4, 2012, the SCAG Regional Council found the 2012 RTP/SCS to be in conformity with the State Implementation Plans for air quality, pursuant to the federal Clean Air Act and the EPA Transportation Conformity Rule. Thereafter, FHWA and FTA made a conformity determination on the 2012 RTP/SCS with said determination to expire on June 4, 2016; and

WHEREAS, on September 11, 2014, in accordance with federal and state requirements, the SCAG Regional Council approved the 2015/16 – 2020/21 Federal Transportation Improvement Program (2015 FTIP), which was federally approved on December 15, 2014. The 2015 FTIP represents

a staged, multi-year, intermodal program of transportation projects which covers six fiscal years and includes a priority list of projects to be carried out in the first four fiscal years; and

WHEREAS, pursuant to Government Code §65080(b)(2)(F) and federal public participation requirements, including 23 C.F.R. §450.316(b)(1)(iv), SCAG must prepare the RTP/SCS by providing adequate public notice of public involvement activities and time for public review. On April 3, 2014, SCAG approved and adopted a Public Participation Plan, to serve as a guide for SCAG's public involvement process, including the public involvement process to be used for the 2016 RTP/SCS, and included an enhanced outreach program that incorporates the public participation requirements of SB 375 and adds strategies to better serve the underrepresented segments of the region; and

WHEREAS, pursuant to Government Code §65080(b)(2)(F)(iii), during the summer 2015, SCAG held a series of RTP/SCS public workshops throughout the region, including residents, elected officials, representatives of public agencies, community organizations, and environmental, housing and business stakeholders; and

WHEREAS, in accordance with the interagency consultation requirements, 40 C.F.R. 93.105, SCAG consulted with the respective transportation and air quality planning agencies, including but not limited to, extensive discussion of the Draft Conformity Report before the Transportation Conformity Working Group (a forum for implementing the interagency consultation requirements) throughout the 2016 update process; and

WHEREAS, the Transportation Conformity Report contained in the Final 2016 RTP/SCS makes a positive transportation conformity

determination. Using the final motor vehicle emission budgets released by ARB and found to be adequate by the EPA, this conformity determination is based upon staff's analysis of the applicable transportation conformity tests; and

WHEREAS, each project or project phase included in the FTIP must be consistent with the approved RTP, pursuant to 23 C.F.R. §450.324(g). Amendment #15-12 to the 2015 FTIP has been prepared to ensure consistency with the Final 2016 RTP/SCS; and

WHEREAS, conformity of Amendment #15-12 to the 2015 FTIP has been determined simultaneously with the Final 2016 RTP/SCS in order to address the consistency requirement of federal law; and

WHEREAS, on November 5, 2015, SCAG Policy Committees (comprising the Community, Economic and Human Development Committee; the Energy and Environment Committee; and the Transportation Committee) recommended that the Regional Council at its December 4, 2015 meeting authorize release of the Draft 2016 RTP/SCS PEIR for a public review and comment period concurrent with the public review and comment period for the Draft 2016 RTP/SCS; and

WHEREAS, on December 3, 2015, the Regional Council approved release of the Draft 2016 RTP/SCS PEIR concurrent with release of the Draft 2016 RTP/SCS for a 60-day public review and comment period; and

WHEREAS, SCAG released the Draft 2016 RTP/SCS and the associated Draft Amendment #15-12 to the 2015 FTIP for a 60-day public review and comment period that began on December 4, 2015 and ended on February 1, 2016; and

WHEREAS, the SCAG also released the Draft 2016 RTP/SCS PEIR concurrently with the release of the Draft 2016 RTP/SCS, and issued a Notice of Availability for the same 60-day public review and comment period of December 4, 2015 to February 1, 2016; and

WHEREAS, SCAG followed the provisions of its adopted Public Participation Plan regarding public involvement activities for the Draft 2016 RTP/SCS and Draft 2016 RTP/SCS PEIR. Public outreach efforts included publication of the Draft 2016 RTP/SCS and Draft 2016 RTP/SCS PEIR on SCAG's website, distribution of public information materials, held four (4) duly-noticed public hearings (three public hearings were video-conferenced to four regional offices in different counties), and 14 elected official briefings within the SCAG region to allow stakeholders, elected officials and the public to comment on the Draft 2016 RTP/SCS and the Draft 2016 RTP/SCS PEIR; and

WHEREAS, during the public review and comment period, SCAG received 162 verbal and written comment submissions on the Draft 2016 RTP/SCS and 81 comment submissions on the Draft 2016 RTP/SCS PEIR; and

WHEREAS, SCAG staff presented an overview of the comments received on the Draft 2016 RTP/SCS and Draft 2016 RTP/SCS PEIR, and a proposed approach to the responses, to the Policy Committees and Regional Council at a joint meeting on March 3, 2016; and

WHEREAS, comment letters and SCAG staff responses on the Draft 2016 RTP/SCS and Draft 2016 RTP/SCS PEIR were posted on the SCAG web page on March 14, 2016, and included as part of the Final 2016 RTP/SCS, Public Participation and Consultation Appendix. SCAG also notified all commenters of the availability of the comments and responses; and

WHEREAS, on March 18, 2016, SCAG posted the proposed Final 2016 RTP/SCS and proposed Final 2016 RTP/SCS PEIR on its website; and

WHEREAS, on March 24, 2016, SCAG's three Policy Committees held a public, special joint meeting to consider a recommendation to the Regional Council to approve and adopt the proposed Final 2016 RTP/SCS and certify the proposed Final 2016 RTP/SCS PEIR at the April 7, 2016 Regional Council meeting; and

WHEREAS, prior to the adoption of this resolution, the Regional Council certified the Final 2016 RTP/SCS PEIR prepared for the 2016 RTP/SCS to be in compliance with CEQA; and

WHEREAS, the Regional Council has had the opportunity to review the Final 2016 RTP/SCS and its related appendices as well as the staff report related to the Final 2016 RTP/SCS, and consideration of the Final 2016 RTP/SCS was made by the Regional Council as part of a public meeting held on April 7, 2016.

NOW, THEREFORE BE IT RESOLVED, the Regional Council hereby approves and adopts the Final 2016 RTP/SCS.

BE IT FURTHER RESOLVED by the Regional Council that:

1. In adopting this Final 2016 RTP/SCS, the Regional Council finds as follows:
 - a. The Final 2016 RTP/SCS complies with all applicable federal and state requirements, including the metropolitan planning provisions as identified in the Code of Federal Regulations Title 23 Part 450 and Title 49, Part 613, and the SCS and other State RTP requirements as identified in California Government Code Section 65080. Specifically, the Final 2016 RTP/SCS fully addresses the requirements relating to the development and content of metropolitan transportation plans as set forth in 23 C.F.R. §450.322 et seq., including issues relating to: identification of transportation facilities that function as an integrated metropolitan transportation system; operational and management strategies; safety and security; performance measures; environmental mitigation; the need for a financially constrained plan; consultation and public participation; and transportation conformity;
 - b. The Final 2016 RTP/SCS complies with the emission reduction targets established by the California ARB and meets the requirements of SB 375 (Steinberg, 2008) as codified in Government Code §65080(b) et seq. by achieving per capita GHG emission reductions relative to 2005 of 8% by 2020 and 18% by 2035; and
 - c. The Final 2016 RTP/SCS's preferred land use scenario and corresponding forecast of population, household and employment growth is adopted at the jurisdictional level, and any corresponding sub-jurisdictional level data and/or maps is advisory only.
2. The Regional Council hereby makes a positive transportation conformity determination of the Final 2016 RTP/SCS and Amendment #15-12 to the 2015 FTIP. In making this determination, the Regional Council finds as follows:
 - a. The Final 2016 RTP/SCS and Amendment #15-12 to the 2015 FTIP passes the four tests and analyses required for conformity, namely: regional emissions analysis; timely implementation of Transportation Control Measures; financial constraint analysis; and interagency consultation and public involvement;
3. In approving the Final 2016 RTP/SCS, the Regional Council also approves and adopts Amendment #15-12 to the 2015 FTIP, in compliance with the federal requirement of consistency with the RTP;
4. That the foregoing recitals are true and correct and incorporated herein by this reference; and
5. SCAG's Executive Director or his designee is authorized to transmit the Final 2016 RTP/SCS and its conformity findings to the FTA and the FHWA to make the final conformity determination in accordance with the Federal Clean Air Act and EPA Transportation Conformity Rule, 40 C.F.R. Parts 51 and 93.

TO BE PASSED, APPROVED AND ADOPTED by the Regional Council of the Southern California Association of Governments at its regular meeting on the 7th day of April, 2016.



Cheryl Viegas-Walker
President
Council Member, City of El Centro

Attest:



Hasan Ikhata
Executive Director

Approved as to Form:



Joann Africa
Chief Counsel

EXECUTIVE SUMMARY

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ENVISIONING OUR REGION IN 2040

Transport yourself 25 years into the future. What kind of Southern California do you envision? SCAG envisions a region that has grown by nearly four million people—sustainably. In communities across Southern California, people enjoy increased mobility, greater economic opportunity and a higher quality of life.

OUR VISION

In our vision for the region in 2040, many communities are more compact and connected seamlessly by numerous public transit options, including expanded bus and rail service. People live closer to work, school, shopping and other destinations. Their neighborhoods are more walkable and safe for bicyclists. They have more options available besides driving alone, reducing the load on roads and highways. People live more active and healthy lifestyles as they bike, walk or take transit for short trips. Goods flow freely along roadways, highways, rail lines and by sea and air into and out of the region—fueling economic growth.

Southern California’s vast transportation network is preserved and maintained in a state of good repair, so that public tax dollars are not expended on costly repairs and extensive rehabilitation. The region’s roads and highways are well-managed so that they operate safely and efficiently, while demands on the regional network are managed effectively by offering people numerous alternatives for transportation.

Housing across the region is sufficient to meet the demands of a growing population with shifting priorities and desires, and there are more affordable homes for all segments of society. With more connected communities, more choices for travel and robust commerce, people enjoy more opportunities to advance educationally and economically. As growth and opportunity are distributed widely, people from diverse neighborhoods across the region share in the benefits of an enhanced quality of life.

With more alternatives to driving alone available, air quality is improved and the greenhouse gas emissions that contribute to global climate change are reduced. Communities throughout Southern California are more prepared to confront and cope with the inevitable consequences of climate change, including droughts and wildfires, heat waves, rising seas and extreme weather. Meanwhile, natural lands and recreational areas that offer people a respite from the busier parts of the region are preserved and protected.

At mid-century, technology has transformed how we get around. Automated cars have emerged as a viable option for people and are being integrated into the overall transportation system. Shared mobility options that rely on instantaneous communication and paperless transactions have matured, and new markets for mobility are created and strengthened.

Above all, people across the region possess more choices for getting around and with those choices come opportunities to live healthier, more economically secure and higher quality lives.

This vision for mid-century, which is built on input received from thousands of people across Southern California, is embodied in the 2016 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS, or Plan), a major planning document for our regional transportation and land use network. It balances the region’s future mobility and housing needs with economic, environmental and public health goals. This long-range Plan, required by the State of California and the federal government, is updated by SCAG every four years as demographic, economic and policy circumstances change. The 2016 RTP/SCS is a living, evolving blueprint for our region’s future.

OUR OVERARCHING STRATEGY

It is clear that the path toward realizing our vision will require a single unified strategy, one that integrates planning for how we use our land with planning for how we get around.

Here is what we mean: we can choose to build new sprawling communities that pave over undeveloped natural lands, necessitating the construction of new roads and highways—which will undoubtedly become quickly overcrowded and contribute to regional air pollution and ever-increasing greenhouse gas emissions that affect climate change.

Or, we can grow in more compact communities in existing urban areas, providing neighborhoods with efficient and plentiful public transit, abundant and safe opportunities to walk, bike and pursue other forms of active transportation, and preserving more of the region’s remaining natural lands for people to enjoy. This second vision captures the essence of what people have said they want during SCAG outreach to communities across the region.

SCAG acknowledges that more compact communities are not for everyone, and that many residents of our region prefer to live in established suburban neighborhoods. The agency supports local control for local land use decisions, while striving for a regional vision of more sustainable growth.

Within the 2016 RTP/SCS, you will read about plans for “High Quality Transit Areas,” “Livable Corridors” and “Neighborhood Mobility Areas.” These are a few of the key features of a thoughtfully planned, maturing region in which people benefit from increased mobility, more active lifestyles, increased economic opportunity and an overall higher quality of life. These features embody the idea of integrating planning for how we use land with planning for transportation.

As we pursue this unified strategy, it will be vital that we ensure that the benefits of our initiatives are widely distributed and that the burdens of development are not carried by any one group disproportionately. Social equity and environmental justice are key considerations of our overall Plan.

CHALLENGES WE FACE

We are living at a time of great change in Southern California. Our region must confront several challenges as we pursue the goals outlined in the 2016 RTP/SCS:

- **We are growing slower:** But our region is projected to grow to 22 million people by 2040—an increase of nearly four million people.
- **Our overall population will be older:** The median age of our region's overall population is expected to rise, with an increasing share of senior citizens. This demographic shift will have major impacts on transportation needs and on our transportation plans. A key challenge for the region will be to provide seniors with more transportation options for maintaining their independence as they age.
- **A smaller percentage of us will be working:** The share of younger people of working age is expected to fall. The ratio of people over the age of 65 to people of working age (15 to 64) is expected to increase. This means that our region could face a labor shortage and a subsequent reduction in tax revenues.
- **A large number of us want more urban lifestyles:** Today's Millennials, born between 1980 and 2000, are expected to demand more compact communities and more access to transit—shifting regional priorities for the overall transportation system and the types of housing that are constructed. Baby Boomers are also expected to increasingly desire these kinds of communities.
- **Many of us will continue to live in the suburbs and drive alone:** Despite the emerging trends discussed above, many people in the region will continue to live in suburban neighborhoods and drive alone to work, school, shopping and other destinations—rather than use public transit and other transportation alternatives. The 2016 RTP/SCS will not change how everyone chooses to get around, but the Plan is designed to offer residents more choices so that we can experience regionwide benefits.
- **Housing prices are increasing:** Housing prices are rising steadily and affordability is declining. As communities are redeveloped to be more compact with new transit options and revitalized urban amenities, existing residents may risk displacement.
- **Our transportation system requires rehabilitation and maintenance:** Southern California's transportation system is becoming increasingly compromised by decades of underinvestment in maintaining and preserving our infrastructure. These investments have not kept pace with the demands placed on the system and the quality of many of our roads, highways, bridges, transit and bicycle and pedestrian facilities is continuing to deteriorate. If we continue on our current path of seriously underfunding system preservation, the cost of bringing our system back to a reasonable state of good repair will grow exponentially.
- **Transportation funding is scarce and insufficient:** Full funding for transportation improvements is currently not sustainable, given the projected needs. Projected revenues from the gas tax, the historic source of transportation funding, will not meet transportation investment needs—and gas tax revenues, in real terms, are actually in decline as tax rates (both state and federal) have not been adjusted in more than two decades while the number of more fuel efficient and alternative powered vehicles continues to grow.
- **Moving goods through the region faces growing pains:** The movement of goods will face numerous challenges as consumer demand for products increases and the region continues to grow as a major exchange point for global trade. Infrastructure for freight traffic will be strained, current efforts to reduce air pollution from goods movement sources will not be sufficient to meet national air quality standards, capacity at international ports will be over-burdened and warehouse space could fall short of demands.
- **Technology is transforming transportation:** Mobility innovations including electric cars, the availability of real-time traveler information, the expansion of car sharing and ridesourcing due to smart phones and other technological advances will require updated planning to smoothly integrate these new travel options into the overall transportation system.
- **Millions suffer from chronic diseases:** Many people in our region suffer from chronic diseases related to poor air quality and physical inactivity. Heart disease, stroke, cancer, chronic lower respiratory disease and diabetes are responsible for 72 percent of all deaths in our region. Nine percent of residents have been diagnosed with diabetes, 27 percent with hypertension and 13 percent with asthma, and more

than 60 percent are overweight or obese, according to the California Health Interview Survey.

- **Climate change demands that we adapt:** The consequences of climate change will continue to impact everyday life for millions of people. The region is expected to experience more droughts and wildfires, water shortages because of drought but also because of declining snowpack in our mountains, rising seas, extreme weather events, and other impacts. Communities will need to make their neighborhoods more resilient to these changes.

OUR PROGRESS SINCE 2012

Although our challenges are great, the region has made significant progress over the past few years.

TRANSIT

Transit service continues to expand throughout the region and the level of service has exceeded pre-recessionary levels—mainly due to a growth in rail service. Significant progress has been made toward completing capital projects for transit, including the Los Angeles County Metropolitan Transportation Authority (Metro) Orange Line Extension and the Metro Expo Line. Meanwhile, five major Metro Rail projects are now under construction in Los Angeles County.

PASSENGER RAIL

Passenger rail is expanding and improving service on several fronts. The Amtrak Pacific Surfliner is now being managed locally by the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency; Riverside County Transportation Commission (RCTC) completed the Perris Valley Line in early 2016; Metrolink became the first commuter railroad in the nation to implement Positive Train Control and purchase fuel-efficient, low-emission Tier IV locomotives; and the California High-Speed Train is under construction in the Central Valley, and planning and environmental work is underway in our region to the Los Angeles/Anaheim Phase One terminus. Several other capital projects are underway or have been completed, including the Anaheim Regional Intermodal Transportation Center (ARTIC) and the Burbank Bob Hope Airport Regional Intermodal Transportation Center, among others.

HIGHWAYS

The expansion of highways has slowed considerably over the last decade because of land, financial and environmental constraints. Still, several projects have been completed since 2012 to improve access and close critical gaps and congestion chokepoints in the regional network. These include the Interstate 10 westbound widening in Redlands and Yucaipa, the Interstate 215 Bi-County HOV Project in Riverside and San Bernardino Counties, and a portion of the Interstate 5 South Corridor Project in Los Angeles County (between North Fork Coyote Creek to Marquardt Avenue), among others.

REGIONAL HIGH-OCCUPANCY VEHICLE (HOV) AND EXPRESS LANE NETWORK

The demands on our region's highways continue to exceed available capacity during peak periods, but several projects to close HOV gaps have been completed. The result has been 39 more lane miles of regional HOV lanes on Interstates 5, 405, 10, 215 and 605, on State Routes 57 and 91, and on the West County Connector Project (direct HOV connection between Interstate 405, Interstate 605 and State Route 22) within Orange County. The region is also developing a regional express lane network. Among the milestones: a one-year demonstration of express lanes in Los Angeles County along Interstate 10 and Interstate 110 was made permanent in 2014; and construction has begun on express lanes on State Route 91 extending eastward to Interstate 15 in Riverside County.

ACTIVE TRANSPORTATION

Our region is making steady progress in encouraging more people to embrace active transportation and more than \$650 million in Active Transportation Program investments are underway. Nearly 38 percent of all trips are less than three miles, which is convenient for walking and biking. As a percentage share of all trips, bicycling has increased more than 70 percent since 2007 to 1.12 percent. More than 500 miles of new bikeways have been constructed in the region, and safety and encouragement programs are helping people choose walking and biking.

GOODS MOVEMENT

The region continues to make substantial progress toward completing several major capital initiatives to support freight transportation and reducing harmful emissions generated by goods movement sources. Progress since 2012 has included implementation of the San Pedro Bay Ports Clean Air Action Program (CAAP), which is reducing diesel particulate matter dropping by 82 percent, nitrogen oxides by 54 percent and sulfur oxides by 90 percent; and the San Pedro Bay Ports Clean Truck Program, which has led to an 80 percent reduction in port truck emissions. The region has also shown progress in advanced technology for goods movement, including a one-mile Overhead Catenary System (OCS) in the City of Carson. Construction of the Gerald Desmond Bridge has begun. Seventeen out of 71 planned grade separation projects throughout the region have been completed, and another 21 are expected to be complete in 2016. Double tracking of the Union Pacific (UP) Alhambra Subdivision has been initiated. The Colton Crossing, which physically separated two Class I railroads with an elevated 1.4-mile-long overpass that lifts UP trains traveling east-west, was completed in August 2013.

SUSTAINABILITY IMPLEMENTATION

Since 2012, SCAG's Sustainability Planning Grant Program has funded 70 planning projects (totaling \$10 million) to help local jurisdictions link local land use plans with 2012 RTP/SCS goals. Local jurisdictions have updated outmoded General Plans and zoning codes; completed specific plans for town centers and Transit Oriented Development (TOD); implemented sustainability policies; and adopted municipal climate action plans. Thirty of the 191 cities and two of the six counties in the SCAG region report having updated their General Plans since 2012, and another 42 cities have General Plan updates pending. Fifty-four percent of the cities reporting adopted or pending General Plan updates include planning for TOD, 55 percent plan to concentrate key destinations, and 76 percent include policies encouraging infill development. Of the counties reporting updates or pending updates to their General Plans, 75 percent include TOD elements, 100 percent encourage infill development, 75 percent promote concentrated destinations, and 75 percent feature policies to address complete communities. To protect water quality, 91 percent of cities have adopted water-related policies and 85 percent have adopted measures to address water quality. To conserve energy, 86 percent of cities have implemented community energy efficiency policies, with 80 percent of those cities implementing municipal energy efficiency policies and 76 percent implementing renewable energy policies. Of the region's 191 cities, 189 have completed sustainability components, with 184 cities implementing at least ten

or more policies or programs and ten cities implementing 20 or more policies or programs. This last group includes Pasadena, Pomona and Santa Monica.

AFFORDABLE HOUSING

The state is offering new opportunities to help regions promote affordable housing. In spring 2015, California's Affordable Housing Sustainable Communities (AHSC) program awarded its first round of funding to applicants after a competitive grant process. Of \$122 million available statewide, \$27.5 million was awarded to ten projects in the SCAG region. Eight-hundred forty-two affordable units, including 294 units designated for households with an income of 30 percent or less of the area median income, will be produced with this funding. Meanwhile, Senate Bill 628 (Beall) and Assembly Bill 2 (Alejo) provide jurisdictions with an opportunity to establish a funding source to develop affordable housing and supportive infrastructure and amenities.

PUBLIC HEALTH

The SCAG region has several ongoing efforts to promote public health. The Los Angeles County Departments of Public Health and City of Los Angeles Planning Department are developing a Health Atlas that highlights health disparities among neighborhoods. In Riverside County, the Healthy Riverside County Initiative has formed a Healthy City Network to continue to successfully work with the county's 28 cities to enact Healthy City Resolutions and Health Elements into their General Plans. The County of San Bernardino has recently completed the Community Vital Signs Initiative, which envisions a "county where a commitment to optimizing health and wellness is embedded in all decisions by residents, organizations and government."

ENVIRONMENTAL JUSTICE

Since the adoption of the 2012 RTP/SCS, social equity and environmental justice have become increasingly significant priorities in regional plans. For example, plans to promote active transportation, improve public health, increase access to transit, preserve open space, cut air pollution and more are all evaluated for how well the benefits of these efforts are distributed among all demographic groups. The State of California's Environmental Protection Agency (Cal/EPA) developed a new tool, CalEnviroScreen, which helps to identify areas in the state that have higher levels of environmental vulnerability due to historical rates of toxic exposure and certain social factors. Based on this tool,

much of the region can stand to benefit from Cap-and-Trade grants that give priority to communities that are disproportionately impacted.

SETTING THE STAGE FOR OUR PLAN

SCAG began developing the 2016 RTP/SCS by first reaching out to the local jurisdictions to hear directly from them about their growth plans. The next step was to develop scenarios of growth, each one representing a different vision for land use and transportation in 2040. More specifically, each scenario was designed to explore and convey the impact of where the region would grow, to what extent the growth would be focused within existing cities and towns and how it would grow—the shape and style of the neighborhoods and transportation systems that would shape growth over the period. The refinement of these scenarios, through extensive public outreach and surveys, led to a “preferred scenario” that helped guide the strategies, programs and projects detailed in the Plan.

MAJOR INITIATIVES

With the preferred scenario selected, the 2016 RTP/SCS, which includes \$556.5 billion in transportation investments, has proposed several major initiatives to strive toward our vision for 2040.

PRESERVING THE TRANSPORTATION SYSTEM WE ALREADY HAVE (FIX-IT-FIRST)

The 2016 RTP/SCS calls for the investment of \$275.5 billion toward preserving our existing system. The allocation of these expenditures includes the transit and passenger rail systems, the State Highway System, and regionally significant local streets and roads.

EXPANDING OUR REGIONAL TRANSIT SYSTEM TO GIVE PEOPLE MORE ALTERNATIVES TO DRIVING ALONE

The 2016 RTP/SCS includes \$56.1 billion for capital transit projects and \$156.7 billion for operations and maintenance. This includes significant expansions of the Metro subway and Light Rail Transit (LRT) system in Los Angeles County. Meanwhile, new Bus Rapid Transit (BRT) routes will expand higher-speed bus service regionally; new streetcar services will link major destinations in Orange County; and new Metrolink extensions will further connect communities in the Inland Empire. Other extensive improvements are planned for local bus, rapid bus, BRT and express service throughout the region. To make transit a more

attractive and viable option, the 2016 RTP/SCS also supports implementing and expanding transit signal priority; regional and inter-county fare agreements and media; increased bicycle carrying capacity on transit and rail vehicles; real-time passenger information systems to allow travelers to make more informed decisions; and implementing first/last mile strategies to extend the effective reach of transit.

EXPANDING PASSENGER RAIL

The 2016 RTP/SCS calls for an investment in passenger rail of \$38.6 billion for capital projects and \$15.7 billion for operations and maintenance. The Plan calls for maintaining the commitments in the 2012 RTP/SCS, including Phase 1 of the California High-Speed Train and the Southern California High-Speed Rail Memorandum of Understanding (MOU), which identifies a candidate project list to improve the Metrolink system and the LOSSAN rail corridor, thereby providing immediate, near-term benefits to the region while laying the groundwork for future integration with California’s High-Speed Train project. These capital projects will bring segments of the regional rail network up to the federally defined speed of 110 miles per hour or greater and help lead to a blended system of rail services.

IMPROVING HIGHWAY AND ARTERIAL CAPACITY

The 2016 RTP/SCS calls for investing \$54.2 billion in capital improvements and \$103.0 billion in operations and maintenance of the State Highway System and regionally significant local streets and roads throughout the region. This includes focusing on achieving maximum productivity by adding capacity, primarily by closing gaps in the system and improving access and other measures including the deployment of new technology. The Plan also continues to support a regional network of express lanes, building on the success of the State Route 91 Express Lanes in Orange County, as well as Interstate 10 and Interstate 110 Express Lanes in Los Angeles County.

MANAGING DEMANDS ON THE TRANSPORTATION SYSTEM

The 2016 RTP/SCS calls for investing \$6.9 billion toward Transportation Demand Management (TDM) strategies throughout the region. These strategies focus on reducing the number of drive-alone trips and overall vehicle miles traveled (VMT) through ridesharing, which includes carpooling, vanpooling and supportive policies for ridesourcing services such as Uber and Lyft; redistributing or eliminating vehicle trips from peak demand periods through incentives for telecommuting and alternative work schedules; and reducing the number of drive-alone trips through increased use of transit, rail, bicycling, walking and other alternative modes of travel.

OPTIMIZING THE PERFORMANCE OF THE TRANSPORTATION SYSTEM

The 2016 RTP/SCS earmarks \$9.2 billion for Transportation System Management (TSM) improvements. These include extensive advanced ramp metering, enhanced incident management, bottleneck removal to improve flow (e.g., auxiliary lanes), expansion and integration of the traffic signal synchronization network, data collection to monitor system performance, integrated and dynamic corridor congestion management, and other Intelligent Transportation System (ITS) improvements. Recent related initiatives include the Caltrans Advanced Traffic Management (ATM) study for Interstate 105 and the Regional Integration of ITS Projects (RIITS) and Information Exchange Network (IEN) data exchange efforts at Los Angeles Metro.

PROMOTING WALKING, BIKING AND OTHER FORMS OF ACTIVE TRANSPORTATION

The 2016 RTP/SCS plans for continued progress in developing our regional bikeway network, assumes all local active transportation plans will be implemented, and dedicates resources to maintain and repair thousands of miles of dilapidated sidewalks. The Plan invests \$12.9 billion in active transportation strategies. The Plan also considers new strategies and approaches beyond those proposed in 2012. To promote short trips, these include improving sidewalk quality, local bike networks and neighborhood mobility areas. To promote longer regional trips, these strategies include developing a regional greenway network and continuing investments in the regional bikeway network and access to the California Coastal Trail. Active transportation will also be promoted by integrating it with the region's transit system; increasing access to 224 rail, light rail and fixed guideway bus stations; promoting 16 regional corridors that support biking and walking; supporting bike share programs; educating people about the benefits of active transportation for students; and promoting safety campaigns.

STRENGTHENING THE REGIONAL TRANSPORTATION NETWORK FOR GOODS MOVEMENT

The 2016 RTP/SCS includes \$70.7 billion in goods movement strategies. Among these are establishing a system of truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along Interstate 710; connecting to the State Route 60 east-west segment and finally reaching Interstate 15 in San Bernardino County; working to relieve the top 50 regional truck bottlenecks; adding mainline tracks for the Burlington Northern Santa Fe (BNSF) San Bernardino and Cajon Subdivisions and the Union Pacific Railroad (UPRR) Alhambra and Mojave Subdivisions; expanding/modernizing intermodal facilities; building highway-rail grade separations; improving port

area rail infrastructure; reducing environmental impacts by supporting the deployment of commercially available low-emission trucks and locomotives; and, in the longer term, advancing technologies to implement a zero- and near zero-emission freight system.

LEVERAGING TECHNOLOGY

Advances in communications, computing and engineering—from shared mobility innovations to zero-emission vehicles—can lead to a more efficient transportation system with more mobility options for everyone. Technological innovations also can reduce the environmental impact of existing modes of transportation. For example, alternative fuel vehicles continue to become more accessible for retail consumers and for freight and fleet applications—and as they are increasingly used, air pollution can be reduced. Communications technology, meanwhile, can improve the movement of passenger vehicles and connected transit vehicles. As part of the 2016 RTP/SCS, SCAG has focused location-based strategies specifically on increasing the efficiency of Plug-in Hybrid Electric Vehicles (PHEV) in the region. These are electric vehicles that are powered by a gasoline engine when their battery is depleted. The 2016 RTP/SCS proposes a regional charging network that will increase the number of PHEV miles driven on electric power, in addition to supporting the growth of the PEV market generally. In many instances, the additional chargers will create the opportunity to increase the electric range of PHEVs, reducing vehicle miles traveled that produce tail-pipe emissions.

IMPROVING AIRPORT ACCESS

Recognizing that the SCAG region is one of the busiest and most diverse commercial aviation regions in the world and that air travel is an important contributor to the region's economic activity, the 2016 RTP/SCS includes strategies for reducing the impact of air passenger trips on ground transportation congestion. Such strategies include supporting the regionalization of air travel demand; continuing to support regional and inter-regional projects that facilitate airport ground access (e.g., High-Speed Train); supporting ongoing local planning efforts by airport operators, county transportation commissions and local jurisdictions; encouraging the development and use of transit access to the region's airports; encouraging the use of modes with high average vehicle occupancy; and discouraging the use of modes that require "deadhead" trips to/from airports (e.g., passengers being dropped off at the airport via personal vehicle).

FOCUSING NEW GROWTH AROUND TRANSIT

The 2016 RTP/SCS plans for focusing new growth around transit, which is supported by the following policies: identifying regional strategic areas for

infill and investment; structuring the Plan on centers development; developing “Complete Communities”; developing nodes on a corridor; planning for additional housing and jobs near transit; planning for changing demand in types of housing; continuing to protect stable, existing single-family areas; ensuring adequate access to open space and preservation of habitat; and incorporating local input and feedback on future growth. These policies support the development of:

- **High Quality Transit Areas (HQTAs):** areas within one-half mile of a fixed guideway transit stop or a bus transit corridor where buses pick up passengers at a frequency of every 15 minutes or less during peak commuting hours. While HQTAs account for only three percent of total land area in SCAG region, they are planned and projected to accommodate 46 percent of the region’s future household growth and 55 percent of the future employment growth.
- **Livable Corridors:** arterial roadways where jurisdictions may plan for a combination of the following elements: high-quality bus frequency; higher density residential and employment at key intersections; and increased active transportation through dedicated bikeways.
- **Neighborhood Mobility Areas (NMAs):** strategies are intended to provide sustainable transportation options for residents of the region who lack convenient access to high-frequency transit but make many short trips within their urban neighborhoods. NMAs are conducive to active transportation and include a “Complete Streets” approach to roadway improvements to encourage replacing single- and multi-occupant automobile use with biking, walking, skateboarding, neighborhood electric vehicles and senior mobility devices.

IMPROVING AIR QUALITY AND REDUCING GREENHOUSE GASES

It is through integrated planning for land use and transportation that the SCAG region, through the initiatives discussed in this section, will strive toward a more sustainable region. The SCAG region must achieve specific federal air quality standards. It also is required by state law to lower regional greenhouse gas emissions. California law requires the region to reduce per capita greenhouse gas emissions in the SCAG region by eight percent by 2020—compared with 2005 levels—and by 13 percent by 2035. The strategies, programs and projects outlined in the 2016 RTP/SCS are projected to result in greenhouse gas emissions reductions in the SCAG region that meet or exceed these targets.

PRESERVING NATURAL LANDS

Many natural land areas near the edge of existing urbanized areas do not

have plans for conservation and are vulnerable to development pressure. The 2016 RTP/SCS recommends redirecting growth from high value habitat areas to existing urbanized areas. This strategy avoids growth in sensitive habitat areas, builds upon the conservation framework and complements an infill-based approach.

FINANCING OUR FUTURE

To accomplish the ambitious goals of the 2016 RTP/SCS through 2040, SCAG forecasts expenditures of \$556.5 billion—of which \$275.5 billion is budgeted for operations and maintenance of the regional transportation system and another \$246.6 billion is reserved for transportation capital improvements.

Forecasted revenues comprise both existing and several new funding sources that are reasonably expected to be available for the 2016 RTP/SCS, which together total \$556.5 billion. Reasonably available revenues include short-term adjustments to state and federal gas excise tax rates and the long-term replacement of gas taxes with mileage-based user fees (or equivalent fuel tax adjustment). These and other categories of funding sources were identified as reasonably available on the basis of their potential for revenue generation, historical precedence and the likelihood of their implementation within the time frame of the Plan.

WHAT WE WILL ACCOMPLISH

Overall, the transportation investments in the 2016 RTP/SCS will provide a return of \$2.00 for every dollar invested. Compared with an alternative of not adopting the Plan, the 2016 RTP/SCS would accomplish the following:

- The Plan would result in an eight percent reduction in greenhouse gas emissions per capita by 2020, an 18 percent reduction by 2035 and a 21 percent reduction by 2040—compared with 2005 levels. This meets or exceeds the state’s mandated reductions, which are eight percent by 2020 and 13 percent by 2035.
- Regional air quality would improve under the Plan, as cleaner fuels and new vehicle technologies help to significantly reduce many of the pollutants that contribute to smog and other airborne contaminants that impact public health in the region.
- The combined percentage of work trips made by carpooling, active transportation and public transit would increase by about four percent,

with a commensurate reduction in the share of commuters traveling by single occupant vehicle.

- The number of Vehicle Miles Traveled (VMT) per capita would be reduced by more than seven percent and Vehicle Hours Traveled (VHT) per capita by 17 percent (for automobiles and light/medium duty trucks) as a result of more location efficient land use patterns and improved transit service.
- Daily travel by transit would increase by nearly one-third, as a result of improved transit service and more transit-oriented development patterns.
- The Plan would reduce delay per capita by 39 percent and heavy-duty truck delay on highways by more than 37 percent. This means we would spend less time sitting in traffic and our goods would move more efficiently.
- More than 351,000 additional new jobs annually would be created, due to the region's increased competitiveness and improved economic performance that would result from congestion reduction and improvements in regional amenities as a result of implementing the Plan.
- The Plan would reduce the amount of previously undeveloped (greenfield) lands converted to more urbanized uses by 23 percent. By conserving open space and other rural lands, the Plan provides a solid foundation for more sustainable development in the SCAG region.
- The Plan would result in a reduction in our regional obesity rate from 26.3 percent to 25.6 percent in areas experiencing land use changes, and a reduction in the share of our population that suffers with high blood pressure from 21.5 percent to 20.8 percent.

HOW WE WILL ENSURE SUCCESS

Our Plan includes several performance outcomes and measures that are used to gauge our progress toward meeting our goals. These include:

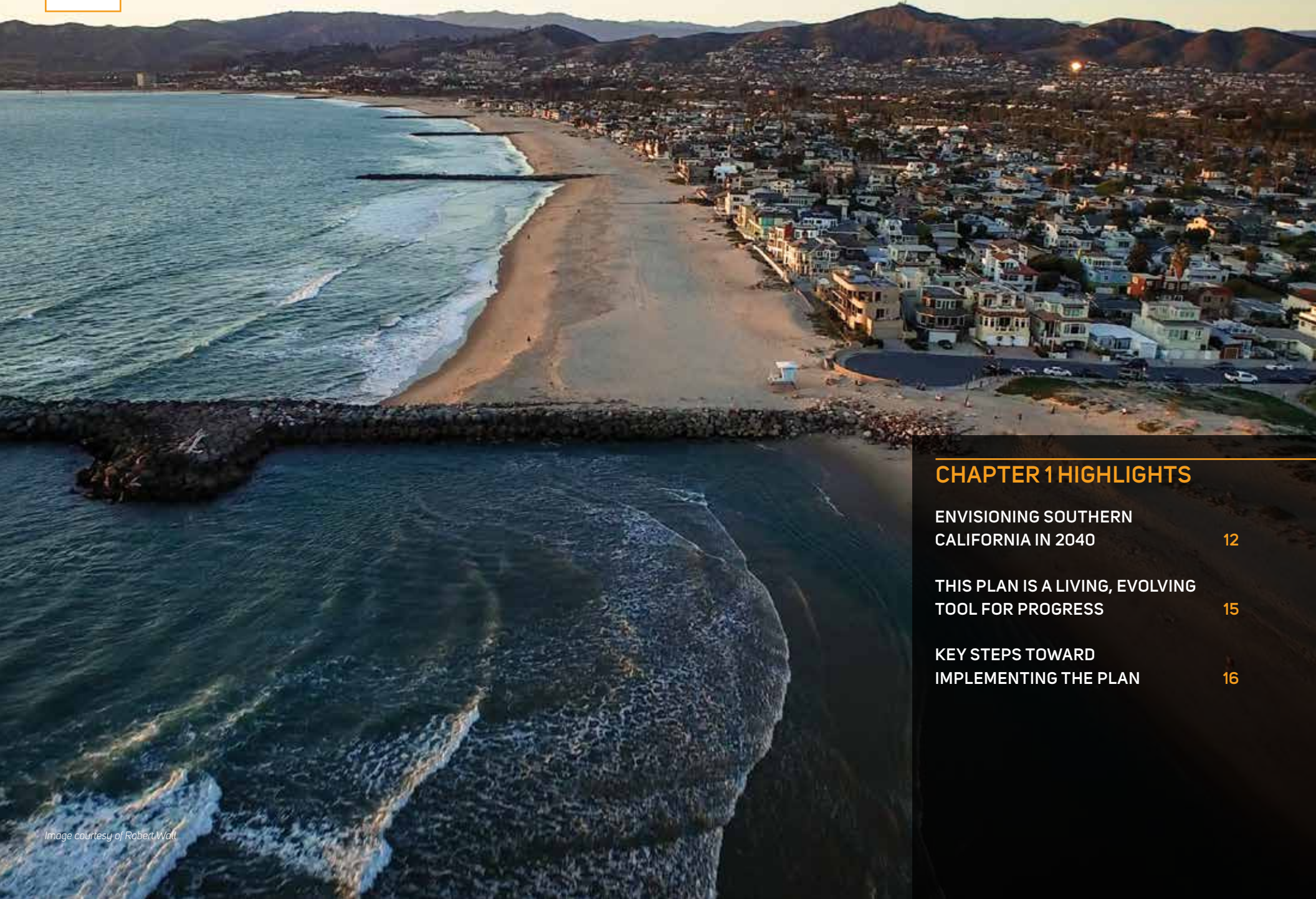
- Location Efficiency, which reflects the degree to which improved land use and transportation coordination strategies impact the movement of people and goods.

- Mobility and Accessibility, which reflects our ability to reach desired destinations with relative ease and within a reasonable time, using reasonably available transportation choices.
- Safety and Health, which recognize that the 2016 RTP/SCS has impacts beyond those that are exclusively transportation-related (e.g., pollution-related disease).
- Environmental Quality, which is measured in terms of criteria pollutants and greenhouse gas emissions.
- Economic Opportunity, which is measured in terms of additional jobs created as a result of the transportation investments provided through the 2016 RTP/SCS.
- Investment Effectiveness, which indicates the degree to which the Plan's expenditures generate benefits that transportation users can experience directly.
- Transportation System Sustainability, which reflects how well our transportation system is able to maintain its overall performance over time in an equitable manner with minimum damage to the environment and without compromising the ability of future generations to address their transportation needs.

The 2016 RTP/SCS is designed to ensure that the regional transportation system serves all segments of society. The Plan is subject to numerous performance measures to monitor its progress toward achieving social equity and environmental justice. These measures include accessibility to parks and natural lands, roadway noise impacts, air quality impacts and public health impacts, among many others.

LOOKING BEYOND 2040

The 2016 RTP/SCS is based on a projected budget constrained by the local, state and federal revenues that SCAG anticipates the region receiving between now and 2040. The Strategic Plan discusses projects and strategies that SCAG would pursue if new funding were to become available. The Strategic Plan discussion includes long-term emission reduction strategies for rail and trucks; expanding the region's high-speed and commuter rail systems; expanding active transportation; leveraging technological advances for transportation; addressing further regional reductions in greenhouse gas emissions; and making the region more resilient to climate change—among other topics. We anticipate that these projects and strategies may inform the development of the next Plan, the 2020 RTP/SCS.



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INTRODUCTION

Southern California is one of the most dynamic and beautiful places on the planet. A global center for entertainment and culture, commerce, tourism and international trade, our region is graced by a temperate climate, a spectacular coastline, rolling hills and inland valleys, towering mountain ranges, and expansive deserts. It is no wonder Southern California has become home to more than 18 million people.

ENVISIONING SOUTHERN CALIFORNIA IN 2040

OUR CHANGING REGION

Today, our region is in the midst of great changes. Our population continues to increase and demographics are shifting. In the coming years, Baby Boomers, born between 1946 and 1964, and Millennials, born between 1980 and 2000, will have an increasingly greater impact on how and where we live and how we travel. Overall, our region will continue to grow more racially and ethnically diverse in the coming decades. These and other changes will transform the character of Southern California over the next 25 years as people choose different places to live and more efficient ways to get around. People will have new expectations for the health and vibrancy of their communities. They will want a greater degree of mobility with transportation options that are more accessible and flexible. People will also expect to have more options for recreational space. They will want cleaner air. How our region responds to growth and the evolving priorities and desires of the people who live here will significantly shape our overall quality of life.

This 2016 RTP/SCS charts a course for closely integrating land use and transportation in certain areas of the region—so that we as a whole can grow smartly and sustainably. It outlines \$556.5 billion in transportation system investments through 2040. The Plan was prepared through a collaborative, continuous and comprehensive (3 Cs) process by SCAG, the largest Metropolitan Planning Organization (MPO) in the nation. It serves as an update to SCAG's 2012 RTP/SCS.

It might seem obvious that as a region we should coordinate decisions about where people live, work, go to school, shop and spend their free time with decisions about the transportation system that serves them. But in a region as large and complex as ours, closely integrating strategies for land use and transportation is a huge undertaking. This Plan, more than just a list of projects and initiatives, tells an important story about our future. It is a story about how we will meet complex and daunting challenges in one of the biggest and most influential metropolitan regions in the world, and ultimately how working together we can integrate decisions about transportation and using land to realize a regional transportation system that promotes economic growth and sustainability.

CHALLENGES WE FACE

As we look to the future, we will confront many challenges, some of which we already face today and others that will emerge as we continue to grow. We are living now with the consequences of growth: more people, more houses, more jobs, more freight traffic and more cars. The six counties that encompass our region—Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura—have all experienced the consequences of that growth. In our urban and suburban areas, roads and highways have grown increasingly congested. As a result, regional air pollution has worsened and greenhouse gas emissions that contribute to climate change have increased. Everyday trips to work, school, shopping and more have become more time consuming and in some cases more costly.

Neighborhoods that many people once considered affordable are now priced out of reach—particularly in established urban communities that have seen major public and private investments such as new transit access and new developments that mix upscale housing with popular stores and restaurants.

As our region's demographics change, there will be a greater desire for housing situated closer to jobs, healthcare, shopping and other amenities, and more public transportation options. The region will have to find ways to meet these demands.

Maintaining and enhancing a transportation system that can tackle these challenges will require adequate funding, and securing that funding for a better transportation system will be perhaps the region's biggest challenge. Our overall transportation system is aging rapidly and deteriorating. Deferring maintenance because of a lack of funding will continue to strain the system.

As our economy grows, freight traffic will increase on our roadways, along rail lines, and at our airports and seaports. This will place new demands on general transportation infrastructure such as highways and surface streets, as well as infrastructure specific to international trade and domestic commerce. This growth in goods movement also will contribute to air pollution, making it harder for the region to attain federal standards for air quality and comply with new state rules for lowering greenhouse gas emissions.

Meanwhile, our region faces huge public health challenges, as people suffer from chronic diseases associated with poor air quality and a lack of physical activity. This is why it is so critical to integrate decisions about where we live and work with decisions about how we travel. It matters how neighborhoods

SUSTAINABILITY

The practice of analyzing the impacts of decisions, policies, strategies and development projects on the Environment, the Economy and Social Equity

are laid out and linked to bus lines, bike and walking paths, and other transportation options.

Finally, our region faces the huge challenge of confronting and coping with the consequences of climate change. Making communities more resilient to heat waves, wildfires, rising seas, extreme rainstorms and other projected impacts will depend on smart planning. We'll review these challenges in more depth in Chapter 3.

REALIZING OUR VISION FOR A BETTER FUTURE

The 2016 RTP/SCS outlines concrete steps for meeting these challenges, and creating the conditions and infrastructure that result in increased mobility, easier access to destinations, and more transportation options. The Plan also analyzes the impacts of its decisions, policies, strategies and development projects on the environment, the economy and social equity. By doing this, the 2016 RTP/SCS promotes a sustainable future in which the environment is protected, economic growth is supported and the Plan's benefits are widely distributed.

The 2016 RTP/SCS envisions vibrant, livable communities that are healthy and safe with transportation options that provide easy access to schools, jobs, services, health care and other basic needs. These communities will be conducive to walking and bicycling and will offer residents improved access to amenities such as parks and natural lands. Collectively, these communities will support opportunities for business, investment and employment and fuel for a more prosperous economy. This vision recognizes the region's tremendous diversity, and that no single solution will work everywhere.

SCAG worked closely with local jurisdictions to develop the Plan, which

incorporates local growth forecasts, projects and programs and includes complementary regional policies and initiatives. Because SCAG encompasses six counties, it is important that the 2016 RTP/SCS reflect the region's diverse needs and priorities. Every effort was made to ensure that this happened.

Since 2009, every MPO in California has been required to develop a Sustainable Communities Strategy as part of its Regional Transportation Plan—therefore the name "RTP/SCS." This SCS is a vital part of the overall Plan. It charts a course for how the SCAG region will reach state-mandated reductions in greenhouse gas emissions from cars and light trucks, which contribute to climate change. This SCS will be discussed extensively in the coming pages. The SCS is a driving force of this Plan, although not the only one. Once implemented along with the rest of the Plan, it will improve the overall quality of life for all residents of the region.

While our region faces great challenges, we are living at a time of technological and economic innovation that will help us meet those challenges. New mobility innovations can help the region meet the challenges of growth and increasing demands on our transportation system. Automated vehicles, drivers available on demand, data-driven infrastructure, and vehicles that respond to both their passengers and the environment are among the new mobility innovations that will reshape how we travel throughout the region. Many people, particularly Millennials, are already embracing some of these mobility innovations and are likely to be early adopters as new ones emerge. But these advances in mobility also have the potential to help all generations maintain their independence as they age.

The Plan considers new patterns of development as the regional economy continues to recover and grow, the composition of our population changes, the housing market responds to evolving needs, and demands and mobility innovations emerge. The Plan also includes a long-term strategic vision for the region that will help guide decisions for transportation and how we use land, as well as the public investments in both, through 2040.

MAJOR THEMES IN THE 2016 RTP/SCS

Throughout this Plan you will read about important themes that resonate throughout the document and help define its focus. A few have already been introduced. These themes include:

Integrating strategies for land use and transportation. The Plan recognizes that transportation investments and future land use patterns are inextricably linked,

and continued recognition of this close relationship will help the region make choices that sustain our existing resources and expand efficiency, mobility and accessibility for people across the region. In particular, the Plan draws a closer connection between where we live and work, and it offers a blueprint for how Southern California can grow more sustainably.

Striving for sustainability. Creating a more sustainable region means growing and living in ways that use our resources efficiently to survive and prosper—from the water we drink, to the air we breathe, to the energy we consume. It is essential that we strive for regional environmental sustainability as we also confront the potential impacts of continued climate change on our transportation infrastructure and communities. In Southern California, striving for sustainability includes achieving state-mandated targets for reducing greenhouse gas emissions from cars and light trucks and federal air quality conformity requirements, and also adapting wisely to a changing environment and climate.

Protecting and preserving our existing transportation infrastructure. The Plan places a priority on investing in the transportation system we already have, to maintain and extend its life and utility. It recognizes that deferring maintenance of infrastructure leads to costlier repairs in the future.

Increasing capacity through improved systems management. Pouring new concrete is not the only way to add capacity to our roadways. Transportation Systems Management, or TSM, is a powerful strategy that aims to improve the capacity and efficiency of the existing transportation system without resorting to large-scale and expensive capital improvements. Examples of TSM projects include coordinating traffic signals along a corridor; deploying changeable message signs that display real-time road information; and ramp meters that control the timing of vehicles driving onto highways.

Giving people more transportation choices. The Plan will provide people with more options for transportation and mobility, offering them various alternatives to driving alone. This will be accomplished by enhancing public transit capacity and increasing its viability by making it more accessible; completing critical road connections; providing greater opportunities for biking and walking, particularly for short trips; exploring how people might use alternative fuel vehicles within their neighborhoods and beyond; increasing telecommuting and flexible work schedules; encouraging new mobility innovations; and improving safety. These Transportation Demand Management, or TDM, strategies will help us better manage the demand we place on the roadway network by reducing the number of people who drive alone and encouraging them to use alternative modes of travel.

Leveraging technology. Advances in communications, computing and engineering—from shared mobility innovations to zero-emissions vehicles—can lead to a more efficient transportation system with more mobility options for everyone. Technological innovations also can reduce the environmental impact of existing modes of transportation. For example, alternative fuel vehicles continue to become more accessible for retail consumers and for freight and fleet applications—and as they are increasingly used, air pollution can be reduced. Communications technology, meanwhile, can improve the movement of passenger vehicles and connected transit vehicles. Moreover, the way urban and suburban areas are shaped can support and encourage shared mobility and other new forms of transportation.

Responding to demographic and housing market changes. The region's demographics and housing market are fluid and dynamic. The housing market has rebounded since the 2012 RTP/SCS was adopted, and the number of Millennials and empty nesters has continued to increase with many seeking smaller housing and a more walkable lifestyle. For many households in the region, minimizing transportation and housing costs remains a priority. The Plan includes strategies focused on compact infill development, superior placemaking (the process of creating public spaces that are appealing), and expanded housing and transportation choices. The goal is to create a region that can respond to changing demographics and markets.

Supporting commerce, economic growth and opportunity. The Plan supports economic growth by building the infrastructure the region needs to promote the smooth flow of goods and easier access to jobs, services, educational facilities, healthcare and more. The Plan also preserves natural lands, improves air quality and creates vibrant urban centers—all of which are critical for attracting and retaining the people and jobs Southern California needs to thrive.

Promoting the links among public health, environmental protection and economic opportunity. The Plan places a priority on implementing the integration of transportation and land use strategies to improve our overall health. The Plan will result in improved air quality, provide more opportunities for people to be physically active, and protect natural lands and habitats. The result: communities will become healthier places to live, allowing people and businesses to thrive.

Building a Plan based on the principles of social equity and environmental justice. The Plan is designed to create regionwide benefits that are distributed equitably, while avoiding having any one group carrying the burdens of development disproportionately. It is particularly important that the Plan

consider the consequences of transportation projects on low-income and minority communities and minimize negative impacts. In striving for environmental justice, the Plan provides specific measures to lessen the negative environmental impacts of transportation projects on these communities, as well as metrics to monitor how successful these measures are throughout the communities.

THIS PLAN IS A LIVING, EVOLVING TOOL FOR PROGRESS

WHY SCAG UPDATES THIS PLAN

The State of California and the federal government require that SCAG and other regional planning agencies update their respective Regional Transportation

MOBILITY AND ACCESSIBILITY

MOBILITY refers to how quickly and efficiently people can travel from one location to another. **ACCESSIBILITY** refers to how connected people's destinations are to transportation options.

Direct improvements to the transportation system can increase mobility. Two examples are speeding up train service and relieving congestion on highways. Improving accessibility requires better coordinating our investments for how we use land with our investments for transportation. Developing housing, businesses and other "Transit Oriented Development" around train stations, for example, improves accessibility.

Plan/Sustainable Communities Strategy every four years. Key laws and requirements drive our work. Two primary mandates include:

- SCAG is required by federal law to prepare and update a long-range (minimum of 20 years) RTP (23 U.S.C.A. §134 et seq). Most areas within the SCAG region have been designated as nonattainment or maintenance areas for one or more transportation-related criteria pollutants. Pursuant to the federal Clean Air Act, SCAG's 2016 RTP/SCS is required to meet all federal transportation conformity requirements, including: regional emissions analysis, financial constraint, timely implementation of transportation control measures, and interagency consultation and public involvement (42 U.S.C. §7401 et seq).
- California Senate Bill 375 (SB 375) requires that the RTP also include an SCS, which outlines growth strategies that better integrate land use and transportation planning and help reduce the state's greenhouse gas emissions from cars and light trucks (California Government Code §65080 (b)(2)(B)). The RTP is combined with the SCS to form the RTP/SCS, which is further detailed in Chapter 5. For the SCAG region, the California Air Resources Board (ARB) has set greenhouse gas reduction targets at eight percent below 2005 per capita emissions levels by 2020, and 13 percent below 2005 per capita emissions levels by 2035. As we will discuss in this Plan, the region will meet or exceed these targets, lowering greenhouse gas emissions (below 2005 levels) by eight percent by 2020; 18 percent by 2035; and 21 percent by 2040.

While SCAG is required to meet these statutory requirements, all good long-term plans are routinely re-evaluated and updated. SCAG is committed to ensuring that the RTP/SCS is a living document that evolves as the region's demographics, priorities, desires and economy change.

BENEFITS BEYOND CLEANER AIR

This Plan, of course, is about much more than cleaner air and reduced greenhouse gas emissions, although those are primary goals. SCAG must plan for accommodating another 3.8 million residents in its region. The region also expects to add another 2.4 million jobs and 1.5 million new households by the Plan horizon of 2040. The strategies contained in the 2016 RTP/SCS are expected to produce numerous benefits. Among them are:

GREENHOUSE GASES

Components of the atmosphere (carbon dioxide, methane, nitrous oxide and fluorinated gases) that contribute to the greenhouse effect

- **Better Placemaking:** The Plan will promote the development of better places to live and work through measures that encourage more compact development in certain areas of the region, varied housing options, bicycle and pedestrian improvements, and efficient transportation infrastructure.
- **Improved Access and Mobility:** The Plan will encourage strategic transportation investments that add appropriate capacity and improve critical road conditions in the region, increase transit capacity and expand mobility options. Meanwhile, the Plan outlines strategies for developing land in coming decades that will place destinations closer together, thereby decreasing the time and cost of traveling between them.
- **Households save more money:** The Plan is expected to result in less energy and water consumption across the region, as well as lower transportation costs for households.
- **Improved Public Health and a Healthier Environment:** Improved placemaking and strategic transportation investments will help improve air quality; improve health as people have more opportunities to bicycle, walk and pursue other active alternatives to driving; and better protect natural lands as new growth is concentrated in existing urban and suburban areas.

These benefits add up to a simple and powerful idea: a more efficient transportation network and more livable and sustainable communities throughout our region.

KEY STEPS TOWARD IMPLEMENTING THE PLAN

To move forward on the Plan, SCAG needs to take some critical steps. Here are a few of them:

1. Funding the Plan

The 2016 RTP/SCS includes a \$556.5 billion financial plan, discussed in Chapter 6 and detailed further in the Transportation Finance Appendix, that identifies how much money will be available to support the region's capital, operating, maintenance and transportation system preservation needs over the life of the Plan. It includes a core revenue forecast of existing local, state and federal funding sources, along with new funding sources that are reasonably expected to be available through 2040.

These new sources of funding include anticipated adjustments to state and federal gas tax rates based on historical trends and recommendations from two national commissions created by Congress; efforts to further leverage existing local sales tax measures; value capture strategies (e.g., tax increment financing); potential national freight program/freight fees; and passenger and commercial vehicle tolls for specific facilities. Other reasonably expected revenues in the future will come from innovative financing strategies, such as private equity participation. The Plan includes strategies to ensure that these sources of revenue are available, in accordance with federal guidelines.

There is also a need to identify and secure funding to support deployment and implementation of the land use policies and strategies contained in the Plan to fully realize a sustainable regional vision. It will be essential to secure resources from the California Greenhouse Gas Reduction Fund, also known as Cap-and-Trade, in order to support the Plan's objectives. Additionally, innovative and emerging financing options such as Enhanced Infrastructure Finance Districts will need to be explored and implemented by local jurisdictions.

2. Collaborating with Local Jurisdictions and Stakeholders

Implementing the Plan will require SCAG to continue working closely with all jurisdictions, just as it did during its development. In particular, SCAG will need to work with the six county transportation commissions responsible for managing and prioritizing the portfolio

of transportation investments in their respective counties. SCAG also must work with the California Department of Transportation (Caltrans), transit operators, port and airport authorities, and other implementing agencies. In addition, the agency will have to work with the local jurisdictions and counties responsible for land use and transportation planning, and the air quality management districts in charge of monitoring conditions throughout the region. The agency will also have to work with key stakeholders including local public health departments to ensure that the Plan benefits the economy and promotes social equity. To ensure that the region makes progress on its goals, SCAG will monitor its own progress toward achieving its targets and will share this information with its partners and the public.

3. Looking Ahead Beyond 2040

To fully address our region's long-term needs, SCAG must consider strategies and investments beyond what is contained in the financially constrained portion of the 2016 RTP/SCS—that is, the investment plan built on revenues that are reasonably expected over the life of the Plan. Chapter 9 provides an overview of potential programs and policies that may be implemented if additional funding becomes available in the future. These include:

- Long-term emission-reduction investments for trucks and rail
- Unfunded operational improvements
- Unfunded capital improvements
- Expansion of our region's high-speed rail and commuter rail systems
- Increased use of active transportation
- Technology and new mobility innovations
- Expansion of the regional network of express lanes

SCAG expects that the 2016 RTP/SCS Strategic Plan will influence the next update to the RTP/SCS in 2020, and the strategies detailed above will eventually be incorporated into future investment plans.

Chapter 2 discusses the current transportation system in the region, how we use land today and also a graphic overview of progress achieved since the 2012 RTP/SCS was adopted. It will be followed in Chapter 3 with a review of challenges we face as a region. The first three chapters of the 2016 RTP/SCS set the stage for a discussion of the Plan's development in Chapter 4 and a comprehensive review of the Plan's strategies, programs and projects in Chapter 5.

THE RTP/SCS

WHAT'S REQUIRED

- Long-term vision of how the region will address regional transportation and land use challenges and opportunities
- Investment framework

FEDERAL

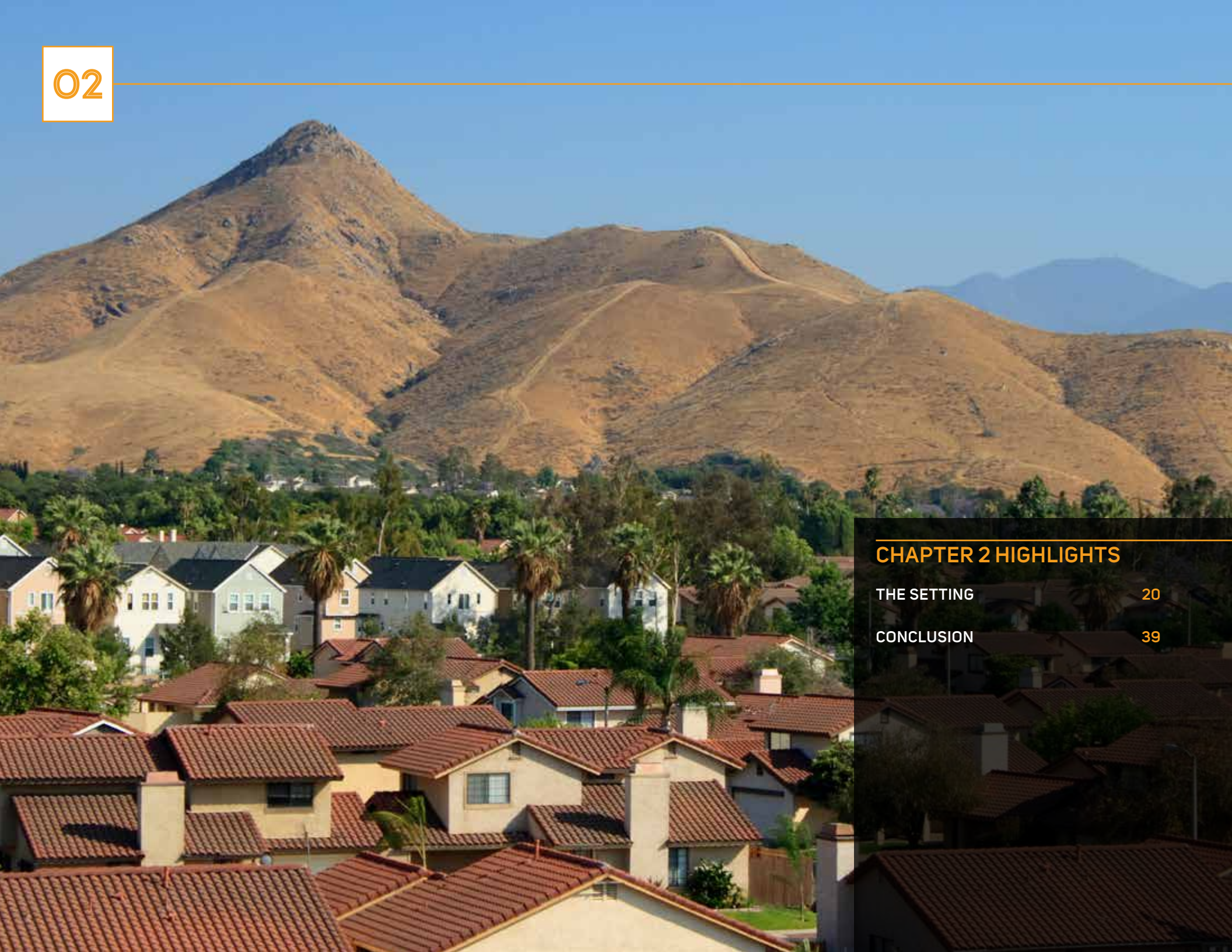
- Updated every four years to maintain eligibility for federal funding
- Long-range: 20+ years into the future
- Demonstrate transportation conformity
 - Regional emissions analysis
 - Financially-constrained (revenues = costs)
 - Timely implementation of transportation control measures
 - Interagency consultation and public involvement
- Must be developed in consultation/coordination with key stakeholders

STATE

- Achieve SB 375 requirements (reduce greenhouse gas emissions from cars and light trucks)

WHAT'S INCLUDED

- Vision, policies and performance measures
- Forecasts (e.g., population, households, employment, land use and housing needs)
- Financial plan
- List of projects (to be initiated and/or completed by 2040)
- Analysis of priority focus areas (e.g., goods movement and active transportation)



CHAPTER 2 HIGHLIGHTS

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WHERE WE ARE TODAY

To plan effectively for the future, it is important to understand the current conditions of land use and transportation throughout our large and complex region. This chapter reviews those current conditions.

THE SETTING

HOW WE USE LAND TODAY

SCAG recognizes that decisions by local jurisdictions about how land is used can impact the regional transportation system, and decisions about regional transportation investments can impact land use. The agency also understands that most land use planning is typically conducted by local jurisdictions, while regional and state agencies often make major decisions about transportation investments.

This is why it is critical for the region to integrate strategies for our transportation system with strategies for how we use land. Only by doing this can we achieve sustainable growth and a high quality of life for our region. This first section of Chapter 2 offers an overview of how we use land in the SCAG region, and its relevance to improving our regional transportation system as we head toward 2040.

CATEGORIZING LAND USE

Of the 38,000 square miles of total land in the SCAG region, only 21 percent is suitable for development. Of this limited developable land, more than half has already been fully developed. However, of the remaining developable land, only a small portion of it can be developed as sustainable transit-ready infill—meaning it can be reached via planned transit service and that it can readily access existing infrastructure (water resources, sewer facilities, etc.). According to regional land use data, only two percent of the total developable land in the region is located in High Quality Transit Areas (HQTAs), defined as areas within one-half mile of a well-serviced fixed guideway transit stop, and including bus transit corridors where buses pick up passengers every 15 minutes or less during peak commute hours. A more compact land development strategy is needed, which will be discussed in Chapter 5. Please note that this limited remaining land for future development does not account for potential reductions of developable acreage resulting from conservation efforts currently underway.

As the agency prepared the 2016 RTP/SCS, it needed to organize the many different types and classifications of land uses in the region for required technical analyses. The SCAG region is diverse and large, and the types and classifications of land use used by one jurisdiction often differ from those used by another. The result is that there are many different land use types and

classifications that SCAG must organize for its own analyses.

To accurately represent land uses throughout the region, SCAG aggregated information from jurisdictions and simplified the types and classifications of land use into a consolidated set of land use types. The agency then converted these consolidated land uses into 35 “Place Types” to reflect the diversity of land use planning. Descriptions, standards and graphic examples of each Place Type can be found in the Reference Documents section of the SCS Background Documentation Appendix. These Place Types were used in an urban setting design tool known as the Urban Footprint Scenario Planning Model (SPM), to demonstrate urban development in the Plan in terms of form, scale and function in the built environment.

SCAG then classified the Place Types into three Land Development Categories (LDCs). A table of how the 35 Place Types were categorized into the three LDCs can be found in the Reference Documents section of the SCS Background Documentation Appendix. The agency used these categories to describe the general conditions that exist and/or are likely to exist within a specific area. They reflect the varied conditions of buildings and roadways, transportation options, and the mix of housing and employment throughout the region. The three Land Development Categories that SCAG used are:

1. **Urban:** These areas are often found within and directly adjacent to moderate and high density urban centers. Nearly all urban growth in these areas would be considered infill or redevelopment. The majority of housing is multifamily and attached single-family (townhome), which tend to consume less water and energy than the larger types found in greater proportion in less urban locations. These areas are supported by high levels of regional and local transit service. They have well-connected street networks, and the mix and intensity of uses result in a highly walkable environment. These areas offer enhanced access and connectivity for people who choose not to drive or do not have access to a vehicle.
2. **Compact:** These areas are less dense than those in the Urban Land Development Category, but they are highly walkable with a rich mix of retail, commercial, residential and civic uses. These areas are most likely to occur as new growth on the urban edge, or as large-scale redevelopment. They have a rich mix of housing, from multifamily and attached single-family (townhome) to small- and medium-lot single-family homes. These areas are well served by regional

and local transit service, but they may not benefit from as much service as urban growth areas and are less likely to occur around major multimodal hubs. Streets in these areas are well connected and walkable, and destinations such as schools, shopping and entertainment areas can typically be reached by walking, biking, taking transit, or with a short auto trip.

3. **Standard:** These areas comprise the majority of separate-use, auto-oriented developments that have characterized the American suburban landscape for decades. Densities in these areas tend to be lower than those in the Compact Land Development Category, and they are generally not highly mixed. Medium- and larger-lot single-family homes comprise the majority of this development form. Standard areas are not typically well served by regional transit service, and most trips are made by automobile.

NATURAL LANDS AND FARM LAND

Southern California is one of the most biodiverse areas on the planet, with an enormous wealth of natural habitats, and flora and fauna that include species that only exist in Southern California. Our iconic mountain ranges, chaparrals, numerous rivers and expansive deserts make up our regional identity. Additionally, Southern California has a rich agricultural history and continues to be a food producer for the rest of the country. However, issues such as infrastructure needs, continuing development pressure, climate change and limited financial resources present significant challenges in protecting and maintaining the quality and quantity our natural lands and farm lands.

A considerable amount of the region's natural lands, including some key habitat areas, are already protected.¹ Some areas, especially near the edge of existing urbanized areas, do not have plans for conservation and are susceptible to development. These include lands that are important and unique habitats and have high per-acre habitat values, such as riparian habitat (i.e., areas adjacent to bodies of water such as streams or rivers). These habitat types tend to have high per-acre habitat values—meaning these areas are home to a high number of species and serve as highly functional habitats. Some key habitat types are underrepresented within areas of the region already under protection.

Local land use decisions play a pivotal role in the future of some of the region's most valuable habitat and farm lands. Many local governments have taken

steps toward planning comprehensively for conserving natural lands and farm lands, while also meeting demands for growth. Across the region, transportation agencies and local governments have used tools, such as habitat conservation plans, to link land use decisions with comprehensive conservation plans in order to streamline development.

To support those and other comprehensive conservation planning efforts and to inform the local land use decision making process, SCAG has studied regional-scale habitat values (see [EXHIBIT 2.1](#)), developed a conservation framework and assembled a natural resource database.² Over the past several years, SCAG and regional partners such as county transportation commissions (CTCs), environmental organizations and local governments have supported natural land restoration, conservation and acquisition in ways that could contribute to reducing greenhouse gas emissions, streamlining projects and addressing climate change impacts to natural habitats. Please see the Natural & Farm Lands Appendix for additional details.

SHIFTING HOUSING TYPES

In the postwar era that shaped the physical landscape and popular image of Southern California, most households consisted of parents with children—often residing on large suburban lots with single-family houses. But in the 21st century, the region is witnessing demographic shifts that are influencing housing choices. Today, a smaller percentage of households have younger children at home, and the number of households without children is dramatically increasing. The housing market is expected to reflect these trends with an increased demand for smaller-lot single-family houses, as well as multifamily housing close to shopping, transit services and other amenities. Currently, 55 percent of the region's homes are detached single-family houses. Over the next 20 years, the region is projected to add another 1.5 million homes, and much of this increase will be homes on smaller lots and multifamily housing (33 percent single-family housing to 67 percent multifamily housing). Though new housing will tend to be multifamily housing, the region's overall housing stock will remain similar to the existing housing stock, with a breakdown of 49 percent single-family housing and 51 percent multifamily housing (see [FIGURE 2.1](#)).

OUR HOUSING NEEDS

As a Council of Governments, SCAG is required by California housing law to

¹ O'Neill, T., & Bohannon, J. (2015). Conservation Framework and Assessment. SCAG.

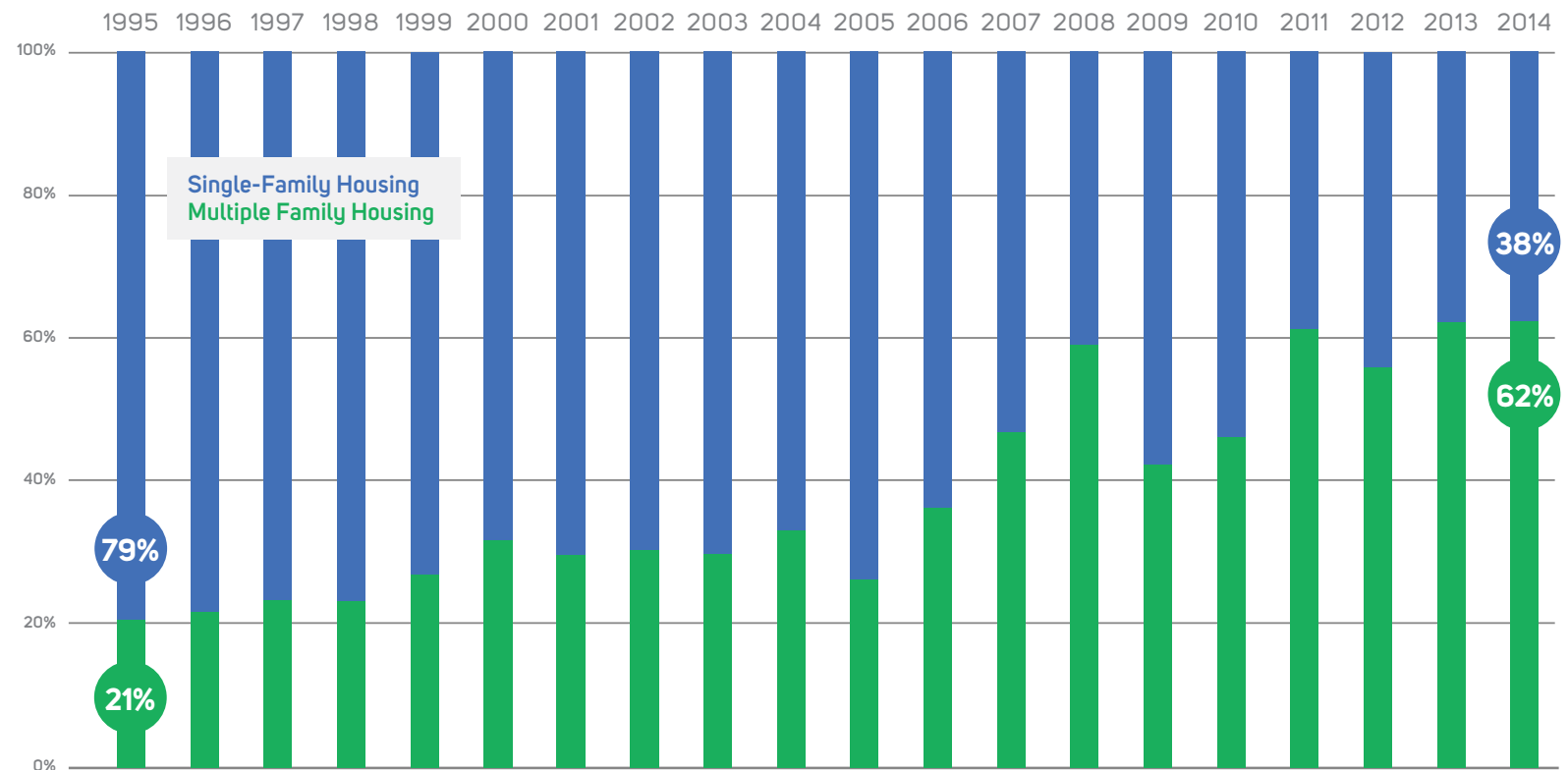
² These documents can be found at: <http://sustain.scag.ca.gov/Pages/LinksResources.aspx>.

conduct a Regional Housing Needs Assessment (RHNA) every eight years. This assessment determines future housing needs for every jurisdiction in a given region for a specific time period. This determination is referred to as the RHNA allocation, which represents projected housing needs for an eight-year period, as required by state law. For our region, the most recent RHNA allocation, also known as the fifth RHNA cycle, was adopted by the SCAG's Regional Council in October 2012 and it covers a projection period between January 2014 and October 2021. The RHNA allocation breaks down housing needs into four income categories: very low (less than 50 percent of the county's median income); low (50 to 80 percent of the median); moderate (80 to 120 percent); and above moderate (more than 120 percent). For the fifth RHNA cycle, the

regional RHNA allocation was 412,137 units, broken down as follows: 100,632 very low; 64,947 low; 72,053 moderate; and 174,505 above moderate.

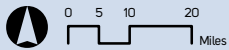
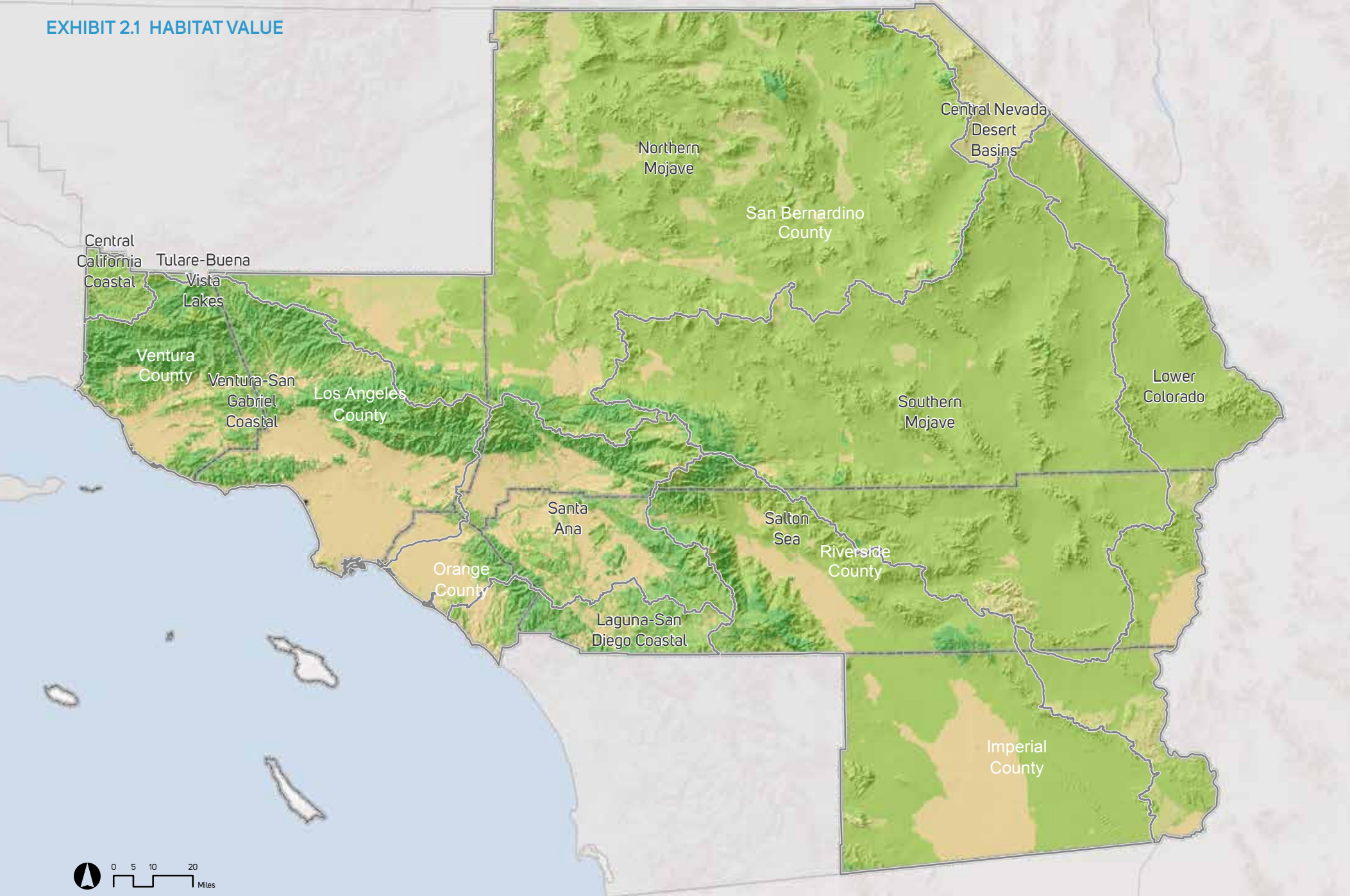
However, although these housing units are planned and zoned for, available data sources indicate that the supply of affordable housing has not met needs, despite strong building activity for market rate housing. For example, during the last RHNA cycle (2006–2014), nearly 22,000 units were constructed using Low Income Housing Tax Credits (LIHTC), a rough benchmark in affordable housing building activity for households with very low income. This building activity represents about 12 percent of the 165,457 units in this category regionally. In contrast, more than 150,000 single-family homes, most likely

FIGURE 2.1 SCAG REGION SHARE OF MULTIPLE/SINGLE BUILDING PERMITS ISSUED



Source: U.S. Census Bureau, Security Pacific National Bank (Prior to 1987) and Construction Industry Research Board (1988 to present)
Single-family housing units include detached, semi-detached, row house and town house units. Multifamily housing includes duplexes, 3-4 unit structures, and apartment type structures with five units or more.

EXHIBIT 2.1 HABITAT VALUE



Per-Acre Habitat Value

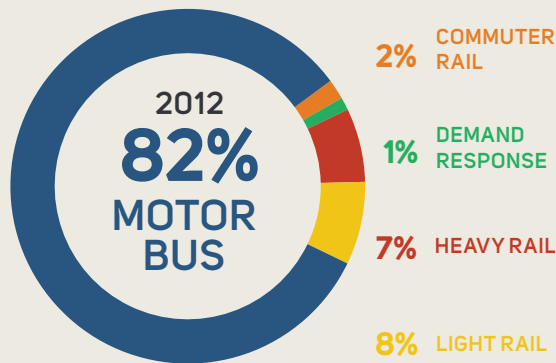


Habitat value refers to the numeric value of a site or area based on an assessment that takes into account species, habitat and functional relationship. The assessment tool aims to spatially capture biodiversity and complexity based on peer-reviewed informational data sets. Please see the Natural & Farm Lands Appendix for a more detailed description of the assessment used to develop the Habitat Value map.

FOCUS TRANSIT

Transit Trips by Mode

The share of bus trips in the region has decreased over time but buses still represent the majority of all transit modes.



Public Transportation Benefits

Enhances personal mobility and access to opportunities.



Source: American Public Transportation Association

REDUCES GASOLINE CONSUMPTION & GHG EMISSIONS

10%–30%

LESS GREENHOUSE GAS EMISSIONS per household

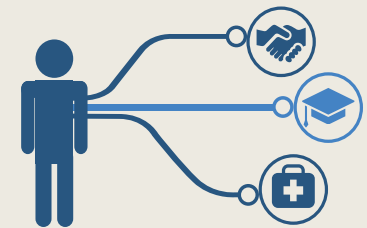
4,000

FEWER MILES DRIVEN reduced gas consumption

\$4
 RETURN FOR EVERY \$1 INVESTED IN TRANSIT

42%
 PROPERTY VALUES PERFORM BETTER WHEN NEAR TRANSIT

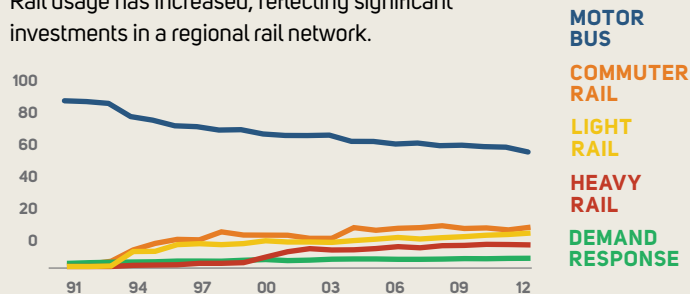
PROVIDES ECONOMIC OPPORTUNITIES



Passenger Miles by Mode

(percent)

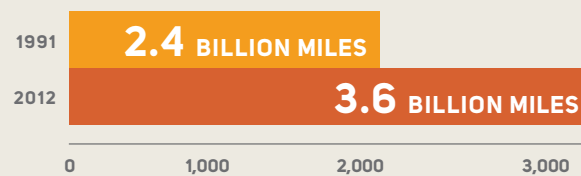
Rail usage has increased, reflecting significant investments in a regional rail network.



Transit Passenger Miles

(millions)

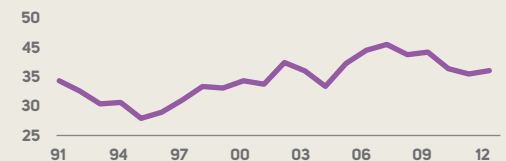
Transit use has increased over the last 20 years. In 2012, transit riders took 711 million trips, traveling more than 3.6 billion miles. Growth in passenger miles was driven by a 15% increase in average transit trip length.



Transit Trips

(per capita)

Growth in transit use has not always kept up with population. The number of transit trips per person is about the same as it was 20 years ago.



suitable for the above moderate income category, representing more than 52 percent of the 293,547 above moderate units needed, were built over the same period. A similar trend can be seen in the first two years after the adoption of the fifth cycle RHNA (2013 and 2014), with barely 2,000 units of new construction reporting use of LIHTC while nearly 30,000 single-family units have been built during this time. No new construction using LIHTC was reported in 2014. Although LIHTC has historically been used in about one out of five new multifamily construction, this data suggests that market rate building activity is far stronger than building activity for very low income households and that the need for affordable housing continues to increase.

Within the housing elements of their General Plans, each jurisdiction in our region is required to show how it would accommodate its RHNA allocation for the designated period. This is accomplished through a sites and inventory analysis that evaluates zoning and land use policies. SCAG is tasked with providing the regional RHNA allocation, but housing elements are reviewed and approved by the California Department of Housing and Community Development. Since the fifth cycle adoption due date of October 2013, 84 percent of the region's jurisdictions have housing elements in compliance with state housing law. The next RHNA allocation for our region is anticipated to be adopted by SCAG in October 2020, with housing elements due by October 2021.

TABLE 2.1 2012 HQTA

COUNTY	WITHIN HQTA			
	HOUSEHOLDS	%	EMPLOYMENT	%
Imperial	0	-	0	-
Los Angeles	1,552,900	48%	2,357,400	56%
Orange	173,500	17%	392,900	26%
Riverside	3,200	0.50%	24,500	4%
San Bernardino	17,200	3%	39,600	6%
Ventura	6,800	3%	22,400	7%
SCAG	1,753,600	30%	2,836,800	38%

HIGH QUALITY TRANSIT AREAS (HQTAs) AND TRANSIT PRIORITY AREAS (TPAs)

The overall land use pattern detailed in the 2012 RTP/SCS reinforced the idea of focusing new housing and employment within the region's HQTAs. For planning purposes, an HQTA, as we have mentioned, is defined as an area within one-half mile of a well-serviced fixed guideway transit stop, and it includes bus transit corridors where buses pick up passengers every 15 minutes or less during peak commute hours. The 2012 RTP/SCS also identified Transit Priority Areas (TPAs), which are defined as locations where two or more high-frequency transit routes intersect. Currently, more than five million residents in the region live within HQTAs. These HQTAs currently accommodate 2.8 million jobs (see [TABLE 2.1](#)).

High density development could also produce high quality housing with consideration of urban design, construction and durability, and result in increased ridership on important public transit investments. Local jurisdictions throughout the region are applying more sophisticated planning practices in the specific plans and zoning codes that govern these areas in order to promote this kind of development. As housing density increases in cities and HQTAs, local governments are investing in pedestrian and bike infrastructure and reducing parking requirements to support people who choose not to have a car or cannot afford one. Local jurisdictions are also creating and retaining affordable housing near transit, helping to increase connectivity to employment opportunities and reducing reliance on automobile ownership.

The positive effects on real estate values, retail sales and property taxes, as well as the social benefits of developing within HQTAs are also well documented.³ For example, less automobile-dependent settings, like HQTAs, spur volunteerism, social interaction and community engagement with more opportunities for face-to-face contact. Creating active places that are busy throughout the day and evening also improves safety and reduces crime rates within the surrounding neighborhood. Increased retail sales and easy transit accessibility translate into higher business profits, rent, commercial real estate values and government property taxes. Similarly, housing value premiums associated with being near a transit station (usually expressed as being within one-quarter to one-half mile of a station) average 17 percent to 30 percent higher than comparable properties located elsewhere.

³ Center for Neighborhood Technology. (2013). The New Real Estate Mantra: Location Near Public Transportation. Washington, D.C.

HQTAs and TPAs are powerful examples of how integrating strategies for land use and transportation can help us achieve our long-term goals for greater mobility, a strong economy and sustainable growth. In the next section of this chapter, we will discuss the state of our overall transportation system today. That will help us set the stage for Chapter 5, where we will review our strategies, programs and projects for our transportation system and explain how we will integrate them with how we use land. Efficient use of our land is the basis for an efficient transportation system.

HOW WE TRAVEL TODAY

TRANSIT

Our regional transit system today is comprised of an extensive network of services provided by dozens of operators. This network includes fixed-route local bus lines, community circulators, express and rapid buses, Bus Rapid Transit (BRT), demand response,⁴ light rail transit, heavy rail transit (subway) and commuter rail.⁵ The region's providers of transit offer the second largest amount of service in the country, after that of the New York City metropolitan area (see [EXHIBIT 2.2](#)).

Transit plays an important role in Southern California's integrated transportation system. It provides an alternative to driving for many and provides mobility to people who do not have cars. The transit network is the region's largest non-automotive passenger transportation mode by trip volume, by a huge degree. Riders of transit took more than eight times as many trips as air travelers in FY2011-12 and nearly 267 times as many trips as passenger rail travelers.

Transit use provides external benefits to the region's transportation system, through investment, reduced traffic congestion and air pollution emissions reductions. The American Public Transportation Association (APTA) estimates that for every billion dollars invested in transit (as of 2007) about 36,000 jobs are created. This includes the direct purchasing power of transit agencies and

also the spending power of the employees of transit agencies.⁶ Were this rate to have held constant into FY2011-12, transit spending in the SCAG region would have resulted in the creation or maintenance of roughly 150,000 jobs.

The Texas Transportation Institute (TII), in its annual Urban Mobility Report, estimates traffic congestion delay averted due to the use of the region's public transportation system. In 2011, using transit helped residents of the SCAG region avoid 10 hours of delay per person, and saved the region more than \$250 million in averted traffic delay costs.

Each of the region's residents take an average of 39 transit trips each year, at an operating and maintenance cost of \$3.46 per trip (this amount increases to roughly \$5.05 when both operations and capital expenditures are accounted for). Transit users typically pay 25 percent of the operating and maintenance cost of their travel, with the remaining 75 percent paid for by state and local public subsidies. Most capital expenditures are also funded with public subsidies, including a larger share of federal grants. Despite recent service cuts, the region's total combined capital and operations spending exceeded \$3.59 billion in FY2011-12.

The past eight years have been tough economically for Southern California's transit agencies. Although bus service accounted for 82 percent of the region's transit trips in FY2011-12, the agencies that provide it have been hit particularly hard. Many have had to cut service. Total bus service provided by the Los Angeles County Metropolitan Transportation Authority (Metro) has declined by 10 percent, Orange County providers have cut bus service by 11 percent, and Los Angeles County Municipal Operators bus service has fallen by three percent.

These declines in service are tied to the Great Recession, as total ridership and per-capita ridership have stagnated. In FY2011-12, ridership of just under 711 million trips was up 1.7 percent compared with the prior year, but it represented a six percent decline from a pre-recession high of more than 750 million trips. The per-capita trip total of nearly 39 for FY2011-12 represents a loss of seven percent from the pre-recession high of more than 42 per-capita trips. Preliminary data for FY2014-15 show that total ridership and per capita ridership have continued to decline. Total transit trips are expected to fall below 700 million for the first time since FY2003-04.

⁴ "Demand response" is defined as a transit mode comprised of passenger cars, vans or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations.

⁵ Commuter rail is discussed separately in more detail, along with intercity passenger rail such as Amtrak and CA High-Speed Train, as part of "Passenger Rail."

⁶ American Public Transportation Association, 2009, "Job Impacts of Spending on Public Transportation: An Update." White Paper.

Since 1991, transit agencies in the region have provided about 13.22 billion transit trips. In that time, urban rail and commuter rail have grown from 1.3 percent of transit trips to 16.1 percent of trips in 2012. Bus trips have declined from 98.6 percent of trips to about 83 percent. Urban and commuter rail together supply 11.6 percent of all Vehicle Revenue Miles because the per vehicle capacity is much higher than that of buses. Urban and commuter rail services are 20.9 percent of all transit operating expenses in our region.

PASSENGER RAIL

Southern California is served by an ever expanding passenger rail network, including intercity, commuter and freight services, and this network is expanding and improving in terms of capacity, efficiency and safety. Many capital, operational and safety improvements are underway and planned throughout this existing network, including transportation corridors currently not served by rail.

The region's passenger rail network, along with the number of passengers and service levels, has steadily grown since 1990, except for a dip during the Great Recession. In 1990, the only passenger rail service operating in the region was the Pacific Surfliner and Amtrak's long-distance trains such as the Coast Starlight and Southwest Chief. Metrolink began commuter rail service in October 1992, and it continues to expand its network and levels of service. The Pacific Surfliner, which carried 2.7 million passengers in FY2013-14, operates 11 daily round-trips between Los Angeles and San Diego, five round-trips between Los Angeles and Santa Barbara/Goleta, and two round-trips north to San Luis Obispo. The Pacific Surfliner is Amtrak's second busiest corridor, behind the Northeast Corridor between Washington, D.C. and Boston. The line's average speed is 46 miles per hour (mph).

The Southern California Regional Rail Authority (SCRRA), the operator of Metrolink, operates 165 weekday trains on seven lines and the system carried 11.7 million passengers in FY2013-14. Weekend service provides 34 trains on Saturdays and 28 on Sundays. Metrolink operates two round-trip express trains: one round-trip on the San Bernardino Line and one round-trip on the Antelope Valley Line (to Palmdale only). System-wide average speed is 37 mph.

Notable recent efforts include the first Metrolink e-ticketing program rollout in 2016. Also, the LOSSAN Rail Corridor (Los Angeles–San Diego–San Luis Obispo Rail Corridor) received a Cap-and-Trade Transit and Intercity Rail Capital Program grant in the spring of 2015 to re-establish a cooperative fare agreement with local connecting transit agencies for free transfers to and from the Pacific

Surfliner. This program had never been fully developed by Caltrans Division of Rail (DOR), and recently it had been discontinued.

These cooperative fare agreements and media efforts include effective marketing across passenger rail markets and transit riders. Metrolink has been successful with its special service trains for both Dodgers' and Angels' games and other special events. These types of services introduce passenger rail to the general public and can lead to new regular customers.

In July 2015, Metrolink started a pilot fare project on the Antelope Valley Line. It included a 25-percent reduction in fares (except for the weekend day pass) and allowed station-to-station travel for just \$2.00. Due to the success of this pilot program, on January 1, 2016 Metrolink implemented a \$3.00 station-to-station fare system-wide. (The \$2.00 station-to-station program was discontinued on the Antelope Valley Line, however the 25 percent fare reduction was extended to June 30, 2016.) Since 2012, Metrolink has offered its successful weekend pass, allowing unlimited travel throughout the entire Metrolink system on both Saturday and Sunday for just \$10.00. (The fare has since increased to \$10.00 per weekend day.) Monthly pass holders can take unlimited trips on the weekend.

The renaissance of rail travel in our region is exciting. However, significant challenges are keeping our commuter and intercity rail networks from realizing their full potential to help reduce highway congestion, and cut air pollution and lower greenhouse gas emissions. Among these challenges:

More than half of the commuter and intercity rail network operates on one track, some of which is owned by freight railroads that maintain priority for their own operations. Passenger trains are assigned "slots," meaning that they are allowed to move in a particular direction for a fixed time period. This results in the relatively slow average speeds noted above, reducing the incentive for commuters to use the train system (and instead prompting them to commute by car), as well as reducing the number of passenger trains that can serve our region.

One-track operations present other challenges. Even a minor delay can lead to a train losing its slot, thereby causing cascading delays throughout the network and throughout the day. Commuter and intercity rail networks in Chicago and on the East Coast have much higher service frequencies than we do in our region, mainly because they have fewer single-track segments and fewer conflicts with freight railroads. Our region has a large list of rail improvements either in the planning phases or which are ready for construction. These

improvements include adding double-tracking, sidings, station improvements and grade separations to increase speed and service levels. However, there is no dedicated long-term funding for commuter and intercity rail to move these projects forward.

ACTIVE TRANSPORTATION

Our region has made steady progress in encouraging people to embrace active transportation, that is, human-powered transportation such as walking and biking. Across our region today, many people live and work in areas where trips are short enough to be completed by walking or biking. Walking and biking as a share of all trips is more than 18 percent in our most urban areas where there are abundant nearby destinations/land uses, yet still reaches 11 percent in rural areas where land uses are less diverse.⁷ There is a strong relationship between land use and travel behavior. Land use characteristics play a key role in determining the conditions for and feasibility of walking and biking in a community, due to the sensitivity of these modes to trip length.

⁷ California Department of Transportation (2012). California Household Travel Survey.

The regional bike network is expanding but remains fragmented. Nearly 500 additional miles of bikeways were built since SCAG's 2012 RTP/SCS, but only 3,919 miles of bikeways exist regionwide, of which 2,888 miles are bike paths/lanes (see [EXHIBIT 2.3](#)).

Walking represents nearly 17 percent of all trips in the SCAG region, with the largest share in Los Angeles County. It is how most transit riders reach their station. Most walk trips (83 percent) are less than one half mile; walkers are less likely to travel further because of a lack of pedestrian friendly infrastructure. Routes to stops and stations are often circuitous and/or obstructed, increasing the time it takes to complete a trip by transit and therefore making the choice to use transit less attractive. A study in Los Angeles County found that the most common barriers to station access on foot or bicycle include: long blocks, highway over/underpasses, concerns about safety and security, sidewalk maintenance, legibility/lack of signage and right-of-way constraints leading to limited space for safe walking and biking.⁸ Currently, all six counties in the SCAG region are pursuing first/last mile solutions to make transit or border crossing stations more accommodating to active transportation. Their efforts are aided by the Federal Transit Administration (FTA), which has extended the "walk-shed" (the area encircling a destination point) from transit stations from a quarter mile to a half mile, enabling transit funding to be used for larger areas around transit stations.⁹ The "bike-shed," as defined through FTA guidance, extends three miles in all directions from a station.

While the number of bicyclists and pedestrians is increasing, so are injuries and fatalities—although not as fast as the growth overall in active transportation. Nevertheless, injuries among those who bike and walk are increasing at a time when the total number of traffic-related injuries and fatalities is dropping regionwide. Improving safety will likely require pursuing innovative strategies (as described in the following sections) to reduce conflicts among bicyclists, pedestrians and automobiles. In 2015, the City of Los Angeles began its Vision Zero Campaign. Vision Zero is a road safety policy that promotes smart behaviors and roadway design that anticipates mistakes, so that collisions do not result in severe injury or death.

⁸ Los Angeles County Metropolitan Transportation Authority (2014) First Last Mile Strategic Plan & Planning Guidelines.

⁹ Department of Transportation (Friday, August 19, 2011): Final Policy Statement on the Eligibility of Pedestrian and Bicycle Improvements Under Federal Transit Law. Federal Register Volume 76, Number 161 Pages 52046-52053.

HOW WE GET TO WORK



14%

CARPOOL



76%

DRIVE ALONE



5%

TRANSIT
(Bus/Rail)

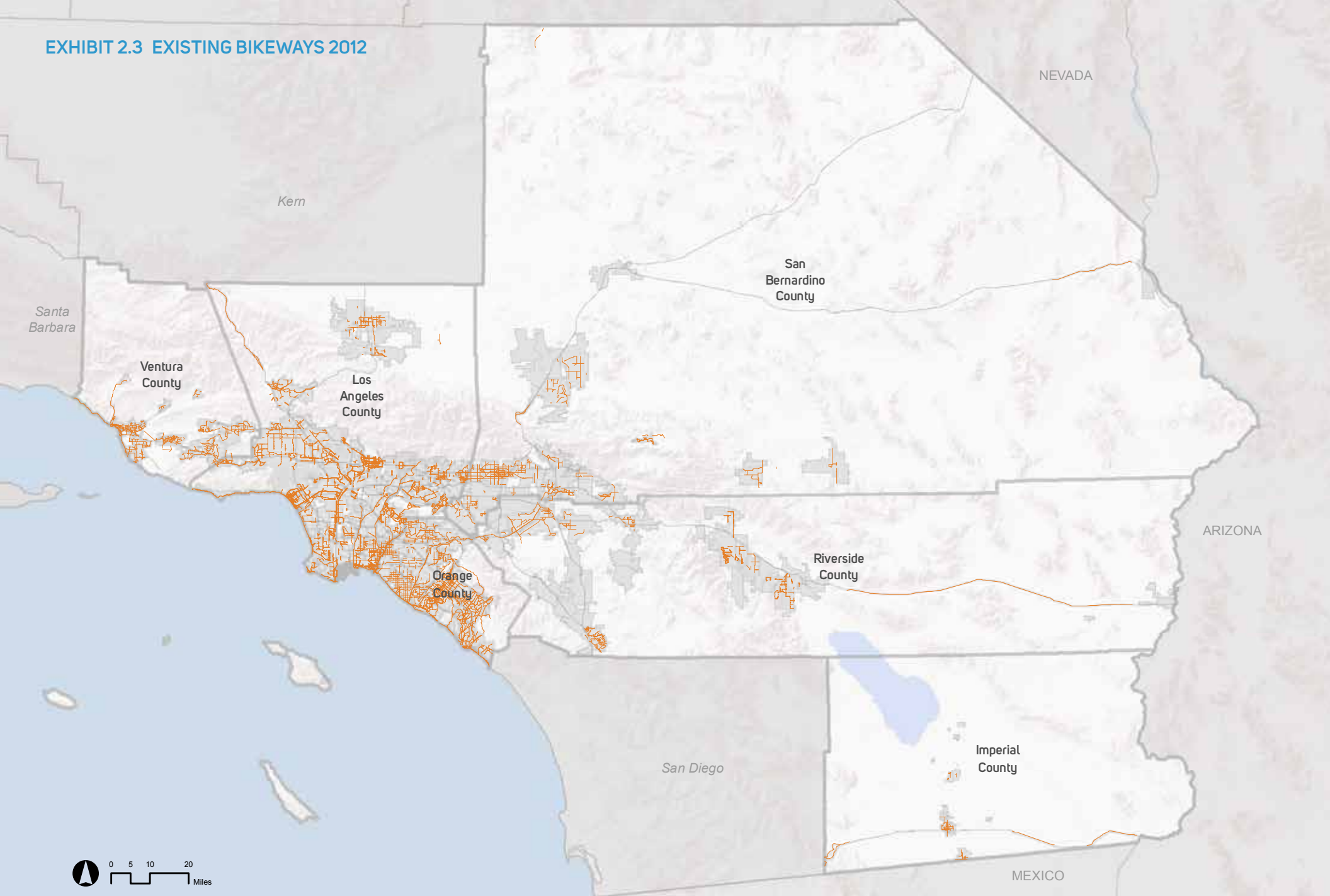


5%

NON-MOTORIZED
(Walk/Bike)

Source: SCAG Regional Travel Demand Model

EXHIBIT 2.3 EXISTING BIKEWAYS 2012



 Bikeways

(Source: SCAG)

HIGHWAYS AND ARTERIALS

Our region's highways and arterials continue to be the backbone of our overall transportation network, and they are vital to moving people and goods throughout the region. Across the Southern California region, our highway and arterial system covers about 70,000 roadway lane miles and accommodates 66 million trips per day. Our roadways are not only used by automobiles and freight trucks, they are also used for transit and for those who choose to walk, bike and use other forms of active transportation. According to SCAG's Regional Travel Demand Model (RTDM), more than nine out of 10 trips rely either entirely or in part on the highway and arterial system. Based on currently available data, there are 3.6 million person-hours of daily delay and 11.8 minutes of daily delay per capita along our region's highways and local arterials.

Maintaining the operational efficiency of our roadways is crucial if we are to maintain the mobility of our region. Unfortunately, traffic congestion continues to adversely affect our highway and arterial system every day. Although we have made improvements, the increasing travel demands that will come with a growing population in coming years will lead to increased congestion. This traffic congestion will not only make life difficult for commuters, it will also degrade our region's air quality and our overall quality of life. To address congestion and to improve our transportation network's efficiency, the region has been investing in Transportation Systems Management and Transportation Demand Management projects as described in the following sections.

TRANSPORTATION SYSTEMS MANAGEMENT (TSM) AND TRANSPORTATION DEMAND MANAGEMENT (TDM)

For our regional transportation system to operate efficiently and smoothly, operators must manage the system effectively, as well as the demands placed on it. To do so, they implement TSM and TDM strategies.

TSM employs a series of techniques designed to maximize the capacity and efficiency of the existing transportation system and its facilities. One of these techniques deploys Intelligent Transportation Systems (ITS), which will be discussed below. TDM involves a variety of strategies to manage the demand placed on our roadway network and to reduce our dependence on driving alone. These include promoting ridesharing, value pricing,¹⁰ telecommuting or alternative work schedules and alternative modes of travel such as transit, passenger rail and active transportation.

¹⁰ Value pricing is a user fee applied during peak demand periods on congested roadways to improve the reliability and efficiency of the transportation system and provide travelers with greater choices.

The common goals of TSM and TDM are to improve the productivity of our transportation system, reduce traffic congestion, improve air quality and reduce or eliminate the need to construct new and expensive transportation infrastructure.

Transportation Systems Management (TSM)

A critical TSM technique is Intelligent Transportation Systems, or ITS, which makes use of advanced detection, communications and computing technologies to improve the safety and efficiency of our surface transportation network. These systems allow system operators and users to better manage and optimize the capacity of the region's transportation system. Data is collected about the status of our highways, traffic signals, transit vehicles, freight vehicles, passenger trains and shared-ride vehicles and is integrated in ways that improve the efficiency of the overall transportation system.

SCAG has a critical role to play in the development and management of ITS in the region. As the region's Metropolitan Planning Organization, SCAG is charged with developing and maintaining the Southern California Regional ITS Architecture. This architecture is the regional planning tool for ensuring a cooperative process to prioritize and deploy ITS technologies and for identifying critical data connections between institutional stakeholders (e.g., connecting two transit operators). This architecture helps the region deploy ITS systems that are truly integrated. Stakeholders are able to share information among many agencies in consistent and compatible formats to achieve improved safety and efficiency. SCAG works closely with the CTCs, local governments and Caltrans Districts to update and maintain the regional architecture and assure the use of required systems, engineering requirements and applicable standards—which is required when federal funds are used on ITS projects.

The Southern California highway system has an extensive ITS system that covers most of the urbanized portion of our region. Loop detectors in the pavement and video cameras provide information on speed and volume, and identify congestion and incidents that are fed to Caltrans/California Highway Patrol (CHP) Transportation Management Centers (TMCs). Arterial ITS systems are in place throughout the region as well. Local arterial systems include advanced signal synchronization capabilities to increase the flow of traffic and also to detect and respond to changes in traffic volume or direction of travel and manage incidents. Like the highway network, these systems include loop and video detection and also rely on wireless data such as that provided by Google.

Most medium- to large-scale, fixed-route and Dial-a-Ride operators in our region have implemented transit ITS components. These include automatic

vehicle location (AVL) and transit signal priority (TSP) systems. Automatic vehicle location systems have greatly increased the effectiveness of real-time scheduling information, increasing convenience for transit passengers. TSP gives transit vehicles signal priority to improve passenger throughput and bus speed. The TSP system is an integral part of Metro's Rapid Bus program, which has 20 routes. Santa Monica's Big Blue Bus, Culver City Bus and Torrance Transit are others that employ TSP systems as well. Using a combination of hard-wired loop technology and wireless technology, they reduce travel times by up to 25 percent.

Transportation Demand Management (TDM)

Our region employs an array of TDM strategies to better manage the demand placed on our roadway network by reducing the number of people who drive alone as well as encouraging them to use alternative modes. As a consequence, these strategies have helped reduce air pollution and greenhouse gas emissions. These strategies include promoting carpooling and vanpooling; biking and walking; car sharing and bike sharing; telecommuting; flexible work schedules; and intelligent parking, among other strategies. The region has a long history of investing in a comprehensive High-Occupancy Vehicle (HOV) or carpool lane system, supported by investments in park-and-ride facilities, rideshare matching and vanpooling services. A 2014 national study of employers by the Families and Work Institute and the Society for Human Resource Management showed that employers are becoming more willing to provide employees with flexible work arrangements and more choices in managing work time, without loss of pay. As Baby Boomers continue to retire in increasing numbers and are replaced by younger, more tech-savvy workers, and as employers continue to embrace technology and remote access capabilities, we expect to see increases in the percentage of workers who telecommute or have flexible work schedules.

A significant amount of travel in the region is still by people who choose to drive alone (42 percent of all trips and nearly 76 percent of work trips). So, the challenge of getting individuals to seek alternative modes of travel remains.

GOODS MOVEMENT

Our region's transportation network for moving goods, referred to as our "goods movement" system, relies today on multiple modes of transportation and complex infrastructure. Whether carrying imported goods from the ports to regional distribution centers, supplying materials for local manufacturers, or delivering consumer goods to residents, our goods movement system sustains regional industries and consumer needs every day. This system includes deep-water marine ports, international border crossings, Class I rail lines, interstate

highways, state routes and local connector roads, air cargo facilities, intermodal facilities, and distribution and warehousing centers. **EXHIBIT 2.4** depicts our region's multimodal goods movement system.

Major Elements of the Goods Movement System:

- **Seaports (Ports of Los Angeles, Long Beach and Hueneme):** Serving as the largest container port complex in the U.S., the Ports of Los Angeles and Long Beach (together called the San Pedro Bay Ports) handled about 117 million metric tons of imports and exports in 2014—for a total value of about \$395.7 billion.¹¹ The Port of Hueneme in Ventura County specializes in the import and export of automobiles, fresh fruit and produce and serves as the primary support facility for the offshore oil industry. In 2014, two-way trade activities through the Port of Hueneme were valued at nearly \$9.2 billion and generated \$1.1 billion in economic activities in the immediate region.¹²
- **Land Ports:** The international border crossings in Imperial County are busy commercial land ports, and they were responsible for more than \$8 billion in imports and \$6 billion in exports in 2014. This cross-border commerce was driven by the maquiladora trade, as well as the movement of agricultural products.¹³
- **Air Cargo Facilities:** The region is home to numerous air cargo facilities, including Los Angeles International Airport (LAX) and Ontario International Airport (ONT). Together they handled more than 99 percent of the region's air cargo, valued at more than \$96 billion,¹⁴ in 2014.
- **Highways and Local Roads:** Our region has more than 70,000 roadway lane miles.¹⁵ Sections of Interstate 710, Interstate 605, State Route 60 and State Route 91 carry the highest volumes of truck traffic in the region and averaged more than 25,000 trucks per day in 2013. Other major components of the regional highway network also serve significant numbers of trucks. These include Interstates 5, 10, 15 and 210. More than 20,000 trucks per day travel on some sections.

¹¹ American Association of Port Authorities and U.S. Trade Online, U.S. Census.

¹² U.S. Trade Online, U.S. Census and Port of Hueneme.

¹³ The term maquiladora refers to a manufacturing operation in Mexico. The majority of them are located along the US border and within the Foreign Trade Zones (FTZs) to capitalize on duty-free and tariff-free provisions for assembly and material processing.

¹⁴ U.S. Trade Online, U.S. Census.

¹⁵ Highway Performance Monitoring System, California Department of Transportation, <http://www.dot.ca.gov/hq/tsip/hpms/>.

FOCUS

GOODS MOVEMENT

THE SCAG REGION IS THE LARGEST INTERNATIONAL GATEWAY IN THE U.S.

supported by AIRPORTS, LAND PORTS OF ENTRY, SEAPORTS, RAILWAYS, HIGHWAYS and WAREHOUSE & DISTRIBUTION CENTERS



REGIONAL AIRPORTS
HANDLED NEARLY
\$96 BILLION
IN INTERNATIONAL AIR CARGO IN 2014

#1 SOUTHERN CALIFORNIA has the **LARGEST CONTAINER PORT COMPLEX** in the UNITED STATES

#9 and has the **NINTH LARGEST CONTAINER PORT COMPLEX** in the WORLD

SOUTHERN CALIFORNIA HAS

3,747 MILES
OF HIGHWAYS
(that is 41% of all the highway road miles in California)

2 CLASS 1 RAILROADS **6** INTERMODAL RAIL YARDS**

** Not including carload and automobile terminals

CLOSE TO
1.2 BILLION SQ. FT.
OF WAREHOUSING & DISTRIBUTION SPACE

CLOSE TO
750 MILLION SQ. FT.
ARE FACILITIES >50K SQ. FT. IN SIZE

(2014)

In 2014, the VALUE OF INTERNATIONAL TRADE that moved through the SCAG region was over

\$515 BILLION
includes maritime and cross-border trade and air freight

In 2014, Goods Movement dependent industries generated

2.9 MILLION



HOW CAN WE GROW WITH LESS IMPACT?

\$2.6 BILLION



COST OF WASTED LABOR HOURS & FUEL from Truck Congestion on Highways



ANNUAL COST OF AIR POLLUTION in the SCAG region is at least

\$14.6 BILLION



371% GROWTH



in VEHICLE HOURS OF DELAY per day at rail-highway grade crossings across the region by 2040

These roads carry a mix of cargo loads, including local, domestic and international. The arterial roadway system also plays a critical role in goods movement, providing first/last mile connections to regional ports, manufacturing facilities, intermodal terminals, warehousing and distribution centers, and retail outlets.

- **Class I Railroads:** Critical to the growth of the region's economy, the Burlington Northern Santa Fe Railway (BNSF) and Union Pacific (UP) carry international and domestic cargo to and from distant parts of the country. The BNSF mainline operates on the Transcontinental Line (and San Bernardino Subdivision). The UP operates on the Coast Line, Saugus Line through Santa Clarita, Alhambra and Los Angeles Subdivisions and Yuma Subdivision to El Paso. Both railroads operate on the Alameda Corridor, which connects directly to the San Pedro Bay Ports. The San Pedro Bay Ports also provide several on-dock rail terminals, along with the six major intermodal terminals operated by the BNSF and UP.
- **Warehouse and Distribution Centers:** The SCAG region is home to one of the largest clusters of logistics activity in North America. In 2014, the region had close to 1.2 billion square feet of facility space for warehousing, distribution, cold storage and truck terminals.¹⁶ Nearly 750 million square feet of this space, in 4,900 buildings, were facilities larger than 50,000 square feet. An estimated ten percent of the occupied warehouse space served port-related uses, while the remaining 90 percent supported domestic shippers.¹⁷ Many of these warehouses are clustered along key goods movement corridors. Port-related warehousing is concentrated in the Gateway Cities subregion, while national and regional distribution facilities tend to be located in the Inland Empire.

Key Goods Movement Functions and Markets

Our region's goods movement system serves a wide range of markets including international, domestic and local trade. Although the international trade market has a significant presence in the region, most freight activities are generated by local businesses moving goods to local customers and supporting national domestic trade. These businesses are sometimes referred to as "goods movement-dependent industries." In 2014, these industries, including manufacturing, wholesale and retail trade, construction, and warehousing, employed nearly three million people throughout the region and

contributed \$291 billion to the regional gross domestic product (GDP). These industries are anticipated to grow substantially, with manufacturing projected to increase its GDP contribution 130 percent by 2040 and wholesale trade growing 144 percent.¹⁸

Growth of E-Commerce and Goods Movement

The retail industry provided nearly \$30 billion in wages and salaries for the region in 2014.¹⁹ This industry includes a wide variety of subsectors such as motor vehicles, furniture, electronics and appliances, building materials, health and personal care products, clothing, sporting goods, and books. One of the most notable changes in the retail industry is the strong growth in e-commerce sales. E-commerce sales for U.S. retailers totaled \$261 billion in 2013, an increase of 13.6 percent from 2012. Total retail sales increased by 3.8 percent in the same period. Within the e-commerce sales merchandise category, clothing and clothing accessories had the largest sales at \$40 billion, followed by electronics and appliances at nearly \$23 billion. E-commerce provides consumers with a broad range of shopping options, including the ability to compare product prices instantaneously from mobile devices and to opt for home delivery or store pick-up of merchandise. Simultaneously, e-commerce has changed how traditional distribution centers and retail outlets are operating to meet customer demand. Distribution centers in the past delivered bulk size goods to their customers or vendors. Because e-commerce orders tend to be smaller in size (i.e., a single item order as compared to a bulk-case order), many retailers and distribution center/warehouse operators are upgrading their facilities, or developing new facilities, to meet surging e-commerce orders. These changes are also generally characterized by the use of smaller trucks and integrator delivery vans (such as UPS, FedEx and DHL) due to overnight or two-day delivery requirements of e-commerce customers.

Same-Day Delivery Demands

Consumers are increasingly demanding quicker fulfillment of their orders. More recent developments include same-day delivery options. To meet the same-day delivery promise, distribution or fulfillment center proximity to population centers becomes critical. This is exemplified by large-scale e-commerce fulfillment center developments at the periphery of urban population centers. At the same time, small to medium size buildings that are narrow, but with ample loading doors and docks in urban cores, have also been attractive as they provide even quicker access to dense population centers than those in the outskirts. Additionally, retailers are increasingly using products available

¹⁶ CoStar Realty Information, Inc. www.costar.com, based on November 2014 data downloads.

¹⁷ Industrial Warehousing in the SCAG Region Study, SCAG, based on the Avison-Young methodology for port-related and non-port related warehousing needs.

¹⁸ REMI TranSight SCAG, CA, USv3.6.5.

¹⁹ Regional Economic Model Inc. TranSight SCAG, CA, US v3.6.5.

at their stores to fulfill e-commerce orders. Parcel hubs, delivery centers and accessibility to local streets and highways throughout the region will continue to be critical to e-commerce growth.^{20 21 22}

²⁰ E-commerce Evolutions – Element 4: Distribution and Fulfillment Centers, NAIOP, May 2015, <http://www.naiop.org/en/E-Library/Business-Trends/Distribution-and-Fulfillment-Centers.aspx>.

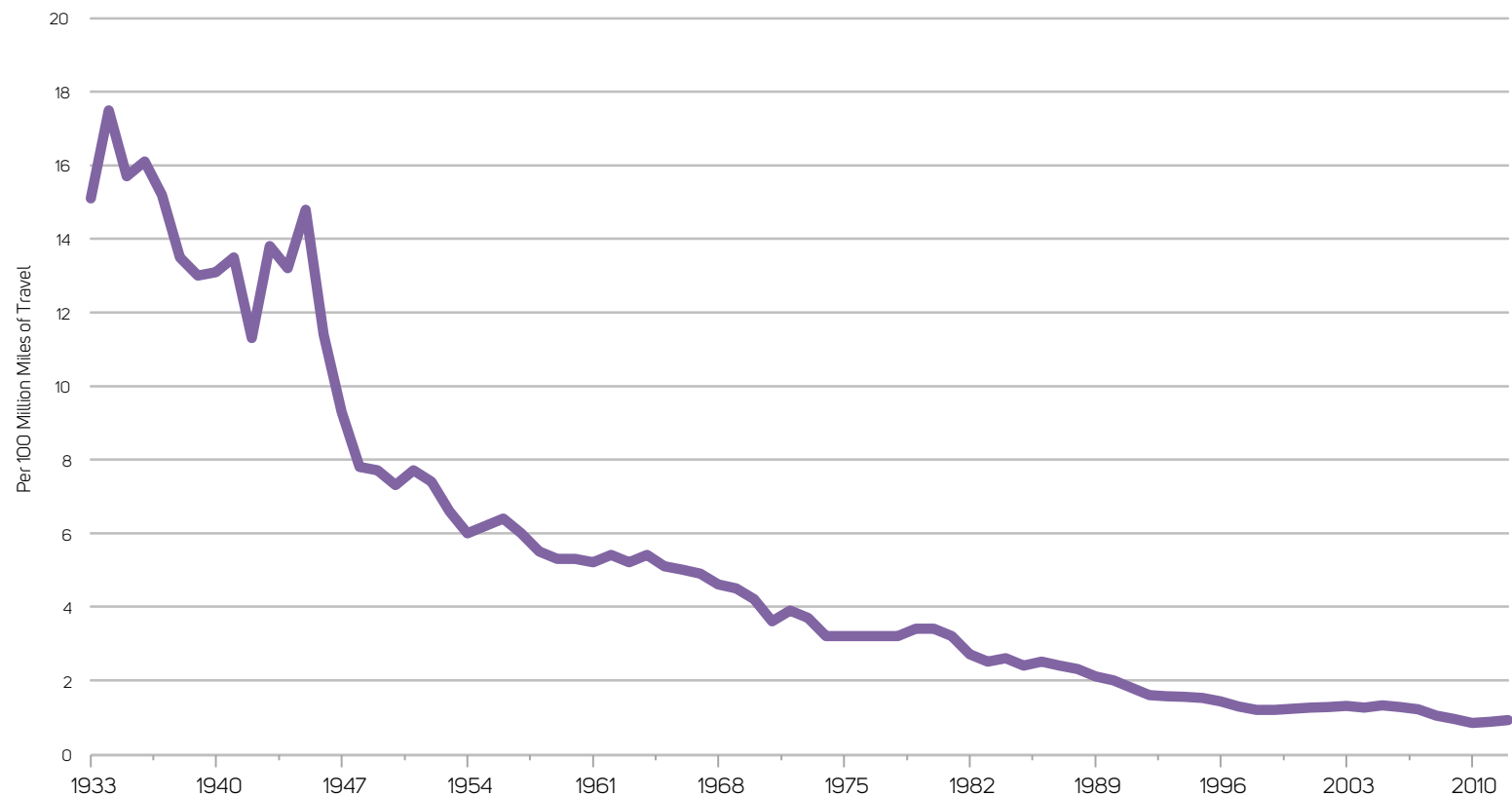
²¹ Retailers must overcome logistics lag for same-day delivery, Kris Bjornson, JLL, April 2014, <http://www.joneslanglasalleblog.com/investor/retailers-must-overcome-logistics-lag-for-same-day-delivery/>.

²² Same-day delivery is transforming the CRE industry, Kris Bjornson, JLL, June 2015, http://www.joneslanglasalleblog.com/investor/same-day-delivery-is-transforming-the-cre-industry/?utm_source=us-retail-ecom&utm_medium=jll-website&utm_campaign=featured-post.

STATE OF SAFETY

The safety of people and goods is one of the most important considerations in developing, maintaining and operating our diverse transportation system. Throughout California, the rate of fatal and injury collisions on highways has declined dramatically since the California Highway Patrol began keeping such data in the 1930s (see [FIGURE 2.2](#)). California has led the nation in roadway safety for many of the past 20 years. Only recently have roadways nationally become as safe as those in California. California's most recently recorded mileage death rate (MDR)—defined as fatalities per 100 million vehicle miles traveled (VMT)—was 0.91, while the MDR within the SCAG region was slightly lower at 0.83. Both MDRs for the state and SCAG region are lower than the national MDR of 1.09.

FIGURE 2.2 MAKING OUR ROADWAYS SAFER: CALIFORNIA MILEAGE DEATH RATE (1933–2012)



Our region has an extensive transportation system, with more than 70,000 lane miles of highway and arterial lanes and 3,900 miles of bikeways. As of 2014, the region had 14.9 million licensed drivers and 11.8 million registered vehicles. As of 2012 (the most recent year that data was available), more than 1,300 people died and 121,000 were injured (of which 6,800 were considered severe) in traffic collisions in the region.

In 2012 President Obama signed into law MAP-21, the Moving Ahead for Progress in the 21st Century Act, which funded surface transportation programs

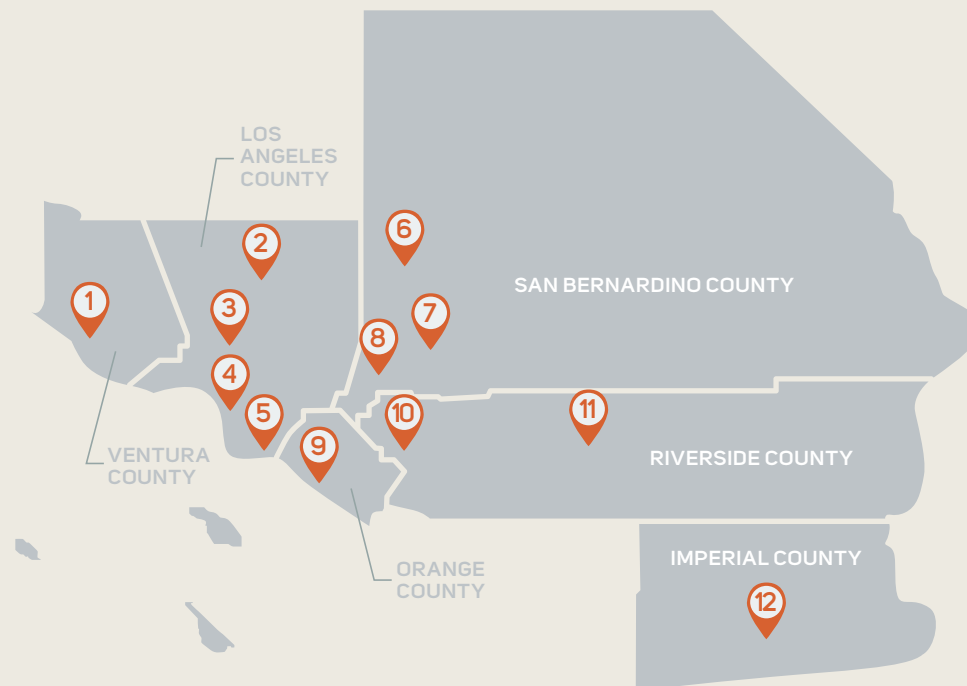
and required states to develop Strategic Highway Safety Plans (SHSPs).²³ The California Department of Transportation (Caltrans) responded by developing an updated SHSP through a participatory process. Throughout 2014, Caltrans conducted an extensive outreach effort to more than 50 agencies and organizations throughout the state—including SCAG—to gather feedback on improving the overall SHSP. This effort led to the release of the final California SHSP in 2015. California’s ultimate goal is to reach zero deaths on our highways—a concept known as “Toward Zero Deaths” (TZD). Specifically, California aims to achieve a three percent per year reduction for the number

²³ In December 2015, the Fixing America’s Surface Transportation Act, or “FAST Act,” was signed into law, which authorizes funding for surface transportation programs. SCAG expects to work with Caltrans to monitor the rulemaking process to implement FAST Act provisions.

Map of Airports

12

EXISTING & PLANNED
COMMERCIAL
AIRPORTS SERVING
THE SCAG REGION



- ① Oxnard
- ② Palmdale
- ③ Burbank Bob Hope
- ④ Los Angeles International
- ⑤ Long Beach
- ⑥ Southern California Logistics
- ⑦ San Bernardino International
- ⑧ Ontario International
- ⑨ John Wayne
- ⑩ March Inland Port
- ⑪ Palm Springs International
- ⑫ Imperial County

AIRLINE PASSENGER VOLUME

71 MILLION
IN 1994

91 MILLION
IN 2014

and rate of fatalities and a 1.5 percent per year reduction for the number and rate of severe injuries. Although the SHSP and previous California SHSPs set various actions that state agencies can take to reduce fatalities, there are complementary strategies that local governments can pursue, such as Vision Zero initiatives. For additional details regarding strategies, please see the Safety & Security Appendix.

As we continue to work to improve safety for motorists, we also must tackle the alarming fatality rates of those who use other modes of transportation. Safety is a priority for all modes of transportation, and improving safety for people who walk and bike is critical. Based on currently available data, about 27 percent of all traffic-related fatalities in our region involved pedestrians and five percent of traffic-related fatalities involved bicyclists, according to data from the Statewide Integrated Traffic Records System (SWITRS).

AVIATION AND GROUND ACCESS

The SCAG region is one of the busiest and most diverse commercial aviation regions in the world. In 2014, more than 60 airlines offered scheduled service to one or more of our region's airports, providing more than 1,200 daily commercial departures—one every 70 seconds. These departing flights travel all over the United States and to every corner of the globe; a total of 169 destinations in 37 countries had non-stop service from our region in 2014. Our airports also play a critical role in the region's goods movement network, and they impact the operations of our ground transportation network as well. The passengers arriving at or departing from our airports generate more than 200,000 daily trips on our region's ground transportation system.

Passenger and cargo air travel in the region is supported by a multiple airport system that spans six counties. There are seven commercial airports with scheduled passenger service, five additional facilities with the infrastructure to accommodate scheduled service, seven active military air fields and more than forty general aviation airports. Worldwide, few other regions have as many commercial airports within a comparable geographic area, making Southern California one of the world's most complex aviation systems.

In 2014, the airports in our region handled more than 1.5 million aircraft operations (take-offs and landings), nearly 800,000 of which were commercial operations. In the face of this huge number of air travelers and aircraft, our airports work efficiently. Flights to our region arrive on schedule more than 80 percent of the time. Thanks to favorable weather conditions, lengthy tarmac

delays that occur in other regions are virtually unheard of here. The size of the regional market for air travel and the absence of a single dominant air carrier in the region result in healthy competition among airlines, so air travelers enjoy some of the lowest average airfares in the country.

Air travel is an important contributor to the region's economic activity. Nearly half of the air travel in the region consists of visitors from other parts of the country and the world traveling here to conduct business, enjoy a vacation or visit friends and relatives. About one-third of air travel to the region is business related. Therefore, any passenger who arrives at or departs from an airport in our region is good for the region as a whole. Spending by passengers who used our airports to visit the region in 2012 contributed nearly \$27.4 billion to the regional economy. The money spent by visitors on meals, lodging, entertainment, transportation and other purchases supported nearly 275,000 jobs.

As with other modes of transportation, the demand for air travel was impacted heavily by the recession that began in 2007. In 2014, the airports in our region served 91.2 million total passengers, surpassing the previous peaks of 89.4 million in 2007 and 88.7 million in 2000.

The demand for air cargo was even more sharply impacted by the recessions of 2001 and 2007. The 2.4 million metric tons of cargo transported through the airports in our region in 2014 remained ten percent below the pre-recession peak of 2.7 million metric tons in each year from 2004–2006 and five percent below year 2000 levels.

In addition to its commercial airports, the SCAG region is also home to a large general aviation (GA) system. Included in this segment are airports serving non-commercial corporate jets, single engine planes, helicopters, emergency and firefighting operations, and flight training activity. General aviation airport facilities also act as relievers to commercial airports and provide diversionary locations for commercial planes that require emergency landings.

There are more than 40 general aviation airports in the SCAG region, and they are as diverse in size and market area as the commercial facilities. Van Nuys Airport (VNY), the second busiest general aviation facility in the United States, serves several important functions for the region, including serving as the base for many corporate jets. As of May 2015, Van Nuys Airport began offering U.S. Customs and Border Protection services for international general aviation flights to benefit business travelers and reduce airspace congestion.

CONCLUSION

Today we face numerous challenges on the road toward greater mobility, a stronger economy and sustainable growth that maintains a high quality of life regionwide. In the Chapter 3, we'll review some of these challenges.

OUR PROGRESS SINCE 2012

THE 2012 RTP/SCS WAS THE FIRST REGIONAL PLAN THAT SCAG DEVELOPED WITH A SUSTAINABLE COMMUNITIES STRATEGY,

a new state requirement following the passage of SB 375, the Sustainable Communities and Climate Protection Act of 2008. The legislation required that land use and transportation planning be integrated to achieve its prescribed greenhouse gas reduction targets and air quality requirements. At its core, the 2012 RTP/SCS envisioned a future in which an abundance of safe and efficient transportation choices provide ready access to jobs, education and healthcare—and the region's economy, public health and overall quality of life are strong. Since 2012, the region has made considerable progress. Here are some highlights:



TRANSIT

Transit service continues to expand throughout the region and the level of service has exceeded pre-recessionary levels—mainly due to a growth in rail service. Significant progress has been made toward completing capital projects for transit, including the Metro Orange Line Extension and the Metro Expo Line. Meanwhile, five major Metro Rail projects are now under construction in Los Angeles County.



PASSENGER RAIL

Passenger rail is expanding and improving service on several fronts. The Amtrak Pacific Surfliner is now being managed locally by the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency; Riverside County Transportation Commission (RCTC) completed the Perris Valley Line in early 2016; Metrolink became the first commuter railroad in the nation to implement Positive Train Control and purchase fuel-efficient, low-emission Tier IV locomotives; and the California High-Speed Train is under construction in the Central Valley, and planning and environmental work is underway in our region to the Los Angeles/Anaheim Phase One terminus. Several other capital projects are underway or have been completed, including the Anaheim Regional Intermodal Transportation Center (ARTIC) and the Burbank Bob Hope Airport Regional Intermodal Transportation Center, among others.



HIGHWAYS

The expansion of highways has slowed considerably over the last decade because of land, financial and environmental constraints. Still, several projects have been completed since 2012 to improve access and close critical gaps and congestion chokepoints in the regional network. These include the Interstate 10 westbound widening in Redlands and Yucaipa, the Interstate 215 Bi-County HOV Project in Riverside and San Bernardino Counties, and a portion of the Interstate 5 South Corridor Project in Los Angeles County (between North Fork Coyote Creek to Marquardt Avenue), among others.



REGIONAL HIGH-OCCUPANCY VEHICLE (HOV) AND EXPRESS LANE NETWORK

The demands on our region's highways continue to exceed available capacity during peak periods, but several projects to close HOV gaps have been completed. The result has been 39 more lanes miles of regional HOV lanes on Interstates 5, 405, 10, 215 and 605, on State Routes 57 and 91 and on the West County Connector Project (direct HOV connection between Interstate 405, Interstate 605 and State Route 22) within Orange County. The region is also developing a regional express lane network. Among the milestones: a one-year demonstration of express lanes in Los Angeles County along Interstate 10 and Interstate 110 was made permanent in 2014; and construction has begun on express lanes on State Route 91 extending eastward to Interstate 15 in Riverside County.



ACTIVE TRANSPORTATION

Our region is making steady progress in encouraging more people to embrace active transportation and more than \$650 million in Active Transportation Program investments are underway. Nearly 38 percent of all trips are less than three miles, which is convenient for walking or biking. As a percentage share of all trips, bicycling has increased more than 70 percent since 2007 to 1.12 percent. More than 500 miles of new bikeways have been constructed in the region and safety and encouragement programs are helping people choose walking and biking as options.



GOODS MOVEMENT

The region continues to make substantial progress toward completing several major capital initiatives to support freight transportation and reducing harmful emissions generated by goods movement sources. Progress since 2012 has included implementation of the San Pedro Bay Ports Clean Air Action Program (CAAP), reducing diesel particulate matter by 82 percent, nitrogen oxide by 54 percent and sulfur dioxide by 90 percent; and the San Pedro Bay Ports Clean Truck Program has led to an 80 percent reduction in port truck emissions. The region has also shown progress in advanced technology for goods movement, including a one-mile Overhead Catenary System (OCS) in the City of Carson. Construction of the Gerald Desmond Bridge has begun. Seventeen out of 71 planned grade separation projects throughout the region have been completed, and another 21 should be completed in 2016. Double tracking of the Union Pacific (UP) Alhambra Subdivision has been initiated. The Colton Crossing, which physically separated two Class I railroads with an elevated 1.4-mile-long overpass that lifts UP trains traveling east-west, was completed in August 2013.



SUSTAINABILITY IMPLEMENTATION

Since 2012, SCAG's Sustainability Planning Grant Program has funded 70 planning projects (totaling \$10 million) to help local jurisdictions link local land use plans with 2012 RTP/SCS goals. Local jurisdictions have updated outmoded General Plans and zoning codes; completed specific plans for town centers and Transit Oriented Development (TOD); implemented sustainability policies; and adopted municipal climate action plans. Thirty of the 191 cities and two of the six counties in the SCAG region report having updated their General Plans since 2012, and another 42 cities have General Plan updates pending. Fifty-four percent of the cities reporting adopted or pending General Plan updates include planning for Transit Oriented Development (TOD), 55 percent plan to concentrate key destinations, and 76 percent include policies encouraging infill development. Of the counties reporting updates or pending updates to their General Plans, 75 percent include TOD elements, 100 percent encourage infill development, 75 percent promote concentrated destinations, and 75 percent feature policies to address complete communities. To protect water quality, 91 percent of cities have adopted water-related policies and 85 percent have adopted measures to address water quality. To conserve energy, 86 percent of cities have implemented community energy efficiency policies, with 80 percent of those cities implementing municipal energy efficiency policies and 76 percent implementing renewable energy policies. Of the region's 191 cities, 189 have completed sustainability components, with 184 cities implementing at least ten or more sustainability policies or programs and ten cities implementing 20 or more sustainability policies or programs. This last group includes Pasadena, Pomona and Santa Monica.



AFFORDABLE HOUSING

The state is offering new opportunities to help regions promote affordable housing. In spring 2015, California's Affordable Housing Sustainable Communities (AHSC) program awarded its first round of funding to applicants after a competitive grant process. Of \$122 million available statewide, \$27.5 million was awarded to ten projects in the SCAG region. Eight-hundred forty-two affordable units, including 294 units designated for households with an income of 30 percent or less of the area median income, will be produced with this funding. Meanwhile, Senate Bill 628 (Beall) and Assembly Bill 2 (Alejo), provide jurisdictions with an opportunity to establish a funding source to develop affordable housing and supportive infrastructure and amenities.



PUBLIC HEALTH

The SCAG region has several ongoing efforts to promote public health. The Los Angeles County Departments of Public Health and the City of Los Angeles Planning Department are developing a Health Atlas that highlights health disparities among neighborhoods. In Riverside County, the Healthy Riverside County Initiative has formed a Healthy City Network to continue to successfully work with the county's 28 cities to enact Healthy City Resolutions and Health Elements into their General Plans. The County of San Bernardino has recently completed the Community Vital Signs Initiative, which envisions a "county where a commitment to optimizing health and wellness is embedded in all decisions by residents, organizations and government."

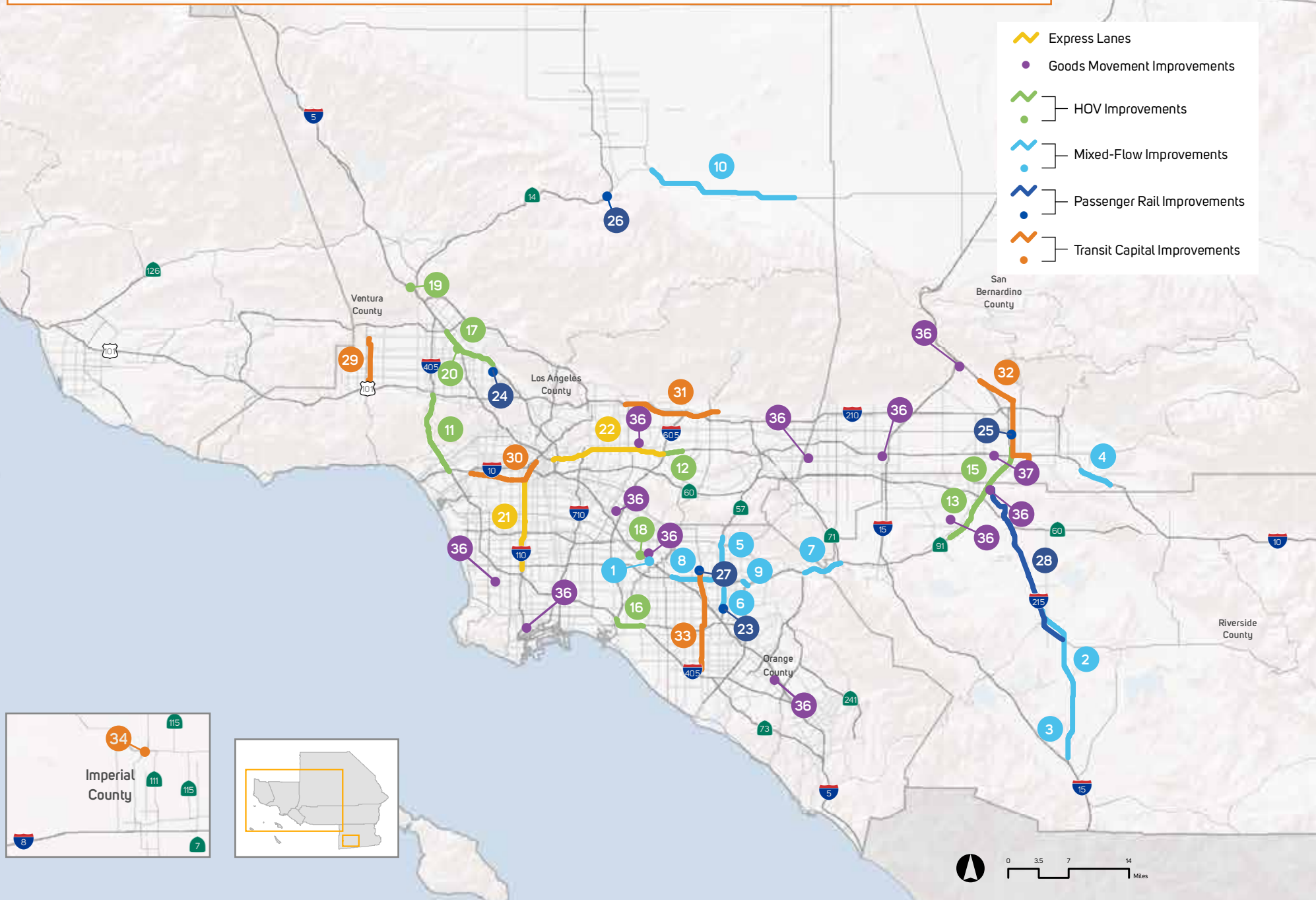


ENVIRONMENTAL JUSTICE

Since the adoption of the 2012 RTP/SCS, social equity and environmental justice have become increasingly significant priorities in regional plans. For example, plans to promote active transportation, improve public health, increase access to transit, preserve open space, cut air pollution and more are all evaluated for how well the benefits of these efforts are distributed among all demographic groups. The State of California's Environmental Protection Agency (Cal/EPA) developed a new tool, CalEnviroScreen, which helps to identify areas in the state that have higher levels of environmental vulnerability due to historical rates of toxic exposure and certain social factors. Based on this tool, much of the region can stand to benefit from Cap-and-Trade grants that give priority to communities that are disproportionately impacted.

OUR PROGRESS SINCE 2012

Mobility Projects in the SCAG Region

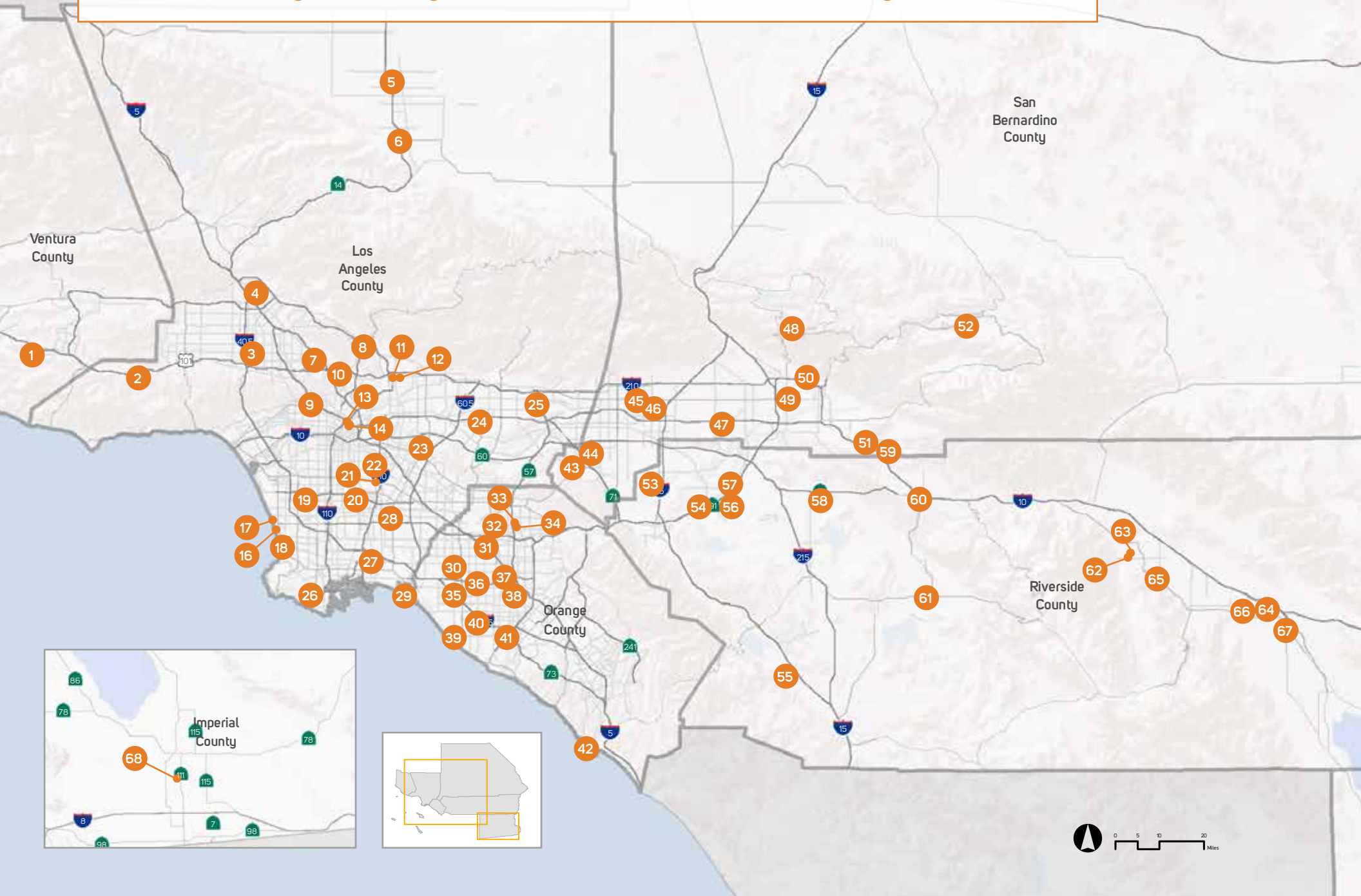




- 1 I-5 South Corridor**
One mixed-flow lane on I-5 from OC line to I-605 (currently in construction, however portion between North Fork Coyote Creek to Marquardt Avenue is complete).
- 2 I-215 Central**
One mixed-flow lane in each direction between Scott Road and Nuevo Road.
- 3 I-215 South**
One mixed-flow lane in each direction between Murrieta Hot Springs Road and Scott Road.
- 4 I-10 Widening**
One westbound mixed flow lane on I-10 between Live Oak Canyon Road in Yucaipa and Ford Street in Redlands.
- 5 State Route 57 Widening (Northern Segment)**
One northbound mixed-flow lane on SR-57 between Orangethorpe Avenue and Lambert Road.
- 6 State Route 57 Widening (Southern Segment)**
One northbound mixed-flow lane on SR-57 between Katella Avenue and Lincoln Avenue.
- 7 SR-91 Lane Addition (Eastern Segment)**
One mixed-flow lane on SR-91 between SR-241 and SR-71.
- 8 SR-91 Lane Addition (Western Segment)**
One westbound mixed-flow lane on SR-91 between SR-57 and I-5.
- 9 SR-91 Lane Extension and Reconstruction**
Addition of a Tustin Avenue exit bypass lane, reconstructing the auxiliary lane and modifying the number one and two lanes of the connector to serve as two general purpose lanes that merge into one general purpose lane just west of Tustin Avenue off-ramp.
- 10 SR-138 Corridor Improvements**
Lane widening on SR-138 between Avenue T and SR-18.
- 11 I-405 Sepulveda Pass Improvements**
Addition of northbound HOV lane on I-405 between I-10 and US-101.
- 12 I-10 HOV Lane (Phase I)**
Addition of HOV lane on I-10 between I-605 and Puente Avenue as permanent facility.
- 13 SR-91 HOV Lane**
Addition of HOV lane on SR-91 from Adams Street to SR-60/I-215 Interchange.
- 14 US-101 HOV Lane**
Addition of HOV lane on US-101 from Mobil Pier Road to Casitas Pass Road.
- 15 I-215 Bi-County HOV Gap Closure**
Addition of HOV lane on I-215 from Orange Show Road to SR-91/SR-60 Interchange.
- 16 West County Connector**
Direct HOV connector between I-405/I-605/SR-22.
- 17 I-5 HOV Lane**
Addition of HOV lane on I-5 from Hollywood Way to SR-118.
- 18 I-5 South Corridor**
Addition of HOV lane on I-5 from OC line to I-605 (currently in construction, however portion between North Fork Coyote Creek to Marquardt Avenue is complete).
- 19 I-5/SR-14 HOV Connector**
Addition of HOV connector between I-5 and SR-14.
- 20 SR-170/I-5 HOV Connector**
Addition of HOV connector between SR-170 and I-5.
- 21 I-110 Express Lanes**
Conversion of the I-110 Harbor Transitway HOV lanes (Harbor Gateway Transit Center to Adams Blvd.) to permanent Express Lanes.
- 22 I-10 Express Lanes**
Conversion of the I-10 El Monte Busway HOV lanes (I-605 to Alameda St.) to permanent Express Lanes.
- 23 Anaheim Regional Intermodal Transportation Center (ARTIC)**
An Intermodal transportation center in Orange County serving Orange County Transportation Authority (OCTA) buses and various intercity buses, as well as Metrolink and the Amtrak Pacific Surfliner.
- 24 Burbank Bob Hope Airport Regional Intermodal Transportation Center**
A multimodal transportation center which includes a consolidated rental car center, bike storage and a bus transit center. A pedestrian bridge to the existing Amtrak and Metrolink station is in the planning stage.
- 25 Downtown San Bernardino Transit Center and Metrolink Extension**
One-mile Metrolink extension to downtown San Bernardino, from the previous terminus at the Santa Fe Depot. This multimodal center serves Metrolink, sbX (bus rapid transit), the future Redlands Rail and local Omnitrans bus lines.
- 26 Vincent Grade/Acton Siding and Platform**
Adds significant capacity to the northern portion of the Antelope Valley Line, which is mostly single track.
- 27 Fullerton Metrolink Station Parking Structure**
Construction of a parking structure providing an additional 814 parking spaces serving Metrolink and OCTA patrons.
- 28 Metrolink Perris Valley Line**
A 24-mile extension of existing Metrolink service from downtown Riverside to south Perris, with four new stations constructed at Riverside Hunter Park, Moreno Valley/March Field, Downtown Perris and South Perris.
- 29 Metro Orange Line Extension**
A four-mile northward extension of the Metro Orange Line from Canoga Station to the Chatsworth Station.
- 30 Metro Exposition Line**
An 8.6 mile light rail corridor connecting Downtown LA and Culver City, including ten new light rail stations.
- 31 Metro Gold Line Foothill Extension Phase 2A**
An 11.5-mile light rail extension between Pasadena and Azusa serving six new stations.
- 32 Omnitrans E Street sbX**
A 16-mile bus rapid transit project including 6-miles of dedicated bus lanes on E Street, providing service between California State University San Bernardino and the City of Loma Linda.
- 33 OCTA Bravo! Route 543**
A new 12-mile limited-stop bus service along Harbor Boulevard, from the Fullerton Transportation Center through the cities of Anaheim, Garden Grove, Santa Ana and terminating at MacArthur Boulevard in Costa Mesa.
- 34 The Brawley Transit Transfer Center**
Transit transfer station in Imperial County serving various Imperial Valley Transit routes including the new Gold Line circulator shuttle.
- 35 SunLine Transit Administrative Facility**
New SunLine Transit administrative building in Coachella Valley.
- 36 Grade Separations**
Various grade separation improvements throughout the region.
- 37 Colton Crossing**
A rail to rail grade separation project that physically separated two Class I mainline rail tracks with an elevated 1.4 mile-long overpass that lifts UP trains traveling east-west. This project removed the chokepoint that existed where the Burlington Northern Santa Fe (BNSF) mainline crossed UP tracks in Colton.

OUR PROGRESS SINCE 2012

Sustainability Planning Grant Projects in the SCAG Region



VENTURA COUNTY

- 1 Ventura County Connecting Newbury Park Multi-Use Pathway Plan

LOS ANGELES COUNTY

- 2 Las Virgenes-Malibu Council of Governments Multi-Jurisdictional Regional Bicycle Plan
- 3 Los Angeles Van Nuys & Boyle Heights Modified Parking Requirements
- 4 Los Angeles Northeast San Fernando Sustainability & Prosperity Strategy
- 5 Lancaster Complete Streets Master Plan
- 6 Palmdale Avenue Q Feasibility Study
- 7 Burbank Mixed-Use Development Standards
- 8 La Cañada Flintridge Climate Action Plan
- 9 Los Angeles Hollywood Central Park
- 10 Glendale Space 134
- 11 Pasadena Form-Based Street Design Guidelines
- 12 Pasadena GHG Emission Reduction Evaluation Protocol
- 13 Los Angeles CEQA Streamlining Assessment
- 14 Los Angeles Park 101 District
- 15 Los Angeles Bicycle Plan Performance Evaluation
- 16 Hermosa Beach Carbon Neutral Plan
- 17 South Bay Bicycle Coalition Mini-Corral Plan

- 18 South Bay COG Neighborhood-Oriented Development Graphics

- 19 Hawthorne Crenshaw Station Area Active Transportation Plan

- 20 Lynwood Safe and Healthy Community Element

- 21 South Gate Gateway District/Eco Rapid Transit Station Specific Plan

- 22 Bell General Plan Update

- 23 Pico Rivera Kruse Rd. Open Space Study

- 24 West Covina Downtown Central Business District

- 25 San Dimas Downtown Specific Plan

- 26 Rancho Palos Verdes/Los Angeles Western Ave. Corridor Design Implementation Guidelines

- 27 Long Beach Willow Springs Wetland Habitat Creation Plan

- 28 Paramount/Bellflower Regional Bicycle Connectivity - West Santa Ana Branch Corridor

ORANGE COUNTY

- 29 Seal Beach Climate Action Plan

- 30 Stanton Green Planning Academy

- 31 Anaheim Bicycle Master Plan Update

- 32 Fullerton East Wilshire Avenue Bicycle Boulevard

- 33 Orange County Parks OC Bicycle Loop

- 34 Placentia General Plan/Sustainability Element & Development Code

- 35 Westminster General Plan Update - Circulation Element

- 36 Garden Grove Re:IMAGINE Pedals & Feet

- 37 Orange County "From Orange to Green" Zoning Code Update

- 38 Santa Ana Complete Streets Plan

- 39 Huntington Beach Neighborhood Electric Vehicle Plan

- 40 Fountain Valley Euclid/I-405 Overlay Zone

- 41 Costa Mesa Implementation Plan for Multi-Purpose Trails

- 42 Dana Point General Plan Update

SAN BERNARDINO COUNTY

- 43 Chino Hills Climate Action Plan and Implementation Strategy

- 44 Chino Bicycle & Pedestrian Master Plan

- 45 Rancho Cucamonga Healthy RC Sustainability Action Plan

- 46 Rancho Cucamonga Metrolink Station and TOD Feasibility Report

- 47 San Bernardino Bloomington Area Valley Blvd. Specific Plan Health & Wellness Element

- 48 SANBAG Climate Action Plan Implementation Tools

- 49 SANBAG Countywide Bicycle Route Mobile Application

- 50 SANBAG Countywide Complete Streets Strategy and Safe Routes to School Study

- 51 Yucaipa College Village/Greater Dunlap Neighborhood Sustainable Community

- 52 Big Bear Lake Rathbun Corridor Sustainability Plan

RIVERSIDE COUNTY

- 53 Eastvale Bicycle & Pedestrian Master Plan

- 54 WRCOG Public Health: Implementing the Sustainability Framework

- 55 WRCOG Land Use, Transportation and Water Quality Planning Framework

- 56 WRCOG Climate Action Plan Implementation

- 57 Riverside Restorative Growthprint

- 58 Moreno Valley Nason St. Corridor Plan

- 59 Calimesa Wildwood & Calimesa Creek Trail Master Plan

- 60 Beaumont Climate Action Plan

- 61 Hemet Downtown Specific Plan

- 62 Palm Springs Urban Forestry Initiative

- 63 Palm Springs Sustainability Master Plan Update

- 64 Indio General Plan Sustainability & Mobility Elements

- 65 Cathedral City General Plan Update - Sustainability

- 66 CVAG CV Link Health Impact Assessment

- 67 Coachella La Plaza East Urban Development Plan

IMPERIAL COUNTY

- 68 Imperial County Transportation Commission Safe Routes to School Plan

CHAPTER 3 HIGHLIGHTS

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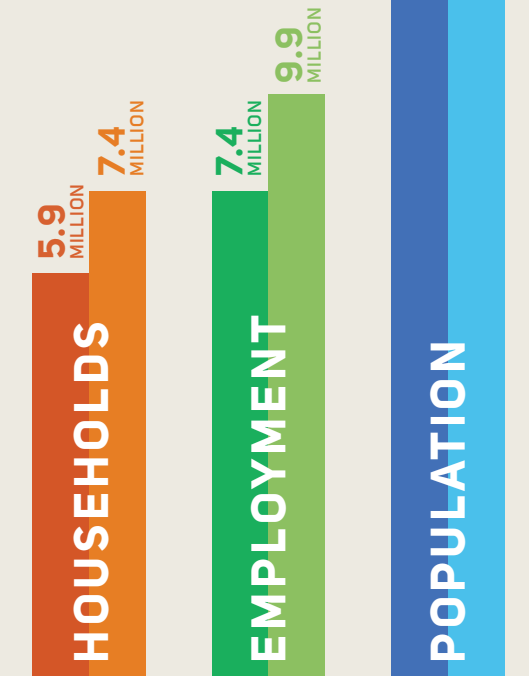
CHALLENGES IN A CHANGING REGION

The challenges facing our region are formidable and require that we strategically plan now. This chapter explores some of our more pressing challenges as we head toward 2040.

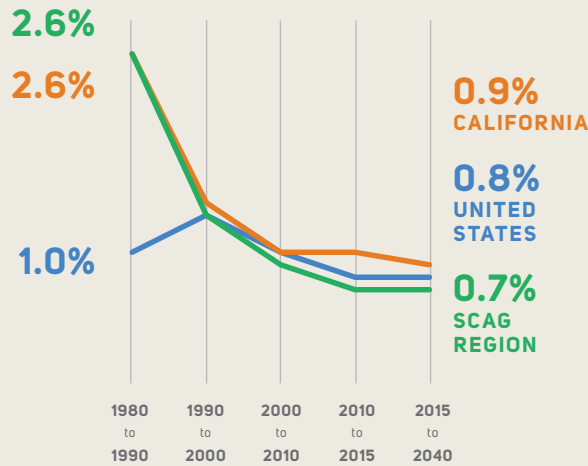
DEMOGRAPHICS

Changes in Ethnic Composition of Population

GROWTH PROJECTIONS 2012 & 2040



Average Annual Population Growth Rate

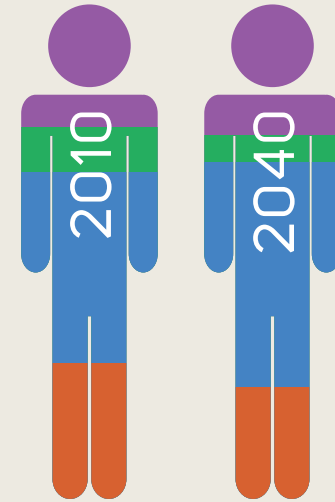


15%
ASIAN & OTHERS*

7%
AFRICAN AMERICAN*

45%
HISPANIC

34%
WHITE*



19%
ASIAN & OTHERS*

5%
AFRICAN AMERICAN*

53%
HISPANIC

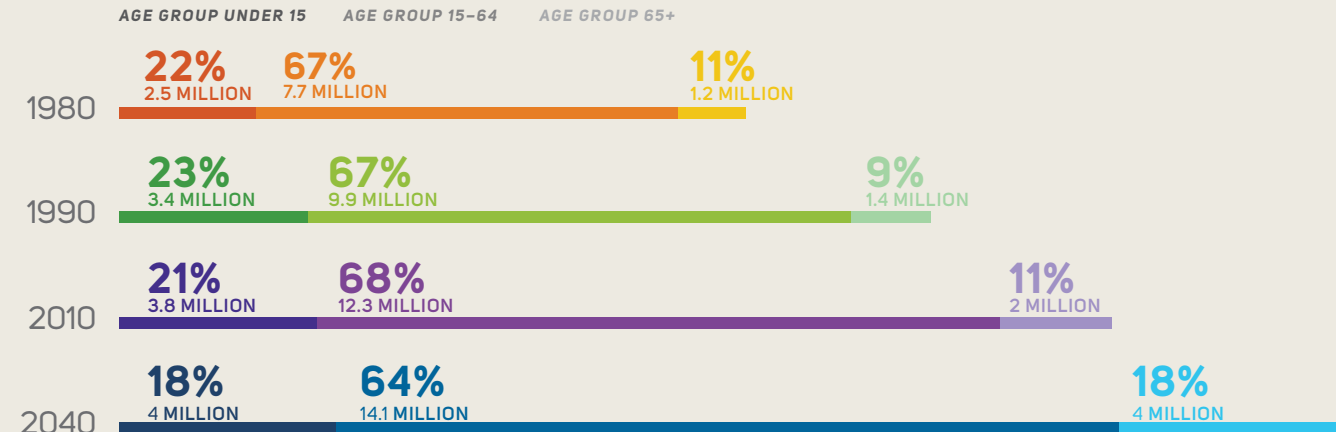
22%
WHITE*

Due to rounding total may not be 100 percent

Source: US Census Bureau, CA DOF, SCAG

* Non-Hispanic | Source: US Census Bureau, SCAG

More Baby Boomers Will Age & Retire



RECESSION, RECOVERY AND CURRENT ECONOMIC CHALLENGES

The Great Recession, which lasted from December 2007 through June 2009, caused massive job losses and had a devastating impact on our region's economic well-being and population growth. Now that the recession is behind us and our region has experienced a decline in unemployment and housing foreclosures, challenges still remain. Though the region's employment levels are now where they were in 2007, our population continues to grow slowly. Also, the region's median household income (adjusted for inflation) has declined as wages have stagnated for a larger population base. This is because of not only the lack of high income jobs for the median household, but the inability to access higher paying jobs that are available but require higher education and/or technical skills. An increase in the number of low-paying jobs, and the resulting lower income, has contributed to more people slipping into poverty.

The health of Southern California's economy depends on the well-being of businesses and households, and a strong and efficient regional transportation system can go a long way in helping businesses and households succeed. An efficient transportation system can lead to an increase in productivity, personal income and ultimately public tax revenues. Businesses depend on a reliable transportation network to create products and services that reach their customers at a reasonable cost. Households depend on an integrated, accessible and dependable transportation network to provide reliable access to education, jobs, shopping and recreational activities. A sustainable, time-efficient and cost-effective transportation system can help neighborhood businesses compete more effectively with those in neighboring jurisdictions. Relieving congestion contributes greatly to future employment growth. For our region to remain a competitor in the global economy, SCAG must continue to invest strategically in transportation infrastructure, while ensuring that it obtains the maximum return on those investments.

CURRENT DEMOGRAPHIC TRENDS

The six counties that comprise our region have experienced significant demographic changes and they can expect even more changes over the next 25 years. The overall population will continue to grow more slowly than in the past, and it will also change in terms of its age distribution and racial and ethnic breakdown. Where people choose to live will also change. More people in our region will increase the demands on our already strained transportation system, as well as on available land for development.

According to the California Department of Finance, our region is now home to 18.9 million people, or about 5.9 percent of the U.S. population and 48.3 percent of California's population. The region is the second-largest metropolitan area in the country, after the New York metropolitan area. If it were a state, our region would rank fifth in the U.S. in terms of the size of its population, just behind New York and ahead of Illinois.

By 2040, the region's population is expected to grow by more than 20 percent to 22 million people—an increase of 3.8 million people. Importantly, we expect the region to grow differently than in the past. Before 1990, population growth was driven largely by both a natural increase and migration. That is, people moved into Southern California from other states and countries and there was additional population growth due to a net increase in the existing population (births minus deaths). Since 1990, however, any gains from immigration have been offset by domestic migration losses and Southern California's population growth has been fueled mostly by a natural increase (more births than deaths)—despite declining fertility rates. This continuing trend is expected to account for most of the Southern California's future population growth by 2040.

As we approach the middle of the century, Southern California's population will still remain racially and ethnically diverse. Currently, we are 47 percent Hispanic, 31 percent non-Hispanic White, 16 percent non-Hispanic Asian/Other and six percent non-Hispanic African American. In particular, the rapid growth of the region's Hispanic population is expected to continue; by 2040 it is projected that 53 percent of the region's residents will be Hispanic. The region's non-Hispanic Asian/Other population is also expected to increase, growing to 19 percent of the population.

Notably, the median age of our region's overall population is projected to rise, with more older people throughout Southern California as we approach the middle of the century. As the Baby Boomer generation continues to age, our region will experience a significant increase in its senior population—a trend expected nationwide. Today, people who are 65 and older represent around 12 percent of the region's total population. But by 2040, the number of seniors will increase to 18 percent (i.e., nearly one in five people in our region). This demographic shift will have major impacts on the locations and types of housing we build and our plans for transportation. This demographic group of seniors covers a wide range of needs; residents in their late sixties and early seventies will have different needs than those in their eighties and nineties. Nonetheless, a key challenge for the region will be to help seniors maintain their independence in their homes and communities.

STATE HIGHWAY SYSTEM PRESERVATION

TOTAL NEEDS =

\$65.8
BILLION

EXISTING FUNDS =

\$26.7
BILLION

GAP =

\$39.0
BILLION

Note: Numbers may not sum to total due to rounding.

As the number and share of seniors are projected to increase, the percentage share of younger people of working age is expected to fall. The ratio of people older than 65 to people of working age (15 to 64) is expected to increase to 28 seniors per 100 working age residents by 2040—up from 16 in 2010. This means that our region could face a labor shortage and a subsequent reduction in tax revenues.

As we plan for the future and face these challenges, we also expect an interesting convergence of interests between two distinct population groups—namely Millennials, who today range in age from 20 to 35, and aging Baby Boomers, who range in age from 51 to 70. Millennials represent 22.4 percent of our region's total population and rely less on automobiles than have previous generations; they are less apt to acquire drivers licenses, drive fewer miles and conduct fewer overall trips. Research also shows that Millennials often prefer to live in denser, mixed-use urban areas well served by transit, rather than decentralized suburban areas. This trend could explain why there has been increasing demand for new multifamily housing.¹ Millennials also are more likely than other groups to embrace a range of mobility options, including shared cars, biking, transit and walking. These evolving preferences for transportation and housing are significant because Millennials will account for a large part of Southern California's overall population in 2040. In the near term, their housing and transportation preferences, when combined with the need of Baby Boomers to maintain their independence, could significantly change how Southern California develops.

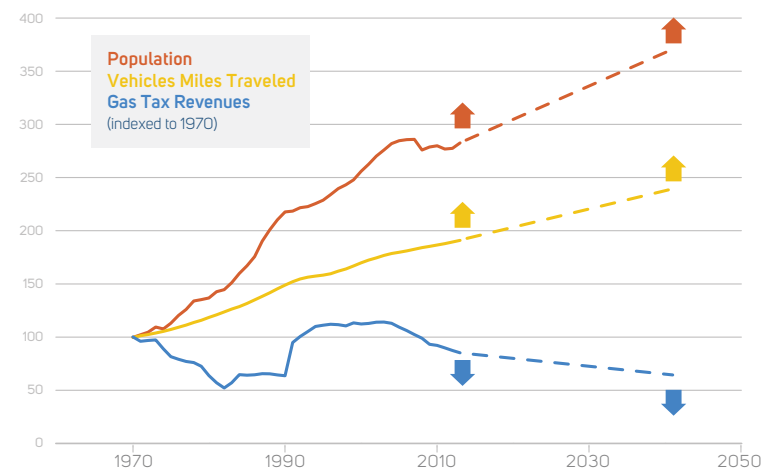
FINANCING TRANSPORTATION

Perhaps our most critical challenge is securing funds for a transportation system that promotes a more sustainable future. The cost of a multimodal transportation system that will serve the region's projected growth in population, employment and demand for travel surpasses the projected revenues expected from the gas tax—our historic source of transportation funding. The purchasing power of our gas tax revenues is decreasing and will continue on a downward trajectory as tax rates (both state and federal) have not been adjusted in more

than two decades while transportation costs escalate, fuel efficiency improves and the number of alternative-fuel vehicles continues to grow. **FIGURE 3.1** highlights the decline in gas tax revenues, in relation to the growing population and demand for travel.

To backfill limited state and federal gas tax revenues, our region has continued to rely on local revenues to meet transportation needs. In fact, 71 percent of SCAG's core revenues are local revenues. Seven sales tax measures have been adopted throughout the region since the 1980s, so the burden of raising tax dollars has shifted significantly to local agencies. In reality, we need a stronger state and federal commitment to raising tax dollars for the Southern California transportation system—given its prominence and importance to the state and national economy, particularly when it comes to the movement of goods. Our region's transportation system should be able to rely on more consistent tax revenues raised at all levels of government.

FIGURE 3.1 CALIFORNIA POPULATION, TRAVEL AND GAS TAX REVENUE TRENDS



Source: Caltrans, California Department of Finance, California State Board of Equalization, White House Office of Management and Budget

¹ Dutzik, T., Inglis, J., & Baxandall, Ph.D., P. (2014). Millennials in Motion: Changing Travel Habits of Young Americans and the Implications for Public Policy. U.S. PIRG Education Fund.

TABLE 3.1 PROPOSED 2016–2040 RTP/SCS GROWTH FORECAST

REGION	POPULATION				HOUSEHOLDS				EMPLOYMENT			
	2012	2020	2035	2040	2012	2020	2035	2040	2012	2020	2035	2040
IMPERIAL	180,000	234,000	272,000	282,000	49,000	72,000	89,000	92,000	59,000	102,000	121,000	125,000
LOS ANGELES	9,923,000	10,326,000	11,145,000	11,514,000	3,257,000	3,494,000	3,809,000	3,946,000	4,246,000	4,662,000	5,062,000	5,226,000
ORANGE	3,072,000	3,271,000	3,431,000	3,461,000	999,000	1,075,000	1,135,000	1,152,000	1,526,000	1,730,000	1,870,000	1,899,000
RIVERSIDE	2,245,000	2,480,000	3,055,000	3,183,000	694,000	802,000	1,009,000	1,055,000	617,000	849,000	1,112,000	1,175,000
SAN BERNARDINO	2,068,000	2,197,000	2,638,000	2,731,000	615,000	687,000	825,000	854,000	659,000	789,000	998,000	1,028,000
VENTURA	835,000	886,000	945,000	966,000	269,000	285,000	306,000	312,000	332,000	375,000	409,000	420,000
SCAG	18,322,000	19,395,000	21,486,000	22,138,000	5,885,000	6,415,000	7,172,000	7,412,000	7,440,000	8,507,000	9,572,000	9,872,000

Source: SCAG

Note: All figures are rounded to the nearest 1,000. The County numbers may not sum to the region total due to rounding.

FOCUS

IMPORTANCE OF SYSTEM PRESERVATION

We Will Pay More—If We Do Not Fix-it-First

EACH \$1 SPENT HERE...

Seals, Thin Overlays (Preventive Maintenance)

SURFACE DAMAGE

4–7 Years



DELAYS SPENDING \$3 HERE...

Thicker Overlays

MINOR DAMAGE

6–7 Years



DELAYS SPENDING \$8 HERE...

Rehabilitation/Reconstruction

MAJOR DAMAGE

10+ Years



Source: 2013 State of the Pavement Report

The State of Disrepair

17%

OF HIGHWAYS ARE **DISTRESSED**

6%

OF LOCAL ROADS IN **FAILED CONDITION** IN 2012

25%

OF LOCAL ROADS WILL BE IN **FAILED CONDITION** IN 2022 UNDER CURRENT (2012) FUNDING

18%

OF BRIDGES RATED AS **FUNCTIONALLY OBSOLETE**

10%

OF BRIDGES RATED AS **STRUCTURALLY DEFICIENT**



of all proposed expenditures through **2040** are allocated to highway & arterial system operations & maintenance in the **2016 RTP/SCS**

Source: Federal Highway Administration National Bridge Inventory & 2014 State Highway Operation & Protection Program

A Bumpy & Costly Ride

Annual Vehicle Maintenance Costs by Metropolitan Area Due to Poor Road Conditions



Bumpy Roads Ahead Study & TRIP, A National Transportation Research Group, 2013

PRESERVING OUR TRANSPORTATION SYSTEM

Southern California's transportation system is in an unfortunate state of disrepair due to decades of underinvestment. Quite simply, investments to preserve the system have not kept pace with the demands placed on it. The inevitable consequence of this deferred maintenance is poor road pavement, which is particularly evident on our highways and local arterials. The rate of deterioration is expected to accelerate significantly as maintenance continues to be deferred. And as maintenance is deferred, the cost of bringing these assets back to a state of good repair is projected to grow exponentially. SCAG estimates that the cost to maintain our transportation system at current conditions, which is far from ideal, will be in the tens of billions of dollars beyond what is currently committed. For instance, the gap between needs and existing funding for the State Highway System through 2040 is now estimated at \$39.0 billion. It should be noted that Caltrans is the owner and operator of the State Highway System and is responsible for funding the operation and maintenance of state highways, while local jurisdictions are responsible for the funding of operations and maintenance of local arterials.

Moving forward, the region needs to continue to "Fix-it-First" as a top priority—that is, focusing the necessary funds on preserving the existing transportation network while strategic investments are made in system expansions. Failing to adequately invest in the preservation of Southern California's roads, highways, bridges, railways, bicycle and pedestrian facilities, and transit infrastructure will only lead to further deterioration, which has the potential to worsen our congestion challenges. In addition, potholes and other imperfections in the roadway come with real costs to motorists, estimated by one study at more than \$700 per household each year. The region's transportation system represents billions of dollars of investments that must be protected in order to serve current and future generations. The loss of even a small fraction of these assets could significantly compromise the region's overall mobility.

Preservation of the region's transit system, for example, is more important than ever as Baby Boomers, one of the fastest growing groups requiring transportation services, age. The region needs to plan for this projected increase in seniors with increased funding for transit and paratransit maintenance and preservation. Preserving infrastructure that encourages active transportation, such as walking and biking, is also important for maintaining mobility for those unable or uninterested in driving. It is also a cost-effective way to increase the number of roadway users without increasing roadway congestion.

MOVING GOODS EFFICIENTLY IN A HUGE AND COMPLEX REGION

The smooth and efficient movement of goods is critical to our regional economy, particularly as our region continues to recover from the recession. A number of key trends and drivers are expected to impact our region's goods movement system. Some of these, along with associated challenges, are highlighted below.

Population and Employment Growth: The regional population and rate of employment in our region are key indicators of economic health, and both are projected to grow rapidly over the next two decades. Our region's population growth is expected to fuel consumer demand for products and the goods movement services that provide them. This increased demand will drive stronger growth in freight traffic on already constrained highways and rail lines. Truck volumes on many key corridors are anticipated to grow substantially, as shown in [EXHIBIT 3.1](#). Truck and auto delays will increase, as will truck-involved accidents. Levels of harmful emissions also will rise. The increase in rail volumes is expected to exacerbate vehicle hours of delay at rail and highway crossings.² Moreover, growing demand for commuter rail services on rail lines owned by the freight railroads will create additional capacity challenges.

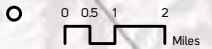
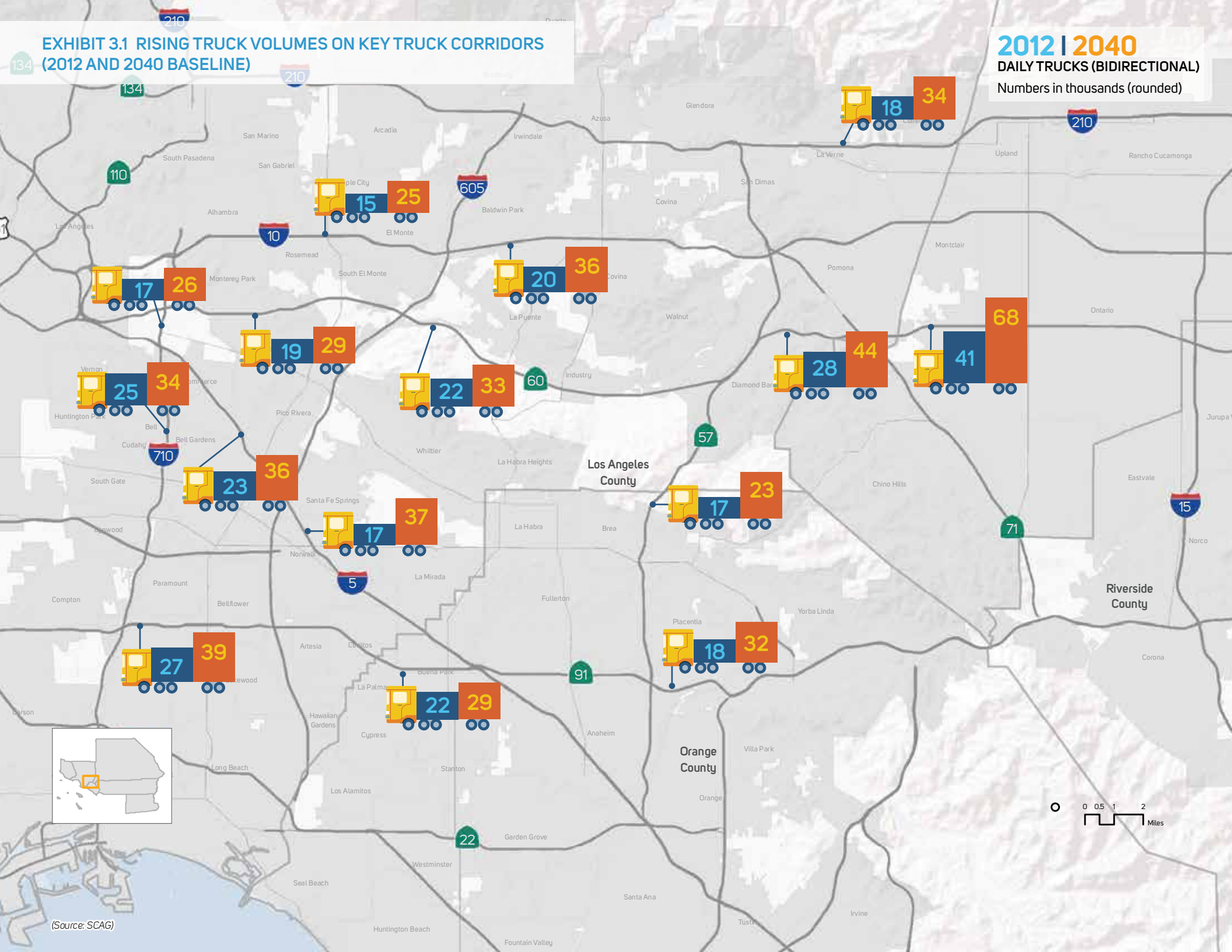
Continued Growth in International Trade: The San Pedro Bay Ports anticipate cargo volumes to grow to 36 million containers by 2040—despite increasing competition with other North American ports, the expansion of the Panama Canal and more recent delays at port terminals due to labor negotiations. Port of Hueneme in Ventura County is also positioned to grow as a preferred port for specialized cargo such as automobiles, break bulk and military cargo. This growth will place further demands on marine terminal facilities, highway connections and rail intermodal terminals. If port-related rail traffic and commuter demands are to be met, mainline rail capacity improvements will be required as well. Meanwhile, mitigating the impacts of increased train traffic in communities will continue to be a challenge.

Logistics Epicenter: Southern California is the nation's epicenter for distribution and logistics activity, and it will continue to be a significant source of well-paying jobs in the region through 2040. The region has close to 1.2 billion square feet of facility space for warehousing, distribution, cold storage and truck terminals.² Nearly 1.1 billion square feet of this space is occupied. By 2040,

² CoStar Realty Information, Inc. www.costar.com, based on November 2014 data downloads.

**EXHIBIT 3.1 RISING TRUCK VOLUMES ON KEY TRUCK CORRIDORS
(2012 AND 2040 BASELINE)**

2012 | 2040
DAILY TRUCKS (BIDIRECTIONAL)
 Numbers in thousands (rounded)



(Source: SCAG)

the region may experience a shortfall of more than 527 million square feet of warehouse space, relative to demand.³

Air Quality Issues: Goods movement emissions contribute to regional air pollution problems (e.g., NOx and PM 2.5) and pose public health challenges. Emissions generated by the movement of goods are being reduced through efforts such as the San Pedro Bay Ports Clean Air Action Plan, as well as regulations such as the statewide Heavy Duty Truck and Bus Rule. But these reductions alone are unlikely to be sufficient to meet regional air quality goals.

Currently, much of the SCAG region does not meet federal ozone and fine particulate air quality standards as mandated by the federal Clean Air Act. The South Coast Air Basin has a deadline to reduce ozone concentrations to 80 parts per billion (ppb) by 2023 under the revoked 1997 eight-hour ozone standards, and further down to 75 ppb by 2031 under the current 2008 eight-hour ozone standards. Moreover, new federal ozone standards are expected to be finalized by the Environmental Protection Agency (EPA) in the 2015/2016 time frame, with an expected new attainment deadline of 2037. This means that NOx emissions in the South Coast Air Basin must be reduced 65 percent by 2023 and 75 percent (beyond projected 2023 emissions) by 2032 in order to attain federal ozone standards.⁴ Additional attainment deadlines are in effect for PM 2.5.

Reducing greenhouse gas emissions is also a priority, as determined by the landmark California legislation Assembly Bill 32 and Senate Bill 375, and the more recent Executive Order B-30-15 signed by Governor Brown in April 2015. Several state measures have been implemented to reduce greenhouse gas emissions, with some implications for freight. These include the Low Carbon Fuel Standard and the inclusion of greenhouse gas emissions from transportation fuels under the California's Cap-and-Trade Program. Additional state programs are under development as part of the state's Sustainable Freight Strategy (SFS).

HOUSING AFFORDABILITY, GENTRIFICATION AND DISPLACEMENT

The cost of housing in Southern California is among the highest in the nation. Across our region, home prices and rents continue to rise, and the region continues to experience a shortage of affordable housing. The California Association of Realtors' (CAR) affordability index, which measures the percentage of households that can afford to purchase a median priced home in the state, remains around 35 percent for the SCAG region. Nearly 55 percent of renters and 45 percent of homeowners spend more than 30 percent of their income on rent or mortgage payments.

Affordability is becoming a significant issue in many communities, particularly in urban areas after the implementation of a new rail line, transit station or other major public investment. Housing unaffordability can undermine the overall goals of the RTP/SCS because it can contribute to suburban sprawl, longer job commutes and higher greenhouse gas emissions. As wealthier "outsiders" move into established communities, the increased demand for housing and business/retail space can lead to escalating costs for residential and commercial real estate. Many traditionally low-income, urban core communities at risk for gentrification are seeing dramatic changes in housing, retail stores, schools and other neighborhood amenities.

The region's overall affordability issues are particularly troubling because the region has a disproportionately high concentration of low-income and minority populations that are unemployed, live under the poverty line, have lower educational attainment, and live in close proximity to environmentally stressed areas. The region accounts for 67 percent of Californians who live in disadvantaged communities, as defined by Senate Bill 535, which requires investment in disadvantaged communities from California's Cap-and-Trade revenues. This represents more than 6.36 million people. Investments in transportation and other public infrastructure, affordable housing, economic development and job creation can help these communities in need.

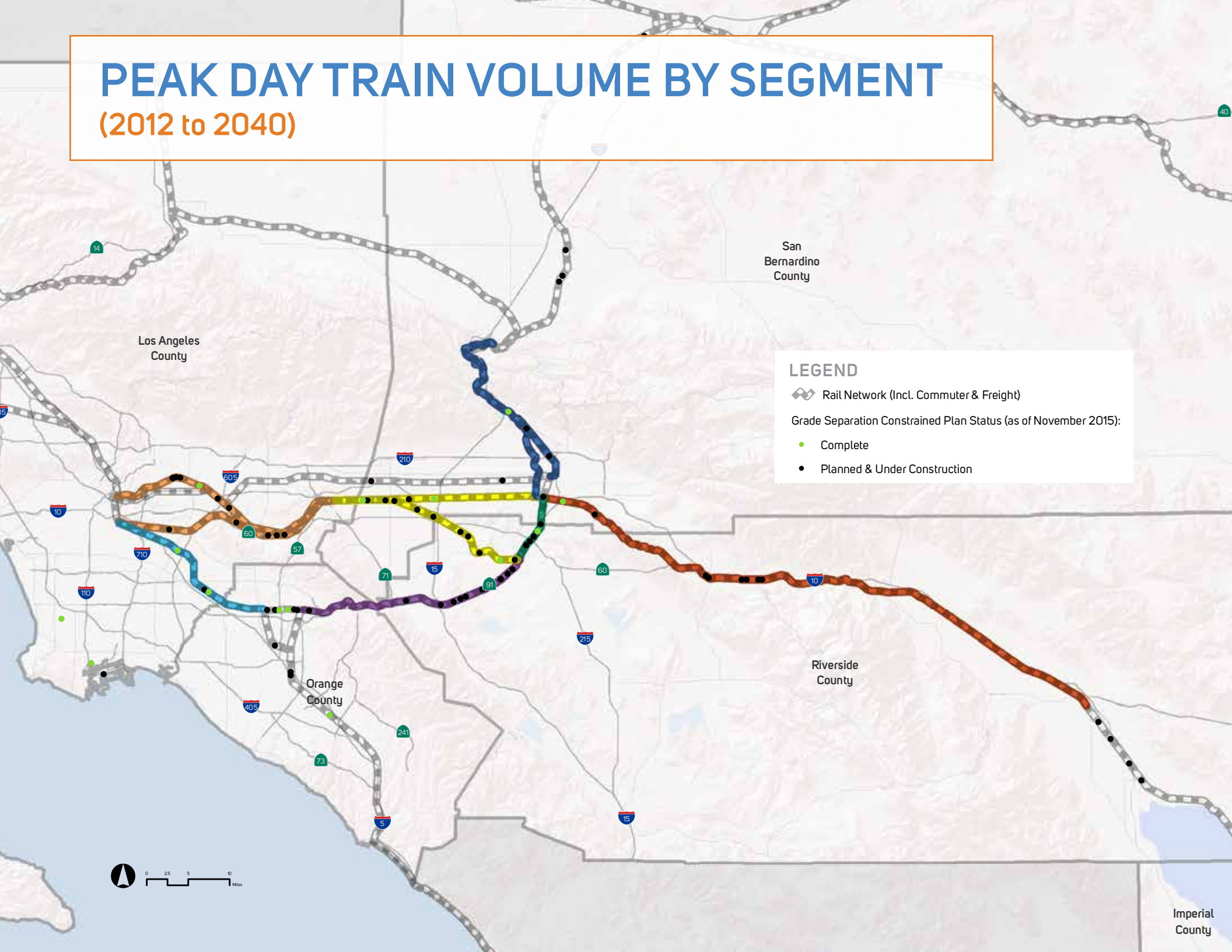
As our region builds communities that are more compact and more transit-oriented, regional greenhouse gas emissions are anticipated to decline and residents from a variety of income levels will continue to make housing choices that allow them to use an increasing number of mobility options. The overall quality of life is expected to increase for many people. Transit investments and strategies will be most effective if coordinated with land use strategies,

³ Industrial Warehousing in the SCAG Region Study, Task 4 Warehousing Demand Forecast.

⁴ Preliminary Draft AQMD Air Quality Management Plan White Paper, Goods Movement, June 2015.

PEAK DAY TRAIN VOLUME BY SEGMENT

(2012 to 2040)

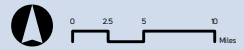


LEGEND

Rail Network (Incl. Commuter & Freight)

Grade Separation Constrained Plan Status (as of November 2015):

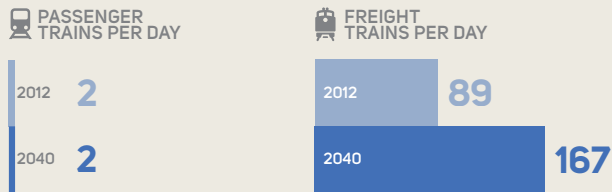
- Complete
- Planned & Under Construction



RAIL SEGMENTS

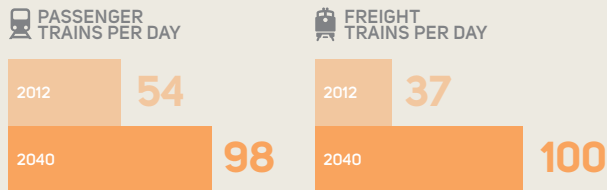
BNSF Cajon Subdivision
San Bernardino-Silverwood PLUS

UPRR Mojave Subdivision
W. Colton-Silverwood



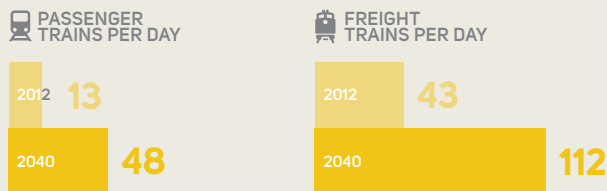
UPRR LA Subdivision
East LA-Pomona PLUS

UP Alhambra Subdivision
Yuma Jct. - Pomona

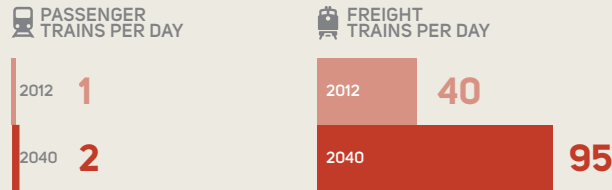


UP LA Subdivision
Pomona-W. Riverside PLUS

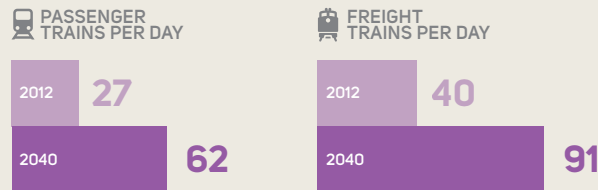
UPRR Alhambra Subdivision
Pomona-W. Colton



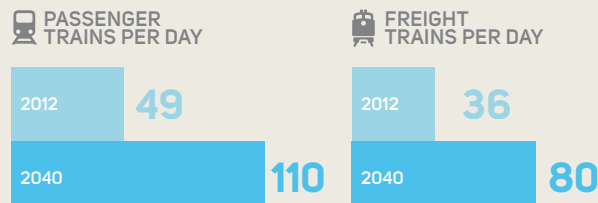
UPRR Yuma Subdivision
Colton - Indio



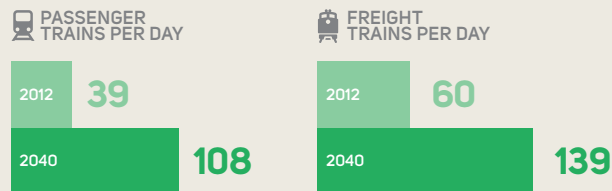
BNSF San Bernardino Subdivision
Atwood-W. Riverside



BNSF San Bernardino Subdivision
Hobart-Fullerton



BNSF San Bernardino Subdivision
W. Riverside-Colton



GRADE SEPARATION PROJECTS

24
CURRENTLY UNDER CONSTRUCTION

+

42
PLANNED

WOULD SAVE AN ESTIMATED

5,500
DAILY VEHICLE HOURS OF DELAY IN 2040



AFFORDABLE HOUSING TOOLBOX FOR LOCAL JURISDICTIONS

1. Streamline the residential project permitting process
2. Reduced fees or waivers for affordable housing development
3. Reduce parking requirements, especially in transit-rich areas
4. Adopt an affordable housing overlay zone
5. Preservation of mobile homes
6. Establish a housing trust fund
7. Add inclusionary zoning to the housing ordinance
8. Density Bonus ordinance
9. Increase density in transit-rich areas
10. Link a housing program with other policies such as active transportation and public health
11. Consider new building types and models, such as accessory dwelling units or small units
12. Establish a Community Revitalization and Investment Authority (per AB 2) or Enhanced Infrastructure Financing District (per SB 628)

including transit-oriented development and providing affordable housing. However, people from low-income communities near new transit infrastructure may face displacement. Generally, displacement refers to a situation in which gentrification places pressure (through eviction or because of market forces) on people from existing communities to relocate to more affordable places. If those communities are priced out and move away from newly constructed transit facilities, those facilities lose the very people who are more likely to use

them. Research suggests that lower income residents generate fewer vehicle miles traveled (VMT) and demonstrate the largest relative VMT reductions with location efficiency.⁵

This Plan's vision and goals include ensuring that regionwide benefits improve social equity—that is, the benefits of our Plan are realized by all populations in our Southern California region while its burdens are not carried disproportionately by one group over another. Providing people throughout our region with access to high quality transit and ensuring that they also have access to more affordable housing are related objectives. Currently, SCAG is partnering with the state and other regional agencies to study issues related to displacement and travel behavior near transit. Those results will inform future regional policies. Community advocates and other housing stakeholders are working to ensure that investments in traditionally low-income communities benefit existing residents and businesses instead of dividing communities. SCAG encourages municipalities to pursue strategies that avoid displacement, especially near transit stations, and ensure that existing communities retain their housing options.

The integration of affordable housing development with the goals of Senate Bill 375 has been the focus of several recently enacted state legislative bills. Bills such as Assembly Bill 2222 (Nazarian) and Assembly Bill 313 (Atkins) aim to preserve affordable housing in rapidly changing development environments, such as in projects that apply for local density bonuses and within Enhanced Infrastructure Financing Districts, respectively. Other bills, such as Assembly Bill 744 (Chau), reduce parking requirements for housing designed for low income households and seniors and meet certain thresholds for transit access, which not only lower the cost of building affordable housing but also encourages the development of affordable housing near transit—a clear goal of Senate Bill 375.

On a local level, there are a variety of tools available for jurisdictions to consider to increase the supply of affordable housing available (please see Affordable Housing Toolbox graphic). These tools are designed to reduce the cost of building affordable housing or establish a funding source for preserving or building affordable housing. While there is not a “one size fits all” approach, SCAG encourages jurisdictions to consider these strategies in order to address local housing affordability challenges.

⁵ Newmark, Ph.D. G., & Haas Ph.D., P. (2015). Income, Location Efficiency, and VMT: Affordable Housing as a Climate Strategy. San Francisco: California Housing Partnership.

Additionally, there are a number of statewide programs and resources to assist local jurisdictions in funding the production of affordable housing. As mentioned in earlier chapters, there are several new funding opportunities to help regions and jurisdictions promote affordable housing. California's Affordable Housing Sustainable Communities (AHSC) program, funded by the statewide Greenhouse Gas Reduction Fund created by Assembly Bill 32, provides funding to certain projects that provide affordable housing through a competitive grant process. Moreover, other programs such as the California Department of Housing and Community Development (HCD)'s Housing-related Parks Program, provides funds to local jurisdictions to maintain and rehabilitate parks and open space based on the number of affordable housing units built. Other opportunities to build housing also include Senate Bill 628 (Beall) and Assembly Bill 2 (Alejo), which allow jurisdictions to establish special reinvestment districts to develop affordable housing and supportive infrastructure and amenities. As the regional MPO, SCAG is committed to providing jurisdictions and stakeholders applying for funding opportunities with data, technical and policy support in order to further the progress of establishing more affordable housing in the region aligned with the goals of the RTP/SCS.

IMPROVING PUBLIC HEALTH

Today, many people in our region suffer from poor health due to chronic diseases related to poor air quality and physical inactivity. Chronic diseases including heart disease, stroke, cancer, chronic lower respiratory disease and diabetes are responsible for 72 percent of all deaths in our region, according to the California Department of Public Health. Furthermore, more than 60 percent of residents are overweight or obese, more than eight percent have diabetes, 27 percent suffer from hypertension and more than 12 percent suffer from asthma, according to the California Health Interview Survey. Health care costs resulting from being physically inactive, obese and overweight and from asthma cost our Southern California region billions of dollars annually in medical expenses, lost life and lost productivity, research shows.⁶ For example, one study showed that health care costs resulting from physical inactivity and obesity reached an estimated \$41.2 billion in 2006 in California.

A growing body of evidence shows that how a neighborhood is laid out and linked to transportation options can shape the lifestyles that people have—

how physically active they are and how safe their everyday lives can be.⁷ As a result, regional planning for land use and transportation across the U.S. has increasingly incorporated strategies to improve public health. MPOs such as SCAG are focusing on improving transportation safety, offering people more opportunities to walk, bike and embrace other forms of active transportation, improve first/last mile connections to transit, and improve access to natural lands. They are also pursuing strategies to make neighborhoods more walkable, improve air quality, help people cope with climate change impacts such as extreme heat events, improve accessibility to essential destinations such as hospitals and schools, and work overall toward a transportation system and land use patterns that promote regional economic strength.

One of the challenges that SCAG faces as it strives to improve public health is the sheer size and diversity of our region. Public health varies widely by geographic location, income and race. There is no one size fits all approach to meeting this complex challenge. It requires flexibility and creativity to ensure that initiatives are effective in both rural and urban areas.

To gain more insight on the connection between how we use land and public health, SCAG has identified seven focus areas for further analysis: access to essential destinations, affordable housing, air quality, climate adaptation, economic opportunity, physical activity and transportation safety. For more details, see the Plan's Public Health Appendix.

CONFRONTING A CHANGING ENVIRONMENT

The consequences of continued climate change already are impacting California and more intensified changes are expected. Ongoing drought conditions, water shortages due to less rainfall as well as declining snowpack in our mountains, and an agriculture industry in crisis have become hard realities in recent years. Climate change is transforming the state's natural habitats and overall biodiversity. Continued changes are expected to impact coastlines as sea levels rise and storm surges grow more destructive. Forests will continue to be impacted by drought and wildfire. Climate change also will impact how we use energy and the quality of public health. Our statewide transportation

⁶ Peck, C., Logan, J., Maizlish, N., & Van Court, J. (2013). *The Burden of Chronic Disease and Injury: California*. 2013. California Department of Public Health.

⁷ Frank, L. D., Schmid, T. L., Sallis, J. F., Chapman, J., & Saelens, B. E. (2005). "Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings from SMARTRAQ." *American Journal of Preventive Medicine*, 28(2S2), 117-125.

system will experience new challenges as well as the global and regional climate continues to change.⁸

Researchers project that both coastal and inland Southern California will see many more days of extreme heat, with temperatures exceeding 95 degrees Fahrenheit.⁹ This is expected to increase heat-related mortality, lower labor productivity and boost demands for energy. Meanwhile, changing patterns of rain and snowfall—including the amount, frequency and intensity of precipitation across the state—will have serious long-term impacts on the supply and quality of water in Southern California.

It is clear that our region needs to prepare for these projected challenges and a big part of that effort is to make individual communities and the region as a whole more resilient to the consequences of climate change. “Climate resiliency” can be defined as the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization and the capacity to adapt to stress and change.¹⁰ Without advance planning and effective action, the consequences of climate change will negatively impact our transportation system, our economy and our everyday lives.

The state’s Adaptive Planning Guide encourages our region and others across California to evaluate the local impacts of climate change. These impacts include increased temperatures, reduced precipitation, rising sea levels, a fall in tourism, reduced water supplies, a heightened risk of wildfire, threats to public health related to degraded air quality and heat, stresses on endangered and threatened species, diminished snowpack and coastal erosion.¹¹ Our region is still facing a serious drought that began in 2012 and its length and severity has led to mandatory water restrictions for the first time in state history. At the same time, state programs designed to meet future climate challenges proactively are

underway. These include initiatives such as the Safeguarding California¹² plan, as well as Governor Brown’s Executive Order calling for new actions to mitigate and adapt to the impacts of climate change. These initiatives present regional agencies such as SCAG with opportunities to show leadership as the state confronts climate change challenges.

Continued climate change will impact our region in various ways and we are now getting a clearer picture of how it will impact the day-to-day lives of those of us who are most vulnerable—such as the poor, the elderly and the disabled. Responding effectively to climate change requires us to cooperate more with one another, to use limited resources more wisely, and to think more creatively to align our goals. The impacts of climate change, like other environmental challenges, are expected to hit hardest those communities that are least equipped to handle them. Particularly in Southern California, public agencies must focus on safeguarding people who are most vulnerable to extreme heat and air pollution. The elderly and children under five years old are most vulnerable to heat-related illness.¹³ As our demographics change, proactive planning that ensures the health of these distinct populations will be increasingly important.

Our region certainly cannot fight climate change alone. It will be a global effort. However, it is up to us to make sure we can adapt to climate change and mitigate its impacts in our own region. We cannot expect anyone else to do this work for us. Long-range regional planning inherently recognizes the relationship between today’s investments and tomorrow’s outcomes. Confronting climate change and building climate resilient communities is, at its core, an exercise in smart planning. We will need to build on actions we have already taken by integrating considerations of climate and sustainability into the approaches we take to grow our economy, protect the environment and public health, and plan for the future.

⁸ California Resources Agency. (n.d.) Fact Sheets on California Climate Risks [Fact Sheet]. Retrieved from http://resources.ca.gov/docs/climate/Safeguarding_Handout_All.pdf.

⁹ Rogers, J., Barba, J., & Kinniburgh, F. (2015). From Boom to Bust? Climate Risk in the Golden State. Risky Business Project. Accessed at <http://riskybusiness.org/uploads/files/California-Report-WEB-3-30-15.pdf>.

¹⁰ Safeguarding California: Reducing Climate Risk. (2014). California Natural Resources Agency. Accessed at http://resources.ca.gov/docs/climate/Final_Safeguarding_CA_Plan_July_31_2014.pdf.

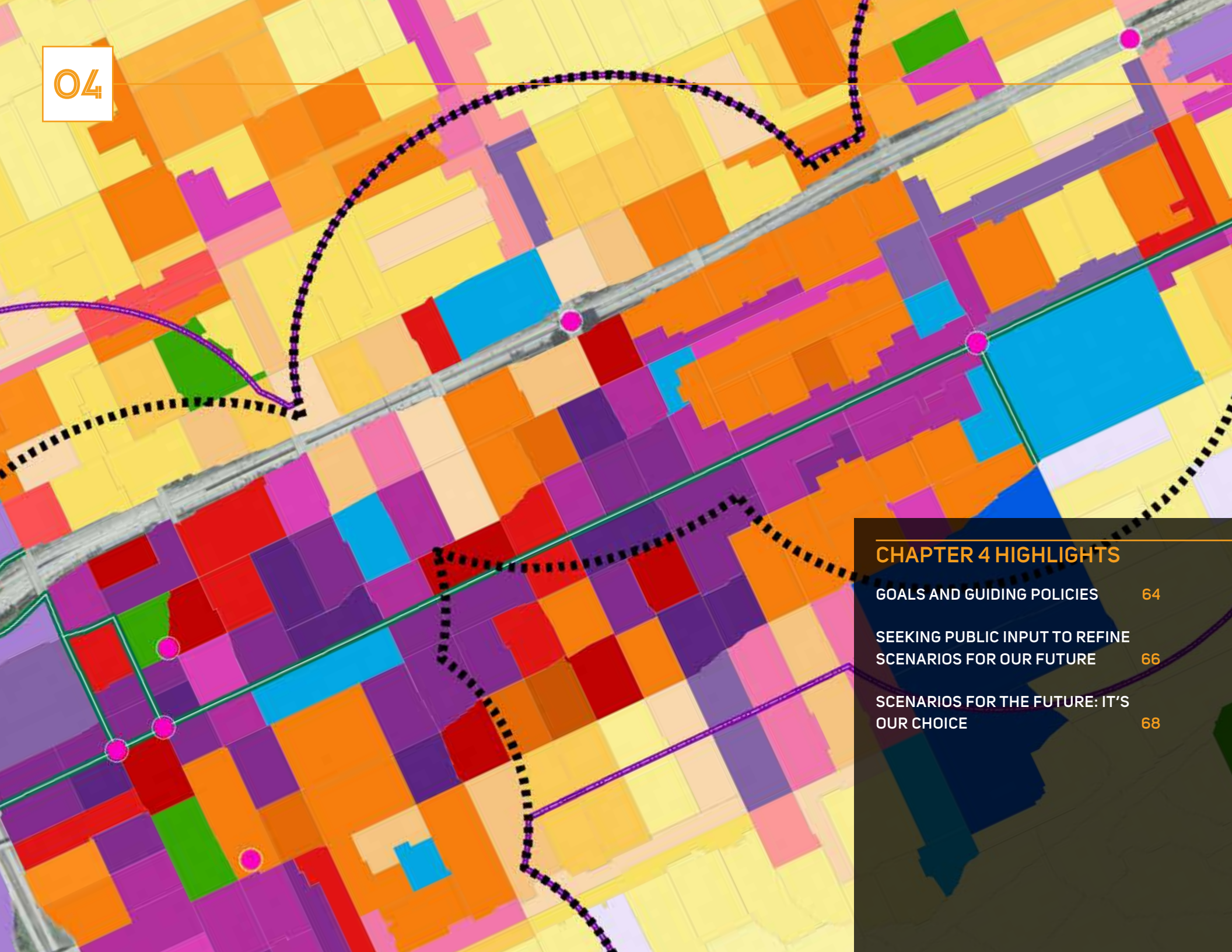
¹¹ California Adaptation Planning Guide: Planning for Adaptive Communities. (2012). California Emergency Management Agency & California Natural Resources Agency. Accessed at http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf.

¹² California Adaptation Planning Guide: Planning for Adaptive Communities. (2012). California Emergency Management Agency & California Natural Resources Agency. Accessed at http://resources.ca.gov/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf.

¹³ California Adaptation Planning Guide: Planning for Adaptive Communities. (2012). California Emergency Management Agency & California Natural Resources Agency.

CONCLUSION

We will now turn to a discussion of how SCAG developed the 2016 RTP/SCS, with a particular emphasis on the extensive public outreach that SCAG conducted to develop the best Plan possible to address our challenges. The 2016 RTP/SCS, after all, is the region's Plan for the future. By design, it reflects the region's needs, priorities and desires—as well as the statutory requirements of the State of California and the federal government.



CHAPTER 4 HIGHLIGHTS

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SEEKING PUBLIC INPUT TO REFINE SCENARIOS FOR OUR FUTURE 66

SCENARIOS FOR THE FUTURE: IT'S OUR CHOICE 68

CREATING A PLAN FOR OUR FUTURE

The RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with goals for the environment, the regional economy, social equity and environmental justice, and public health. Ultimately, the Plan is intended to help guide transportation and land use decisions and public investments.

This update, the 2016 RTP/SCS, reflects goals and guiding policies and a vision developed through extensive outreach to the general public and numerous stakeholders across our region. SCAG values the region's tremendous diversity and acknowledges that it cannot tackle challenges in the same way everywhere. This chapter discusses how the Plan was developed, and it offers an overview of SCAG's "preferred scenario" for land use and transportation in our region in 2040. SCAG developed this preferred scenario to guide its update of the 2012 RTP/SCS and then settle on a final set of strategies, programs and projects that will place the region more firmly on the road toward achieving its goals. Those strategies, programs and projects are reviewed in Chapter 5.

GOALS AND GUIDING POLICIES

As SCAG updated the 2012 RTP/SCS, it evaluated its existing goals, guiding policies and performance measures to determine whether they should be refined. Since the adoption of the 2012 RTP/SCS, several developments have occurred that influenced the development of the 2016 RTP/SCS. These include:

- A surface transportation funding and authorization bill known as "Moving Ahead for Progress in the 21st Century Act" (MAP-21) was signed into law by President Obama on July 6, 2012. MAP-21 includes specific goals for safety; improving the condition of transportation infrastructure; reducing congestion and making the transportation system more reliable; freight movement and economic vitality; and environmental sustainability. MAP-21 now requires that Metropolitan Planning Organizations such as SCAG set performance targets for improving transportation safety and system preservation in coordination with state departments of transportation.

At the time this document was being prepared, the federal rulemaking process to implement MAP-21 was not yet complete. SCAG will continue to monitor rulemaking to understand the implications for the Plan, and take the necessary steps to fully evaluate the final rule. Also, in December 2015, the Fixing America's Surface Transportation Act, or "FAST Act," was signed into law. The FAST Act is a five-year transportation funding and authorization bill that maintains many of the MAP-21 provisions, but also has new provisions including a national freight program. As with MAP-21, SCAG will monitor the rulemaking process to implement FAST Act provisions.

2016 RTP/SCS GOALS

1. Align the plan investments and policies with improving regional economic development and competitiveness.
2. Maximize mobility and accessibility for all people and goods in the region.
3. Ensure travel safety and reliability for all people and goods in the region.
4. Preserve and ensure a sustainable regional transportation system.
5. Maximize the productivity of our transportation system.
6. Protect the environment and health of our residents by improving air quality and encouraging active transportation (e.g., bicycling and walking).
7. Actively encourage and create incentives for energy efficiency, where possible.
8. Encourage land use and growth patterns that facilitate transit and active transportation.
9. Maximize the security of the regional transportation system through improved system monitoring, rapid recovery planning, and coordination with other security agencies.*

**SCAG does not yet have an agreed-upon security performance measure.*

2016 RTP/SCS GUIDING POLICIES

1. Transportation investments shall be based on SCAG's adopted regional Performance Indicators.
2. Ensuring safety, adequate maintenance and efficiency of operations on the existing multimodal transportation system should be the highest RTP/SCS priorities for any incremental funding in the region.
3. RTP/SCS land use and growth strategies in the RTP/SCS will respect local input and advance smart growth initiatives.
4. Transportation demand management (TDM) and active transportation will be focus areas, subject to Policy 1.
5. HOV gap closures that significantly increase transit and rideshare usage will be supported and encouraged, subject to Policy 1.
6. The RTP/SCS will support investments and strategies to reduce non-recurrent congestion and demand for single occupancy vehicle use, by leveraging advanced technologies.
7. The RTP/SCS will encourage transportation investments that result in cleaner air, a better environment, a more efficient transportation system and sustainable outcomes in the long run.
8. Monitoring progress on all aspects of the Plan, including the timely implementation of projects, programs, and strategies, will be an important and integral component of the Plan.

- The rapid advancement of new technologies such as real-time traveler information, on-demand shared mobility services enabled by smartphone applications, car sharing and bike sharing is influencing how households travel and their choices about vehicle ownership. New technologies are encouraging more efficient transportation choices, which help public agencies manage the multimodal transportation system more efficiently.
- There is a continuing emphasis on reducing greenhouse gas emissions, even after the adoption of Senate Bill 375. On April 29, 2015, Governor Brown issued Executive Order B-30-15, which establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030. Because the transportation sector is the largest contributor to California's greenhouse gas emissions (more than 36 percent), SCAG anticipates updated and more stringent regional emissions reduction targets.

This Plan's goals are intended to help carry out our vision for improved mobility, a strong economy and sustainability. Based on our assessment of these developments, the goals of the 2016 RTP/SCS, which are represented graphically in this chapter, remain unchanged from those adopted in the 2012 RTP/SCS.

The guiding policies for the 2016 RTP/SCS are intended to help focus future investments on the best-performing projects and strategies to preserve, maintain and optimize the performance of the existing transportation system. Two additional guiding policies have been added since 2012. The first addition (Guiding Policy 6) addresses emerging technologies and the potential for such technologies to lower the number of collisions, improve traveler information, reduce the demand for driving alone and lessen congestion related to road incidents and other non-recurring circumstances (a car collision, for example). The second addition (Guiding Policy 7) recognizes the potential for transportation investments to improve both the efficiency of the transportation network and the environment.

SEEKING PUBLIC INPUT TO REFINE SCENARIOS FOR OUR FUTURE

To develop a preferred scenario for the region at 2040, SCAG first generated four preliminary scenarios for our region's future—each one representing a different vision for land use and transportation in 2040. More specifically, each scenario was designed to explore and convey the impact of where the region would grow, to what extent the growth would be focused within existing cities and towns, and how it would grow—in other words, the shape and style of the neighborhoods and transportation systems that would shape growth over the period. To help the agency refine these four scenarios, SCAG reached out extensively to the general public and numerous stakeholders to seek their views and input. Refining the scenarios was an important step on the road toward settling on a preferred scenario—which offers a comprehensive picture of what kind of future we want. The scenarios and the selected preferred scenario proved to be powerful planning tools to solidify our vision for our region at the middle of the century. These preliminary scenarios are not the ones modeled in the Program Environmental Impact Report (PEIR).

Public outreach was integral to the development of the entire RTP/SCS, but particularly during the refinement of scenarios. To ensure that the 2016 RTP/SCS was developed openly and inclusively, the agency implemented a comprehensive public outreach and involvement program. This was based on a Public Participation Plan adopted by SCAG's Regional Council in April 2014. Specific public engagement strategies used during the development of the Draft 2016 RTP/SCS included:

- Developing materials for public outreach in a variety of formats to reach broad audiences, including a short video, fact sheets, surveys, PowerPoint presentations and poster boards.
- Centralizing RTP/SCS information on a new easy-to-use microsite, developed to be mobile/tablet friendly and compliant with the 1990 Americans with Disabilities Act.
- Supporting multiple committees, task forces and working groups made up of SCAG partners, stakeholders and interested groups to develop the key components of the Plan.
- Holding multiple public open houses before the release of the Draft RTP/SCS, to allow direct and interactive participation with interested parties.

OUR COUNTY TRANSPORTATION COMMISSIONS

The SCAG region includes a total of six county transportation commissions (CTCs), one for each county—Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura. Each CTC is responsible for planning and implementing countywide transportation improvements, allocating locally-generated transportation revenues, state and federal funding, and, in some cases, operating transit services. During each RTP/SCS update, the CTCs provide SCAG with extensive project lists that are then incorporated into the Plan. The projects included on these lists are regarded as regionally significant and/or anticipated to receive (or already receiving) federal and state funds. In addition, the CTCs anticipate that these projects will be initiated or completed by the Plan's horizon year (in this case, 2040). The 2016 RTP/SCS includes more than 4,000 projects—ranging from highway improvements, railroad grade separations, bicycle lanes, new transit hubs and replacement bridges. CTCs are a valuable resource for learning more about projects that are coming to your community by 2040.



CALIFORNIA TRANSPORTATION PLAN 2040

INTEGRATING CALIFORNIA'S TRANSPORTATION FUTURE

The State of California, with direction from the California Department of Transportation (Caltrans), developed a statewide, long-range transportation plan with a 25-year planning horizon, the California Transportation Plan 2040 (CTP 2040). The Draft CTP 2040 provides a long-range policy framework to meet California's future mobility needs and reduce greenhouse gas emissions. Caltrans is required to develop this plan per Senate Bill 391 (2009). Specifically, emissions must be reduced to 1990 levels from current levels by 2020, and 80 percent below the 1990 levels by 2050 as described by Assembly Bill 32 (2006) and Executive Order S-03-05 (2015). The CTP 2040 will demonstrate how major metropolitan areas, rural areas, and state agencies can coordinate planning efforts to achieve critical statewide goals. Like the CTP 2040, the 2016 RTP/SCS aims to motivate the development of an integrated, multi-modal transportation system that is sustainable, improves mobility and enhances our quality of life. Though the CTP 2040 is not yet finalized (anticipated approval in the next year), it helped inform the goals, policies and strategies included in the 2016 RTP/SCS.



- Announcing the schedule for the open houses through a wide variety of means, including community calendars, distributing flyers at local events and libraries, email newsletters, social media and ethnic media.
- Seeking the assistance of transit agencies, stakeholder organizations and their communication channels to maximize outreach opportunities.
- Reaching out to traditionally underrepresented and/or underserved audiences.
- Evaluating public participation activities to continually improve the outreach process.

The overall Plan was developed with input from local governments, county transportation commissions (CTCs), tribal governments, non-profit organizations, businesses and local stakeholders within Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. Outreach and coordination efforts also included work with providers of public transportation, county transportation commissions, and designated Consolidated Transportation Services Agencies (CTSAs) to ensure consistency with the plans and programs of these agencies, including short and long range plans of Coordinated Public Transit Human Services Transportation Plans. A fuller discussion of these plans can be found on pages 61–65 of the Transit Appendix.

From past plan development cycles, SCAG had heard from many participants about the need for early engagement during the development of the RTP/SCS. For members of the public, SCAG conducted public engagement activities between May and July 2015, with 23 open house events held across six counties. These events helped educate residents on the goals of the Plan, explore topics included in the Plan and gather input on priorities with an electronic survey. Participants reviewed poster boards showing projected changes in population and demographics within their county and the region, and then were asked for their input on how the region could accommodate growth in a variety of areas. These include providing transportation options, improving public health, preserving natural lands and supporting economic opportunities.

During discussion of the scenarios, major components were presented with maps, charts and figures. SCAG presented results associated with each scenario at public open houses held throughout the region to help stakeholders understand regional growth options. Participants learned about:

- The impact that different options for growth would have on transportation, land use, the economy and the environment
- The degree to which growth could be focused within the region's local jurisdictions over the next 25 years
- The potential shape and style of neighborhoods and transportation systems
- How varying combinations of land use and transportation strategies lead to different land consumption, travel, energy, water and pollutant impacts

Specific details on the scenarios can be found in the SCS Background Documentation Appendix.

Recognizing that not all members of the public could attend the open houses, SCAG provided an opportunity to participate virtually by providing workshop materials and a survey online. Hundreds of Southern Californians participated online and gave input on transit accessibility, transportation investments and other topics. A summary report from the survey was presented at a special joint meeting of SCAG's Regional Council and Policy Committees, and this report is also included in the Public Participation & Consultation Appendix.

In addition to these outreach efforts, all regular and special meetings of SCAG's Transportation Committee; Community, Economic and Human Development Committee; Energy and Environment Committee; Legislative/Communications and Membership Committee; Executive Administration Committee; and Regional Council were publicly noticed and opportunities for public comment were provided at each meeting. Federally required interagency consultation was done through the monthly meetings of the Transportation Conformity Working Group. Additional outreach strategies that were implemented are outlined in Public Participation & Consultation Appendix.

SCAG is not an implementing agency, so it is not directly involved in the construction or operation of transportation projects and other infrastructure improvements discussed in this Plan. The significance of the 2016 RTP/SCS is that the vision contained within the Plan sets the tone for policy development by other government agencies throughout the region. The public involvement discussed in this chapter helped the SCAG board and staff members understand the needs and concerns of stakeholders, leading to a more meaningful collective vision for the region's future.

SCENARIOS FOR THE FUTURE: IT'S OUR CHOICE

To refine the scenarios and ultimately develop a preferred scenario, SCAG gathered a large amount of feedback at the public meetings we have discussed. An important part of this process involved conducting comprehensive surveys.

SURVEY PARTICIPATION

Participants at public workshops were asked to complete a 37-question survey to provide input on their priorities, and open-ended feedback was encouraged. The survey was also available for completion on SCAG's website. Survey questions and a summary of responses are included in Public Participation & Consultation Appendix. Between the 2016 RTP/SCS Open Houses and the 2016 RTP/SCS website, more than 650 residents from throughout the SCAG region participated in the survey. About 75 percent of open house attendees participated in the survey, indicating that stakeholders were engaged during the workshops and wanted to participate in a meaningful way. The majority of survey participants resided in Los Angeles County, making up 51 percent of the total, followed by Orange County at 15 percent and Riverside, San Bernardino and Ventura Counties at nine percent each. Five percent of online participants did not state in which county they reside.

SURVEY RESULTS

Expanding transportation choices was clearly a priority for survey participants. Whether it is through public transportation, express lanes, bicycles or personal vehicles, our region wants as wide a range of choices as possible. When asked what our top priority should be for managing our regional highway and road system, the top two responses were almost evenly split. Most respondents wanted to protect and preserve existing transportation infrastructure—supporting a “Fix-it-First” policy—and they wanted to achieve maximum productivity through system management and demand management.

Moreover, the general open-ended comments received suggested there should be less focus on constructing new roads and lanes to build capacity. When asked about transportation budget priorities, survey respondents primarily favored creating more public transportation options, followed closely

by constructing bikeways and then improving traffic flow. Regarding transit, feedback received from comment cards was particularly helpful. The most prevalent comments stated a desire for:

- More efficient posting of time schedules
- More accurate system maps
- Better integration of fare systems
- Increasing space for bicycles on public transit
- Creating a comprehensive, efficient and regional-scale bus system
- Exploring opportunities such as double-decker highways that explicitly allow transit operations on one level
- Expanding transit commuter options

Open-ended written comments provided helpful direction in the area of active transportation. Many commenters preferred enhancing non-motorized infrastructure such as bike lanes and sidewalks to improve access to transit and increasing transportation options for all. Suggested strategies included:

- Simultaneously funding road improvements and prioritizing pedestrian infrastructure
- Increasing resources for Complete Streets and protected bike lanes
- Providing public education for motorists, cyclists and pedestrians to help everyone understand how roads are to be shared

Survey participants recognized the connection between public health, active transportation and the environment. When asked about which areas of public health they were most concerned about, air quality was the top health concern among respondents. Having safe areas for walking, biking and physical activity was also a concern, as was access to healthy food.

There is no “one size fits all” type of land use or density in a region as diverse as ours. However, it is fair to say that survey participants generally favored infill development rather than expanding our urban footprint into natural areas or

farmland; 80 percent of respondents preferred development in existing areas. For example, when asked where future residential development should mostly occur, the majority of participants said they preferred part mixed-use, part urban areas. Some suburban mixed-use areas were also desired, but strictly urban or suburban areas were least favored. When asked what type of housing should be built to accommodate our region’s future population, multifamily attached housing was the leading response. Small-lot detached homes and townhouses were somewhat favored, and large lot detached housing was least favored. About 90 percent of survey participants found protecting natural habitat areas to be important or very important.

Collectively, the survey responses offered an invaluable guide to help finalize the Plan’s investments, strategies and priorities. They reflect how regional stakeholders want us to address priority areas such as transit and roadway investments, system management, active transportation, land use and public health.

OUR PREFERRED SCENARIO

The extensive public outreach, coupled with detailed analysis of each scenario and coordination with technical and policy committees, led to our selection of a preferred scenario for the 2016 RTP/SCS based upon SCAG’s “Policy Growth Forecast.” This preferred scenario also incorporated inputs from local jurisdictions, including the land use and transportation strategies, investments and policies reflected in the 2012 RTP/SCS.

The preferred scenario envisions future regional growth that is well coordinated with the transportation system improvements of the approved 2012 RTP/SCS, as well as anticipated new transportation projects planned by the region’s CTCs and transit providers. It also incorporates best practices for increasing transportation choices; reducing our dependence on personal automobiles; allowing future growth in walkable, mixed-use communities and in High-Quality Transit Areas (HQTAs); and further improving air quality.

Regional investments in making transit trips quicker and easier are expanded to increase transit ridership. New land use concepts such as “Livable Corridors” and “Neighborhood Mobility Areas” are also introduced. These are described in more detail later in the Plan. In the preferred scenario for the 2016 RTP/SCS, new residential growth from 2012 to 2040 is split between multifamily housing (66 percent) and detached single-family homes (34 percent). The preferred scenario is the result of an investment plan that is assumed to be financially constrained.

To help our regional partners envision how the preferred scenario fosters development on the ground, SCAG built upon its earlier outreach and solicited feedback from local jurisdictions on the distribution of new households and employment at the neighborhood level, through 2040. During the review of the draft policy growth forecast in summer 2015, jurisdictions were asked to provide input on the growth scenario, including information on specific planned development projects with entitlements, other planned projects, or recently completed developments. Accordingly, the following core principles provided the framework for the preferred scenario:

- **Principle #1:** The preferred scenario will be adopted at the jurisdictional level, thus directly reflecting the population, household and employment growth projections derived from the local input process and previously reviewed and approved by local jurisdictions. The preferred scenario maintains these projected jurisdictional growth totals, meaning future growth is not reallocated from one local jurisdiction to another.
- **Principle #2:** The preferred scenario at the Transportation Analysis Zone (TAZ) level is controlled to be within the density ranges* of local general plans or input received from local jurisdictions.
- **Principle #3:** For the purpose of determining consistency for California Environmental Quality Act (CEQA), lead agencies such as local jurisdictions have the sole discretion in determining a local project’s consistency with the 2016 RTP/SCS.
- **Principle #4:** TAZ level data or any data at a geography smaller than the jurisdictional level has been utilized to conduct required modeling analyses and is therefore advisory only and non-binding given that

sub-jurisdictional forecasts are not adopted as part of the 2016 RTP/SCS. TAZ level data may be used by jurisdictions in local planning as it deems appropriate. There is no obligation by a jurisdiction to change its land use policies, General Plan, or regulations to be consistent with the 2016 RTP/SCS.

- **Principle #5:** SCAG will maintain communication with agencies that use SCAG sub-jurisdictional level data to ensure that the “advisory and non-binding” nature of the data is appropriately maintained.

Consistent with the above stated principles, the preferred scenario and corresponding forecast of population, household and employment growth is adopted at the jurisdictional level as part of the 2016 RTP/SCS and sub-jurisdictional level data and/or maps associated with the 2016 RTP/SCS is advisory only. For purposes of qualifying for future funding opportunities and/or other incentive programs, sub-jurisdictional data and/or maps used to determine consistency with the Sustainable Communities Strategy shall only be used at the discretion and with the approval of the local jurisdiction. However, this does not otherwise limit the use of the sub-jurisdictional data and/or maps by SCAG, CTCs, Councils of Governments, SCAG Subregions, Caltrans and other public agencies for transportation modeling and planning purposes. Any other use of the sub-jurisdictional data and/or maps not specified herein, shall require agreement from the Regional Council, respective policy committees and local jurisdictions.

The preferred scenario improves the reduction of greenhouse gas emissions in the region and enhances public health and other co-benefits from large transportation investments and improvements in technology—particularly those that focus on transit and first/last mile strategies.

Furthermore, the preferred scenario offers a vision for how we want our region to grow over the next quarter century and it gives us a clear-eyed view of what we want to achieve. Guided by goals and policies, built through analysis and refined with extensive public input, developing the preferred scenario set the stage for the hard work of building a comprehensive plan of land use and transportation strategies, programs and projects designed to confront our many challenges and move our region toward the vision embodied in the preferred scenario.

**With the exception of the six percent of TAZs that have average density below the density range of local general plans. The TAZs showing lower densities than GP designations are consistent with existing conditions and future land use and growth projections provided by local jurisdictions. SCAG did not lower the growth.*

Chapter 5 reviews those strategies, programs and projects that collectively will move the region toward realizing the outcomes seen in the preferred scenario—including more livable, healthy and economically strong communities and a more sustainable future.



CHAPTER 5 HIGHLIGHTS

INTEGRATING TRANSPORTATION
AND LAND USE PLANNING: THE
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THE ROAD TO GREATER MOBILITY & SUSTAINABLE GROWTH

At the beginning of Chapter 1, we reviewed several themes that resonate throughout the 2016 RTP/SCS. The first of these was: “Integrating strategies for land use and transportation.” This is SCAG’s overarching strategy for achieving its goals of regional economic development, maximized mobility and accessibility for all people and goods in our region, safe and reliable travel, a sustainable regional transportation system, a protected natural environment, health for our residents, and more.

INTEGRATING TRANSPORTATION AND LAND USE PLANNING: THE KEY TO ACHIEVING OUR GOALS

By integrating our strategies for transportation with our strategies for using land—in other words, considering in tandem how we grow and how we get around—we can build the communities that we want. Planning that does not strive for this close integration can result in sprawling suburbs connected haphazardly to poorly managed highways and isolated communities that lack easy access to public transportation connecting people from home to work, school and other destinations. Precious resources are squandered: time, energy, money, productivity, clean air and good health, among others.

As the region's transportation planning agency, SCAG has long promoted the concept of integrating transportation planning and land use planning. Since 2002, with the Southern California Compass and Shared Growth Vision for the region and the subsequent Compass Blueprint program (now the Sustainability Planning Grant Program), SCAG has promoted integrated planning tools for local governments that want their residents to have more mobility options, make their communities more livable, increase prosperity among all people and strive for sustainability. Subsequent policies adopted at the regional level in 2004, 2008 and 2012 have supported and advanced the integration of transportation and land use planning.

With the passage of Senate Bill 375 in 2008, the State of California formalized the idea of integrating planning statewide when the California Air Resources Board (ARB) set regional targets for reducing greenhouse gas emissions and required every Metropolitan Planning Organization (MPO) in the state to develop an SCS that charted a course toward reduced emissions and a more sustainable future. A central tenet of the SCS requirement is for MPOs to integrate land use and transportation planning.

Here is one example: High Quality Transit Areas (HQTAs) are places where people live in compact communities and have ready access to a multitude of safe and convenient transportation alternatives to driving alone—including walking and biking, taking the bus, light rail, commuter rail, the subway and/or shared mobility options. Along high quality bus corridors, for instance, a bus arrives at least every 15 minutes. Residential and commercial development is integrated with plans for transit, active transportation and other alternatives to driving alone.

The integrated strategies, programs and projects reviewed in this chapter are designed to improve a region with very specific changes underway: Over the next 25 years, our region's population is projected to grow by more than 20 percent, from about 18 million people to more than 22 million people. Diverse households will reside in all types of communities, including urban centers, cities, towns, suburban neighborhoods and rural areas. Much of the region will continue to be populated by households living in detached single-family dwellings located in lower-density suburban areas. However, 67 percent of new residences will be higher density multifamily housing, built as infill development within HQTAs. Households will demand more direct and easier access to jobs, schools, shopping, healthcare and entertainment, especially as Millennials mature and seniors grow in number. Concurrently, our Southern California region will remain a vital gateway for goods and services, an international center for innovation in numerous industries and a place that offers its residents a high standard of living. We know that our future growth will add new pressures to our transportation system and to our communities. However, through long-term planning that integrates strategies for transportation and land use, we can ensure that our region grows in ways that enhance our mobility, sustainability and quality of life.

OUR STRATEGIES FOR TRANSPORTATION AND LAND USE

In the discussion that follows, transportation and land use strategies are grouped separately, but it will nevertheless become clear how closely they are related to one another. The section that follows is the heart of the 2016 RTP/SCS, and by the end of the chapter our region's course toward a more mobile and sustainable future should be evident.

Serving as an MPO, Regional Transportation Planning Agency and Council of Governments, SCAG has an essential responsibility to develop an RTP/SCS that is dedicated to detailing recommended regional transportation investments and strategies. The agency has developed these transportation strategies in the context of how we are projected to grow and live as a region in coming decades. In this chapter we will first review regional strategies for growth and land use and then move into a comprehensive review of the agency's plans for the region's multi-faceted transportation system.

LAND USE STRATEGIES

The land use strategies included in this Plan are built on a foundation of contributions from communities, cities, counties and other local agencies across our region. The land use patterns reviewed here, for example, are based on local general plans as well as input from local governments. For this Plan update, SCAG was committed to preserving the growth forecasts provided by local jurisdictions at the jurisdictional level.

At the same time, Senate Bill 375 requires that SCAG, as the region's MPO, strive to develop a vision of regional development patterns that integrate with and support planned transportation investments. As part of that mandate, an overall land use pattern has been developed that respects local control, but also incorporates best practices for achieving state-mandated reductions in greenhouse gas emissions through decreases in per capita vehicle miles traveled (VMT) regionally.

2016 RTP/SCS LAND USE POLICIES

The 2016 RTP/SCS reaffirms the 2008 Advisory Land Use Policies that were incorporated into the 2012 RTP/SCS. These foundational policies, which have guided the development of this Plan's strategies for land use, are:

- Identify regional strategic areas for infill and investment
- Structure the plan on a three-tiered system of centers development¹
- Develop "Complete Communities"
- Develop nodes on a corridor
- Plan for additional housing and jobs near transit
- Plan for changing demand in types of housing
- Continue to protect stable, existing single-family areas
- Ensure adequate access to open space and preservation of habitat
- Incorporate local input and feedback on future growth.

2016 RTP/SCS LAND USE STRATEGIES

For this Plan, land use strategies are described in this section.

Reflect The Changing Population And Demands

The SCAG region, home to about 18.3 million people in 2012, currently features 5.9 million households and 7.4 million jobs. By 2040, the Plan projects that these figures will increase by 3.8 million people, with nearly 1.5 million more homes and 2.4 million more jobs. HQTAs will account for three percent of regional total land, but will accommodate 46 percent and 55 percent of future household and employment growth respectively between 2012 and 2040. The 2016 RTP/SCS land use pattern contains sufficient residential capacity to accommodate the region's future growth, including the eight-year regional housing need, as shown in [TABLE 5.1](#). The land use pattern accommodates about 530,000 additional households in the SCAG region by 2020 and 1.5 million more households by 2040. The land use pattern also encourages improvement in the jobs-housing balance by accommodating 1.1 million more jobs by 2020 and about 2.4 million more jobs by 2040.

This 2016 RTP/SCS reflects a continuation of the shift in demographics and household demand since 2012. This shift is apparent in the land use development pattern, which assumes a significant increase in small-lot, single-family and multifamily housing that will mostly occur in infill locations near bus corridors and other transit infrastructure. In some cases, the land use pattern assumes that more of these housing types will be built than currently anticipated in local General Plans. This shift in housing type—especially the switch from large-lot to small-lot single-family homes—is already occurring as developers respond to new demands. In 2008, 45 percent of all housing units were multifamily homes. From 2012 through 2040, the Plan projects that 66 percent of the 1.5 million new homes expected to be built in the SCAG region will be multifamily units, reflecting demographic shifts and anticipated market demand. This will result in an increase of multifamily units in the region to 49 percent of all housing units in the region.

Combating Gentrification and Displacement

The 2012 RTP/SCS discussed strategies to combat gentrification and displacement, a continuing challenge that we discussed in Chapter 3. Jurisdictions in the SCAG region should continue to be sensitive to the possibility of gentrification and work to employ strategies to mitigate its potential negative community impacts. Generally, the SCAG region will benefit from higher-density infill development, which means that neighborhoods will be adding to the local housing stock rather than maintaining the current stock and simply changing the residential population. In addition, local jurisdictions are encouraged to pursue the production of permanent affordable housing through deed restrictions or development by non-profit developers, which will ensure that some units will remain affordable to lower-income households. SCAG will

¹ Complete language: "Identify strategic centers based on a three-tiered system of existing, planned and potential relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment." A more detailed description of these strategies and policies can be found on pps. 90–92 of the SCAG 2008 Regional Transportation Plan, adopted in May 2008.

work with local jurisdictions and community stakeholders to seek resources and provide assistance to address possible gentrification impacts of new development on existing communities and vulnerable populations.

Focus New Growth Around Transit

The 2016 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in the region's HQTAs (see [EXHIBIT 5.1](#)). While maintaining jurisdictional totals, the overall land use pattern moves new development from areas outside of HQTAs into these areas. SCAG incorporated land use plans provided by local jurisdictions into this pattern. While many residents and employees within half a mile of a transit stop or corridor can walk or bike to transit, not all of these areas are targeted for new growth and/or land use changes. The 2016 RTP/SCS assumes that 46 percent of new housing and 55 percent of new employment locations developed between 2012 and 2040 will be located within HQTAs, which comprise only three percent of the total land area in the SCAG region. Since adoption of the 2012 RTP/SCS, jurisdictions have referenced HQTAs in their planning documents and have positioned themselves to compete for California's Cap-and-Trade auction proceeds to support Transit Oriented Development (TOD) and active transportation infrastructure.

HQTAs are a cornerstone of land use planning best practice in the SCAG region because they concentrate roadway repair investments, leverage transit and active transportation investments, reduce regional life cycle infrastructure costs, improve accessibility, avoid greenfield development, create local jobs, and have the potential to improve public health and housing affordability. Here, households have expanded transportation choices with ready access to a multitude of safe and convenient transportation alternatives to driving alone—including walking and biking, taking the bus, light rail, commuter rail, the subway and/or shared mobility options. Households have more direct and easier access to jobs, schools, shopping, healthcare and entertainment, especially as Millennials form households and the senior population increases. Moreover, focusing future growth in HQTAs can provide expanded housing choices that nimbly respond to trends and market demands, encourage adaptive reuse of existing structures, revitalize main streets and increase Complete Street investments.

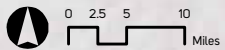
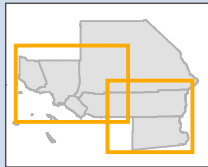
Additional local policies that ensure that development in HQTAs achieve the intended reductions in VMT and greenhouse gas emissions include:

TABLE 5.1 REGIONAL HOUSING NEEDS ASSESSMENT, ADOPTED 2012

Projection period 2014–2021

COUNTY	NUMBER OF VERY LOW INCOME HOUSEHOLDS	NUMBER OF LOW INCOME HOUSEHOLDS	NUMBER OF MODERATE INCOME HOUSEHOLDS	NUMBER OF ABOVE MODERATE INCOME HOUSEHOLDS	TOTAL
Imperial	4,194	2,553	2,546	7,258	16,551
Los Angeles	45,672	27,469	30,043	76,697	179,881
Orange	8,734	6,246	6,971	16,015	37,966
Riverside	24,117	16,319	18,459	42,479	101,374
San Bernardino	13,399	9,265	10,490	24,053	57,207
Ventura	4,516	3,095	3,544	8,003	19,158
SCAG	100,632	64,947	72,053	174,505	412,137

EXHIBIT 5.1 HIGH QUALITY TRANSIT AREAS IN THE SCAG REGION FOR 2040 PLAN



High Quality Transit Areas (including rail stations and qualifying bus corridors, see glossary for definition)

- 2012 Base Year
- 2040 Plan (Note: 2040 Plan Rail Station Alternatives shown as)

(Source: SCAG)

- Affordable housing requirements
- Reduced parking requirements
- Adaptive reuse of existing structures
- Density bonuses tied to family housing units such as three- and four-bedroom units
- Mixed-use development standards that include local serving retail
- Increased Complete Streets investments around HQTAs. Complete Streets are streets designed, funded and operated to enable safe access for roadway users of all ages and abilities, including pedestrians, bicyclists, motorists and transit riders.

The State of California is also trying to encourage growth around transit with the passage of Senate Bill 743 (SB 743), which seeks to facilitate transit-oriented projects in existing urbanized areas. The bill creates a new exemption from CEQA for certain projects that are residential or employment centers or mixed-used projects located within a Transit Priority Area (TPA), a part of a specific plan with a certified EIR and consistent with the SCS or APS.

Transit Oriented Development, HQTAs and Local Air Quality Impacts

The 2016 RTP/SCS recognizes guidance from the 2005 ARB air quality manual, which recommends limiting the siting of sensitive uses within 500 feet of highways and urban roads carrying more than 100,000 vehicles per day. This ARB guidance is carefully applied in areas that support Transit Oriented Development. Less than 10 percent of HQTAs planned in the 2016 RTP/SCS would fall within 500 feet of highways and highly traveled corridors, according to geographic information system (GIS) analyses. While density is increased in some areas of HQTAs, growth remains constant in areas within 500 feet of highways and urban roads to reflect local input, thereby balancing the growth distribution.

Plan for Growth Around Livable Corridors

The Livable Corridors strategy seeks to revitalize commercial strips through integrated transportation and land use planning that results in increased economic activity and improved mobility options. Since 2006, SCAG has provided technical assistance for 19 planning efforts along arterial roadway corridors. These corridor planning studies focused on providing a better understanding of how corridors function along their entire length. Subsequent research has distinguished the retail density and the specific kinds of retail needed to make these neighborhood nodes destinations for walking and biking.

From a land use perspective, Livable Corridors strategies include a special emphasis on fostering collaboration between neighboring jurisdictions to encourage better planning for various land uses, corridor branding, roadway improvements and focusing retail into attractive nodes along a corridor.

Livable Corridors Network

SCAG identified 2,980 miles of Livable Corridors along arterial roadways discussed in corridor planning studies funded through the Sustainability Planning Grant program and along enhanced bus transit corridors identified by regional partners. However, the land use strategies proposed in the 2016 RTP/SCS are not tied to a specific corridor. Livable Corridors are predominately a subset of the HQTAs, however 154 miles are not designated as HQTAs. These miles were identified in Sustainability Planning Grant projects and are proposed for active transportation improvements and the land use planning strategies described below.

Livable Corridors Strategies

The Livable Corridors concept combines three different components into a single planning concept to model the VMT and greenhouse gas emission reduction benefits:

- **Transit improvements:** The associated county transportation commissions (CTCs) have identified some of these corridors for on-street, dedicated lane Bus Rapid Transit (BRT) or semi-dedicated BRT-light. The remaining corridors have the potential to support other features that improve bus performance. These other features include enhanced bus shelters, real-time travel information, off-bus ticketing, all door boarding and longer distances between stops to improve speed and reliability.
- **Active transportation improvements:** Livable Corridors should include increased investments in Complete Streets to make these corridors and the intersecting arterials safe for biking and walking.
- **Land use policies:** Livable Corridor strategies include the development of mixed-use retail centers at key nodes along the corridors, increasing neighborhood-oriented retail at more intersections and zoning that allows for the replacement of under-performing auto-oriented strip retail between nodes with higher density residential and employment. These strategies will allow more context sensitive density, improve retail performance, combat blight and improve fiscal outcomes for local communities.

Provide More Options For Short Trips

Thirty-eight percent of all trips in the SCAG region are less than three miles. The 2016 RTP/SCS includes land use strategies, Complete Streets integration and a set of state and local policies to encourage the use of alternative modes of transportation for short trips in new and existing Neighborhood Mobility Areas (NMAs) and Complete Communities. In addition to the active transportation strategies that will be discussed below, land use strategies include pursuing local policies that encourage replacing motor vehicle use with Neighborhood Electric Vehicle (NEV) use. NEVs are a federally designated class of passenger vehicle rated for use on roads with posted speed limits of 35 miles per hour or less.

Neighborhood Mobility Areas

NMAs have a high intersection density, low to moderate traffic speeds and robust residential retail connections. These areas are suburban in nature, but can support slightly higher density in targeted locations. The land use strategies include shifting retail growth from large centralized retail strip malls to smaller distributed centers throughout an NMA. This strategy has shown to improve the use of active transportation or NEVs for short trips. Steps needed to support NEV use include providing state and regional incentives for purchases, local planning for charging stations, designating a local network of low speed roadways and adopting local regulations that allow smaller NEV parking stalls. NMAs are applicable in a wide range of settings in the SCAG region. The strategies associated with this concept are intended to provide sustainable transportation options for residents of the region who do not have convenient access to high-frequency transit options.

Complete Communities

Development of “complete communities” can provide households with a range of mobility options to complete short trips. The 2016 RTP/SCS supports the creation of these mixed-use districts through a concentration of activities with housing, employment, and a mix of retail and services, located in close proximity to each other. Focusing a mix of land uses in strategic growth areas creates complete communities wherein most daily needs can be met within a short distance of home, providing residents with the opportunity to patronize their local area and run daily errands by walking or cycling rather than traveling by automobile.

Support Local Sustainability Planning

To implement the SCS, SCAG supports local planning practices that help lead to a reduction of greenhouse gas emissions. Many local governments in the SCAG region serve as models for implementing the SCS. Sustainable Planning & Design, Zoning Codes and Climate Action Plans are three methods that local agencies have been adopting and implementing to help meet the regional targets for greenhouse gas emission reductions outlined in the SCS.

Sustainable Planning & Design

Many of the local policy documents that SCAG has reviewed are based on best practices that encourage infill and mixed-use development. Mixed-use design guidelines embrace and encourage increased densities and a mixing of uses, while also reflecting community character. For example, numerous suburban specific plans in the SCAG region encourage the revitalization of traditional main streets, downtowns and corridors. Other plans provide guidance for converting single-use office parks and industrial districts into mixed employment, retail and residential districts.

Sustainable Zoning Codes

Many cities and counties in the SCAG region have adopted form-based zoning codes that are tailored to local conditions, such as specifying building size and design parameters but allowing for more flexibility regarding use. Moreover, several cities and counties are updating their zoning codes to make development standards more environmentally friendly and equitable. One example is the City of San Gabriel’s “Greening the Code” strategy, which identifies ways for the city’s existing development code to facilitate more sustainability. New policies can involve coordinating landscaping practices with water conservation, best management practices for stormwater management and capture, creating better pedestrian connectivity, allowing more flexibility for mixed-use development and promoting energy efficient designs.

Climate Action Plans

SCAG is supporting several local governments throughout the region in the formation of Climate Action Plans (CAP). CAPs outline strategies for reducing greenhouse gas emissions in a cost effective manner. This is done by creating greenhouse gas inventories so that local governments can efficiently target their emission reduction practices to sources that pollute the most. Strategies outlined by CAPs in the SCAG region include Green Building guidelines for municipal buildings and facilities, implementing public electric vehicle charging stations and establishing energy retrofit incentive programs for residents.

2016 RTP/SCS Strategy

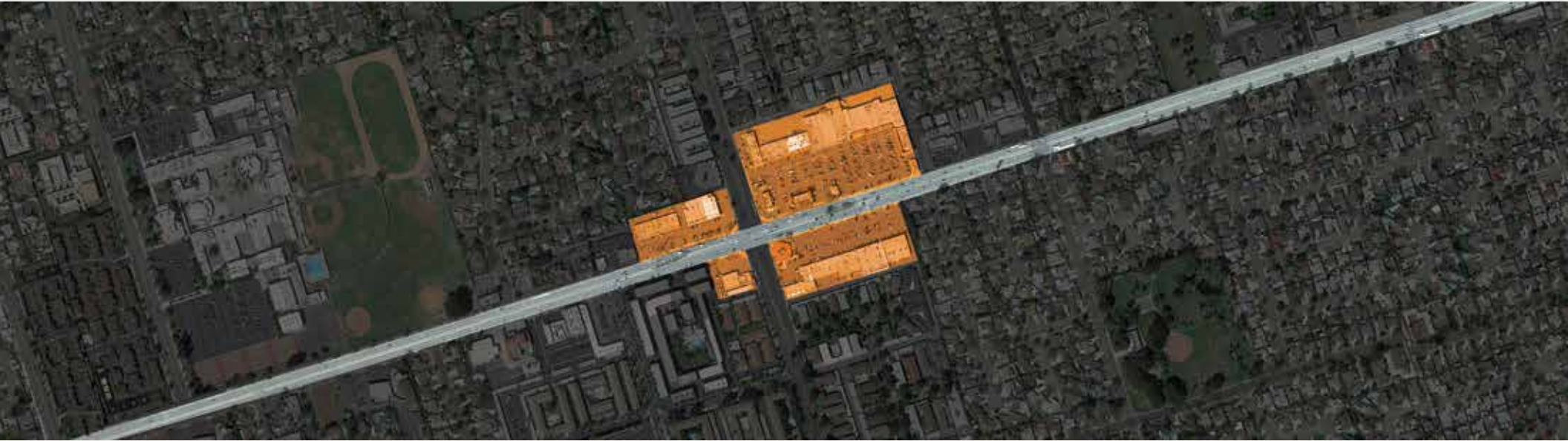
LIVABLE CORRIDORS

Enhancing the Connection Between Transit and Land Use

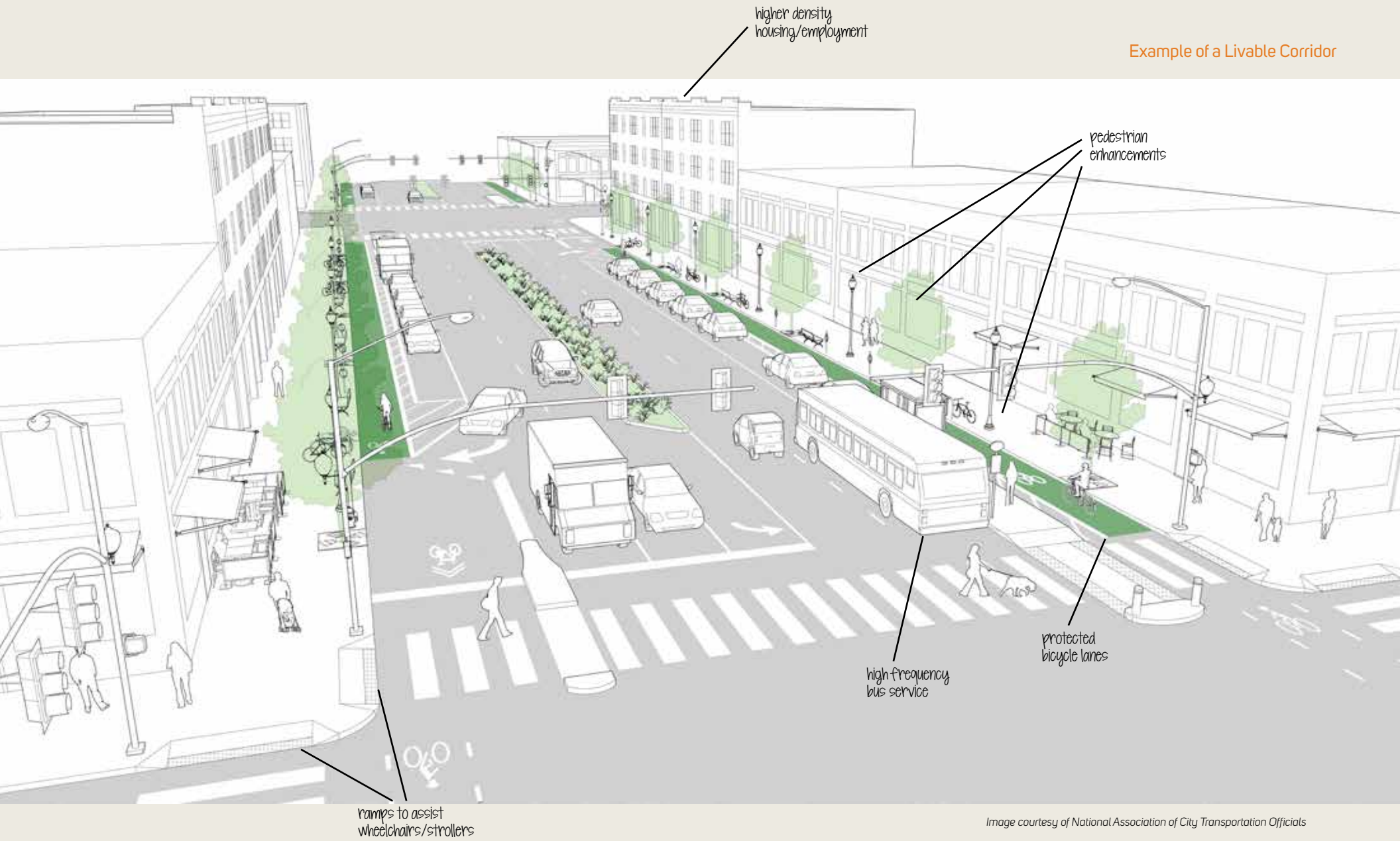
The SCAG region is crisscrossed by long arterial corridors, many of which are a legacy of Spanish colonial routes that linked the early missions and post-colonial ranchos. The suburban communities that developed rapidly after World War II were formed between these corridors, on a large (often one square mile) grid system. The inland portions of the South Bay, the Gateway Cities, the San Fernando and San Gabriel valleys, as well as the northern portions of Orange County follow this pattern. SCAG's Livable Corridors Strategy considers these suburban development patterns and proposes to encourage development along the boulevards that not only serve as major travel routes, but also destinations.

As the region transitions to higher investments in infill development and high quality, high frequency transit, these arterials are well suited to connect the region. The Livable Corridor Strategy specifically advises local jurisdictions to plan and zone for increased density at key nodes along the corridor and replacement of single-story under-performing strip retail with well-designed higher density housing and employment centers. This development along key corridors, when coordinated with improvements to the frequency and speed of buses along the corridors, will make transit a more convenient and viable option. Additionally, enhanced roadway designs to accommodate active transportation will also increase the vibrancy along these boulevards.

Several important transit investments in the SCAG region will help encourage this land use strategy. The Santa Ana Harbor Blvd Specific Plan incorporates the improved Orange County Transportation Authority (OCTA) Bravo! Route 543 and the planned OC Streetcar into its vision of the future. In Rancho Cucamonga, the City received a SCAG grant to reconcile the various specific plans along Foothill Blvd in anticipation of a future extension of the Omnitrans SbX. Across Los Angeles County, the Los Angeles County Metropolitan Transportation Authority (Metro) is planning for a high frequency network of buses with fewer stops. And the City of Los Angeles incorporated a "Transit Enhanced Network" as part of its General Plan Mobility Element to complement these investments.



Example of a Livable Corridor



higher density housing/employment

pedestrian enhancements

high-frequency bus service

protected bicycle lanes

ramps to assist wheelchairs/strollers

2016 RTP/SCS Strategy

NEIGHBORHOOD MOBILITY AREAS

Encouraging Active Transportation for Short Trips

About 38 percent of all trips in the region are three miles or less. That is a short enough distance that can be covered by walking or biking, but more than 78 percent of these trips are made by driving. While convenient, driving for short trips can cause unnecessary congestion and pollution. What can be done to make it more convenient for people to walk, bike or even skate instead of driving, when practical?

The Neighborhood Mobility Areas strategy represents a set of state and local policies to encourage the use of active and other non-automobile modes of transportation, particularly for short trips in many suburban areas in Southern California developed between the late 1890s and the early 1960s. These suburban developments

often were designed for streetcars and walking, in addition to automobiles and are characterized by small to medium lot single-family homes, a denser grid network of local roads, a higher density of intersections and accessibility to neighborhood retail establishments. By employing Complete Streets strategies, such as bike lanes, roundabouts, wider sidewalks or better lighting, the neighborhood design could encourage a return to greater active transportation use for those short trips. Similarly, planning a connected network of dedicated lanes and roadways with speed limits 35 mph and under can encourage more use of Neighborhood Electric Vehicles (NEV) for short trips. NEVs produce negligible greenhouse gas emissions (based on energy production) and zero local

pollution. In addition, NEVs take up less roadway capacity, less parking area at both the origin and destination and reduce the probability of an injury or fatality in the event of a collision with a pedestrian or bicyclist.

The Neighborhood Mobility Area concept is not new. Across the country, they are referred to as streetcar suburbs, first generation suburbs or suburban villages. But its application here in Southern California, when coupled with the renaissance some parts of the region are experiencing with transit and active transportation, would provide residents with greater mobility choices and an alternative to driving short distances.



Example of a Neighborhood Mobility Area



street lighting for better visibility and safety

ramps to assist wheelchairs/strollers

bulb-outs to make intersections safer

high-visibility crosswalks

trees and landscaping to provide shade/improve walkability

Protect Natural and Farm Lands

Many natural and agricultural land areas near the edge of existing urbanized areas do not have plans for conservation and they are susceptible to the pressures of development. Many of these lands, such as riparian areas, have high per-acre habitat values and are host to some of the most diverse yet vulnerable species that play an important role in the overall ecosystem.

Developing Conservation Strategies

Local land use decisions play a pivotal role in the fate of some of the region's most valuable habitat and farm lands. Many local governments have taken steps toward planning comprehensively for conserving natural lands and farm lands, while also meeting demands for growth. Across the region, transportation agencies and local governments have used habitat conservation plans and other tools to link land use decisions with comprehensive conservation plans in order to streamline development.

To support those and other comprehensive conservation planning efforts and to inform the local land use decision making process, SCAG studied regional scale habitat values, developed a conservation framework and assembled a natural resource database.² To coordinate with and support the viability of the Livable Corridors and HQTAs land use strategies, this Plan suggests redirecting growth away from high value habitat areas to existing urbanized areas.

SCAG is engaging numerous stakeholders as it creates a Natural Lands Conservation Plan. Building on this effort may lead to a regional conservation program that CTCs, jurisdictions, agencies and non-profits can align with and support. This strategic and comprehensive approach allows the region to meet its housing and transportation needs, while ensuring that important natural lands, farm lands and water resources are protected. The 2012 RTP/SCS committed to a regional mitigation plan for inclusion in the 2016 RTP/SCS. With that as the foundation, the following are next steps for further developing a conservation strategy. More information can be found in the Natural & Farm Lands Appendix.

- Expanding upon the Open Space Conservation Database and Framework by incorporating strategic mapping layers to build the database and further refine the priority conservation areas
- Encouraging CTCs to develop advanced mitigation programs and/or include them in future transportation measures

- Aligning with funding opportunities and pilot programs to begin implementation of the Natural Lands Conservation Plan through acquisition and restoration
- Providing incentives to jurisdictions that cooperate across county lines to protect and restore natural habitat corridors, especially where corridors cross county boundaries.

TRANSPORTATION STRATEGIES

The strategies for land use are tightly integrated with considerations for transportation, and that relationship is vital for our region to achieve its long-term regional goals. The same applies to our discussion of transportation strategies. The success of strategies related to transportation can only be achieved if they are tied closely to how we use land—how and where we grow, where we live, work, go to school, shop and so on. SCAG is pursuing numerous strategies divided into two broad categories: Maximizing Our Current System and Completing Our System. In all, the 2016 RTP/SCS includes \$556.5 billion in transportation system investments through 2040.

MAXIMIZING OUR CURRENT SYSTEM

Working to make sure our existing transportation system is operating at maximum efficiency is a leading regional priority—and doing this is critical for the land use strategies discussed above to be effective. Over the past half century, the SCAG region has invested hundreds of billions of dollars into building and expanding the multimodal transportation system that we rely on today. Our investments must be protected and properly maintained to ensure that maximum productivity and efficiency are gained from the system. Under the system management approach, priority is given to maintaining and preserving the system, as well as ensuring that it is being operated as safely, efficiently and effectively as possible. This approach is illustrated in the system management pyramid (FIGURE 5.1). Protecting our previous investments and getting the most out of every component is the highest priority for our region.

Preserve Our Existing System

Southern California's transportation system is becoming increasingly compromised by decades of underinvestment in maintaining and preserving our infrastructure. These investments have not kept pace with the demands placed on the system and the quality of many of our roads, highways, bridges, transit, and bicycle and pedestrian facilities are continuing to deteriorate. Unfortunately, the longer they deteriorate the more expensive they will be to fix in the future. Even worse, deficient conditions compromise the safety of users throughout the

² SCAG 2014 Inventory of Natural Resources Databases in SCAG region. Accessed at <http://sustain.scag.ca.gov/Sustainability%20Portal%20Document%20Library/SCAG%20Inventory%20Natural%20Resources%20GIS%20Databases.pdf>.

network. For all of these reasons, system preservation and achieving a state of good repair are top priorities of the 2016 RTP/SCS.

About \$275.5 billion, or nearly half of all of the 2016 RTP/SCS proposed expenditures through 2040, is allocated to system preservation and operation (see [FIGURE 5.2](#)). Chapter 6 reflects the allocation of these expenditures for the transit and passenger rail systems, the State Highway System, and regionally significant local streets and roads within the 2016 RTP/SCS. Note that the allocation for the State Highway System includes bridges; the allocation for transit includes funding to both preserve and operate the transit system; and the allocation for regionally significant local streets and roads includes bridges and active transportation safety improvements. The 2016 RTP/SCS system preservation strategies include:

- Protecting and preserving what we have first, supporting a “Fix-it-First” principle.
- Considering life-cycle costs beyond construction.

FIGURE 5.1 SYSTEM MANAGEMENT PYRAMID



- Continuing to work with stakeholders to identify and support new sustainable funding sources and/or increased funding levels for preservation and maintenance.

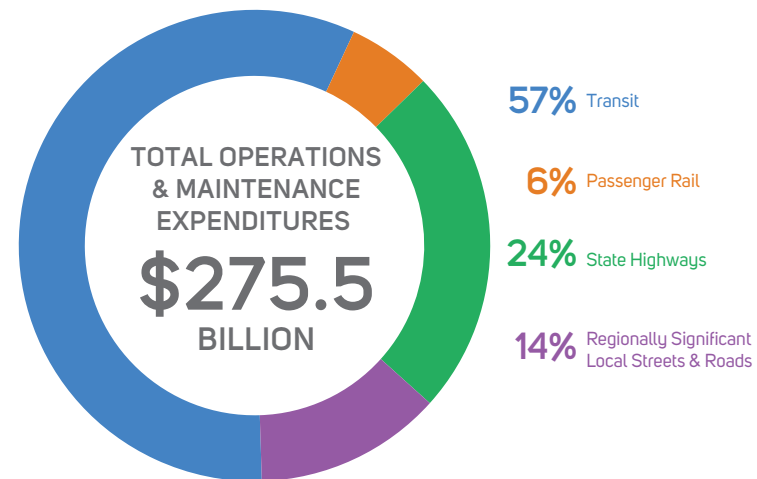
Manage Congestion

Congestion Management Process (CMP)

Federal regulations for Metropolitan Transportation Planning and Programming require the development, establishment and implementation of a CMP that is fully integrated into the regional planning process.³ The Federal Highway Administration (FHWA) defines the CMP as a “systematic approach . . . that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under title 23 U.S.C. and title 49 U.S.C., through the use of operational management strategies.” In compliance

³ 23 CFR 450.320.

FIGURE 5.2 PRESERVATION AND OPERATIONS EXPENDITURES



Note: Numbers may not sum to total due to rounding.

with federal law,⁴ SCAG has made the CMP an integral part of the regional transportation planning process, including the 2016 RTP/SCS and the Federal Transportation Improvement Program (FTIP). The CMP is part of SCAG's integrated approach to improving and optimizing the transportation system, to provide for the safe and effective management of the regional transportation system through the use of monitoring and maintenance, demand reduction, land use, operational management strategies and strategic capacity enhancements. SCAG undertakes eight actions that are considered by FHWA to be the core of the CMP. These include developing regional objectives for congestion management; using performance measures and monitoring to understand the causes of congestion; identifying problems and needs; developing alternative strategies; and evaluating effectiveness. A more complete discussion of SCAG's CMP is provided in the Congestion Management Appendix.

The CMP requires that roadway projects that significantly increase the capacity for single-occupancy vehicles (SOVs) be addressed through a CMP that provides appropriate analysis of reasonable, multimodal travel demand reduction and operational management strategies for the corridor. If alternative strategies are neither practical nor feasible, appropriate management strategies must be considered in conjunction with roadway capacity improvement projects that would increase SOV capacity. SCAG previously used a \$50 million threshold to identify SOV capacity-enhancing projects, but the agency is replacing this criterion with a project distance-based length criterion of one mile or more for the 2017 FTIP. Further details of this process are included in the upcoming 2017 FTIP.

Transportation Demand Management (TDM)

The 2016 RTP/SCS commits \$6.9 billion toward TDM strategies throughout the region. There are three main areas of focus:

- Reducing the number of SOV trips and overall vehicle miles traveled (VMT) through ridesharing, which includes carpooling, vanpooling and supportive policies for shared ride services such as Uber and Lyft.
- Redistributing or eliminating vehicle trips from peak demand periods through incentives for telecommuting and alternative work schedules.
- Reducing the number of SOV trips through the use of other modes of travel such as transit, rail, bicycling and walking.

In addition, the following strategies expand and encourage the implementation of TDM strategies to their fullest extent:

- Rideshare incentives and rideshare matching.
- Parking management and parking cash-out policies.
- Preferential parking or parking subsidies for carpoolers.
- Intelligent parking programs.
- Promotion and expansion of Guaranteed Ride Home programs.
- Incentives for telecommuting and flexible work schedules.
- Integrated mobility hubs and first/last mile strategies.
- Incentives for employees who bike and walk to work.
- Investments in active transportation infrastructure.
- Investments in Safe Routes to School programs and infrastructure.

Transportation Systems Management (TSM)

The 2016 RTP/SCS includes \$9.2 billion for TSM improvements. These include extensive advanced ramp metering, enhanced incident management, bottleneck removal to improve flow (e.g., auxiliary lanes), expansion and integration of the traffic signal synchronization network, data collection to monitor system performance, and other Intelligent Transportation System (ITS) improvements.

The 2016 RTP/SCS identifies a comprehensive set of strategies that work in concert to optimize the performance of the transportation system. This set of strategies does not focus solely on expanding the system, but also considers how we operate the system; how we coordinate land use planning with transportation planning; how we deal with incidents such as collisions or special events; how we provide information to the traveling public so people can make informed decisions about how, where and when to travel; and how we maintain the system. All of these strategies are based on a foundation of comprehensive system monitoring so that we can understand how the transportation system is performing and where we need improvement. This approach is based in part on work that California Department of Transportation (Caltrans) has done for many years to optimize the performance of the State Highway System. Two important categories for TSM strategies are:

1. **Corridor Mobility and Sustainability Improvement Plans:** Caltrans, SCAG and county partners in the past have worked together to improve the efficiency of our highways and arterials through the development of Corridor System Management Plans (CSMPs). Since the passage of Proposition 1B in November 2006 and with the creation Corridor Mobility Improvement Account (CMIA), which

⁴ 23 USC 134 and 49 USC 5303-5305.

served to improve mobility on the State Highway System, several CSMPs have been developed for various corridors throughout the SCAG region. Historically, the response to congestion has been to add additional capacity. However, CSMPs have provided a lower cost, higher benefit option toward making highways and parallel arterial systems, transit and incident response management more efficient and were designed to focus primarily on operational strategies to optimize corridor performance through ITS strategies, in conjunction with operational and capacity improvements towards improving productivity along highway corridors. SCAG recognizes the efforts taken thus far under the current CSMP framework to improve mobility, but believes that CSMPs can be further improved upon. SCAG encourages the development of Corridor Sustainability Studies (CSS) which will build upon the existing CSMP framework by analyzing the corridor from a multimodal perspective. More specifically, these studies will include a focus on newer planning priorities such as Complete Streets and a Smart Mobility Framework (not addressed by current CSMPs). SCAG recognizes that the region could benefit from a site specific CSS focused on improving mobility for all modes of travel throughout the region.

2. **Integrated Corridor Management (ICM):** The ICM Initiative was first introduced by the U.S. Department of Transportation (U.S. DOT) back in 2006. Under the ICM approach, all elements within a corridor are considered to evaluate opportunities that move people and goods in the most efficient manner possible, while simultaneously ensuring that the greatest operational efficiencies are achieved. Since the introduction of ICM, great progress has been made. In Los Angeles, Caltrans (in coordination with Los Angeles County Metropolitan Transportation Authority or Metro) and various cities have embarked on the first Integrated Corridor Management pilot project on Interstate 210. This project aims to minimize congestion due to collisions and is also referred to as the Connected Corridors initiative. Over the next ten years, Caltrans plans to implement similar projects on 25 additional congested corridors statewide. ICM strategies to be considered as part of the Interstate 210 project include:

- Integration of highway ramp meters and arterial signal systems
- Arterial signal coordination
- Traffic re-routing due to incidents or events
- Transit signal priority on arterials and on-ramps
- Parking management

- Traveler communication (via changeable message signs, 511, radio, social networks, mobile app) of traffic conditions, transit services, parking, alternate route/trip/mode options
- System coordination/communication between Caltrans (highway operator) and local jurisdictions (arterial operators).

Additional System Management Initiatives include:

- Arterial Signal Synchronization projects that have been completed on various arterials through the region to optimize traffic flow
- The Dynamic Corridor Congestion Management (DCCM) initiative in Los Angeles County, in which Caltrans is developing a corridor management initiative on Interstate 110 to coordinate highway ramp metering with arterial signals. Various efforts have been completed to inform the traveling public of expected travel times to various destinations and in some cases provide travel time comparisons with transit.
- The Caltrans Advanced Traffic Management (ATM) study for Interstate 105 and the Regional Integration of ITS Projects (RIITS) and IEN data exchange efforts at Los Angeles Metro.

Promote Safety and Security

Ensuring the safety and security of our transportation network for residents and visitors is a top priority. SCAG supports the implementation of the Strategic Highway Safety Plan (SHSP), which has an overarching goal of Toward Zero Deaths. The state's short-term goals are to reduce the number and rate of fatalities by three percent per year and to reduce the number and rate of severe injuries by 1.5 percent per year. SCAG is continuing to work with Caltrans and the CTCs toward identifying other means of improving the safety and security of our transportation system.

Regarding our transportation network's security, there are numerous agencies that participate in the response to incidents and assist with hazard preparations for individual jurisdictions. These include the California Emergency Management Agency, county offices of emergency management, fire departments, police departments and the California Highway Patrol. Collaboration among many of these agencies is essential when addressing incidents regionwide. The Federal Emergency Management Agency (FEMA) oversees this coordination. However, FEMA defines metropolitan areas differently than the U.S. DOT, so this limits SCAG's ability to participate at an agency level. Nevertheless, SCAG seeks to use its strengths and organization to assist first responders, recovery teams and planners alike in a supporting role.

FOCUS

BENEFITS OF TRANSPORTATION SYSTEMS MANAGEMENT/ TRANSPORTATION DEMAND MANAGEMENT (TSM/TDM)



Enhanced Incident Management

Reduces incident-related congestion, which is estimated to represent half of the total congestion in urban areas



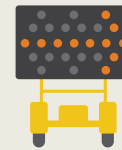
Improved Data Collection

Allows implementing agencies and operators to monitor system performance and optimize the impact of transportation investments



Transit Automatic Vehicle Location

Enables monitoring of transit vehicles and ensures on-time performance



Advanced Traveler Information

Provides real-time traffic conditions and alternative routing, and therefore allows the public to make more informed travel decisions



Advanced Ramp Metering

Alleviates congestion and reduces collisions at on-ramps and highway-to-highway interchanges



Universal Transit Fare Cards (Smart Cards)

Reduces time required to purchase transit tickets and allows interoperability among transit providers

Traffic Signal Synchronization

Minimizes wait times at traffic signals and therefore reduces travel time

Case Study: Interstate 210 Pilot Project

Historically, efforts to reduce congestion have focused solely on individual networks, in which underutilized capacity in parallel highway lanes, arterial lanes and transit services were often not considered. In recent years, TSM/TDM strategies have been developed to increase efficiency through the use of technologies. The application of these technologies, such as intelligent transportation systems (ITS), and a commitment by Caltrans and its partner agencies to work together have the potential to transform the ways that corridors are currently operated.

In 2012, Caltrans, with assistance from Metro and California Partners for Advanced Transportation Technology (PATH) at UC Berkeley, developed the first Integrated Corridor Management (ICM) pilot project within the SCAG region along the Interstate 210 (I-210) corridor. The purpose of the pilot is to look at all opportunities to move people and goods in the most efficient manner possible, to ensure the greatest potential gains in operational performance. This includes

seeking ways to improve how arterials, highways, transit and parking systems work in conjunction with one another.

Strategies to be considered as part of the project include:

- Integration of highway ramp meters and arterial signal systems
- Arterial signal coordination
- Traffic re-routing due to incidents or events
- Transit signal priority on arterials and on-ramps
- Parking management (e.g., smart parking—locating available parking spaces at transit stations and private parking garages)
- Variable lane configuration systems
- Traveler communication (via changeable message signs, 511, radio, social networks, mobile app) of traffic

conditions, transit services, parking, alternate route/trip/mode options

- System coordination/communication between Caltrans and local jurisdictions

The pilot is still under development, but it has already changed the way state and local transportation agencies work together in managing transportation systems. Caltrans aims to eventually expand the application of ICM concepts to other corridors over the next ten years. In this context, the Interstate 210 Pilot is a test bed to demonstrate how an ICM project can be developed by engaging and building consensus among corridor stakeholders, to address congestion for the betterment of an entire network.



SCAG continues to pursue the following strategies toward ensuring safety and security:

- Ensure transportation safety, security and reliability for all people and goods throughout the region.
- Prevent, protect, respond to and recover from major human-caused or natural events in order to minimize the threat and impact to lives, property, the transportation network and the regional economy.
- Provide a policy forum to help develop regional consensus and education on security policies and emergency responses.
- Assist in expediting the planning and programming of transportation infrastructure repairs from major disasters.
- Encourage the integration of transportation security measures into transportation projects early in the development process by leveraging SCAG's relevant plans, programs and processes (including regional Intelligent Transportation Systems (ITS) architecture).

For more details on safety and security and additional policies and strategies, please review the Transportation Safety & Security Appendix.

COMPLETING OUR SYSTEM

Strategies for improving and expanding the many modes of transportation that make up the regional network must be integrated closely with our strategies for how we use land. The success of transit; passenger rail; walking, biking and other forms of active transportation; our highways and arterials; the efficient movement of goods; and our regional airport system all depend on a close relationship with how our region uses land and how we grow. This is particularly true when it comes to improving and building a transit system that can best serve people in communities throughout our region. It is the first transportation category for which numerous strategies are reviewed.

Transit

Since 1991, the SCAG region has spent more than \$50 billion dollars on public transportation. This includes high profile investments in rail transit and lower profile, vital investments in operations and maintenance. Looking toward 2040, the 2016 RTP/SCS maintains a significant investment in public transportation across all transit modes and also calls for new household and

employment growth to be targeted in areas that are well served by public transportation to maximize the improvements called for in the Plan. This investment package includes a selection of major capital investments described in [TABLE 5.2](#), which displays all locally notable transit capital projects and additional capital investment packages totaling more than \$500 million. These investments include new rail transit facilities, vehicle replacements, bus system improvements and capitalized maintenance projects.

When these projects are completed, the region will have a greatly expanded urban rail network, including ten light rail projects and three heavy rail projects on the Metro Rail system. New BRT and rapid bus routes will provide additional higher speed bus service in Los Angeles and Orange Counties and the Inland Empire. Orange County will add new streetcar services to link major destinations in Anaheim, Santa Ana and Garden Grove to the Metrolink system. Riverside County will extend Metrolink to San Jacinto and San Bernardino County will connect Metrolink to Ontario International Airport and to Redlands via Downtown San Bernardino.

In addition, the 2016 RTP/SCS includes extensive local bus, rapid bus, BRT and express service improvements. An expanded point-to-point express bus network will take advantage of the region's carpool and express lane network. New BRT service, limited-stop service and increased local bus service along key corridors, in coordination with transit-oriented development and land use, will encourage greater use of transit for short local trips. See [EXHIBIT 5.2](#).

Also included in the investment package are renewed commitments to asset management and maintaining a state of good repair. [TABLE 5.3](#) describes all transit operations and maintenance investments over \$500 million. This list includes bus, urban rail and paratransit operations, the implementation of the Orange County Transportation Authority's (OCTA's) Short Range Transit Plan, expanded bus service on targeted corridors, preventative maintenance and an increased commitment on asset preservation funded from innovative revenue sources.

Aside from capital projects, there are many improvements that can help make transit operate more efficiently and effectively, make it more accessible to more travelers and increase ridership. The 2016 RTP/SCS recommends additional transit initiatives. Among them:

TABLE 5.2 SELECTED TRANSIT CAPITAL PROJECTS

COUNTY	PROJECT
Los Angeles	Airport Metro Connector
Los Angeles	Crenshaw LAX Transit Corridor
Los Angeles	East San Fernando Valley Transit Corridor
Los Angeles	Eastside Transit Corridor Phase 2
Los Angeles	Exposition Transit Corridor, Phase 2 to Santa Monica
Los Angeles	Metro Gold Line Foothill Extension Phase 2A
Los Angeles	Metro Gold Line Foothill Extension: Azusa to County Line
Los Angeles	Purple Line Extension to La Cienega, Century City, Westwood
Los Angeles	Regional Connector
Los Angeles	Sepulveda Pass Corridor
Los Angeles	South Bay Metro Green Line Extension
Los Angeles	West Santa Ana Branch Transit Corridor
Los Angeles	Bus & Rail Capital—LA County Near Term
Los Angeles	Countywide Bus System Improvement—Metro Fleet
Los Angeles	Countywide Bus System Improvement—LA County Muni Fleet
Los Angeles	Metro Rail System Improvements (Capital Costs Only)
Los Angeles	Metro Rail Rehabilitation and Replacement (Capital Costs Only)
Los Angeles	Transit contingency/new rail yards/additional rail cars (Capital costs only)—LA County
Los Angeles	Vermont Short Corridor
Los Angeles	Metro Red Line Extension: Metro Red Line Station North Hollywood to Burbank Bob Hope Airport
Los Angeles	Metro Green Line Extension: Metro Green Line Norwalk Station to Norwalk Metrolink Station
Los Angeles	Slauson Light Rail: Crenshaw Corridor to Metro Blue Line Slauson Station
Orange	Anaheim Rapid Connection
Orange	Countywide Fixed-Route, Express and Paratransit Capital (Baseline)—Orange County
Orange	OC Streetcar
Riverside	Coachella Valley Bus Rapid Service
Riverside	Perris Valley Line
Riverside	Perris Valley Line Extension to San Jacinto
San Bernardino	Foothill/5th Bus Rapid Transit
San Bernardino	Gold Line Phase 2B to Montclair
San Bernardino	Metrolink San Bernardino Line Double tracking
San Bernardino	Passenger Rail Service from San Bernardino to Ontario Airport
San Bernardino	Redlands Rail
San Bernardino	West Valley Connector Bus Rapid Transit

Source: 2016 RTP/SCS Project List

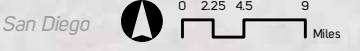
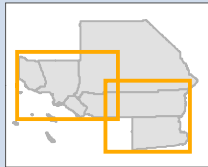
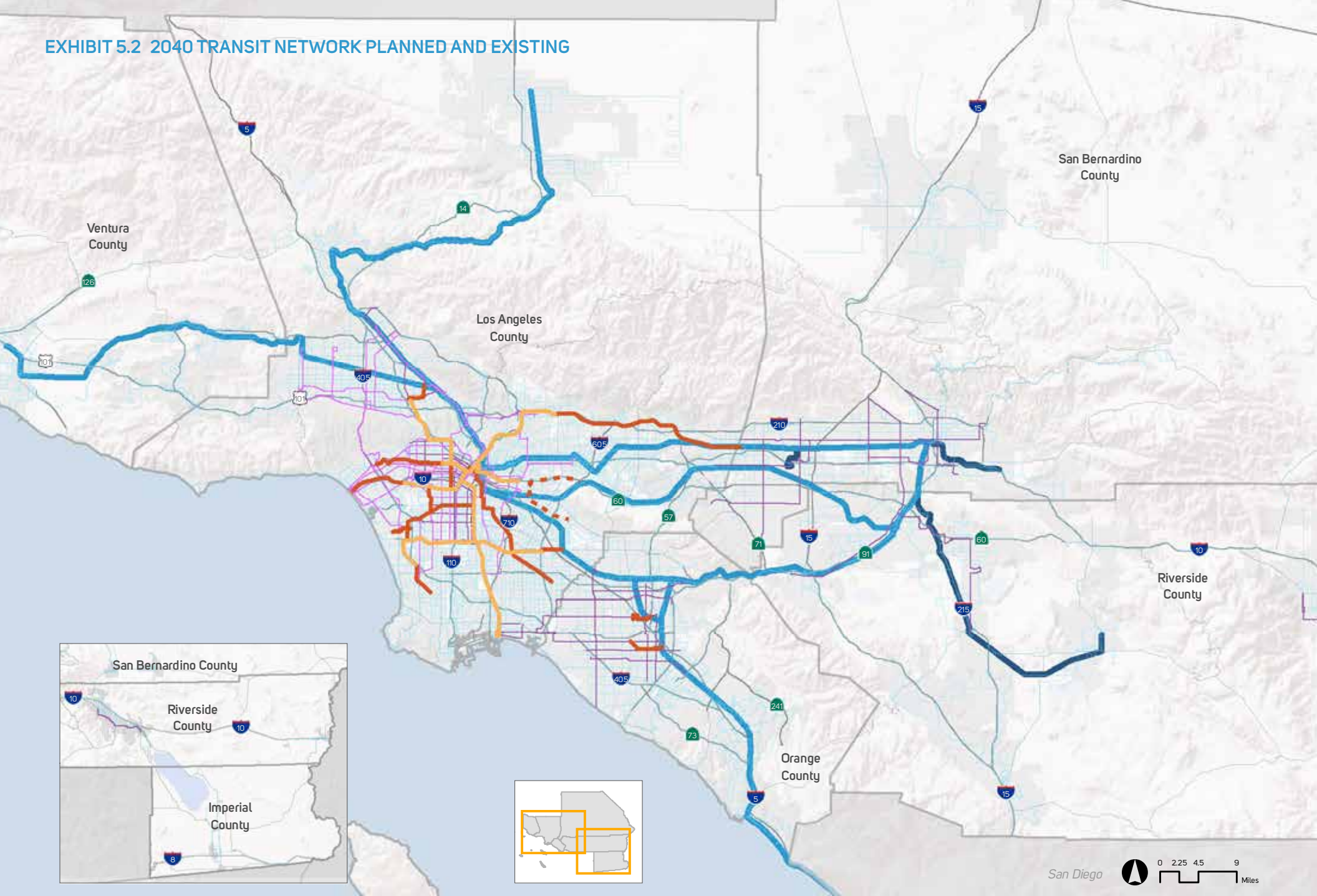
TABLE 5.3 MAJOR TRANSIT OPERATIONS AND MAINTENANCE PROJECTS AND INVESTMENTS

(Over \$500 Million)

COUNTY	PROJECT
Los Angeles	Access Services Incorporated (Paratransit)—Metro subsidy
Los Angeles	Preventive Maintenance (Capital & Operating Maintenance Items Only)—LA County
Orange	Countywide Fixed-Route, Express and Paratransit Operations—Orange County
Orange	OCTA SRTP Implementation
Orange	Metrolink Operations—Orange County
Orange	Transit Extensions to Metrolink—Go Local Operations—Orange County
San Bernardino	San Bernardino Countywide Local Transit Service Operations
Regionwide	Regionwide Transit Operations and Maintenance—Preservation
Regionwide	Expand Bus Service: Productive Corridors
Regionwide	Expand Bus Service: BRT
Regionwide	Expand Bus Service: Point-to-Point

Source: 2016 RTP/SCS Project List

EXHIBIT 5.2 2040 TRANSIT NETWORK PLANNED AND EXISTING



- Commuter Rail
 - 2012 Base Year
 - 2040 Plan
- Urban Rail
 - 2012 Base Year
 - 2040 Plan
- Urban Rail Alternatives
- Rapid Bus and Bus Rapid Transit
 - 2012 Base Year
 - 2040 Plan
- Bus Routes (2012 Base Year & 2040 Plan)

(Source: SCAG)

Implement and Expand Transit Priority Strategies: Transit priority strategies include transit signal priority, queue jumpers and bus lanes. Signal priority is a highly effective treatment that speeds up bus service and attracts new transit riders. The Metro Rapid program in Los Angeles County has increased speeds by more than 20 percent, compared with the local service on the same street. It also has brought new riders to its system. Bus lanes are even more effective at increasing speeds, however in our region there is a dearth of such lanes. SCAG encourages transit agencies and local jurisdictions to implement them, where appropriate.

Implement Regional and Inter-County Fare Agreements and Media: Implementing additional inter-jurisdictional fare agreements and media, such as Los Angeles County's EZ Pass, will make transit more attractive and accessible. A pass that would cover all transit services in Los Angeles and Orange counties, or the whole SCAG region, is an example. OCTA, the LOSSAN Managing Agency, recently secured a California Cap-and-Trade grant to establish fare agreements between the Pacific Surfliner and local transit operators along its corridor where an Amtrak ticket will be good for a connecting transit fare.

Implement New BRT and Limited-Stop Bus Service: BRT service provides frequent, high quality bus service and is characterized by features such as dedicated lanes, traffic signal priority, limited stops, pre-boarding fare payment and unique branding. BRT is about 20 percent faster than traditional local bus service. It is a premium service and has proven to attract new riders to transit. BRT implementation does require some capital investment, but it is scalable so that transit agencies can implement a range of elements to improve bus service depending upon the resources available. In an environment of scarce funding, offering limited-stop service is also an excellent alternative to BRT because it involves strategically reducing the number of stops a bus would serve along a given route. Limited-stop service has been shown to be about 15 percent faster than traditional local service.

Increase Bicycle Carrying Capacity on Transit and Rail Vehicles: Bicycling is becoming more popular and our transit system can do more to accommodate bicyclists. Many buses have bike racks with capacity for only two bikes. Meanwhile, Metro and Metrolink are now allowing more bicycles on their railcars and providing bicycle lockers at rail and fixed guideway bus stations. Allowing more bikes on transit vehicles, to a reasonable point, will increase transit ridership.

Expand and Improve Real-Time Passenger Information Systems: Most medium to large size transit agencies now offer up-to-the-minute updates on arrival and departure times. This allows passengers to make more informed travel decisions and improve the overall travel experience.

Implement First/Last Mile Strategies to Extend the Effective Reach of Transit: This is an area of study with recent focus. Making transit more accessible for biking or walking that first mile to a transit station, or from a transit station, or both, will encourage more transit use and reduce air pollution and greenhouse gas emissions. More than 90 percent of Metrolink riders drive to their origin station, representing a significant potential for providing alternatives. As mentioned before, several cities in Orange County are planning streetcar services to connect Metrolink riders to their final destinations.

Implement Local Circulators: Many jurisdictions in the region already have networks of local community circulators and fixed-route systems. Implementing more of these services would provide alternatives for residents of increasingly compact communities.

Passenger Rail

The 2016 RTP/SCS proposes three main passenger rail strategies that will improve speed, service and safety and provide an attractive alternative to driving alone. They are:

- Improving the Los Angeles–San Diego–San Luis Obispo Rail Corridor (LOSSAN Corridor)
- Improving the existing Metrolink system
- Implementing Phase One of the California High-Speed Train

The state's High-Speed Train will provide an additional intrastate transportation option in California, offering an alternative to air and auto travel and providing new capacity for travel on the state's highways and airports. The California High-Speed Rail Authority (CHSRA), in partnership with the Federal Railroad Administration (FRA), which has provided \$3.6 billion in High-Speed and Intercity Passenger Rail funding, have chosen to begin construction in the San Joaquin Valley. The system will then be built south to our region, connecting to Palmdale, Burbank Bob Hope Airport, Los Angeles Union Station and Anaheim by 2029. This is consistent with the CHSRA's adopted 2014 Business Plan and Draft 2016 Business Plan.

Existing passenger rail facilities in Southern California and the Bay Area (the “bookends” of the Phase One system) will also be improved to provide immediate, near-term benefits while laying the groundwork for future integration with High-Speed Train. This “blended approach” to deliver the full integrated system, through phased implementation over time, will help reduce costs and environmental impacts. With the adoption of the 2012 RTP/SCS, the region and the CHSRA committed to spending \$1 billion in Prop. 1A funds and other fund sources on these early investments in the “bookends.”

This commitment by CHSRA and the transportation agencies was formalized in the memorandum of understanding (MOU) between CHSRA, Metrolink, SCAG, San Diego Association of Governments (SANDAG), Metro, Riverside County Transportation Commission (RCTC) and the City of Anaheim. The MOU includes a candidate project list to which \$1 billion will be programmed in order to provide interconnectivity to the California High-Speed Train project and improve the speed, capacity and safety of our existing passenger rail network. The list includes 74 projects totaling nearly \$4 billion and it shows the need for capital investments to improve the speed and service of the existing rail network regionwide. The top six projects on this list are each of the five county’s (Los Angeles, Orange, Riverside, San Bernardino and San Diego) top projects—plus the Southern California Regional Interconnector Project (SCRIP, formerly called the Los Angeles Union Station Run-Through Tracks). See [TABLE 5.4](#).

TABLE 5.4 TOP SIX MOU PROJECTS

Los Angeles	Southern California Regional Interconnector Project
Los Angeles	CP Brighton to CP Roxford Double Track
Orange	State College Blvd. Grade Separation
Riverside	McKinley St. Grade Separation
San Bernardino	CP Lilac to CP Rancho Double Track
San Diego	San Onofre to Pulgas Double Track

CP = A track switch, or the location of a track signal or other marker with which dispatchers can specify when controlling trains.

SCRIP is number one on the list because it will deliver regional benefits for all counties. Los Angeles Union Station was originally designed as a “stub” rail facility, with tracks only leaving the station in a northerly direction and no through-train operation capability. Up to six tracks will be built to extend out of the south of Union Station and across U.S. Route 101 to connect with the main tracks along the Los Angeles River. These additional tracks will increase Union Station’s capacity by 40 to 50 percent, enabling the scheduling of many more through trains with improved running times. They will also result in sharply reduced air pollution and greenhouse gas emissions from idling locomotives.

Several additional strategies are designed to increase rail ridership in our region by making rail travel more attractive as an alternative to commuting alone by car. These strategies will serve three distinct rail markets: commuter, intercity and interregional. The first is served by Metrolink, the second by Amtrak and the third will be served by California High-Speed Train service. However, the three carriers can be attractive to multiple rail travel markets. Passenger rail strategies for these markets include:

Increase Speed and Service: As noted above, the high-speed rail system MOU partners are in the process of planning and implementing the MOU capital projects to improve capacity, speed and service, bringing at least some segments of our rail network up to the federally defined high speed of 110 miles per hour or greater and to implement a blended system of rail services. In addition to the MOU project list, these projects are detailed in the LOSSAN Strategic Implementation Plan for 2030 and the Metrolink 2015 Strategic Assessment that looks out 10 years to 2025. As speeds and service levels improve, these services will become more competitive with SOV travel and as a result ridership will continue to grow. Further, their schedules should be adjusted once the state’s High-Speed Train project is implemented, so that all rail services complement and feed one another.

Improve Accessibility and Connectivity: This strategy includes establishing rail connections to our region’s airports, and improving transit, bicycling and walking accessibility and connectivity to rail stations. Burbank Bob Hope Airport is presently the region’s best-served airport by rail, and will soon host two rail stations in the near future with service provided by two Metrolink lines, Amtrak and the state’s High-Speed Train in the future. Ontario International Airport (ONT) is not directly served by rail, although SCAG together with Metro, SANBAG and CHSRA are studying various options to provide direct rail service

to the airport. LAX is also currently not served by any rail, but will be within the next decade via the Crenshaw Line and the Airport Metro Connector. Improving transit bicycling and walking accessibility to our region's passenger rail stations is also critical. Increasing rail feeder bus services in our region to passenger rail stations would reduce the incentive for SOV travel. Establishing more transit services such as OCTA's Stationlink service would provide this incentive. Finally, there is still little BRT or BRT-Lite service in our region outside of Los Angeles County, and establishing more BRT routes to serve rail stations such as the current Omnitrans sbX Green Line and the Riverside Transit Agency's future RapidLink Line 1 will help meet this goal.

Secure Increased Funding and Dedicated Funding Sources: Passenger rail has traditionally lacked dedicated funding streams. Amtrak is funded annually by the U.S. Congress, usually resulting in funding amounts insufficient to meet state of good repair needs or to increase Amtrak's levels of service and expand the network. With local control of the Pacific Surfliner now complete, the State of California has guaranteed funding levels to maintain current service levels (but not to increase service levels) for the first three years. One new funding source is California's Cap-and-Trade Transit and Intercity Rail Capital Program, which received \$25 million in FY2014-15 and 10 percent of annual Cap-and-Trade auction proceeds beginning in FY2015-16. This FY2015-16 allocation is currently estimated to be more than \$200 million. Similarly, the CHSRA has been given a dedicated Cap-and-Trade funding stream of 25 percent of funds, beginning in FY2015-16 (for FY2014-15 CHSRA received \$250 million). FY2015-16 funding is estimated at more than \$600 million.

Support Increased TOD and First/Last Mile Strategies: Increased TOD and first/last mile planning and investments are crucial to passenger rail station area planning. Increased and effective TOD improves our region's jobs/housing balance, and it reduces VMT, air pollution and greenhouse gas emissions. First/last mile investments also reduce VMT, air pollution and greenhouse gas emissions and encourage rail users to access rail stations with options other than driving alone.

Implement Cooperative Fare Agreements and Media: Cooperative fare agreements and media also offer opportunities for increasing rail ridership and attracting new riders. For example, the Rail2Rail pass allows Metrolink monthly pass riders who have origin and destination points along the LOSSAN corridor to ride Amtrak. In 2014, the North County Transit District (NCTD) reached an agreement with Caltrans Division of Rail (DOR), in which five daily Pacific Surfliner trains stop at all non-Pacific Surfliner Amtrak (Coaster) stops

in San Diego County. This service has proven quite popular and successful. Agreements like this one could be expanded once the California High-Speed Train is built.

Active Transportation

The 2016 RTP/SCS includes \$12.9 billion for active transportation improvements, including \$8.1 billion in capital projects and \$4.8 billion as part of the operations and maintenance expenditures on regionally significant local streets and roads. The Active Transportation portion of the 2016 Plan updates the Active Transportation portion of the 2012 Plan, which has goals for improving safety, increasing active transportation usage and friendliness, and encouraging local active transportation plans. It proposes strategies to further develop the regional bikeway network, assumes that all local active transportation plans will be implemented, and dedicates resources to maintain and repair thousands of miles of dilapidated sidewalks. To accommodate the growth in walking, biking and other forms of active transportation regionally, the 2016 Active Transportation Plan also considers new strategies and approaches beyond those proposed in 2012. Among them:

- Better align active transportation investments with land use and transportation strategies to reduce costs and maximize mobility benefits
- Increase the competitiveness of local agencies for federal and state funding
- Develop strategies that serve people from 8–80⁵ years old to reflect changing demographics and make active transportation attractive to more people
- Expand regional understanding of the role that short trips play in achieving RTP/SCS goals and performance objectives, and provide a strategic framework to support local planning and project development geared toward serving these trips
- Expand understanding and consideration of public health in the development of local plans and projects.

⁵ 8–80 years old is an age span that is used as a shorthand to refer to expanding the potential for all people to use active transportation. The term refers to addressing the needs school aged children who would be conceivably allowed to walk or bike to school unaccompanied if the environment were safer and older senior citizens who prefer physical separation from the noise and speed of vehicles.

Active Transportation has 11 specific strategies to maximize active transportation in the SCAG region. These are grouped into four broad categories: regional trips, transit integration, short trips and education/encouragement. All 11 strategies are based on a comprehensive local bikeway and pedestrian network that uses Complete Streets principles. These strategies include:

Regional Trips Strategies:

1. Regional Greenway Network
2. Regional Bikeway Network
3. California Coastal Trail Access

Transit Integration Strategies:

4. First/last mile (to transit)
5. Livable Corridors
6. Bike Share Services

Short Trips Strategies:

7. Sidewalk Quality
8. Local Bikeway Networks
9. Neighborhood Mobility Areas

Education/Encouragement Strategies:

10. Safe Routes to School
11. Safety/Encouragement Campaigns

Regional Trips Strategies

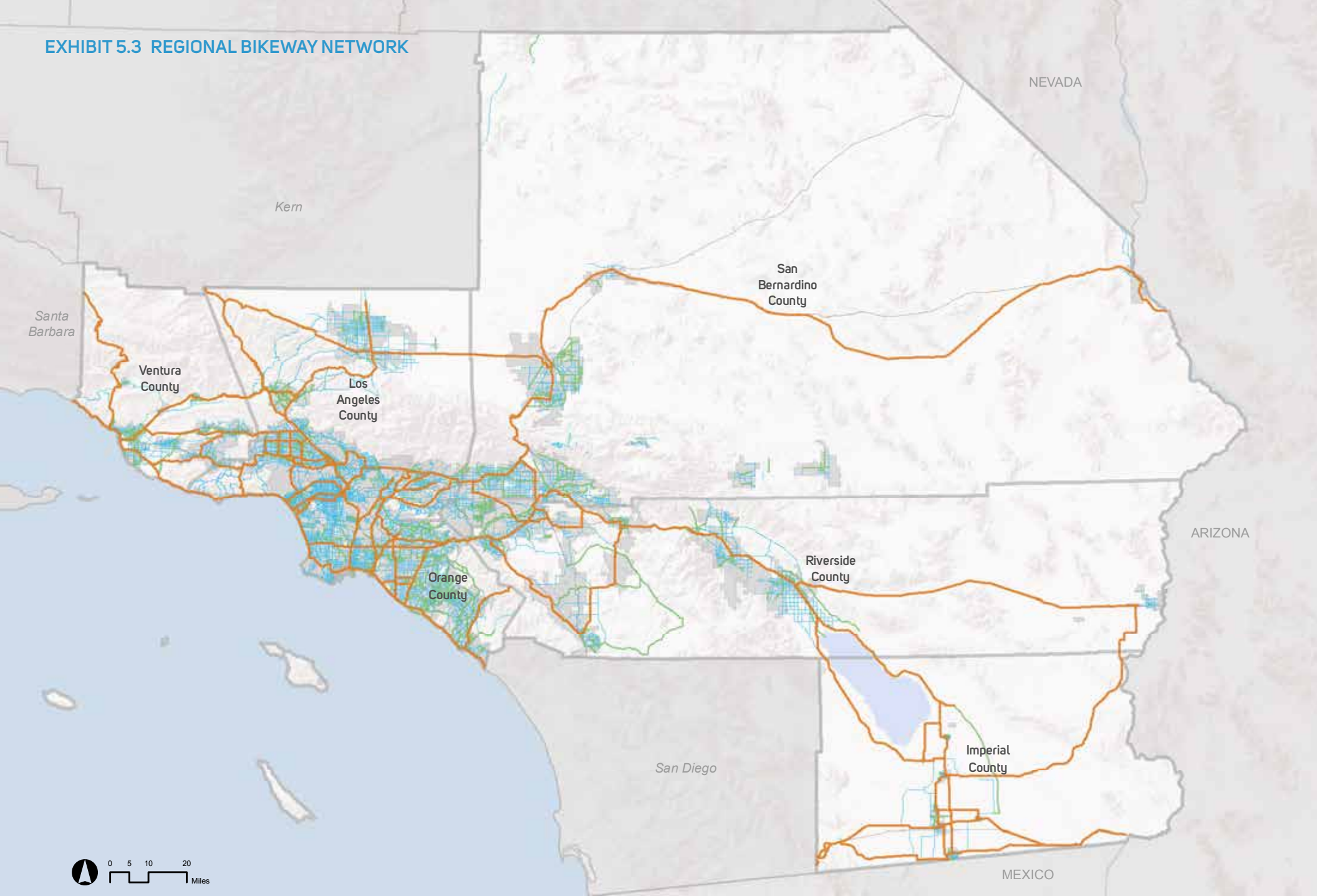
Developing the following networks will serve those longer trips that people make less frequently, but add to total miles traveled. They are primarily biking trips for commuting and recreation. Although trips covering the full length of these corridors may be a small percentage of active transportation travel, the networks provide a backbone for shorter trips, much in the way the Interstate Highway System is used by many people as a bypass for short trips from one on-ramp to the next off-ramp. Completing the following networks are key strategies for promoting regional trips:

1. **Regional Greenway Network (RGN):** The planned RGN is a 2,200-mile system of separated bikeways mostly using riverbeds, drainage channels and utility corridors. The RGN connects to the regional

bikeway network. This strategy provides the opportunity to better integrate urban green space, active transportation and watershed management, providing new urban green space for residents to go to for travel and recreation, including low-stress access to the California Coastal Trail. Benefits include increased health, improved safety and enhanced quality of life. These low-stress bikeways, connected to the regional bikeway network and local bikeways, should provide an attractive option for those bicyclists who do not wish to ride along roadways with motor vehicles. They include the High Desert Corridor; Santa Ana River Trail; OC Loop; Los Angeles River; San Gabriel River; San Jose Creek; Rio Hondo River; Ballona Creek; Bike Route 33; and CVLink.

2. **Regional Bikeway Network (RBN):** The planned RBN consists of 2,220 miles of interconnected bikeways that connect to jurisdictions, local bikeways and destinations. It connects to the RGN and has designated routes and wayfinding signage that help bicyclists easily understand the route structure and destinations. The primary purpose is to serve regional trips, commuting and recreational bicycling. Using locally existing and planned local bikeways as the foundation, the RBN closes gaps, connects jurisdictions, and provides a regional backbone for local bikeways and greenways. By having assigned route names/numbers, bicyclists can more easily travel across jurisdictions without having to frequently consult maps or risk having bikeways end on busy streets. It is anticipated that trips longer than three miles will likely be used in part on the RBN. SCAG has identified 12 regionally significant bikeways that connect the region. These include Bike Route 66; Bike Route 10; Bike Route 126; Pacific Coast Bike Route; Bike Route 5; Santa Ana River Trail; High Desert Corridor; Bike Route 33; Los Angeles River; San Gabriel River; Bike Route 86; and Bike Route 76 (see [EXHIBIT 5.3](#)).
3. **California Coastal Trail (CCT) Access:** Trails along the coast of California have been utilized as long as people have inhabited the region. The CCT was established by the Coastal Act of 1976 to develop a "continuous public right-of-way along the California coastline; a trail designed to foster appreciation and stewardship of the scenic and natural resources of the coast through hiking and other complementary modes of non-motorized transportation." The 2016 RTP/SCS Active Transportation Appendix identifies the improvements necessary to help complete the portions of the CCT in Ventura, Los Angeles and Orange counties and to provide biking and walking access to the CCT.

EXHIBIT 5.3 REGIONAL BIKEWAY NETWORK



Regional Bikeway Network Regional Greenway Network Local Bikeway Networks

(Source: SCAG)

Transit Integration Strategies

Transit Integration refers to a suite of strategies designed to better integrate active transportation and transit by improving access for pedestrians, bicyclists and other people traveling under their own power around transit stations. Active transportation projects that fall within this suite of strategies are particularly competitive for Cap-and-Trade funding programs. Cap-and-Trade funding programs include the Affordable Housing and Sustainable Communities Program (AHSC), which aims to better link housing, transit and active transportation to reduce greenhouse gas emissions. With this in mind, the strategies detailed below will be most successful if they are coordinated with land use strategies such as TOD and providing affordable housing.

4. **First/Last Mile (to rail):** This strategy uses a Complete Streets approach to maximize the number of people walking or biking to rail. By 2040, 11 percent of people will live within one half mile of a rail station, and 27 percent will live within one mile of a rail station. By increasing the comfort and removing barriers to walking or biking, more people will walk or bike to transit stations. These stations include all Los Angeles County light rail, subway and fixed guideway bus stations and Metrolink stations; all Orange County Metrolink Stations and OC Bravo busways; all San Bernardino County Metrolink stations and SBx busways; all Riverside County Metrolink stations; and all Ventura County Metrolink stations.

The existing transit access “shed” is considered the half-mile radius around a station (requiring a 10-minute walk), although in many cases the access shed is much smaller due to barriers in the built environment (a lack of crosswalks, long blocks, unsafe overpasses or underpasses). The strategy of developing first/last mile solutions will increase the number of people walking within and beyond one half mile, by creating the conditions that allow people to travel a longer distance in the same amount of time (10 minutes). The number of bicyclists accessing transit is also anticipated to increase, both within the one-mile bike access shed and beyond to a new bike access shed of three miles (requiring a 15-minute bike ride). Infrastructure improvements may include dedicated bike routes, sidewalk enhancements, mid-block crossings (short-cuts), reduced waiting periods at traffic signals, bicycle parking, signage and wayfinding, and others.

In Los Angeles County, Metro has proposed an extensive active transportation network to support first/last mile access, including pathways that extend one half mile around each of the Metro stations.

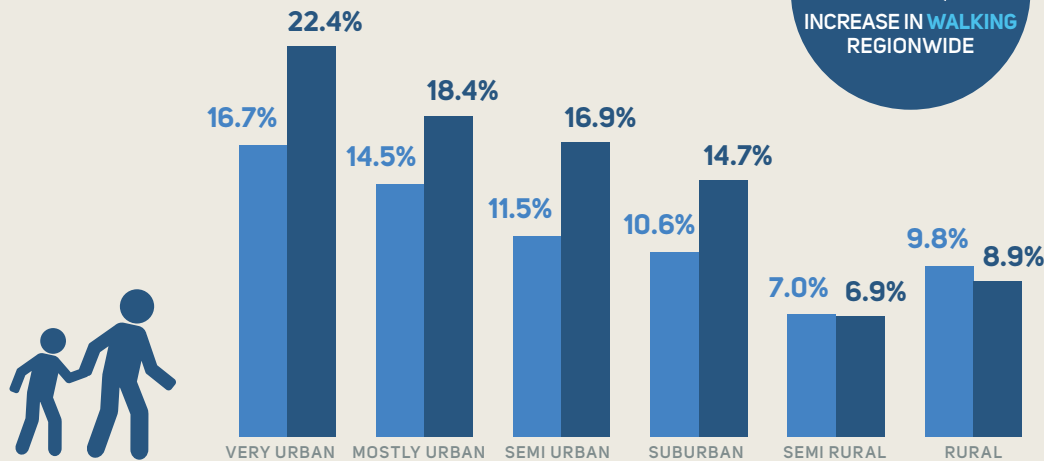
The pathways are envisioned to provide facilities and design elements that are consistent across the transit system, enabling seamless and intuitive door-to-door journeys. Pathways will be established along the most heavily traveled routes to transit stations, connecting riders to and from population and employment centers and other major destinations. They will improve and shorten the time it takes to access transit, enhancing the overall transit experience. The pathways will also facilitate transfers between modes, including traditional modes such as buses and park and ride lots, as well as new mobility options such as bike share and car share that can be integrated throughout active transportation networks.

First/last mile plans that include many of the same investments as outlined in Metro’s first/last mile plan have been completed in Orange and San Bernardino counties as well. The regional strategy builds upon these planned investments, proposing enhancements at 224 rail stations by 2040.

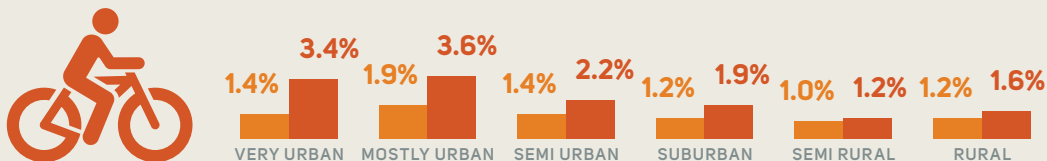
5. **Livable Corridors:** From an active transportation standpoint, this strategy is similar to the first/last mile strategy noted above, but it targets high-quality bus corridors rather than the rail and fixed guideway system. (Planning for growth around Livable Corridors is also an important land use strategy) Livable Corridors share many of the same characteristics as transit-oriented rail corridors, but they have lower density development. Active transportation investments focus on sidewalk maintenance/enhancement, intersection improvements, bicycle lanes and bicycle boulevards to facilitate safe and easy access to mixed-use commercial nodes where residents can meet most of their daily needs and access bus service. In addition, this strategy promotes the inclusion of bike lanes, shared bus-bike lanes or separated bikeways. These run along or parallel to the main corridor to promote inter-regional connectivity. In developing the 2016 RTP/SCS, SCAG identified just under 3,000 miles of potential Livable Corridors. However, the investments proposed in the Plan under this strategy are not tied to a specific corridor; rather, the Plan assumes resources to support 670 miles accessing and along 154 miles of corridor. The Plan also provides policy language to support a much broader rollout of Livable Corridors to inspire and support local planning for projects. Having plans prepared with shovel-ready projects will allow our region to effectively compete for Affordable Housing and Sustainable Communities Program Inter-Connected Projects.

Biking & Walking in the Region

WALK TRIPS 2012 BASE YEAR 2040 PLAN



BIKE TRIPS 2012 BASE YEAR 2040 PLAN



Go Human and Traffic Safety

Across the SCAG region, the nature of streets and types of travel on them is changing dramatically. Bicycling is growing in popularity and the expansion of transit and explosion of new mobility services, like Uber and Lyft, means more people are walking and biking to make connections. However, as more people bicycle and walk, safety for these modes becomes increasingly important. In the SCAG region in 2012, 27 percent and five percent of all traffic fatalities were pedestrians and bicyclists, respectively.

Funded by a \$2.3 million grant from the 2014 California Active Transportation Program, SCAG and its partners launched Go Human, a campaign to promote traffic safety and encourage people to walk or bike. Go Human is a reminder to all that people on the road are not just objects that get in our way—they are human beings. In late September 2015, messaging encouraging drivers to slow down and look for pedestrians and cyclists was distributed across all six counties in both English and Spanish. Advertisements appeared on local transit buses, bus shelters, Facebook, Pandora and local radio stations throughout the region. The launch date coincided with the decline in daylight hours, a period when pedestrian collisions begin to peak.

Go Human is a collaborative effort with county transportation commissions, county health departments and local cities and jurisdictions across the region. SCAG has worked with partners to expand the initial advertising purchases through partner newsletters, advertisements on websites, posters in local facilities and on social media. For example, the Los Angeles County Department of Public Works donated advertising space at 100 bus shelters. SCAG's funding also includes the production of toolkits and trainings to promote active transportation and the implementation of open streets and temporary events starting in spring 2016. For more information on the campaign, visit www.gohumansocal.org.



6. **Bike Share Services:** Bike share is a point-to-point service combining the convenience of a bicycle with the accessibility of public transportation.⁶ Using closely packed bike rental kiosks in heavily urbanized areas, bike share is designed to replace short-distance motor vehicle trips, reduce parking demand and complement local bus services such as DASH in the City of Los Angeles. Most importantly, bike share acts as a first/last mile strategy and it will be closely integrated with high quality transit stations. Los Angeles Metro, Santa Monica and Long Beach are currently implementing bike share within Los Angeles County. Bike share is anticipated to grow beyond these initial areas over the course of the Plan. A pilot program was recently completed in the City of Fullerton, in Orange County. The University of California, Irvine already has a bike share system in place for students and faculty. The regional bike share system will be comprised of about 8,800 bikes and 880 stations/kiosks.

Short Trips Strategies

For the purposes of this RTP/SCS, SCAG considers short trips as any trip less than three miles. These trips are primarily the utilitarian trips we take every day to the store, school or a restaurant. Planning policy objectives, including reducing VMT and greenhouse gas emissions and improving public health, depend highly on our region's ability to address these short trips. That's because trips less than three miles account for 38 percent of all trips in the region. Short trips can easily be taken by walking or biking.

The land use strategies described earlier in this chapter and promoted by the 2016 RTP/SCS seek to improve location efficiency—in other words, minimize the distance between origins and destinations to create even more short trips in the future. The short trip strategies described below aim to ensure that the roadway network evolves to help realize the walkable/bikeable vision advanced by land use strategies in regional and local plans, and improve mobility and reduce travel times in locations that are already considered location-efficient.

7. **Sidewalk Quality:** The Plan calls for 10,500 miles of sidewalks to be repaired or improved. This includes making them Americans with Disabilities Act (ADA) compliant and adding amenities such as exercise spots (logs or other no-maintenance objects that can be used for sitting, stretching or mild exercise) and rest seats for older walkers.

These improvements are in addition to sidewalk enhancements incorporated into the other active transportation strategies.

8. **Local Bikeway Networks:** The region's Local Bikeway Networks promote local mobility, while also providing the needed bikeway density to interconnect with the regional bikeway network. The Plan proposes expanding the local bikeway network by an additional 6,016 miles. This is in addition to the 2,760 additional bikeway miles incorporated into other active transportation strategies, bringing total regional, local and greenway bikeway mileage to 12,700.
9. **Neighborhood Mobility Areas:** This strategy is targeted to locations that have a high proportion of short trips due to the mix of land uses, a fairly dense street grid pattern and the presence of locally serving retail destinations. These locations, however, do not benefit from high quality transit. Where Livable Corridors focus on connections to a corridor, Neighborhood Mobility Areas focus on connections within the neighborhood—to schools, places of worship, parks or greenways, and other destinations. SCAG has identified potential locations in the region to establish Neighborhood Mobility Areas. However, the investments proposed in the Plan under this strategy are not tied to a specific community. Some of the practices that inform this concept include: Level of Traffic Stress (LTS) bicycle planning, NEV planning, Plug-in Vehicle (PEV) readiness planning and a geographic analysis of commute trip lengths. These planning practices are based on the idea that non-auto trips increase as the perceived danger and anxiety for the user decreases.

Education/Encouragement Strategies

Getting more people to bike and walk is not just about building the infrastructure. Individuals must feel safe biking and walking. The 2016 RTP/SCS Safety campaigns have two strategies: Safe Routes to School, which focuses on instilling safe habits at a young age while encouraging walking and biking to school; and a Safety/Encouragement campaign, which aims to reach all roadway users through a mix of education and training seminars and encouragement strategies.

10. **Safe Routes to School:** Safe Routes to School is a comprehensive TDM strategy aimed at encouraging children to walk and bicycle to school. It includes a wide variety of implementation strategies centered on the "6 Es"—Education, Encouragement, Engineering,

⁶ King County Bike Share Business Plan. (2012). The Bike Share Partnership. Accessed at http://altaplanning.com/wp-content/uploads/King_County_Bike_Share_Business_Plan_0.pdf.

EXHIBIT 5.4 MAJOR HIGHWAY PROJECTS



- ↗ Express Lanes
 ↗ Toll Lanes
↗ Mixed-Flow Lanes
↗ Freight Corridors
↗ HOV Lanes
↗ Improvement TBD
- ▲ Planned/Proposed Express Lane Direct Connectors
 ▲ Proposed HOV-to-Express Lane Direct Connector Conversions
● HOV Lane Connectors

(Source: SCAG)

Enforcement, Evaluation and Equity. When implemented, the 6 Es improve safety, reduce congestion and VMT, improve air quality and increase the physical activity of students and their parents—which improves public health outcomes. SCAG works with each county through SCAG’s sustainability joint work programs, which are collaborative planning programs designed to support regional sustainability goals through local projects. Each joint-work program includes a Safe Routes to School program component.

11. **Education/Encouragement Campaigns:** Safety campaigns that employ advertising, public service announcements and media kits are designed to educate the public on the importance of safety. Other efforts aim to educate bicyclists, pedestrians and motorists on the rights and responsibilities of sharing the road. The 2016 RTP/SCS anticipates that these campaigns will be conducted every five years during the course of the Plan.

Highways and Arterials

The majority of trips in our region today is still made on our region’s highways and arterials. Yet, the expansion of our highways and arterials has slowed down over the last decade. Revenue from traditional sources to fund transportation improvements is declining and costly expansions to address congestion may not be financially feasible. However, given that critical gaps and congestion chokepoints still exist within the network, improvements beyond TSM and TDM strategies need to be considered. Closing these gaps to complete the system will allow residents and visitors alike to enjoy improved access to opportunities such as jobs, education, recreation and healthcare.

Our highways and arterials serve as a crucial backbone of our overall regional transportation network. As part of the 2016 RTP/SCS, SCAG continues to advocate for a comprehensive solution based on a system management approach to manage and maintain our highway and arterial network. Although we recognize that we can no longer rely on system expansion alone to address our mobility needs, critical gaps and congestion chokepoints in the network still hinder access to certain parts of the region. County transportation plans have identified projects to close these gaps, eliminate congestion chokepoints and complete the system. Such improvements are included in the 2016 RTP/SCS. [EXHIBIT 5.4](#) and [TABLE 5.5](#) highlight some of the proposed highway completion projects. For projects that are currently or will be going through environmental clearance, SCAG would update the list as part of future RTP amendments if warranted by the nature of the project changes. A comprehensive list of projects is provided in the Project List Appendix.

Our region boasts one of the most comprehensive High Occupancy Vehicle (HOV) systems in the nation and heavy investments have been made to expand it. As part of the Plan, strategic HOV gap closures, highway-to-highway direct HOV connectors, and HOV direct access ramps need to be proposed as a strategy to complete the system. In addition, it should be noted that various highways within Orange County feature continuous access on certain HOV lanes. Studies have shown that continuous access HOV lanes do not perform any worse compared with limited access HOV lanes. [TABLE 5.6](#) highlights some of the Plan’s major HOV projects.

Our region’s arterial system is comprised of local streets and roads that serve many different functions. One is to link our region’s residents with schools, jobs, healthcare, recreation, retail and other destinations. Our region’s arterials account for more than 80 percent of the total road network and they carry a majority of overall traffic. A number of arterials run parallel to major highways and they can provide alternatives to them. Beyond motor vehicles, our arterials serve other modes of travel, including transit and active transportation. The 2016 RTP/SCS proposes a variety of arterial projects and improvements throughout the region. Operational and technological improvements can maximize system productivity through various cost-effective and non-labor intensive means—beyond improvements to expand capacity. These include signal synchronization, spot widening and adding grade separations at major intersections. In addition, as part of the Complete Streets Deputy Directive⁷ (DD-64-R2), improvements such as bicycle lanes, lighting, landscaping, sidewalk widening and ADA compliance measures have shifted the focus of arterials toward considering multiple users—while also providing a greater sense of place. The 2016 RTP/SCS highways and local arterials framework and guiding principles are summarized here:

- Focus on achieving maximum productivity through strategic investments in system management and demand management.
- Focus on adding capacity primarily (but not exclusively) to:
 - Close gaps in the system.
 - Improve access where needed.
- Support policies and system improvements that will encourage the seamless operation of our roadway network from a user perspective.

⁷ Complete Streets – Integrating the Transportation System. (2014) [Deputy Directive]. California Department of Transportation. Accessed at: http://www.dot.ca.gov/hq/tp/offices/ocp/docs/dd_64_r2.pdf.

TABLE 5.5 SAMPLE MAJOR HIGHWAY PROJECTS COMMITTED BY THE COUNTIES

	COUNTY	ROUTE	DESCRIPTION	COMPLETION YEAR	COST (\$1,000s)
MIXED-FLOW LANES	Imperial	SR-98	Widen and improve SR-98 or Jasper Rd to 4/6 lanes	2025	\$1,170,483
	Imperial	SR-111	Widen and improve to a 6-lane highway with interchanges to Heber, McCabe, and Jasper, and overpass at Chick Rd	2030	\$999,136
	Los Angeles	SR-57/SR-60	Improve the SR-57/SR-60 interchange	2029	\$475,000
	Orange	I-5	Add one mixed-flow lane in each direction from SR-57 to SR-91	2040	\$305,924
	Orange	SR-55	Add one mixed-flow lane in each direction and fix chokepoints from I-405 to I-5 and add one auxiliary lane in each direction between select on/off ramps and operational improvements through project limits	2030	\$274,900
	Orange	SR-91	Add one eastbound mixed-flow lane on SR-91 from SR-57 to SR-55 and one westbound mixed-flow lane from Kraemer to State College	2030	\$425,000
	Orange	I-405	Add one mixed-flow lane in each direction from I-5 to SR-55	2030	\$374,540
	Orange	I-405	Add one mixed-flow lane in each direction from SR-73 and I-605	2022	\$1,300,000
	Ventura	SR-118	Add one mixed-flow lane in each direction from Tapo Canyon Rd to LA Avenue	2025	\$216,463
EXPRESS LANES	Los Angeles	I-110	Construct express lane off-ramp connector from 28th St to Figueroa St	2023	\$55,000
	Riverside	I-15	Add one express lane in each direction from Cajalco Rd to SR-7	2029	\$453,174
	San Bernardino	I-15	Add two express lanes in each direction from US-395 to I-15/I-215 interchange	2030	\$687,994
HOV LANES	Los Angeles	I-5	Add one HOV lane in each direction from Weldon Canyon Rd to SR-14	2017	\$410,000
	Los Angeles	SR-14	Add one HOV lane in each direction from Ave P-8 to Ave L	2027	\$120,000
	Los Angeles	SR-71	Convert expressway to highway-add one HOV lane and one mixed-flow lane	2028	\$13,392
	Orange	I-5	Add one HOV lane in each direction from Pico to SD County Line	2040	\$237,536
	Riverside	I-15	Add one HOV lane in each direction from SR-74 to I-15/I-215 interchange	2039	\$375,664
	San Bernardino	I-10	Add one HOV lane in each direction from Ford to RV County Line	2030	\$126,836
	San Bernardino	I-215	Add one HOV lane in each direction from SR-210 to I-15	2035	\$249,151
	San Bernardino	I-210	Add one HOV lane in each direction from I-215 to I-10	2040	\$178,780
Ventura	US-101	Add one HOV lane in each direction from LA/VEN County Line to SR-33	2029	\$132,000	

TABLE 5.6 MAJOR HOV LANE PROJECTS

COUNTY	ROUTE	FROM	TO	COMPLETION YEAR
Los Angeles	I-5	Weldon Canyon	SR-14	2017
Los Angeles	I-5	Pico Canyon	Parker Rd	2025
Los Angeles	SR-14	Ave P-8	Ave L	2027
Los Angeles	SR-71	Mission Blvd	Rio Rancho Rd	2028
Orange	I-5	Pico	SD County Line	2040
Orange	I-5	SR-55	SR-57	2018
Orange	SR-73	I-405	MacArthur	2040
Riverside	I-15	SR-74	I-15/I-215 Interchange	2039
Riverside	I-215	Nuevo Rd	Box Springs Rd	2030
San Bernardino	I-10	Ford St	RV/SB County Line	2030
San Bernardino	I-215	SR-210	I-15	2035
San Bernardino	I-210	I-215	I-10	2040
Ventura	US-101	Moorpark Rd	SR-33	2029
HIGHWAY TO HIGHWAY HOV CONNECTORS				
Los Angeles	I-5/I-405	Connector (partial)		2029
Los Angeles	I-405/I-110	Connector Improvements		2021
Orange	I-405/SR-73	Connector		2040
San Bernardino	I-10/I-15	Connector (partial)		2035

TABLE 5.7 REGIONAL EXPRESS LANE NETWORK

	COUNTY	ROUTE	FROM	TO
EXPRESS LANE ADDITIONS	Los Angeles	I-10	I-605	San Bernardino County Line
	Los Angeles	I-105*	I-405	I-605
	Los Angeles	I-405**	I-5	Orange County Line
	Los Angeles	I-605	I-10	Orange County Line
	Orange	SR-55	SR-91	I-405
	Orange	SR-73	I-405	MacArthur Boulevard
	Orange	I-405**	Los Angeles County Line	SR-55
	Orange	I-605	Los Angeles County Line	I-405
	Riverside	I-15**	San Bernardino County Line	SR-74
	Riverside	SR-91*	Orange County Line	I-15
	San Bernardino	I-10**	Los Angeles County Line	Ford Street
	San Bernardino	I-15**	High Desert Corridor	Riverside County Line
EXPRESS LANE DIRECT CONNECTORS	Los Angeles	I-405/I-110	I-405 NB to I-110 NB and I-110 SB to I-405 SB	
	Orange	I-5/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	SR-91/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	SR-91/SR-241	SR-241 NB to SR-91 EB and SR-91 WB to SR-241 SB	
	Orange	I-405/SR-55	Existing HOV to proposed express lane direct connector	
	Orange	I-405/SR-73	Planned HOV to proposed express lane direct connector	
	Orange	I-405/I-605	Existing HOV to proposed express lane direct connector	
	Riverside	SR-91/I-15	SR-91 EB to I-15 SB and I-15 NB to SR-91 WB	

Notes: * Dual express lanes for entire length ** Dual express lanes for a section

- Any new roadway capacity project must be developed with consideration and incorporation of congestion management strategies, including demand management measures, operational improvements, transit and ITS, where feasible.
- Focus on addressing non-recurring congestion with new technology.
- Support Complete Streets opportunities where feasible and practical.

Regional Express Lane Network

Consistent with our regional emphasis on the system management pyramid, recent planning efforts have focused on enhanced system management, including the integration of value pricing to better use existing capacity and offer users greater travel time reliability and choices. Express lanes that are appropriately priced to reflect demand can outperform non-priced lanes in terms of throughput, especially during congested periods. Moreover, revenue generated from priced lanes can be used to deliver the needed capacity provided by the express lanes sooner and to support complementary transit investments.

The regional express lane network included in the 2016 RTP/SCS builds on the success of the State Route 91 express lanes in Orange County, as well as the Interstate 10 and Interstate 110 express lanes in Los Angeles County. Additional efforts underway include the extension of the State Route 91 express lanes to Interstate 15, as well planned express lanes on Interstate 15 in Riverside County. Express lanes are also planned for Interstate 15 and Interstate 10 in San Bernardino County and Interstate 405 in Orange County. [TABLE 5.7](#) displays the segments in the proposed regional express lane network.

Goods Movement

Recent regional efforts have focused on strategies to develop a coherent, refined and integrated regional goods movement system that would address expected growth trends. Key strategies are highlighted below.

Regional Clean Freight Corridor System

The 2016 RTP/SCS continues to envision a system of truck-only lanes extending from the San Pedro Bay Ports to downtown Los Angeles along Interstate 710, connecting to the State Route 60 east-west segment and finally reaching Interstate 15 in San Bernardino County. Such a system would address the growing truck traffic and safety issues on core highways through the region and serve key goods movement industries. Truck-only lanes add capacity in congested corridors, improve truck operations and safety by separating trucks and autos, and provide a platform for the introduction of

zero- and near zero-emission technologies. Ongoing evaluation of a regional freight corridor system is underway, including recent work on an environmental impact report (expected to be recirculated in 2016) for the Interstate 710 segment. Additionally, as a part of the 2016 RTP/SCS, SCAG continues to refine the east-west corridor component of the system along the State Route 60 corridor. Current efforts have focused on working to identify an initial operating segment. Additional study is underway to evaluate the East-West Freight Corridor project concept.

The East-West Freight Corridor would carry between 58,000 and 78,000 clean trucks per day that would be removed from adjacent general-purpose lanes and local arterial roads. The corridor would benefit a broad range of goods movement markets, both port-related and local goods movement-dependent industries. Truck delay would be reduced by up to 11 percent. Truck traffic on State Route 60 general purpose lanes would be reduced by 42 to 82 percent, depending on location; it would be reduced by as much as 33 percent on Interstate 10 and as much as 20 percent on adjacent arterials. Separating trucks and autos would also reduce truck-involved collisions on east-west highways that currently have some of the highest collision levels in the region (20–30 collisions a year on certain segments).

The regional freight corridor system also includes an initial segment of Interstate 15 that would connect to the East-West Freight Corridor, reaching just north of Interstate 10. Additional study is anticipated for this segment.

Truck Bottleneck Relief Strategy

In 2013, the American Transportation Research Institute (ATRI) identified the Los Angeles Metropolitan Area as leading the nation in costs to the trucking industry caused by traffic congestion, with nearly \$1.1 billion in added operational costs to truckers.⁸ The SCAG region had five of the top 100 truck bottlenecks in the U.S. in 2014—identified by ATRI as follows:

#8	State Route 60 at State Route 57 in Los Angeles County
#17	Interstate 710 at Interstate 105 in Los Angeles County
#37	Interstate 10 at Interstate 15 in San Bernardino County
#39	Interstate 15 at State Route 91 in Riverside County
#55	Interstate 110 at Interstate 105 in Los Angeles County. ⁹

⁸ Cost of Congestion to the Trucking Industry. (2014). American Transportation Research Institute.

⁹ Congestion Impact Analysis of Freight Significant Highway Locations. (2014). American Transportation Research Institute.

With driver wages and fuel costs representing more than 50 percent of total motor carrier costs, truck congestion has major impacts on the bottom line of the trucking industry. Truck bottlenecks are also emission “hot spots” that generally have significantly degraded localized air quality because of increased idling from passenger vehicles and trucks.

In past RTPs, SCAG directly addressed truck bottlenecks by developing a coordinated strategy to identify and mitigate the top-priority truck bottlenecks. This analysis has been updated for the 2016 RTP/SCS and includes a “refresh” of truck bottleneck delays for the locations where congestion data were available. It also identifies potential new truck bottlenecks.

The 2016 RTP/SCS allocates an estimated \$5 billion toward strategies to relieve goods movement bottlenecks. Examples of bottleneck relief strategies include ramp meterings, extending merging lanes, improving ramps and interchanges, improving capacity and adding auxiliary lanes. Additional information is provided in the Goods Movement Appendix.

Rail Strategy

The region’s railroad system provides critical connections between the largest port complex in the country and producers and consumers throughout the U.S. More than half of the international cargo arriving at the San Pedro Bay Ports uses rail. Railroads also serve domestic industries, predominantly for long-haul freight leaving the region. The extensive rail network in the SCAG region offers shippers the ability to move large volumes of goods over long distances at lower costs, compared with other transportation options. The 2016 RTP/SCS continues to incorporate the following rail strategies for goods movement:

- **Mainline Rail Improvements and Capacity Expansion:** This includes double or triple tracking certain rail segments, implementing new signal systems, building universal crossovers and constructing new sidings. These improvements would benefit both freight rail and passenger rail service, depending on their location.
- **Rail Yard Improvements:** This includes upgrades to existing rail yards, as well as construction of new yards to handle the projected growth in cargo volumes.
- **Grade Separations of Roads From Rail Lines:** These projects reduce vehicular delay, improve emergency vehicle access, reduce the risk of accidents and lower emissions levels.
- **Rail Operation Safety Improvements:** This includes technology such as Positive Train Control (PTC) that can greatly reduce the risk of rail collisions.

The benefits of the rail strategies to the region are considerable and include mobility, safety and environmental gains. These strategies could eliminate nearly 5,500 hours of vehicle delay per day at grade crossings, decrease emissions (NOx, CO2 and PM 2.5) by nearly 44,000 lb. per day, and reduce overall train delay to the year 2000 level.

Goods Movement Environmental Strategy

Along with growth in the region’s population and economy comes a growing demand to deliver goods in areas where people live and work. As a result, goods movement transportation has been a major source of emissions that contributes to regional air pollution problems, as well as localized air pollution “hot spots” that can have adverse health impacts. Moreover, much of the SCAG region (and nearly all of the urbanized area) does not meet federal ozone and fine particulate (PM 2.5) air quality standards. The transportation of goods is also a major source of greenhouse gas emissions that contribute to global climate change. Because of the need to maintain and improve our quality of life, economically and environmentally, SCAG proposes the environmental strategy below to address the air quality impacts of goods movement, while also allowing for the efficient and safe goods movement flow throughout the region. A critical component of this strategy, as described below, is the integration of advanced technologies that have co-benefits such as air quality, energy security and economic growth opportunities.

The 2016 RTP/SCS focuses on a two-pronged approach for achieving an efficient freight system that reduces environmental impacts. For the near term, the regional strategy supports the deployment of commercially available low-emission trucks and locomotives while centering on continued investments into improved system efficiencies. For example, the region envisions increased market penetration of technologies already in use, such as heavy-duty hybrid trucks and natural gas trucks. Applying ITS solutions to improve operational efficiency is also recommended. In the longer term, the strategy focuses on advancing technologies—taking critical steps now toward the phased implementation of a zero- and near zero-emission freight system. SCAG is cognizant of the need to incorporate evolving technologies with plans for new infrastructure. These include technologies to fuel vehicles, as well as to charge batteries and provide power.

The plan to develop and deploy advanced technologies includes phased implementation, during which technology needs are defined, prototypes are tested and developed, and efforts are scaled up. [FIGURE 5.3](#) illustrates this process. The phases are summarized as follows:

FIGURE 5.3 PHASES OF TECHNOLOGY DEVELOPMENT AND DEPLOYMENT



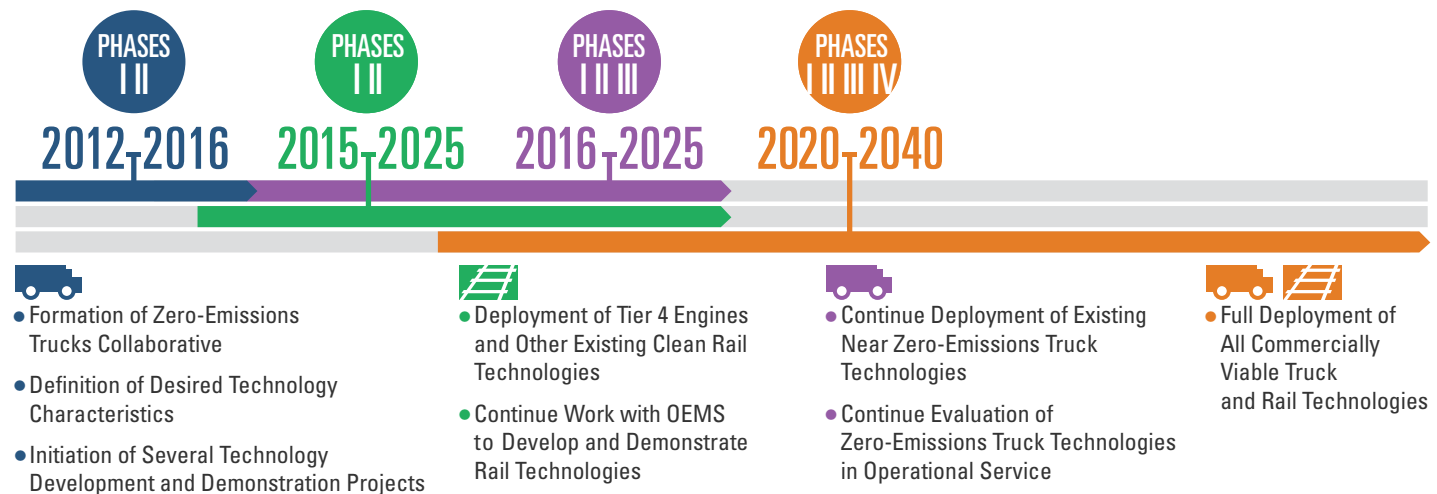
PHASE I Project Scoping and Evaluation of Existing Work: Continue to build on current regional research and technology testing efforts to further define the needs that the new technology must provide and to better understand the current capabilities, costs and stage of development of potential technologies.

PHASE II Evaluation, Development and Prototype Demonstrations: Evaluate, develop and test initial vehicle prototypes. Work with public and private sector partners to secure funding commitments for the development of new technology prototypes and demonstrations.

PHASE III Initial Deployment and Operational Demonstration: Initially deploy potential technologies, preferably with industry partners who can evaluate and report on their performance in the real world. Funding may be used for incentives for initial deployment and the continued evaluation and development of technologies.

PHASE IV Full-Scale Demonstrations and Commercial Deployment: Scale up deployment of viable technologies and implement needed regulatory and market mechanisms to launch them commercially. The Phase IV time frame accommodates the readiness of different levels of technology for various applications.

FIGURE 5.4 TRUCK AND RAIL TECHNOLOGY DEVELOPMENT AND DEPLOYMENT TIMELINE



Phases of New Technology Development and Deployment

The time frames illustrated in [FIGURE 5.4](#) suggest a path toward implementing the phases described above. This cycle of technology development is continuous, and it will renew itself as new innovations emerge and technologies continue to evolve. The timelines presented are broad, to capture the breadth of technologies in various stages of development and to allow for further innovation in this sector. This path is discussed in greater detail in the Goods Movement Appendix.

Since SCAG adopted the 2012 RTP/SCS, the region has attracted outside funding and committed its own funding to support research and development efforts. Several studies have been conducted to date that contribute to “project scoping” by providing a greater understanding of the regional truck market and how truck use defines key performance parameters such as range and power needs. To evaluate and develop prototypes, three large-scale research and development efforts are underway to develop and test zero-emission trucks and charging infrastructure. These projects require continuing collaboration between original equipment manufacturers and public sector agencies.

Meeting Airport Demand

As discussed in Chapter 2, our region is served by a multiple airport system that includes commercial airports, military airfields and general aviation airports. All of these airports function as part of a system that provides a high level of air service to our residents and to visitors. Services that are not practical or financially viable at one airport in the system can be provided at an alternative facility. In addition, many of our airports function as relievers for other airports in case of emergencies or irregular operations due to inclement weather or other unusual events.

The commercial passenger and cargo airports in our region, especially those in the urbanized areas, each face constraints on their operations. At each airport, these constraints may include airspace conflicts, runway configurations, terminal capacity, ground access congestion and legal restrictions such as noise control ordinances. Because of the varying constraints on individual airports, it is important to maintain a diverse group of airports to serve the overall air travel demand of the region extending into the future.

Accommodating the future demand for air passenger and air cargo is critical to the economic health of the region. The economic impact of air travel to the region is expected to increase from \$27.4 billion in 2012 to \$43.8 billion in 2040 (in 2012 dollars), an increase of nearly 60 percent. The number of jobs

supported by visitors arriving by air is expected to increase from 275,000 to 452,000. If the region’s aviation system and supporting ground access network cannot accommodate the expected demand, some of this potential economic activity could be lost to other regions.

Forecasting Air Passenger Demand Based on the historical relationship between economic activity and the demand for air travel, as well as expected future economic conditions in our and other regions, total air passenger demand in our region is expected to increase from 91.2 million annual passengers (MAP) in 2014 to 136.2 MAP in 2040. This represents a 1.6 percent annual growth rate over the forecast period. This regional demand forecast for air passenger travel is strong and reflects the potential for the region to have long-term economic recovery and growth. More detail about the forecast methodology is presented in the Aviation & Airport Ground Access Appendix.

Some of the airports in our region benefit from having long runways, uncongested airspace and spacious, modern terminals. Airports with these benefits are expected to be able to accommodate any growth in demand foreseeable through 2040. However, four of the commercial airports in urban parts of the region face physical or policy constraints that may limit their capacity to accommodate increases in demand by 2040. The individual airport demand forecasts reflect the following constraints:

- Burbank Bob Hope Airport: 7.3 MAP (airfield capacity)
- Los Angeles International Airport: 82.9–96.6 MAP (airfield capacity)
- Long Beach Airport: 5.0 MAP (noise compatibility ordinance)
- John Wayne Airport: 12.5 MAP (settlement agreement adopted by Board of Supervisors)

An analysis of these constraints is included in the Aviation & Airport Ground Access Appendix.

Several recent trends in the airline industry were considered in the capacity analyses. For example, the average number of seats on commercial flights in and out of airports in our region increased from 107 in 2007 to 119 in 2014, so each “operation” (take-off or landing) on the airfield and each “turn” (arrival and departure) of a gate can include more passengers. Therefore, as a result of airline industry trends, the estimated capacity of several constrained airports has increased compared to prior analyses, although there may not have been any physical change at the airport itself.

2040 AIR PASSENGER FORECAST

Airport Specific Demand, Million Annual Passengers (MAP)

Midpoint of 2040 Total
Regional Aviation Demand:

136.2 MAP



Based on the overall forecast regional demand for air travel, the origins and destinations of trips within the region and the capacity constraints of individual airports, the figure “2040 Airport Demand Forecasts” on the previous page presents the anticipated air travel demand at each commercial airport in our region in 2040.

Forecasting Air Cargo

The development of the air cargo demand forecasts is similar to that of the air passenger forecasts. The demand for air cargo is driven largely by the economic interrelationship of our region and other regions around the world. Because of its high cost, shipment by air is used primarily for time-sensitive and high-value goods. Total air cargo transported through our region’s airports has experienced an uneven recovery since the recession of 2007, but remained below year 2000 levels even in 2014. Based on the historical relationship between economic activity and the demand for air cargo, as well as expected future economic conditions in our and other regions, total air cargo demand in our region is expected to increase from 2.43 million metric tons in 2014 to 3.78 million metric tons in 2040. This represents a 1.8 percent annual growth rate over the forecast period.

In 2014, more than 99 percent of air cargo in our region was handled at five airports: Los Angeles International Airport (77 percent), Ontario International Airport (19 percent), Burbank Bob Hope Airport (2 percent), John Wayne Airport (0.7 percent) and Long Beach Airport (0.6 percent). Air cargo can be classified as “belly” cargo (carried in the bellies of passenger airplanes) or full-freighter cargo (carried in dedicated freighter aircraft). LAX handled nearly 99 percent of the region’s belly cargo and 70 percent of the full-freighter cargo.

Following the 2012 RTP/SCS, the air cargo forecasts assume some redistribution of air cargo across the airports in the region. Cargo carried on passenger airlines or by their cargo divisions is unlikely to be redistributed because these carriers benefit from consolidation of their passenger and cargo facilities at the same airport. Cargo carried by integrated delivery services, such as FedEx and UPS, is also unlikely to be redistributed because of the major investments these companies have made in facilities at individual airports (primarily, Ontario International Airport). Therefore, only cargo carried by charter airlines or all-cargo airlines would potentially diversify to other airports and, of the cargo that could potentially diversify, only some actually will.

Airport Ground Access

The ground access network serving the region’s airports is critical to both the aviation system and the ground transportation system. Passengers’ choice of

airports is based in part on the travel time to the airport and the convenience of access, so facilitating airport access is essential to the efficient functioning of the aviation system. In addition, airport related ground trips can contribute to local congestion in the vicinity of the airports.

Currently, more than 200,000 air passengers arrive at or depart from the region’s airports every day. By 2040, this number is forecast to increase to more than 330,000. Passenger surveys indicate that three percent of passengers take transit to LAX and one percent take transit to Burbank Bob Hope Airport. Surveys are not available at other airports, but because these two airports have the best transit access in the region it is likely that the transit share at the remaining airports is significantly below one percent.

The large majority of air passengers use a motor vehicle, either their own or a rental vehicle, to get to and from the airport. About half of all air passengers in the region are picked up or dropped off at the airport by a friend or relative. Each end of these pick-up/drop-off air trips results in two ground trips: one to the airport followed by one returning from the airport. Therefore, taking steps to encourage travelers to use transit or other modes of shared transportation is vital.

To reduce ground transportation congestion related to air passenger travel, the 2016 RTP/SCS includes the following strategies:

- Support the regionalization of air travel demand
- Continue to support regional and inter-regional projects that facilitate airport ground access (e.g., High-Speed Train, High Desert Corridor)
- Support ongoing local planning efforts by airport operators, CTCs and local jurisdictions
- Encourage the development and use of transit access to the region’s airports
- Encourage the use of modes with high average vehicle occupancy (AVO)
- Discourage the use of modes that require “deadhead” trips to/from airports

In recent years, airport operators, CTCs and SCAG have all undertaken their own initiatives to improve ground access at the region’s aviation facilities. The sections below discuss recent efforts and recommended strategies to improve ground access at three existing commercial airports in the region that have invested considerably in improving ground access. A more detailed discussion

of ground access improvement strategies at airports across the region is included in the Aviation & Airport Ground Access Appendix.

Burbank Bob Hope Airport

Burbank Bob Hope Airport is the only airport in the region with a direct rail-to-terminal connection, via the recently completed Regional Intermodal Transportation Center (RITC). The RITC serves multiple modes, including public parking, a consolidated rental car facility, regional bus service and bicycles, and commuter rail at the Metrolink Ventura line station. A pedestrian bridge currently in design will further facilitate access between the train station and the airport. In addition, a second rail station is currently planned on the Metrolink Antelope Valley line. BurbankBus has recently begun operating all-day bus service between the North Hollywood Metro Red Line Station and the airport, utilizing the RITC.

Key 2016 RTP/SCS projects for Burbank Bob Hope Airport include:

- Increased Metrolink service systemwide
- Metro Red Line extension from North Hollywood to Burbank Bob Hope Airport
- New east-west BRT service from Orange Line/North Hollywood to Pasadena (no direct connection to Burbank Bob Hope Airport)

Additional strategies include:

- Construct new Metrolink Station on Antelope Valley Line
- Support increased Metrolink service to stations on Ventura Line and Antelope Valley Line
- Support recommendations of recent Ground Transportation and Land Use Study:
 - Improve transit connection to North Hollywood Red/Orange Line Station
 - Improve transit connection to Pasadena and Glendale
- Support the development of a High-Speed Train station on Hollywood Way and provide convenient access between the station and the airport

Los Angeles International Airport

LAX is owned and operated by Los Angeles World Airports (LAWA), a

proprietary department of the City of Los Angeles. In December 2014, LAWA's Board of Airport Commissioners approved a plan to overhaul and modernize LAX's ground access and transportation connections for arriving and departing passengers. The approved program includes:

- The LAX Train (Automated People Mover System)
- Intermodal Transportation Facilities (ITF)
- Consolidated Rent-A-Car Center (CONRAC)
- Central terminal area improvements
- Connection with the under-construction Metro Crenshaw Line

The CONRAC will consolidate the numerous off-site rental car facilities in the surrounding area into one convenient location 1.5-miles east of LAX and adjacent to Interstate 405 for convenient regional highway access. Two ITFs are included in the program offering airport travelers locations for parking, passenger pick-up and drop off, and flight check-in outside the terminal and away from the congested World Way roadway within LAX. The eastern ITF will include Metro facilities to connect with Metro's planned 96th Street/Aviation Boulevard Station serving the under-construction Metro Crenshaw/LAX Transit Project and existing Metro Green Line, as well as a bus plaza for Metro and municipal buses. The LAX Train will be an elevated automated people mover system with six stations connecting the CONRAC, both ITFs and Metro facilities to the LAX passenger terminals. The environmental review process for this project began in 2015 and construction is expected to begin in 2017.

Key 2016 RTP/SCS projects for LAX include:

- New Crenshaw/Green Line station at 96th/Aviation
- Automated People Mover

Additional strategies include:

- Support construction of Automated People Mover (APM) with connection to Metro Crenshaw Line
- Support construction of Consolidated Rental Car facility and Intermodal Transportation Facilities to reduce private vehicles and shuttles in Central Terminal Area
- Support expansion of FlyAway service to new markets
- Support ability of ride-hailing services to pick up passengers, to reduce deadhead trips in the central terminal area

Ontario International Airport

The 2014 SANBAG Ontario Airport Rail Access Study examined six alternatives to connect Ontario Airport to the regional rail system. One of these alternatives is the Metro Gold Line Foothill Extension Phase 2C that would extend the eastern terminus of the Metro Gold Line to the airport. However, Phase 2C is not funded at this time. Improved transit access from the Rancho Cucamonga Metrolink Station is included in the 2016 RTP/SCS project list.

Key 2016 RTP/SCS projects for Ontario Airport include:

- New Rancho Cucamonga Metrolink to ONT rail connection
- Numerous local highway interchange, arterial and grade separation improvements

Additional strategies include:

- Support recommendations of SANBAG Ontario Airport Rail Access Study to initiate transit connection to Metrolink and build transit market
- Continue analysis of transit options in upcoming SCAG Inter-County Transit and Rail Study
- Support development of intermodal transportation center
- Explore possibility of direct access from future Interstate 10 Express Lanes
- Consider focus on tourist charters that can attract passengers and use high-capacity vehicles for ground access
- Continue improvements to highways and arterials

For more details on how the region is expected to meet demands for airport service in the future, see the Aviation & Airport Ground Access Appendix.

TECHNOLOGICAL INNOVATION AND 21ST CENTURY TRANSPORTATION

Since SCAG adopted the 2012 RTP/SCS, technology and innovation have emerged as major themes of this Plan update. Technology as a concept is a very broad topic. The term has myriad connotations and encompasses products such as smart phones and electric cars; advancements in software development such as real-time travel information and online banking; and new service paradigms such as ride sourcing and peer-to-peer home sharing. Some of these so-called “new” concepts have actually been around for a long time, but only recently have they scaled up because of technological innovations. For example, car

sharing and bike sharing concepts have been in development since the 1980s, but only in recent years has the ubiquity of cellular phones with Internet access, precise geographic mapping and the ability to instantly approve payments between users and providers made these systems more useful to a wider audience. The 2016 RTP/SCS uses the term “mobility innovations” to characterize the new technologies that help us move about the region.

MOBILITY INNOVATIONS

The 2016 RTP/SCS includes policies and analyzes the market growth of four key new mobility innovations: Zero-Emissions Vehicles, Neighborhood Electric Vehicles, Car sharing services and Ridesourcing (also known as Transportation Network Companies or TNCs). Please see the Mobility Innovations Appendix for policy recommendations and additional information.

Zero-Emissions Vehicles

While SCAG’s policies are technology neutral with regard to supporting zero- and/or near zero-emissions vehicles, this section will focus on zero-emissions vehicles. Since SCAG adopted the 2012 RTP/SCS, the Governor’s Office released the Zero Emissions Vehicle (ZEV) Action Plan for 2013 and 2015. These plans identified state level funding to support the implementation of Plug-in Electric Vehicle (PEV) and Hydrogen Fuel Cell refueling networks. As part of the 2016 RTP/SCS, SCAG modeled PEV growth specific to Plug-in Hybrid Electric Vehicles (PHEV) in the SCAG region. These are electric vehicles that are powered by a gasoline engine when their battery is depleted. The 2016 RTP/SCS proposes a regional charging network that will increase the number of PHEV miles driven on electric power. In many instances, these chargers may double the electric range of PHEVs. A fully funded regional charging network program would result in a reduction of one percent per capita greenhouse gas emissions.

Neighborhood Electric Vehicles (NEVs)

Neighborhood Mobility Areas reflect state and local policies to encourage the use of alternative modes of transportation for short trips. In the SCAG region, about 38 percent of all trips are three miles or less, but nearly 78 percent of these trips are made by driving full-sized cars. These short trips can easily be taken using an NEV. Policies to increase the purchase and roadway designs that increase the use of NEVs for short trips in Neighborhood Mobility Areas would result in a reduction of 0.1 percent per capita greenhouse gas emissions.

Shared Mobility (Includes the concept of Ridesourcing)

Shared Mobility refers to new mobility paradigms as well as old models that

GHG REDUCTIONS FROM MOBILITY INNOVATIONS 2040

ZERO-EMISSIONS VEHICLE (ZEV)

1.0%

NEIGHBORHOOD ELECTRIC VEHICLE (NEV)

0.1%

CARSHARING/ RIDESOURCING

0.9%

are finding new markets and methods of delivery, thanks to new technology platforms. Shared Mobility encompasses a wide range of services including:

- Return Trip Car Sharing
- Point-to-Point Car Sharing
- Peer-to-Peer Car Sharing
- Ridesourcing (also known as Transportation Network Companies)
- Dynamic On-Demand Private Transit
- Vanpool and Private Employer Charters

For all these services, mobile computing and payment systems are reducing transaction costs and opening up traditional mobility services to a wider population of producers and consumers. The net effect of these services on transportation mode choices and per capita VMT is still to be determined. However, preliminary research shows that the availability and use of these services correlates with a reduction in individual vehicle ownership. This reduction in ownership, meanwhile, results in an increase in non-motor vehicle modes for discretionary trips. In other words, people who no longer own a car will be more selective in their car trips.

In developing the 2016 RTP/SCS, SCAG looked at areas in which shared mobility services are expected to increase. The Plan anticipates robust growth in car sharing and ridesourcing. Ridesourcing is a term coined by researchers to refer to mobile phone-based applications that put riders in touch with drivers for a fee. Some drivers on one platform are professionals, while many other drivers are non-professionals earning income from giving rides. Policies to increase the use of car sharing and ridesourcing would result in a combined reduction of 0.9 percent greenhouse gas emissions.

ANTICIPATING CAR-TO-CAR COMMUNICATION AND AUTOMATED VEHICLE TECHNOLOGIES

Automakers already are manufacturing and installing advanced driver assist systems that can automatically center, reduce speed and brake in anticipation of vehicles ahead. Trucking companies are road testing automated driving and “platooning”—in which automated trucks safely follow or draft each other at very close distances to conserve fuel. Global corporations and research labs are testing small, fully automated vehicles on public roads. Certain automakers have begun experimenting with new service models like “fractional ownership” in which targeted customers collectively lease and share a vehicle. Locking and ignition packages are being offered to simplify the use of peer-to-peer

car sharing platforms. These developments point to a very different vehicle ownership paradigm 25 years from now.

Automated/Connected Vehicle (ACV) innovations cover a range of enabling advancements that allow vehicles to operate with less driver input and coordinate with other vehicles to achieve improvements in safety, throughput and user experience. The term ACV covers on-board sensing capabilities, data integration and vehicle-to-vehicle (V2V) communication. ACV covers two distinct innovation paths: autonomous operation, where vehicles rely on digital maps and on-board sensing to operate without any driver input; and connected vehicle operation, where vehicles communicate with one another as well as the roadways they are traveling on. However, these two paths are being developed simultaneously and they may need to be integrated to achieve full benefits in terms of safety and reducing congestion, as promised by researchers. Vehicle to Infrastructure (V2I) communication is another aspect that is covered under roadway ITS operations. It is important to note that vehicles capable of partially automated operation, such as the top-of-the-line Mercedes S-Class and Infiniti Q35, are already available to the public. The California and Nevada Departments of Motor Vehicles (DMV) have already licensed manufacturers for on-road testing and those agencies will be releasing consumer model permitting rules by 2016.

Due to the uncertainty of deployment timelines and operational characteristics, initial research shows inconsistent impacts on travel behavior and locational choice. Some traffic simulations show that in the initial phases ACVs may increase congestion, especially if safety features are mandated at the expense of system operational efficiency. On the other hand, if fully automated vehicles change the vehicle ownership paradigm, they may facilitate more on-demand transportation services and an increased reduction in household vehicle ownership. In the long term, ACVs have the ability to dramatically increase the carrying capacity of the regional roadway network.

PROTECTING THE ENVIRONMENT

Integrating the many transportation and land use strategies discussed in this chapter will help protect the region’s natural environment—in numerous ways. SCAG has been committed to this integration, as well as protecting the environment, for years. However, environmental protection is now a major requirement of Moving Ahead for Progress in the 21st Century Act (MAP-21). Pursuant to Section 23 U.S. Code Section 134, “a long-range transportation plan shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including

activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.” The 2016 RTP/SCS also considers and is consistent with the provisions of the Fixing America’s Surface Transportation Act (FAST Act).

The 2016 RTP/SCS, therefore, includes a discussion of mitigation measures consistent with these requirements. As a public agency in California, SCAG first and foremost fulfills mitigation requirements by complying with the California Environmental Quality Act (CEQA), so this section of the Plan includes a summary of mitigation as laid out in the Program Environmental Impact Report (PEIR) accompanying the 2016 RTP/SCS.

In addition, as part of the planning process, MPOs “shall consult, as appropriate, with State and local agencies responsible for land use management, natural resources, environmental protection, conservation and historic preservation concerning the development of the transportation plan.” They also must consider, if available, “State conservation plans or maps” and “inventories of natural or historic resources.”

California law requires SCAG to prepare and certify a PEIR prior to adopting the 2016 RTP/SCS. The PEIR evaluates potential environmental impacts of the 2016 RTP/SCS when compared with existing conditions, and proposes measures at the program level to mitigate impacts to the maximum extent feasible for those resource areas that would be affected by the Plan (and associated induced growth). These impact areas include Aesthetics; Agriculture and Forestry Resources; Air Quality; Biological Resources; Cultural Resources; Energy; Geology and Soils; Greenhouse Gas Emissions and Climate Change; Hazards and Hazardous Materials; Hydrology and Water Quality; Land Use and Planning; Mineral Resources; Noise; Population, Housing and Employment; Public Services; Recreation; Transportation, Traffic and Safety; and Utilities and Service Systems. The 2016 RTP/SCS also acts as a “self-mitigating” plan in certain impact areas, in that its policies and strategies lead to improved environmental outcomes for air quality, greenhouse gas emissions, public health, congestion and other indicators, while accommodating existing and projected population growth. The section below summarizes the mitigation program contained within the PEIR for this Plan. The general purpose of the mitigation measures included in the PEIR is to identify how to protect the environment, and natural and cultural resources; improve the linkage between transportation and environmental planning; and enhance public health in concert with the proposed transportation improvements and related land use planning strategies.

It should be clearly noted that the 2016 RTP/SCS itself leads to improved environmental outcomes for per capita greenhouse gas emissions, the preservation of natural lands, recreational and active transportation opportunities and improved public health, among other key environmental indicators compared to the No Project Alternative. Nevertheless, the implementation of Plan programs, policies and strategies may lead to environmental impacts compared to the existing conditions. As such, program-level performance-based mitigation measures designed to offset any identified potentially significant adverse programmatic level environmental effects are summarized below. Project-level environmental mitigation should be appropriately identified and prepared by implementing agencies on a project-by-project or site-by-site basis as projects proceed through the design and decision-making process. Transportation project implementation and development decisions are subject to their own environmental review process and are expected to implement project-specific mitigation measures to minimize environmental impacts. This section, along with more detailed information in the PEIR, provides a framework that identifies feasible measures as resources which lead agencies can and should implement when they identify and mitigate project-level environmental impacts.

MITIGATION STRATEGIES

The PEIR provides a list of mitigation measures, which would be implemented by SCAG on a regional level, in order to assist in reducing environmental impacts related to implementation of the 2016 RTP/SCS. SCAG is also responsible for developing a plan to monitor mitigation activities to track progress on implementation of these measures at the regional level. SCAG’s mitigation is consistent with the general role played by a Metropolitan Planning Organization, including developing and sharing information, collaborating with partners and developing regional policies. SCAG works with member agencies and stakeholders but it does not identify, evaluate or implement projects or project-specific mitigation.

In addition, the PEIR includes a “catch-all” mitigation measure for each of the CEQA resource categories, stating that lead agencies “can and should” comply with generally applicable performance standards that are linked to existing statutes, regulations and adopted general plans, where available and appropriate. They are not intended to supersede compliance with existing law, regulations and adopted general plans. Instead, they help explain to lead agencies that the existing regulatory framework that could assist in mitigating potential environmental impacts at the project level.

CONSERVATION PLANNING POLICY

Long-range transportation plans are required to discuss the types of potential environmental mitigation activities and potential areas to carry out these activities. This includes activities that may have the greatest potential to restore and maintain the environmental functions affected by the Plan [23 U.S. Code Sec. 134]. As such, this is being addressed in the 2016 RTP/SCS and is separate and distinct from the mitigation measures addressed in the PEIR.

SCAG could approach federal requirements for mitigation by continuing and expanding the efforts already undertaken since the adoption of the 2012 RTP/SCS. Those efforts included mapping potential priority conservation areas, engaging partners, and developing regional mitigation policies and approaches for this plan. As outlined in the 2012 RTP/SCS, the goal of these efforts is the development of a program of large-scale acquisition and management of important habitats lands to mitigate impacts related to future transportation projects. In the 2016 RTP/SCS, regional goals also include supporting local land use strategies that reduce the demand for building outside of the existing development footprint, especially in important habitat areas. Building on this effort has the potential to create a regional conservation program that stakeholders such as CTCs, local jurisdictions, agencies, and non-profits can align with and support. SCAG has already engaged many of these stakeholders by convening a working group. This strategic and comprehensive approach allows for regional growth and progress, while at the same time ensuring that important natural and working lands and water resources are protected in perpetuity. With that as the foundation, the following suggested next steps for further development of a conservation policy could include the following:

- Expanding on the Natural Resource Inventory Database and Conservation Framework and Assessment by incorporating strategic mapping layers to build the database and further refine the priority conservation areas
- Encouraging CTCs to develop advance mitigation programs or include them in future transportation measures
- Aligning with funding opportunities and pilot programs to begin implementation of the Conservation Plan through acquisition and restoration
- Providing incentives to jurisdictions that cooperate across county lines to protect and restore natural habitat corridors, especially where corridors cross county boundaries

Please see the Natural & Farm Lands Appendix for additional detail.

SUMMARY OF THE ENVIRONMENTAL MITIGATION PROGRAM

The 2016 RTP/SCS includes an environmental mitigation program that links transportation planning to the environment. Building on its strong commitment to the environment as demonstrated in the 2012 RTP/SCS, SCAG's mitigation program is intended to function as a resource for lead agencies to consider in identifying mitigation measures to reduce impacts anticipated to result from future projects as deemed applicable and feasible by such agencies. This mitigation discussion also utilizes documents created by federal, state and local agencies to guide environmental planning for transportation projects. The following discussion focuses on specific resource areas and example mitigation measures to avoid or substantially reduce the significant environmental impacts in these areas.

AESTHETICS

The SCAG region includes several highway segments that are recognized by the State as designated scenic highways or are eligible for such designation. Construction and implementation of projects in the 2016 RTP/SCS could impact designated scenic highways and restrict or obstruct views of scenic resources such as mountains, ocean, rock outcroppings, etc. In addition, some transportation projects could add urban visual elements, such as transportation infrastructure (highways, transit stations) to previously natural areas.

Mitigation measures developed by SCAG to minimize impacts to Aesthetics include, but are not limited to, information sharing regarding the locations of designated scenic vistas, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government and direct technical assistance efforts such as the Toolbox Tuesday Training series and the sharing of associated online training materials.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans and Caltrans designated scenic vistas, aesthetics performance standards-based mitigation measures may include, but are not limited to:

- Encourage the implementation of design guidelines by counties and cities, local policies, and programs aimed at protecting views of scenic corridors and avoiding visual intrusions in design of projects to minimize contrasts in scale and passing between the project and surrounding natural forms and developments.
- Design landscaping along highway corridors to add significant natural elements and visual interest to soften the hard-edged, linear transportation corridors.

- Remove blight or nuisances that compromise visual character or visual quality of project areas including graffiti abatement, trash removal, landscape management, maintenance of signage and billboards in good condition, and replacing compromised native vegetation and landscape.

AGRICULTURE AND FORESTRY RESOURCES

Approximately 2.6 million acres of important agricultural lands in the SCAG region currently exists. Out of the 2.6 million acres, 1.1 million acres are designated as Important Farmland and the other 1.5 million acres are designated as grazing land. With respect to forests and timberlands, forest lands include the Angeles National Forest, Cleveland National Forest, Los Padres National Forest, and San Bernardino National Forest, as well as forest lands with open space zones in Imperial and Los Angeles counties. No Timberland Production Zone exists within the SCAG region. However, the harvesting of timberland is only permitted in two agricultural zones, with one limited to Christmas tree harvesting. The 2016 RTP/SCS includes transportation projects and strategies that would have the potential to convert some Prime Farmland, Farmland of Statewide Importance, and Unique Farmland in all six counties and affect Local Farmland and Grazing land in five of the six counties. Forest and timberland zones would result in less than significant impacts.

SCAG-developed mitigation measures include, but are not limited to, coordination among applicable resource agencies, information sharing, and regional program development as part of SCAG's ongoing regional planning efforts, such as web-based planning tools for local government including CA LOTS, and other GIS tools and data services, including, but not limiting to, Map Gallery, GIS library, and GIS applications; and direct technical assistance efforts such as the Toolbox Tuesday Training series and sharing of associated online Training materials. Lead agencies, such as county and city planning departments, shall be consulted during this update process.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, review of county and general plans and consistent with the Farmland Protection Policy Act of 1981 and the Farmland Mapping and Monitoring Program of the California Resources Agency, agriculture and forestry resource performance standards-based mitigation measures may include, but are not limited to:

- Encourage enrollments of agricultural lands that have Williamson Act programs.
- Develop project relocation realignment to avoid lands in Williamson Act contracts.

- Establish conservation easements consistent with the recommendations of the Department of Conservation, Farmland Security Zones, Williamson Act contracts, or other conservation tools.

AIR QUALITY

The 2016 RTP/SCS includes programs, policies and measures to address air emissions. Measures that help mitigate air emissions are comprised of strategies that reduce congestion, increase access to public transportation, improve air quality, and enhance coordination between land use and transportation decisions. In order to disclose potential environmental effects of the 2016 RTP/SCS, SCAG has prepared an estimated inventory of the region's emissions, and identified mitigation measures. The mitigation measures seek to achieve the maximum feasible and cost-effective reductions in emissions.

Mitigation measures developed by SCAG to minimize impacts to Air Quality include, but are not limited to, the determination as part of its conformity findings, pursuant to the federal CAA, that the Plan and its subsequent updates provided for the timely implementation of transportation control measures (TCM). Demonstration of TCM timely implementation including a list of these TCMs is documented in the Transportation Conformity Analysis Appendix. Additionally, during the 2016 to 2040 planning period, SCAG shall pursue activities to reduce the impacts associated with health risks for sensitive receptors within 500 feet of highways and high-traffic volume roadways.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility and jurisdiction of ARB, air quality management districts and other regulatory agencies, air quality performance standards-based mitigation measures may include, but are not limited to:

- Reduce emissions with the use of clean fuels and reducing petroleum dependency.
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas.
- Revegetate disturbed lands, including vehicular paths created during construction to avoid future off-road vehicular activities.
- As appropriate, require that portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, obtain ARB Portable Equipment Registration with the state or local district permit.

BIOLOGICAL RESOURCES

The 2016 RTP/SCS seeks to minimize transportation-related impacts on wildlife, and also better integrate transportation infrastructure into the environment.

Impacts to biological resources generally include displacement of native vegetation and habitat on previously undisturbed land; habitat fragmentation and decrease in habitat connectivity; and displacement and reduction of local, native wildlife including sensitive species. Building new transportation routes and facilities through undisturbed land or expanding facilities and increasing the number of vehicles traveling on existing routes will directly injure wildlife species, cause wildlife fatalities, and disturb natural behaviors such as breeding and nesting. Without appropriate mitigation, this will result in the direct reduction or elimination of species populations (including sensitive and special-status species) and native vegetation (including special-status species and natural communities) as well as the disruption and impairment of ecosystem services provided by native habitat areas.

Mitigation measures developed by SCAG to minimize impacts to biological resources include, but are not limited to, consultation with resource agencies, as well as local jurisdictions to incorporate any local HCPs or other similar planning documents. Development of a conservation strategy with local jurisdictions and agencies and maintaining a list/map of potential conservation opportunity areas based on the most recent land use data.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, within county and city general plans, the responsibility and jurisdiction of the USFWS, the CDFW, and other applicable agencies, biological resources performance standards-based mitigation measures may include, but are not limited to:

- Design projects to avoid sensitive natural communities and riparian habitats.
- Install fencing and/or mark sensitive habitat to be avoided during construction activities.
- Salvage and stockpiling topsoil and perennial plants for use in restoring native vegetation to all areas of temporary disturbance within the project area.

CULTURAL RESOURCES

Impacts to cultural resources, inclusive of tribal cultural resources, generally

include substantial adverse changes to historical and archaeological resources and direct or indirect changes to unique paleontological resources or sites or unique geological features. These impacts can occur at the localized scale and in relation to existing conditions, as the Plan itself does not affect the total amount of growth in the region. Adverse changes include the destruction of culturally and historically (recent or geologic time) significant and unique historical, archaeological, paleontological, and geological features.

Mitigation measures developed by SCAG to minimize impacts to Cultural resources include, but are not limited to, sharing of information and SCAG's ongoing regional planning efforts such as web-based planning tools for local government including CA LOTS, and direct technical assistance efforts such as the Toolbox Tuesday series. Resource agencies, such as the Office of Historic Preservation shall be consulted during this process.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and review of county and city general plans, cultural resources performance standards-based mitigation measures may include, but are not limited to:

- Comply with Section 106 of the National Historic Preservation Act (NHPA) including, but not limited to, projects for which federal funding or approval is required for the individual project.
- Employ design measures to avoid historical resources and undertake adaptive reuse where appropriate and feasible. If resources are to be preserved, as feasible, project sponsors should carry out the maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction in a manner consistent with the Secretary of the Interior's Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
- Comply with California Health and Safety Code, Section 7050 and Sections 18950–18961, in the event of discovery or recognition of any human remains during construction or excavation activities associated with the project, in any location other than a dedicated cemetery, ceasing further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the coroner of the county has been informed and has determined that no investigation of the cause of death is required.

ENERGY

California consumes more energy than any other state except Texas. However, in terms of energy consumption per person, California ranks 49th among the 50 states and District of Columbia. Current annual energy consumption in

California (including transportation) is approximately 7,641 trillion Btu, which represents approximately 7.9 percent of the nation's energy consumption. Transporting water into California is also a very energy intensive process. The California State Water Project (SWP) is the single largest user of energy in the state. The SWP uses approximately 5 billion kWh/year of electricity which is equal to 2 to 3 percent of the total electricity consumed in California. Water-related energy consumes approximately 20 percent of the total electricity in California. Implementation of the 2016 RTP/SCS would result in an increase in energy use due to the increase in households and transportation projects in the SCAG region.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and energy providers, through its Energy and Environment Committee, and administration of the Clean Cities program, Sustainability Planning grants program, and other SCAG energy-related planning activities, to encourage energy efficient building development. Additional measures include, pursuing partnerships with Southern California Edison, municipal utilities, and the California Public Utilities Commission to promote energy efficient development in the SCAG region, through coordinated planning, data and information sharing activities

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, county and city form-based zoning codes and future updated zoning codes, energy performance standards-based mitigation measures may include, but are not limited to:

- Using energy efficient materials in building design, construction, rehabilitation, and retrofit.
- Reduce lighting, heating, and cooling needs by taking advantage of light colored roofs, trees for shade, and sunlight.

GEOLGY AND SOILS

Impacts to geological resources generally include the disturbance of unstable geologic units (rock type) or soils, causing the loss of topsoil and soil erosion, slope failure, subsidence, project-specific seismic activity and structural damage from expansive soils. These activities, in addition to building projects on and around Alquist-Priolo Fault Zones and other local faults, could expose people and/or structures to the risk of loss, injury, or death.

Mitigation measures developed by SCAG to minimize impacts to Geology and Soils include, but are not limited to, sharing of information, and regional program development as part of SCAG's ongoing regional planning efforts,

such as web-based planning tools for local government including CA LOTS, and direct technical assistance efforts such as the Toolbox Tuesday series. Resource agencies, such as the U.S. Geology Survey shall be consulted during this update process.

Based on County and City General Plans, geology and soils performance standards-based mitigation measures may include, but are not limited to:

- Comply with Section 4.7.2 of the Alquist-Priolo Earthquake Fault Zoning Act, requiring a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.
- Comply with the CBC and local regulatory agencies with oversight of development associated with the project, ensuring that projects are designed in accordance with county and city code requirements for seismic ground shaking.
- Adhere to design standards described in the California Building Code and all standard geotechnical investigation, design, grading, and construction practices to avoid or reduce impacts from earthquakes, ground shaking, ground failure, and landslides.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

California is the fifteenth largest emitter of greenhouse gases on the planet. The transportation sector, primarily cars and trucks that move goods and people, is the largest contributor with 37 percent of the state's total greenhouse gas emissions in 2013. On road emissions (from passenger vehicles and heavy duty trucks) constitute 90 percent of the transportation sector total. In order to disclose potential environmental effects of the 2016 RTP/SCS, SCAG has prepared an estimated inventory of the region's existing greenhouse gas emissions, identified mitigation measures, and compared alternatives in the PEIR. Although the 2016 RTP/SCS demonstrates a reduction in per capita greenhouse gas emissions and meets Senate Bill 375 targets, mitigation is identified here in summary form, and in the PEIR, to provide information on how greenhouse gas emissions can be reduced from other sectors as well as through subsequent planning and implementation.

SCAG developed mitigation measures include, but are not limited to, updating any future RTP/SCS to incorporate polices and measures that lead to reduced greenhouse gas emissions in accordance with Assembly Bill 32; coordination with ARB and air districts in efforts to implement the Assembly Bill 32 plan; continuing the coordination with other metropolitan planning organizations regarding statewide strategies to reduce greenhouse gas emissions and facilitate the implementation of Senate Bill 375. Additional measures include,

working with utilities, sub-regions, and other stakeholders to promote an accelerated penetration of zero (and/or near zero) emission vehicles in the region, including developing a strategy for the deployment of public charging infrastructure.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility and jurisdiction of ARB, local air districts, and/or lead agencies, greenhouse gas emissions and climate change standards-based mitigation measures may include, but are not limited to:

- Reduce emissions resulting from a project through implementation of project features, project design, or other measures.
- Incorporate Best Available Control Technology (BACT) during design, construction and operation of projects to minimize greenhouse gas emissions.
- Adopt plan or mitigation program for the reduction of emissions that are required as part of the Lead Agency's decision.
- Use energy and fuel efficient vehicles and equipment.
- Use the minimum feasible amount of greenhouse gas emitting construction materials that is feasible.
- Incorporate design measures to reduce greenhouse gas emissions from solid waste management through encouraging solid waste recycling and reuse.
- Incorporate design measures to reduce energy consumption and increase use of renewable energy.
- Plant shade trees in or near construction projects where feasible.
- Construct buildings to Leadership in Energy and Environmental Design (LEED) certified standards.

HAZARDS AND HAZARDOUS MATERIALS

Implementation of the 2016 RTP/SCS would affect the transportation and handling of hazardous materials in the SCAG region. Expected significant impacts include risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach neighborhoods and communities adjacent to transportation facilities. The hazardous materials mitigation program aims to minimize the significant hazard to the public or the environment that involves the release of hazardous materials into the environment.

SCAG developed mitigation measures include, but are not limited to, coordination efforts with the United States Department of Transportation (U.S. DOT), the Office of Emergency Services, California Department of Transportation (Caltrans) and the private sector to continue to conduct driver safety training programs. Additionally, SCAG shall encourage the U.S. DOT and the California Highway Patrol to continue to enforce speed limits and existing regulations governing goods movement and hazardous materials transportation.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, provisions of the Hazardous Waste Control Act, the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, the Hazardous Waste Source Reduction and Management Review Act of 1989, and the California Vehicle Code, hazards and hazardous materials standards-based mitigation measures may include, but are not limited to:

- Provide a written plan of proposed routes of travel demonstrating use of roadways designated for the transport of hazardous materials.
- Follow the manufacturer's recommendations on use, storage, and disposal of chemical products used during construction.
- During routine maintenance of construction equipment, properly contain and remove grease and oils.

HYDROLOGY AND WATER QUALITY

Impacts to hydrology and water quality from the 2016 RTP/SCS include potential water quality impairment from increased impervious surfaces. Increased impervious surfaces in water recharge areas potentially impact groundwater recharge and groundwater quality. Cumulative impacts include increased impervious surfaces; increased development in alluvial fan floodplains; and increased water demand and associated impacts, such as drawdown of groundwater aquifers. These impacts can occur at the localized scale and in relation to existing conditions, as the Plan itself does not affect the total amount of growth in the region. Increased output of greenhouse gases from the region's transportation system impacts the security and reliability of the imported water supply.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and water quality agencies, to encourage regional-scale planning for improved water quality management/demand and pollution prevention, providing opportunities for information sharing with respect to wastewater treatment and regional program development to promote Low Impact Development (LID) and reduce hydromodification.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the jurisdiction and authority of the Regional Water Quality Control Boards and other regulatory agencies, hydrology and water quality standards-based mitigation measures may include, but are not limited to:

- Complete, and have approved, a Stormwater Pollution Prevention Plan (SWPPP) prior to initiation of construction.
- Complete, and have approved, a Standard Urban Stormwater Management Plan, prior to occupancy of residential or commercial structures.
- Incorporate as appropriate, treatment and control features such as detention basins, infiltration strips, and porous paving, other features to control surface runoff and facilitate groundwater recharge into the design of new projects early on in the process to ensure that adequate acreage and elevation contours are provided during the right-of-way acquisition process.

LAND USE AND PLANNING

The 2016 RTP/SCS contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as a forecasted Land Development Category pattern of development described in detail in the SCS. These transportation projects and land use strategies are generally consistent with the county- and regional-level general plan data available to SCAG; however, general plans are not updated consistently. The Plan includes a projected Land Development Category pattern of development that, in order to maximize the effectiveness of the transportation system differs from local General Plan land uses beyond 2020.

SCAG developed mitigation measures include, but are not limited to, coordinate with member cities and counties to encourage that general plans consider and reflect as appropriate RTP/SCS policies and strategies. Other measures include infill, mixed-use, higher density and other sustainable development, and work with partners to identify incentives to support the creation of affordable housing in mixed-use zones. Additionally, SCAG shall work with its member cities and counties to encourage that transportation projects and growth are consistent with the RTP/SCS and general plans.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, land use and planning standards-based mitigation measures may include, but are not limited to:

- Ensure that the project is consistent with the applicable goals and policies of the adopted general plan where the project is located.
- Where an inconsistency is identified, determine if the environmental, social, economic, and engineering benefits of the proposed land use strategy or transportation improvement warrant a variance from adopted zoning or an amendment to the general plan.
- Wherever feasible incorporate direct crossings, overcrossings, or undercrossings at regular intervals for multiple modes of travel (e.g., pedestrians, bicyclists, vehicles).

MINERAL RESOURCES

Transportation projects as well as Land Development Category development patterns influenced by land use strategies identified in the 2016 RTP/SCS would require substantial amounts of aggregate resources to construct facilities. This would result in a significant impact. The six-county and 191 cities SCAG region has about 1,446 million tons of permitted aggregate reserves. The California Geological Survey (CGS) estimates that the SCAG region would need about 4,728 million tons of aggregate over the next 50 years. The difference of 3,282 million tons in demand could result in a shortage of aggregate supply. Based on this anticipated shortage of aggregate supply over the next 50 years, there would be an anticipated shortage during the next 25 years during implementation of the 2016 RTP/SCS.

SCAG developed mitigation measures include, but are not limited to, the coordination with the Department of Conservation, the CGS to maintain a database of (1) available mineral resources in the SCAG region including permitted and un-permitted aggregate resources and (2) the anticipated 50-year demand for aggregate and other mineral resources. Based on the results of this survey, SCAG shall work with local agencies on strategies to address anticipated demand, including identifying future sites that may seek permitting and working with industry experts to identify ways to encourage and increase recycling to reduce the demand for aggregate.

Based on County and City General Plans, mineral resources standards-based mitigation measures may include, but are not limited to:

- Recycle and reuse building materials resulting from demolition, particularly aggregate resources, to the maximum extent practicable.
- Identify and use building materials, particularly aggregate materials, resulting from demolition at other construction sites in the SCAG region, or within a reasonable hauling distance of the project site.

- Design transportation network improvements in a manner (such as buffer zones or the use of screening) that does not preclude adjacent or nearby extraction of known mineral and aggregate resources following completion of the improvement and during long-term operations.

NOISE

Some of the principal noise generators within the SCAG region are associated with transportation (i.e., airports, highways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Noise impacts resulting from the 2016 RTP/SCS generally include exposure of sensitive receptors to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities.

SCAG developed mitigation measures include, but are not limited to, the coordination with member agencies as part of SCAG's outreach and technical assistance to local governments under Toolbox Tuesday Training series, to encourage that projects involving residential and commercial land uses are encouraged to be developed in areas that are normally acceptable to conditionally acceptable, consistent with the Governor's Office of Planning and Research Noise Element Guidelines.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, noise standards-based mitigation measures may include, but are not limited to:

- Install temporary noise barriers during construction.
- Include permanent noise barriers and sound-attenuating features as part of the project design.
- Schedule construction activities consistent with the allowable hours pursuant to applicable general plan noise element or noise ordinance where construction activities are authorized outside the limits established by the noise element of the general plan or noise ordinance; notify affected sensitive noise receptors and all parties who will experience noise levels in excess of the allowable limits for the specified land use, of the level of exceedance and duration of exceedance; and provide a list of protective measures that can be undertaken by the individual, including temporary relocation or use of hearing protective devices.

POPULATION, HOUSING AND EMPLOYMENT

Transportation projects and land use strategies including new and expanded infrastructure are necessary to improve travel time and can enhance quality of life for those traveling throughout the region. The package of transportation improvements in the 2016 RTP/SCS is designed to accommodate total growth while maintaining or improving for mobility. The Plan would not affect the total growth in population in the region. The 2016 RTP/SCS can affect the distribution of that growth. Land use and housing impacts associated with transportation projects and development influenced by land use strategies, such as dividing established communities through right-of-way acquisition, can occur at a localized scale.

SCAG developed mitigation measures include, but are not limited to, working with member agencies to encourage and assist growth strategies to create an urban form designed to focus development in HQTAs in accordance with the policies, strategies and investments contained in the 2016 RTP/SCS, enhancing mobility and reducing land consumption.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, population, housing and employment standards-based mitigation measures may include, but are not limited to:

- Evaluate alternate route alignments and transportation facilities that minimize the displacement of homes and businesses. Use an iterative design and impact analysis where impacts to homes or businesses are involved to minimize the potential of impacts on housing and displacement of people.
- Prioritize the use of existing ROWs, wherever feasible.
- Develop a construction schedule that minimizes potential neighborhood deterioration from protracted waiting periods between right-of-way acquisition and construction.
- Construct affordable housing units, deed restricted to remain affordable for an appropriate period of time, as feasible or payment of fee, with the appropriate nexus to the impact, where such fees were established to address loss of affordable housing.

PUBLIC SERVICES

Any impacts to public services are identified only in relation to existing conditions or at a localized scale. These impacts generally include additional

demands on fire and police services, schools and landfills. Additional police and fire personnel would be needed to adequately respond to emergencies and routine calls, particularly on new or expanded transportation facilities. Other potential impacts at a localized scale could entail demands on public schools, solid waste facilities and disposal facilities.

SCAG developed mitigation measures include, but are not limited to, supporting local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, public services standards-based mitigation measures may include, but are not limited to:

- Coordinate with local public protective security services to ensure that the existing public protective security services would be able to handle the increase in demand for their services. If the current levels of services at the project site are found to be inadequate, provide fair share contributions towards infrastructure improvements and/or personnel requirements for the appropriate public services
- Identify projects that have the potential to generate the need for expanded emergency response services. Where such services and related staffing needs exceed the capacity of existing facilities, provide for the construction of new facilities directly as an element of the project or through a dedicated fair share contributions toward infrastructure improvements.

RECREATION

Impacts to recreation from the 2016 RTP/SCS would result from an increase in population. The use of regional parks and other recreational facilities are expected to increase and result in a substantial physical deterioration of facilities at an accelerated rate. Additionally, transportation projects included in the 2016 RTP/SCS could result in potentially significant impacts to recreational facilities which include closures to gaps in the highway network through areas that currently service as open space lands.

SCAG developed mitigation measures include, but are not limited to, facilitating the reduction of impacts as a result of increased use in recreational facilities through cooperation with member agencies, information sharing, and program

development in order to ensure consistency with planning for expansion of new neighborhood parks within or in nearby accessible locations to HQTAs in funding opportunities and programs administered by SCAG.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines and review of county and city general plans, recreation standards-based mitigation measures may include, but are not limited to:

- Where projects require the construction or expansion of recreational facilities or the payment of equivalent Quimby fees, consider increasing the accessibility to natural areas and lands for outdoor recreation from the proposed project area, in coordination with local and regional open space planning or management agencies.
- Where construction or expansion of recreational facilities is included in the project or required to meet public park service ratios, apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of such facilities, through the imposition of conditions required to be followed to avoid or reduce impacts associated with air quality, noise, traffic, biological resources, greenhouse gas emissions, hydrology and water quality, and others that apply to specific construction or expansion of new or expanded public service facilities.

TRANSPORTATION, TRAFFIC AND SAFETY

The 2016 RTP/SCS takes into account the population, households, and employment projected for 2040, and therefore the largest demand on the transportation system expected during the lifetime of the plan. In accounting for the effects of regional population growth, the model output provides a regional, long-term and cumulative level of analysis for the impacts of the 2016 RTP/SCS on transportation resources. The regional growth, and thus, cumulative impacts, is captured in the vehicle miles traveled (VMT), vehicle hours traveled (VHT), and heavy-duty truck VHT data. Consistent with Senate Bill 375 Regional Target Advisory Committee's final report to the California Air Resources Board, the 2016 RTP/SCS includes projects and strategies to reduce congestion and promote friendly speeds on the roadways. A subset of projects included in the 2016 RTP/SCS reduces greenhouse gas emissions by providing relief of existing and projected congestion. Those include toll roads, express lanes, high occupancy vehicle lanes, and dedicated truck toll lanes. Congestion pricing is a transportation demand management tool incorporated into the 2016 RTP/SCS that would reduce greenhouse gas emissions in addition to more efficient utilization of existing facilities. The SCAG region is vulnerable to

numerous threats that include both natural and human caused incidents. As such, a mitigation program related to safety is included in the PEIR.

SCAG developed mitigation measures include, but are not limited to, the facilitation of minimizing impacts to emergency access through ongoing regional planning efforts such as meetings with local member agencies, maintain forums with policy makers, and workshops with local, regional, and state partners such as Department of Transportation, Congestion Management Agencies, Fire Department, and other local enforcement agencies during consultation on development and maintenance of the Regional Transportation Plan.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, county and city general plans and congestion management programs, transportation standards-based mitigation measures may include, but are not limited to:

- Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for high-occupancy vehicles, providing larger parking spaces to accommodate vans used for ride-sharing, and designating adequate passenger loading and unloading and waiting areas.
- Encourage bicycling to transit facilities by providing additional bicycle parking, locker facilities, and bike lane access to transit facilities when feasible.
- Encourage the use of public transit systems by enhancing safety and cleanliness on vehicles and in and around stations, providing shuttle service to public transit, offering public transit incentives and providing public education and publicity about public transportation services.
- Encourage bicycling and walking by incorporating bicycle lanes into street systems in regional transportation plans, new subdivisions, and large developments, creating bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking, and encouraging commercial projects to include facilities on-site to encourage

employees to bicycle or walk to work.

- Build or fund a major transit stop within or near transit, or transit-oriented development.

UTILITIES AND SERVICE SYSTEMS

Impacts to utilities and service systems from the 2016 RTP/SCS include the potential for the construction of new utility infrastructure or expansion of existing infrastructure. Additional impacts could result in an increased amount of pollutants in urban runoff attributed to landscape irrigation, highway runoff, and illicit dumping. As mentioned previously, implementation of the Plan would increase impervious surfaces in the SCAG region through a combination of transportation projects and development influenced by land use strategies. Additional impacts such as insufficient water supply, strain to wastewater and solid waste treatment plants could also occur.

SCAG developed mitigation measures include, but are not limited to, working with local jurisdictions and water quality agencies, to encourage regional-scale planning for improved water quality management/demand and pollution prevention, providing opportunities for information sharing with respect to wastewater treatment and program development in the region.

Consistent with the provisions of Section 15091 of the State CEQA Guidelines, and within the responsibility of local jurisdictions including the Imperial, Riverside, San Bernardino, Los Angeles, Ventura and Orange Counties Flood Control District, utilities and service systems standards-based mitigation measures may include, but are not limited to:

- Reduce exterior consumptive uses of water in public areas, and should promote reductions in private homes and businesses, by shifting to drought-tolerant native landscape plantings (xeriscaping), using weather-based irrigation systems.
- Reuse and minimize construction and demolition (C&D) debris and diversion of C&D waste from landfills to recycling facilities.
- Implement or expand city or county-wide recycling and composting programs for residents and businesses.

CONCLUSION

These transportation and land use strategies, programs and projects are ambitious, but based on our history SCAG is confident that together they will advance our movement toward a more mobile and sustainable region that achieves our long-term goals for people across our region. By closely integrating transportation and land use planning, the 2016 RTP/SCS places the region firmly on that path. For more details on the planned investments reviewed in this chapter, including a project list, please see the Project List Appendix.

The following chapter, “Paying for Our Plan,” presents a review of how we expect to fund our ambitious list of transportation investments—that is, where the money will come from and what economic and policy developments could impact the availability of public funds needed to realize our goals.



Image courtesy of Samer Mardini

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PAYING FOR THE PLAN

In accordance with federal fiscal constraint requirements, this chapter and a more detailed appendix on our financial plan identify how much money SCAG reasonably expects will be available to support our region's surface transportation investments.

INTRODUCTION

The financially constrained 2016 RTP/SCS includes both a “traditional” core revenue forecast comprised of existing local, state and federal sources and more innovative but reasonably available sources of revenue to implement a program of infrastructure improvements that keeps freight and people moving. As in the past, the financial plan describes steps we can take to obtain needed revenues to implement the region’s transportation vision.

The financial plan highlights the importance of finding new and innovative ways to pay for transportation, including our ever-expanding backlog of projects to preserve our existing transportation system. Nationally, we continue to face an insolvency crisis with the Federal Highway Trust Fund, as fuel tax receipts have declined precipitously. Similarly, the viability of California’s State Highway Account remains in question, as only a fraction of our needs are funded through state sources. Our region continues to rely heavily on local sources of tax revenue. Seven sales tax measures in the region generate 71 percent of core revenues for transportation improvements.

It is vital that we find new ways to make transportation funding more sustainable in the long term, and efforts are underway to explore how we can transition from our current system based on fuel taxes to a more direct system based on user fees. Recent action by the state Legislature to launch the California Road Charge Pilot Program is a critical step in this transition.

In our region, numerous policy and technical studies have been conducted on the subject and more work is planned to examine and demonstrate the viability of user fee systems, including toll networks. Our region has successfully implemented toll systems in the past, with the Transportation Corridor Agencies’ network of privately financed toll roads, the State Route 91 Express Lanes in Orange County and more recently with the express lanes along Interstate 10 and Interstate 110 in Los Angeles County.

The SCAG region has secured the necessary resources to support transportation investments detailed in past RTPs, and our current financial plan will continue to meet necessary milestones to implement the 2016 RTP/SCS. The following sections describe the financial assumptions and methodologies used for forecasting revenues and expenditures for transportation investments. Other SCS implementation costs are not included in this analysis.

ECONOMIC OUTLOOK AND KEY FINANCIAL ASSUMPTIONS

SCAG’s financial model reflects historical growth trends and reasonable future expectations for key revenue sources. The inability of existing excise taxes to keep pace with increasing transportation needs and the impacts of increasing fuel efficiency on traditional revenue sources are key considerations in the financial plan.

INFLATION

Inflation can have a profound impact over the long-term time horizon of our Plan. SCAG’s revenue model accounts for historical inflation trends, as measured by the Gross Domestic Product (GDP) Price Deflator.

FIGURE 6.1 shows the trends in inflation by the GDP Price Deflator. Although inflation rates have varied considerably over time, they have generally trended between two and four percent. Accordingly, a 2.4 percent inflation rate is used to adjust constant dollar (revenue) forecasts into nominal (year-of-expenditure) dollars.

CONSTRUCTION COST INCREASES

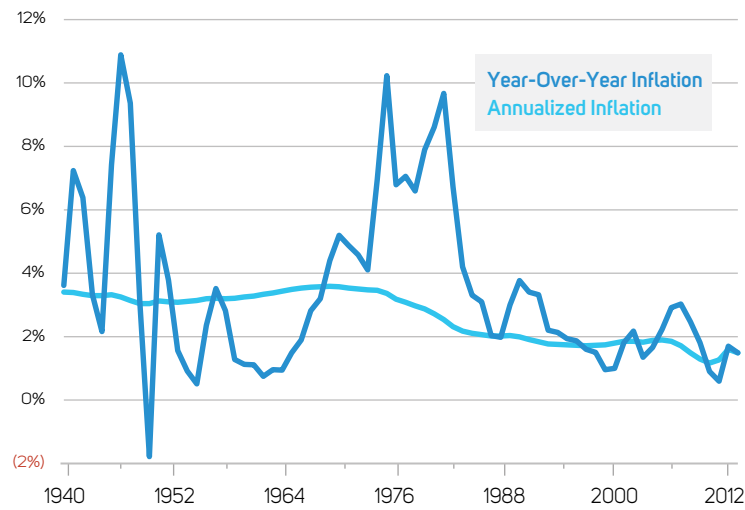
The rise in construction costs can further erode the purchasing power of transportation revenues. **FIGURE 6.2** shows the increase and decline in California highway construction costs since the early 1970s. While recent corrections have slowed the longer-term increase in costs, the growth still remains above general inflation. The financial plan uses a 3.2 percent annual inflation factor to estimate future and nominal (year-of-expenditure) costs.

RETAIL SALES GROWTH

Changes in personal consumption patterns and the overall population are main contributors to the growth in retail sales. Over the 30-year period from FY1981-82 to FY2011-12, statewide retail sales grew by 1.8 percent in real terms (when the effects of inflation are eliminated). The financial plan assumes retail sales growth ranging from 1.8 percent to 3.9 percent in real terms.

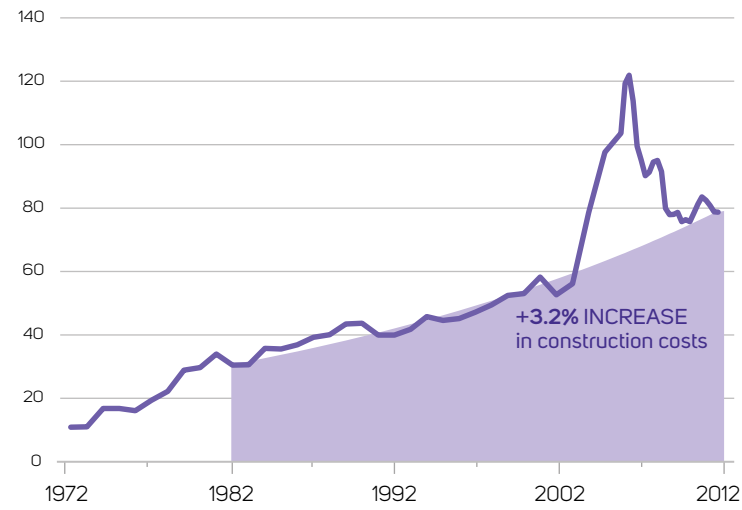
Growth in construction costs (3.2%) outpaces general inflation (2.4%)

FIGURE 6.1 HISTORICAL INFLATION TRENDS (ANNUAL INFLATION)



Source: Office of Management and Budget, Budget of the United States Government, FY 2016 Budget

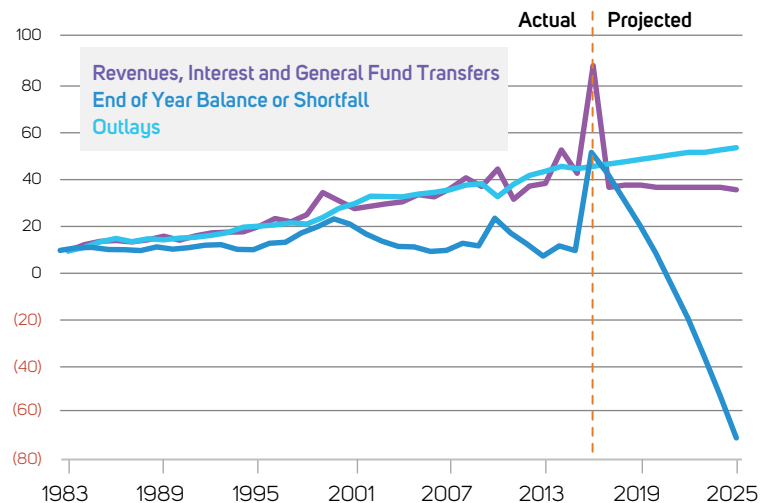
FIGURE 6.2 GROWTH IN HIGHWAY CAPITAL COSTS (INDEX VALUE)



Source: California Department of Transportation

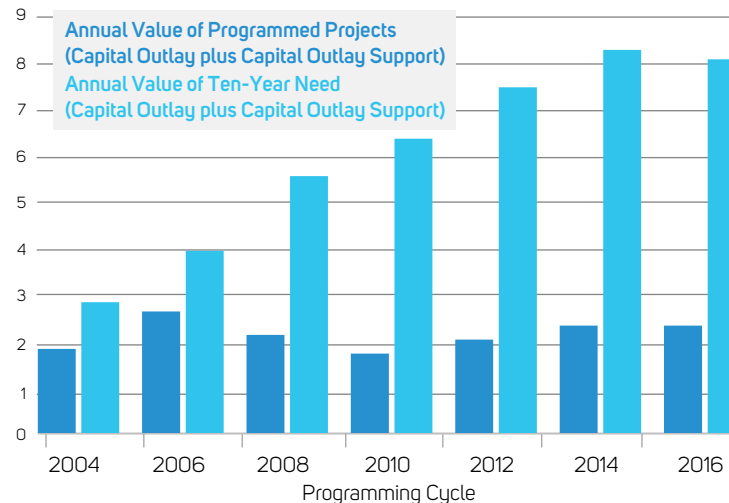
The viability of the state and federal revenue sources is of concern

FIGURE 6.3 STATUS OF THE FEDERAL HIGHWAY TRUST FUND (\$ BILLIONS)



Source: Congressional Budget Office and Federal Highway Administration

FIGURE 6.4 STATUS OF THE STATE HIGHWAY OPERATION AND PROTECTION PROGRAM (SHOPP) (\$ BILLIONS)



Source: California Department of Transportation, 2015 Ten-Year SHOPP Plan

FUEL CONSUMPTION

Excise taxes on gasoline and diesel fuels are the basis of most federal and state transportation funding sources. Since these taxes are based on cents-per-gallon purchased, they depend solely on fuel consumption and are not indexed to inflation or construction costs. While changes in vehicle miles traveled (VMT) will continue to play a role during the Plan period, increases in conventional fuel efficiency and the adoption of alternative fuel vehicles will reduce overall fuel consumption. The financial plan assumes that increases in vehicle fuel efficiency will reduce fuel consumption by 0.9 percent per year during the Plan period.

STATUS OF THE FEDERAL HIGHWAY TRUST FUND

The Federal Highway Trust Fund provides federal highway and transit funding from a nationally-imposed 18.3 cent-per-gallon gasoline excise tax. Since 2008, the Trust Fund has failed to meet its obligations and has required the United States Congress to authorize \$141.1 billion in transfers from the General Fund to keep it solvent. The negative balances shown on [FIGURE 6.3](#) illustrate the projected inability of the Trust Fund to pay its obligations into the highway account.

At the time of the 2016 RTP/SCS, nearly a decade has passed without substantive Congressional agreement on a long-term solution to provide adequate funding for the Trust Fund. The recently passed transportation reauthorization known as the FAST Act relies on \$70 billion of one-time, non-user fees to keep the Trust Fund solvent through 2020. It does not address the present, long-term structural deficiency that exists in funding the Trust Fund. Although the financial plan assumes that Congress will reach agreement on reauthorizing federal spending for transportation programs over the Plan horizon, the core revenues available from the Trust Fund are expected to decline due to increasing fuel efficiency and other factors.

STATUS OF THE STATE HIGHWAY ACCOUNT

Despite the “Gas Tax Swap,” the effective state gas excise tax rate of 18 cents-per-gallon has remained unadjusted for more than 20 years. Gas tax revenues remain the only source of funding for the State Highway Operation and Protection Program (SHOPP), which funds projects to maintain the State Highway System. As shown in [FIGURE 6.4](#), previous levels of funding have been considerably less than actual needs. Statewide, the 2015 Ten-

Year SHOPP Plan identifies \$8.0 billion in statewide annual needs, while expenditures programmed for the next four years are only \$2.3 billion annually. Continued underinvestment in the maintenance needs of the State Highway System will only increase the cost of bringing our highway assets back to a state of good repair.

LOCAL SALES TAX MEASURES

The SCAG region continues to rely heavily on local sales tax measures for the timely delivery of transportation projects. While most counties impose a 0.5 percent sales tax to fund transportation projects, Los Angeles County levies a 1.5 percent tax—a combination of two permanent half-cent sales taxes and Measure R at 0.5 percent. Measure R is not permanent and expires in 2039. Riverside County’s Measure A also expires in 2039. Measure I in San Bernardino County expires in 2040, followed by Orange County’s Measure M in 2041. Measure D in Imperial County expires in 2050. Ventura County is the only county in the region without an existing dedicated sales tax for transportation. However, Ventura County is in the process of seeking voter approval on a half-cent sales tax, which is reflected as part of the reasonably available revenues.

TRANSIT OPERATING AND MAINTENANCE (O&M) COSTS

Future transit O&M costs depend on a variety of factors, such as future revenue-miles of service, labor contracts and the age of rolling stock. For the 2016 RTP/SCS, transit O&M costs are estimated based upon historical increases. The regional average increase of 2.7 percent is used for most operators. For Los Angeles County, the financial plan relies on detailed forecasts from the county transportation commission, which is also consistent with historical data.

MULTIMODAL SYSTEM PRESERVATION AND MAINTENANCE

The 2016 RTP/SCS identifies \$275.5 billion in total system preservation and maintenance needed to bring transit, passenger rail, regionally significant local streets and roads, and the State Highway System to a state of good repair. While the Plan includes core revenue sources for system preservation, these sources are limited due to restrictions on the use of funds and voter-approved commitments to major capital initiatives.

REVENUE & EXPENDITURE CATEGORIES

CORE AND REASONABLY AVAILABLE REVENUES

The 2016 RTP/SCS financial plan includes two types of revenue forecasts. Both are included in the financially constrained plan:

- Core revenues
- Reasonably available revenues

The *core revenues* identified are existing transportation funding sources projected to FY2039-40. The core revenue forecast does not include future increases in state or federal gas excise tax rates (other than the adjustments reflecting the state gasoline sales tax swap) or adoptions of regional gasoline taxes, mileage-based user fees and new tax measures. These revenues provide a benchmark from which additional funding can be identified.

MULTIMODAL SYSTEM PRESERVATION & MAINTENANCE NEEDS

(in nominal dollars)



Note: Numbers may not sum to total due to rounding.

The region's *reasonably available revenues* include new sources of transportation funding likely to materialize within the 2016 RTP/SCS time frame. These sources include adjustments to existing state and federal gas tax rates, value capture strategies, potential national freight program funds, tolls for specific facilities and private equity participation. Federal guidelines on fiscal constraint permits the inclusion of revenues that are reasonably available. In accordance with federal guidelines, the Plan includes strategies for ensuring the availability of these sources.

EXPENDITURE CATEGORIES

Transportation expenditures in the SCAG region are summarized into three main categories:

- Capital costs for transit, state highways and regionally significant arterials (local streets and roads)
- Operating and maintenance costs for transit, state highways and regionally significant arterials (local streets and roads)
- Debt service payments (for current and anticipated bond issuances)

CORE REVENUES

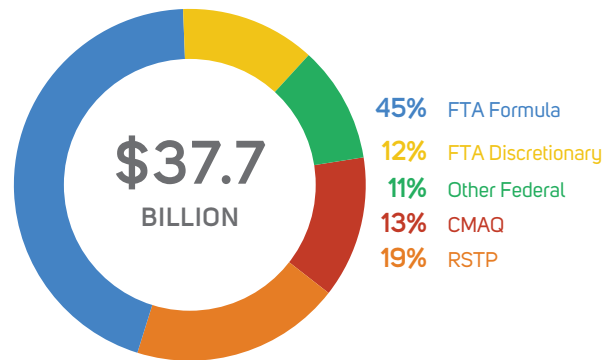
SCAG's regional core revenue model forecasts transportation revenues over the entire 2016 RTP/SCS time horizon. The revenue model is comprehensive and supports analysis by county or funding source. The revenue forecast was developed using the following framework:

- Incorporate financial planning documents developed by local county transportation commissions and transit operators in the region, where available
- Ensure consistency with both local and state planning documents
- Utilize published data sources to evaluate historical trends
- Conduct sensitivity testing of assumptions to augment local forecasts, as needed

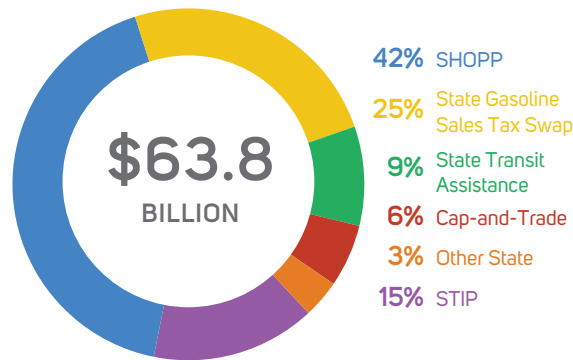
The region's revenue forecast horizon for the financial plan is FY2015-16 through FY2039-40. Consistent with federal guidelines, the plan takes into account inflation and reports statistics in nominal (year-of-expenditure) dollars. **TABLE 6.1** shows these core revenues in five-year increments by county.

FIGURE 6.5 CORE REVENUES (IN NOMINAL DOLLARS)

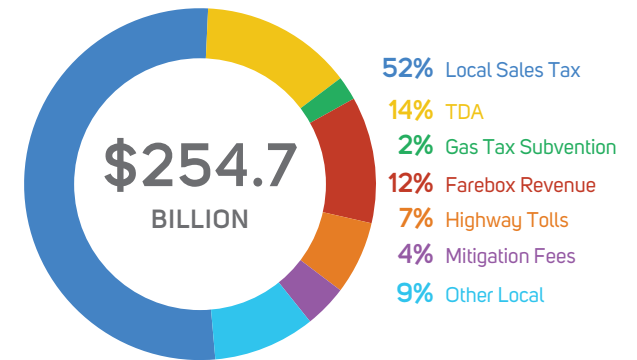
FEDERAL Federal sources are expected to comprise a small portion of overall transportation funds (\$37.7 billion). Federal Transit Administration (FTA) funds account for 57 percent of federal funding in the SCAG region. The financial plan also assumes that CMAQ funding will decline in 2022, 2031 and 2036 due to the region achieving attainment for a number of criteria pollutants and reducing the severity level of others.



STATE The State Transportation Improvement Program (STIP), the State Highway Operations and Protection Program (SHOPP) and the State Gasoline Sales Tax Swap account for the bulk of the state funding available.



LOCAL Local sales taxes provide the largest single source of local funding. When local sales taxes in all five counties with such measures are included, these taxes account for more than half (52 percent) of local sources.



The majority of revenues in the SCAG region come from local sources. The share of state sources (18 percent) has increased since the last RTP as a result of Cap-and-Trade Auction Proceeds.

LOCAL + STATE + FEDERAL = **\$356.1 BILLION**

TABLE 6.1 CORE REVENUE FORECAST FY 2016–2040

(in Nominal Dollars, Billions)

COUNTY	FY 2016–2020	FY 2021–2025	FY 2026–2030	FY 2031–2035	FY 2036–2040	TOTAL
Imperial	\$0.5	\$0.5	\$0.6	\$0.7	\$0.8	\$3.2
Los Angeles	\$34.3	\$38.0	\$45.4	\$53.1	\$55.0	\$225.8
Orange	\$8.5	\$8.5	\$10.1	\$12.1	\$14.2	\$53.4
Riverside	\$5.4	\$6.3	\$7.6	\$9.3	\$10.0	\$38.6
San Bernardino	\$4.2	\$4.8	\$5.6	\$6.5	\$7.5	\$28.6
Ventura	\$1.0	\$1.1	\$1.3	\$1.5	\$1.7	\$6.5
TOTAL	\$53.9	\$59.2	\$70.6	\$83.1	\$89.3	\$356.1

Source: SCAG Revenue Model 2015 Note: Numbers may not sum to total due to rounding.

REASONABLY AVAILABLE REVENUES

There are several new funding sources that are reasonably expected to be available for the 2016 RTP/SCS. The following guiding principles were used for identifying reasonably available revenues:

- Establish a user fee-based system that better reflects the true cost of transportation, provides firewall protection for new and existing transportation funds, and ensures an equitable distribution of costs and benefits.
- Promote national and state programs that include return-to-source guarantees, while maintaining flexibility to reward regions that continue to commit substantial local resources.
- Leverage locally available funding with innovative financing tools (e.g., tax credits and expansion of the Transportation Infrastructure Finance and Innovation Act [TIFIA]) to attract private capital and accelerate project delivery.
- Promote funding strategies that strengthen the federal commitment to the nation’s goods movement system, recognizing the pivotal role that our region plays in domestic and international trade.

TABLE 6.2 identifies eight categories of funding sources that are considered to be reasonably available and are included in the financially constrained plan. These sources were identified on the basis of their potential for revenue generation, historical precedence and the likelihood of their implementation

within the time frame of the 2016 RTP/SCS. For each funding source, SCAG has examined the policy and legal context of implementation and has prepared an estimate of the potential revenues generated. Additional documentation of funding sources included in the financial plan are provided in the Transportation Finance Appendix.

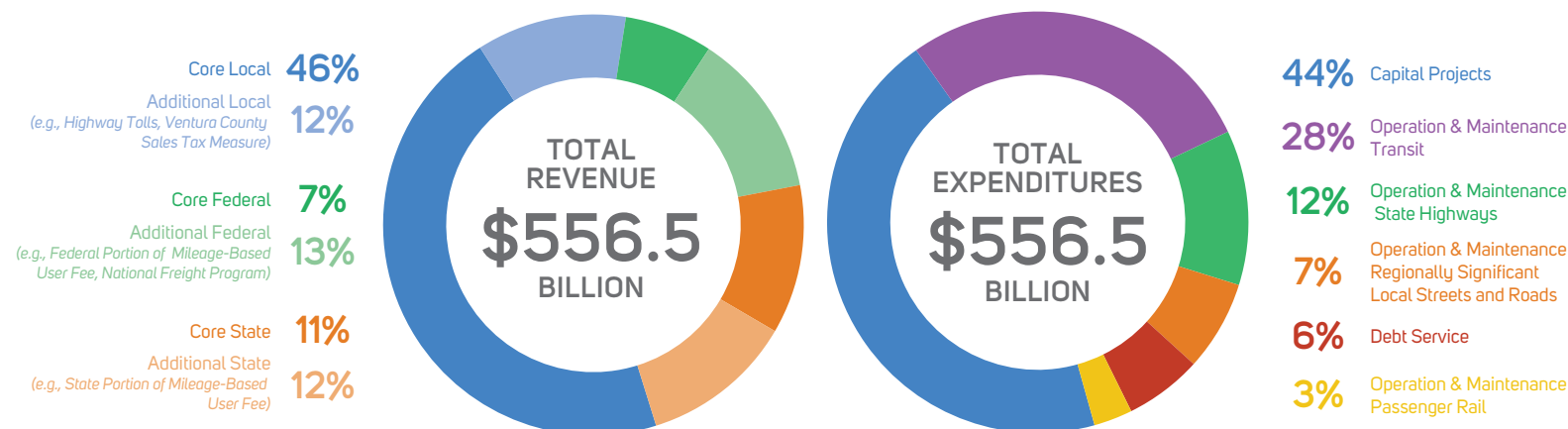
SUMMARY OF REVENUE SOURCES AND EXPENDITURES

The SCAG region’s financially constrained 2016 RTP/SCS includes revenues from both core and reasonably available revenue sources, which together total \$556.5 billion from FY2015-16 through FY2039-40 (see **TABLE 6.3**). The Plan is funded 57 percent by local sources, 23 percent by state sources and 19 percent by federal sources, as illustrated in **FIGURE 6.6**.

Capital projects total \$246.6 billion in nominal dollars. Operating and maintenance (O&M) costs total \$275.5 billion, while debt service obligations total \$34.5 billion. Transit-related costs comprise the largest share of O&M costs for the region, totaling \$156.7 billion.

TABLE 6.4 presents the SCAG region’s revenue forecast by source in five-year increments, from FY2015-16 through FY2039-40. This is followed by **TABLE 6.5**, which provides details of the region’s expenditures by category in five-year increments.

FIGURE 6.6 FY 2016–2040 SUMMARY OF REVENUE AND EXPENDITURES (IN NOMINAL DOLLARS)



Source: SCAG Revenue Model 2015 Note: Numbers may not sum to total due to rounding.

TABLE 6.2 NEW REVENUE SOURCES AND INNOVATIVE FINANCING STRATEGIES

(in Nominal Dollars, Billions)

REVENUE SOURCE	DESCRIPTION	AMOUNT	ACTIONS TO ENSURE AVAILABILITY	RESPONSIBLE PARTY(IES)
State and Federal Gas Excise Tax Adjustment to Maintain Historical Purchasing Power	Additional \$0.10 per gallon gasoline tax imposed at the state and the federal levels starting in 2020 to 2024 to maintain purchasing power.	\$6.0	Requires action of state Legislature and Congress. Strategy is consistent with recommendations from two national commissions to move immediately with augmenting fuel tax resources through conventional Highway Trust Fund mechanisms. Rate is also consistent with proposals introduced in state Legislature during 2015–2016 session.	State Legislature, Congress
Mileage-Based User Fee (or equivalent fuel tax adjustment)	Mileage-based user fees would be implemented to replace gas taxes—estimated at about \$0.04 (in 2015 dollars) per mile starting in 2025 and indexed to maintain purchasing power.	\$124.8 (est. increment only)	Requires action of state Legislature and Congress. Strategy is consistent with recommendations from two national commissions to move toward a mileage-based user fee system. In 2014, state Legislature passed Senate Bill (SB) 1077 (DeSaulnier) directing California to conduct a pilot program to study the feasibility of a road charge as a replacement to the gas tax beginning no later than January 1, 2017. The FAST Act establishes the Surface Transportation System Funding Alternatives program, which provides grants to states to demonstrate alternative user-based revenue mechanisms that could maintain the long-term solvency of the Trust Fund.	State Legislature, Congress
Highway Tolls (includes toll revenue bond proceeds)	Toll revenues generated from East-West Freight Corridor and regional express lane network.	\$23.5	Assembly Bill (AB) 1467 (Nunez) Chapter 32, Statutes of 2006 authorized Caltrans and regional transportation agencies to enter into comprehensive development lease agreements with public and private entities or consortia of those entities for certain types of transportation projects. Further, AB 521 (Runner) Chapter 542, Statutes of 2006 modified provisions in AB 1467. Senate Bill Second Extraordinary Session 4 (SBX2 4) Chapter 2, Statutes of 2009 (Cogdill) established the legislative authority until January 1, 2017, allowing for regional transportation agencies and Caltrans to enter into an unlimited number of public-private partnerships (PPP) and deleted the restrictions on the number and type of projects that may be undertaken. Chapter 474, Statutes of 2009 (AB 798) established the California Transportation Financing Authority (CTFA). Highway projects that meet planning and environmental review requirements are eligible for tolling subject to meeting requirements of the CTFA. AB 798 also lifted the requirement for express lane projects authorized under AB 1467 to have separate legislative approval. SB 1316 (Correa) enabled RCTC to impose tolls along SR-91 Express Lanes. The I-15 Express Lanes in Riverside County were authorized by AB 1954 (Jeffries). SB 1298 (Hernandez) authorized continued tolling along the I-10 and I-110 Express Lanes in Los Angeles County. AB 914 (Brown) allowed express lanes along I-10 and the I-15 in San Bernardino County. AB 194 (Frazier) allowed the California Transportation Commission to authorize additional express lane projects.	MPO, CTCs, Caltrans, CTFA, and FHWA as may be applicable

TABLE 6.2 CONTINUED

REVENUE SOURCE	DESCRIPTION	AMOUNT	ACTIONS TO ENSURE AVAILABILITY	RESPONSIBLE PARTY(IES)
Private Equity Participation	Private equity share as may be applicable for key initiatives: e.g., toll facilities; also, freight rail package assumes railroads' share of costs for main line capacity and intermodal facilities.	\$3.4	Region has authority as noted above. Current funding plans for specific intermodal facilities assume private sources.	MPO, CTCs, private consortium, state Legislature, and Union Pacific/BNSF as appropriate for specific facilities
Freight Fee/National Freight Program	The recent reauthorization of the federal surface transportation act (the FAST Act) provides dedicated federal funding for infrastructure improvements supporting the national freight network through the newly created National Highway Freight Program and the Nationally Significant Freight and Highway Projects program. These programs are funded at approximately \$2.1 billion per year nationally. Regional estimate assumes a conservative percentage of national totals.	\$5.4	Current efforts at the local/regional level continue to endorse a federal program for freight. Other mechanisms to ensure the establishment of a funding program for freight may entail working with local/regional, state, and federal stakeholders to assess a national freight fee. Freight fees could be assessed in proportion to relative impacts on the transportation system.	Congress and potentially state Legislature as well as local/regional stakeholders
State Bond Proceeds, Federal Grants & Other for California High-Speed Rail Program	State general obligation bonds authorized under the Bond Act approved by California voters as Proposition 1A in 2008; federal grants authorized under American Recovery and Reinvestment Act and High-Speed Intercity Passenger Rail Program; Cap-and-Trade Auction Proceeds; potential use of qualified tax credit bonds; and private sources.	\$34.0	Estimate for Southern California segments based on statewide system total per 2014 California High-Speed Rail Business Plan. Further coordination anticipated with the California High-Speed Rail Authority in finalizing business plan; additionally, the High-Speed Rail Authority will pursue private-sector participation as a source of system financing.	MPO, California High-Speed Rail Authority, local/regional stakeholders, private-sector partners
Value Capture Strategies	Assumes formation of special districts (Enhanced Infrastructure Financing Districts) including use of tax increment financing for specific initiatives.	\$1.2	Pursue necessary approvals for special districts by 2020. Benefit assessment districts require majority approval by property owners; community facility districts require two-thirds approval; work with private entities for joint development opportunities as may be applicable.	MPO, CTCs, local jurisdictions, property owners along project corridors, developers
Local Option Sales Tax	Half-cent sales tax measure for Ventura County	\$2.1	Local sales tax measure to be placed on ballot by 2020	Ventura County

TABLE 6.3 SUMMARY OF REVENUE SOURCES

TABLE 6.3.1 CORE AND REASONABLY AVAILABLE REVENUE PROJECTIONS—LOCAL REVENUE SOURCES

(in Nominal Dollars, Billions)

REVENUE SOURCE	REVENUE PROJECTION ASSUMPTIONS	REVENUE ESTIMATE
Local Option Sales Tax Measures	<p>Description: Locally imposed ½ percent sales tax in four counties (Imperial, Orange, Riverside, and San Bernardino). Permanent 1 percent (combination of two ½ cent sales taxes) plus Measure R through 2039 in Los Angeles County. Measure D in Imperial County expires in 2050; Measure M in Orange County expires in 2041; Measure A in Riverside County expires in 2039; and Measure D in San Bernardino County expires in 2040.</p> <p>Assumptions: Sales taxes grow consistent with county transportation commission forecasts and historical trends.</p>	\$132.7
Transportation Development Act (TDA)—Local Transportation Fund	<p>Description: The Local Transportation Fund (LTF) is derived from a ¼ cent sales tax on retail sales statewide. Funds are returned to the county of generation and used mostly for transit operations and transit capital expenses.</p> <p>Assumptions: Same sales tax growth rate as used for local option sales tax measures.</p>	\$35.6
Gas Excise Tax Subventions (to Cities and Counties)	<p>Description: Subventions to counties and local jurisdictions in region from the California state gas tax. Revenues for the forecast are proportionate to the percentage of streets and roads that are regionally significant.</p> <p>Assumptions: Gasoline fuel consumption declines in real terms by 1.6 percent due to increasing fuel efficiency in conventional vehicles and adoption of electric and hybrid vehicles. Regionally significant streets and roads (28 to 48 percent of total roads) are classified as either arterials or collectors.</p>	\$5.6
Transit Farebox Revenue	<p>Description: Transit fares collected by transit operators in the SCAG region.</p> <p>Assumptions: Farebox revenues increase consistent with historic trends, planned system expansions, and operator forecasts.</p>	\$29.7
Highway Tolls (in core revenue forecast)	<p>Description: Revenues generated from toll roads operated by the Transportation Corridor Agencies (TCA), from the SR-91 Express Lanes operated by the Orange County Transportation Authority (OCTA) and Riverside County Transportation Commission (RCTC), and from the express lanes along I-10 and I-110 in Los Angeles County.</p> <p>Assumptions: Toll revenues grow consistent with county transportation commission forecasts and historical trends.</p>	\$17.2
Mitigation Fees	<p>Description: Revenues generated from development impact fees. The revenue forecast includes fees from the Transportation Corridor Agency (TCA) development impact fee program, San Bernardino County's development impact fee program and Riverside County's Transportation Uniform Mitigation Fee (TUMF) for both the Coachella Valley and Western Riverside County.</p> <p>Assumptions: The financial forecast is consistent with revenue forecasts from TCA, Riverside County Transportation Commission (RCTC), and the San Bernardino Associated Governments (SANBAG).</p>	\$10.1
Other Local Sources	<p>Description: Includes committed local revenue sources such as transit advertising and auxiliary revenues, lease revenues, and interest and investment earnings from reserve funds.</p> <p>Assumptions: Revenues are based on financial data from transit operators and local county transportation commissions.</p>	\$23.8
LOCAL SUBTOTAL		\$254.7

Note: Numbers may not sum to total due to rounding.

TABLE 6.3.2 CORE AND REASONABLY AVAILABLE REVENUE PROJECTIONS—STATE REVENUE SOURCES

(in Nominal Dollars, Billions)

REVENUE SOURCE	REVENUE PROJECTION ASSUMPTIONS	REVENUE ESTIMATE
State Transportation Improvement Program (STIP)	<p>Description: The STIP is a five-year capital improvement program that provides funding from the State Highway Account (SHA) for projects that increase the capacity of the transportation system. The SHA is funded through a combination of state gas excise tax, the Federal Highway Trust Fund, and truck weight fees. The STIP may include projects on state highways, local roads, intercity rail, or public transit systems. The Regional Transportation Planning Agencies (RTPAs) propose 75 percent of STIP funding for regional transportation projects in Regional Transportation Improvement Programs (RTIPs). Caltrans proposes 25 percent of STIP funding for interregional transportation projects in the Interregional Transportation Improvement Program (ITIP).</p> <p>Assumptions: Funds are based upon the 2014 Report of STIP Balances County and Interregional Shares, August 1, 2014. Fuel consumption declines in real terms by 0.9 percent due to increasing fuel efficiency in conventional vehicles and adoption of electric and hybrid vehicles.</p>	\$9.6
State Highway Operation and Protection Plan (SHOPP)	<p>Description: Funds state highway maintenance and operations projects.</p> <p>Assumptions: Short-term revenues are based on overlapping 2012 and 2014 SHOPP programs. Long-term forecasts are consistent with STIP forecasts and assume decline in fuel consumption.</p>	\$26.7
State Gasoline Sales Tax Swap	<p>Description: Prior to 2010, state sales tax on gasoline funded discretionary projects through the Transportation Investment Fund, which distributed revenues to the STIP, local streets and roads, and transit. In 2010, the sales tax revenues were “swapped” for an increased excise tax (initially 17.3 cents) recalculated each year to ensure revenue neutrality.</p> <p>Assumptions: The forecast is based on current funding levels as reported by the State Controller. Future revenues grow by 1.8 percent (in real terms) to be revenue neutral consistent with the gasoline sales tax swap.</p>	\$15.7
State Transit Assistance Fund (STA)	<p>Description: STA is funded from the diesel sales tax and is distributed by population share and revenue share of the transit operators.</p> <p>Assumptions: The forecast is based on current funding levels reported by the State Controller. Future funding declines with fuel consumption using assumptions consistent with other sources.</p>	\$5.8
Cap-and-Trade Auction Proceeds	<p>Description: The Global Warming Solutions Act of 2006 (AB 32) established the goal of reducing greenhouse gas (GHG) emissions statewide to 1990 levels by 2020. In order to help achieve this goal, the California Air Resources Board (ARB) adopted a regulation to establish a Cap-and-Trade program that places a “cap” on the aggregate GHG emissions from entities responsible for roughly 85 percent of the state’s GHG emissions. As part of the Cap-and-Trade program, ARB conducts quarterly auctions where it sells emission allowances. Revenues from the sale of these allowances fund projects that support the goals of AB 32, including transit and rail investments. Funds associated with non-transportation investments and High-Speed Rail are not included in this amount. Funds associated with High-Speed Rail are address under Innovative Financing and New Revenue Sources.</p> <p>Assumptions: The forecast is based on current revenue estimates from the Legislative Analyst’s Office (LAO). The LAO projects statewide revenues to reach a cumulative program total of \$15 billion by 2020. Given the uncertainty about future allowance prices, annual growth is assumed to be flat beyond 2020. SCAG’s revenue projection for Cap-and-Trade Auction Proceeds is conservative and represents a bottom floor estimate for the region. Proceeds for transportation could be significantly greater.</p>	\$3.7
Other State Sources	<p>Description: Other state sources include remaining Highway Safety, Traffic, Air Quality, and Port Security Bond Act of 2006 (Proposition 1B), Active Transportation Program, and other miscellaneous state grant apportionments for the SCAG region.</p> <p>Assumptions: Short-term revenues are based on actual apportionments. Future Active Transportation Program funding declines with fuel consumption using assumptions consistent with other sources.</p>	\$2.2
STATE SUBTOTAL		\$63.8

Note: Numbers may not sum to total due to rounding.

TABLE 6.3.3 CORE AND REASONABLY AVAILABLE REVENUE PROJECTIONS—FEDERAL REVENUE SOURCES

(in Nominal Dollars, Billions)

REVENUE SOURCE	REVENUE PROJECTION ASSUMPTIONS	REVENUE ESTIMATE
FHWA Non-Discretionary Congestion Mitigation and Air Quality (CMAQ) Program	<p>Description: Program to reduce traffic congestion and improve air quality in non-attainment areas.</p> <p>Assumptions: Short-term revenues are based upon the Caltrans apportionment estimates. Long-term revenues assume that fuel consumption declines by 0.9 percent (in real terms) annually. CMAQ funding is assumed to be reduced by 25 percent in 2022, an additional 25 percent in 2031, and an additional 25 percent in 2036 due to improved air quality.</p>	\$4.9
FHWA Non-Discretionary Regional Surface Transportation Program (RSTP)	<p>Description: Projects eligible for RSTP funds include rehabilitation and new construction on any highways included in the National Highway System (NHS) and Interstate Highways (including bridges). Also, transit capital projects, as well as intracity and intercity bus terminals and facilities, are eligible.</p> <p>Assumptions: Short-term revenues are based upon the Caltrans apportionment estimates. Long-term revenues assume that fuel consumption declines by 0.9 percent (in real terms) annually.</p>	\$7.3
FTA Formula Programs 5307 Urbanized Area Formula, 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Formula, 5311 Rural Formula, 5337 State of Good Repair Formula, and 5339 Bus and Bus Facilities Formula	<p>Description: This includes a number of FTA programs distributed by formula. 5307 is distributed to state urbanized areas with a formula based upon population, population density, number of low-income individuals, and transit revenue and passenger miles of service. Program funds capital projects, planning, job access and reverse commute projects, and operations costs under certain circumstances. 5310 funds are allocated by formula to states for projects providing enhanced mobility to seniors and persons with disabilities. 5311 provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000. 5337 is distributed based on revenue and route miles and provides funds for repairing and upgrading rail transit systems, high-intensity bus systems that use High-Occupancy Vehicle (HOV) lanes, including bus rapid transit (BRT). 5339 provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities.</p> <p>Assumptions: Formula funds are assumed to decline in proportion with the Federal Highway Trust Fund. As with the FHWA sources, fuel consumption declines by 0.9 percent (in real terms) annually.</p>	\$16.8
FTA Non-Formula Program 5309 Fixed Guideway Capital Investment Grants ("New Starts")	<p>Description: Provides grants for new fixed guideways or extensions to fixed guideways (projects that operate on a separate right-of-way exclusively for public transportation, or that include a rail or a catenary system), bus rapid transit projects operating in mixed traffic that represent a substantial investment in the corridor, and projects that improve capacity on an existing fixed guideway system.</p> <p>Assumptions: Operators are assumed to receive FTA discretionary funds in rough proportion to what they have received historically. As with the FHWA sources, fuel consumption declines by 0.9 percent (in real terms) annually.</p>	\$4.7
Other Federal Sources	<p>Description: Includes other federal programs, such as Transportation Investment Generating Economic Recovery (TIGER) competitive grant program, Highway Safety Improvement Program, Federal Safe Routes to School, Highway Bridge Program, and earmarks.</p> <p>Assumptions: Short-term revenues are based on actual apportionments. Long-term revenues assumes a 0.9 percent (in real terms) annual decline in fuel consumption as used for other federal funding sources.</p>	\$4.0
FEDERAL SUBTOTAL		\$37.7

Note: Numbers may not sum to total due to rounding.

TABLE 6.3.4 CORE AND REASONABLY AVAILABLE REVENUE PROJECTIONS—INNOVATIVE FINANCING AND NEW REVENUE SOURCES

(in Nominal Dollars, Billions)

REVENUE SOURCE	REVENUE PROJECTION ASSUMPTIONS	REVENUE ESTIMATE
State and Federal Gas Excise Tax Adjustment to Maintain Historical Purchasing Power	Description: Additional 10-cents-per-gallon gasoline tax imposed by the state and federal government starting in 2020 through 2024. Assumptions: Forecast consistent with historical tax rate adjustments for both state and federal gas taxes.	\$6.0
Mileage-Based User Fee (or equivalent fuel tax adjustment)	Description: Mileage-based user fees would be implemented to replace existing gas taxes (state and federal) by 2025. Assumptions: Consistent with recommendations from two national commissions established under SAFETEA-LU, it is assumed that a national mileage-based user fee system would be established during the latter years of the RTP/SCS. An estimated \$0.04 per mile (in 2015 dollars) is assumed starting in 2025 to replace existing gas tax revenues.	\$124.8 (est. increment only)
Highway Tolls (includes toll revenue bond proceeds)	Description: Toll revenues generated from regional toll facilities (e.g., East-West Freight Corridor and regional express lane network). Assumptions: Toll revenues based on recent feasibility studies for applicable corridors. Also includes toll revenue bond proceeds.	\$23.5
Private Equity Participation	Description: Private equity share as may be applicable for key initiatives. Assumptions: Private capital is assumed for a number of projects, including toll facilities; also, freight rail package assumes railroads' share of costs for main line capacity and intermodal facilities.	\$3.4
Freight Fees/National Freight Program	Description: Establishment of a national freight program consistent with federal surface transportation reauthorization (FAST ACT) and/or establishment of freight fees imposed nationally. Assumptions: The recently passed federal transportation reauthorization bill provides dedicated freight funding of approximately \$2.1 billion per year nationally. Regional estimate assumes a conservative percentage of proposed national program.	\$5.4
State Bond Proceeds, Federal Grants & Other for California High-Speed Rail Program	Description: Estimated total per 2014 California High-Speed Rail Business Plan. Assumptions: State general obligation bonds authorized under the Bond Act approved by California voters as Proposition 1A in 2008; federal grants authorized under ARRA and the High-Speed Intercity Passenger Rail Program (HSIPR); Cap-and-Trade Auction Proceeds; potential use of qualified tax credit bonds; and private sources.	\$34.0
Value Capture Strategies	Description: Formation of special districts—Enhanced Infrastructure Financing Districts. Assumptions: This strategy refers to capturing the incremental value generated by transportation investments. Specifically, SCAG assumes the formation of special districts, including Enhanced Infrastructure Financing Districts (EIFDs) for specific projects (e.g., East-West Freight Corridor).	\$1.2
Local Option Sales Tax	Description: Locally imposed ½ percent sales tax measure for Ventura County. Assumptions: Sales tax grows consistent with historical trends in county retail sales.	\$2.1
NEW REVENUE SOURCE SUBTOTAL		\$200.4
GRAND TOTAL		\$556.5

Note: Numbers may not sum to total due to rounding.

TABLE 6.4 FY 2016–2040 RTP/SCS REVENUES

(in Nominal Dollars, Billions)

REVENUE SOURCES		FY 2016–2020	FY 2021–2025	FY 2026–2030	FY 2031–2035	FY 2036–2040	TOTAL
LOCAL	Sales Tax	\$21.1	\$26.6	\$32.8	\$40.9	\$46.8	\$168.3
	• Local Option Sales Tax Measures	\$16.8	\$21.2	\$26.1	\$32.4	\$36.3	\$132.7
	• Transportation Development Act (TDA)—Local Transportation Fund	\$4.3	\$5.4	\$6.8	\$8.5	\$10.6	\$35.6
	Gas Excise Tax Subventions (to Cities and Counties)	\$1.0	\$1.1	\$1.1	\$1.2	\$1.2	\$5.6
	Transit Farebox Revenue	\$3.9	\$4.9	\$5.9	\$6.9	\$8.2	\$29.7
	Highway Tolls (in core revenue forecast)	\$2.0	\$2.6	\$3.3	\$4.2	\$5.2	\$17.2
	Mitigation Fees	\$1.7	\$1.9	\$2.1	\$2.3	\$2.1	\$10.1
	Other Local Sources	\$7.0	\$3.6	\$5.3	\$5.6	\$2.4	\$23.8
	Local Total	\$36.7	\$40.5	\$50.5	\$61.0	\$65.9	\$254.7
STATE	State Transportation Improvement Program (STIP)	\$1.4	\$1.8	\$2.0	\$2.1	\$2.3	\$9.6
	• Regional Transportation Improvement Program (RTIP)	\$1.1	\$1.4	\$1.5	\$1.6	\$1.7	\$7.2
	• Interregional Transportation Improvement Program (ITIP)	\$0.4	\$0.5	\$0.5	\$0.5	\$0.6	\$2.5
	State Highway Operation and Protection Plan (SHOPP)	\$4.3	\$5.0	\$5.4	\$5.8	\$6.2	\$26.7
	State Gasoline Sales Tax Swap	\$2.0	\$2.4	\$3.0	\$3.7	\$4.6	\$15.7
	State Transit Assistance Fund (STA)	\$0.9	\$1.0	\$1.2	\$1.3	\$1.4	\$5.8
	Cap-and-Trade Auction Proceeds	\$0.7	\$0.8	\$0.8	\$0.8	\$0.8	\$3.7
	Other State Sources	\$0.7	\$0.3	\$0.4	\$0.4	\$0.4	\$2.2
	State Total	\$10.0	\$11.4	\$12.6	\$14.1	\$15.7	\$63.8
FEDERAL	Federal Transit	\$4.0	\$4.1	\$4.2	\$4.7	\$4.3	\$21.5
	• Federal Transit Formula	\$2.9	\$3.1	\$3.3	\$3.6	\$3.9	\$16.8
	• Federal Transit Non-Formula	\$1.2	\$1.0	\$0.9	\$1.1	\$0.5	\$4.7
	Federal Highway & Other	\$3.1	\$3.1	\$3.3	\$3.3	\$3.3	\$16.2
	• Congestion Mitigation and Air Quality (CMAQ)	\$1.2	\$1.1	\$1.1	\$0.9	\$0.7	\$4.9
	• Regional Surface Transportation Program (RSTP)	\$1.2	\$1.3	\$1.4	\$1.6	\$1.7	\$7.3
	• Other Federal Sources	\$0.7	\$0.7	\$0.8	\$0.9	\$0.9	\$4.0
	Federal Total	\$7.2	\$7.3	\$7.5	\$8.0	\$7.7	\$37.7
INNOVATIVE FINANCING & NEW REVENUE SOURCES	State and Federal Gas Excise Tax Adjustment	\$1.3	\$4.8	\$0.0	\$0.0	\$0.0	\$6.0
	Mileage-Based User Fee	\$0.0	\$5.5	\$31.9	\$39.6	\$47.9	\$124.8
	Highway Tolls (includes toll revenue bond proceeds)	\$0.2	\$9.0	\$4.2	\$4.6	\$5.5	\$23.5
	Private Equity Participation	\$1.1	\$0.1	\$2.1	\$0.1	\$0.0	\$3.4
	Freight Fee/National Freight Program	\$0.7	\$0.9	\$1.0	\$1.2	\$1.5	\$5.4
	State Bond Proceeds, Cap-and-Trade Auction Proceeds, & Other for California High-Speed Rail Program	\$6.0	\$10.0	\$8.0	\$5.0	\$5.0	\$34.0
	Value Capture Strategies	\$0.0	\$1.2	\$0.0	\$0.0	\$0.0	\$1.2
	Local Option Sales Tax (Ventura County)	\$0.1	\$0.4	\$0.5	\$0.6	\$0.7	\$2.1
	Innovative Financing & New Revenue Sources Total	\$9.4	\$31.8	\$47.6	\$51.1	\$60.5	\$200.4
REVENUE TOTAL	\$63.3	\$91.1	\$118.2	\$134.2	\$149.8	\$556.5	

Note: Numbers may not sum to total due to rounding.

TABLE 6.5 FY 2016–2040 RTP/SCS EXPENDITURES

(in Nominal Dollars, Billions)

RTP COSTS	FY 2016–2020	FY 2021–2025	FY 2026–2030	FY 2031–2035	FY 2036–2040	TOTAL
CAPITAL PROJECTS:	\$27.6	\$46.7	\$56.0	\$57.0	\$59.2	\$246.6
Arterials	\$3.3	\$2.2	\$2.4	\$5.0	\$5.4	\$18.4
Goods Movement (includes Grade Separations)	\$8.0	\$18.9	\$19.5	\$12.2	\$12.1	\$70.7
High-Occupancy Vehicle/Express Lanes	\$2.7	\$2.2	\$2.5	\$3.7	\$4.1	\$15.2
Mixed-Flow and Interchange Improvements	\$2.2	\$1.4	\$2.6	\$2.9	\$3.0	\$12.2
Toll Facilities	\$1.8	\$3.2	\$2.3	\$0.6	\$0.5	\$8.4
Transportation Systems Management (including ITS)	\$0.9	\$1.1	\$1.4	\$2.9	\$2.9	\$9.2
Transit	\$6.4	\$8.6	\$11.0	\$14.4	\$15.7	\$56.1
Passenger Rail	\$0.8	\$6.3	\$10.3	\$10.4	\$10.8	\$38.6
Active Transportation	\$0.8	\$1.7	\$1.7	\$2.0	\$2.0	\$8.1
Transportation Demand Management	\$0.2	\$0.2	\$1.6	\$2.3	\$2.6	\$6.9
Other (includes Environmental Mitigation, Landscaping, and Project Development Costs)	\$0.5	\$0.6	\$0.7	\$0.7	\$0.2	\$2.7
OPERATIONS AND MAINTENANCE:	\$30.8	\$38.0	\$54.9	\$69.3	\$82.5	\$275.5
State Highways	\$9.0	\$10.5	\$12.4	\$15.7	\$18.2	\$65.8
Transit	\$18.5	\$23.3	\$29.4	\$38.6	\$46.9	\$156.7
Passenger Rail	\$1.6	\$2.3	\$3.0	\$3.8	\$5.0	\$15.7
Regionally Significant Local Streets and Roads*	\$1.7	\$1.9	\$10.1	\$11.1	\$12.5	\$37.3
DEBT SERVICE	\$4.9	\$6.4	\$7.3	\$7.9	\$8.0	\$34.5
COST TOTAL	\$63.3	\$91.1	\$118.2	\$134.2	\$149.8	\$556.5

Note: Numbers may not sum to total due to rounding.

* Includes \$4.8 billion for active transportation in addition to capital project investment level of \$8.1 billion for a total of \$12.9 billion for active transportation improvements



CHAPTER 7 HIGHLIGHTS

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Image courtesy of Alameda Corridor-East Construction Authority

A PLAN THAT CREATES ECONOMIC OPPORTUNITY: THE BIG PICTURE

Southern California is a huge geographic region. Often, employers in one area cannot easily access workers living in another. A more efficient transportation system, with increased public transit, will create a more efficient and competitive labor market and add economic activity and jobs into the economy.

The 2016 RTP/SCS outlines strategies for investing in transportation infrastructure that will benefit Southern California, the state and the nation in terms of economic development, job creation, economic growth and poverty reduction—as well as overall business and economic competitive advantages in the global economy. Over the 2016–2040 period, the 2016 RTP/SCS calls for spending more than \$556.5 billion on transportation improvement projects. The economic analysis prepared for the 2016 RTP/SCS, shown in more detail in the Economic & Job Creation Analysis Appendix, shows that significant employment will be generated throughout our region over the 25-year period of the Plan. The 2016 RTP/SCS boosts employment in two ways—providing jobs for people in highway and rail construction, operation and maintenance; and boosting the economic competitiveness of the region by making it a more attractive place to do business.

Even though we have gained back many of the jobs lost in the Great Recession, the region is contending with a larger population base and stagnant wages, which has resulted in even more of Southern California’s population slipping into poverty. More concerning is the fact that a staggering one in four children live below the poverty line in the region. The 2016 RTP/SCS is a major job creation engine, and the types of jobs created by the Plan, coupled with improved access to those jobs, have the potential to provide greater economic opportunity throughout the region. With jobs that can help sustain people in need, we can rebuild our infrastructure, rebuild our middle class and move citizens throughout Southern California from poverty to prosperity.

The economic analysis shows that construction, maintenance and operations expenditures specified in the 2016 RTP/SCS, as well as the indirect and induced jobs that flow from those expenditures, will generate an average of more than 188,000 new jobs annually on average.

When investments are made in the transportation system, the economic benefits go far beyond the jobs created building, operating and maintaining it. Unlike spending to satisfy current needs, infrastructure delivers benefits for decades. The infrastructure, once built, can enhance the economic competitiveness of a region. Projects that reduce congestion may help firms produce at lower cost, or allow those firms to reach larger markets or hire more capable employees. An economy with a well-functioning transportation system is a more attractive place for firms to do business, enhancing the economic competitiveness of our region. An additional 351,000 annual jobs will be created by the SCAG region’s increased competitiveness and improved economic performance that will result from congestion reduction and improvements in regional amenities due to implementation of the 2016 RTP/SCS.

THE ECONOMIC BENEFITS OF INVESTING IN TRANSPORTATION

As we mentioned briefly above, the 2016 RTP/SCS will lead to more jobs in at least two ways:

1. Providing direct jobs in highway and rail construction, transportation, and transit operations and maintenance
2. Enhancing economic competitiveness in the region by making it a more attractive place to do business and to live

These two impacts are summarized below.

- **Providing direct jobs in highway and rail construction, transportation, and transit operations and maintenance:** The 2016 RTP/SCS will employ people to build, operate and maintain transportation projects as a result of the Plan’s regional infrastructure investments. Economists refer to these jobs as the “direct effect” of the investments. Direct effects ripple through the economy, creating additional jobs in two ways:
 - **Indirect Effects:** Indirect effects are the jobs in companies that support the direct jobs created by the RTP/SCS spending. The firms and agencies that build and maintain the transportation system with RTP/SCS funding buy materials, office supplies and business services. All of those supply purchases that are necessitated by the RTP/SCS spending are indirect effects.
 - **Induced Effects:** Additionally, employees of the firms and agencies that build, operate and maintain the Southern California regional transportation system use their wages to buy all kinds of goods—housing, food, clothing, entertainment and more—and that supports additional jobs. This ripple effect creates what economists call “induced effects.” Employees who build, operate and maintain the RTP/SCS will earn wages to buy goods and services associated with daily living.
- **Enhancing economic competitiveness in the region by making it a more attractive place to do business:** Academic scholars have long understood that public infrastructure investments create direct jobs and additional multiplier effects from those jobs. But recently, economic research has illuminated how transportation spending also improves the viability and productivity of firms in regions, by increasing economic competitiveness through the increased

efficiency of a transportation system. A well-planned, well-functioning transportation system and integrated land use pattern can allow firms to communicate and conduct business with one another more quickly, draw workers from larger labor market pools, and ship and receive goods and services at lower costs. All of this can contribute to enhanced regional economic competitiveness, raising the productivity of firms in the region and leading to more jobs than those generated to build, operate and maintain the RTP/SCS.

WHY TRANSPORTATION ACCESS IS IMPORTANT FOR THE REGIONAL ECONOMY

Two economic transformations have occurred over the past two to three decades that have made transportation access an increasingly important element of regional economies. First, metropolitan economies increasingly rely on the value of proximity—what urban economists call “agglomeration economies,” or the propensity of successful local economies to cluster. Second, congestion has risen to levels that limit economic growth, research shows.

- **Agglomeration Economies and the Need for Access:** Firms benefit from being near other firms. Santa Monica’s “Silicon Beach” is a location where technology firms have easy access to other nearby peer firms, creating an environment of shared ideas, talent and interaction. Yet, that access is not always as readily available as it might seem. A video gaming company in Santa Monica might benefit from access to talent at Caltech or movie studios in Burbank, but both are easily an hour away during much of the day because of traffic congestion. So, the benefit of agglomeration—nearby access to business partners, customers and ideas—is diminished by a congested transportation system.

The benefits of local concentrations of firms are increasingly based on face-to-face communication. Research has shown that firms have higher productivity when locating near other firms, and those productivity benefits are often short-distance phenomena. Good transportation access “shrinks distance” by allowing businesses to more quickly access knowledge, suppliers and customers. Well-performing transportation systems, by contributing to dense, lively, walkable neighborhoods, can also create communities that are conducive to serendipitous meetings and face-to-face

communication. This is particularly important in knowledge-intensive or creative industries.

- **Congestion and Employment:** Traffic congestion has been increasing in nearly all U.S. metropolitan areas. Research shows that traffic delays inhibit job growth. In the Los Angeles metropolitan area, actual employment growth from 1990 to 2003 was 567,983 new jobs, but researchers have estimated that with a 50 percent reduction in congestion in the region’s metropolitan areas, employment growth from 1990 to 2003 would have been 700,235 new jobs. Research suggests that the employment enhancing effect of reducing congestion by implementing the 2016 RTP/SCS investments is larger in more congested urban areas. This is intuitive; the “distance shrinking” effect of managing congestion is more important in more congested urban areas. This is also a non-linear effect; congestion relief grows more important for the economy as congestion levels rise.

This sets the background and context for the economic impact study of the 2016 RTP/SCS. Metropolitan economies are increasingly relying on agglomeration benefits, as knowledge-based firms desire to locate near other similar firms. This phenomenon has long been familiar in Silicon Valley, and evidence suggests that the need to locate near similar firms is becoming pervasive in many segments of modern economies. At the same time, congestion has increased the “effective distance” within metropolitan areas and the evidence suggests that the negative economic effects of congestion are largest (and growing) in our most congested cities. Creating better access and mobility, a key goal of 2016 RTP/SCS, can be a clear pathway toward stimulating economic growth.

There are five possible paths through which transportation improvements can increase regional economic competitiveness. Each of these is described in the following sections.

1. **Improved labor market matching:** Reducing travel time allows firms to hire from a larger geographic area. This effectively increases the firm’s labor market—particularly in a large urban area like the SCAG region where reductions in commuting time can yield access to many more potential employees. Increasing the size of the labor pool allows firms to find a better employee match for its needs. By hiring employees who better suit their needs, the firm can produce more (i.e., employees are more productive) for the same cost. This allows the firm to be more competitive and capture a larger market share. And that, in turn, can lead to increased hiring if the increase in market share overcomes

the tendency of firms to produce more with fewer employees due to improved employer-employee job matches.

2. **Firms move into the region in response to enhanced economic competitiveness:** This effect flows in part from the first effect. If the region's transportation system supports more efficient commutes, then employers will be encouraged to draw from larger labor market pools. And if that larger employee pool allows firms to hire better employees, eventually those firms will move into the region in response to those improved hiring prospects. This is especially true for firms that rely on a skilled workforce. The increases in firm productivity that initially come from improved labor market matching will result in firms moving into the SCAG region from other locations over longer periods of time.
3. **Reduced congestion increases labor supply:** Metropolitan regions compete for mobile labor. That means that those regions with lower traffic congestion will (when all else is equal) lure more migrants—simply due to the value of offering commuters lower traffic congestion. This increases the supply of available labor. In metropolitan areas with high traffic congestion and longer commutes, the labor pool will have to be compensated either in the form of higher wages, lower house prices or both. These two related effects are, in fact, one and the same—the higher wages in high congestion metropolitan areas reflect the need to lure in a labor pool that otherwise might choose to locate in lower congestion locales. Reduced congestion can attract more workers to a region, allowing a firm to hire quality workers at reasonable wages.
4. **Increased market for firms' products:** Reductions in travel time also can allow firms to supply a larger market area, leading to increased economic competitiveness and regional job growth. One example is the goods movement/freight traffic that moves through the Ports of Los Angeles and Long Beach. Larger ports can build infrastructure that speeds up the processing of shipments, therefore lowering costs. Supply chain managers favor Southern California because of the speed and reliability that goods can be moved around the region and to the rest of the nation. As the economy expands, congestion robs the area of this competitive advantage. Reducing shipping times for landside freight, from the ports to points within and beyond the region, can help increase shipping volumes and lead to lower costs. This ultimately can add up to higher productivity, making the region's ports more cost effective than other competitive points of entry.

5. **Learning:** In a growing knowledge-based economy, cities are increasingly engines of economic innovation. Nearly all economic advances—in consumer products, technology, medicine, consumer services, retailing and logistics, and entertainment and fine arts—are created in metropolitan areas. A large and growing body of literature argues that much of the economic advantage of cities is the learning that is possible when individuals and firms are in close proximity. Engineers in Silicon Valley interact regularly, within and across different firms, creating a world-class hub of knowledge and innovation that is unrivaled in the computing, advanced electronics and software industries. The movie industry in Los Angeles provides the same center for knowledge and learning in the entertainment industry. Such learning effects are central to many industries, including manufacturing processes and services that increasingly rely on innovations to remain competitive. Transportation investments that reduce traffic congestion can allow people to interact more readily with a larger pool of like-minded experts, increasing the learning and innovation in a regional economy. That can allow local firms to innovate in ways that lowers costs, improves products and leads to larger market share. Over time, that improved innovation environment will attract mobile labor and capital (workers and firms) from other regions, further boosting economic activity.

QUANTIFYING THE ECONOMIC IMPACT OF THE PLAN

To quantify the economic impact of the Plan's implementation, the SCAG economic team used data and software from Regional Economic Models, Inc. (REMI). The REMI TranSight model is an advanced economic analysis model that combines input-output approaches, coupled with a model of resident and firm migration into and out of our region to model the direct, indirect and induced effects of the 2016 RTP/SCS spending. REMI also includes a general equilibrium model combined with New Economic Geography approaches to model changes in economic competitiveness. REMI TranSight is the most advanced tool commercially available for analysis that forecasts the total economic effects of changes to transportation systems. All of the economic analysis of the Plan was conducted using REMI models. More details on the REMI models and the methodologies that SCAG used can be found in the Economic & Job Creation Analysis Appendix.

THE RESULTS OF OUR ANALYSIS

Results are reported in two parts:

1. Jobs that result from the 2016 RTP/SCS investment spending (direct, indirect and induced effects)
2. Additional jobs that flow from the improvements to the transportation network, resulting in network efficiencies and related increases in regional economic and business competitiveness

JOBS THAT RESULT FROM THE RTP/SCS INVESTMENT SPENDING (DIRECT, INDIRECT AND INDUCED EFFECTS)

TABLE 7.1 shows the annual average new jobs from the 2016 RTP/SCS financial plan spending. The job impact is reported as annual average jobs in five-year periods (starting with 2016–2020), for each county and for the entire region. The last column in **TABLE 7.1** shows jobs, averaged over all Plan years, from 2016 RTP/SCS construction, operations and maintenance spending.

REMI TranSight model outputs predicted that jobs from transit operations and maintenance (O&M) expenditures in the region grow from an annual average of 119,000 in 2016–2020 to 173,000 in the last five years of the Plan (2036–

2040). As a fraction of the total jobs from the Plan's spending (construction and O&M), transit O&M jobs grow from half of the jobs in 2016–2020 to nearly two-thirds of all jobs in 2036–2040. Transit O&M spending, as a fraction of the total Plan spending, was virtually constant across those two time periods—increasing from 37 percent of total Plan spending in 2016–2020 to 39 percent of Plan spending in 2036–2040. The large increase in the share of the Plan's jobs from transit O&M while the share of the Plan's spending from transit O&M stays constant is not consistent.

Upon examination, the research team concluded that the size of the SCAG region's transit spending is outside of what REMI can accurately model in the later years of the Plan. In the years 2036–2040, the region will spend \$7.5 billion per year on transit O&M, while REMI's baseline forecast of the size of the transit industry in the region during that same time period is about \$2 billion per year. The large difference is not due to any fault of the REMI model, but rather is due to the fact that the SCAG region is building the largest transit public works project in the history of the U.S.—an investment at a scale well beyond what has been experienced in other similar metropolitan areas during recent decades and even of a magnitude unprecedented compared to prior SCAG RTPs. The scale of the transit investment and the resulting magnitude of the increase in transit O&M are beyond what the research team believes the REMI TranSight model can reliably forecast at this point in time, therefore, the growth in jobs from transit O&M spending was adjusted downward.

TABLE 7.1 2016 RTP/SCS EMPLOYMENT IMPACT FROM CONSTRUCTION, OPERATIONS AND MAINTENANCE SPENDING

Annual Average Jobs Relative to Baseline (Thousands)

REGION	2016–2020	2021–2025	2026–2030	2031–2035	2036–2040	AVG PER YEAR
Imperial	1.68	2.14	4.54	4.55	4.55	3.49
Los Angeles	110.74	112.71	99.16	86.01	93.78	100.48
Orange	52.99	21.17	16.75	17.41	20.05	25.67
Riverside	31.99	19.33	25.09	28.84	24.90	26.03
San Bernardino	32.53	26.41	26.98	27.11	25.13	27.63
Ventura	7.13	6.00	6.02	3.71	4.04	5.38
SCAG REGION	237.06	187.76	178.53	167.63	172.45	188.69

Source: SCAG calculations from 2016 RTP/SCS financial plan input into REMI model. Note that the REMI model reports full and part-time jobs and the job numbers include both full-time and part-time jobs. Figures may not add up due to rounding.

ADDITIONAL JOBS THAT FLOW FROM THE IMPROVEMENTS TO THE TRANSPORTATION NETWORK, RESULTING IN NETWORK EFFICIENCIES AND RELATED INCREASES IN REGIONAL ECONOMIC AND BUSINESS COMPETITIVENESS

Network efficiency in the form of improved transportation access is a second source of job growth. [TABLE 7.2](#) shows the jobs from improved economic competitiveness that result from decreases in travel times and less costly trip-making relative to the baseline. Note that the economic competitiveness jobs grow over time, as the effect of the 2016 RTP/SCS relative to baseline results in increasingly larger transportation improvements and resulting cumulative network efficiencies over the course of the Plan.

FULL RESULTS

The full economic results of the 2016 RTP/SCS investment are summarized in the table, with millions of new jobs (annual average) resulting from the Plan in five-year time periods and an annual average shown for 2016-2040. The total combined jobs from the two effects—Plan investment (construction, operations and maintenance spending) and network efficiency/economic competitiveness—are shown summed together in the table to highlight the total economic impact of the 2016 RTP/SCS.

TABLE 7.2 2016 RTP/SCS JOBS FROM ENHANCED ECONOMIC COMPETITIVENESS, REMI ESTIMATES OF JOBS FROM NETWORK EFFICIENCY PLUS AMENITIES AND OPERATIONS

Annual Average Jobs Relative to Baseline (Thousands)

REGION	2016–2020	2021–2025	2026–2030	2031–2035	2036–2040	AVG PER YEAR
Imperial	0.1	0.4	0.73	1.19	1.73	0.83
Los Angeles	40.62	137.22	225.15	292.13	320.1	203.04
Orange	7.43	25.6	42.42	65.98	99	48.09
Riverside	9.11	31.37	48.78	66.25	83.43	47.78
San Bernardino	6.36	25.56	47.08	65.72	79.91	44.93
Ventura	0.81	3.6	7.33	10.1	10.7	6.51
SCAG REGION	64.4	223.74	371.49	501.38	594.87	351.19

Source: SCAG calculations from 2016 RTP/SCS travel model results input into REMI TranSight model. Figures may not add up due to rounding.

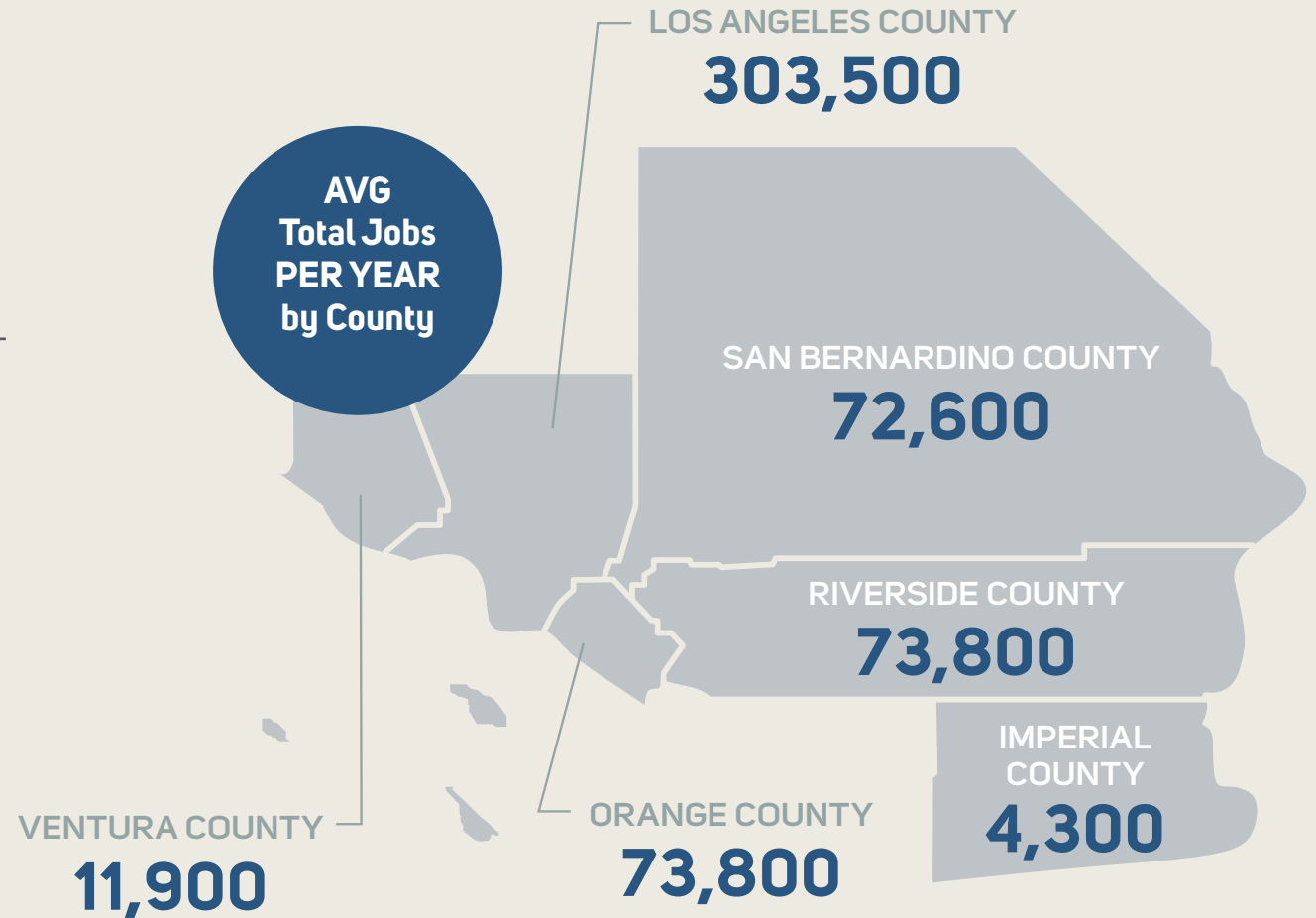
CREATING JOBS IN THE SCAG REGION



539,900

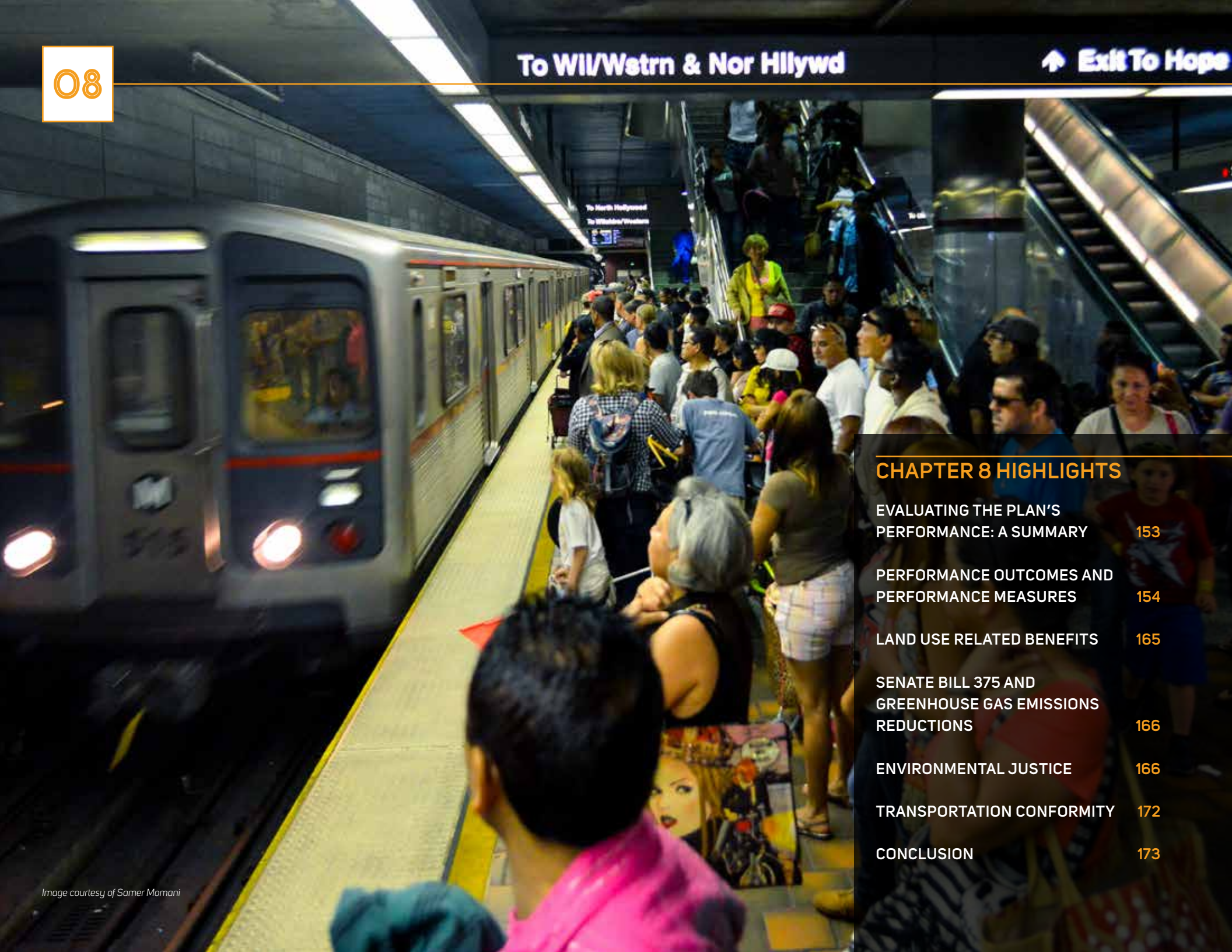
AVG Total JOBS
per year
in the SCAG region

Total jobs, all sources, construction, operations and maintenance, network benefits, from 2016 RTP/SCS. In comparison, the 2012 RTP/SCS would create 528,500 average total jobs during the life of the plan.



To Wll/Wstrn & Nor Hillywd

Exit To Hope



CHAPTER 8 HIGHLIGHTS

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MEASURING OUR PROGRESS FOR THE FUTURE

The 2016 RTP/SCS uses a number of performance measures to help gauge progress toward meeting the goals and objectives of our region, as well as how the Plan meets federal requirements, including the intent of the current federal transportation authorization. The measures also address state requirements for reducing greenhouse gas emissions and planning for a more sustainable future. The 2016 RTP/SCS is expected to result in significant benefits to our region with respect to mobility and accessibility, air quality, economic growth and job creation, sustainability, and environmental justice. An extended discussion on how the Plan performs, along with the outcomes it achieves, is the topic of this chapter.

PLAN PERFORMANCE RESULTS

This graphic highlights the key benefits of implementing the 2016 RTP/SCS in terms of mobility, economy, efficiency and air quality.

Spending Less Time on the Road

20.5 miles

average daily vehicle miles driven per person



7.4%
↓

9.2 mins

daily delay per capita (extra time spent in traffic)



39%
↓

More Economic Opportunities



\$1.00 = \$2.00
INVESTMENT BENEFIT



351,000

additional jobs supported by improving competitiveness

Efficiency Cost Savings

HOUSEHOLD COSTS (transportation/energy/water use)

\$14,000/yr

12%
↓

REDUCTION IN BUILDING ENERGY COSTS

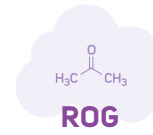


4%
↓

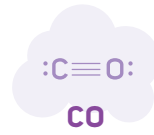
PASSENGER VEHICLE FUEL USE

10%
↓

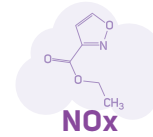
Improved Air Quality



49.1 TONS
↓8%
45.0 TONS



338.6 TONS
↓9%
307.7 TONS



96.4 TONS
↓9%
88.2 TONS



13.3 TONS
↓5%
12.6 TONS

GHG REDUCTIONS

2020 **↓8%**
2035 **↓18%**
2040 **↓21%**

EVALUATING THE PLAN'S PERFORMANCE: A SUMMARY

COMPARING THE PLAN VS. NO PLAN

Implementation of the 2016 RTP/SCS will secure a safe, efficient, sustainable and prosperous future for our region. To demonstrate how effective the Plan would be toward achieving our regional goals, SCAG conducted a “Plan vs. No Build” (or Baseline) analysis—essentially comparing how the region would perform with and without implementation of the Plan. This analysis is summarized in this chapter. More details on this analysis and its results can be found in the Performance Measures Appendix.

First and foremost, the 2016 RTP/SCS meets all of the federal and state requirements. It meets all provisions for transportation conformity under the federal Clean Air Act. Cleaner fuels and new vehicle technologies will help significantly reduce many of the pollutants that contribute to smog and other airborne contaminants that may impact public health in the region. The Plan also performs well when it comes to meeting state-mandated targets for reducing greenhouse gas emissions from cars and light trucks. The state-determined targets for the SCAG region are an eight percent per capita reduction in greenhouse gas emissions from automobiles and light trucks by 2020, and a 13 percent reduction by 2035 (compared with 2005 levels). The Plan would result in an eight percent reduction in emissions by 2020, an 18 percent reduction by 2035, and a 21 percent reduction by 2040 as compared to 2005 levels.

Overall, the analysis clearly demonstrates that implementing the 2016 RTP/SCS would result in a regional transportation network that improves travel conditions and air quality, while also promoting an equitable distribution of benefits—that is, social equity. Trips to work, schools and other key destinations would be quicker and more efficient under the Plan. The 2016 RTP/SCS integrates multiple transportation modes, leading to increases in carpooling, demand for transit and use of active transportation modes for trips during peak travel hours and at other times. More specifically, our analysis found that, in

comparison to the Baseline, the Plan will:

- Increase the combined percentage of work trips made by active transportation and public transit by about four percent, with a commensurate reduction in the share of commuters traveling by single occupant vehicle.
- Reduce Vehicle Miles Traveled (VMT) per capita by 7.4 percent and Vehicle Hours Traveled (VHT) per capita by about 17 percent (for automobiles and light/medium duty trucks) as a result of more location efficient land use patterns and improved transit service.
- Increase daily transit travel by nearly one-third, as a result of improved transit service and more transit-oriented development patterns.
- Reduce delay per capita by 39 percent.
- Reduce total heavy duty truck delay by 40 percent.
- Create an estimated 351,000 (or more) additional new jobs annually, due the region's increased competitiveness and improved economic performance that will result from congestion reduction and improvements in regional amenities with implementation of the Plan.
- Reduce the amount of previously undeveloped (greenfield) lands converted to more urbanized use by 23 percent. Conservation of open space and other rural lands is achieved by focusing new residential and commercial development in higher density areas. Through this strategy of conservation, the Plan provides a solid foundation for more sustainable development in the SCAG region.

The 2016 RTP/SCS also focuses on improving public health outcomes in the SCAG region. Some key performance results include a reduction in our regional obesity rate and reductions in the share of our population that suffers with hypertension and type 2 diabetes. The total annual health costs for respiratory disease will be reduced under the Plan more than 13 percent compared with the Baseline. These public health improvements are the result of investments in active transportation, more walkable communities and improved regional air quality as promoted in the 2016 RTP/SCS.

PERFORMANCE OUTCOMES AND PERFORMANCE MEASURES

This section summarizes how well the 2016 RTP/SCS is expected to perform when fully implemented. [TABLE 8.1](#) lists the 2016 RTP/SCS performance outcomes and the associated measures used to evaluate performance, using the SCAG Regional Travel Demand Model (RTDM) and other tools. The table also includes specific performance results for both the Baseline and the Plan for each of the measures. Additional performance measures that will be used for ongoing regional monitoring are discussed in the Performance Measures Appendix.

In the discussion of performance outcomes, three scenarios are referenced: Base Year, Baseline and Plan.

- **Base Year** represents existing conditions as of 2012—that is, our region as it was in 2012: our transportation system, land use patterns and socio-economic characteristics (e.g., households and employment). The year 2012 was selected as the Base Year for this analysis because it is the year of the previous RTP/SCS.
- **Baseline** assumes a continuation of the development trends of recent decades, with local General Plans not including the intensified policies regarding growth distribution as promoted in the Plan. This scenario represents a future in 2040 in which only the following have been implemented: transportation projects currently under construction or undergoing right-of-way acquisition; those transportation programs and projects programmed and committed to in the 2015 Federal Transportation Improvement Program (FTIP); and/or transportation projects that have already received environmental clearance.
- **Plan** represents future conditions in 2040, in which the transportation investments and strategies detailed in the 2016 RTP/SCS are fully realized.

The Base Year, Baseline and Plan scenarios discussed in this chapter were developed to help evaluate the performance of the strategies, programs and projects presented in Chapter 5—the core of the 2016 RTP/SCS—and to meet various state and federal requirements.

On the following pages, a summary is provided of the Plan’s performance outcomes, along with their associated performance measures. Some of the significant co-benefits provided by the Plan are summarized in [TABLE 8.2](#).

LOCATION EFFICIENCY

The Location Efficiency outcome reflects the degree to which improved coordination of land use and transportation planning impacts the movement of people and goods in the SCAG region. This outcome has several associated performance measures that will be used for monitoring the degree to which the region is advancing toward our Location Efficiency goals:

1. Share of Growth in High Quality Transit Areas (HQTAs)
2. Land Consumption
3. Vehicle Miles Traveled (VMT)
4. Transit Mode Share
5. Average Distance for Work and Non-Work Trips
6. Percent of Trips Less than Three Miles
7. Work Trip Length Distribution

In addition to these seven metrics, measures of mobility and accessibility also serve to further reinforce the importance of the location efficiency outcome. Measures supporting the Mobility and Accessibility outcome are discussed in the next section of this chapter.

The following is a summary of the Location Efficiency performance measures:

SHARE OF GROWTH IN HIGH QUALITY TRANSIT AREAS (HQTAS)

Between 2012 and 2040, growth in the regional share of both households and employment in the HQTAs is projected to increase from the Baseline scenario to the Plan scenario.

LAND CONSUMPTION

The land consumption metric measures the amount of agricultural land that has changed from rural to more intensive development patterns to accommodate new growth. Greenfield land consumption refers to development that occurs on land that has not previously been developed for, or otherwise impacted by, urban uses, including agricultural lands, forests, deserts and other undeveloped sites. As shown in [TABLE 8.2](#), new land consumption under the Plan would be substantially less than what would occur under the Baseline.

PLAN PERFORMANCE RESULTS IN THE SCAG REGION

Daily Vehicle Miles Traveled (VMT) per capita



Baseline to Plan Comparison
-7.4%

Base Year to Plan Comparison
-10.2%

Daily Minutes of Delay per capita



Baseline to Plan Comparison
-39%

Base Year to Plan Comparison
-22%

	2012 BASE YEAR	2040 BASELINE	2040 PLAN	
DAILY VMT per capita	24.8 MILES	26.3 MILES	25.1 MILES	IMPERIAL COUNTY
DAILY DELAY per capita	0.7 MINUTES	2.7 MINUTES	2.0 MINUTES	
DAILY VMT per capita	21.5 MILES	20.2 MILES	18.4 MILES	LOS ANGELES COUNTY
DAILY DELAY per capita	14.7 MINUTES	16.4 MINUTES	11.5 MINUTES	
DAILY VMT per capita	23.8 MILES	22.8 MILES	21.4 MILES	ORANGE COUNTY
DAILY DELAY per capita	11.9 MINUTES	13.2 MINUTES	7.9 MINUTES	
DAILY VMT per capita	23.3 MILES	23.7 MILES	21.7 MILES	RIVERSIDE COUNTY
DAILY DELAY per capita	5.9 MINUTES	12.3 MINUTES	5.6 MINUTES	
DAILY VMT per capita	26.6 MILES	27.1 MILES	25.9 MILES	SAN BERNARDINO COUNTY
DAILY DELAY per capita	7.6 MINUTES	17.1 MINUTES	7.4 MINUTES	
DAILY VMT per capita	22.4 MILES	21.9 MILES	20.2 MILES	VENTURA COUNTY
DAILY DELAY per capita	7.0 MINUTES	11.5 MINUTES	5.7 MINUTES	

TABLE 8.1 2016 RTP/SCS PERFORMANCE MEASURES AND RESULTS (IN THOUSANDS OF HOURS)

PERFORMANCE MEASURE	DEFINITION	OBJECTIVE	CATEGORY	2040 BASELINE	2040 PLAN	INDICATOR
OUTCOME: LOCATION EFFICIENCY						
Share of growth in High Quality Transit Areas (HQTAs)	Share of the region's growth in households and employment in HQTAs	Improvement (increase) over No Project Baseline	Percent of households in HQTAs	36%	46%	↑
			Percent of jobs in HQTAs	44%	55%	↑
Land consumption	Greenfield land consumed and refill land consumed	Improvement (decrease) over No Project Baseline	Greenfield land consumed	154 sq miles	118 sq miles	↓
Vehicle Miles Traveled (VMT) per capita	Average daily vehicle miles driven per person	Improvement (decrease) over No Project Baseline	Automobiles and light-duty trucks	22.1 miles	20.5 miles	↓
Transit mode share	The share of total trips that use transit for work and non-work trips	Improvement (increase) over No Project Baseline	All Trips	2.2%	3.1%	↑
			Work Trips	5.6%	8.2%	↑
Average distance traveled for work and non-work trips	The average distance traveled for work or non-work trips	Improvement (decrease) over No Project Baseline	Work Trips	15.1 miles	15.5 miles	↑
			Non-Work Trips	7.8 miles	7.9 miles	↑
Percent of trips less than 3 miles	The share of work and non-work trips which are fewer than 3 miles	Improvement (increase) over No Project Baseline	Work Trips	20.4%	20.3%	↑
			Non-Work Trips	41.7%	41.9%	↑
Work trip length distribution	The statistical distribution of work trip length in the region	Improvement (increase) over No Project Baseline	Trip Length: 10 miles or Less	51.6%	50.9%	↓
			Trip Length: 25 miles or Less	81.8%	81.0%	↓
OUTCOME: MOBILITY AND ACCESSIBILITY						
Person delay per capita*	Delay per capita can be used as a supplemental measure to account for population growth impacts on delay	Improvement (decrease) over No Project Baseline	Daily minutes of delay per capita	15.0 mins	9.2 mins	↓
Person delay by facility type*	Delay: Excess travel time resulting from the difference between a reference speed and actual speed	Improvement (decrease) over No Project Baseline	Highway	3,035,105 hrs	2,023,417 hrs	↓
			HOV	251,547 hrs	42,590 hrs	↓
			Arterial	2,254,896 hrs	1,327,235 hrs	↓
Truck delay by facility type*	Delay: Excess travel time resulting from the difference between a reference speed and actual speed	Improvement (decrease) over No Project Baseline	Highway	274,456 hrs	171,828 hrs	↓
			Arterial	47,561 hrs	20,998 hrs	↓
Travel time distribution for transit, SOV and HOV modes for work and non-work trips*	Travel time distribution for transit, SOV and HOV for work and non-work trips	Improvement (increase) over No Project Baseline	% of PM peak transit trips <45 minutes	22%	26%	↑
			% of PM peak HOV trips <45 minutes	72%	79%	↑
			% of PM peak SOV trips <45 minutes	82%	89%	↑

TABLE 8.1 CONTINUED

PERFORMANCE MEASURE	DEFINITION	OBJECTIVE	CATEGORY	2040 BASELINE	2040 PLAN	INDICATOR
OUTCOME: SAFETY AND HEALTH						
Collision rates by severity by mode (per 100 million vehicle miles)*	Collision rate per 100 million vehicle miles by mode and number of fatalities and serious injuries by mode (all, bicycle/pedestrian)	Improvement (decrease) over No Project Baseline	Serious injuries	N/A	1.60	
			Fatalities	N/A	0.31	
Criteria pollutants emissions (tons per day)	CO, NOx, PM 2.5, PM 10 and VOC	Meet Federal air quality conformity requirements (FR)	Reactive organic gases (ROG)	49.1 tons	45.0 tons	↓
			Carbon monoxide (CO)	338.6 tons	307.7 tons	↓
			Oxides of nitrogen (NOx)	96.4 tons	88.2 tons	↓
			Particulate matter (PM 10)	32.6 tons	30.8 tons	↓
			Particulate matter (PM 2.5)	13.3 tons	12.6 tons	↓
			Nitrogen dioxide (NO2)	94.6 tons	86.8 tons	↓
Air pollution-related health measures	Pollution-related respiratory disease incidence and cost	Improvement (decrease) over No Project Baseline	Pollution-related health incidences (annual)	270,328	234,363	↓
			Pollution-related health costs (annual)	\$4.48 billion	\$3.88 billion	↓
Physical activity-related health measures	Physical activity/weight related health issues and costs	Improvement over No Project Baseline	Daily per capita walking	12.1 mins	16.0 mins	↑
			Daily per capita biking	1.6 mins	2.0 mins	↑
			Daily per capita driving	64.8 mins	61.9 mins	↓
			Obese population (%)**	26.3%	25.6%	↓
			High blood pressure (%)**	21.5%	20.8%	↓
			Heart disease (%)**	4.4%	4.2%	↓
			Diabetes Type 2 (%)**	6.1%	6.0%	↓
Mode share of walking and bicycling	Mode share of walking and biking for work trips, non-work trips and all trips	Improvement (increase) over No Project Baseline	Walk share (Work)	4.4%	5.6%	↑
			Bike share (Work)	0.5%	0.7%	↑
			Walk share (Non-Work)	12.0%	15.0%	↑
			Bike share (Non-Work)	1.8%	2.5%	↑
			Walk share (All Trips)	10.7%	13.5%	↑
			Bike share (All Trips)	1.6%	2.2%	↑

TABLE 8.1 CONTINUED

PERFORMANCE MEASURE	DEFINITION	OBJECTIVE	CATEGORY	2040 BASELINE	2040 PLAN	INDICATOR
OUTCOME: ENVIRONMENTAL QUALITY						
Greenhouse gas emissions	CO, NOx, PM 2.5, PM 10 and VOC emissions; and per capita greenhouse gas emissions (CO2)	Meet state greenhouse gas reduction targets (SR)	Reduction in per capita greenhouse gas emissions from 2005 levels	N/A	8% in 2020 18% in 2035 21% in 2040	
OUTCOME: ECONOMIC OPPORTUNITY						
Additional jobs supported by improving competitiveness	Number of jobs added to the economy as a result of improved transportation conditions which make the region more economically competitive	Improvement (increase) over No Project Baseline	Annual number of new jobs generated	N/A	351,000+	
Additional jobs supported by transportation investments	Total number of jobs supported in the economy as a result of transportation expenditures	Improvement (increase) over No Project Baseline	Annual number of new jobs generated	N/A	188,000+	
OUTCOME: INVESTMENT EFFECTIVENESS						
Benefit/Cost Ratio	Ratio of monetized user and societal benefits to the agency transportation costs	Greater than 1.0	Benefit ratio per \$1 investment	N/A	2.0	
OUTCOME: TRANSPORTATION SYSTEM SUSTAINABILITY						
Cost to preserve multimodal system to current and state of good repair	Annual cost per capita required to preserve the regional multimodal transportation system to current conditions	Improvement (decrease) over Base Year	Cost per capita (per year)	N/A	\$368	
OUTCOME: ENVIRONMENTAL JUSTICE						
See Table 8.4: Performance Measures: Environmental Justice		Meet Federal requirements. No unaddressed disproportionately high and adverse effects for low income or minority communities (FR)				

Notes:

(FR) Federal requirement

(SR) State requirement

* MAP-21 calls for performance measures and targets associated with congestion, safety, reliability, freight movement, infrastructure condition, environment and project delivery. However, federal rule-making in support of MAP-21 performance measures is still in progress.

** Results are for areas experiencing land use and population changes not the entire SCAG region.

Acronyms

HOV: High-Occupancy Vehicle

SOV: Single-Occupancy Vehicle

TABLE 8.2 2016 RTP/SCS KEY BENEFITS

BENEFIT CATEGORIES	BASELINE	RTP/SCS	SAVINGS	% SAVINGS
Local Infrastructure and Services Costs: Capital and Operations and Maintenance Costs to Support New Growth, 2012–2040 ¹	\$40.6 billion	\$37.3 billion	\$3.3 billion	8.1%
Household Costs: Transportation and Home Energy/Water Use, All Households, Annual (2040)	\$16,000	\$14,000	\$2,000	12.3%
Land Consumption: New (greenfield) Land Consumed to Accommodate New Growth 2012–2040	154 sq miles	118 sq miles	36 sq miles	23.4%
Building Energy Use: Residential and Commercial Buildings, Cumulative, 2012–2040 (measured in British Thermal Units (BTUs))	20,311 trillion	19,563 trillion	748 trillion	3.7%
Building Energy Costs: Residential and Commercial Buildings, Cumulative, 2012–2040	\$762 billion	\$735 billion	\$27 billion	3.5%
Building Water Use: Residential and Commercial Buildings, Cumulative, 2012–2040 (measured in Acre Feet (AF))	134 million	133.2 million	0.8 million	0.6%
Building Water Costs: Residential and Commercial Buildings, Cumulative, 2012–2040	\$186 billion	\$185 billion	\$1 billion	0.5%
Household Driving: Annual Passenger VMT, 2040	177.7 billion	150 billion	27.7 billion	15.6%

Note: ¹ Operations and maintenance costs referenced here include costs beyond those for transportation (e.g., sewer and water operations and maintenance costs).

VEHICLE MILES TRAVELED (VMT) PER CAPITA

This measure is new to the 2016 RTP/SCS. VMT (for automobiles and light trucks) per capita has become an increasingly significant metric since the passage of Senate Bill 375, which led to state-determined reduction targets for regional greenhouse gas emissions from automobiles and light trucks. Automobiles and light duty trucks are a major contributor to greenhouse gas emissions, producing more than 60 percent of transportation sector emissions. Therefore, VMT reduction is a critical component of a comprehensive regional strategy for reducing greenhouse gas emissions. By monitoring progress in reducing per capita VMT through implementation of the various transportation investments and land use strategies outlined in this Plan, we will be better able to accurately gauge our momentum toward achieving our goals for reducing regional greenhouse gas emissions. Daily per capita VMT in the SCAG region is projected to decrease significantly in 2040 under the Plan.

TRANSIT MODE SHARE

Transit mode share is another new metric for the 2016 RTP/SCS. It measures the share of transit trips made throughout the region for work and non-work purposes. This new measure will help us to identify how well the transit strategies and improvements proposed in the 2016 RTP/SCS are working toward providing better and more diverse commuting options for the traveling public. Ideally, with better transit service, more commuters will choose that

TABLE 8.3 TRANSIT MODE SHARE BY COUNTY

(Plan 2040)

COUNTY	WORK TRIPS	ALL TRIPS
Imperial	0.6%	0.3%
Los Angeles	12.0%	4.7%
Orange	3.8%	1.7%
Riverside	1.1%	0.5%
San Bernardino	2.1%	0.7%
Ventura	1.6%	0.7%
SCAG Region	8.2%	3.1%

option over driving alone, further reducing VMT and regional greenhouse gas emissions. **TABLE 8.3** shows transit mode share by county for work trips and for all trips in 2040 as projected under the Plan.

AVERAGE DISTANCE FOR WORK AND NON-WORK TRIPS

The average distance for work trips in 2040 is projected to increase slightly under the Plan. The average distance traveled for non-work trips in 2040 is projected to remain relatively constant between the Baseline and the Plan.

PERCENT OF TRIPS LESS THAN THREE MILES

The vast majority of trips in Southern California today are made by people driving alone. As the length of trips becomes shorter, particularly to within a few miles, people are more likely to use transit, bike, walk or choose other alternatives to driving alone. By 2040, the share of work trips and non-work trips less than three miles is projected to remain relatively unchanged.

WORK TRIP LENGTH DISTRIBUTION

The share of trips less than ten miles in 2040 is projected to be just over 50 percent under both the Baseline and the Plan. Likewise, the share of trips under 25 miles would be about 81 percent for both the Baseline and the Plan.

MOBILITY AND ACCESSIBILITY

The Mobility and Accessibility outcome is defined as the ability to reach desired destinations with relative ease and within a reasonable time, using reasonably available transportation choices. This section discusses the mobility and accessibility performance measures for the 2016 RTP/SCS.

MOBILITY

The Mobility performance measure relies on the commonly used measure of delay. Delay is defined as the difference between actual travel time and the travel time at a pre-defined reference or optimal speed for each modal alternative. It is measured in vehicle-hours of delay (VHD), which can then be used to derive person-hours of delay. The mobility measures used to evaluate alternatives for this outcome include:

- Person Delay by Facility Type (Highway, High Occupancy Vehicle (HOV) Lanes, Arterials)
- Person Delay per Capita
- Truck Delay by Facility Type (Highway, Arterial)

One additional measure for delay that is readily available for ongoing monitoring, but which cannot be readily forecast, is non-recurrent delay. Recurrent delay is the day-to-day delay that occurs because too many vehicles are on the road at the same time. Non-recurrent delay is the delay that is caused by collisions, weather, special events or other atypical incidents. Non-recurrent delay can be mitigated or reduced by improving incident management strategies. Other uses of intelligent transportation technologies, such as traffic signal coordination and the provision of real-time information about unexpected delays, allow travelers to make better informed decisions regarding the availability of transportation alternatives, including transit. Non-recurrent delay as an on-going regional monitoring measure is discussed in greater detail in the Performance Measures Appendix.

Person Delay by Facility Type (Highway, High Occupancy Vehicle (HOV) Lanes, Arterials)

Since the 2012 RTP/SCS, the person delay measure has been expanded to differentiate between single-occupancy vehicle (SOV) and HOV delay. Person delay on our highways under the Plan would improve on Baseline conditions, while delay on HOV facilities will be reduced more dramatically. Delay on our regional arterial roadways would also improve between the Baseline and the Plan. **FIGURE 8.1** shows total person hours of delay by facility type.

Person Delay Per Capita

Normalizing delay by the number of people living in an area provides insight as to how well the region is mitigating traffic congestion in light of increasing population growth. Delay per capita is expected to grow considerably, particularly in the Inland Empire counties of Riverside and San Bernardino, under Baseline conditions. However, implementation of the Plan would reduce per capita delay substantially to below 2012 levels.

Truck Delay by Facility Type (Highway, Arterial)

This measure estimates the average daily truck delay by facility type for highways and arterials. The 2016 RTP/SCS includes significant investments in a regional freight corridor and other improvements to facilitate goods movement. It is estimated that the Plan would reduce heavy-duty truck delay on the highway and arterial systems. However, truck delay under the Plan would still be above Base Year levels, partly due to the projected growth in trade and associated truck traffic.

Highway Non-Recurrent Delay

As indicated previously, this measure will be used only for ongoing regional monitoring, not for evaluation of alternatives for the 2016 RTP/SCS. Non-recurrent delay refers to the share of congestion that is considered to be atypical. **FIGURE 8.2** shows the relative proportion of highway congestion that is estimated to be caused by non-recurrent events by county.

Highway Speed Maps

Maps illustrating highway speed conditions during the afternoon peak period (3 PM to 7 PM) based upon the SCAG RTDM results for the Base Year, Baseline and Plan are provided in the Performance Measures Appendix. Additional speed maps are provided in the Highways & Arterials Appendix.

ACCESSIBILITY

The Accessibility outcome is used to evaluate how well the transportation system performs in providing people access to opportunities. Opportunities may include jobs, education, medical care, recreation, shopping or any other activities that may help enhance a person's quality of life. For the 2016 RTP/SCS, accessibility is simply defined as the distribution of trips by mode by travel time.

As with the 2012 RTP/SCS, accessibility is measured by taking afternoon or PM peak period travel demand model results for the base and forecast years and identifying the percentage of commute or home-based work trips that are completed within 45 minutes. Peak periods are those times during the weekday when commuting travel on regional roadways reaches its highest levels. Typically, peak periods occur twice daily, first during the morning commute when people are traveling to their workplaces and again in the late afternoon when people are returning home from work. **FIGURE 8.3** shows these results. In all cases, the 2040 Plan would improve accessibility for home-based work trips over the Baseline.

The 2016 RTP/SCS provides a comprehensive measure of accessibility, including the transit, SOV, and HOV modes, for both work and non-work trips. The results of these mode-specific accessibility analyses can be found in the Performance Measures Appendix.

FIGURE 8.1 DAILY PERSON-HOURS OF DELAY BY FACILITY TYPE (IN THOUSANDS)

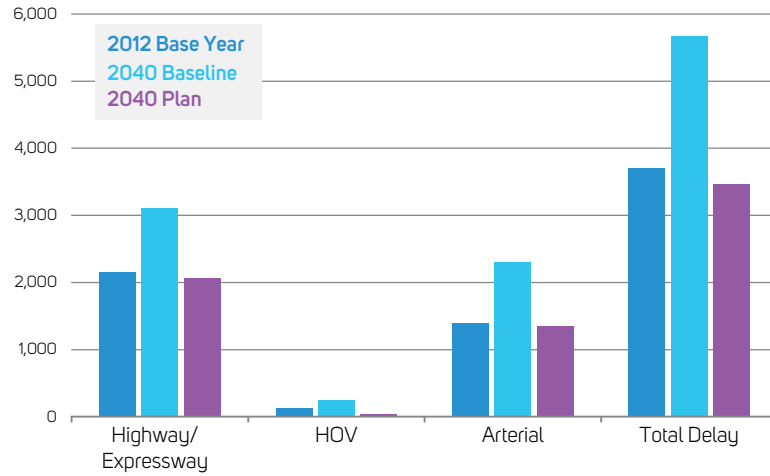


FIGURE 8.3 WORK TRIPS COMPLETED WITHIN 45 MINUTES

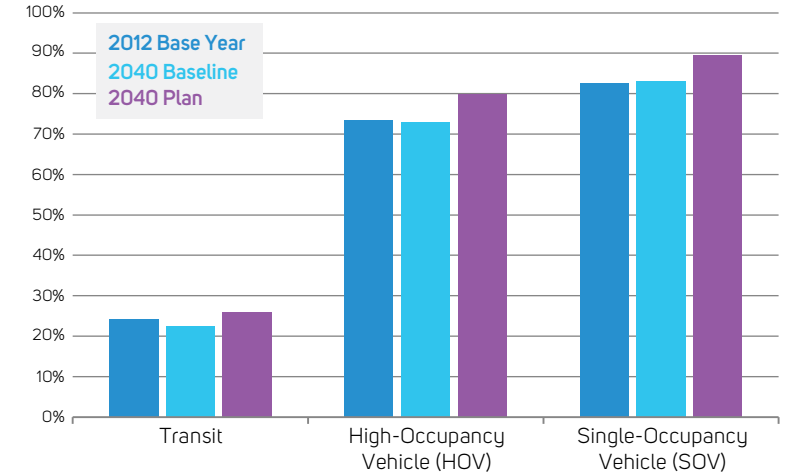
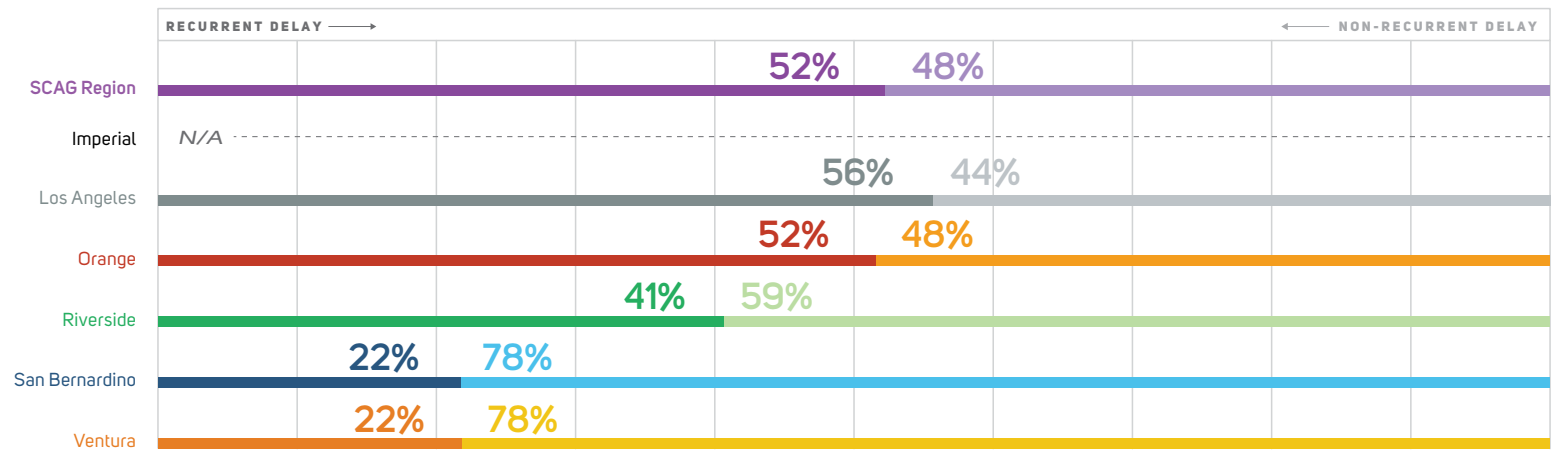


FIGURE 8.2 RECURRENT AND NON-RECURRENT CONGESTION (2011)



SAFETY AND HEALTH

The Safety and Health outcomes have been carried over from the 2012 RTP/SCS. In addition, the 2016 RTP/SCS includes new measures to evaluate the health outcomes of the Plan, including three new measures discussed below. The safety and health impacts of regional transportation improvements cannot be easily forecast, but total collisions can show a reduction in future years, particularly if people shift from travel modes with higher collision risk to modes with lower collision risk. The total number of collisions is generally used as the performance measure for safety and it can be partially projected by using mode and facility specific collision rates (highways, arterials and transit). This approach is used for the 2016 RTP/SCS, but it is important to note that this methodology does not take into account safety improvements specific to each mode. It only reflects changes based on modal or facility shifts. For monitoring, this measure can be reported historically by time period (month) and by mode (including for active transportation). Safety and Health outcome trends are discussed in greater detail in the Performance Measures Appendix.

Recognizing that the RTP/SCS integrates transportation and land use and has impacts beyond those exclusively transportation-related, the 2016 RTP/SCS includes three new health-related measures: mode share for walking and biking, rates of physical activity and weight-related disease, and incidence of respiratory/pollution-related disease.¹

The health benefits of an active lifestyle have become increasingly apparent in recent years, and there is growing support for improving the walkability and bikability of the communities where we live and work. The linkage between obesity and disease has been well documented, and providing the appropriate community design and infrastructure to support a more active lifestyle is an important first step toward promoting healthy communities. Walking and biking mode shares can be used to evaluate the 2016 RTP/SCS alternatives, while the disease-focused measures may also be useful for on-going regional monitoring.

A health measure carried over from the 2012 RTP/SCS is tons of criteria air pollutants, which is highly correlated to public health concerns such as asthma. There are six common air pollutants that are monitored in accordance with federal air quality regulations.² These criteria pollutants include particulate

matter (PM 10 and PM 2.5), carbon monoxide (CO), nitrogen oxides (NO_x), and nitrogen dioxide (NO₂). These pollutants require careful monitoring because of their known adverse effects on human health. While children, older residents and persons with existing respiratory illnesses are most vulnerable to the effects of air pollutants, the health effects of long-term exposure are a concern for everyone in the region. Some of the major health concerns of exposure to high levels of these criteria pollutants include respiratory irritation, reduced lung capacity, chest pain, and aggravation of asthma and other respiratory illnesses.³

Airborne particulate matter comes in all sizes. However, particles smaller than ten micrometers in diameter are considered the most dangerous to human health because they are small enough to be absorbed into the lungs. The finer the particle size, the more dangerous they are. Particulate matter smaller than 2.5 micrometers is a particularly serious concern for people with existing heart or lung disease, as even short-term exposure to high levels of PM 2.5 may aggravate symptoms. High levels of carbon monoxide (CO) is also considered a health hazard, especially for people with compromised respiratory or coronary function, as CO is known to reduce the flow of oxygen through the human body. Long-term exposure to high levels of nitrogen dioxide, which is produced primarily through the burning of fossil fuels, may cause a narrowing of the bronchial airways, resulting in chronic bronchitis or aggravation of asthma symptoms.⁴ The criteria pollutant performance measure supports both the Safety and Health outcome and the Environmental Quality outcome.

The 2016 RTP/SCS would improve physical activity outcomes through improved location efficiency, which increases the share of short trips and through the provision of additional investments in active transportation networks including first/last mile improvements, Safe Routes to School projects and regional bikeway infrastructure. It would also increase access to natural lands and parks, which would further increase opportunities for physical activity.

New to the 2016 RTP/SCS is the development of a new Public Health module for the Urban Footprint/Scenario Planning Model to measure the Plan's impact on physical activity. The model was evaluated by a statewide review panel consisting of representatives of state, regional and local agencies. The Plan is expected to result in 4.3 additional minutes of physical activity per capita over the Baseline in areas experiencing changes in land use, which would improve

¹ Ogden, Ph.D., C., & Carroll, M.S.P.H, M. (2010). Prevalence of Overweight, Obesity, and Extreme Obesity Among Adults: United States, Trends 1960–1962 Through 2007–2008. Center for Disease Control and Prevention. Accessed at http://www.cdc.gov/nchs/data/hestat/obesity_adult_07_08/obesity_adult_07_08.htm.

² For more information on Federal air quality standards, see U.S. Environmental Protection Agency, National Ambient Air Quality Standards (NAAQS): <http://www3.epa.gov/ttn/naaqs/criteria.html>.

³ For more information on the health impacts of criteria air pollutants, see U.S. Environmental Protection Agency, Six Common Air Pollutants: <http://www3.epa.gov/airquality/urbanair/>.

⁴ For more information on the health impacts of particulate matter, see U.S. Environmental Protection Agency, Particle Matter (PM) Health, Last Accessed October 7, 2015: <http://www3.epa.gov/pm/health.html>.

health outcomes related to obesity by 2.7 percent and high blood pressure by 3.3 percent for residents in those areas. For a broader discussion of the Scenario Planning Model, please see the SCS Background Documentation Appendix. For more detailed information on the connection between physical activity and health outcomes, please see the Public Health Appendix.

ENVIRONMENTAL QUALITY

This outcome is measured in terms of criteria pollutant and greenhouse gas emissions. Emissions are estimated using the SCAG RTDM results, which are used as input to the California Air Resources Board's (ARB) Emission Factors (EMFAC) model. Pollutant emissions are reported in detail as part of the Transportation Conformity Analysis Appendix. The impact of air quality on public health is discussed in the Safety and Health outcome section of this chapter. Monitoring of regional greenhouse gas emissions is discussed in the Performance Measures Appendix.

ECONOMIC OPPORTUNITY

The economic opportunity outcome is measured in terms of additional jobs created through improved regional economic competitiveness as a result of the transportation investments provided through the 2016 RTP/SCS. An annual average of more than 188,000 new jobs would be generated by the construction and operations expenditures in the 2016 RTP/SCS, in addition to more than 351,000 annual jobs that would be created in a broad cross-section of industries by the region's increased competitiveness and improved economic performance—as a result of the improved transportation system. Additional economic benefits of the 2016 RTP/SCS are discussed in Chapter 7.

INVESTMENT EFFECTIVENESS

The investment effectiveness outcome indicates the degree to which the Plan's expenditures generate benefits that transportation users can experience directly. This outcome is important because it describes how the Plan's transportation investments make productive use of increasingly scarce funds.

The benefit/cost ratio is the measure used to evaluate the cost-effectiveness outcome, as it compares the incremental benefits with the incremental costs of multimodal transportation investments. The benefits are divided into several categories, including:

- Savings resulting from reduced travel delay
- Air quality improvements
- Safety improvements
- Reductions in vehicle operating costs

For these categories, travel demand and air quality models are used to estimate the benefits of the Plan compared with the Baseline. Most of these benefits are a function of changes in VMT and VHT. Not all impacts are linear, so reductions in congestion can increase or decrease vehicle operating costs and emissions. Delay savings are reflected directly in the VHT statistics. To estimate the benefit/cost ratio, the benefits in each category are converted into dollars and added together. These are divided by the total incremental costs of the Plan's transportation improvements to produce a ratio. The investments in the 2016 RTP/SCS would provide a return of \$2.00 for every dollar invested, for a benefit/cost ratio of 2.0. For this analysis, all benefits and costs are expressed in 2012 dollars. Benefits are estimated over the RTP/SCS planning period through 2040. The user benefits are estimated using California's Cal-B/C framework and incorporate SCAG's RTDM outputs. The costs include the incremental public expenditures over the entire 2016 RTP/SCS planning period.⁵

TRANSPORTATION SYSTEM SUSTAINABILITY

A transportation system is sustainable if it maintains its overall performance over time in an equitable manner with minimum damage to the environment, and at the same time does not compromise the ability of future generations to address their transportation needs. Sustainability, therefore, pertains to how our decisions today impact future generations. One of the measures used to evaluate system sustainability is the total inflation-adjusted cost per capita to maintain our overall multimodal transportation system performance at current conditions. The 2016 RTP/SCS includes two additional new measures to support this outcome: State Highway System pavement condition and local roads pavement condition. These additional performance measures will strengthen the transportation system sustainability outcome and further support implementation of MAP-21.

⁵ California Department of Transportation. (2009). California Life-Cycle Benefit/Cost Analysis Model (Cal-B/C) User's Guide (Version 4.0). Accessed at http://www.dot.ca.gov/hq/tpp/offices/eab/benefit_files/CalBC_User_Guide_v8.pdf.

The 2016 RTP/SCS is committed to maintaining a sustainable regional transportation system by allocating \$275.5 billion toward maintaining and operating the system in a state of good repair over the period of the Plan. This amounts to an average annual per capita investment of about \$368 (in 2015 dollars) for each year of the Plan period. More details on performance measures for the Transportation System Sustainability outcome are presented in the Performance Measures Appendix.

LAND USE RELATED BENEFITS

Unlike the Plan, the Baseline scenario relies more heavily on growth in undeveloped lands at the edges of cities and beyond and focuses more new housing toward single-family developments in suburban settings. Using a different modeling process from that used for the mobility-based performance measures, additional land use related performance results were derived

using the single framework model as described in the SCS Background Documentation Appendix.

The land use strategy of the 2016 RTP/SCS promotes location efficiency by orienting new housing and job growth in areas served by high quality transit and in other targeted opportunity areas including existing main streets, downtowns and corridors where infrastructure already exists. This more compact land use pattern, combined with the transportation network improvements and strategies identified in the 2016 RTP/SCS, would result in improved pedestrian and bicycle access to community amenities, shorter average trip lengths and reduced vehicle miles traveled. This strategy also supports the development of more livable communities that provide more housing choices, conserve natural resources, offer more and better transportation options, and promote an overall better quality of life.

The more focused land use pattern promoted in the Plan also reduces the need for significant capital investments. Because new development is focused in areas where infrastructure already exists, there is not as much need to extend or build new local roads, water and sewer systems, and parks. However, in other instances, modernization of utilities needs to be considered and completed to accommodate the additional use. There are also operations and maintenance (O&M) cost savings. O&M costs include the ongoing local expenditures required to operate and maintain the infrastructure serving new residential growth. It is important to note the O&M costs referred to in this section are not the same O&M costs discussed in other sections of the 2016 RTP/SCS.

The 2016 RTP/SCS land use strategy also reduces the average household costs associated with driving and residential energy and water use. A land use pattern that contains more mixed-use/walkable and urban infill development accommodates a higher proportion of growth in more energy-efficient housing types like townhomes, apartments and smaller single-family homes, as well as more compact commercial building types. It should be noted that location is also an important factor in determining energy costs: buildings located in the warmer areas of the region use more energy each year, in part because they require more energy for cooling during the summer months.

As California is facing major constraints on water supplies due to ongoing drought conditions throughout the state, there is a strong emphasis on reducing residential water use. Residential water use is a function of both indoor and outdoor water needs, with outdoor use (landscape irrigation) accounting for the majority of the difference among housing types. Because homes with

RTP/SCS GREENHOUSE GAS REDUCTIONS

Percent Reduction from 2005 Levels Per Capita

	2020	2035	2040
ARB TARGET	8%	13%	N/A
2016 RTP/SCS	8%	18%	21%
% DIFFERENCE	0%	5%	N/A

* ARB has set GHG emissions reduction targets for 2020 and 2035, but not for 2040

larger yards require more water for landscape irrigation, lot size is generally highly correlated with a household's overall water consumption. Therefore, a land use pattern with a greater proportion of large lot single-family homes will require more water than a land use pattern that features a larger share of compact and urban infill development, which includes more attached and multifamily homes. And, as is the case for energy use, the location and type of new development has a significant bearing on water use: homes in the warmer and more arid locations of the region will consume more water to maintain lawns and other landscaping.

SENATE BILL 375 AND GREENHOUSE GAS EMISSIONS REDUCTIONS

As discussed previously in this Plan, Senate Bill 375 requires that SCAG and other Metropolitan Planning Organizations (MPOs) throughout the state develop a Sustainable Communities Strategy to reduce per capita greenhouse gas emissions through integrated transportation, land use, housing and environmental planning.

Pursuant to Senate Bill 375, ARB set per capita greenhouse gas emissions reduction targets from passenger vehicles for each of the state's 18 MPOs. For the SCAG region, the targets are set at eight percent below 2005 per capita emissions levels by 2020 and 13 percent below 2005 per capita emissions levels by 2035. Although ARB has not adjusted SCAG's regional targets since the 2012 RTP/SCS, SCAG anticipates that the region's targets could change—considering the Governor's recent Executive Order.⁶ Because the transportation sector is the largest contributor to California's greenhouse gas emissions (more than 36 percent), SCAG anticipates updated and more stringent regional greenhouse gas reduction targets may be forthcoming.⁷

In the meantime, the 2016 RTP/SCS achieves per capita greenhouse gas emissions reductions relative to 2005 of eight percent in 2020, 18 percent in 2035, and 21 percent in 2040—exceeding the reductions that ARB currently requires. For more detailed information and analysis regarding monitoring of air quality and greenhouse gas emissions in the SCAG region, please see the Transportation Conformity Analysis Appendix.

⁶ California Air Resources Board. (2015). Frequently Asked Questions About Executive Order B-30-15 2030 Carbon Target and Adaptation. [Fact Sheet]. Retrieved from http://www.arb.ca.gov/newsrel/2030_carbon_target_adaptation_faq.pdf

⁷ California Air Resources Board. California Greenhouse Gas Emission Inventory. (2015) [Website]. Retrieved from <http://www.arb.ca.gov/cc/inventory/data/data.htm>.

ENVIRONMENTAL JUSTICE

The concept of environmental justice is about equal and fair access to a healthy environment, with the goal of protecting minority and low-income communities from incurring disproportionate negative environmental impacts. SCAG's environmental justice program includes two main elements: technical analysis and public outreach. In the regional transportation-planning context, SCAG's role is to 1) ensure that when transportation decisions are made, low-income and minority communities have ample opportunity to participate in the decision-making process, and 2) identify whether such communities receive an equitable distribution of benefits and not a disproportionate share of burdens.

As such, SCAG adheres to all federal and state directives on environmental justice. All public agencies that use federal funding must make environmental justice part of their mission and adhere to three fundamental environmental justice principles:

1. To avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The 2016 RTP/SCS program of environmental justice public outreach and analysis, described in detail in the Environmental Justice Appendix, reviews federal legislation pertaining to environmental justice; major equity issues specific to our region; SCAG policies and programs related to this important topic; outreach efforts in communities across the region; and SCAG's efforts to identify demographic groups to ensure environmental justice in all of our communities.

TABLE 8.4 2016 RTP/SCS PERFORMANCE MEASURES: ENVIRONMENTAL JUSTICE

PERFORMANCE MEASURE	DEFINITION	PERFORMANCE TARGET	SUMMARY OF IMPACTS
2016 RTP/SCS revenue sources in terms of tax burdens ¹	Proportion of 2016 RTP/SCS revenue sources (taxable sales, income, and gasoline taxes) for low income and minority populations	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—households in poverty will not contribute disproportionately to the overall funding of the Plan. Minority households will not pay a higher proportion of taxes to fund the 2016 RTP/SCS than their relative representation in the region as a whole
Share of transportation system usage ¹	Comparison of transportation system usage by mode for low income and minority households vs each group's population share in the greater region	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—low income and minority groups show a higher usage of transit and active transportation modes and positions these communities to benefit from the investments in the 2016 RTP/SCS
2016 RTP/SCS investments ¹	Allocation of Plan investments by mode (bus, HOV lanes, commuter/high speed rail, highways/arterials, and light/heavy rail transit)	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the share of transportation investments for low income and minority communities outpaces these groups' financial burdens for the 2016 RTP/SCS
Distribution of travel time savings and travel distance reductions ¹	Details what groups are overall benefiting as a result of the Plan in terms of travel time and distance savings	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan's travel time and person-mile savings for low income households and minority communities is in line with each group's usage of the transportation system
Geographic distribution of transportation investments	Examination of transit, roadway and active transportation infrastructure investments in various communities throughout the region	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan's transportation infrastructure investments are distributed throughout the region in proportion to population density
Jobs-housing imbalance ¹	Comparison of median earnings for intra-county vs inter-county commuters for each county in the SCAG region; analysis of relative housing affordability and jobs throughout the region	Establish existing conditions (not a performance measure for the Plan)	Existing conditions show that higher wage workers tend to commute longer distances than lower wage workers. Inland counties show a lower job-to-worker ratio than coastal counties, indicating that there are more long distance commuters in inland counties. Please refer to the Environmental Justice Appendix for potential strategies to improve conditions at the local level
Accessibility to employment and services ¹	Percentage of employment and shopping destinations within a one- and two-mile travel buffer from each neighborhood; also, share of employment and shopping destinations that can be reached within 30 minutes by auto or 45 minutes by bus or all transit modes during the evening peak period	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan will improve the number of accessible destinations within 45 minutes of travel and within short distances for low income and minority communities both by auto and transit
Accessibility to parks and schools	Share of population within a one- and two-mile travel buffer from a regional park or school; also, share of park acreage that can be reached within 30 minutes by auto or 45 minutes by bus or all transit modes during the evening peak period	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan will improve the number of destinations accessible within 45 minutes of travel and short distances for low income and minority communities both by auto and transit
Gentrification and displacement ¹	Examination of historical demographic and economic trends for areas surrounding rail transit stations	Establish existing conditions (not a performance measure for the Plan)	Historic trends from 2000 to 2012 show that population living in areas within a half mile of rail transit stations are not strongly influenced by the larger region's demographic and economic trends. For example, the growth of Hispanics and seniors (age 65 and above) in these areas has not kept pace with regional trends. Patterns in residents' income and housing prices suggest that gentrification may be happening and low income and minority households are at risk for displacement. Refer to the Environmental Justice Appendix for potential strategies to reduce impacts at the local level
Emissions Impact Analysis ¹	Comparison of Plan and Baseline scenarios; identification of areas that are lower performing as a result of the Plan, along with a breakdown of demographics for those areas	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan will result in reductions in carbon monoxide and particulate matter emissions for on-road vehicles and benefits will be experienced both by minority and low income households and in communities with a high concentration of minority and low income groups

TABLE 8.4 CONTINUED

PERFORMANCE MEASURE	DEFINITION	PERFORMANCE TARGET	SUMMARY OF IMPACTS
Air quality health impacts along highways and highly traveled corridors ¹	Comparison of Plan and Baseline scenarios and demographic analysis of communities in close proximity to highways and highly traveled corridors	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan will result in an overall reduction in emissions in areas that are near roadways, which have been seen to have a higher concentration of minority and low income groups than the region as a whole
Aviation noise impacts ¹	Comparison of Plan and Baseline scenarios; breakdown of population by race and ethnicity for low performing airport noise impacted areas	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan will result in aviation noise areas that are geographically smaller than the Baseline scenario, and will benefit minority and low income households as a result
Roadway noise impacts ¹	Comparison of Plan and Baseline scenarios, identification of areas that are low performing as a result of the Plan; breakdown of population for these impacted areas by race/ethnicity and income	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—the Plan results in a reduction of roadway noise when compared to the Baseline scenario, which has a benefit to minority and low income households who represent a higher share of population who live in close proximity to major roadways
Active transportation hazard	Breakdown of population by demographic group for areas that experience the highest rates of bicycle and pedestrian collisions	Establish existing conditions (not a performance measure for the Plan)	Collision data from 2012 shows that low income and minority communities incur a higher rate of bicycle and pedestrian risk. Improvements in active transportation infrastructure and Complete Streets measures, such as those proposed in the Plan, have been shown to reduce hazard to bicyclists and pedestrians. Refer to the Environmental Justice Appendix for potential strategies to reduce risk at the local level
Rail-related impacts ¹	Breakdown of population by demographic group for areas in close proximity to rail corridors and planned grade separations	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—there is no significant difference between the Plan and the Baseline in the concentration of minority and low income communities in areas directly adjacent to commercial and passenger railways
Public health analysis	Historical emissions and health data summarized for areas that have high concentrations of minority and low income population	Establish existing conditions (not a performance measure for the Plan)	Recent trends indicate that air quality is improving throughout the region. For select areas that show increase, there is sometimes a higher proportion of minority and low income population. When examining public health indicators from the CalEnviroScreen tool, it appears that areas with the highest concentrations of minority and low income population incur some of the highest risks in the region. Refer to the Environmental Justice Appendix for potential strategies to improve conditions at the local level
Climate vulnerability	Breakdown of population by demographic group for areas potentially impacted by substandard housing, sea level rise and wildfire risk	Establish existing conditions (not a performance measure for the Plan)	Existing conditions indicate that minority and low income populations are at a greater risk for experiencing negative impacts of climate change. Refer to the Environmental Justice Appendix for potential strategies to reduce impacts at the local level.
Proposed mileage-based user fee impacts	Examination of potential impacts from implementation of a mileage-based user fee on low income households in the region	No unaddressed disproportionately high and adverse effects for low income or minority communities	No unaddressed disproportionate impacts—results show that the mileage-based user fee is less regressive to low income residents than the current gasoline tax.

Note: ¹ Performance measures used in the Environmental Justice Analysis for the 2012 RTP/SCS

ENVIRONMENTAL JUSTICE PERFORMANCE MEASURES

In the development of the analysis, SCAG identified 18 performance measures to analyze existing environmental justice parameters in the region and to address any potential impacts of the 2016 RTP/SCS on the various environmental justice population groups. SCAG also examined potential impacts at various geographies and specifically employed a community-based approach for the 2016 RTP/SCS based on guidance from stakeholders. A brief description of the environmental justice performance measures is provided in this section. A more detailed presentation of the results of the 2016 RTP/SCS environmental justice analysis can be found in the Environmental Justice Appendix. [TABLE 8.4](#) describes the 2016 RTP/SCS environmental justice performance measures and provides a summary of impacts for each of the measures.

PERFORMANCE MEASURE 1: 2016 RTP/SCS REVENUE SOURCES IN TERMS OF TAX BURDENS

Different funding sources (i.e., income, property, sales and fuel taxes) can impose disproportionate burdens on lower-income and minority groups. Sales and gasoline taxes, which are the primary sources of funding for the region's transportation system, were evaluated for the purposes of this analysis. The amount of taxes paid was broken down to demonstrate how tax burdens fall on various demographic groups. As in previous RTP environmental justice reports, the 2016 RTP/SCS environmental justice analysis examined in detail the incidence, distribution and burden of taxation.

PERFORMANCE MEASURE 2: SHARE OF TRANSPORTATION SYSTEM USAGE

SCAG analyzed the use of various transportation modes by race/ethnicity and by income quintile (an income quintile is a category into which 20 percent of households ranked by income fall).

PERFORMANCE MEASURE 3: 2016 RTP/SCS INVESTMENTS

The strategy that public agencies pursue to invest in transportation has a huge impact on environmental justice. In short, it can determine what transportation choices will be available to low-income and minority communities. A disproportionate allocation of resources for various transit investments, for example, can indicate a pattern of discrimination.

PERFORMANCE MEASURE 4: DISTRIBUTION OF TRAVEL TIME SAVINGS AND TRAVEL DISTANCE REDUCTIONS

SCAG assessed both the distribution of travel time and distance savings that are expected to result from implementing the 2016 RTP/SCS, by analyzing demographic data and the associated mode usage statistics for each Transportation Analysis Zone (TAZ) in the region. With this input, an estimate for the time savings for each income group and ethnic group can be identified for trips involving transit (bus and rail) and automobiles.

PERFORMANCE MEASURE 5: GEOGRAPHIC DISTRIBUTION OF TRANSPORTATION INVESTMENTS

This section is a new addition to the environmental justice analysis for the 2016 RTP/SCS and examines where transportation investments are planned throughout the region. Building on the new community-based approach for the overall effort, a summary of investments for areas with a high concentration of minority population and/or low income population is included for roadway, transit and active transportation investments.

PERFORMANCE MEASURE 6: JOBS-HOUSING IMBALANCE

An imbalance or mismatch between employment and housing in a community is considered to be a key contributor to local traffic congestion. Some argue that these imbalances and mismatches are also impediments to environmental justice. Driving is expensive and people who can't afford to own a car generally need to live near to their jobs so they can get to work using transit, or by walking or biking.

PERFORMANCE MEASURE 7: ACCESSIBILITY TO EMPLOYMENT AND SERVICES

Accessibility is vital for social and economic interactions. As a measure, accessibility is determined by the spatial distribution of potential destinations; the ease of reaching each destination by various transportation modes; and the magnitude, quality and character of the activities at the destination sites. Travel costs are central: the lower the costs of travel, in terms of time and money, the more places people can reach within a certain budget—that is, the greater the accessibility. The number of destination choices that people have is equally crucial: the more destinations and the more varied the destinations, the higher the level of accessibility.

PERFORMANCE MEASURE 8: ACCESSIBILITY TO PARKS AND NATURAL LANDS

Similar to the method used for measuring accessibility to jobs, accessibility to parks is defined as the percentage of park acreage reachable within a 30-minute travel time by auto and 45-minute travel time by local bus and all transit options. For this round of SCAG's environmental justice effort, analysis was included that measured accessibility to the recently designated San Gabriel Mountains National Monument. Also included in our accessibility analysis (for employment and services) is a measurement of the share of population within a one- and two-mile travel distance of all regional parks and open space under the Plan and Baseline scenario, based on the principle that shorter trips should be encouraged through implementation of the 2016 RTP/SCS.

PERFORMANCE MEASURE 9: GENTRIFICATION AND DISPLACEMENT

The integration of transportation and land use planning has been recognized for its ability to reduce VMT, air pollution and greenhouse gases, while also increasing opportunities for physical activity. However, there has been some criticism of smart growth strategies in relation to housing affordability, specifically in regard to Transit-Oriented Development (TOD). In response to these concerns, SCAG developed a methodology to monitor demographic trends in and around transit-oriented communities. For the 2016 RTP/SCS, recent indicators show that emerging trends for areas in close proximity to rail transit stations (one half mile surrounding a rail transit stop) are not consistent with those for the greater region. From 2000 to 2012, the region experienced huge growth for certain cohorts, specifically the Hispanic population and seniors aged 65 and over. This same trend was also seen in areas near rail transit stations, but to a much lesser degree. At the same time, median household income has decreased less, and median gross rent has increased more, in these transit oriented communities than has been the trend for the greater region. These divergent growth patterns represent evidence indicating likely gentrification, which may lead to displacement for low income households.⁸

SCAG will continue to monitor growth in TOD areas and is committed to promoting affordable housing throughout the region. Additional tools that local jurisdictions may use to combat displacement of low income and minority residents are provided in the Environmental Justice Toolbox, located in the Plan's Environmental Justice Appendix.

⁸ Environmental Justice Emerging Trends and Best Practices Guidebook, Document Number: FHWAHEP-11-024 (2011). U.S. Department of Transportation, Federal Highway Administration.

PERFORMANCE MEASURE 10: EMISSIONS IMPACT ANALYSIS

Air pollution comes from many different sources and can be classified into two types: ozone and particulate matter. Ozone pollution takes a gaseous form and is generated as vapor emitted from fuels commonly used in motor vehicles and industrial processes. Ozone is formed by the reaction between volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the presence of sunlight. Ozone negatively impacts the respiratory system. Particulate matter (PM 10 and PM 2.5) are very fine particles made up of materials such as soot, ash, chemicals, metals and fuel exhaust that are released into the atmosphere. Particulate pollution has been linked to significant health problems, including aggravated asthma, respiratory disease, chronic bronchitis, decreased lung function and premature death.

Transportation projects can have both positive and negative impacts on the environment. Conversely, appropriate transportation investments can motivate travelers to shift to less polluting modes (e.g., bus, train, carpooling or commuter rail). On the other hand, investments that increase traffic on a particular facility typically degrade air quality in the immediate vicinity of that facility. Low-income and minority groups may be at particular risk for health hazards resulting from air pollution, and the objective for this analysis is to assess impacts for these groups as a result of the Plan versus Baseline (no-build) scenario.

PERFORMANCE MEASURE 11: AIR QUALITY HEALTH IMPACTS ALONG HIGHWAYS AND HIGHLY TRAVELED CORRIDORS

Exposure to air pollutants is considered an environmental justice issue due to the disproportionate share of minority and low-income populations living in close proximity to heavily traveled corridors, particularly near port and logistics activities. This exposure to unhealthy air results in nearly 5,000 premature deaths annually in the SCAG region, as well as 140,000 children with asthma and other respiratory symptoms. More than half of Americans exposed to PM 2.5 pollution that exceeds the national standard live in the SCAG region.⁹ This measure examines the potential emissions impacts of the RTP/SCS for PM and ozone emissions that result from on-road vehicles both at the TAZ level and for areas in close proximity to highways and highly traveled corridors.

⁹ California Air Resources Board, South Coast Air Quality Management District, and SCAG. (2011). Powering the Future: A Vision for Clean Energy, Clear Skies, and a Growing Economy. [Fact Sheet]. http://www.arb.ca.gov/newsrel/2011/powering_the_future.pdf.

PERFORMANCE MEASURE 12: AVIATION NOISE IMPACTS

The SCAG region supports the nation's largest regional airport system, in terms of the number of airports and overall aircraft operations operating in a very complex airspace environment. This system has six established air carrier airports, including Los Angeles International (LAX), Burbank Bob Hope, John Wayne, Long Beach, Ontario and Palm Springs. There are also four emerging air carrier airports within the Inland Empire and in North Los Angeles County. These include San Bernardino International Airport, March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport and Palmdale Airport (joint use with Air Force Plant 42).

The regional aviation system also includes more than 40 general aviation airports and two commuter airports—for a total of more than 55 public use airports. Although the projected demand for airport capacity has decreased in comparison with what was projected in the 2012 RTP/SCS, there is still moderate growth expected in the future. The challenge is striking a balance between the aviation capacity needs of Southern California and the quality of life for people living near airports. This measure evaluates the impact of aviation noise on neighborhoods close to airports and examines the potential impacts on environmental justice populations specifically.

PERFORMANCE MEASURE 13: ROADWAY NOISE IMPACTS

The SCAG region has an extensive roadway system consisting of more than 70,000 lane miles. It includes one of the country's most extensive HOV lane systems and a growing network of toll lanes, as well as express lanes. The region also has a vast network of arterials and other minor roadways and noise may cause significant environmental concerns. Noise associated with highway traffic depends on a number of factors that include traffic volumes, vehicle speed, vehicle fleet mix (cars, trucks) and the location of the highway with respect to schools, daycare facilities, parks and other "sensitive receptors." According to FHWA guidance, noise impacts occur when noise levels increase substantially in comparison with existing levels. Impacts are assessed in this section by examining how the RTP/SCS affects roadway noise and by determining the population groups that could potentially be most impacted by roadway noise.

PERFORMANCE MEASURE 14: ACTIVE TRANSPORTATION HAZARDS

Encouraging a healthier, more active lifestyle in all of our communities is one of the featured goals of this Plan. Making walking and bicycling safer

transportation options is key to attracting more people to choose these alternatives. Bicycling or walking along roadways in close proximity with motor vehicles is often perceived as dangerous, and reducing hazards in the pedestrian and cycling environment is a primary strategy toward achieving our goal of promoting healthier, more active communities.

As a new environmental justice indicator for the 2016 RTP/SCS, Active Transportation Hazards seeks to evaluate incidences of motor vehicle collisions involving bicyclists and pedestrians in our communities, with the goal of promoting an improved environment for active transportation users and encouraging more residents to make the choice to walk or bicycle in their communities. As with other environmental justice performance measures, this indicator will be used to identify patterns of active transportation hazards and potential disparities among our various communities.

PERFORMANCE MEASURE 15: RAIL-RELATED IMPACTS

Freight rail emissions account for five percent of all NOx emissions and four percent of all PM emissions generated by regional goods movement activities, as described in the Goods Movement Appendix. When compared with all regional PM and NOx sources, the contributions by freight rail emissions is even lower. However, environmental pollution from locomotives, rail yards and other rail facilities must be considered, as concentrations of rail activities can cause localized rail-related pollution. In response to input from our federal partners, SCAG developed a summary analysis to address potential environmental justice impacts in areas adjacent to railroads and rail facilities, although further discussion and analysis is recommended. This outcome analyzes environmental justice communities adjacent to railroads and rail facilities, rail impacts to sensitive receptors, and examines environmental justice concerns that may potentially be alleviated by grade separation projects.

PERFORMANCE MEASURE 16: PUBLIC HEALTH IMPACT

A new environmental justice indicator for the 2016 RTP/SCS, the Public Health measure seeks to evaluate the potential disparity among communities in the SCAG region in terms of public health issues that may be associated with historical toxic exposure and local transportation infrastructure. Like the Active Transportation Hazards measure discussed previously, inclusion of this new analysis is intended to further the goal of fostering healthier lifestyle choices in all of our communities. It is a key goal of this Plan to provide more and better opportunities for physical activity and other healthy lifestyle choices throughout the SCAG region.

PERFORMANCE MEASURE 17: CLIMATE VULNERABILITY

This is another new environmental justice performance indicator that seeks to identify regional disparities in regard to vulnerability to the consequences of climate change among the various communities in the SCAG region. Of particular interest in this analysis will be relative risk for sea level rise, wildfires, and flooding. It is understood that climate change is expected to impact different regions in different ways. In Southern California, we may expect development of a general trend of warmer temperatures, less precipitation and higher sea levels along our coasts.

This combination of climatic changes will likely result in increased wildfire danger, particularly in the foothill areas where our cities adjoin our local mountains. Due to melting ice caps in the polar regions, a steady rise in global sea level is expected. This may impact the coastal regions of Southern California. This new measure will allow SCAG to obtain a better understanding of how these anticipated changes in our local climate may impact our more vulnerable communities.¹⁰

PERFORMANCE MEASURE 18: PROPOSED MILEAGE-BASED USER FEE IMPACTS

This analysis is based on a proposed transportation improvement funding strategy that recommends implementation of a user fee based on VMT. If implemented, the mileage-based user fee would replace the current gasoline tax and is estimated to cost about four cents (2015 value) per mile and would be indexed to maintain its purchasing power beginning in 2025. Implementation of this financing strategy would require action by the California State Legislature and/or the U.S. Congress. This measure examines the impact of the gasoline tax on low income households and assesses the mileage-based user fee as a replacement option.

¹⁰ For more information on potential climate change impact in Southern California, see Southern California Association of Governments and Dan Cayan, Climate Change: What Should Southern California Prepare for?: http://www.scag.ca.gov/documents/climate-change_dancayan.pdf.

TRANSPORTATION CONFORMITY

REQUIREMENTS

The Federal Clean Air Act (CAA) establishes the National Ambient Air Quality Standards (NAAQS) and planning requirements for certain air pollutants. To comply with the CAA in achieving the national air quality standards, the ARB develops a State Implementation Plan (SIP) for each federal designated non-attainment and maintenance area within California. SIP development is a joint effort of the local air agencies and ARB working with federal, state and local agencies, including regional MPOs.

Transportation conformity is required under the CAA section 176(c) to ensure that federally supported highway and transit project activities “conform” to, or are consistent with, the purpose of the applicable SIP. Conformity for the purpose of the SIP means that transportation activities including regional transportation plans, transportation improvement programs and transportation projects will not cause new air quality violations, worsen existing air quality violations, or delay timely attainment of the relevant NAAQS. Conformity applies to areas that are designated by the U.S. Environmental Protection Agency (EPA) as being in non-attainment or maintenance for the following transportation related criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, and particulate matter (PM 2.5 and PM 10).

Under the U.S. Department of Transportation Metropolitan Planning regulations and the EPA’s Transportation Conformity regulations, the 2016 RTP/SCS is required to pass the following four conformity tests in order to demonstrate transportation conformity:

- Regional Emissions
- Timely Implementation of Transportation Control Measures (TCMs)
- Financial Constraint
- Interagency Consultation and Public Involvement

The Regional Council adopts the initial transportation conformity determination, while FHWA/Federal Transit Administration (FTA) approves the final transportation conformity determination for the 2016 RTP/SCS.

CONFORMITY ANALYSIS AND FINDINGS

As documented in the Transportation Conformity Analysis Appendix, the 2016 RTP/SCS meets all federal transportation conformity requirements and demonstrates transportation conformity. The findings associated with the conformity tests are described in detail in the Transportation Conformity Analysis Appendix.

TRANSPORTATION CONFORMITY AND GREENHOUSE GAS EMISSION REDUCTION TARGETS

Although transportation conformity is a federal requirement and reducing greenhouse gas emissions is a state mandate, both requirements are highly interrelated. First of all, each of the 2016 RTP/SCS policies, strategies, programs and projects that contribute to transportation conformity are the same policies, strategies, programs and projects that help to meet state targets for reducing greenhouse gas emissions—and vice versa. Secondly, although transportation conformity addresses emissions of criteria pollutants and their precursors, such emissions originate from the same source as greenhouse gas emissions: the combustion of fossil fuels in motor vehicles.

Any strategies that result in reduction or elimination of use of fossil fuels in motor vehicles may help the 2016 RTP/SCS meet both federal transportation conformity requirements and state greenhouse gas emissions reduction targets. In addition, the regional emissions analysis used for transportation conformity and the emissions analysis conducted for meeting greenhouse gas reduction targets use the same regional transportation model and ARB's Emission Factors (EMFAC) model. Finally, there is greater awareness of the need for more concerted efforts at the federal, state and local levels to integrate the SIP development process with planning and actions to address climate change. As a result, transportation conformity and greenhouse gas emissions reductions will become even more interconnected and more mutually supportive.

CONCLUSION

As we look toward mid-century, it is important to consider what the region can do beyond the transportation projects for which we expect to have funding. In our final chapter, 'Looking Ahead,' additional strategies and investments will be presented that would bring the SCAG region closer to achieving our goals for improved mobility and accessibility, a strong economic future, sustainable growth, and ultimately an enhanced quality of life for everyone in our region.



Image courtesy of Allan Crawford

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LOOKING AHEAD

This Plan has discussed many long-term needs for our region's transportation system. Despite \$556.5 billion in investments reviewed in the 2016 RTP/SCS, this still will not be enough to address all of our needs as we head toward mid-century. In addition, as noted earlier, state policies will continue to push the region to achieve sustainability goals beyond the horizon of the plan.

INTRODUCTION

The implication of the Governor’s Executive Order B-30-15, referenced earlier, is that state-mandated targets to reduce greenhouse gas emissions will likely become more ambitious and will be extended to target years beyond 2040. The first part of this chapter describes the 2016 Regional Strategic Plan, a list of projects without identified funding that would benefit mobility in the region. The second part of this chapter, which concludes this presentation of the 2016 RTP/SCS, provides insight into developments that will impact the region beyond 2040.

THE 2016 STRATEGIC PLAN

This chapter serves as a Strategic Plan for discussing what strategies, programs and projects the region should pursue in coming decades if and when additional funding becomes available. This Strategic Plan is intended to help inform future updates to SCAG’s RTP/SCS, beyond the 2016 RTP/SCS. Back in 2008, SCAG first developed a Strategic Plan to guide long-term decisions for transportation investments and strategies. The Strategic Plan in the agency’s 2008 RTP helped inform what kinds of investments to include in the 2012 RTP/SCS—as part of that Plan’s financially constrained transportation network.

Not surprisingly, the Strategic Plan included in the 2012 RTP/SCS played a large role in informing the investments and strategies detailed in the Financially Constrained Plan of the 2016 RTP/SCS (also referred to as the “Constrained Plan”). Among these are:

- **Promoting Active Transportation:** The 2012 Strategic Plan called for further enhancements to the active transportation system, including an increased focus on first/last mile connections to and from public transit, increasing the density of bikeways, incorporating Complete Streets practices that make streets friendlier to pedestrians and bicyclists, and increasing connectivity for pedestrians and bicyclists between jurisdictions. As part of the 2012 RTP/SCS, \$6.7 billion was allocated for active transportation. Since the 2012 RTP/SCS was adopted, active transportation has been recognized as a regional priority, not just a local priority. Orange County began work on a strategic bikeway network and completed the first portion in 2012, and it is fully incorporated into the 2016 RTP/SCS. Meanwhile, Los Angeles County is developing its own Active Transportation Strategic Plan.

- **Expanding the High-Occupancy Vehicle (HOV) Lanes System:** The 2012 Strategic Plan recommended expanding our regionwide HOV lane network, although these improvements were unfunded. The 2016 RTP/SCS now fully funds an HOV expansion project within Orange County as part of its Constrained Plan.
- **Improving Local Highway Grade Separations:** The 2012 Strategic Plan recommended constructing grade separations on our local highways, although these improvements were unfunded as well. The 2016 RTP/SCS fully funds several grade separation projects throughout the region as part of its Constrained Plan.

It is clear that the 2012 Strategic Plan played a large role in influencing the 2016 Constrained Plan, as intended. Moving forward, we expect the Strategic Plan discussed in this chapter will help inform future RTP/SCS updates. Should additional funding become available to pursue projects beyond our Constrained Plan, more consensus would be needed and in some cases further studies would be warranted before specific projects could move forward.

LONG-TERM EMISSIONS-REDUCTION STRATEGIES FOR RAIL

As part of our current Strategic Plan, we will continue ongoing work with railroads, air quality management agencies and other stakeholders to reach our goal of a zero-emissions rail system.

FREIGHT RAIL

Achieving a rail system with zero emissions will be challenging because freight rail operates as a national system and locomotives cannot remain captive to our region. Any new technology will require an operational strategy to change out locomotive types, or it will require compatible infrastructure nationwide to provide new types of cleaner power and/or fuel to locomotives.

These challenges are formidable, but several near zero- and zero-emissions rail technologies are actually under development. A zero-emissions rail system would require full electrification and such a system could be powered by electric catenary or linear synchronous motors. There are also options for a hybrid-electric engine or a battery tender car, which provide additional power, allowing locomotives to operate in zero-emissions mode while battery power is available.

Opportunities for near zero-emissions include incorporating liquid natural gas tender cars and after treatment systems. Tier 4 engines and earlier engine types can be retrofitted to operate with natural gas, though safety and operational issues remain challenging. Additional after-treatment options are in the conceptual stage, which could go beyond Tier 4 standards.

Please see the Goods Movement Appendix for more detail on these technologies, as well as a plan to deploy these technologies as they become commercially viable.

CALIFORNIA HIGH-SPEED TRAIN

The California High-Speed Train will be electrified and will therefore produce no emissions along its operating corridors. Furthermore, the California High-Speed Rail Authority (CHSRA) has committed to using 100 percent renewable energy to power its trains. Because of the expected reduction in air and auto travel, the CHSRA estimates its service will save 2.0 million to 3.2 million barrels of oil annually, beginning in 2030.¹ With plans for a zero-emissions high-speed rail system in Southern California, and as the freight rail sector makes advances in near zero- and zero-emissions technologies, the region's passenger and commuter rail systems should pursue a similar strategic vision.

LONG-TERM EMISSIONS-REDUCTION STRATEGIES FOR TRUCKS

The reduction or elimination of emissions from heavy-duty trucking is equally important to our long-term vision of a zero-emissions goods movement system. In the near term, our 2016 RTP/SCS proposes an aggressive program to bring into service more clean fuel trucks and hybrid trucks that are now available. For the longer term, we provide a detailed plan to advance zero-emissions truck technologies, as described in the Goods Movement Appendix.

The trucking market offers unique challenges because of heavy vehicle and load weights, operational performance requirements, and high incremental costs. However, several reduced-emissions trucks are commercially available now and many zero- and near zero-emissions trucks are under development. Reduced-emissions natural gas trucks already have been deployed at our region's ports and several hundred hybrid electric trucks are on the road due to the Hybrid Truck and Bus Voucher Incentive Project (HVIP) at the California Air Resources Board.

Other promising technologies include plug-in hybrid-electric trucks, which have batteries that are charged through an external power source; battery-electric trucks, which can generate their own power or receive power from an outside source; and hydrogen fuel cell electric trucks. The South Coast Air Quality Management District (SCAQMD) is leading several ongoing demonstration programs, with funding from regional partners and state and federal agencies that are developing prototype zero-emissions trucks. These programs are also accessing the compatibility of these trucks with wayside power charging infrastructure. These demonstration programs rely on partnerships with original equipment manufacturers that can develop truck prototypes and with private sector partners that can test and evaluate prototypes in real world operating conditions.

For more information on the steps toward development and deployment of these technologies and more detail about potential technologies, please see the Goods Movement Appendix.

UNFUNDED OPERATIONAL IMPROVEMENTS

Well-targeted investments to improve our roadways can yield numerous benefits. Adding auxiliary lanes and managed lanes; improving interchanges; deploying on-ramp metering devices and adaptive signals; and other ITS enhancements can make the entire roadway system more efficient, increase capacity and help reduce congestion. Caltrans Corridor System Management Plans (CSMPs) have identified a number of improvements throughout the State Highway System (SHS) to improve productivity. The future development of corridor mobility and sustainability improvement plans (i.e., Corridor Sustainability Studies) for various corridors throughout the SCAG region may also identify future operational improvements not only within the SHS, but for all modes of travel throughout the region.

UNFUNDED CAPITAL IMPROVEMENTS

Regionally significant major corridor improvements and strategies described in the Strategic Plan are identified in [TABLE 9.1](#). A complete list is contained in the 2016 RTP/SCS Project List contained as part of Project List Appendix.

¹ California High Speed Rail Authority. Environmental Fact Sheet, August 2014.

EXPANDING OUR REGION'S HIGH-SPEED TRAIN SYSTEM

CALIFORNIA HIGH-SPEED TRAIN

The California High-Speed Train will provide people with an additional option for traveling within the state, offering an alternative to flying and driving. This will be especially important as highways and airports continue to become more congested and constrained as California's population continues to grow. Phase One of the system, approved by voters, extends from the Kern County line in our region through Palmdale and Burbank to Los Angeles Union Station and Anaheim. Phase Two, extending from downtown Los Angeles to San Diego, will link many urban areas and other destinations within our Southern California region via the San Gabriel Valley and the Inland Empire. This corridor is about 160 miles long and it traverses Los Angeles, Riverside, San Bernardino and San Diego counties. With more than 21 million residents, these four counties make up about 56 percent of the state's current population. And they're projected to grow significantly by 2050.

Upon completion, Phase Two will provide important access to planned and existing regional centers, including Ontario International Airport, the March Inland Port, and potentially San Bernardino International and Corona airports—helping to meet SCAG's long-term goal of regionalizing air travel in Southern California. Eventually, Phase Two is expected to be the basis for further high-speed rail extensions into Nevada and Arizona.

Phase One and Two of the California High-Speed Train will provide excellent regional connectivity to our region by connecting with a robust network of intercity and commuter rail, subway, light rail, modern streetcars and fixed-route transit systems. Integrated planning will allow these regional and local transportation networks to complement the High-Speed Train. Commuter, intercity and interregional rail services and transit serve distinct travel markets, but coordinating their schedules will further increase the region's rail and transit ridership by attracting new and crossover passengers to these different market segments.

XPRESSWEST

In addition to the California High-Speed Train, our region has other important high-speed rail projects in development. XpressWest is a high-speed rail service that will connect Victorville and Las Vegas along the Interstate 15 corridor and connect via the High Desert Corridor to Palmdale and California High-Speed Train Phase One. It will use "steel wheel on steel rail" electric multiple unit train technology, at speeds of up to 150 miles per hour (mph).

TABLE 9.1 MAJOR STRATEGIC PLAN PROJECTS

IMPERIAL COUNTY

SR-111 Corridor Improvements

LOS ANGELES COUNTY

Metro Blue Line Extension to California State University Long Beach

Metro Gold Line Eastside Extension Beyond Phase II Terminus

Metro Green Line Extension to San Pedro, Long Beach and LA/Orange County Line

Metro Orange Line Extension to Burbank Bob Hope Airport

Orangeline High-Speed Transit (Union Station to Santa Clarita)

I-605 HOV lanes from I-10 to I-210

ORANGE COUNTY

Additional Transit Station Improvements to Fullerton Transportation Center and Santa Ana Regional Transportation Center

Fullerton College Connector

SR-133 Multimodal Corridor Improvements

RIVERSIDE COUNTY

Coachella Valley Daily Rail Service between Downtown Los Angeles and Indio

CETAP - Riverside County to Orange County

Perris Valley Line Extension to Temecula

SAN BERNARDINO COUNTY

San Bernardino Mountain-Valley Railway System between San Bernardino/Highland and Big Bear Lake

VENTURA COUNTY

Santa Paula Branch Line

VARIOUS COUNTIES

Cordon Pricing Demonstration Projects (locations to be determined)

California High-Speed Train System Phase 2

California/Nevada Super-Speed Train Anaheim to Las Vegas

Expanded Express Lane Network (beyond Constrained Plan)

Long-Term Goods Movement Emission-Reduction Strategies for Rail and Trucks

Mileage-Based User Fee Demonstration Projects and Implementation Strategy

Additional Metrolink and LOSSAN Improvements (beyond financially constrained plan)

XpressWest High-Speed Rail Between Palmdale-Victorville-Las Vegas

That would result in a trip between Victorville and Las Vegas lasting only 80 minutes. XpressWest has secured federal environmental Records of Decision and authorization to construct and operate. In November 2015, XpressWest was awarded the franchise to construct and operate high-speed rail service within Nevada between Southern California and Las Vegas by the Nevada High Speed Rail Authority.

SOUTHWEST HIGH-SPEED RAIL

In September 2014, the Federal Railroad Administration (FRA) released the *Southwest Multi-State Rail Planning Study*. This study analyzed candidate high-speed rail corridors in several southwest states. California, Nevada and Arizona are included as the “primary” area and New Mexico, Utah and Colorado are included as the “extended” area. The study includes:

1. “Core Express” with top speeds greater than 125 mph
2. “Regional” with top speeds of 90 mph to 125 mph
3. “Emerging/Feeder” with top speeds up to 90 mph

The California High-Speed Train and XpressWest corridors were identified as Core Express corridors in the study. The study also recommended a particular emphasis on the Phoenix to Southern California corridor as a future high-speed rail market to be studied.

EXPANDING OUR REGION’S COMMUTER RAIL SYSTEM

METROLINK AND PACIFIC SURFLINER

Both the Amtrak Pacific Surfliner and Metrolink are forecast to significantly increase their ridership and number of daily trains through 2040. The Constrained Plan of this 2016 RTP/SCS includes funding the first \$1 billion of the Southern California High-Speed Rail Memorandum of Understanding (MOU). However, this \$1 billion investment only funds the top 12 projects on the project list, which contains 74 projects totaling \$4 billion. Metrolink recently completed its long-range Strategic Assessment in 2016 and it forecasts growth in the number of daily trains from 165 current weekday trains today to 240 weekday trains by 2025. In addition, the 2012 Los Angeles–San Diego–San Luis Obispo Rail Corridor (LOSSAN) Strategic Implementation Plan (SIP)

forecasts up to 310 weekday Metrolink trains by 2040. For the Amtrak Pacific Surfliner, the SIP forecasts up to 18 daily round trips between downtown Los Angeles and San Diego, and additional round trips between downtown Los Angeles and Santa Barbara and San Luis Obispo. Additionally, the SIP includes:

- New East Ventura to Santa Barbara commuter service with four round trips per day
- New Los Angeles to San Diego commuter service with five round trips per day (operations split between Metrolink and Coaster)
- New express service with four round trips per day (operations split between Metrolink and the Pacific Surfliner)
- New Metrolink service to San Jacinto with eight round trips per day

Today, the average speed for Metrolink is about 37 mph, and the average speed for the Pacific Surfliner is 46 mph. Average speeds vary by line, and while top speeds are 79 mph (and a segment of 90 mph through Camp Pendleton), predominant one-track operations in our region greatly reduce the average system speed. Even if all 74 of the MOU projects are built, our region will still have large portions of its rail network constrained by one-track operations. This reinforces the need to fund capital projects in order to speed up service and make passenger rail more attractive to the commuter who drives alone. SCAG’s Strategic Plan vision for speed and service improvements to Metrolink and Pacific Surfliner calls for an intensive investment in capital projects to further increase speed and service levels over and above the Constrained Plan. The Strategic Plan results in even more segments of the network operating at speeds of 110 mph or more. These projects include additional double tracking, sidings, station improvements, grade separations and grade crossings. Not only will this benefit commuter rail trips in our region, it will benefit Amtrak intercity and California High-Speed Train interregional trips also, as the three systems feed and complement one another. While these rail networks serve three distinct travel markets, improving all three will encourage people to consider and use all three in their travel decisions, rather than be limited to any single mode of transportation.

In addition to capital improvements, our strategic vision calls for considerably more express trips, regular special event services, and implementation of new Bus Rapid Transit (BRT) services that directly connect with Metrolink and the Pacific Surfliner.

EXPANDING ACTIVE TRANSPORTATION

There is great potential for walking, biking and other forms of active transportation to expand beyond what is proposed in this 2016 RTP/SCS. Policies designed to reduce greenhouse gas emissions will continue to highlight active transportation as a key step toward a more sustainable region. As transit service expands and a wider range of shared-mobility options become available, active transportation will serve regional mobility, ensuring that people can quickly, easily and safely transfer from one mode of transportation to the next. Active transportation also plays a critical role in helping the region to realize its vision for how it uses land, which includes accommodating more people in vibrant, mixed-use communities and urban centers. Sidewalks and active transportation networks contribute to the attractiveness and economic vitality of mixed-use communities. They also play an important role in reducing congestion and increasing mobility.

EXPANDED REGIONAL GREENWAY NETWORK

New active transportation plans by local jurisdictions will aspire beyond what is considered in the 2016 RTP/SCS Constrained Plan, and as a result new innovative strategies will be tested and proven effective throughout our region. One expected innovation is to create greater physical separations between bicyclists and motor vehicles, particularly on higher-speed streets. Separated bikeways and Class 1 bikeways are considerably more expensive options than installing bike lanes or sharrows, but these more expensive options have been shown to increase ridership.² The SCAG region currently has four miles of separated bikeways and these now operate on an “experimental” basis in local jurisdictions such as Long Beach and Redondo Beach. Caltrans is developing guidelines to incorporate separated bikeways into the California Manual for Uniform Traffic Control Devices (MUTCD). Once incorporated, local governments will be able to freely incorporate separated bikeways without incurring liability. In this Strategic Plan, SCAG assumes that our region will have about 230 miles of new separated bikeways converted from bike lanes on arterial streets. As part of the effort to develop separated bikeways, this Strategic Plan envisions greater integration of watershed planning, river rehabilitation, and access for bicyclists and pedestrians. It further envisions the use of open area drainage channels that were once creeks, and the maintenance roads next to them for walking and biking. It envisions greater coordination of rights of way under utility lines.

² Chapter 3: Why Choose Separated Bike Lanes? (2015). In Separated Bike Lane Planning and Design Guide. Federal Highway Administration.

EXPANDED BIKE SHARE

Bike Share, an innovative program in which people can share bicycles, can be expanded beyond the 880 stations regionwide that are envisioned in the Constrained Plan. Because it is such a new service, more local jurisdictions may wish to deploy bike share facilities where they can. This Strategic Plan anticipates an additional 1,084 stations regionwide, should funding become available.

FIRST/LAST MILE

The first/last mile challenge, which deters many people from using transit, can be alleviated as more than 200 high quality transit stations identified in the Strategic Plan Project List increases to nearly 700 stations as urban areas become more developed and more bus routes offer people higher quality transit choices.

LIVABLE CORRIDORS

Pedestrian travel will also increase substantially as a consequence of higher density development. New treatments installed as part of routine roadway maintenance, such as bulb-outs, sanctuary islands and innovative midblock crossing signals such as the high-intensity activated crosswalk beacon (commonly referred to as “HAWK”) will increase pedestrian safety. These treatments will expand livable corridors by 93 percent beyond the 16 areas in the Constrained Plan into new areas focusing on transit growth and new “village” development along new corridors. Funding for some of these treatments will come during the development process, through focused developer fees, or by pursuing other innovative funding strategies. Meanwhile, bicycle treatments such as bike racks and long-term secure bike parking will increase the convenience of biking.

NEIGHBORHOOD MOBILITY AREAS

Utilizing Complete Streets principles and applying them aggressively in the planning and implementation of neighborhood roadway improvements will increase mobility further. Traffic calming, combined with land use changes, will provide more opportunities for bicycling and walking in less urban settings such as local “village areas” with sidewalk café seating and local farmers markets. Connections to these villages will be promoted by strategies that tackle the first/last mile challenge that transit faces. Bicycle boulevards and other lower-speed streets that give bicycles priority have been shown to be effective at calming traffic, while increasing safety and bicyclist connectivity. This Strategic Plan sees local governments increasing the use of Complete Streets principles in their roadway improvements, expanding these areas beyond what is in the

Constrained Plan, increasing bikeway density and improving the quality of life for even more residents.

STRATEGIC FINANCE

VALUE PRICING STRATEGY

Following the adoption of the 2008 RTP, SCAG initiated a comprehensive study of value pricing strategies, which has come to be known as the Express Travel Choices Study. The emerging regional value pricing strategy is structured to help the region meet its transportation demand management and air quality goals, while also providing a reliable and dedicated source of revenue. The value pricing strategy could allow users of the transportation system to know the true cost of their travel, resulting in informed decision-making and a more efficient use of the transportation system. Value pricing strategies evaluated through the Express Travel Choices Study include a regional express lane network, cordon pricing and a mileage-based user fee. Although some of these pricing concepts have been incorporated into the Constrained Plan as elements are pursued as pilot initiatives or are under construction for implementation (e.g., segments of the regional express lane network), these strategies still face a number of significant hurdles before their full benefits can be realized. A second phase of the Express Travel Choices Study, initiated after the adoption of the 2012 RTP/SCS and ongoing, continues to establish an implementation plan for the regional value pricing strategy.

As we discussed in Chapter 6, SCAG will also continue to participate in state and national efforts to address the long-term transition of excise fuel taxes to mileage-based user fees.

OUR REGION BEYOND 2040

TECHNOLOGY AND NEW MOBILITY INNOVATIONS BEYOND 2040

Technological innovations have the potential to make existing transportation choices more widely available and easier to use throughout the region. By providing more options for local and regional trips, technological innovations have the potential to shift travel to less environmentally damaging modes, lessen the negative environmental impacts associated with current vehicle use,

increase system efficiency, improve safety, and reduce auto-related collisions and fatalities. However, realizing the potential benefits (and potential negative impacts) depends on the rate of development and the adoption of a wide range of public and private sector innovations. Although SCAG and its partners should be prepared for the widest possible range of technological advancements related to the transportation system, quantifying the benefits of certain new mobility innovations may be premature due to uncertain fluctuations in future market demand.

Many of these new applications and transportation services are being discussed in the media, and there are some reservations about how long they will last. Although they may have limited applicability in many parts of our region today, there is little doubt that certain technological innovations in transportation will grow significantly during the time frame of the 2016 RTP/SCS and beyond. The population in 2040 will have an entirely different expectation of the role of technology in their everyday lives than generations past. Changing demographics and broad economic trends have led to a demand for more flexible transportation options, the expansion of the sharing economy and calls for communities where people can live, work and play within a small area. This Plan reflects the ever-expanding portfolio of new mobility innovations that advanced technologies can enable and considers their long-term, regional impacts.

Currently, the clean technology industry and application developers outpace government in delivering technological innovation to the transportation sector. In light of this, SCAG continues to research the impacts of transportation innovation in terms of scale and longevity, looking at things such whether a technology or innovation will be amenable to only a small segment of the population and/or last for 10, 15 or 30 years? Or, are we at the outset of a major paradigm shift? Are tipping points just around the corner? Will the longstanding trend of the majority of trips taken by automobile persist?

The 2012 RTP/SCS identified policies to support a number of best practices and technological innovations that were not fully modeled at the time, such as alternative fuel vehicles and neighborhood electric vehicles. This 2016 RTP/SCS addresses new transportation innovations that have been planned and deployed since 2012, such as neighborhood electric vehicles (NEV), car sharing, bike sharing and ridesourcing (identified by the California Public Utilities Commission (CPUC) as Transportation Network Companies). SCAG has developed modeling assumptions and methodologies to analyze these mobility innovations and local land use regulations.

In addition to the new mobility innovations mentioned above, the region can expect to see significant growth in the deployment and use of automated vehicles. By some estimates, automation features being introduced within the next five years could be available in up to 70 percent of the vehicles on the road in 2040. The following are some examples of automated driving features that need to be considered and supported. There are a wide range of demonstration projects that could be pursued by SCAG and its partners, in collaboration with private sector organizations with increased federal, state and local funding:

- **Jam-Assist and Advanced Collision Avoidance:** Combining advanced collision detection and avoidance technology currently in development, vehicles will operate “hands-off” and “feet-off” on highways. These features could also improve operation in low-speed environments. Equipping transit vehicles with jam assist could dramatically improve vehicle throughput in congested transit-only corridors, or in Bus Rapid Transit systems.
- **Semi-Automated Mode Vehicles:** Vehicles will operate without driver input under certain limited conditions, while requiring driver input for most portions of the trip. This is the current state of technology with the Google car. However, safety and traffic benefits will begin to spread throughout the roadway network as this technology advances. Vehicles will be able to operate without driver input, although the driver will need to monitor the vehicle’s operation. These features could be available in both consumer and commercial vehicles as early as 2018–2020 and could represent a sizable minority of the fleet mix as early as 2030–2035.
- **Fully Automated Mode Vehicles:** Vehicles will operate without driver input in certain conditions, requiring driver input for other portions of the trip. Most researchers agree that this will be the mid-term state of vehicle automation. In highway driving conditions, drivers will turn over full control of the vehicle and vehicle systems will communicate with one another. Vehicles will be able to form “platoons” in order to operate at closer distances (less than 1.8 seconds apart in one Japanese study) in order to improve fuel consumption and traffic flows. Freight industry representatives are interested in whether the National Highway Traffic Safety Administration (NHTSA) will waive driver work hour limits for following vehicles under platooning conditions. In low-speed conditions, “platooning” could improve transit bus operations and automation could improve bus/curb alignment. To some researchers, this could facilitate a new business model of mobility—as a service similar to the way cellphone plans are priced, especially in dense urban areas.

- **Fully Automated Vehicles:** Vehicles will operate without driver input, but will still require a driver to monitor the vehicle. The vehicle will navigate trips from beginning to end and possibly self-park within low-speed environments. This technology could potentially be available as early as 2025–2030, but it will not be used in a significant share of vehicles until 2035–2040.
- **Fully Autonomous Vehicles:** Passenger vehicles will operate with or without drivers, resulting in radical changes to urban form. Cars will park themselves, attend to maintenance and refueling, or alter ownership patterns so that they stay in constant circulation. Driverless taxi, freight and transit vehicles could have a dramatic impact on various professional driving careers.

ADDRESSING SUSTAINABILITY AND GREENHOUSE GAS EMISSIONS BEYOND 2040

In addition to Governor Brown’s Executive Order discussed earlier, a number of policy trends are converging that will continue to push the state and region toward increasing de-carbonization of the transportation and energy sectors. Over the past 20 years, the international community has outlined a goal of limiting global warming to two degrees Celsius above pre-industrial levels. In the context of California, these trends include advancing beyond the Governor’s Executive Order goal of reducing greenhouse gas emissions by 80 percent below 1990 levels by 2050 to reducing greenhouse gas emissions by 100 percent later in the century. This could be accomplished in stages through various market and regulatory tools such as the Cap-and-Trade program and updates to the Assembly Bill 32 Scoping Plan. Electrification of the transportation sector over the next few decades is likely to be one outcome of these trends. The California Energy Commission (CEC) is also developing net zero energy building policies. Caltrans has prepared a new state transportation plan to significantly reduce vehicle miles traveled. Through the Senate Bill 375 target setting process, ARB will likely propose higher greenhouse gas reduction targets for metropolitan planning organizations through the continued integration of transportation and land use planning. Finally, Cap-and-Trade Triennial Investment Plans will continue to be updated to fund the implementation of greenhouse reduction goals.

However, the international science community is increasingly concerned that the two degrees Celsius goal is not stringent enough to avoid significant and perhaps irreversible climate damage to the planet, and serious discussions are occurring to reduce the international goal to 1.5 degrees Celsius. Whether

or not a consensus develops to intensify the climate change goals, California policymakers recognize the incredibly significant role of local jurisdictions and regions in taking climate action. Local jurisdictions and regions should expect to face new regulations and targets to significantly reduce greenhouse gas emissions for many decades ahead.

PREPARING THE REGION FOR RESILIENCY AGAINST CLIMATE CHANGE

In addition to creating a low-carbon sustainable future, the state and region will also be facing the human and infrastructure costs of adapting to climate change impacts that already are occurring. These include growing wildfire threats, sea-level rise and coastal flooding, increased mudslides and flooding, extreme heat waves and large reductions in water supplies.

Our region must prepare to confront these changes, and an important objective of this Strategic Plan is to build a region that is more resilient to these and other consequences of climate change. The twin policy goals of mitigation and adaptation will dominate state, regional and local planning for energy, water and transportation for the rest of this century. New collaborative programs and partnerships between businesses, academia, community groups, residents and all levels of government will be required.

Here is a simple but compelling example of how our region can become more resilient to the consequences of climate change: first/last mile strategies call for steps to make it easier for people to get to and from transit stops, such as building sidewalks and bike paths and installing places where people can lock up their bicycles near transit stations. These investments make transit more accessible while helping the region meet its goal of reducing the number of miles that people travel alone in their cars. But to make first/last mile strategies effective as our region faces more frequent days of extreme heat and intense rainstorms, they have to be refined. A more climate resilient strategy would be to design sidewalks and bike paths with native drought tolerant shade trees, as well as adding shade features at transit stations. Also, as pedestrian infrastructure is built, it should include adequate drainage and other storm water management features, to ensure access and safety during heavy rainstorms.

Looking to the state for recommendations on how to mitigate and adapt to climate change is challenging because its policies are evolving. Still, they come with a sense of urgency.³ The State of California recognizes the increasingly significant role that regional planning and local actions can play in meeting the state-level goals related to climate change. SCAG will continue to help the region further develop into a hub for local and regional government innovation, leadership and collaboration. For example, SCAG funded the Green Region Initiative category of projects, as part of the Sustainability Planning Grant Program. These grants provide local governments with technical expertise so they can develop local climate action plans, energy plans, water plans, open space strategies and public health plans. Working to make our region more resilient to the inevitable consequences of continued climate change is a major priority of this Plan, and it will continue to resonate in future updates as we head toward 2040 and well beyond.

CONCLUSION

As our region continues to grow in the coming years, we must ensure that effective strategies are in place toward fulfilling the needs of our growing population. With the understanding that our Constrained Plan can only get us so far, additional strategies must be considered to truly address the diverse needs of everyone who uses the regional transportation network.

The challenges ahead as we strive toward increased mobility, more livable and healthy communities and a more sustainable region are significant. But this Plan, the 2016 RTP/SCS, charts a course toward progress. It serves as a roadmap toward 2040 and a vision for a better future. It is a living document and it will change as circumstances change as we progress toward mid-century.

Above all, our RTP/SCS is a collective and inclusive effort—one that aims for a bright future for all of us.

³ See California State Executive Order B-30-15.

GLOSSARY

AASHTO American Association of State Highway and Transportation Officials – A nonprofit, non-partisan association representing highway and transportation departments in the 50 states, the District of Columbia and Puerto Rico.

AB 32 Assembly Bill 32 – Signed into law on September 26, 2006, it requires that the state’s global warming emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on global warming emissions that will be phased in starting in 2012 in addition to other measures. In order to effectively implement the cap, AB 32 directs the California Air Resources Board (ARB) to develop appropriate regulations and establish a mandatory reporting system to track and monitor global warming emissions levels.

AB 169 Assembly Bill 169 – Provides for the sixteen federally recognized tribes in the SCAG region to join the SCAG Joint Powers Authority (JPA) to participate in the Southern California Association of Governments by voting at the SCAG General Assembly.

ACE Alameda Corridor East – A 35-mile corridor extending through the San Gabriel Valley between East Los Angeles and Pomona and connecting the Alameda Corridor to the transcontinental railroad network.

Active Transportation A mode of transportation that includes walking, running, biking, skateboarding and other human powered forms of transportation. It can also include low-speed electrical devices such as motorized wheel chairs, Segways, electric-assist bicycles and neighborhood electric vehicles, such as golf carts.

ADA Americans with Disabilities Act of 1990 – Guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, state and local government services and telecommunications. It prescribes federal transportation requirements for transportation providers.

Agricultural Lands Land designated for farming; specifically the production of crops and rearing of animals to provide food and other products.

AHSC Affordable Housing and Sustainable Communities – A state grant program from the Greenhouse Gas Reduction Fund that addresses land-use, housing, transportation and land preservation projects to support infill and compact development to reduce greenhouse gas emissions.

AJR 40 Assembly Joint Resolution No. 40 – Introduced on August 23, 2007, the resolution calls upon the governor to declare a state of emergency in respect to the air quality health crisis in the South Coast Air Quality Basin related to emissions of PM 2.5 and to direct steps necessary to address the emergency.

ANCA Federal Airport Noise and Capacity Act of 1990 – Establishes a national aviation noise policy that reviews airport noise and access restrictions on operations for Stage 2 and Stage 3 aircraft.

Antelope Valley AQMD Antelope Valley Air Quality Management District – The air pollution control agency for the portion of Los Angeles County north of the San Gabriel Mountains.

AQMP Air Quality Management Plan – Regional plan for air quality improvement in compliance with federal and state requirements.

ARB Air Resources Board – State agency responsible for attaining and maintaining healthy air quality through setting and enforcing emissions standards, conducting research, monitoring air quality, providing education and outreach and overseeing/assisting local air quality districts. ARB is also responsible for implementing AB 32 and establishing regional greenhouse gas emission reduction targets for automobile and light trucks under SB 375.

ATIS Advanced Traveler Information Systems – Technology used to provide travelers with information, both pre-trip and in-vehicle, so they can better utilize the transportation system.

ATMS Advanced Transportation Management Systems – Technology used to improve the operations of the transportation network.

ATP Active Transportation Program – Provides state funds for city and county projects that improve safety and convenience for bicycle commuters, recreational riders and safe routes to school programs. Replaces the Bicycle Transportation Account (BTA).

Automated Vehicle U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA) has defined five increasing levels of vehicle automation at five levels:

0. No-Automation: The driver is in complete and sole control of the primary vehicle controls .
1. Function-Specific Automation: Automation at this level involves one or more specific control functions.
2. Combined Function Automation: This level involves automation of at least two primary control functions designed to work in unison to relieve the driver of control of those functions.
3. Limited Self-Driving Automation: Vehicles at this level of automation enable the driver to cede full control of all safety-critical functions under certain traffic or environmental conditions.
4. Full Self-Driving Automation: The vehicle is designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip.

Autonomous Vehicle Vehicles in which operation of the vehicle occurs without direct driver input to control the steering, acceleration and braking and are designed so that the driver is not expected to constantly monitor the roadway while operating in self-driving mode.

AVO Average Vehicle Occupancy – Calculated by dividing the total number of travelers by the total number of vehicles.

Base Year The year 2012, used in the RTP/SCS performance analysis as a reference point for current conditions.

Baseline Future scenario which includes only those projects that are existing, undergoing right-of-way acquisition or construction, come from the first year of the previous RTP or RTIP, or have completed the NEPA process. The Baseline is based upon the adopted 2015 FTIP. The Baseline functions as the “No Project” alternative used in the RTP/SCS Program EIR.

BEV Battery Electric Vehicle – An electric drive vehicle powertrain that is powered by an on-board battery. A BEV is a sub-class of Plug-in Electric Vehicle.

Bikeway Common term for any designated bicycle facility, such as a bike path, bike lane, bike route, sharrow, bicycle boulevard or cycle-track.

Bike Share An integrated network of bicycle rental kiosks in heavily urbanized areas. The bike share network is intended to reduce short-distance driving by providing low-cost bicycle rentals at regular intervals (200 yards apart) throughout the heavily urbanized area.

BLS Bureau of Labor Statistics – The principal fact-finding agency for the federal government in the broad field of labor economics and statistics.

BNSF Burlington Northern and Santa Fe Railway Company.

BTA Bicycle Transportation Account – Provides state funds for city and county projects that improve safety and convenience for bicycle commuters. Replaced by the California Active Transportation Program (ATP).

Bus A transit mode comprised of rubber-tired passenger vehicles operating on fixed-routes and schedules over roadways.

BRT Bus Rapid Transit – Bus transit service that seeks to reduce travel time through measures such as traffic signal priority, automatic vehicle location, dedicated bus lanes, limited-stop service and faster fare collection policies.

CAA Clean Air Act – 1970 federal act that authorized EPA to establish air quality standards to limit levels of pollutants in the air. EPA has promulgated such standards (or NAAQS) for six criteria pollutants: sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone, lead and particulate matter (PM 10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these

standards is a “non-attainment” area. States must develop SIPs to explain how they will comply with the CAA. The act was amended in 1977 and again in 1990.

CAFR Comprehensive Annual Financial Report – Official annual financial report that encompasses all funds and financial components associated with any given organization.

Cal B/C Model California Life-Cycle Benefit/Cost Analysis Model – Developed for the California Department of Transportation (Caltrans) as a tool for benefit-cost analysis of highway and transit projects. It is an Excel (spreadsheet) application structured to analyze several types of transportation improvement projects in a corridor where there already exists a highway facility or a transit service (the base case).

Caltrans California Department of Transportation – State agency responsible for the design, construction, maintenance and operation of the California State Highway System, as well as that portion of the Interstate Highway System within the state’s boundaries.

Cap-and-Trade A market based regulation that is designed to reduce greenhouse gases (GHGs) from multiple sources. Cap-and-Trade sets a firm limit or cap on GHGs and minimize the compliance costs of achieving California’s AB 32 goals. The cap will decline approximately 3 percent each year beginning in 2013. Trading creates incentives to reduce GHGs below allowable levels through investments in clean technologies. With a carbon market, a price on carbon is established for GHGs. Market forces spur technological innovation and investments in clean energy. Cap-and-Trade is an environmentally effective and economically efficient response to climate change.

Car Share An integrated network of passenger vehicles available for short-term rental in heavily urbanized areas. Car share can take the form of return systems in which a vehicle must be returned to the parking space from which it was rented. Alternatively, it can take the form of point-to-point systems in which the car can be returned to another space, or left anywhere within a pre-determined geographic zone.

Catalytic Demand Additional aviation demand that is created by companies that locate in the proximity of expanding airports with developable land around them to reduce airport ground access time and costs for their employees and clients. Catalytic demand is greatest for large hub airports, particularly international airports.

CEHD Community, Economic and Human Development Committee – A SCAG committee that studies the problems, programs and other matters which pertain to the regional issues of community, economic and human development and growth. This committee reviews projects, plans and programs of regional significance for consistency and conformity with applicable regional plans.

CEQA California Environmental Quality Act – State law providing certain environmental protections that apply to all transportation projects funded with state funds.

CETAP Community Environmental and Transportation Acceptability Process – Part of the Riverside County Integrated Project that is examining where to locate possible major new multimodal transportation facilities to serve the current and future transportation needs of Western Riverside County, while minimizing impacts on communities and the environment.

CHSRA California High-Speed Rail Authority – Agency responsible for planning, designing, constructing and operating a state-of-the-art high-speed rail system in California.

CIP Capital Improvement Program – Long-range strategic plan that identifies capital projects; provides a planning schedule and financing options.

CMAQ Congestion Mitigation and Air Quality Program – Federal program initiated by ISTEA to provide funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion.

CMIA Corridor Mobility Improvement Account – These funds would be allocated by the California Transportation Commission to highly congested travel corridors in the state. Projects in this category must be a high priority; be able to start construction by 2012; improve mobility in a highly congested corridor by improving travel times and reducing vehicle hours of delay; connect the State Highway System; and improve access to jobs, housing, markets and commerce.

CMP Congestion Management Program – Established by Proposition 111 in 1990, requires each county to develop and adopt a CMP that includes highway and roadway system monitoring, multimodal system performance analysis, transportation demand management program, land-use analysis program and local conformance.

CNSSTC California-Nevada Super-Speed Train Commission – Public-private partnership developed to promote a high-speed link between California and Nevada.

CO Carbon Monoxide – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely. It is a byproduct of highway vehicle exhaust, which contributes about 60 percent of all CO emissions nationwide.

COG Council of Governments – Under state law, a single or multi-county council created by a joint powers agreement.

Complete Streets Streets designed and operated to enable safe access for all roadway users of all ages and abilities, including pedestrians, bicyclists, motorists and transit riders.

Complete Streets Approach An approach to funding for planning, designing and maintaining roadways that incorporates Complete Streets implementation as the variable costs in larger road construction or rehabilitation projects. This approach can dramatically reduce the costs of Complete Streets as compared to implementation of stand-alone projects.

Commuter Bus (CB) Fixed-route bus systems that are primarily connecting outlying areas with a central city through bus service that operates with at least five miles of continuous closed-door service. This service typically operates using motorcoaches (aka over-the-road buses) and usually features peak scheduling, multiple-trip tickets and multiple stops in outlying areas with limited stops in the central city.

Commuter Rail (CR) A transit mode that is an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas (UZAs), or between urbanized areas and outlying areas. Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by multi-trip tickets, specific station to station fares, railroad employment practices and usually only one or two stations in a central business district. Commuter Rail does not include heavy rail rapid transit, or light rail/streetcar transit service, or intercity rail service.

Congestion Management Process Systematic approach required in transportation management areas (TMAs) that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under Title 23 U.S.C. and Title 49 U.S.C., through the use of operational management strategies.

Connected/ Automated Vehicles Refers to the interrelated nature of connectivity and automation in new vehicle technology. Connected vehicles are vehicles that use any of a number of different communication technologies to communicate with the driver, other cars on the road (vehicle-to-vehicle [V2V]), roadside infrastructure (vehicle-to-infrastructure [V2I]) and the “Cloud” to improved safety, user experience and collision avoidance.

Constant Dollars Dollars expended/received in a specific year adjusted for inflation/deflation relative to another time period.

Corridor In planning, a broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways, as well as transit lines and routes.

CSMP Corridor System Management Plans.

CTC California Transportation Commission – Eleven voting members and two non-voting ex-officio members. Nine of the members are appointed by the Governor, one is appointed by the Senate Rules Committee and one is appointed by the Speaker of the Assembly, to oversee and administer state and federal transportation funds and provide oversight on project delivery.

CTIPS California Transportation Improvement Program System – A project programming database system used to efficiently and effectively develop and manage various transportation programming documents as required under state and federal law.

CTP California Transportation Plan – A statewide, long-range transportation policy plan that provides for the movement of people, goods, services and information. The CTP offers a blueprint to guide future transportation decisions and investments that will ensure California's ability to compete globally, provide safe and effective mobility for all persons, better link transportation and land-use decisions, improve air quality and reduce petroleum energy consumption.

CVO Commercial Vehicle Operations – Management of commercial vehicle activities through ITS.

Deficiency Plan Set of provisions contained in a Congestion Management Plan to address congestion when unacceptable levels of congestion occur. Projects implemented through the Deficiency Plan must, by statute, have both mobility and air quality benefits.

Demand Response A transit mode comprised of automobiles, vans, or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. A demand response (DR) operation is characterized by vehicles that do not operate over a fixed route or on a fixed schedule except on a temporary basis.

Displacement The process that occurs when the increasing property values brought about through gentrification drive out the existing residents and business operators and attract a new and different demographic population to an area. Lower income residents may also become unable to access housing in certain areas due to increasing housing prices. Please also see Gentrification.

DTIM Direct Travel Impact Model – A vehicle emissions forecasting model.

EDF Environmental Defense Fund – A national non-profit organization that seeks to protect the environmental rights of all people, including future generations.

EIR Environmental Impact Report – An informational document, required under CEQA, which will inform public agency decision-makers and the public generally of the significant environmental effects of a project, possible ways to minimize significant effects and reasonable alternatives to the project.

EIS Environmental Impact Statement (federal) – National Environmental Policy Act (NEPA) requirement for assessing the environmental impacts of federal actions that may have a significant impact on the human environment.

EMFAC Emission Factor – Model that estimates on-road motor vehicle emission rates for current year as well as backcasted and forecasted inventories.

Enabling Technology This term refers to a technological innovation which lays the foundation or creates a platform that allows a separate unrelated technology to achieve commercialization. For example, car share and bike share systems have been under development since the early 1970s. However the explosion of smart phone usage and the convergence of mobile banking and GPS location services have made these systems viable for a larger portion of the population.

Environmental Justice (EJ) The concept of Environmental Justice is about equal and fair access to a healthy environment, with the goal of protecting minority and low-income communities from incurring disproportionate negative environmental impacts.

EPA Environmental Protection Agency – Federal agency established to develop and enforce regulations that implement environmental laws enacted by Congress to protect human health and safeguard the natural environment.

Executive Order B-30-15 Executive Order signed by Governor Brown on April 29, 2015, which establishes a California Greenhouse Gas (GHG) reduction target of 40 percent below 1990 levels by 2030.

Express Lane An HOV lane that single-occupant drivers can pay to drive in, also referred to as "High Occupancy Toll Lanes."

EWFC An east-west segment of the Regional Clean Freight Corridor System that connects I-710 to the west and I-15 to the east.

EV Electric Vehicle – A vehicle fully or partially powered by an electric engine. Synonymous with Plug-In Electric Vehicle (PEV).

EV Charging Station A location where a vehicle can be parked and the electric storage or battery can be recharged. EV Charging Stations can be private or publicly accessible and can be free to the user or used for a fee. EV Charging Stations are configured in three different levels defined by the amount of electricity that can be transmitted to the vehicle. Level 1 provides energy through a 120 Volt AC Plug comparable to a household product. Based on the battery type and vehicle, AC Level 1 charging adds about 2 to 5 miles of range to a PEV per hour of charging time. Level 2 equipment offers charging through 208 or 240 V AC electrical connection comparable to a household appliance such as a washing machine. AC Level 2 adds about 10 to 20 miles of range

per hour of charging time. Direct-current (DC) fast charging equipment, or Level 3 (typically 208/480 V AC three-phase input), enables rapid charging along heavy traffic corridors and can add 50 to 70 miles of range in about 20 minutes.

FAA Federal Aviation Administration – Federal agency responsible for issuing and enforcing safety regulations and minimum standards, managing air space and air traffic and building and maintaining air navigation facilities.

FAST Act Fixing America’s Surface Transportation Act (H.R. 22) – Signed into law by President Obama on December 4, 2016. Funding surface transportation programs at over \$305 billion for five years through 2020.

FCV Fuel Cell Vehicle – Electric vehicles that are powered by hydrogen fuel cells.

FHWA Federal Highway Administration – Federal agency responsible for administering the Federal-Aid Highway Program, which provides federal financial assistance to the states to construct and improve the National Highway System, urban and rural roads and bridges.

Financially Constrained Expenditures are said to be financially constrained if they are within limits of anticipated revenues.

First Mile/Last Mile Strategies designed to increase transit usage by making it more convenient and safe to walk or bike to transit stations. Includes such strategies as wayfinding, bikeways, sidewalk repair and bike share.

FRA Federal Railroad Administration – Federal agency created to promulgate and enforce rail safety regulations, administer railroad assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy and consolidate government support of rail transportation activities.

FTA Federal Transit Administration – The federal agency responsible for administering federal transit funds and assisting in the planning and establishment of areawide urban mass transportation systems. As opposed to FHWA funding, most FTA funds are allocated directly to local agencies, rather than to Caltrans.

FTIP Federal Transportation Improvement Program – A six-year comprehensive listing of transportation projects proposed for federal funding, that require a federal action, or are regionally significant and are within the planning area of an MPO. The last two years are for informational purposes only.

FTZ Foreign Trade Zones.

FY Fiscal Year – The twelve-month period on which the budget is planned. The state fiscal year begins July 1 and ends June 30 of the following year. The federal fiscal year begins October 1 and ends September 30 of the following year.

GAO Government Accountability Office – Congressional agency responsible for examining matters related to the receipt and payment of public funds.

Gentrification While holding many definitions, is commonly understood as a change process in historically low-wealth communities that results in rising real estate values coupled with shifts in the economic, social and cultural demographics and feel of the communities. Please also see Displacement.

GHG Greenhouse Gases – Components of the atmosphere that contribute to the greenhouse effect. The principal greenhouse gases that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide and fluorinated gases.

GGRF Greenhouse Gas Reduction Funds are administered by state and local agencies for a variety of greenhouse gas (GHG) emission reductions programs, including energy efficiency, public transit, low-carbon transportation and affordable housing.

GIS Geographic Information System – Powerful mapping software that links information about where things are with information about what things are like. GIS allows users to examine relationships between features distributed unevenly over space, seeking patterns that may not be apparent without using advanced techniques of query, selection, analysis and display.

GNP Gross National Product – An estimate of the total value of goods and services produced in any specified country in a given year. GNP can be measured as a total amount or an amount per capita.

Grade Crossing A crossing or intersection of highways, railroad tracks, other guideways, or pedestrian walks, or combinations of these at the same level or grade.

Greenfield Also known as “raw land,” land that is privately owned, lacks urban services, has not been previously developed and is located at the fringe of existing urban areas.

GRP Gross Regional Product.

HCP Habitat Conservation Plan – Established under Section 10 of the federal Endangered Species Act to allow development to proceed while protecting endangered species. A federal Habitat Conservation Plan is typically accompanied by a state Natural Communities Conservation Plan or NCCP.

HDT Heavy-Duty Truck – Truck with a gross vehicle weight of 8,500 pounds or more.

Heavy Rail A transit mode that is an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails, separate rights-of-way (ROW) from which all other vehicular and foot traffic are excluded, sophisticated signaling and raised platform loading.

HiAP Health in All Policies – HiAP is a collaborative strategy that aims to improve public health outcomes by including health considerations in the decision-making process across sectors and policy areas. HiAP addresses the social determinants of health by encouraging transportation practitioners to work with nontraditional partners who have expertise related to public health outcomes, such as city and county public health departments.

HQTA High-Quality Transit Areas – Generally a walkable transit village or corridor, consistent with the adopted RTP/SCS and is within one half-mile of a well-served transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours. The definition that SCAG has been using for the HQTA is based on the language in SB 375 which defines:

Major Transit Stop A site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (CA Public Resource Code Section 21064.3).

HQTC High-Quality Transit Corridor – A corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

HICOMP Highway Congestion Monitoring Program (Caltrans) – A report that measures the congestion that occurs on urban area highways in California.

Home-Based Work Trips Trips that go between home and work, either directly or with an intermediate stop. Home-based work trips include telecommuting, working at home and non-motorized transportation work trips.

HOT Lane High-Occupancy Toll Lane – An HOV lane that single-occupant drivers can pay to drive in, also referred to as “Express Lanes.”

HOV Lane High-Occupancy Vehicle Lane – A lane restricted to vehicles with two (and in some cases three) or more occupants to encourage carpooling. Vehicles include automobiles, vans, buses and taxis.

HPMS Highway Performance Monitoring System – A federally mandated program designed by FHWA to assess the performance of the nation’s highway system.

HSIPR High-Speed Intercity Passenger Rail Program – A Federal Railroad Administration program created to invest in new high-speed rail corridors and existing rail corridors to improve speed and service.

HST High-Speed Train – Intercity passenger rail service that is reasonably expected to reach speeds of at least 110 mile per hour.

HUD U.S. Department of Housing and Urban Development – Federal agency charged with increasing homeownership, supporting community development and increasing access to affordable housing free from discrimination.

ICAPCD Imperial County Air Pollution Control District – Local air pollution control agency mandated by state and federal regulations to implement and enforce air pollution rules and regulations.

ICE Internal Combustion Engine – Refers traditional vehicle engines that are powered by the burning of fuel sources, including gasoline, diesel and natural gas.

ICTC Imperial County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements and administering the county’s transportation sales tax revenues.

ICTF Intermodal Container Transfer Facility – a near-dock intermodal rail facility owned and operated by Union Pacific Rail Road, adjacent to the SPB ports.

IGR Intergovernmental Review Process – The review of documents by several governmental agencies to ensure consistency of regionally significant local plans, projects and programs with SCAG’s adopted regional plans.

Infrastructure The basic facilities, equipment, services and installations needed for the growth and functioning of a community.

IOS Initial Operating Segment.

ISTEA Intermodal Surface Transportation Efficiency Act – Signed into federal law on December 18, 1991, it provided authorization for highways, highway safety and mass transportation for FYs 1991–1997 and served as the legislative vehicle for defining federal surface transportation policy.

ITIP Interregional Transportation Improvement Program – The portion of the STIP that includes projects selected by Caltrans (25 percent of STIP funds).

ITS Intelligent Transportation Systems – Systems that use modern detection, communications and computing technology to collect data on system operations and performance, communicate that information to system managers and users and use that information to manage and adjust the transportation system to respond to changing operating conditions, congestion, or accidents. ITS technology can be applied to arterials, highways, transit, trucks and private vehicles. ITS include Advanced Traveler Information Systems (ATIS), Advanced Public Transit Systems (APTS), Advanced Traffic Management Systems (ATMS), Advanced Vehicle Control Systems (AVCS) and Commercial Vehicle Operations (CVO).

JPA Joint Powers Authority – Two or more agencies that enter into a cooperative agreement to jointly wield powers that are common to them. JPAs are a vehicle for the cooperative use of existing governmental powers to finance and provide infrastructure and/or services in a cost-efficient manner.

LACMTA Los Angeles County Metropolitan Transportation Authority, also referred to as “Metro” – Agency responsible for planning and funding countywide transportation improvements, administering the county’s transportation sales tax revenues and operating bus and rail transit service.

LAWA or LAX Los Angeles World Airports – Aviation authority of the City of Los Angeles. LAWA owns and operates Los Angeles International (LAX), Ontario International, Van Nuys and Palmdale Airports.

LCV Longer-Combination Vehicles – Includes tractor-trailer combinations with two or more trailers that weigh more than 80,000 pounds.

LEM Location Efficient Mortgage – Allows people to qualify for larger loan amounts if they choose a home in a densely populated community that is well served by public transit and where destinations are located close together so that they can also walk and bike instead of driving everywhere.

LRT Light Rail Transit – A mode of transit that operates on steel rails and obtains its power from overhead electrical wires. LRT may operate in single or multiple cars on separate rights-of-way or in mixed traffic.

Livable Communities Any location in which people choose may be viewed as “livable.” However, communities that contain a healthy mix of homes, shops, workplaces, schools, parks and civic institutions coupled with a variety of transportation choices, give residents greater access to life’s daily essentials and offer higher quality of life to a wider range of residents. In 2009, the U.S. DOT, EPA and HUD established the following 6 Principles of Livability:

1. Provide more transportation choices
2. Expand location- and energy-efficient housing choices

3. Improve economic competitiveness of neighborhoods
4. Target federal funding toward existing communities
5. Align federal policies and funding
6. Enhance the unique characteristics of all communities

Livable Corridors Arterial roadways where local jurisdictions may plan for a combination of the following elements: high-quality bus frequency; higher density residential and employment at key intersections; and increased active transportation through dedicated bikeways. Most, but not all Livable Corridors would be located within HQTAs. Livable Corridor land-use strategies include development of mixed use retail centers at key nodes along corridors, increasing neighborhood-oriented retail at more intersections, applying a “Complete Streets” approach to roadway improvements and zoning that allows for the replacement of underperforming auto-oriented strip retail between nodes with higher density residential and employment.

LTF Local Transportation Fund – A fund which receives TDA revenues.

MAP Million Annual Passengers – Used to quantify airport activity.

MAP-21 Moving Ahead for Progress in the 21st Century – Signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over \$105 billion for fiscal years (FY) 2013 and 2014, MAP-21 was the first long-term highway authorization enacted since 2005. To allow more time for development and consideration of a long-term reauthorization of surface transportation programs, Congress has enacted short term extensions of the expiring law, MAP-21.

Market Incentives Measures designed to encourage certain actions or behaviors. These include inducements for the use of carpools, buses and other HOVs in place of single-occupant automobile travel. Examples include HOV lanes, preferential parking and financial incentives.

MCGMAP Multi-County Goods Movement Action Plan

MDAB Mojave Desert Air Basin – Area defined by state law as comprising the desert portions of Los Angeles, Kern, Riverside and San Bernardino Counties.

MDAQMD Mojave Desert Air Quality Management District – Local air agency mandated by state and federal regulations to implement and enforce air pollution rules and regulations; encompasses the desert portion of San Bernardino County from the summit of the Cajon Pass north to the Inyo County line, as well as the Palo Verde Valley portion of Riverside County.

Measure A Revenues generated from Riverside County’s local half-cent sales tax.

Measure D Revenues generated from Imperial County’s local half-cent sales tax.

Measure I Revenues generated from San Bernardino County's local half-cent sales tax.

Measure M Revenues generated from Orange County's local half-cent sales tax.

Measure R Revenues generated from Los Angeles County's local half-cent sales tax. Los Angeles County has two permanent local sales taxes (Propositions C and A) and one temporary local sales tax (Measure R).

Metrolink Regional commuter rail system connecting Los Angeles, Orange, Riverside, San Bernardino and Ventura Counties and operated by SCRRA.

MIS Major Investment Study – The preliminary study, including preliminary environmental documentation, for choosing alternative transportation projects for federal transportation funding. An MIS is a requirement, which is conducted cooperatively by the study sponsor and the MPO.

Mixed Flow Traffic movement having autos, trucks, buses and motorcycles sharing traffic lanes.

Mode A particular form of travel (e.g., walking, traveling by automobile, traveling by bus, or traveling by train).

Mode Split The proportion of total person trips using various specified modes of transportation.

Model A mathematical description of a real-life situation that uses data on past and present conditions to make a projection.

MPO Metropolitan Planning Organization – A federally required planning body responsible for transportation planning and project selection in a region.

MTS Metropolitan Transportation System – Regional network of roadways and transit corridors.

Multimodal A mixture of the several modes of transportation, such as transit, highways, non-motorized, etc.

NAAQS National Ambient Air Quality Standards – Targets established by the U.S. Environmental Protection Agency (EPA) for the maximum contribution of a specific pollutant in the air.

NAFTA North American Free Trade Agreement – An agreement between the governments of Canada, Mexico and the United States to eliminate barriers to trade and facilitate the cross-border movement of goods and services.

NCCP Natural Communities Conservation Plan – Program under the Department of Fish and Game that uses a broad-based ecosystem approach toward planning for the protection of plants, animals and their habitats, while allowing compatible and appropriate economic activity.

NEPA National Environmental Protection Act – Federal environmental law that applies to all projects funded with federal funds or requiring review by a federal agency.

NGV Natural Gas Vehicle – Vehicles that are powered by internal combustion engines that burn compressed or liquid natural gas.

NIMS National Incident Management System – Nationwide template that enables all government, private-sector and non-governmental organizations to work together during a domestic incident.

Nominal Dollars Actual dollars expended/received in a specific year without adjustments for inflation/deflation.

Non-Reportable TCM The following de minimis committed TCMs are defined in the Final 2015 FTIP Guidelines as non-reportable TCMs for the purpose of TCM timely implementation reporting:

1. Bus/shuttle/paratransit fleet expansion projects with fewer than 5 vehicles
2. Bus stop improvement projects
3. Bicycle facility less than 1 mile and pedestrian facility less than 1/4 mile
4. Intelligent transportation systems/control system computerization projects with fewer than 3 traffic signals,
5. Changeable message sign projects with fewer than 5 signs
6. Bike parking facilities, new or expansion, with nine or fewer bike lockers/slots
7. Expansion of bus station/shelter/transfer facilities with nine or fewer bike lockers/slots and
8. Rail station expansion with addition of nine or fewer bike lockers/slots.

NOx Nitrogen oxides – A group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. NOx are a major component of ozone and smog and they are one of six principal air pollutants tracked by the EPA.

NMA Neighborhood Mobility Areas – Areas Neighborhood Mobility Areas with roadway networks where Complete Streets and sustainability policies support and encourage replacing single and multi-occupant automobile use with biking, walking, skateboarding and slow speed electric vehicles (such as e-bikes, senior mobility devices and neighborhood electric vehicles.) Complete Streets strategies can include traffic calming, bicycle priority streets (bicycle boulevards) and pedestrian connectivity to increase physical activity, improve connectivity to the regional bikeway/greenway networks, local businesses and parks. NEV strategies include network identification, signage, intersection treatments and shared NEV/bike lanes to connect low speed roadway areas.

NTD National Transit Database – The Federal Transit Administration's (FTA) national database for transit statistics.

O&M Operations and Maintenance – The range of activities and services provided by the transportation system and for the upkeep and preservation of the existing system.

OCS Overhead Catenary System – A type of wayside power where vehicles may connect to and draw power from overhead wires.

OCTA Orange County Transportation Authority – Agency responsible for planning and funding countywide transportation improvements, administering the county’s transportation sales tax revenues and operating bus transit service.

OEM Original Equipment Manufacturer.

OLDA Orangeline Development Authority – Joint exercise of powers authority developed by the cities located along the Orangeline corridor.

OnTrac Orange-North America Trade Rail Access Corridor – Formed in April of 2000 to build and support the Orangethorpe Avenue Grade Separation and Trade Corridor project, a 5-mile-long railroad-lowering project that will completely grade separate 11 rail crossings in the cities of Placentia and Anaheim.

Open Space Generally understood as any area of land or water which, for whatever reason, is not developed for urbanized uses and which therefore enhances residents’ quality of life. However, note that each county and city in California must adopt an open space element as part of its general plan. The element is a statement of local planning policies focusing on the use of unimproved land or water for 1) the preservation or managed production of natural resources, 2) outdoor recreation and 3) the promotion of public health and safety. Therefore, open space will be defined by each jurisdiction based on their own unique resources and environment.

OWP Overall Work Program – SCAG develops an OWP annually, describing proposed transportation planning activities for the upcoming fiscal year, including those required by federal and state law.

Parking Cash-Out Program An employer-funded program under which an employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space.

Parking Subsidy The difference between the out-of-pocket amount paid by an employer on a regular basis in order to secure the availability of an employee parking space not owned by the employer and the price, if any, charged to an employee for use of that space.

PMT Passenger Miles Traveled – The cumulative sum of the distances ridden by each public transportation passenger.

PATH Partners for Advanced Transit and Highways – Joint venture of Caltrans which includes the University of California and other public and private academic institutions and industries.

PEIR Program Environmental Impact Report – An information document that analyzes and discloses potential environmental effects of large-scale plans or programs in accordance with provisions of the California Environmental Quality Act (CEQA).

PeMS Highway Performance Measurement System – A service provided by the University of California, Berkeley, to collect historical and real-time highway data from highways in the state of California in order to compute highway performance measures.

Person Trip A trip made by a person by any mode or combination of modes for any purpose.

PEV Plug-in Electric Vehicle – Refers to all vehicles that can be plugged into an external source of electricity in order to recharge an on-board battery which will provide some or all power to an electric engine.

PHEV Plug-in Hybrid Electric Vehicle – A vehicle powertrain that combines an electric engine with a traditional internal combustion engine. The two engines can operate in parallel with the electric engine operating at certain speeds, or the engines can operate sequentially, with all power being provided by the electric engine until the battery power is exhausted.

PHL Pacific Harbor Line, Inc.

PM 10 Particulate Matter – A mixture of solid particles and liquid droplets found in the air 10 micrometers or less in size (a micrometer is one-millionth of a meter). These coarse particles are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling and crushing and grinding operations, as well as windblown dust.

PM 2.5 Particulate Matter – A mixture of solid particles and liquid droplets found in the air 2.5 micrometers or less in size (a micrometer is one-millionth of a meter). These fine particles result from fuel combustion from motor vehicles, power generation and industrial facilities, as well as from residential fireplaces and wood stoves.

PMD LA/Palmdale Regional Airport – Regional airport located in Palmdale.

POLA Port of Los Angeles.

POLB Port of Long Beach.

PPP Public-Private Partnership – Contractual agreements formed between a public agency and private-sector entity that allow for greater private-sector participation in the delivery of transportation projects.

PRC Peer Review Committee – An “informal” committee of technical experts usually organized and invited to review and comment on various technical issues and processes used in the planning process.

Proposition 1A Passed by voters in 2006, Proposition 1A protects transportation funding for traffic congestion relief projects, safety improvements and local streets and roads. It also prohibits the state sales tax on motor vehicle fuels from being used for any purpose other than transportation improvements and authorizes loans of these funds only in the case of severe state fiscal hardship.

Proposition 1B Highway Safety, Traffic Reduction, Air Quality and Port Security State of California – Passed in November 2006, Proposition 1B provides \$19.9 billion to fund state and local transportation improvement projects to relieve congestion, improve movement of goods, improve air quality and enhance safety and security of the transportation system.

Proposition A Revenues generated from Los Angeles County’s local half-cent sales tax. Los Angeles County has two permanent local sales taxes (Propositions C and A) and one temporary local sales tax (Measure R).

Proposition C Revenues generated from Los Angeles County’s local half-cent sales tax. Los Angeles County has two permanent local sales taxes (Propositions C and A) and one temporary local sales tax (Measure R).

PSR Project Study Report – Defines and justifies the project’s scope, cost and schedule. PSRs are prepared for state highway projects and PSR equivalents are prepared for projects not on the State Highway System. Under state law, a PSR or PSR equivalent is required for STIP programming.

PTA Public Transportation Account – The major state transportation account for mass transportation purposes. Revenues include a portion of the sales tax on gasoline and diesel fuels.

Public Transportation As defined in the Federal Transit Act, “Transportation by a conveyance that provides regular and continuing general or special transportation to the public, but does not include school bus, charter, or intercity bus transportation or intercity passenger rail transportation provided by the entity described in chapter 243 (Amtrak or a successor to such entity).”

PUC Public Utilities Commission – Regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit and passenger transportation companies.

Railroad Siding A short stretch of railroad track used to store rolling stock or enable trains on the same line to pass; also called sidetrack.

RBN Regional Bikeway Network – A system of regionally interconnected bikeways linking cities and counties in the SCAG region.

RC Regional Council – Conducts the affairs of SCAG; implements the General Assembly’s policy decisions; acts upon policy recommendations from SCAG policy committees and external agencies; appoints committees to study specific problems; and amends, decreases or increases the proposed budget to be reported to the General Assembly.

RCP Regional Comprehensive Plan – Developed by SCAG, the RCP is a vision of how Southern California can balance resource conservation, economic vitality and quality of life. It will serve as a blueprint to approach growth and infrastructure challenges in an integrated and comprehensive way.

RCTC Riverside County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements and administering the county’s transportation sales tax revenues.

RGN Regional Greenway Network – A regional system of bikeways physically separate from traffic. It makes use of riverbeds and under-utilized utility corridors. It is part of the Regional Bikeway Network (RBN).

RHNA Regional Housing Needs Assessment – Quantifies the need for housing within each jurisdiction of the SCAG region based on population growth projections. Communities then address this need through the process of completing the housing elements of their General Plans.

Ridesourcing A generic term coined by researchers at University of California, Berkeley for the act of using a Transportation Network Company such as Lyft or Uber. The term distinguishes this mode from car sharing and from taxi use. A user is “sourcing” a ride from an online community, in exchange for a brokered payment.

Riparian Area Habitats, vegetation, and ecosystems adjacent to or part of rivers and streams.

Robust Flight Portfolio Providing a range of flight offerings in different haul length categories including short-haul, medium-haul, long-haul and international flights.

ROG Reactive Organic Gas – Organic compounds assumed to be reactive at urban/regional scales. Those organic compounds that are regulated because they lead to ozone formation.

RSTIS Regionally Significant Transportation Investment Study – Involves identifying all reasonable transportation options, their costs and their environmental impacts. RSTIS projects are generally highway or transit improvements that have a significant impact on the capacity, traffic flow, level of service, or mode share at the transportation corridor or sub-area level.

RSTP Regional Surface Transportation Program – Established by California state statute utilizing federal Surface Transportation Program funds. Approximately 76 percent of the state’s RSTP funds must be obligated on projects located within the 11 urbanized areas of California with populations of 200,000 or more.

RTMS Regional Transportation Monitoring System – Internet-based transportation monitoring system. The RTMS will be the source for real-time and historical transportation data collected from local, regional and private data sources.

RTP Regional Transportation Plan – Federally required 20-year plan prepared by metropolitan planning organizations and updated every four years. Includes projections of population growth and travel demand, along with a specific list of proposed projects to be funded.

RTSS Regional Transit Security Strategy – Strategy for the region with specific goals and objectives related to the prevention, detection, response and recovery of transit security issues.

Rural Areas Rural locales consist of all of the areas within the SCAG region that are not within Urban Areas (please see definition).

SAFETEA-LU Safe, Accountable, Flexible, Efficient Transportation Equity Act A Legacy for Users – Signed into law by President Bush on August 10, 2005, it authorized the federal surface transportation programs for highways, highway safety and transit for the 5-year period of 2005–2009.

SANBAG San Bernardino Associated Governments – The council of governments and transportation planning agency for San Bernardino County. SANBAG is responsible for cooperative regional planning and developing an efficient multimodal transportation system countywide.

SANDAG San Diego Association of Governments.

SB 45 Senate Bill 45 (Chapter 622, Statutes of 1997, Kopp) – Established the current STIP process and shifted control of decision-making from the state to the regional level.

SB 375 Senate Bill 375 (Chapter 728, Steinberg) – Established to implement the state’s greenhouse gas (GHG) emission-reduction goals, as set forth by AB 32, in the sector of cars and light trucks. This mandate requires the California Air Resources Board to determine per capita GHG emission-reduction targets for each metropolitan planning organization (MPO) in the state at two points in the future—2020 and 2035. In turn, each MPO must prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its GHG reduction target through integrated land use, housing and transportation planning.

SB 535 Senate Bill 535 (Chapter 830, De León) – Established that a quarter of the proceeds from the Greenhouse Gas Reduction Fund must also go to projects that provide a benefit to disadvantaged communities. A minimum of 10 percent of the funds must be for projects located within those communities. The legislation gives the California Environmental Protection Agency responsibility for identifying those communities.

SB 974 Senate Bill 974 – Introduced by Senator Alan Lowenthal, SB 974 would impose a \$30 fee on each shipping container processed at the Ports of Los Angeles, Long Beach and Oakland for congestion management and air quality improvements related to ports.

SBD San Bernardino International Airport – International airport located in San Bernardino.

SCAB South Coast Air Basin – Comprises the non-Antelope Valley portion of Los Angeles County, Orange County, Riverside County and the non-desert portion of San Bernardino County.

SCAG Southern California Association of Governments – The metropolitan planning organization (MPO) for six counties including Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.

SCAQMD South Coast Air Quality Management District – The air pollution control agency for Orange County and major portions of Los Angeles, Riverside and San Bernardino Counties in Southern California.

SCCAB South Central Coast Air Basin – Comprises San Luis Obispo, Santa Barbara and Ventura Counties.

SCIG Southern California International Gateway, a proposed rail near-dock facility for the BNSF adjacent to the SPB ports.

SCRIFA Southern California Railroad Infrastructure Financing Authority.

Scrip A form of fare payment transferrable among transportation providers, often issued by Dial-A-Ride transit service providers to be used on taxis.

SDOH Social Determinants of Health – Includes the circumstances in which people are born, grow up, live, work, play and age. Economic opportunities, government policies and the built environment all play a role in shaping these circumstances and influencing public health outcomes.

SED Socioeconomic Data – Population, employment and housing forecast.

SFS Sustainable Freight Strategy – A new plan underway by ARB.

SGC The Strategic Growth Council is a state agency tasked with encouraging the development of sustainable communities.

SHA State Highway Account – The major state transportation account for highway purposes. Revenues include the state excise taxes on gasoline and diesel fuel and truck weight fees.

Shared Mobility Services Refers to a wide variety of new mobility services and encompasses bike share, car share, app-based transit services and ridesourcing. This term refers to the way in which these modes are offered as services brokered by a mobile application and each vehicle is shared amongst multiple users.

SHOPP State Highway Operation and Protection Program – A four-year capital improvement program for rehabilitation, safety and operational improvements on state highways.

SHSP Strategic Highway Safety Plan – A statewide, coordinated safety plan that provides a comprehensive framework for reducing fatalities and severe injuries to motorists, pedestrians, and bicyclists on all public roads. SHSP goals and objectives are data-driven and results are measured. Actions designed to achieve the objectives are developed by hundreds of safety stakeholders from the four E's of highway safety: engineering, education, enforcement and emergency medical services. In California, Caltrans coordinates the effort to develop the plan.

SIP State Implementation Plan – State air quality plan to ensure compliance with state and federal air quality standards. In order to be eligible for federal funding, projects must demonstrate conformity with the SIP.

Smart Growth Principles The following principles developed by the Smart Growth Network, a partnership of government, business and civic organizations created in 1996:

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty and critical environmental areas
7. Strengthen and direct development towards existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair and cost effective
10. Encourage community and stakeholder collaboration in development decisions

Social Equity Equal opportunity in a safe and healthy environment.

SOV Single-Occupant Vehicle – Privately operated vehicle that contains only one driver or occupant.

SOx Sulfur oxide – Any of several compounds of sulfur and oxygen, formed from burning fuels such as coal and oil.

SPB Ports San Pedro Bay Ports.

SRTS Safe Routes to School – Part of a nationwide/region-wide program to increase students walking or biking to school. Includes engineering, educational and enforcement activities. Funded through the State Active Transportation Program (ATP).

SSAB Salton Sea Air Basin – Comprises the Coachella Valley portion of Riverside County and all of Imperial County.

STA State Transit Assistance – State funding program for mass transit operations and capital projects. Current law requires that STA receive 50 percent of PTA revenues.

STIP State Transportation Improvement Program – A five-year capital outlay plan that includes the cost and schedule estimates for all transportation projects funded with any amount of state funds. The STIP is approved and adopted by the CTC and is the combined result of the ITIP and the RTIP.

STP Surface Transportation Program – Provides flexible funding that may be used by states and localities for projects on any federal-aid highway, bridge projects on any public road, transit capital projects and intracity and intercity bus terminals and facilities. A portion of funds reserved for rural areas may be spent on rural minor collectors.

Sustainability The practice of analyzing the impact of decisions, policies, strategies and development projects on the Economy, the Environment and Social Equity (commonly referred to as the three E's). In the 2008 Agency Strategic Plan, SCAG adopted the following definition of Sustainability as one of its core operational values: "We work with our partners and local governments to achieve a quality of life that provides resources for today's generation while preserving an improved quality of life for future generations."

TANN Traveler Advisory News Network – Provides real-time traffic and transportation information content to communications service providers and consumer media channels both nationally and internationally.

TAZ Traffic Analysis Zone – Zone system used in travel demand forecasting.

TC Transportation Committee – Committee used to study problems, programs and other matters which pertain to the regional issues of mobility, air quality, transportation control measures and communications.

TCM Transportation Control Measure – A project or program that is designed to reduce emissions or concentrations of air pollutants from transportation sources. TCMs are referenced in the State Implementation Plan (SIP) for the applicable air basin and have priority for programming and implementation ahead of non-TCMs.

TCWG Transportation Conformity Working Group – Forum used to support interagency coordination to help improve air quality and maintain transportation conformity.

TDA Transportation Development Act – State law enacted in 1971 that provided a 0.25 percent sales tax on all retail sales in each county for transit, bicycle and pedestrian purposes. In non-urban areas, funds may be used for streets and roads under certain conditions.

TDM Transportation Demand Management – Strategies that result in more efficient use of transportation resources, such as ridesharing, telecommuting, park-and-ride programs, pedestrian improvements and alternative work schedules.

TEA-21 Transportation Equity Act for the 21st Century – The predecessor to SAFETEA-LU, it was signed into federal law on June 9, 1998. TEA-21 authorized the federal surface transportation programs for highways, highway safety and transit for the six-year period of 1998–2003. TEA-21 builds upon the initiatives established in ISTEA.

TEU Twenty-Foot Equivalent Unit – A measure of shipping container capacity.

TIFIA Transportation Infrastructure Finance and Innovation Act of 1998 – Established a new federal credit program under which the U.S. DOT may provide three forms of credit assistance—secured (direct) loans, loan guarantees and standby lines of credit—for surface transportation projects of national or regional significance. The program’s fundamental goal is to leverage federal funds by attracting substantial private and other non-federal co-investment in critical improvements to the nation’s surface transportation system. Sponsors may include state departments of transportation, transit operators, special authorities, local governments and private entities.

TNC Transportation Network Companies – This is the technical term for ridesourcing companies used by the California Public Utilities Commission in order to create a new class of mobility provider distinguished from taxi companies and limousines.

TOD Transit-Oriented Development – A planning strategy that explicitly links land-use and transportation by focusing mixed housing, employment and commercial growth around bus and rail stations (usually within ½ mile). TODs can reduce the number and length of vehicle trips by encouraging more bicycle/pedestrian and transit use and can support transit investments by creating the density around stations to boost ridership.

TP&D Transportation Planning and Development Account – A state transit trust fund that is the funding source for the STA program.

TSP Transit Signal Priority – A set of operational improvements that use technology to facilitate the movement of transit vehicles and reduce their dwell time at traffic signals by holding green lights longer or shortening red lights. TSP may be implemented at individual intersections or across corridors or entire street systems. Objectives of TSP include improved schedule adherence and improved transit travel time efficiency while minimizing impacts to normal traffic operations.

Trantrak RTIP Database Management System.

TSWG Transportation Security Working Group – Advises the operating organizations on transportation safety matters associated with the transfer or shipment of hazardous materials.

TUMF Transportation Uniform Mitigation Fee – Ordinance enacted by the Riverside County Board of Supervisors and cities to impose a fee on new development to fund related transportation improvements.

TZEV Transitional Zero Emissions Vehicles – Terminology used by the Air Resources Board (ARB) to refer to Plug-in Hybrid Electric Vehicles, since these vehicles produce emissions when they are powered by the internal combustion engine.

Union Station Los Angeles Union Station is the main railway station in Los Angeles.

UPT Unlinked Passenger Trips – The number of passengers who board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

UP Union Pacific Railroad.

Urban Areas Urban Areas in the SCAG region represent densely developed territory, and encompass residential, commercial and other non-residential urban land uses where population is concentrated over 2,500 people in a given locale.

Urban Growth Boundary A regional boundary that seeks to contain outward urban expansion by limiting development outside of the boundary, while focusing new growth within the boundary. Urban growth boundaries lead to the preservation of natural and agricultural lands, redevelopment and infill in existing communities and optimization of existing infrastructure and transportation investments.

U.S. DOT U.S. Department of Transportation – Federal agency responsible for the development of transportation policies and programs that contribute to providing fast, safe, efficient and convenient transportation at the lowest cost consistent with those and other national objectives, including the efficient use and conservation of the resources of the United States. U.S. DOT is comprised of ten operating administrations, including FHWA, FTA, FAA and FRA.

Value Pricing A user fee applied during peak demand periods on congested roadways to improve the reliability and efficiency of the transportation system and provide travelers with greater choices.

VCTC Ventura County Transportation Commission – Agency responsible for planning and funding countywide transportation improvements.

Vehicle Hours of Delay The travel time spent on the highway due to congestion. Delay is estimated as the difference between vehicle hours traveled at a specified free-flow speed and vehicle hours traveled at a congested speed.

VRH Vehicle Revenue Hours – The hours that a public transportation vehicle actually travels while in revenue service. Vehicle revenue hours include layover/recovery time, but exclude deadheading, operator training, vehicle maintenance testing and school bus and charter services.

VRM Vehicle Revenue Miles – The miles that a public transportation vehicle actually travels while in revenue service. Vehicle revenue miles include layover/recovery time, but exclude deadheading, operator training, vehicle maintenance testing and school bus and charter services.

VHDD Vehicle Hours of Daily Delay – Hours of delay attributed to congestion for vehicles each day.

VMT Vehicle Miles Traveled – On highways, a measurement of the total miles traveled by all vehicles in the area for a specified time period. It is calculated by the number of vehicles times the miles traveled in a given area or on a given highway during the time period. In transit, the number of vehicle miles operated on a given route or line or network during a specified time period.

VOC Volatile Organic Compounds – Organic gases emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products and other industrial sources. Ozone, the main component of smog, is formed from the reaction of VOCs and NOx in the presence of heat and sunlight.

ZEV Zero Emissions Vehicles – Vehicles that produce no tailpipe emissions of criteria pollutants. Generally, ZEVs feature electric powertrains. Technically, ZEVs are still responsible for some greenhouse gas (GHG) emissions, as the GHG content from the electricity generation must be accounted for.

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South Coast AQMD Air Quality Significance Thresholds

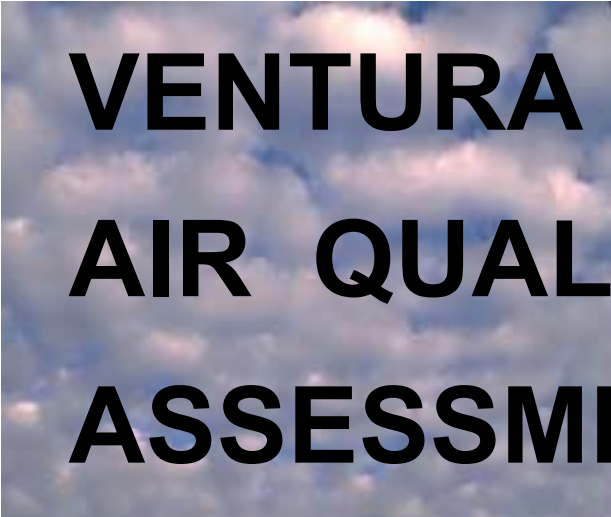
Mass Daily Thresholds ^a		
Pollutant	Construction	Operation
NO _x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM ₁₀	150 lbs/day	150 lbs/day
PM _{2.5}	55 lbs/day	55 lbs/day
SO _x	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to South Coast AQMD Rule 402	
GHG	10,000 MT/yr CO ₂ eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants ^b		
NO ₂ 1-hour average annual arithmetic mean	South Coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM ₁₀ 24-hour average annual average	10.4 µg/m ³ (construction) ^c & 2.5 µg/m ³ (operation) 1.0 µg/m ³	
PM _{2.5} 24-hour average	10.4 µg/m ³ (construction) ^c & 2.5 µg/m ³ (operation)	
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99 th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 µg/m ³ (state)	
CO 1-hour average 8-hour average	South Coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day Average Rolling 3-month average	1.5 µg/m ³ (state) 0.15 µg/m ³ (federal)	

^a Source: South Coast AQMD CEQA Handbook (South Coast AQMD, 1993)

^b Ambient air quality thresholds for criteria pollutants based on South Coast AQMD Rule 1303, Table A-2 unless otherwise stated.

^c Ambient air quality threshold based on South Coast AQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million µg/m³ = microgram per cubic meter ≥ = greater than or equal to
 MT/yr CO₂eq = metric tons per year of CO₂ equivalents > = greater than



VENTURA COUNTY
AIR QUALITY
ASSESSMENT
GUIDELINES

October 2003



Ventura County
Air Pollution
Control District

VENTURA COUNTY AIR QUALITY ASSESSMENT GUIDELINES

Adopted by the Ventura County

Air Pollution Control Board

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VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT

Mission Statement

To protect public health and agriculture from the adverse effects of air pollution by identifying air pollution problems and developing a comprehensive program to achieve and maintain state and federal air quality standards.

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1. INTRODUCTION

1.1 INTRODUCTION

The California Environmental Quality Act (CEQA) requires evaluation of the environmental impacts, including air quality impacts, of proposed projects. CEQA applies to all discretionary activities proposed or approved by California public agencies, unless an exemption applies. The *Ventura County Air Quality Assessment Guidelines* (Guidelines) is an advisory document that provides lead agencies, consultants, and project applicants with a framework and uniform methods for preparing air quality evaluations for environmental documents.

The Guidelines recommend specific criteria and threshold levels for determining whether a proposed project may have a significant adverse air quality impact. The Guidelines also provide mitigation measures that may be useful for mitigating the air quality impacts of proposed projects. It should be noted, however, that these are guidelines only, and their use is not required or mandated by the Ventura County Air Pollution Control District (APCD or District). The final decision of whether to use these Guidelines rests with the lead agency responsible for approving the project.

The Guidelines are available for purchase from the District by calling 805/645-1433, or they can be downloaded free of charge from the District website at <http://www.vcapcd.org/pubs.htm>. This document is divided into eight chapters:

- Chapter 1: Introduction
- Chapter 2: Environmental Setting
- Chapter 3: Air Quality Significance Thresholds
- Chapter 4: Air Quality Management Plan Consistency
- Chapter 5: Estimating Ozone Precursor Emissions
- Chapter 6: Assessing Project-Specific, Localized, Non-Ozone Impacts
- Chapter 7: Mitigation Measures
- Chapter 8: General Conformity

The Guidelines are not applicable to equipment or operations required to have Ventura County APCD permits (Authority to Construct or Permit to Operate). APCD permits are generally required for stationary and portable (non-vehicular) equipment or operations that may emit air pollutants. This permit system is separate from CEQA and involves reviewing equipment design, followed by inspections, to ensure that the equipment will be built and operated in compliance with APCD regulations. The District has a two-step permit processing system. An Authority to Construct must be obtained before initiating construction or installation of the equipment or operations subject to APCD permit requirements. The second step of the process requires the applicant to apply for a Permit

to Operate upon completion of construction or installation authorized by an Authority to Construct.

Moreover, the emissions from equipment or operations requiring APCD permits are not counted towards the air quality significance thresholds. This is for two reasons. First, such equipment or processes are subject to the District's New Source Review permit system, which is designed to produce a net air quality improvement. Second, facilities are required to mitigate emissions from equipment or processes subject to APCD permit by using emission offsets and by installing Best Available Control Technology (BACT) on the process or equipment.

To determine whether or not the proposed equipment or operation requires an APCD Permit, contact the APCD Engineering Division at 805/645-1401. Table 1-1 lists examples of equipment and operations that may require an APCD permit pursuant to the APCD Rules and Regulations. See Appendix B, Common Equipment and Processes Requiring a Ventura County APCD Permit To Operate, for more a more detailed list of processes and equipment that require an APCD Permit to Operate.

The District assists project applicants and lead agencies with preparation of environmental documents by providing air quality data and other needed information. The District also reviews and comments on air quality sections of environmental documents and prepares air quality sections of environmental documents for agencies upon request.

The District may be involved in the CEQA process in several ways, as described below:

Lead Agency - The District acts as a lead agency when it has the primary authority to implement or approve a discretionary project. This typically occurs when air pollution rules and air quality plans are developed.

Responsible Agency - The District acts as a responsible agency when it has discretionary approval authority over an aspect of a project, but does not have the primary discretionary authority of a lead agency. As a responsible agency, the District may coordinate the environmental review process with the District's permitting process.

Commenting Agency - The APCD acts as a commenting agency for projects that have the potential to impact air quality and for which it is not a lead agency or a responsible agency. To this end, the APCD regularly reviews and provides comments on environmental documents prepared by lead agencies.

**TABLE 1-1
EXAMPLES OF EQUIPMENT AND OPERATIONS
THAT MAY REQUIRE AN APCD PERMIT**

Combustion Equipment

- Boilers and process heaters
- Engines 50 HP or greater
- Gas turbines
- Incinerators

Equipment That Emit Dust or Other Particulate Matter

- Concrete batch plants
- Asphalt concrete plants
- Rock, sand, and aggregate plants
- Abrasive blasting operations

Equipment and Processes That Emit Solvents or Other Reactive Organic Compounds (ROC)

- Dry-cleaning machines
- Gasoline tanks and dispensing facilities
- Contaminated soil or groundwater remediation systems
- General painting and coating operations

Equipment and Processes That Emit Air Toxics or May Cause a Nuisance

- Chrome plating operations
- Operations such as spa, bathtub, or counter-top manufacturing that use polyester resins
- Wood stripping operations that use methylene chloride
- Agricultural produce fumigation chambers that use organic gases

The District is available for consultation at any time during the project review and approval process. At certain times, consultation is required by CEQA. When the District has discretionary approval authority over an aspect of a project for which another public agency is serving as lead agency, the District should be consulted as a responsible agency. Moreover, CEQA requires and provides opportunities for District review before the preparation of the environmental document and during public review of the completed environmental document.

The District encourages local jurisdictions to address air quality issues as early as possible in the project review process. Local jurisdictions should work with project applicants on issues such as potential land use conflicts and site design to encourage transportation alternatives to the automobile. Resolving land use and site design issues while a proposal is at the conceptual stage maximizes opportunities to incorporate measures to minimize a project's air quality impacts. By the time a project gets to the CEQA process, it may be more costly and time-consuming to redesign the project to

incorporate air quality mitigation measures. Therefore, features benefiting air quality should be incorporated into a project before significant resources have been expended designing the project.

In Ventura County, motor vehicles are the largest category of air pollutant emissions. Land use decisions are critical to air quality planning because land use patterns influence transportation usage. The District encourages site planning that incorporates land use design features that benefit air quality. Project applicants and consultants should consider land use design issues during project design to:

- Encourage the development of higher density housing and employment centers near public transit corridors.
- Encourage compact development featuring a mix of uses that locates residences near jobs and services.
- Provide services such as food sales, banks, post offices, and other personal services within office parks and other large developments.
- Encourage infill development.
- Ensure that the design of streets, sidewalks, and bike paths within a development encourages walking and biking.
- Orient building entrances toward sidewalks and transit stops.
- Provide landscaping to reduce energy demand for cooling.
- Orient buildings to minimize energy required for heating and cooling.

1.2 BACKGROUND

Air pollution is hazardous to human health. It also diminishes the yield and quality of many agricultural crops, reduces atmospheric visibility, degrades soils and materials, and damages native vegetation. State and national ambient air quality standards are established to protect public health and welfare, and minimize the effects mentioned above. These standards pertain to pollutants in ambient air, the air that people breathe outside of buildings as they go about their daily activities.

The federal government has established National Ambient Air Quality Standards (NAAQS) to protect public health (primary standards); and welfare, such as property and agriculture (secondary standards). California has separate, more stringent standards. There are state and national standards for ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM), and lead (Pb). In addition, California has standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-

reducing particles. Table 2-1, “Ambient Air Quality Standards,” presents federal and state ambient air quality standards. Regions throughout the state and country are classified as being either attainment or nonattainment areas, depending on the number of times an air quality standard has been exceeded.

The air pollutants of most concern in Ventura County are ozone and particulate matter. Ventura County is an attainment area for all standards presented in Table 2-1, “Ambient Air Quality Standards,” except the following:

Ozone	1 Hour	State and Federal: Nonattainment
	8 Hour	Federal: Not designated*
PM₁₀	24 Hour	State: Nonattainment**
	Annual Average	State: Nonattainment**
PM_{2.5}	24 Hour	Federal: Not designated
	Annual Average	State and Federal: Not designated

* The California Air Resources Board (ARB) has recommended to the United States Environmental Protection Agency (U.S. EPA) a designation of nonattainment for Ventura County.

** The ARB has designated Ventura County a nonattainment area based upon the state 24 hour and annual average PM₁₀ standards

Check the District website at <http://www.vcapcd.org> for the most current attainment status.

Ozone, the primary ingredient of smog, is formed in the atmosphere through complex chemical reactions involving VOC, nitrogen oxides (NO_x), and ultraviolet energy from the sun.

Particulate matter is comprised of very small solids or liquids, such as dust, soot, aerosols, fumes, and mists. The particles of primary concern are those with an aerodynamic diameter of 10 microns or smaller (PM₁₀). From a health perspective, the most damaging component of PM₁₀ is the fine particle fraction 2.5 microns or smaller (PM_{2.5}). These particles have the greatest likelihood of being inhaled deeply and remaining in the lungs.

The federal Clean Air Act Amendments of 1990 (CAAA) require that states achieve the NAAQS by specified dates, based on the severity of an area’s air quality problem. Ventura County is designated a severe ozone nonattainment area, and as such, is required by the CAAA to attain the federal one-hour ozone standard by November 15, 2005 (see Section 1.3.2, “Federal Clean Air Act”). Ventura County has made significant progress toward attainment of the federal one-hour ozone standard. For years 2000 - 2002, Ventura County averaged only one ozone exceedance day per year, technically meeting

the federal standard. Ventura County is still officially designated a nonattainment area for the federal standard, however. Ventura County has not been designated for the federal eight-hour ozone standard.

As of April 2003, air quality data indicate that Ventura County is in compliance with the federal annual PM_{2.5} standard; official designation has not yet taken place.

Ventura County must also comply with the requirements of the California Clean Air Act (CCAA). The CCAA became effective January 1, 1989, and requires that all areas of California attain and maintain the State Ambient Air Quality Standards by the earliest practicable date (see Section 1.3.3, "California Clean Air Act"). Ventura County frequently exceeds the state ozone standard and is designated a severe ozone nonattainment area. The state ozone standard is more stringent than the federal one-hour ozone standard, and will be more difficult to attain.

PM₁₀ concentrations in Ventura County exceed the state 24-hour air quality standard. Ventura County has not yet been classified for the state new PM₁₀ or PM_{2.5} annual average standards.

1.3 REGULATORY SETTING

1.3.1 California Environmental Quality Act

CEQA (Public Resources Code (PRC) §§21000 - 21177) was enacted by the State Legislature in 1970. The purpose of CEQA is to help ensure that governmental decision-makers and the public are fully informed of potential significant environmental effects of proposed projects and activities. CEQA also requires that environmental impacts be avoided or reduced where feasible. Project alternatives must be considered that accomplish the project purpose if the project is found to have significant impacts. Mitigation measures are employed when no feasible alternative can be identified. Any feasible mitigation measure that reduces the severity of a significant impact to insignificance must be implemented. When there are no feasible, viable alternatives, and there are no feasible mitigation measures available to reduce the project's impact, a statement of overriding considerations can be adopted. This enables a public agency to approve a project despite significant environmental effects. However, a public agency that approves a project with significant impacts after all feasible mitigation measures have been applied, must disclose to the public its reasons for approving the project despite the significant impacts.

CEQA applies to activities directly undertaken by governmental agencies, activities financed in whole or in part by governmental agencies, and private activities that require approval from governmental agencies. There are several basic steps in the CEQA process. First, an agency determines whether a project is subject to CEQA or exempt from CEQA analysis. Second, if the project is subject to CEQA, the agency prepares an

Initial Study to determine whether the project may have a significant effect on the environment. If there is no substantial evidence that the project may have a significant effect, the agency prepares a Negative Declaration (ND). If the project can be modified to avoid or reduce the significant effect to a level of less than significant (and there is no substantial evidence that the project as revised may have a significant effect), the agency prepares a Mitigated Negative Declaration (MND). If the Initial Study shows that the project may have a significant effect, and the effects cannot be reduced to a less than significant level with an MND, the agency prepares an Environmental Impact Report (EIR).

An EIR is a detailed report that analyzes the environmental effects of a project, identifies potential measures to mitigate identified significant adverse environmental effects, and potential project alternatives. If mitigation measures or alternatives are not available or are infeasible, a project may still be approved if the lead agency makes certain formal findings.

The California Resources Agency adopts procedures, known as the “CEQA Guidelines” (California Code of Regulations (CCR) §§15000 - 15387), that provide detailed steps that lead agencies must follow to implement CEQA. Sections of CEQA and the CEQA Guidelines that are relevant for the preparation of air quality analyses are presented in Appendix C, Sections of CEQA and the CEQA Guidelines Relevant to Air Quality Impact Analysis.

1.3.2 Federal Clean Air Act

The first comprehensive national air pollution legislation was the federal Clean Air Act of 1970. In 1977, the federal Clean Air Act was amended to require plans for meeting the national health-based standards “as expeditiously as practicable,” but no later than December 31, 1982. However, the Clean Air Act permitted the U.S. EPA to extend the attainment date of some ozone and carbon monoxide nonattainment areas.

In 1990, the federal Clean Air Act was significantly amended. Under the CAAA, areas that do not meet the federal one-hour ozone standard are classified according to the severity of each area’s respective ozone problem. The classifications are Marginal, Moderate, Serious, Severe, and Extreme. Marginal areas are closest to meeting the federal one-hour ozone standard. Extreme areas have the worst air quality problems. Areas with more severe ozone problems have progressively more stringent requirements to meet under the federal Clean Air Act. An area’s classification determines how long the area has to attain the federal ozone standard. Marginal areas had three years; Moderate areas - six years; Serious areas - nine years; Severe areas - either 15 or 17 years, depending on the magnitude of their ozone problem; and, Extreme areas - 20 years. The South Coast Air Basin is the only area in the country designated as Extreme. Ventura County is a Severe area for ozone and must attain the federal one-hour ozone standard by 2005.

The CAAA contain a number of requirements designed to improve air quality. These include motor vehicle emission limits, pollution controls on industrial facilities, use of low-polluting vehicle fuels, permit and compliance programs, and economic incentives to encourage industries to voluntarily curtail emissions.

In July 1997, the U.S. EPA approved new federal standards for PM_{2.5}, and modified the PM₁₀ and ozone standards. The new federal standards are presented in Table 2-1, “Ambient Air Quality Standards.”

1.3.3 California Clean Air Act

The CCAA was enacted on September 30, 1988, and became effective January 1, 1989. The purpose of the CCAA is to achieve the more stringent health-based state clean air standards at the earliest practicable date.

The state standards are more stringent than the federal air quality standards. Similar to the federal Clean Air Act, the CCAA also classifies areas according to pollution levels. Under the CCAA, Ventura County is a severe ozone nonattainment area, and is a state PM₁₀ nonattainment area. The CCAA requires that the standards be attained at the earliest practicable date. Further, districtwide air emissions must be reduced at least five percent per year (averaged over three years) for each nonattainment pollutant or its precursors. A district may achieve a smaller average reduction if the district can demonstrate that, despite inclusion of every feasible measure in its air quality plan, it is unable to achieve the five percent annual reduction in emissions.

On June 20, 2002, the ARB approved revisions to the PM₁₀ annual average standard, and established an annual average standard for PM_{2.5}. These standards are presented in Table 2-1, “Ambient Air Quality Standards.”

1.3.4 Ventura County Air Quality Management Plan

The 1991 Air Quality Management Plan (AQMP) was prepared in response to the CCAA. The 1991 Plan elaborated on information contained in the 1982 and 1987 AQMPs. It also included new and modified control measures designed to move the county further toward achieving state clean air standards.

The 1994 AQMP was prepared to satisfy the planning requirements of the CAAA and to outline a strategy for meeting the federal one-hour ozone clean air standard while accommodating anticipated growth. The Plan indicated that Ventura County would attain the federal one-hour air quality standard for ozone by 2005.

The District prepared a revision to the 1994 AQMP in 1995. This revision updated information that had changed since the 1994 AQMP, including minor adjustments to the 1990 baseline emission inventory, actions taken by the ARB to approve additional control strategies, changes to the photochemical modeling, and several other changes. The 1995

Plan Revision indicated that Ventura County would attain the federal one-hour ozone standard by 2005. It focused on ways to reduce ozone levels, and did not address PM₁₀, since Ventura County is an attainment area for the federal PM₁₀ standard. The U.S. EPA approved the 1994 AQMP and 1995 AQMP Revision on February 7, 1997.

The District prepared a 1997 AQMP Revision to update the proposed adoption and implementation dates for nine control measures that were included in the 1995 Plan Revision. The U.S. EPA approved the 1997 AQMP Revision on April 21, 1998.

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2. ENVIRONMENTAL SETTING

2.1 INTRODUCTION

Section 15125 of the California Environmental Quality Act (CEQA) Guidelines states that “an environmental impact report (EIR) must include a description of the environment in the vicinity of the project, as it exists before the commencement of the project, from both a local and regional perspective.” This chapter of the *Ventura County Air Quality Assessment Guidelines* (Guidelines) can be used as the basis for the air quality setting section of environmental documents. It also provides a description of the environmental factors that affect regional and local air pollutants.

The information in the air quality setting section of an EIR should include a discussion of the existing levels of air pollutants at the proposed project site and significant sources of air emissions, both stationary and mobile, at the site.

2.2 AIR QUALITY SETTING

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB) have established ambient air quality standards to protect the health and welfare of the general public. Regions throughout the state and country are classified as being either attainment or nonattainment for specific criteria pollutants, depending on the number of times an air quality standard is exceeded. Table 2-1, “Ambient Air Quality Standards,” shows federal and state air quality standards for criteria pollutants.

Ventura County is located in the South Central Coast Air Basin (comprised of Ventura County, Santa Barbara County, and San Luis Obispo County, see Figure 2-1, “Ventura County Air Pollution Control District Boundaries”).

Ventura County is a severe nonattainment area for the federal and state one-hour ozone standards, and has been recommended by the ARB as a nonattainment area for the federal eight-hour ozone standard. Table 2-2, “Number of Days Exceeding the Federal and State Ambient Air Quality Standards for Ozone,” shows the number of days exceeding the federal and state ozone standards from 1990 to 2002. Table 2-3, “Maximum Ozone Concentrations - Ventura County,” shows the maximum one-hour ozone concentrations in Ventura County during this same period. Ozone concentrations have declined steadily at most air monitoring stations, as have the number of exceedances, since 1980. These air quality improvements have occurred despite a growing population. Between 1980 and 2002, Ventura County’s population increased by 253,500, a 47.6 percent increase. Although ozone levels have declined significantly in recent years, the county still experiences frequent violations of the state ozone standard. Inland areas of the county (Simi Valley, Thousand Oaks, and Piru) exceed the ozone standard more frequently than the coastal areas.

**TABLE 2-1
AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	California Standards ¹	National Standards ²	
		Concentration ³	Primary ^{3,4}	Secondary ^{3,5}
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235 µg/m ³) ⁶	Same as Primary Standard
	8 Hour	-----	0.08 ppm (157 µg/m ³) ⁶	
Fine Particulate Matter (PM _{2.5})	24 Hour	No Separate State Standard	65 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m ³ *	15 µg/m ³	
Respirable Particulate Matter (PM ₁₀)	24 Hour	50 µg/m ³	150 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m ³ *	50 µg/m ³	
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	None
	1 Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	-----	0.053 ppm (100 µg/m ³)	Same as Primary Standard
	1 Hour	0.25 ppm (470 µg/m ³)	-----	
Lead	30 Day Average	1.5 µg/m ³	-----	-----
	Calendar Quarter	-----	1.5 µg/m ³	Same as Primary Standard
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	-----	0.030 ppm (80 µg/m ³)	-----
	24 Hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)	-----
	3 Hour	-----	-----	0.5 ppm (1300 µg/m ³)
	1 Hour	0.25 ppm (655 µg/m ³)	-----	-----
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 – 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.	No National Standards	
Sulfates	24 Hour	25 µg/m ³		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)		

* On June 20, 2002, the Air Resources Board approved staff's recommendation to revise the PM₁₀ annual average standard to 20 µg/m³ and to establish an annual average standard for PM_{2.5} of 12 µg/m³. These standards took effect on July 5, 2003. Information regarding these revisions can be found at <http://www.arb.ca.gov/research/aaqs/std-rs/std-rs.htm>.

- California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter PM₁₀, PM_{2.5}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly concentrations over the standard is equal or less than one. The 8-hour ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current national policies.
- Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect public health.
- National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- New national 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997. Contact U.S. EPA for further clarification and current national policies.

FIGURE 2-1
VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT BOUNDARIES



**TABLE 2-2
NUMBER OF DAYS EXCEEDING THE FEDERAL AND STATE
AMBIENT AIR QUALITY STANDARDS FOR OZONE
(1-hour standard*)**

Location	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
El Rio	0/9**	0/12	3/17	1/8	0/7	0/7	0/8	0/2	0/1	0/1	0/0	0/0	0/0
Ventura	0/5	2/12	0/4	2/5	0/3	0/4	1/10	0/2	0/0	0/0	0/0	0/0	0/0
Simi Valley	14/86	32/97	6/58	8/40	15/80	22/85	13/73	2/47	4/37	2/31	1/31	2/32	0/14
Piru	4/46	4/44	0/15	0/4	2/19	1/20	0/17	0/6	1/4	0/3	0/3	0/16	0/10
Ojai	2/27	4/30	4/33	1/23	2/17	2/27	2/38	0/10	0/13	0/7	0/15	1/17	1/15
Thousand Oaks	3/27	0/20	2/31	4/22	2/28	1/28	5/26	0/20	1/13	0/9	0/6	0/4	0/3
Countywide	18/99	33/106	10/69	13/58	17/88	23/90	17/80	2/59	5/41	2/33	1/37	2/34	1/23

*Federal 1-hour standard: >0.12 parts per million; State 1-hour standard: >0.09 parts per million.

**Number of days exceeding national standard/number of days exceeding state standard.

Source: Ventura County Air Pollution Control District (APCD), February 2003.

**TABLE 2-3
MAXIMUM OZONE CONCENTRATIONS - VENTURA COUNTY
(hourly average - parts per million)**

Location	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
El Rio	0.12	0.12	0.14*	0.14	0.12	0.12	0.12	0.10	0.11	0.10	0.08	0.09	0.09
Ventura	0.11	0.13	0.11*	0.14	0.10	0.12	0.13	0.11	0.09	0.09	0.08	0.09	0.08
Simi Valley	0.16	0.17	0.14	0.15	0.16	0.17	0.16	0.13	0.17	0.13	0.13	0.13	0.12
Piru	0.14	0.15	0.12	0.11	0.14	0.13	0.12	0.11	0.13	0.10	0.10	0.12	0.12
Ojai	0.14	0.17	0.15	0.14	0.13	0.14	0.14	0.11	0.11	0.11	0.11	0.13	0.13
Thousand Oaks	0.17	0.12	0.13*	0.13	0.14	0.15	0.14	0.12	0.13	0.11	0.10	0.12	0.12

*Does not meet representative criteria.

Source: Ventura County APCD, February 2003.

Ventura County also is a nonattainment area for the state standard for PM₁₀ (particulate matter with an aerodynamic diameter of 10 microns or smaller). Table 2-4, “Number of Days Exceeding the State Ambient Air Quality Standards for PM₁₀,” shows the number of violations of the state PM₁₀ standard from 1990 to 2002.

Ambient levels of other pollutants in Ventura County do not violate state or federal standards.

TABLE 2-4
NUMBER OF DAYS EXCEEDING THE STATE AMBIENT
AIR QUALITY STANDARDS FOR PM₁₀
 (24-hour standard*)

Location	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
El Rio	10	4	5	4	2	3	1	3	1	1	1	2	2
Ventura	4	4	2	1	1	2	0	**	**	**	**	**	**
Simi Valley	11	16	7	4	4	8	2	4	0	6	3	4	3
Piru	8	11	5	5	2	4	5	8	1	2	3	1	1
Ojai	7	7	1	1	1	0	0	0	2	2	0	0	0
Thousand Oaks	**	**	3	2	4	4	1	3	0	5	6	1	0
Countywide	20	24	10	10	8	9	7	13	3	10	9	5	6

*Greater than 50 micrograms per cubic meter.

**No monitor at location.

Source: Ventura County APCD, February 2003.

2.3 METEOROLOGICAL FACTORS AFFECTING AIR QUALITY

The air above Ventura County often exhibits weak vertical and horizontal dispersion characteristics, which limit the dispersion of emissions and cause increased ambient air pollutant levels. Persistent temperature inversions prevent vertical dispersion. The inversions act as a “ceiling” that prevents pollutants from rising and dispersing. Mountain ranges act as “walls” that inhibit horizontal dispersion of air pollutants.

The diurnal land/sea breeze pattern common in Ventura County recirculates air contaminants. Air pollutants are pushed toward the ocean during the early morning by the land breeze, and toward the east during the afternoon, by the sea breeze. This creates a “sloshing” effect, causing pollutants to remain in the area for several days. Residual emissions from previous days accumulate and chemically react with new emissions in the presence of sunlight, thereby increasing ambient air pollutant levels.

This pollutant “sloshing” effect happens most predominantly from May through October (“smog” season). Air temperatures are usually higher and sunlight more intense during the “smog” season. This explains why Ventura County experiences the most exceedances of the state and federal ozone standards during this six-month period.

2.4 EFFECTS OF AIR POLLUTION

2.4.1 Health Effects

Ambient air pollution is a major public health concern. The most well-known acute air pollution episodes occurred in the Meuse Valley, Belgium in 1930 (60 deaths); in Donora, Pennsylvania in 1948 (20 deaths); and London, England in 1952 (4,000 deaths). Although acute air pollution episodes with such readily evident excess deaths are now unlikely in the United States, air pollution continues to be linked to respiratory illness and a slight increase in death rates.

According to the ARB, 80,000 deaths that occur each year in California may be attributed to illnesses aggravated by air pollution. While air pollution affects everyone, some people are more susceptible to its effects than others. Research has established that air pollution:

- Aggravates heart and lung illnesses.
- Adds stress to the cardiovascular system, forcing the heart and lungs to work harder to provide oxygen to the body.
- Speeds the aging process of the lungs, accelerating the loss of lung capacity.
- Damages respiratory system cells even after symptoms of minor irritation disappear.
- May cause immunological changes.
- Causes lung inflammation.
- Increases health care utilization (hospitalization, physician, and emergency room visits).
- May contribute to the development of diseases such as asthma, bronchitis, emphysema, and cancer.
- May cause a reduction in life span.

The federal government estimates that between 10 and 12 percent of United States total health costs are attributable to air pollution-related illnesses. Air pollution is thought to be responsible for a two percent loss in United States worker efficiency. If ozone pollution were reduced in urban areas, there would be approximately 49.9 million fewer cases of air pollution-related illnesses annually in the United States; asthma attacks alone would decrease by 1.9 million annually.

On a per-capita basis, the health benefits measured in dollars from reducing ozone concentrations to federal and state one-hour standards are estimated to be \$196 and \$214 each year, respectively, for every person living in the South Coast Air Basin (the greater Los Angeles area). Per capita annual health benefits associated with meeting federal and state particulate standards are estimated to be \$575 and \$972, respectively. Assuming the per capita savings in the South Coast Air Basin are applicable to Ventura County, the projected health cost savings for achieving the PM₁₀ standard in Ventura County is estimated to be \$45 to \$69 million per year. According to the U.S. EPA, for every dollar spent on air pollution controls since 1970, \$45 has been gained in health and environmental benefits.

2.4.2 Effects on Plants

2.4.2.1 Damage to Agriculture

Increased health costs are only one portion of the total economic effects that result from air pollution. Many of the major agricultural crops grown in California, including Ventura County, are significantly damaged by air pollution, with from 20 to 50 percent of losses in some crop yields. Studies on the effects of smog exposure on fruit trees (specifically orange trees, ornamental plants, and home garden plants) have shown reductions in fruit yield and visible plant damage resulting from smog. One study showed that productivity of Valencia orange trees can be reduced by 30 percent when exposed to ozone levels that frequently occur in Southern California. Another study showed that naval orange trees produced about 50 percent more fruit when protected from smog. In addition, trees protected from smog dropped fewer leaves. The statewide average yield loss for citrus due to air pollution was about 11 percent in 1988.

Smog and particulates interfere with photosynthesis and can injure leaves, reduce growth, reduce crop quality, reduce reproductive capacity, increase weed and pest infestation, and/or kill the plant, thereby reducing crop yield. Damage often occurs before visible symptoms of injury are noticed. Particulates also can interfere with beneficial biological pest control by preventing beneficial insects from preying on agricultural crop-eating pests.

Areas in California where plant damage from air pollution has been reported coincides with the areas of highest population density. These areas include a triangular zone extending from the Mexican border to approximately 80 miles north and eastward of Ventura. Some of the greatest plant damage from air pollution is seen on fruit and vegetable crops, and flowers.

According to a 1987 study by the ARB, a number of important statewide crops suffer substantial yield losses due to ozone. Air pollution has been estimated to cost the agricultural industry in California between \$150 million and \$1 billion a year. An economic analysis of the costs of air pollution to agriculture attributes 90 percent of direct

crop losses from air pollution to ozone. Nationally, ozone is estimated to account for a five to ten percent loss in agricultural production. The cost of this loss from ozone is about \$5 billion each year. The greatest agricultural losses due to air pollution are in those crops in which the foliage is the marketed portion of the plant, such as lettuces, alfalfa, and spinach. Beans are no longer commercially grown in Southern California because of their susceptibility to air pollution.

Damage to agricultural crops from air pollution is an economic concern in Ventura County. According to the ARB, several agricultural crops grown in Ventura County suffer from exposure to air pollution. One study concluded that ozone exposure in Ventura County caused a reduction in orange crop yield of 19 percent in 1991. For that same year, lemon crops suffered an eight percent yield reduction, sweet corn seven percent, and dry beans 19 percent yield reductions, respectively.

2.4.2.2 Damage to Natural Vegetation

Air pollution is known to harm all major native plant groups, including flowering plants, conifers, ferns, mosses, lichens, and fungi. The effects on native vegetation are similar to those of agricultural crops. In the Geysers region of Napa, Lake, and Sonoma counties, injury to native plants, such as oaks and maples, has taken place downwind of geothermal power plants. Trees and other plant life in the San Joaquin Valley and adjacent Sierra Nevada Mountains suffer from air pollution generated in the upwind urban areas. Ozone damage has been observed in the forests of Southern California and in the Sierra Nevada mountains. Certain species of oak and pine trees are sensitive to air pollution.

Studies on Ponderosa and Jeffrey Pines trees in the 1980s revealed that two out of every five Ponderosa and Jeffrey Pine trees exhibited needle damage from air pollution. The National Park Service has measured an eleven percent reduction in the growth rate of selected Jeffrey Pine trees since 1965. Pine needles exposed to ozone develop yellow, blotchy marks and needles older than two years fall off, giving branches a whiskbroom appearance. Needles and debris from trees killed by smog not only increase the risk of forest fire, but reduce seed germination and the chances of seedling survival.

Coastal sage scrub and chaparral also are sensitive to air pollutants. The most important effect is a reduced ability to cope with drought, disease, and insects. Air pollution may put these plants at a reproductive disadvantage by causing them to produce fewer seeds. These conditions can lead to changes in succession, resulting in a totally different plant community occupying a site.

Total yield and quality of forage and range are all affected by air pollution. This presents serious consequences for the state's livestock industry. Compared to grasses grown in clean air, loss in yield of grasses grown in smoggy air is as high as 10 to 20 percent. Moreover, ozone reduces carbohydrate levels of grasses by up to 56 percent.

2.4.3 Damage to Materials

In addition to human health and vegetation, air pollution also damages materials such as plastics, rubber, paint, and metals. Damage includes erosion and discoloration of paint, cracking of rubber, corrosion of metals and electrical components, soiling and decay of building stone and concrete, fading, a reduction of tensile strengths of fabrics, and soiling and crumbling of nonmetallic building materials. High smog concentrations significantly shorten the lifespan of materials, which increases maintenance and replacement costs. The national cost of damage to materials caused by ozone is estimated to range from \$1.5 to \$3.9 billion every year.

2.5 CRITERIA AIR POLLUTANTS

A criteria air pollutant is any air pollutant for which ambient air quality standards have been set by the U.S. EPA or the ARB. Criteria pollutants include ozone (O₃), fine particulate matter (PM_{2.5}), respirable particulate matter (PM₁₀), carbon monoxide (CO), nitrogen dioxide (NO₂), lead (Pb), sulfur dioxide (SO₂), visibility-reducing particles, sulfates, and hydrogen sulfide. The sections below provide more detail about the criteria pollutants of concern in Ventura County.

2.5.1 Ozone

Ozone is formed in the atmosphere by a series of complex chemical reactions and transformations in the presence of sunlight. Oxides of nitrogen (NO_x) and reactive organic compounds (ROC) are the principal constituents in these reactions. Ozone is a pungent, colorless, toxic gas and is the major air pollutant of concern in Ventura County.

Sources: Ozone is known as a secondary pollutant because it is formed in the atmosphere through a complex series of chemical reactions, rather than emitted directly into the air. The major sources of NO_x in Ventura County are motor vehicles and other combustion processes. The major sources of ROC in Ventura County are motor vehicles, cleaning and coating operations, petroleum production and marketing operations, and solvent evaporation.

Effects: Ozone is a strong irritating gas that can chemically burn and cause narrowing of airways, forcing the lungs and heart to work harder to provide oxygen to the body. A powerful oxidant, ozone is capable of destroying organic matter – including human lung and airway tissue; it essentially burns through cell walls. Ozone damages cells in the lungs, making the passages inflamed and swollen. Ozone also causes shortness of breath, nasal congestion, coughing, eye irritation, sore throat, headache, chest discomfort, breathing pain, throat dryness, wheezing, fatigue, and nausea. It can damage alveoli, the individual air sacs in the lungs where oxygen and carbon dioxide are exchanged. Ozone has been associated with a decrease in resistance to infections. People most likely to be affected by ozone include the elderly, the young, and athletes. Ozone may pose its worst

health threat to people who already suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis.

2.5.2 Particulate Matter 10 Microns or Smaller in Diameter (PM₁₀)

PM₁₀ consists of particulate matter (fine dusts and aerosols) ten microns or smaller in aerodynamic diameter. Ten microns is about one-seventh the width of a human hair. When inhaled, particles larger than ten microns generally are caught in the nose and throat and do not enter the lungs. PM₁₀ gets into the large upper branches of the lungs just below the throat, where they are caught and removed (by coughing, spitting, or swallowing).

Sources: The primary sources of PM₁₀ include: dust, paved and unpaved roads, diesel exhaust, acidic aerosols, construction and demolition operations, soil and wind erosion, agricultural operations, residential wood combustion, and smoke. Secondary sources of PM₁₀ include tailpipe emissions and industrial sources. These sources have different constituents, and therefore, varying effects on health. Road dust is composed of many particles other than soil dust. It also includes engine exhaust, tire rubber, oil, and truck load spills. Diesel exhaust contains many toxic particles and elemental carbon (soot), and is considered a toxic air contaminant in California. Airborne particles absorb and adsorb toxic substances and can be inhaled and lodge in the lungs. Once in the lungs, the toxic substances can be adsorbed into the bloodstream and carried throughout the body.

PM₁₀ concentrations tend to be lower during the winter months because meteorology greatly affects PM₁₀ concentrations. During rain, concentrations are relatively low, and on windy days, PM₁₀ levels can be high. Photochemical aerosols, formed by chemical reactions with manmade emissions, may also influence PM₁₀ concentrations.

Effects: Elevated ambient particulate levels are associated with premature death, an increased number of asthma attacks, reduced lung function, aggravation of bronchitis, respiratory disease, cancer, and other serious health effects.

Short-term exposure to particulates can lead to coughing, minor throat irritation, and a reduction in lung function. Long-term exposure can be more harmful. The U.S. EPA estimates that eight percent of urban non-smoker lung cancer risk is due to PM₁₀ in soot from diesel trucks, buses, and cars. Additional studies by the U.S. EPA and the Harvard School of Public Health estimate that 50,000 to 60,000 deaths per year in the United States are caused by particulates. PM₁₀ particles collect in the upper portion of the respiratory system, affecting the bronchial tubes, nose, and throat. They contribute to aggravation of asthma, premature death, increased number of asthma attacks, bronchitis, reduced lung function, respiratory disease, aggravation of respiratory and cardiovascular disease, alteration of lung tissue and structure, changes in respiratory defense mechanisms, and cancer.

2.5.3 Particulate Matter 2.5 Microns or Smaller in Diameter (PM_{2.5})

PM_{2.5} is a mixture of particulate matter (fine dusts and aerosols) 2.5 microns or smaller in aerodynamic diameter. 2.5 micrometers is approximately 1/30 the size of a human hair; so small that several thousand of them could fit on the period at the end of this sentence. Particles 2.5 microns or smaller get down into the deepest portions of the lungs where gas exchange occurs between the air and the blood stream. These are the most dangerous particles because the deepest portions of the lungs have no efficient mechanisms for removing them. If these particles are soluble in water, they pass directly into the blood stream within minutes. If they are not soluble in water, they are retained deep in the lungs and can remain there permanently.

Sources: PM_{2.5} particles are emitted from activities such as industrial and residential combustion processes, wood burning, and from diesel and gasoline-powered vehicles. They are also formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, ammonia, and volatile organic compounds that are emitted from combustion activities, and then become particles as a result of chemical transformations in the air (secondary particles).

Effects: PM_{2.5} infiltrates the deepest portions of the lungs and remains there longer, increasing the risks of long-term disease, including chronic respiratory disease, cancer, and increased and premature death. Other effects include increased respiratory stress and disease, decreased lung function, alterations in lung tissue and structure, and alterations in respiratory tract defense mechanisms.

2.5.4 Carbon Monoxide

Carbon monoxide is a common colorless, odorless, highly toxic gas. It is produced by natural and anthropogenic combustion processes.

Sources: The major source of CO in urban areas is incomplete combustion of carbon-containing fuels (primarily gasoline, diesel fuel, and natural gas). However, it also results from combustion processes, including forest fires and agricultural burning. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles.

Ambient CO concentrations are generally higher in the winter, usually on cold, clear days and nights with little or no wind. Low wind speeds inhibit horizontal dispersion, and surface inversions inhibit vertical mixing.

Traffic-congested intersections have the potential to result in localized high levels of CO. These localized areas of elevated CO concentrations are termed CO “hotspots.” CO hotspots are defined as locations where ambient CO concentrations exceed the State Ambient Air Quality Standards (20 ppm, 1-hour; 9 ppm, 8-hour).

Effects: When inhaled, CO does not directly harm the lungs. The impact from CO is on oxygenation of the entire body. CO combines chemically with hemoglobin, the oxygen-transporting component of blood. This diminishes the ability of blood to carry oxygen to the brain, heart, and other vital organs. Red blood cells have 220 times the attraction for CO than for oxygen. This affinity interferes with movement of oxygen to the body's tissues. Effects from CO exposure include headaches, nausea, and death. People with heart ailments are at risk from low-level exposure to CO. Also sensitive are people with chronic respiratory disease, the elderly, infants and fetuses, and people suffering from anemia and other conditions that affect the oxygen-carrying capacity of blood. High levels of CO in a concentrated area can result in asphyxiation. Studies show a synergistic effect when CO and ozone are combined.

2.5.5 Nitrogen Dioxide

Nitrogen dioxide is formed in the atmosphere primarily by the rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. It is a reddish brown gas with an odor similar to that of bleach. NO₂ participates in the photochemical reactions that result in ozone.

Sources: The greatest source of NO, and subsequently NO₂, is the high-temperature combustion of fossil fuels such as in motor vehicle engines and power plant boilers. NO₂ and NO are referred to collectively as NO_x.

Effects: NO₂ can irritate and damage the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections such as influenza. Researchers have identified harmful effects similar to those caused by ozone, with progressive changes over four hours of exposure. Negative health effects are apparent after exposure to NO₂ levels as low as 0.11 ppm for a few minutes. This level of exposure may elicit or alter sensory responses. Higher concentrations (0.45 - 1.5 ppm) may cause impaired pulmonary function, increased incidence of acute respiratory disease, and difficult breathing for both bronchitis sufferers and healthy persons.

2.5.6 Lead

Lead is a bluish-gray metal that occurs naturally in small quantities. Lead also occurs in a variety of compounds such as lead acetate, lead chloride, lead chromate, lead nitrate, and lead oxide. Pure lead is insoluble in water. However, some lead compounds are water-soluble.

Sources: Lead and lead compounds in the atmosphere often come from fuel combustion sources, such as the burning of solid waste, coal, and oils. Historically, the largest source of lead in the atmosphere resulted from the combustion of leaded gasoline in motor vehicles. However, with the phase-out of leaded gasoline, concentrations of lead in the air have substantially decreased. Industrial sources of atmospheric lead

include steel and iron factories, lead smelting and refining, and battery manufacturing. Atmospheric lead may also result from lead in entrained dust and dirt contaminated with lead. Lead-based paints were commonly used in the past, and lead paint chips or dust can be inhaled or ingested.

Effects: Acute health effects of lead may include gastrointestinal distress (such as colic), brain and kidney damage, and even death. Lead also has numerous chronic health effects, including anemia, central nervous system damage, and male and female reproductive dysfunction, as well as effects on blood pressure, kidney function, and vitamin D metabolism. Developing fetuses and children are particularly sensitive to lower concentrations of blood lead, and the effects may include increased risk of pre-term delivery, low birth weight, and the impairment of hearing, growth, and mental development. The U.S. EPA's Office of Air Quality Planning and Standards ranks lead as a "high concern" pollutant based on its severe chronic toxicity. Human studies regarding the cancer risks of lead have been inconclusive. However, the U.S. EPA considers lead to be a probable human carcinogen.

2.5.7 Sulfur Dioxide

Sulfur dioxide is a colorless gas with a sharp, irritating odor. It can react in the atmosphere to produce sulfuric acid and sulfates, which contribute to acid deposition and atmospheric visibility reduction. It also contributes to the formation of PM₁₀.

Sources: Most of the SO₂ emitted into the atmosphere is from burning sulfur-containing fossil fuels by mobile sources such as marine vessels and farm equipment, and stationary fuel combustion.

Effects: SO₂ irritates the mucous membranes of the eyes and nose, and may also affect the mouth, trachea, and lungs. Healthy people may experience sore throats, coughing, and breathing difficulties when exposed to high concentrations. SO₂ causes constriction of the airways and poses a health hazard to asthmatics, who are very sensitive to SO₂. Research indicates that normally-breathing asthmatics performing moderate to heavy exercise will experience SO₂-induced bronchoconstriction (breathing difficulties) when breathing SO₂ for at least five minutes at concentrations lower than one part per million. Consecutive SO₂ exposures (repeated within 30 minutes or less) result in a diminished response compared with the initial exposure. Children often experience more respiratory tract infections when they are exposed to SO₂.

2.6 TOXIC AIR CONTAMINANTS

Toxic air contaminants (TACs), also referred to as hazardous air pollutants, are air pollutants (excluding O₃, CO, SO₂, and NO₂) that may reasonably be anticipated to cause cancer, developmental effects, reproductive dysfunction, neurological disorders, heritable gene mutations, or other serious or irreversible acute or chronic health effects in humans.

TACs are regulated under different federal and state regulatory processes than ozone and the other criteria air pollutants. Health effects of TACs may occur at extremely low levels and it is typically difficult to identify levels of exposure that do not produce adverse health effects.

TACs generally consist of four types: organic chemicals, such as benzene, dioxins, toluene, and perchlorethylene; inorganic chemicals such as chlorine and arsenic; fibers such as asbestos; and metals such as mercury, cadmium, chromium, and nickel. These air contaminants are defined by the U.S. EPA, the State of California, and other governmental agencies. Currently, more than 900 substances are regulated TACs under federal, state, and local regulations. Appendix D, Major Toxic Air Contaminant Regulations and Common Toxic Air Contaminant Sources and Substances, presents the major federal and state programs and regulations to reduce toxic air contaminant emissions.

Sources: Toxic air contaminants are produced by a great variety of sources, including industrial facilities such as refineries, chemical plants, chrome plating operations, and surface coating operations; commercial facilities such as dry cleaners and gasoline stations, motor vehicles, especially diesel-powered vehicles; and, consumer products. TACs can be released as a result of normal industrial operations, as well as from accidental releases during process upset conditions.

Effects: Health effects from TACs vary with the type of pollutant, the concentration of the pollutant, the duration of exposure, and the exposure pathway. TACs usually get into the body through breathing, although they can also be ingested, or absorbed through the skin.

Adverse effects on people tend to be either acute (short-term) or chronic (long-term). Acute effects result from short-term, high levels of airborne toxic substances. These effects may include nausea, skin irritation, cardiopulmonary distress, and even death. Chronic effects result from long-term, low level exposure to airborne toxic substances. Effects can range from relatively minor to life-threatening. Less serious chronic effects can include skin rashes, dry skin, coughing throat irritation, and headaches. More serious chronic effects can include lung, liver, and kidney damage; nervous system damage; miscarriages, and genetic and birth defects; and, cancer. Many TACs can have both carcinogenic and non-carcinogenic health effects.

2.7 OTHER POLLUTANTS OF CONCERN

2.7.1 San Joaquin Valley Fever

San Joaquin Valley Fever (formally known as Coccidioidomycosis) is an infectious disease caused by the fungus *Coccidioides immitis*. San Joaquin Valley Fever is also known as Valley Fever, Desert Fever, or Cocci.

Sources: Infection is caused by inhalation of *Coccidioides immitis* spores that have become airborne when dry, dusty soil or dirt is disturbed by wind, construction, farming, or other activities. The Valley Fever fungus tends to be found at the base of hillsides, in virgin, undisturbed soil. It usually grows in the top few inches of soil, but can grow down to 12 inches. The fungus does not survive well in highly populated areas because there is not usually enough undisturbed soil for the fungus to grow. Additionally, the fungus is not likely to be found in soil that has been or is being cultivated and fertilized. This is because manmade fertilizers, such as ammonium sulfate, enhance the growth of the natural microbial competitors of the Valley Fever fungus. Infection is most frequent during summers that follow a rainy winter or spring, especially after wind and dust storms. Valley Fever infection is common only in arid and semiarid areas of the Western Hemisphere. In the United States, it is mostly found from Southern California to southern Texas. In Ventura County, the Valley Fever fungus is most prevalent in the county's dry, inland regions.

Effects: In its primary form, symptoms appear as a mild upper respiratory infection, acute bronchitis, or pneumonia. The most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches, although 60 percent of people infected are asymptomatic and do not seek medical attention. In the remaining 40 percent, symptoms range from mild to severe. A small percentage, less than one percent, die as a result of the disease.

The incubation period for the primary infection is from one to four weeks. Occasionally, a progressive form of Valley Fever develops from the primary form and may appear after a few weeks, months, or even years. In this progressive form, Valley Fever may cause a chronic infection of many organs, including the skin, lymph glands, spleen, liver, bones, kidneys, and brain. Individuals most vulnerable to Valley Fever are agricultural workers, construction and road workers, and archeologists, because they are exposed to the soil where the fungus might be just below the surface. Many infections, however, occur in persons without occupational exposure. Of those without an occupational risk of contracting the disease, the most susceptible are those with suppressed immune systems due to such conditions as organ transplants, HIV infection, Hodgkin's disease, diabetes, and pregnancy (3rd trimester). Domestic animals, especially dogs, are also susceptible to Valley Fever.

There are about 100,000 new cases of Valley Fever per year in the southwestern United States. The average number of reported new cases of Valley Fever in Ventura County before 1994 was 40 per year. In 1994, the year of the Northridge earthquake, the number of reported new cases of Valley Fever was 243. This increase was attributed to the great quantities of airborne dust generated by the Northridge earthquake. Since 1995, the number of reported cases has been comparable to the average before 1994. However, the actual number of cases may be much higher because Valley Fever is often misdiagnosed as the flu and not reported by physicians.

2.7.2 Odors

Odors are substances in the air that pose a nuisance to nearby land uses such as residences, schools, daycare centers, and hospitals. Odors are typically not a health concern, but can interfere with the use and enjoyment of nearby property.

Sources: Odors may be generated by a wide variety of sources. Following are examples of facilities and operations that may generate significant odors:

- Wastewater treatment facilities
- Sanitary landfills
- Transfer stations
- Composting facilities
- Asphalt batch plants
- Painting and coating operations
- Fiberglass operations
- Food processing facilities
- Feed lots/ dairies
- Petroleum extraction, transfer, processing, and refining operations and facilities
- Chemical manufacturing operations and facilities
- Rendering plants

Effects: Objectionable odors created by a facility or operation may cause a nuisance or annoyance to surrounding populations.

2.7.3 Fugitive Dust

Fugitive dust refers to solid particulate matter that becomes airborne because of wind action and human activities. Fugitive dust particles are mainly soil minerals, but also can be sea salt, pollen, spores, tire particles, etc. About half of fugitive dust particles (by weight) are larger than 10 microns and settle quickly. Fugitive dust particles 10 microns or smaller can remain airborne for weeks.

Sources: The primary sources of fugitive dust are grading and excavation operations associated with road and building construction, aggregate mining and processing operations, and sanitary landfill operations. Unpaved roadways also are a large source of fugitive dust. Other sources of fugitive dust include demolition activities, unpaved roadway shoulders, vacant lots, material stockpiles, abrasive blasting operations, and off-road vehicles. The amount of fugitive dust created by such activities is dependent largely on the type of soil, type of operation taking place, size of the area, degree of soil disturbance, soil moisture content, and wind speed.

Effects: When fugitive dust particles are inhaled, they can travel easily to the deep parts of the lungs and may remain there, causing respiratory illness, lung damage, and even

premature death in sensitive people. Fugitive dust also may be a nuisance to those living and working nearby. Dust blown across roadways can lead to traffic accidents by reducing visibility. Fugitive dust can soil and damage materials and property, such as fabrics, vehicles, and buildings. Particulates deposited on agricultural crops can lower crop quality and yield. Additionally, fugitive dust can lead to the spread of San Joaquin Valley Fever, a potential health hazard caused by a fungus that lives in the soil.

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3. AIR QUALITY SIGNIFICANCE THRESHOLDS

3.1 INTRODUCTION

The Ventura County Air Pollution Control District (APCD or District) reviews and comments on the adequacy and accuracy of environmental documents for projects that may affect air quality in Ventura County. Such documents include Notices of Preparation, Initial Studies, Negative Declarations, Mitigated Negative Declarations (MND), and Environmental Impact Reports (EIR). The APCD recommends that an MND or an EIR be prepared for projects that meet one or more of the significance criteria listed below.

As stated in Chapter 1, these criteria are guidelines only. The final decision on the significance of air quality impacts, the appropriate environmental document, and mitigation measures, lies with the lead agency for the project. These Guidelines are not applicable to equipment, operations, or processes required to have an APCD Permit to Operate.

3.2 DEFINITION OF SIGNIFICANCE

Section 15002(g) of the California Environmental Quality Act (CEQA) Guidelines defines “significant effect on the environment” as “a substantial adverse change in the physical conditions that exist in the area affected by the proposed project.” When an environmental document identifies a significant environmental effect, the government agency approving the project must make findings as to whether the adverse environmental effects have been substantially reduced or if not, why they were not substantially reduced. Appendix G, Environmental Checklist Form, of the state CEQA Guidelines presents a model initial study checklist. This checklist includes suggested criteria, in question format, for determining whether a project will have a “potentially significant impact” on air quality. According to the criteria, a project will have a “potentially significant impact” on air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- Expose the public (especially schools, day care centers, hospitals, retirement homes, convalescence facilities, and residences) to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

According to Appendix G, a “potentially significant impact” finding is appropriate if there is substantial evidence that an effect may be significant.

In addition, the Ventura County Air Pollution Control Board has adopted a policy stating that general development projects whose emissions are expected to meet or exceed the criteria in Section 3.3, “Recommended Significance Criteria,” will have a potentially significant adverse impact on air quality.

3.3 RECOMMENDED SIGNIFICANCE CRITERIA

The following are suggested threshold criteria for determining whether an EIR or an MND should be prepared for a development project to address potential adverse air quality impacts. Tests of significance are not limited to the criteria listed below. Other factors, especially those related to the location of the project and potential impacts on nearby populations (e.g., schools, day care centers, residences, and hospitals) also should be examined. These include: proximity of the project to populated areas, proximity of the proposed project to other pollutant sources (e.g., industrial facilities emitting odorous or hazardous substances), and projects with potential land use conflicts.

3.3.1 Criteria Pollutants

1. Ozone (based on emission levels of reactive organic compounds and oxides of nitrogen)

The following are the reactive organic compounds (ROC) and nitrogen oxides (NO_x) thresholds that the Ventura County Air Pollution Control Board has determined will individually and cumulatively jeopardize attainment of the federal one-hour ozone standard, and thus have a significant adverse impact on air quality in Ventura County. Chapter 5, Estimating Ozone Precursor Emissions, presents procedures for estimating project emissions.

- (a) Ojai Planning Area*

Reactive Organic Compounds:	5 pounds per day
Nitrogen Oxides:	5 pounds per day

- (b) Remainder of Ventura County**

Reactive Organic Compounds:	25 pounds per day
Nitrogen Oxides:	25 pounds per day

* The Ojai Planning Area is the area defined as the “Ojai Valley” in Ventura County Non-Coastal Zoning Ordinance, Article 12, Section 8112-2, plus the Ventura (Ojai) Non-growth Area (NGA) (as depicted in the *1987 Ventura County Air Quality Management Plan (AQMP)*, Appendix E-87, Figure E-1,

“Map of Ventura County with Growth/Nongrowth Areas,” page E-11). In these Guidelines, see Figure 3-1, “Ojai Planning Area.”

** The City of Simi Valley uses a significance threshold of 13.7 tons per year of reactive organic compounds or nitrogen oxides, as directed by the City of Simi Valley City Council.

2. Criteria Pollutants – General

A project that may cause an exceedance of any ambient air quality standard (state or federal), or may make a substantial contribution to an existing exceedance of an air quality standard will have a significant adverse air quality impact. “Substantial” is defined as making measurably worse an existing exceedance of a state or federal ambient air quality standard. For example, a project that directly or indirectly produces large quantities of carbon monoxide (CO) could cause an exceedance of the state or federal CO standards. Such a determination may require the use of an appropriate air quality model.

3. Ozone – Cumulative Impacts Based on Project-Specific AQMP Consistency

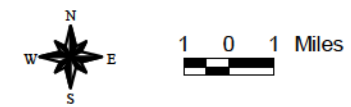
A project with emissions of two pounds per day or greater of ROC, or two pounds per day or greater of NO_x that is found to be inconsistent with the AQMP will have a significant cumulative adverse air quality impact. A project with emissions below two pounds per day of ROC, and below two pounds per day of NO_x, is not required to assess consistency with the AQMP.

Inconsistent projects are usually those that cause the existing population to exceed the population forecasts contained in the most recently adopted AQMP. Chapter 4, Air Quality Management Plan Consistency, presents specific procedures for determining project consistency with the AQMP. Those procedures should be followed before making a final consistency determination for a project.

4. Ozone – Cumulative Impacts Based on General Plan AQMP Consistency

Any General Plan Amendment or revision that would provide directly or indirectly for increased population growth above that forecasted in the most recently adopted AQMP will have a significant cumulative adverse air quality impact.

**FIGURE 3-1
OJAI PLANNING AREA**



-  **Ojai Planning Area**
(Ojai Growth & Non-Growth Areas + Ventura (Ojai) Non-Growth Area)
-  **Remainder of Ventura County**



3.3.2 Other Pollutants of Concern

1. Fugitive Dust

- (a) A project that may be reasonably expected to generate fugitive dust emissions in such quantities as to cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property (see California Health and Safety Code, Division 26, §41700) will have a significant adverse air quality impact.
- (b) A project for which an appropriate air dispersion modeling analysis shows a possible violation of an ambient particulate standard will have a significant adverse air quality impact.

Chapter 6, Assessing Project-Specific, Localized, Non-Ozone Impacts, includes a discussion of fugitive dust emissions.

2. Toxic Air Contaminants

Impacts from toxic air contaminants (TACs) may be estimated by conducting a health risk assessment (HRA). The HRA procedure involves the use of an air quality model and a protocol approved by the APCD. Following are the recommended significance thresholds:

- (a) Lifetime probability of contracting cancer is greater than 10 in one million (as identified in an HRA).
- (b) Ground-level concentrations of non-carcinogenic toxic air pollutants would result in a Hazard Index of greater than 1 (as identified in an HRA).

The Hazard Index is determined by dividing the “annual exposure level” by the “reference exposure level.” The “annual exposure level” (AEL) is the estimated annual average concentration level of a TAC that is estimated to occur as a result of the proposed project. The “reference exposure level” (REL) is a concentration level or dose, at or below which no adverse health effects are anticipated. RELs generally are based on the most sensitive adverse health effect reported in the medical and toxicological literature.

Chapter 6, Assessing Project-Specific, Localized, Non-Ozone Impacts, includes a discussion of toxic air pollutants.

3. Odors

A qualitative assessment indicating that a project may reasonably be expected to generate odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property (see California Health and Safety Code, Division 26, §41700) will have a significant adverse air quality impact.

Chapter 6, Assessing Project-Specific, Localized, Non-Ozone Impacts, provides a discussion of odors.

3.4 CHOOSING THE APPROPRIATE ENVIRONMENTAL DOCUMENT FOR AIR QUALITY IMPACT ANALYSES

1. Negative Declaration

A negative declaration is appropriate if all of the following apply:

- The project will emit less than 5 pounds per day of ROC and less than 5 pounds per day of NO_x in the Ojai Planning Area, or less than 25 pounds per day of ROC and less than 25 pounds per day of NO_x in the remainder of the county.
- The project will be consistent with the most recently adopted AQMP.
- The project does not require a General Plan Amendment that will directly or indirectly increase population growth above that forecasted in the most recently adopted AQMP.
- The project will not have any other significant adverse air quality impacts.

2. Mitigated Negative Declaration

A mitigated negative declaration is appropriate if all of the following apply:

- Mitigation measures have been agreed to by the project applicant that reduce project emissions to less than 5 pounds per day of ROC and less than 5 pounds per day of NO_x in the Ojai Planning Area, or less than 25 pounds per day of ROC and less than 25 pounds per day of NO_x in the remainder of the county.
- The project will be consistent, or made to be consistent, with the most recently adopted AQMP.
- The project does not require a General Plan Amendment that will directly or indirectly increase population growth above that forecasted in the most recently adopted AQMP.

- There are no other significant air quality impacts, or the applicant has agreed to mitigate all other air quality impacts.
- The project applicant has agreed to mitigate project-related significant air quality impacts through a revision to the project description.

3. Environmental Impact Report

An EIR should be prepared for any project that meets or exceeds one or more of the significance criteria listed in Section 3.3, “Significance Criteria,” and the project cannot qualify for an MND.

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4. AIR QUALITY MANAGEMENT PLAN CONSISTENCY

4.1 INTRODUCTION

The primary objective of the *Ventura County Air Quality Management Plan* (AQMP) is to provide continuous air pollutant emission reductions over time, with the goal of attaining the federal and state standards for ozone. City and county growth consistent with the AQMP is a vital component of the overall AQMP ozone control strategy to ensure continued progress towards attaining the federal and state ozone standards.

Section 15125(d) of the California Environmental Quality Act (CEQA) Guidelines stipulates that Environmental Impact Reports (EIR) shall discuss “any inconsistencies between a proposed project and applicable general plans and regional plans. Such regional plans include, but are not limited to, the applicable air quality attainment or maintenance plan (or State Implementation Plan)...” Moreover, pursuant to Appendix G, “Environmental Checklist Form,” of the state CEQA Guidelines, a project that would “conflict with or obstruct implementation of the applicable air quality plan” may have a significant adverse air quality impact. The lead agency proposing to approve or implement the project is responsible for making the AQMP consistency determination.

An environmental document for a proposed project must address project consistency with the AQMP. Project consistency with the AQMP can be determined by comparing the actual population growth in the county with the projected growth rates used in the AQMP. The projected growth rate in population is used as an indicator of future emissions from population-related emission categories in the AQMP. These emission estimates are used, in part, to project the date by which Ventura County will attain the federal ozone standard. The County of Ventura Planning Division maintains an ongoing population tracking system. Therefore, a demonstration of consistency with the population forecasts used in the most recently adopted AQMP should be used for assessing project consistency with the AQMP.

However, if there are more recent population forecasts that have been adopted by the Ventura Council of Governments (VCOG) where the total county population is lower than that included in the most recently adopted AQMP population forecasts, lead agencies may use the more recent VCOG forecasts for determining AQMP consistency.

The geographic subareas used in the forecasts are known as growth and non-growth areas. These areas are based on a network of analysis zones created by the State Department of Transportation and the Ventura County Public Works Agency. The growth and non-growth areas are comprised of aggregated analysis zones.

Figure 4-1, “Ventura County Growth and Non-growth Areas,” is a map that shows the growth and non-growth areas of the county. This map is based on the February 1998 version of the 1990 Analysis Zones map prepared by the Graphics Division of the

Resource Management Agency. The entire present and projected boundary area of each of the ten cities in the county is within a respective growth area. In addition to the ten growth areas, there are three unincorporated growth areas. The unincorporated growth areas include urbanized development that has already occurred, or is expected to occur under the Ventura County General Plan. An example is the Piru Growth Area. The remainder of the AQMP population forecast covers the unincorporated non-growth areas. These areas are not expected to receive significant urban development. All of the non-growth areas, except for the Ojai Non-growth Area, are aggregated together for AQMP consistency assessment purposes. The excepted area comprises part of the Ojai Valley.

4.2 PROCEDURES FOR DETERMINING CONSISTENCY WITH THE AQMP

The following sections describe the procedures for determining project consistency with the AQMP. Consistency with the AQMP does not mean that a project will not have a significant project-specific adverse air quality impact. However, inconsistency with the AQMP is considered a significant cumulative adverse air quality impact.

A project with estimated emissions two pounds per day or greater of reactive organic compounds (ROC), or two pounds per day or greater of nitrogen oxides (NO_x) that is inconsistent with the AQMP will have a significant cumulative adverse air quality impact. Inconsistent projects are usually those that cause the existing population to exceed the population forecasts contained in the most recently adopted AQMP (see Table 4-1, “1995 AQMP Population Forecasts”).

In addition to addressing consistency with the population forecasts, the air quality impact assessment should also address project consistency with emission reduction strategies included in the AQMP. The AQMP contains a number of transportation and energy control measures that help to reduce project emissions. These often can be used to help reduce a project’s indirect emissions. Transportation and energy conservation control measures should be incorporated into the project design early in the planning process.

4.2.1 Projects Exempt from Consistency Assessments

A project that conforms to the applicable General Plan designation and has emissions below two pounds per day of ROC, and below two pounds per day of NO_x, is not required to assess consistency with the AQMP. Consequently, a project with emissions below these levels is also considered to have a less than significant cumulative adverse air quality impact.

4.2.2 General Plan Amendments

Any General Plan Amendment that will result in population growth above that forecasted in the most recently adopted AQMP is inconsistent with the AQMP. It will therefore have a significant cumulative adverse air quality impact.

**TABLE 4-1
1995 AQMP POPULATION FORECASTS***

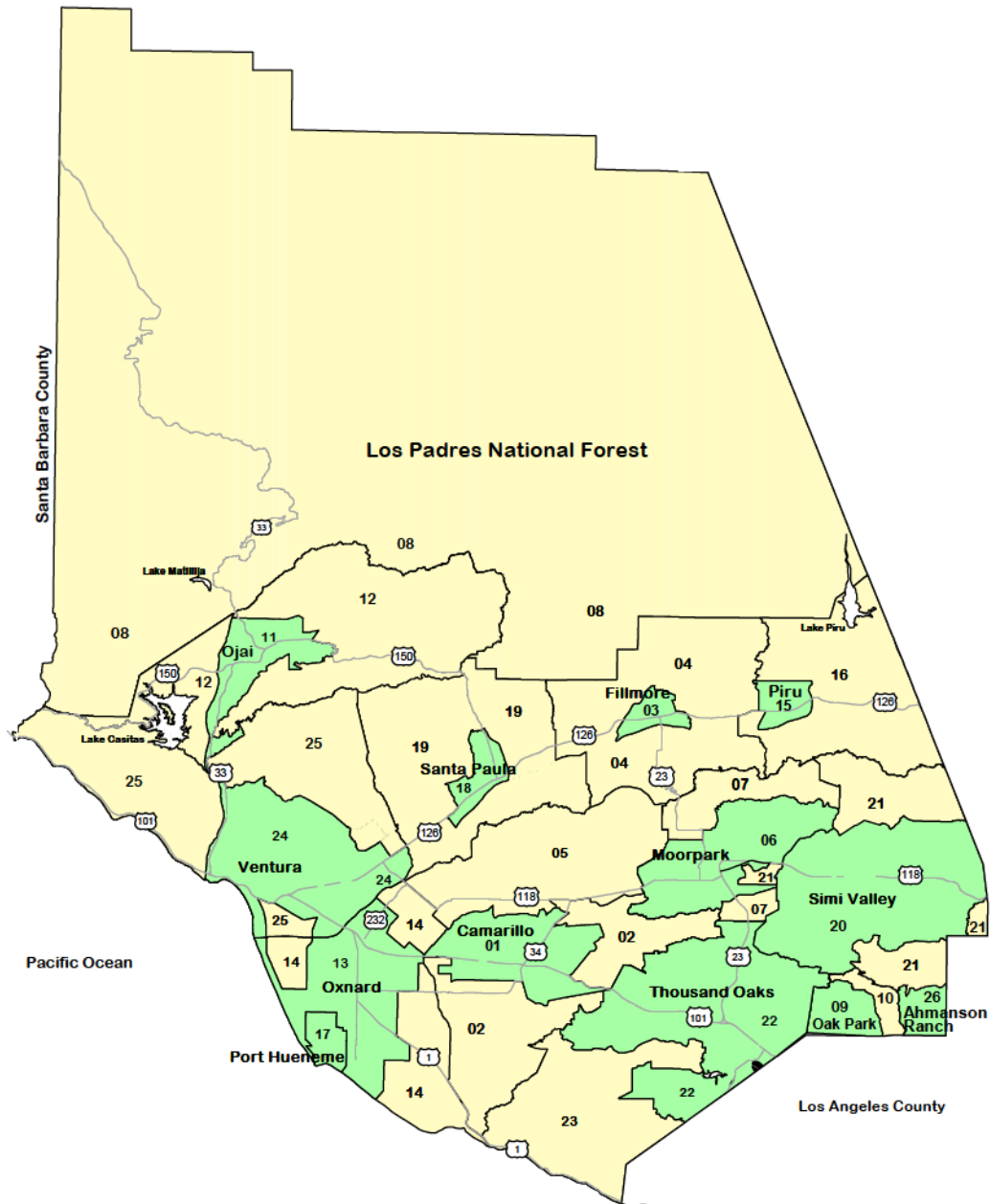
	2000	2001	2002	2003	2004	2005
<u>Growth Areas</u>						
Ahmanson Ranch	5,203	5,500	5,793	6,087	6,379	6,669
Camarillo	67,916	68,761	69,599	70,428	71,253	72,072
Fillmore	17,833	17,991	18,149	18,305	18,460	18,614
Moorpark	39,591	40,975	42,389	43,791	45,185	46,570
Oak Park	17,098	17,098	17,100	17,100	17,101	17,101
Oxnard	161,000	162,408	163,800	165,184	166,557	167,918
Piru	1,604	1,634	1,667	1,697	1,727	1,759
Port Hueneme	25,875	26,236	26,595	26,950	27,304	27,654
Santa Paula	30,070	30,548	31,021	31,493	31,963	32,429
Simi Valley	121,170	123,212	125,235	127,243	129,232	131,207
Thousand Oaks	122,816	124,010	125,192	126,369	127,533	128,691
Ventura	110,000	111,001	112,001	112,999	114,000	115,000
Ojai G/NGAs**	30,060	30,258	30,456	30,648	30,837	31,032
<u>Non-growth Areas</u>						
Aggregated NGAs***	26,182	26,592	26,978	27,379	27,758	28,158
<u>County Total</u>	776,418	786,224	795,975	805,673	815,289	824,874

* Based on population forecasts adopted by VCOG on June 24, 1993, and used in the 1995 AQMP Revision, Appendix E-95. Population forecasts from the most recently adopted AQMP should be used for AQMP consistency analyses. If there are more recent population forecasts that have been adopted by VCOG where the total county population is lower than that included in the most recently adopted AQMP, lead agencies may use the more recent VCOG forecasts for determining AQMP consistency. Contact APCD staff at 805/645-1427 or 805/645-1439 for questions about the most current population forecasts.

** G/NGAs = Growth and Non-growth areas.

*** Excludes the Ojai Non-growth Area.

**FIGURE 4-1
VENTURA COUNTY GROWTH AND NON-GROWTH AREAS**



GROWTH AREAS

- 01 Camarillo GA
- 03 Fillmore GA
- 06 Moorpark GA
- 09 Oak Park GA
- 11 Ojai GA
- 13 Oxnard GA
- 15 Piru GA
- 17 Port Hueneme GA
- 18 Santa Paula GA
- 20 Simi Valley GA
- 22 Thousand Oaks GA
- 24 Ventura GA
- 26 Ahmanson Ranch GA

NON-GROWTH AREAS

- 02 Camarillo NGA
- 04 Fillmore NGA
- 05 Las Posas NGA
- 07 Moorpark NGA
- 08 North Half NGA
- 10 Oak Park NGA
- 14 Oxnard NGA
- 16 Piru NGA
- 19 Santa Paula NGA
- 21 Simi Valley NGA
- 23 Thousand Oaks NGA
- 25 Ventura NGA

3 0 3 Miles



4.2.3 General Land Use Development Projects

The following procedures should be used to determine project consistency with the AQMP for projects conforming to applicable general plans and having emissions of two pounds or greater per day of ROC or two pounds or greater per day of NOx.

Using Figure 4-1, “Ventura County Growth and Non-growth Areas,” determine the growth or non-growth area in which the project is located. If the appropriate growth or non-growth area cannot be determined, contact the APCD Planning Division at 805/645-1427 or 805/645-1439.

If the project is in a growth area, refer to Section 4.2.3.1, “Projects Located in Growth Areas (Except Ojai Growth Area).” If the project is in a non-growth area, refer to Section 4.2.3.2, “Projects Located in Non-growth Areas (Except Ojai Non-growth Area).” If the project is located in the Ojai Growth or Non-growth area, refer to Section 4.2.3.3, “Projects Located in the Ojai Growth and Non-growth Areas.”

4.2.3.1 Projects Located in Growth Areas (Except Ojai Growth Area)

1. Determine if the project conforms to the applicable General Plan.
2. Determine the current estimated population of the growth area. This information can be provided by APCD Planning Division staff.
3. Compare the current estimated population of the growth area (obtained in step 2 above) with the growth area population target for the next year. For example, if the current year is 2000, compare the estimated existing population of the growth area with the population target for 2001. Refer to Table 4-1, “1995 AQMP Population Forecasts.”

If the current estimated population of the growth area is below its next year’s population target, and the project conforms to the applicable General Plan designation, the project is determined to be consistent with the AQMP.

4. If the current estimated population of the growth area exceeds its next year’s population target, the project should be found to be inconsistent with the AQMP. Inconsistency with the AQMP is considered a significant cumulative adverse air quality impact.

4.2.3.2 Projects Located in Non-growth Areas (Except Ojai Non-growth Area)

1. Determine if the project conforms to the applicable General Plan.
2. Determine the current estimated population of the aggregated non-growth areas.

This information can be provided by APCD Planning Division staff.

3. Compare the current estimated population of the aggregated non-growth areas (obtained in step 2 above) with the aggregated non-growth area population target for the next year. For example, if the current year is 2000, compare the estimated existing population of the aggregated non-growth areas with the population target for 2001. Refer to Table 4-1, "1995 AQMP Population Forecasts."

If the current estimated population of the aggregated non-growth areas is below its next year's population target, and the project conforms to the applicable General Plan designation, the project is determined to be consistent with the AQMP.

4. If the current estimated population of the aggregated non-growth areas exceeds its next year's population target, the project should be found to be inconsistent with the AQMP. Inconsistency with the AQMP is considered a significant cumulative adverse air quality impact.

4.2.3.3 Projects Located in the Ojai Growth and Non-growth Areas

Consistency with the population forecasts for the Ojai Growth and Non-growth Areas (also known as the Ojai Valley) is assured due to Article 12 of the Ventura County Non-Coastal Zoning Ordinance. Article 12, which was adopted in July 1982, established a residential building permit allocation program to ensure consistency with the adopted AQMP population projections.

4.3 INCONSISTENCY WITH THE AQMP AND CUMULATIVE ADVERSE AIR QUALITY IMPACTS

A project that is determined to be inconsistent with the AQMP is also determined to have a significant cumulative adverse air quality impact. If a project is inconsistent, there are several options:

1. The project could be revised to eliminate the inconsistency. Project revisions might require that the project be phased, reduced in size, or delayed to ensure consistency with the AQMP population forecasts.
2. Mitigation measures could be applied to reduce or eliminate the inconsistency. This could consist of a jurisdiction adopting a residential building permit allocation program to pace population growth with the AQMP population forecasts in such a way as to ensure that population projections contained in the AQMP are not exceeded.
3. The project could be denied.
4. The project could be approved if the lead agency determines and issues a statement

that there are overriding considerations to approve the project. This does not relieve the decision-making body of the requirement to mitigate the impact to the maximum extent feasible, as required by Section 15126(c) of the CEQA Guidelines.

A finding that a project is consistent with the AQMP does not necessarily ensure that a project will not have a significant project-specific adverse impact on air quality. The recommended criteria for determining whether a project will have an adverse impact on air quality can be found in Section 3.3, "Recommended Significance Criteria."

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5. ESTIMATING OZONE PRECURSOR EMISSIONS

5.1 INTRODUCTION

The primary source of air pollutant emissions associated with residential, commercial, institutional, and some industrial land uses, is motor vehicles. These land uses may not result in significant amounts of direct emissions, but they may generate motor vehicle trips, whose emissions may adversely affect air quality. These land uses are therefore often referred to as “indirect” emission sources.

This chapter describes four methods that are recommended for estimating ozone precursor emissions, all based on the URBEMIS computer program. The California Air Resources Board (ARB) originally developed this program in 1982. As of October 2003, the most current version of the URBEMIS program is URBEMIS2002. This computer program is designed to estimate air emissions from land use development projects. URBEMIS2002 uses ARB’s most recent motor vehicle emission factor model, EMFAC2002 (hence the name URBEMIS2002). As stated in Chapter 1, the Guidelines are not applicable to equipment or operations required to have Ventura County APCD permits (Authority to Construct or Permit to Operate). Moreover, the emissions from equipment or operations requiring APCD permits are not counted towards the air quality significance thresholds.

Previous versions of URBEMIS (URBEMIS versions 1 through 5) were designed to estimate only motor vehicle emissions from trips generated by land use development. URBEMIS has been enhanced so that the user also can estimate construction and area source emissions. Area sources are groups of similar emission sources that do not contribute significant amounts of emissions individually, but do contribute significantly in the aggregate. Examples of area sources include fuel combustion from natural gas appliances, utility engines (including landscape maintenance equipment), and consumer products. URBEMIS also now allows the user to select mitigation measures for construction emissions, area source emissions, and project operational emissions (see Sections 7.4, “Construction Mitigation,” 7.5.1, “Area Source Mitigation Measures,” and 7.5.2, “Operational Mitigation Measures”). URBEMIS2002 contains several additional land uses, major enhancements to the construction emissions and mitigation measures module, and includes a screening analysis option.

Motor vehicle trip rates in URBEMIS are based primarily on the average daily trip data for the various land uses in the Institute of Transportation Engineers’ (ITE) publication *Trip Generation*, Sixth Edition (1997). Motor vehicle trip generation rates different than those listed in ITE’s *Trip Generation* or URBEMIS can be used if the lead agency is provided justification and documentation to its satisfaction that such changes are warranted. Documentation and justification of any changes to the URBEMIS default values should be included in the environmental document.

URBEMIS requires entry of specific information concerning the number and type of units for each land use. It also requires entry of information specific to Ventura County. Ventura County-specific default inputs are contained in copies of the program obtained from the Ventura County Air Pollution Control District (APCD or District), the ARB (<http://www.arb.ca.gov/planning/urbemis/urbemis2002/urbemis2002.htm>), or the South Coast Air Quality Management District (<http://www.aqmd.gov/ceqa/urbemis.html>).

Ventura County-specific default inputs to the URBEMIS computer program are presented in Section 5.3.3.1, “Ventura County-Specific Default Inputs to the URBEMIS Computer Program.” Input values other than the Ventura County-specific defaults may be used for calculating emissions. Likewise, modified trip generation rates and percent work trips also may be used. However, as stated earlier, if different values are used, full documentation and justification for the different values should be provided to the satisfaction of the lead agency that such changes are warranted.

Appendix E, Definition of Land Use Categories for Trip Generation and Project Emission Calculation Purposes, contains definitions of all of the land uses contained in ITE’s *Trip Generation*. The sixth edition of the ITE manual contains nineteen new land use classifications, revisions to several land use descriptions, and updated trip generation factors for various land uses. Not all of the land uses in ITE’s *Trip Generation* are in URBEMIS. However, URBEMIS inputs can be easily modified so that emissions from land uses not in URBEMIS can be calculated using URBEMIS.

Appendix F, Project Screening Analysis Tables, contains land uses, organized by project size and year of project completion, listing the size of land use (in terms of dwelling units, square feet, or fueling positions) that will exceed the reactive organic compounds (ROC) and oxides of nitrogen (NOx) significance thresholds described in Chapter 3 (see also Section 5.3.1, “Project Screening Analysis Tables”). Projects smaller than the applicable values in Appendix F will not have a significant adverse impact on air quality with respect to ROC and/or NOx emissions. Although a project may fall below the applicable ROC or NOx threshold values in Appendix F, the project should still be assessed for other potential significant air quality impacts, such as fugitive dust, odors, toxic air contaminants, and project consistency with the AQMP.

APCD recommends that lead agencies use the most recent version of URBEMIS adopted by the ARB and the corresponding version of EMFAC. Trip generation factors should be obtained from the most recent version of ITE’s *Trip Generation*, or other sources, as appropriate, with justification and documentation to the satisfaction of the lead agency that such changes are warranted.

5.2 CALCULATING OZONE PRECURSOR EMISSIONS FROM PROJECT CONSTRUCTION

Construction operations generate ROC, NO_x, fugitive dust emissions, and possibly air toxics. This section discusses methodologies for calculating ROC and NO_x emissions from project construction. The methodology to estimate fugitive dust emissions is presented in Section 6.2, “Fugitive Dust.” The methodology to estimate toxic air contaminant emissions is presented in Section 6.5, “Toxic Air Contaminants.”

The primary sources of construction-related ROC and NO_x emissions are gasoline- and diesel-powered, heavy-duty, mobile construction equipment, such as scrapers and motor graders. ROC and NO_x emissions associated with heavy-duty mobile construction equipment should be quantified based on the type of equipment anticipated to be used. Most of such equipment is diesel-powered. URBEMIS can be used to calculate ROC and NO_x emissions from heavy-duty mobile construction equipment. URBEMIS divides construction emissions into three phases: demolition (Phase 1), site grading (Phase 2), and building construction (Phase 3). Building construction is further subdivided into building equipment, architectural coating, asphalt paving, and worker trips. If the URBEMIS program is used to calculate ozone precursor emissions from project construction, the program should be run separately for the construction emissions and for the operational emissions, and the results should not be combined for purposes of comparing to applicable thresholds.

The URBEMIS User’s Guide presents emission factors, equipment horsepower, load factors, and hours per day of operation that can be used to manually estimate ROC and NO_x emissions associated with diesel- and gasoline-powered heavy-duty mobile construction equipment. The emission factors in the table are presented in pounds per hour. The emission equation used by URBEMIS for each piece of equipment is as follows:

Equipment Emissions (pounds per day) = # of pieces of equipment * grams per brake horsepower-hour * equipment horsepower * hours/day * load factor

Grams per brake-horsepower hour is based on the construction year and on the average life expectancy of the equipment type. Grams per brake horsepower hour emissions and average equipment life expectancy are from Appendix B of the California Air Resources Board’s (ARB’s) off-road model (California Air Resources Board 2000). Emission factors used in URBEMIS are found in Appendix H of the URBEMIS User’s Guide.

Construction-related emissions (including portable engines and portable engine-driven equipment subject to the ARB’s Statewide Portable Equipment Registration Program, and used for construction operations or repair and maintenance activities) of ROC and NO_x are not counted towards the two significance thresholds, since these emissions are temporary. However, construction-related emissions should be mitigated if estimates of

ROC and NO_x emissions from the heavy-duty construction equipment anticipated to be used for a particular project exceed the 5 pounds per day threshold in the Ojai Planning Area, or the 25 pounds per day threshold in the remainder of the county. Mitigation measures to reduce such emissions are listed in Section 7.4.3, “ROC and NO_x Construction Mitigation Measures” and in the mitigation module of URBEMIS.

5.3 CALCULATING OPERATIONAL EMISSIONS

This section presents three methods for assessing whether project emissions will be significant: a screening analysis (Section 5.3.1, “Project Screening Analysis Tables”), a minimal run screening analysis using URBEMIS (Section 5.3.2, “URBEMIS Computer Program -Screening Analysis Mode”), or a detailed run (Section 5.3.3, “URBEMIS Computer Program - Detailed Run”). Lead agencies need not perform the detailed run unless the screening analysis tables or screening analysis URBEMIS run indicates that the project will exceed the 5 pounds per day threshold for ROC and NO_x in the Ojai Planning Area, or the 25 pounds per day threshold for ROC and NO_x in the remainder of the county as described in Chapter 3, Air Quality Significance Thresholds.

For purposes of determining whether or not the project will have a significant adverse impact on air quality, those project-related ROC and NO_x emissions from equipment that is required to have a Ventura County APCD Permit to Operate need not be considered. Such emissions should be subtracted from total project emissions before making a determination as to whether or not the project will have an adverse impact on air quality. Emissions that should be counted toward the ROC and NO_x significance threshold include any emissions that will occur as a result of approval of some type of discretionary use permit.

The project screening analysis mode in the URBEMIS program and the project screening analysis tables in Appendix F of this Guidelines use the default vehicle fleet mix for calculating estimated project emissions. Therefore, for projects where the fleet mix includes a greater percentage of heavy-duty vehicle trips than the default fleet mix, project emissions may be significantly underestimated in the screening analysis mode and the screening analysis tables. An example of this situation might be a warehouse facility where the vehicle trips are predominantly heavy-duty diesel trips. The District recommends that if a lead agency determines that the expected vehicle fleet mix for a project will include more heavy duty vehicles than the default fleet mix, project screening analyses are not appropriate.

5.3.1 Project Screening Analysis Tables

Appendix F identifies project sizes (by project type and year of project completion) that will exceed the ROC or NO_x significance thresholds. The tables in Appendix F were generated using the default values for Ventura County, and the default trip generation rates in URBEMIS. These trip generation rates are from the ITE’s *Trip Generation*, Sixth

Edition, and other sources, as documented in the User's Guide for URBEMIS. The "pass-by trip" option was selected for all land use categories. Emissions from area sources (e.g., natural gas usage, landscaping equipment, and consumer products) have also been included in the tables. The screening analysis in Appendix F does not account for any air quality mitigation measures. For each land use, the applicable unit numbers and/or project size was increased until the resultant ROC emissions or NO_x emissions exceeded the 5 and 25 pounds per day significance thresholds.

Generally, NO_x emissions exceed the significance thresholds before ROC emissions, and therefore usually indicate the project size that will exceed the applicable significance threshold. The years of project completion in Appendix F are those for which there are EMFAC2002 emission factors.

Projects smaller than the applicable threshold values in Appendix F will not have a significant adverse impact on air quality with respect to the one-hour ozone standard. Although a project may fall below the applicable ROC or NO_x threshold values in Appendix F, the project should still be assessed for other potential significant air quality impacts, including, but not limited to, fugitive dust, odors, toxic air contaminants, and project consistency with the AQMP.

If a project is a single land use type (e.g., single family detached housing), Appendix F can be used to determine whether the project is likely to exceed the significance thresholds. If the project is near the size necessary to exceed the significance thresholds, the URBEMIS program should be run, using either the screening analysis mode (see Section 5.3.2, "URBEMIS Computer Program - Screening Analysis Mode"), or a detailed run (see Section 5.3.3, "URBEMIS Computer Program - Detailed Run"). Also, if a project has unique conditions that deviate from the Ventura County default values (see Section 5.3.3.1), the screening analysis is not appropriate, and a detailed run should be performed.

APCD recommends that lead agencies use the most recent version of URBEMIS adopted by the ARB and the corresponding version of EMFAC. Therefore, if a more current version of URBEMIS is available, the District recommends using the more current version of URBEMIS instead of the tables in Appendix F.

5.3.2 URBEMIS Computer Program - Screening Analysis Mode

The URBEMIS screening analysis mode is appropriate if the project contains more than one land use, or if the lead agency has trip generation data from other sources (e.g., traffic studies). Completing a run as described in this section will provide emission estimates that do not account for any air quality mitigation measures, pass-by trips, internal trips, or double-counting adjustments. It relies on the default inputs for Ventura County, and requires only the most basic information about the project. The Summary output lists project area and operational emissions separately, and then adds the emissions together

for an estimate of total project emissions. The Detailed output lists project area and operational emissions. Therefore, project area and operational emissions must be added together to estimate total project emissions. If output from an URBEMIS screening analysis run produces ROC and/or NO_x emissions estimates at, near, or over the applicable significance threshold, a detailed URBEMIS run should be conducted.

Although an URBEMIS screening analysis run may produce ROC and/or NO_x emission estimates less than the applicable significance threshold, the subject project still should be assessed for other potential significant air quality impacts, such as fugitive dust, odors, toxic air contaminants, and project consistency with the AQMP.

5.3.3 URBEMIS Computer Program - Detailed Run

A detailed URBEMIS run is appropriate if any of the following apply: 1) the screening analysis tables indicate that the proposed project will likely exceed ROC or NO_x significance thresholds; 2) the URBEMIS screening analysis mode shows project emissions at, near, or over the applicable ROC or NO_x significance threshold; 3) mitigation measures will be included in the project; or 4) a more detailed analysis of the project is desired. See Section III, "Using URBEMIS2002," Appendix B, "Area Source Emissions," and Appendix C, "Operational (Motor Vehicle) Emissions," of the URBEMIS7G manual for further details. The Summary output lists project area and operational emissions separately, and then adds the emissions together for an estimate of total project emissions. The Detailed output lists project area and operational emissions separately. Therefore, for an estimate of total project emissions from the Detailed output, project area and operational emissions should be added together.

As with the Appendix F screening analysis tables and the URBEMIS screening analysis mode, if a detailed URBEMIS run indicates that project ROC and NO_x emissions will be below the applicable significance threshold, the project still should be assessed for other potential significant air quality impacts, including, but not limited to, fugitive dust, odors, toxic air contaminants, and project consistency with the AQMP.

5.3.3.1 Ventura County-Specific Default Inputs to the URBEMIS Computer Program

The following default values should be used for projects located in Ventura County. These default values may be replaced with more specific project data. However, justification and documentation for the changes should be provided to the satisfaction of the lead agency that such changes are warranted. Documentation and justification of any changes to the URBEMIS default values should be included in the environmental document. If a more current version of the URBEMIS program is available and has updated Ventura County default values, those values should be used instead.

Project Area: Ventura County.

Target Year: Year of project occupancy, or, if not an available choice in the program, the year of project occupancy rounded to the nearest five-year increment.

Ambient Temperature: Use 75° for the summer ambient temperature. Use 50° for the winter ambient temperature.

Trip Characteristics:

Average Speed		Trip Percentages	Trip Lengths	
			Urban	Rural
40	Home-based work	27.4	12.0	15.0
40	Home-based shop	17.7	7.8	10.0
40	Home-based other	54.9	10.0	10.0
40	Commercial-based commute		10.0	15.0
40	Commercial-based non-work		10.0	15.0

Note: Trip percentages for “home-based” trips must add to 100 percent.

5.3.3.2 Area Emissions Estimates

Area sources are sources that individually emit fairly small quantities of air pollutants, but cumulatively may generate significant quantities of emissions. Area source emissions include fuel combustion from natural gas appliances, utility engines (including landscape maintenance equipment), and consumer products. APCD recommends that area source emissions be estimated for all projects that have these types of emission sources. The Summary output lists project area and operational emissions separately, and then adds these emissions together for an estimate of total project emissions. The Detailed output lists project area and operational emissions separately. Therefore, for an estimate of total project emissions from the Detailed output, project area and operational emissions should be added together.

5.3.3.3 Adjustment for Double Counting of Pass-by and Diverted-linked Trips

Traffic generation rates for certain land uses can be overestimated by double counting vehicle trips. This occurs when an establishment attracts some of its trips from traffic passing the site while on the way to another location. Not accounting for the pass-by and diverted-linked trips can substantially overstate indirect source emissions associated with a proposed land use project. By quantifying pass-by and diverted-linked rates for projects, a more accurate representation of indirect source emissions can be obtained.

Trip-making can be categorized as:

Primary Trips: Trips made for the specific purpose of visiting the project. A home-to-shopping-to-home combination of trips is a primary trip set.

Pass-by Trips: Trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are defined as trips from traffic passing the site on an adjacent street that contains direct access to the project. These trips do not require a diversion from another roadway, and do not add additional mileage. An example is a stop at a convenience store on the way home from work.

Diverted-linked Trips: Trips attracted from the traffic on roadways within the vicinity of the project but requiring a diversion from that roadway to another roadway to gain access to the project site. These roadways could include streets or freeways adjacent to the project, but without direct access to the project.

The URBEMIS computer program offers a method to adjust estimates of project emissions to account for pass-by and diverted-linked trips. While in the URBEMIS program, the Operational Emissions main screen provides an option for selecting pass-by trip adjustments. Clicking this box instructs the program to apply the recommended pass-by and diverted-linked rates. Table 3 of the URBEMIS User's Guide shows estimates of pass-by and diverted linked trip percentages used in the URBEMIS program.

The URBEMIS program can be used to adjust for pass-by and diverted-linked trips only when a default land use category is used. Within any of the default land use categories, the trip generation rate may be modified, and the "pass-by trips" option still works properly. However, if a non-default land use option is used (i.e., the "blank" row in the "Select/Edit Land Use" screens), the "pass-by trips" option does not work properly.

For more information about the use of this program feature, see the URBEMIS User's Guide (Section III.8.1, "Specifying Vehicle Emissions," and Appendix C, "Operational (Motor Vehicle) Emissions, Pass-By Trips").

5.3.3.4 Adjustment for Double Counting of Internal Trips in Multi-use Projects

Trip generation rates in URBEMIS include both motor vehicle trip generation and attraction. Vehicle trips that originate within, and stay within, project boundaries are called internal trips. Therefore, URBEMIS may double count trips if a project contains both residential and non-residential components. However, URBEMIS contains a routine that minimizes double counting of internal trips in mixed-use projects and area plans, master plans, community plans, specific plans, and general plans. The routine only applies if at least one residential and one non-residential land use is specified by the URBEMIS user and the user selects the double-counting correction setting. The routine

is described in the URBEMIS User's Guide (Section III.8.1, "Specifying Vehicle Emissions," and Appendix C, "Operational (Motor Vehicle) Emissions, Double Counting of Multiuse Projects").

5.4 CALCULATING EMISSIONS FROM PROJECT-RELATED STATIONARY SOURCES

Air emissions from any project-related stationary air emission sources that do not require permits from the District should be estimated and included in total project emissions.

Stationary sources are non-mobile equipment, devices, operations, or processes that directly emit air pollutants. Most stationary sources are associated with commercial and industrial facilities and operations. Examples of stationary sources are industrial engines and boilers, turbines, spray paint booths, electronic component manufacturing operations, ready-mixed concrete facilities, plating operations, printing operations, plastic products manufacturing, and coffee roasters.

Air emissions from a wide range of stationary sources are controlled through the District's air pollution permit program. The District permit program mitigates emission increases from stationary sources by requiring emission control devices, emission and process limits, and emission offsets. Appendix B, Common Equipment and Processes Requiring a Ventura County APCD Permit to Operate, provides guidance for determining if equipment and processes will require an APCD Permit to Operate. In addition to Appendix B, lead agencies can refer to District Rule 23, Exemptions from Permit, for a detailed list of equipment and processes that do not require a District permit. Rule 23 is available from the ARB's website at <http://www.arb.ca.gov/drdb/ven/curhtml/r23.htm>. Lead agencies and project applicants also can contact the District's Engineering Division at 805/645-1401 for any questions regarding equipment, operations, and processes that may require a District permit.

Air emissions for equipment, operations, and processes that do not require a District permit may be calculated using emission factors available from the District. Lead agencies and project applicants can contact the District's Permit Section at 805/645-1401 for information regarding appropriate emission factors and emission calculation methodology for a wide range of stationary sources. In addition to District emission factors, emission factors for stationary sources can be obtained from Volume I of the Environmental Protection Agency's *Compilation of Air Pollutant Emission Factors* (AP-42). AP-42, Volume I, contains information on over 200 stationary source categories, and is available at the United States Environmental Protection Agency (U.S. EPA) website at www.epa.gov/ttn/chief/ap42.html.

Emission factor information also may be available from certified environmental documents and from air emissions tests of the subject equipment or very similar equipment. Lead agencies can contact the District at 805/645-1401 to inquire about any

appropriate emission test data that the District may have for a particular stationary source or source type.

6. ASSESSING PROJECT-SPECIFIC, LOCALIZED, NON-OZONE IMPACTS

6.1 INTRODUCTION

The previous chapter presented a methodology for assessing project impacts on regional ozone levels. This chapter presents information on how to assess a project's impacts on pollutant levels other than ozone. These impacts tend to be localized near the area where they are produced.

Project construction and operation activities can result in several air pollutants whose effects are often localized near the area of their origin. Such air quality effects are termed local air quality impacts and include, but are not necessarily limited to, fugitive dust, carbon monoxide (CO), toxic air contaminants (TACs), odors, and entrained fungal spores that cause San Joaquin Valley Fever.

Many of these pollutants can adversely impact the general population, especially those most likely to suffer adverse health effects from air pollution, such as children, the elderly, and those suffering from acute and chronic medical conditions. Land uses where such people are likely to reside or spend a substantial amount of time include residences, schools, playgrounds, day care centers, job sites, retirement homes, convalescent homes, and hospitals.

The project environmental document should identify any land uses near the project site that may have people who are particularly sensitive to localized, non-ozone air quality impacts. Reasonably foreseeable such land uses should be identified as well. This would include potential land uses that could reasonably be sited nearby based on zoning or land use designations.

The location of a development project is a major factor in determining whether it will cause or be impacted by localized, non-ozone air quality impacts. The potential for adverse localized, non-ozone air quality impacts increases as the distance between the source of such emissions and sensitive populations decreases. Localized air pollutants can adversely affect all members of the population, and thus any consideration of potential air quality impacts should include all members of the population. Localized air pollution impacts generally occur in one of two ways: 1) A new source of air pollutants is proposed close to existing populations (An example would be an industrial facility proposed for a site near a residential area or a day-care center); and, 2) A new development proposed near an existing industrial facility.

To minimize localized air pollution impacts, lead agencies should consider limiting or avoiding the following types of potential land use conflicts:

- A development project near a congested intersection or roadway. High traffic volumes and congested conditions can lead to high but localized concentrations of CO, particulate matter (PM), or TACs.
- Development projects close to a source of TACs or high traffic levels.
- Development projects near a source of odorous emissions. Although odors generally do not pose a health risk, they can be a nuisance if they interfere with the use of neighboring land uses.
- Development projects near a source of high levels of dust emissions. Fugitive dust can pose health risks (when it results in elevated PM₁₀ and PM_{2.5} levels) and can be a nuisance if it interferes with neighboring land uses.

When evaluating whether a development proposal has the potential to result in localized impacts, lead agency staff should consider the nature of the proposed development and its potential to produce air pollutant emissions, the distance between the emitting facility and the potentially affected population, the direction of prevailing winds, and local topography. Often, providing a buffer zone between the source of emissions and the subject population will alleviate the problem.

6.2 FUGITIVE DUST

The Ventura County Air Pollution Control District (APCD or District) recommends minimizing fugitive dust, especially during grading and excavation operations, rather than quantifying fugitive dust emissions. Therefore, the mitigation measures described in Section 7.4.1, “Fugitive Dust Mitigation Measures,” should be applied to all project-related dust-generating operations and activities. Occasionally, the District may recommend that a project’s potential to affect ambient particulate concentrations be analyzed with an appropriate air pollutant dispersion computer model. The purpose of such an analysis is to help determine if the amount of dust that will be generated by project-related activities will cause an exceedance of an ambient particulate air quality standard.

If the analysis indicates a possible violation of an ambient particulate air quality standard, a finding of significant impact should be made and appropriate mitigating measures identified. The District will recommend that PM modeling be conducted if, in its opinion, project-related activities and operations may generate airborne PM in such quantities as to cause an exceedance of a particulate ambient air quality standard in an area where people live and work, including, but not limited to, residential areas, schools, day care centers, office complexes, and hospitals. Examples of projects that may require supplemental modeling include mining and quarrying operations, landfills, and excavation and grading operations for large development projects. If the District recommends a particulate modeling analysis, it will provide guidance as to appropriate models and modeling protocols.

6.3 SAN JOAQUIN VALLEY FEVER

There is no recommended threshold for a significant San Joaquin Valley Fever impact. However, listed below are factors that may indicate a project's potential to create significant Valley Fever impacts:

- Disturbance of the top soil of undeveloped land (to a depth of about 12 inches)
- Dry, alkaline, sandy soils.
- Virgin, undisturbed, non-urban areas.
- Windy areas.
- Archaeological resources probable or known to exist in the area (Native American midden sites).
- Special events (fairs, concerts) and motorized activities (motocross track, All Terrain Vehicle activities) on unvegetated soil (non-grass).
- Non-native population (i.e., out-of-area construction workers).

The lead agency should consider the factors above that are applicable to the project or the project site. The likelihood that the Valley Fever fungus may be present and impact nearby land uses (or the project itself) increases with the number of the above factors applicable to the project or the project site. Based on these or other factors, if a lead agency determines that project activities may create a significant Valley Fever impact, the District recommends that the lead agency consider the Valley Fever mitigation measures listed in Section 7.4.2, "Valley Fever Mitigation Measures." These mitigation measures focus on fugitive dust control to minimize fungal spore entrainment, as well as minimizing worker exposure.

6.4 CARBON MONOXIDE

The District recommends use of the CALINE4 computer model to determine if a project may create or contribute to an existing CO hotspot. CALINE4 is the latest in a series of line source air quality models developed by the California Department of Transportation (Caltrans). Given the magnitude of the CO source, site geometry, and local meteorology, CALINE4 can predict pollutant concentrations for receptors located within 500 meters of a roadway. In addition to predicting concentrations of relatively inert pollutants such as CO, the model can predict nitrogen dioxide (NO₂) and suspended particle concentrations. It also has special options for modeling air quality near intersections, street canyons, and parking facilities.

Historically, the CALINE series of models required relatively minimal input from the user. Spatial and temporal arrays of wind direction, wind speed, and diffusivity were not needed by the models. While CALINE4 uses more input parameters than its predecessors, it is still considered a very easy model to implement. For most

applications, optional inputs can be bypassed and many other inputs can be assigned assumed worst-case values.

In addition to CALINE4, Caltrans has developed a CO hotspot screening procedure. This procedure can be used to provide a quick “worst-case” estimate of ambient CO concentrations near a roadway intersection. The screening procedure is contained in Caltrans’ *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol). Both CALINE4 and the CO Protocol, including the CO screening procedure, can be downloaded from the Caltrans Environmental Division’s webpage, located at <http://www.dot.ca.gov/hq/env/air/index.htm>.

6.4.1 Screening Procedure for Carbon Monoxide Analysis

A CO hotspot screening analysis using the screening procedure in Caltrans’ CO Protocol should be conducted for any project with indirect emissions greater than the applicable ozone project significance thresholds in Section 3.3.1 that may significantly impact roadway intersections that are currently operating at, or are expected to operate at, Levels of Service E, or F. A CO hotspot screening analysis should also be conducted for any project-impacted roadway intersection at which a CO hotspot might occur. It is especially important to conduct such an analysis if a proposed project will either create or contribute to a CO hotspot that may adversely affect the public, especially the young, the elderly, and those with medical conditions that could be exacerbated by elevated CO concentrations. If the screening analysis indicates that there may be a CO hotspot, the CALINE4 model should be run as outlined in Appendix B, “Detailed Analysis,” of the Caltrans CO Protocol.

The screening analysis was designed to estimate 1-hour and 8-hour CO concentrations for projects involving signalized intersections. The methodology estimates 1-hour CO levels, which then can be converted to estimates of 8-hour CO levels. Screening procedures for additional types of projects were under development at the time the Caltrans CO Protocol was being developed and will be released as supplements to the protocol.

Using the screening methodology to calculate an 8-hour average CO concentration as presented in the Caltrans CO Protocol, it is not possible for a project to result in a modeled 1-hour exceedance of the 1-hour CO standard without also causing a violation of the corresponding 8-hour standard. This is a consequence of using a “persistence factor” to convert the modeled 1-hour concentration to an 8-hour concentration.

The purpose of the screening procedure is to obtain conservative estimates of CO concentrations without having to run CALINE4. Step-by-step instructions on how to use the screening procedure are given in Appendix A, “Screening Procedure,” of the Caltrans CO Protocol.

The screening procedure is not applicable to all projects. If the screening procedure assumptions are not appropriate for the subject project, the screening procedure is not applicable, and the CALINE4 model should be used. The main limitations of the screening procedure are presented in Table 6-1, “Scenarios That Should Not Be Modeled Using the Screening Procedure.”

**TABLE 6-1
SCENARIOS THAT SHOULD NOT BE MODELED
USING THE SCREENING PROCEDURE**

Vehicles in cold start mode greater than 50%
Percentage of heavy-duty gasoline trucks greater than 1.2%
Traffic volumes greater than 1,000 vehicles/hour/lane
January mean minimum temperature less than 35° F

The screening analysis requires the user to input certain information, such as intersection type, traffic volume, analysis year, background CO concentration, and average cruise speed. All of the needed information is outlined in the screening protocol. Most of the information is project-specific and must be supplied. The APCD recommends that the highest CO concentration reported over the last three years for either the El Rio or Simi Valley air monitoring stations (whichever is nearest the project site) be used for the background CO concentrations. Table 6-2 gives the highest 1-hour and 8-hour CO concentrations for both the El Rio and Simi Valley monitoring stations for 2000 - 2002. Contact the District at 805/645-1427 for updated information on carbon monoxide levels. The average speed should be the same as that used in the URBEMIS emissions analysis. Typically, that will be 40 miles per hour.

**TABLE 6-2
HIGHEST BACKGROUND CARBON MONOXIDE CONCENTRATIONS FOR –
2000 - 2002 AT THE EL RIO AND SIMI VALLEY MONITORING STATIONS**
(parts per million)

	<u>1-hour</u>	<u>8-hour</u>
El Rio	2.3	1.6
Simi Valley	6.2	4.3

6.4.2 Detailed Procedure for Carbon Monoxide Analysis

If the screening procedure is not applicable for the subject project, or if the screening procedure indicates a potential CO hotspot, the CALINE4 model should be run as outlined in Appendix B, “Detailed Analysis,” of the Caltrans CO Protocol.

CALINE4 also requires the user to supply certain input parameters. The inputs should be as recommended in the CO Protocol, except that the background CO concentrations should be the highest 1-hour and 8-hour CO concentration reported over the last three years for either the El Rio or Simi Valley air monitoring stations (whichever is nearest the project site, see Table 6-2). If inputs other than those recommended in the Caltrans CO Protocol or these Guidelines are used, they should be justified and documented to the satisfaction of the lead agency that such changes are warranted. Documentation and justification of any changes to the CO Protocol default values should be included in the environmental document.

If the CALINE4 model indicates that the project may cause a CO hotspot (or contribute to an existing hotspot), a finding of significant impact should be made, unless mitigation measures can be implemented that reduce the hotspot concentration to less than the applicable CO standard. Mitigation measures to reduce significant CO impacts are discussed in Section 7.5.5, “Carbon Monoxide Mitigation.”

6.5 TOXIC AIR CONTAMINANTS

All projects that may emit TACs should be assessed to determine whether those TAC emissions may adversely impact nearby populations. When considering potential TAC impacts, lead agencies should consider both of the following situations: 1) a proposed new or modified facility that may emit TACs near existing land uses; and, 2) a new land use proposed near an existing facility that emits TACs.

6.5.1 Determining Whether the Project Will Emit Toxic Air Contaminants

The first step in determining whether a proposed project may adversely impact nearby populations with TACs is for the lead agency to determine whether the subject project will emit toxic substances. This information may be obtained from the project applicant as part of the permit review process. The lead agency should inquire about the types and amounts of toxic substances the facility may use and emit to the atmosphere. Lead agencies also can refer to Appendix D, Major Toxic Air Contaminant Regulations and Common Toxic Air Contaminant Sources and Substances, for a list of common TAC sources and substances that may be encountered at facilities in Ventura County. Moreover, many types of equipment and processes that require a District Permit to Operate also emit TACs. Therefore, lead agencies can refer to Appendix B, Common Equipment and Processes Requiring a Ventura County APCD Permit to Operate.

In addition to the TAC sources and substances listed in Appendix D, the lead agency also should refer to the extensive list of toxic chemicals called the *Title III List of Lists, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-know Act (EPCRA) and Section 112(r) of the Clean Air Act, as Amended*. This list can be downloaded from <http://www.epa.gov/ceppo/pubs/title3.pdf>. This consolidated chemical list includes chemicals subject to reporting requirements under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), and chemicals listed under Section 112(r) of Title III of the Clean Air Act (CAA) of 1990, as amended. Lead agencies also can refer to State of California's Office of Environmental Health Hazard Assessment (OEHHA) website at <http://www.oehha.ca.gov/home.html>. This page provides access to OEHHA's Toxicity Criteria Database, the Proposition 65 list of chemicals known to the State of California to cause cancer, birth defects or other reproductive harm, and information regarding TAC health risk assessments.

Finally, lead agencies can contact the District's Air Toxics Section at 805/645-1405 or 805/645-1478 to obtain information regarding whether a facility, facility type, or operation emits or will emit TACs. This can be particularly important and useful because health risk assessments have been conducted for many such facilities in Ventura County under the District's Air Toxics "Hotspots" Program. These health risk assessments are on file with the District and are available for public review.

6.5.2 Assessing the Impact of Toxic Air Contaminant Emissions

If a lead agency determines that a project it is considering will emit TACs, the next step is to assess the potential of those toxic emissions to adversely impact nearby populations. This determination can be made by conducting an appropriate TAC health risk assessment.

The California Air Pollution Control Officers Association (CAPCOA) has developed TAC health risk assessment guidelines to provide consistent, statewide procedures for preparing the health risk assessments required under the Air Toxics "Hot Spots" Act. The title of these guidelines is *CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines*. The current version of the CAPCOA guidelines is dated October 1993. The CAPCOA guidelines can be downloaded from the California Air Resource Board's (ARB) website at <http://www.arb.ca.gov/ab2588/riskassess.htm>.

The District has prepared a supplement to the CAPCOA guidelines for preparing health risk assessments in Ventura County. The District's supplemental guidelines is titled *Supplement to the CAPCOA Air Toxics "Hot Spots" Program Risk Assessment Guidelines*. The current version of this document is dated March 23, 1995, and can be downloaded from the District's website at http://www.vcapcd.org/air_toxics.htm. The District recommends that lead agencies conduct TAC risk assessments in accordance with

the CAPCOA Risk Assessment Guidelines, as supplemented by the District's supplemental guidelines.

The CAPCOA Risk Assessment Guidelines contain procedures for both screening level and formal health risk assessments. Because formal TAC health risk assessments can be complex and time consuming, a screening health risk analysis is useful for quickly defining a worst-case estimate of risk and for determining if further analysis using a formal health risk assessment is needed. However, a screening health risk assessment for a project is not appropriate if the assumptions and parameters on which the screening risk analysis is based are not suitable for the subject project. In such a case, the screening analysis may not be accurate and a formal risk assessment should be conducted.

If the results of the screening analysis show that the lifetime excess cancer risk to the maximum exposed individual is less than one in one-million and the hazard indices for acute and chronic noncancer health effects are less than 0.1, no further analysis for TAC impacts is needed. If the results are greater than these values, then a formal health risk assessment should be conducted. The results of both the screening health risk assessment and the formal health risk assessment should be included and documented in the environmental document for the project.

Lead agencies also should consult with the District's Engineering and Permit Division at 805/645-1421 or 805/645-1405 as early as possible in their respective project review and approval process for projects that will emit TACs. Such projects also may require a Permit to Operate from the District. All projects that require a District Permit to Operate are evaluated by the District for potential TAC impacts. Moreover, California Health and Safety Code §42301.6 and Public Resources Code §21151.8 (a)(2), require that any new school, or proposed industrial or commercial project site located within 1,000 feet of a school, must be referred to the District for review.

6.5.3 Projects Near Existing Sources of Toxic Air Contaminants

Proposed new land uses that will be located within one-quarter mile of an existing source (or sources) of TACs should be evaluated for the potential to be impacted by those TACs. A lead agency processing a land use entitlement for a project near an existing source of toxic air emissions should consult with the District's Air Toxics Section to review any toxic air emissions information, especially health risk assessments, the District may have regarding that source of toxic air emissions. Such information may have been gathered by the District pursuant to the District's AB 2588 Air Toxics "Hot Spots" Program and as part of the air pollution permit process for facilities that require air pollution permits.

If the District has required a health risk assessment for the existing TAC source, the lead agency should, in consultation with the District, review that health risk assessment to determine an area around the source within which people in the proposed project would be exposed to either a cancer or noncancer risk in excess of the significance thresholds for

TACs presented in Section 3.3.2, “Other Pollutants of Concern.” If there is more than one source of toxic air emissions within one-quarter mile of the proposed project, the lead agency should develop an individual health risk for the proposed project based on the health risk assessments for all of the identified toxic air emissions sources.

If a health risk assessment has not been done for the nearby source of TACs, the lead agency should make a reasonable attempt to gather toxic air emissions information from that source. No proprietary information should be needed to perform the health risk assessments. A health risk assessment then should be conducted for that source if the lead agency has obtained sufficient information on which to base the assessment. The lead agency should consult with the District’s Air Toxics Section to determine whether the location of the proposed project relative to the TAC source has the potential to subject people in the proposed project to TAC risks in excess of the TAC significance thresholds presented in Section 3.3.2, “Other Pollutants of Concern.” Pursuant to CEQA §15151, the sufficiency of the air toxics analysis should be reviewed in light of what is reasonably feasible.

Based on the results of the preceding analyses, a determination should be made by the lead agency as to whether the subject project, as proposed, would subject the population of the project to significant TAC impacts. If it is determined that the population would be subjected to a significant TAC impact, appropriate mitigation measures should be proposed to reduce that impact to acceptable levels. TAC mitigation measures are discussed in Section 7.5.6, “Toxic Air Contaminant Mitigation.”

6.5.4 Asbestos

Asbestos is listed as a TAC by both the State of California and by the U.S. EPA. It is discussed in these Guidelines as a separate TAC issue because of its widespread presence in the environment, its human health implications, and its concern among the public.

Construction projects sometimes require the demolition of existing buildings at the project site. Depending upon the types of building materials that were used and the year in which the building was constructed, many different areas and fixtures in a building may contain asbestos. Exposure to asbestos may cause serious health effects. For example, asbestos exposure can increase the risk of lung cancer by five times. Cancer of the stomach and internal organs such as the mouth, esophagus, larynx, kidneys, and colon can also be caused by asbestos exposure. Asbestos is likely to be found in buildings constructed before 1979 and almost certain to be present in those built before 1950.

Demolition or renovation activities involving asbestos materials are subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as listed in the Code of Federal Regulations (40 CFR Part 61, Subpart M). These regulations apply to commercial projects as well as some types of residential projects, and require a thorough inspection (or survey) of the site that is to be demolished or renovated

to determine whether asbestos materials are present. These regulations also contain notification and remediation requirements.

Demolition or renovation activities involving asbestos materials also are subject to APCD Rule 62.7, Asbestos, Demolition and Renovation. The District's Compliance Division should be contacted at 805/645-1443 to determine any asbestos inspection and compliance requirements before commencing demolition or renovation of any building. Compliance with APCD Rule 62.7 is adequate to ensure that asbestos entrainment will not cause a significant adverse impact.

Additional information regarding asbestos materials and regulation of activities involving asbestos can be found at the District's website located at <http://www.vcapcd.org/asbestos.htm>.

6.6 ODORS

The environmental document for a proposed project should include an assessment of the potential for a proposed project to cause a public nuisance by subjecting surrounding land uses to objectionable odors. A public nuisance is defined by APCD Rule 51, Nuisance, as "...such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or to the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." The assessment also should evaluate the potential for a proposed project to be impacted by objectionable odors from nearby existing or proposed land uses. Potential odor impacts on residential areas, schools, day care centers, playgrounds, retirement homes, convalescent homes, hospitals, and job sites warrant the closest examination. Any project that has the potential to create a public nuisance by subjecting members of the public to objectionable odors should be deemed to have a significant odor impact.

The first step in an odor analysis is to determine whether the proposed project (or nearby source) could generate odorous emissions in such quantities as to be a nuisance to nearby land uses (or to the proposed project). This should be based on information submitted by the project applicant and on the lead agency's and the District's knowledge and experience with the same or similar facility type. For example, new housing developments generally do not cause odor nuisances to nearby land uses. However, a proposed fiberglass manufacturing facility near an existing or proposed residential development may pose a nuisance to the residents of that development because of odors. Table 6-3, "Project Screening Distances for Odorous Land Uses," lists facility types known to emit objectionable odors and thus may be sources of nuisance odors to nearby land uses. The list is a guide and, as such, is not all-inclusive. Other types of facilities not on the list also may generate objectionable odors. Lead agencies should consider the odor potential of each new project based on its type and its location with respect to other land uses that may be adversely affected by any odors the proposed project may generate.

For projects that may generate odorous emissions, or may be impacted by odorous emissions, the next step is to determine if the potential source of the odors, or the potential receptor of the odors, is closer than the screening distances in Table 6-3.

If the source (or a similar type) is listed on Table 6-3, and the distance between the source and the receptor of the subject odors is closer than the distances in Table 6-3, a more thorough evaluation should be conducted. The evaluation should be based on possible objectionable odors associated with the same or similar facilities, the type and potential severity of the odorous emissions, the probability of process operations (including possible short-term process upsets) releasing odorous emissions, complaint history associated with those projects (contact the District's Compliance Division at 805/645-1445 for information regarding a facility's complaint history), the distance between the potential odorous source, prevailing wind direction and speed, the percentage of time that a potential affected population will be located downwind of the proposed project, and any other information that the lead agency finds applicable.

For a project locating near an existing source of odorous emissions, a significant odor impact may occur if the odor source has:

- More than one confirmed odor complaint per year with the District, averaged over a three-year period.
- Three unconfirmed odor complaints per year with the District, averaged over a three-year period.

Any odor complaints should be mapped in relation to the odor source to establish a general boundary for any possible odor impacts. It should be noted that, due to confidentiality requirements regarding citizen nuisance complaints to the District, only the block number of any such complaints will be given. The name and address of the complainants, and the date of the complaints, will not be given.

For new projects that may emit odorous emissions, the analysis should consider the distance and frequency of odor complaints that have occurred in the vicinity of similar facilities.

If it is determined that a proposed project may either cause a significant odor impact, or be significantly impacted by odors from an existing facility, all feasible mitigation measures should be applied to minimize or eliminate the odors. Mitigation measures to reduce significant odor impacts are discussed in Section 7.5.7, "Odor Mitigation."

**TABLE 6-3
PROJECT SCREENING DISTANCES
FOR ODOROUS LAND USES**

Land Use	Screening Distance
Wastewater Treatment Facilities*	2 miles
Sanitary Landfills*	1 mile
Solid Waste Transfer Station*	1 mile
Composting Facilities*	1 mile
Asphalt Batch Plants*	1 mile
Painting and Coating Operations*	1 mile
Fiberglass Operations*	1 mile
Food Processing Facilities*	1 mile
Coffee Roasters**	1 mile
Commercial Charbroiling**	1 mile
Feed Lots/Dairies*	1 mile
Petroleum Refineries*	2 miles
Chemical Manufacturing Facilities*	1 mile
Green Waste and Recycling Operations**	2 miles
Wastewater Pumping Facilities**	1 mile
Mushroom Farms**	2 miles
Petroleum Extraction, Processing, Storage, and Non-retail Marketing Facilities**	1 mile
Rendering Plants*	1 mile
Metal Smelting Plants**	1 mile

*Guide for Assessing and Mitigating Air Quality Impacts, Table 4-2, "Project Screening Trigger Levels for Potential Odor Sources," San Joaquin Valley Unified Air Pollution Control District, August 1998.

**Ventura County APCD staff, August 2000.

7. MITIGATION MEASURES

7.1 INTRODUCTION

This chapter provides guidance on selecting mitigation measures for projects that may have a significant impact on air quality. The chapter also includes guidance for evaluating mitigation measure effectiveness, implementation, and monitoring. The mitigation measure tables in the chapter contain measures, organized by type, that project proponents and public agencies can consider to mitigate a project's air quality impacts. The tables of mitigation measures are not intended to be exhaustive, and lead agencies and project proponents are encouraged to identify and quantify additional appropriate mitigation measures for specific projects. Mitigation measures to reduce emissions from project construction are presented in Section 7.4, "Construction Mitigation." Section 7.5, "Project Mitigation" presents measures that can be used to reduce emissions during the "operational" period of the project, after project construction has been completed.

7.2 CEQA REQUIREMENTS FOR MITIGATION MEASURES

The California Environmental Quality Act (CEQA) Guidelines require that Environmental Impact Reports (EIRs) "describe measures which could minimize significant adverse impacts" (California Code of Regulations (CCR) §15126(c)). In addition, the CCR states that "a public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures that would substantially lessen any significant effects that the project would have on the environment" (CCR §15021(a)(2)).

"Feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (CCR §15364). Lead agencies are responsible for determining the feasibility of mitigation measures. If impacts identified in the environmental analysis cannot be mitigated below the significance threshold, they must, nevertheless, be reduced as much as feasible. Air quality thresholds of significance are discussed in Chapter 3, Air Quality Significance Thresholds.

In making a finding concerning the feasibility of mitigation measures, the CCR allows public agencies to find that "specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives in the final EIR" (CCR §15091(a)(3)). However, in making such a finding, CCR §15091(b) states that the findings "shall be supported by substantial evidence in the record." Furthermore, the courts have ruled that the agency must present some explanation to supply the logical step between the ultimate finding and the facts in the record.

It is possible that project emissions will still be significant after inclusion of all feasible mitigation measures. A public agency may approve a project with a significant

environmental impact. According to the CEQA Guidelines, “if the specific economic, legal, social, technological, or other benefits of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered ‘acceptable’” (CCR §15093(a)). In doing so, “the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record” (CCR §15093(b)). The decision-making agency must make a statement in the record of its views on the ultimate balancing of the merits of approving the project despite the environmental impact. If an agency makes a statement of overriding consideration, the statement should be included in the record of the project approval and should be mentioned in the notice of determination.

An air quality section of an environmental document must identify all potential effects of a project on the environment and examine available alternatives to avoid, minimize, reduce, eliminate, or compensate for significant impacts. For each potential adverse impact, mitigation measures should be identified to reduce impacts below the air quality threshold of significance (see Section 3.3, “Significance Criteria”). Design modifications that could reduce impacts also should be considered. The control effectiveness of each measure should be quantified to the extent possible. If a measure cannot be quantified, a qualitative discussion should be provided explaining the benefits of the proposed mitigation measure. If a proposed mitigation measure has the potential to cause a significant effect, the effects of the mitigation measure should be discussed, though in less detail than the proposed project (CCR §15126.4(D)).

7.2.1 Effectiveness Estimates

Mitigation measure effectiveness estimates should be based on reasonable assumptions about the project. When developing mitigation measures for environmental documents, the lead agency should document all assumptions and sources used in determining the measure’s effectiveness. This includes what emissions will be affected by the measure, how the measure will affect the targeted emissions, the source of the effectiveness estimate for the measure, and any circumstances that warrant effectiveness beyond the minimum effectiveness estimates contained in URBEMIS, these Guidelines, or other sources.

7.2.2 Implementation, Monitoring, and Enforceability

The lead agency should identify the method of measure implementation, monitoring, and enforceability at the time of measure development, including:

- Who is responsible for implementation.
- What must be done, and for how long.
- Where it is to be carried out.

- An implementation schedule, including interim implementation targets if the project is to be phased.
- What additional measures, if any, must be done and by whom if: 1) the measure is implemented but does not achieve the anticipated emission reductions, or 2) the entity responsible for implementation fails to implement the measure.
- Who is responsible for monitoring measure implementation.
- Criteria for assessing whether the measure has been implemented.
- Enforcement mechanisms to ensure implementation.

Implementation

CEQA provides that mitigation includes “reducing or eliminating the impact over time by preservation or maintenance operations during the life of the action” (CCR §15370(d)). However, for many projects, the life of the action may be difficult to determine. Residential projects may have a life span of 50 years or more. Commercial and industrial projects may have a life span of 10 years or less. Frequently, jurisdictions will issue conditional use permits for commercial and industrial projects for only 5 or 10 years, after which the project must reapply for an extension or modification of the existing conditional use permit, at which time additional conditions may be imposed.

Monitoring

CEQA requires that a public agency that incorporates changes or alterations to a project to mitigate significant effects must also adopt monitoring or reporting requirements for the mitigation measures that it imposes. Monitoring or reporting requirements must be adopted for mitigation measures required through EIRs and for Mitigated Negative Declarations (MNDs). The monitoring or reporting requirements must be adopted when the agency makes findings required by CEQA for project approval (Public Resources Code (PRC) §21081.6(a)). Each lead agency should determine how long monitoring or reporting requirements are necessary given that the motor vehicle fleet is becoming cleaner over time and that new technology will be available in the future that will substantially lessen the emissions thereafter.

Enforceability

The lead agency should structure mitigation measure implementation and enforcement in such a way as to maximize the likelihood that the measure will be fully implemented, as required by Public Resources Code §21081.6(b), which states:

A public agency shall provide that measures to mitigate or avoid significant effects on the environment are fully enforceable through permit conditions, agreements, or other measures. Conditions of project approval may be set forth in referenced documents which address required mitigation measures or, in the case of the adoption of a plan, policy, regulation, or other public project, by incorporating the mitigation measures into the plan, policy, regulation, or project design.

A lead agency can implement mitigation measures through such mechanisms as land use entitlement conditions, recording the conditions on the property title, incorporating the mitigation measures in a development agreement, incorporating the mitigation measures into the project description or specific plan, or by drawing up a mitigation agreement between the project proponent and the lead agency.

7.3 PLAN-LEVEL MITIGATION

This section describes Ventura County Air Pollution Control District (APCD or District) recommendations for lead agencies preparing environmental documents for large-scale plans and policy documents including (but not limited to): general, community, master, area, specific, and local coastal plans. Since these plans and policy documents are intended to guide development patterns, they are an ideal mechanism to encourage land use design and development that minimizes air quality impacts. The most appropriate stage to address issues, such as allowable land use densities, mixing of land uses, street standards, and parking requirements, is at the plan level. Many of the specific mitigation measures discussed in Section 7.5.2, “Operational Mitigation Measures,” can be promoted at the plan level through zoning ordinances, parking standards, and design guidelines. Additionally, both the California Air Resources Board website at <http://www.arb.ca.gov> and the U.S. Environmental Protection Agency website at <http://epa.gov> have recommendations for designing projects to reduce air quality impacts. Incorporating air quality strategies into plan and policy documents can minimize the need for mitigation of individual development proposals.

Cities and the County should consider the following strategies when developing or revising plan and policy documents:

- A commitment to determine and mitigate project level and cumulative air quality impacts under CEQA (including implementation of the transportation control measures in the *Ventura County Air Quality Management Plan* (AQMP), such as the Transportation Demand Management (TDM) Facilities Ordinance (TCM B), Non-motorized Strategies (TCM D), and Regional Transit Programs (TCM E)).
- A commitment to integrate land use plans, transportation plans, and air quality plans.
- A commitment to plan land uses in ways that support a multi-modal transportation system.

- A commitment to take local action to support programs that reduce congestion and vehicle trips.

7.4 CONSTRUCTION MITIGATION

The mitigation measures described in this section are designed to control emissions caused by project construction activities - grading, clearing, excavation, earth moving, and mobile equipment necessary to perform these activities. Measures to control fugitive dust caused by project construction are presented in Section 7.4.1, “Fugitive Dust Mitigation Measures.” Measures to control Valley Fever fungal spore entrainment are presented in Section 7.4.2, “Valley Fever Mitigation Measures.” Measures to control reactive organic compounds (ROC) and oxides of nitrogen (NOx) emissions from project construction are presented in Section 7.4.3, “ROC and NOx Construction Mitigation Measures.”

As discussed in Section 5.2, “Calculating Ozone Precursor Emissions from Project Construction,” construction-related ROC and NOx emissions are not counted toward the ROC and NOx significance thresholds, since these emissions are only temporary. Therefore, when calculating project emissions using URBEMIS, construction emissions should not be included in the analysis; only area source emissions and operational emissions boxes should be included. However, after project emissions have been calculated, the user may want to access the construction mitigation measures component of the program. If so, in the “Load an Existing Project” screen, select “Edit These Project Settings,” then check the construction box in the “Project Emission Sources” panel. This will enable you to access the construction module of the URBEMIS program, including the mitigation measure screens. Additional mitigation measures not quantified by URBEMIS can be included in the construction emissions analysis by choosing the user defined mitigation tabs for each of the three construction phases.

Since the air pollutant levels in Ventura County exceed the state and federal ozone standards and the state PM₁₀ standard, APCD recommends that lead agencies include measures in Sections 7.4.1, “Fugitive Dust Mitigation Measures,” and 7.4.3, “ROC and NOx Construction Mitigation Measures,” in all projects that include construction activities, with special attention given to projects that require a grading permit. If the project poses a risk for Valley Fever (see Section 6.3, “San Joaquin Valley Fever”), APCD recommends that the measures in Section 7.4.2, “Valley Fever Mitigation Measures,” be included (in addition to the measures in Section 7.4.1, “Fugitive Dust Mitigation Measures,” to minimize Valley Fever fungal spore entrainment.

7.4.1 Fugitive Dust Mitigation Measures

Control techniques for fugitive dust generally involve watering, chemical dust control agents for soil stabilization, scheduling of activities, and vehicle speed control. Watering, the most common and generally least expensive method, provides only temporary dust

control. Watering also usually requires the use of diesel-powered watering trucks or pumps. The effectiveness of water for fugitive dust control depends greatly on the prevailing weather conditions and frequency of application. Chemical dust control agents provide longer dust suppression, but are not effective in reducing the large portion of construction dust emissions caused by grading, excavation, and cut-and-fill operations. Dust control agents for soil stabilization are useful primarily for application on completed cuts, fills, and unpaved roadways. Fugitive dust emissions from inactive portions of a construction site can be reduced up to 80 percent with chemical stabilizers. Chemical stabilizers, however, may be costly and should be limited to environmentally-safe materials to avoid adverse effects on plant and animal life.

Scheduling activities during periods of low wind speed will also reduce fugitive dust emissions. Low wind speeds typically occur during morning hours. Highest wind speeds are observed during Santa Ana wind conditions, which commonly occur between October and February with December having the highest frequency of events. Additionally, vehicle speed control can reduce fugitive dust emissions from unpaved roads and areas at construction sites by up to 60 percent, assuming compliance with a 15 miles per hour (mph) on-site speed limit.

Fugitive dust mitigation measures are presented below, as a model Fugitive Dust Mitigation Plan. This model plan is intended to be a starting point for lead agencies to use for fugitive dust mitigation. As new measures become available or known, lead agencies should add them to their standard list of fugitive dust mitigation measures. The model fugitive dust plan can be incorporated into a project in a variety of ways, including (but not limited to): part of a project description, developer agreement, as project conditions, or as part of a larger air quality or project mitigation plan.

7.4.1.1 Model Fugitive Dust Mitigation Plan

1. The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized to prevent excessive amounts of dust.
2. Pre-grading/excavation activities shall include watering the area to be graded or excavated before commencement of grading or excavation operations. Application of water (preferably reclaimed, if available) should penetrate sufficiently to minimize fugitive dust during grading activities.
3. Fugitive dust produced during grading, excavation, and construction activities shall be controlled by the following activities:
 - a) All trucks shall be required to cover their loads as required by California Vehicle Code §23114.
 - b) All graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved on-site roadways, shall be treated to prevent fugitive dust. Treatment shall include, but not necessarily be limited to, periodic

watering, application of environmentally-safe soil stabilization materials, and/or roll-compaction as appropriate. Watering shall be done as often as necessary and reclaimed water shall be used whenever possible.

4. Graded and/or excavated inactive areas of the construction site shall be monitored by (indicate by whom) at least weekly for dust stabilization. Soil stabilization methods, such as water and roll-compaction, and environmentally-safe dust control materials, shall be periodically applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area should be seeded and watered until grass growth is evident, or periodically treated with environmentally-safe dust suppressants, to prevent excessive fugitive dust.
5. Signs shall be posted on-site limiting traffic to 15 miles per hour or less.
6. During periods of high winds (i.e., wind speed sufficient to cause fugitive dust to impact adjacent properties), all clearing, grading, earth moving, and excavation operations shall be curtailed to the degree necessary to prevent fugitive dust created by on-site activities and operations from being a nuisance or hazard, either off-site or on-site. The site superintendent/supervisor shall use his/her discretion in conjunction with the APCD in determining when winds are excessive.
7. Adjacent streets and roads shall be swept at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.
8. Personnel involved in grading operations, including contractors and subcontractors, should be advised to wear respiratory protection in accordance with California Division of Occupational Safety and Health regulations.

7.4.2 Valley Fever Mitigation Measures

As discussed in Section 6.3, “San Joaquin Valley Fever,” if the project site poses a risk for Valley Fever, APCD recommends that the lead agency include appropriate Valley Fever mitigation measures in the environmental document for the project. These measures should be considered, in addition to the fugitive dust mitigation measures listed in Section 7.4.1, “Fugitive Dust Mitigation Measures,” to minimize Valley Fever risk during project construction:

1. Restrict employment to persons with positive coccidioidin skin tests (since those with positive tests can be considered immune to reinfection).
2. Hire crews from local populations where possible, since it is more likely that they have been previously exposed to the fungus and are therefore immune.
3. Require crews to use respirators during project clearing, grading, and excavation operations in accordance with California Division of Occupational Safety and Health regulations.

4. Require that the cabs of grading and construction equipment be air-conditioned.
5. Require crews to work upwind from excavation sites.
6. Pave construction roads.
7. Where acceptable to the fire department, control weed growth by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.
8. During rough grading and construction, the access way into the project site from adjoining paved roadways should be paved or treated with environmentally-safe dust control agents.

7.4.3 ROC and NOx Construction Mitigation Measures

As discussed in Chapter 5, Estimating Ozone Precursor Emissions, ozone precursor emissions from construction vehicles can be substantial. However, there are very few feasible measures available to reduce these emissions. APCD recommends the following measures to mitigate ozone precursor emissions from construction motor vehicles:

1. Minimize equipment idling time.
2. Maintain equipment engines in good condition and in proper tune as per manufacturers' specifications.
3. Lengthen the construction period during smog season (May through October), to minimize the number of vehicles and equipment operating at the same time.
4. Use alternatively fueled construction equipment, such as compressed natural gas (CNG), liquefied natural gas (LNG), or electric, if feasible.

7.5 PROJECT MITIGATION

The mitigation measures described in this section are designed to control emissions caused by activities at the project site after construction is completed and the project is operational. Mitigation measures to control area source emissions from the project are presented in Section 7.5.1, "Area Source Mitigation Measures." Mitigation measures to control operational emissions are presented in Section 7.5.2, "Operational Mitigation Measures." Mitigation measures that can be applied to a project, but which may take place at a location other than the project site, are presented in Section 7.5.3, "Off-Site TDM Fund."

URBEMIS contains project mitigation measure options. When running the program, checking the "Mitigation Measures" boxes in the main screens for area source emissions and operational emissions can access those options, respectively. Additional mitigation measures not quantified by URBEMIS can be included in the project emissions analysis by choosing "New Area Source Mitigation Measures" in the Area Emissions main screen

(see Section III.7 of the URBEMIS User's Guide), and by choosing "User Measure" in the Operational Emissions main screen (see Section III.8 of the URBEMIS User's Guide).

7.5.1 Area Source Mitigation Measures

Area sources are sources that individually emit small quantities of air pollutants, but which cumulatively may generate significant quantities of emissions. Area source emissions include fuel combustion from natural gas appliances, utility engines (including landscape maintenance equipment), and consumer products. Area source mitigation measures include, but are not limited to, energy efficiency measures to reduce air emissions associated with energy generation and use. Such measures include increasing structural energy efficiency beyond the requirements of California's Title 24 energy efficiency standards (Title 24, California Code of Regulations, Part 6 - *California Energy Efficiency Standards for Residential and Nonresidential Buildings*). Title 24, Part 6 can be downloaded from <http://www.energy.ca.gov/title24/>.

Area source mitigation measures to reduce project emissions are listed in Table 7-1, "Area Source Mitigation Measures."

APCD recommends that area source mitigation measures be included in all projects that have been determined to have a significant air quality impact. If, after including all feasible area source mitigation measures, the project still exceeds the ROC and NO_x significance thresholds, operational mitigation measures (Section 7.5.2, "Operational Mitigation Measures") should be applied to the project.

**TABLE 7-1
AREA SOURCE MITIGATION MEASURES**

Emission Source	Mitigation Measure	Emission Reduction (%)	
		ROC	NOx
Residential Water Heaters	Use solar or low emission water heaters	11	9.5
	Use central water heating systems	9	8
Residential Heating	Orient buildings to the north for natural cooling and heating	14	13
	Increase walls and attic insulation beyond Title 24* requirements	14	13
	Provide electric maintenance equipment	100	100
Residential Landscape Maintenance	Provide electric maintenance equipment	100	100
Commercial Water Heaters	Use solar or low-emission water heaters	0.5	0.5
	Use central water heating systems	0.5	0.5
Commercial Heating	Orient buildings to the north for natural cooling and heating	11	13.5
	Increase walls and attic insulation beyond Title 24* requirements	10	9
	Provide electric maintenance equipment	100	100
Commercial Landscape Maintenance	Provide electric maintenance equipment	100	100
Industrial Heating	Orient buildings to the north for natural cooling and heating	2	3

*Title 24, California Code of Regulations, Part 6 - California Energy Efficiency Standards for Residential and Nonresidential Buildings

Source: URBEMIS User's Guide, Yolo-Solano Air Quality Management District, November 2002.

7.5.2 Operational Mitigation Measures

Operational emissions include emissions associated with motor vehicle trips generated by or attracted to land uses, and from dust generated by motor vehicles associated with the project on paved or unpaved roads. For many land uses, motor vehicle trips are often the primary source of emissions associated with the project. These motor vehicle trip emissions associated with land uses are often referred to as "indirect sources" of emissions. Broadly speaking, mitigation measures to reduce emissions from project operation include strategies that reduce vehicle trips or vehicle miles traveled (VMT), use of low emission vehicles, and measures that improve traffic flow or reduce congestion.

The URBEMIS program categorizes operational mitigation measures by project type - either residential or non-residential (commercial/industrial). The program requires input

of two types of information: 1) information about the environment surrounding the project area (called "Environmental Factors" on the Operational Emission Sources main screen), and 2) information about the mitigation actually being done for the project (called "Vehicle Trip Mitigation"). URBEMIS applies the environmental factors created by the project environment screens to the project specific mitigation measures. This results in percent reduction in trips and reductions in VMT. Correction factors are then applied to account for differences in measure effectiveness by trip type and trip distance. Emission factors are then applied to the trips and VMT reductions to yield mitigation measure emission reductions.

Environmental Factors

Environmental factors describe conditions that exist or are planned around the project area with regard to the pedestrian, bicycle, and transit environment. These screens require a qualitative assessment of conditions surrounding the project areas. The user has two options: selecting the default settings, which is the level achievable by a standard suburban-oriented subdivision or commercial development; or, developing environmental factors by going through a series of screens describing the pedestrian, transit, and bicycle environment surrounding the project.

One factor that lead agencies should consider in evaluating the project environment is each jurisdiction's locally-adopted Transportation Demand Management (TDM) Facilities Ordinance. These ordinances were adopted by all of the cities and the County of Ventura as required by state law related to the Congestion Management Plan (CMP) requirements. The Ventura County Transportation Commission adopted a model ordinance which contains the following seven basic elements, which were to be included in all local ordinances in Ventura County:

1. Standards for the number, size, and location of preferential carpool and vanpool parking spaces.
2. Standards for the number and location of bicycle racks and/or lockers.
3. Requirements for the provision, where feasible and appropriate, of transit stop improvements (i.e., bus pullouts, bus pads, shelters, etc.)
4. Requirement for the provision of a transportation information center at non-residential developments serving 50 or more employees.
5. Safe and convenient access for pedestrians and bicyclists from the external circulation system to on-site buildings or internal streets/sidewalks.
6. A formal role for transit operators in the local jurisdiction's environmental and developmental review processes.
7. Requirements for large developments to address the provision of needed services in close proximity to either jobs or housing.

Vehicle Trip Mitigation

The Vehicle Trip Mitigation screens describe measures associated with the specific project being implemented. URBEMIS categorizes these project measures as follows: regional and non-regional transit measures, residential measures, and non-residential measures. Operational mitigation measures to reduce project emissions are listed in Table 7-2, “Operational Mitigation Measures.” APCD recommends that the mitigation measures selected for a project be developed and implemented within a comprehensive on-site program, where possible, to enhance the effectiveness of the individual measures. Appendix R-94, Transportation Control Measure Documentation, of the *Ventura County Air Quality Management Plan* can also be used for information about transportation control measures.

As stated in Section 5.3, “Calculating Emissions from Residential, Commercial, Industrial, and Institutional Development Projects,” emissions from stationary sources, including industrial equipment, are controlled through the Ventura County APCD permit, inspection, and enforcement programs and procedures, and, therefore, are not addressed in these Guidelines.

APCD recommends that operational mitigation measures be included in projects that have been determined to have a significant air quality impact, even after including all feasible area source mitigation measures (Section 7.5.1, “Area Source Mitigation Measures”). If the project exceeds the ROC and NO_x significance thresholds after inclusion of area and operational mitigation measures (Sections 7.5.1, “Area Source Mitigation Measures,” and 7.5.2, “Operational Mitigation Measures”), off-site TDM fund mitigation measures (Section 7.5.3, “Off-site TDM Fund”) should be applied to the project.

Project applicants may propose other mitigation measures not included in these Guidelines. Project applicants and lead agencies should consult with the Ventura County APCD before including miscellaneous mitigation measures in an environmental document.

**TABLE 7-2
OPERATIONAL MITIGATION MEASURES**

Measure Type	Mitigation Measure	Max. Trip Reduction (%)[*]
<u>Residential</u>		
Transit Infrastructure	Project density meets transit level of service requirements	6
	Provide transit shelters, benches, etc.	2
	Provide street lighting	0.5
	Provide route signs and displays	0.5
	Provide bus turnouts/bulbs	1
Pedestrian Infrastructure	Mixed use project (residential oriented)	3
	Provide sidewalks and/or pedestrian paths	1
	Provide direct pedestrian connections	1
	Provide pedestrian safety design/infrastructure	0.5
	Provide street furniture and artwork	0.5
	Provide street lighting	0.5
	Provide pedestrian signalization and signage	0.5
Bicycle Infrastructure	Provide bike lanes/paths connecting to bikeway system	2 **
Trip Reduction/VMT	Park-and-ride lots	***
	Satellite telecommuting center	***
<u>Commercial/Industrial</u>		
Transit Infrastructure	Project density meets transit level of service requirements	6
	Provide transit shelters, benches, etc.	2
	Provide street lighting	0.5
	Provide route signs and displays	0.5
	Provide bus turnouts/bulbs	1
Pedestrian Infrastructure	Mixed use project (commercial oriented)	1
	Floor area ratio 0.75 or greater	1
	Provide wide sidewalks and onsite pedestrian facilities	1
	Project uses parking structure(s)/small dispersed lots	1

TABLE 7-2 (CONTINUED)

Measure Type	Mitigation Measure	Max. Trip Reduction (%)[*]
<u>Commercial/Industrial</u>		
Pedestrian	Provide street lighting	0.5
Infrastructure (cont'd)	Project provides shade trees to shade sidewalks	0.5
	Project provides street art and/or street furniture	0.5
	Project uses zero building setback with entrance on street	0.5
	Provide pedestrian safety designs/infrastructure at crossings	0.5
	Articulated storefront display windows for visual interest	0.25
	No long uninterrupted walls along pedestrian access routes	0.25
	Bicycle Infrastructure	Provide bike lanes/paths connecting to bikeway system
	Provide secure bicycle parking	1
	Provide employee lockers and showers	1
Trip Reduction	Charge for employee parking	
	- more than \$5/day	10
	- \$3-\$5/day	4
	- less than \$3/day	2
	Shuttle/minibus service to transit/multi-modal center	2
	Preferential carpool/vanpool parking	1.5
	Parking limited (below minimum)	1
	Employee rideshare incentive program	1
	Day care center on-site or within ½ mile	1
	Employee telecommuting program	40
	Compressed work schedule	
	- 3/36	40
	- 4/40	20
	- 9/80	10
Charge for customer parking		
- \$1/hour	11	
- \$0.60/hour	5	
- \$0.25/hour	2	

TABLE 7-2 (CONTINUED)

Measure Type	Mitigation Measure	Max. Trip Reduction (%)[*]
<u>Commercial/Industrial</u> VMT	Lunch/shopping shuttle service	1.5
	Provide on-site shops and services	
	- many frequently needed services	5
	- some frequently needed services	3
Trip Reduction/VMT	- minor services	1
	Park-and-ride lots	**
	Satellite telecommuting center	***

* URBEMIS Program Screens, Yolo-Solano Air Quality Management District, November 2002.

**number of spaces x 89% x miles/trip = miles reduced.

***number of workstations x 89% x miles/trip = miles reduced.

7.5.3 Contribution to an Off-Site TDM Fund

The Off-Site TDM Fund is a mitigation measure than can be used by project proponents for projects and programs that exceed the ROC and NOx significance thresholds. This measure applies to commercial, industrial, institutional, and residential projects, and calls for contributing to a city or county mobile source emission reduction fund established specifically to reduce emissions from transportation sources. The amount of funding is commensurate with the amount of emissions that need to be mitigated. Mitigation programs that could be funded through such an off-site TDM fund include (but are not limited to) public transit service, vanpool programs/subsidies, rideshare assistance programs, and off-site TDM facilities.

APCD recommends that this mitigation measure be implemented only after all feasible area and operational mitigation measures (Sections 7.5.1, “Area Source Mitigation Measures,” and 7.5.2, “Operational Mitigation Measures”) have been applied to the development project, and project emissions are still considered significant. The amount of funding should be commensurate with the quantity of emissions left to be mitigated after application of all other feasible area and operational source mitigation measures. The following conditions should apply to the use of the funds collected (including accumulated interest) under an Off-site TDM Fund:

1. The lead agency should determine the basis for collection and how the funds are to be spent. The funds should be spent or committed to a mitigation project within five years of receipt of the funds.

2. Funds should be used for mitigation projects or programs in areas that are either directly or indirectly impacted by the development project and are within Ventura County. Ridesharing arrangements or public transit services that originate outside the area but serve the area directly or indirectly impacted by the development project are also eligible uses of the funds.
3. The lead agency should establish an off-site TDM fund to receive and hold the funds until the funds are spent on an approved mitigation project or program.
4. Funds should not be used for traffic engineering projects, including signal synchronization, intersection improvements, and channelization, as these projects are related to improving traffic congestion and not air quality.
5. Any on-site or off-site TDM facilities provided by a development project to mitigate its emissions before determining the funding should not be credited toward the funds paid by the development project as a mitigation measure. Doing so would be taking credit for the mitigation twice.
6. A development project that is to be developed in phases should calculate the pro-rata share of funding from each phase of development based on emissions for the year of complete buildout. Such pro-rata share of funding should be paid in one lump sum or spread out evenly over three years in order to minimize the initial cost and provide a stable funding source.
7. The lead agency should report annually to its respective governing board on collection, expenditure, and use of collected funds.
8. The calculation and use of funding to a mobile source emission reduction fund must be in accordance with all applicable statutory requirements.

The cost of reducing emissions through funding an off-site TDM fund can be determined using the equation shown below. The cost should be calculated separately for ROC and NOx. The amount is based on only the higher of the two costs, since funding will result in mitigation programs that reduce both pollutants. Usually, the cost to mitigate NOx emissions will be greater than the cost to mitigate ROC emissions because the NOx emissions for most projects are greater than ROC emissions.

$$TC_{(ROC \text{ or } NOx)} = EE_{(ROC \text{ or } NOx)} \times UC_{(ROC \text{ or } NOx)} \times D \times 3 \text{ years}$$

where:

$TC_{(ROC \text{ or } NOx)}$ = Total cost for TDM fund mitigation program

$EE_{(ROC \text{ or } NOx)}$ = Excess emissions; pounds per day of ROC or NOx over the applicable significance threshold

$UC_{(ROC \text{ or } NOx)}$ = Unit cost per lb. of ROC or NOx reduced

ROC = \$5.18 (for projects completed in 2000)

NOx = \$7.54 (for projects completed in 2000)

D = Days of operation per year

The unit cost is \$5.18 per pound of ROC reduced, and \$7.54 per pound of NO_x reduced, for development projects that will be completed in 2000. These amounts are based on the cost-effectiveness of ridesharing programs as calculated using the 2000 - 2001 fiscal year budget for Southern California Rideshare's (SCR) Ventura Office, the expected number of rideshare arrangements that SCR expected to form in Ventura County during 2000 - 2001, a Ventura County-specific light-duty vehicle fleet, and home-work commute trip emissions estimated by URBEMIS7G. The TDM funding unit cost (ROC or NO_x) should be indexed to inflation for development projects that will be completed in future years. The recommended inflation factor can be calculated by dividing the most recent January Consumer Price Index (CPI) (All Urban Consumers (All Items 1982-84 = 100)) value for the Los Angeles-Riverside-Orange County, California region by the January 2000 CPI index value, which was 167.9. Consumer Price Index information is developed by the U. S. Department of Labor Statistics and can be found on their web site at <http://stats.bls.gov/>. The Consumer Price Index CPI information also can be found at the Department of Industrial Relations web site located at <http://www.dir.ca.gov/dlsr/PresentCCPI.html#Bookmark1>.

At a minimum, the Ventura County APCD recommends that all development projects with significant air quality impacts fully mitigate the excess emissions through funding measures for at least three years. This method of determining the amount results in an annual cost to fully mitigate both ROC and NO_x emissions associated with a development project below the 5 pounds per day threshold in the Ojai Planning Area, or below the 25 pounds per day threshold in the remainder of the county.

Funding of this kind is considered to have lessened or reduced the significant environmental impact of the subject development project (see Section 7.2, "CEQA Requirements for Mitigation Measures"). A jurisdiction may allow a development project to spread the amount over the three-year period in order to minimize the initial cost to the project proponent. In most cases, the emissions from a development project will still exceed the 5 pounds per day threshold in the Ojai Planning Area, or 25 pounds per day threshold in the remainder of the county after the three-year funding. Therefore, each lead agency should determine if overriding considerations are necessary to approve the development project due to these emissions.

7.5.4 Fugitive Dust Mitigation

Mitigation measures should be identified for a project if operation of the project will cause significant fugitive dust impacts. Mitigation measures identified as construction mitigation in the Model Fugitive Dust Mitigation Plan in Section 7.4.1, "Fugitive Dust Mitigation Measures," are also applicable to fugitive dust generated by project operation.

7.5.5 Carbon Monoxide Mitigation

Mitigation measures, including changes in the project, should be identified that will eliminate, or at least reduce, any modeled CO hotspots as much as feasible. Such mitigation measures will typically involve reducing traffic congestion and improving traffic flow and/or reducing idling time on roadways impacted by the project. Examples of such mitigation measures include roadway widening, adding new turn and through lanes, and changing signal light timing. The effectiveness of any proposed CO mitigation measures should be quantified by estimating the effects of the measures on traffic volumes, congestion, and/or speeds, and then remodeling the CO concentrations with CALINE4.

7.5.6 Toxic Air Contaminant Mitigation

Specific mitigation measures should be identified and considered for those projects that may release toxic or hazardous air contaminants to the atmosphere in amounts that may be injurious to nearby populations. Such mitigation measures should consider both routine and non-routine toxic air pollutant releases. Mitigation measures may involve handling, storage, and disposal methods that minimize release of the subject substances to the atmosphere. In some cases, air pollution control devices or process operation modifications can be employed. Furthermore, new facilities that may release toxic or hazardous substances to the atmosphere should not be located adjacent to residences, schools, day care centers, hospitals or similar land uses where people live or frequent. Conversely, such land uses should not be located near existing facilities that emit toxic and/or hazardous air contaminants.

7.5.7 Odor Mitigation

Specific mitigation measures should be identified and considered for those projects that may release odorous emissions in such quantities as to cause a public nuisance to nearby populations.

For some projects, operational changes, add-on controls, or process changes, such as carbon adsorption, incineration, or relocation of stacks/vents, can minimize odorous emissions. The lead agency may contact the District for further information regarding appropriate add-on emission controls and other technological methods to minimize odorous emissions. In many cases, however, the most effective mitigation strategy is to provide a sufficient distance, or buffer zone, between the odor source and the receptor(s) to ensure that the public will not be subjected to nuisance levels of odorous emissions. Odor mitigation measures placed on projects that are odor receptors (e.g., residential areas) that rely on sealing buildings, filtering air, or disclosure statements are not appropriate in place of technological control or buffer zones.

In establishing the size of the buffer zone, the lead agency should assess such factors as the severity of the potential odors, the length of time that potentially affected populations will be affected by the odors, prevailing wind direction and speed, and actions taken (or that will be taken) at the facility to control odorous emissions. A safety margin should also be considered in establishing the buffer zone to allow for possible future expansions of operations at the source of the odors. Lead agencies can consult the District regarding the appropriate buffer zone size for particular projects that may create significant odor impacts.

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8. GENERAL CONFORMITY

8.1 INTRODUCTION

Section 176(c) of the federal Clean Air Act (CAA) states that federal agencies cannot carry out, fund, or approve any project unless the project conforms to the applicable State Implementation Plan's (SIP) purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of these standards. A SIP is a compilation of all of a state's air quality plans and rules that have been approved by the U.S. Environmental Protection Agency (U.S. EPA). The applicable SIP in Ventura County is the most recent *Ventura County Air Quality Management Plan* (AQMP) approved by the U.S. EPA plus all Ventura County Air Pollution Control District (APCD) rules and regulations approved by the U.S. EPA.

There are two types of federal conformity actions: general (non-transportation) and transportation. Pursuant to CAA requirements, the U.S. EPA developed general and transportation conformity regulations that implement Section 176(c). U.S. EPA promulgated the general conformity criteria and procedures (Title 40 of the Code of Federal Regulations (CFR) Part 6; Part 51, Subpart W; and Part 93, Subpart B) on November 30, 1993. U.S. EPA promulgated the transportation conformity criteria and procedures (Title 40 of the CFR, Part 51, Subpart T; and Part 93, Subpart A) on November 24, 1993, and last revised them August 15, 1997. Transportation conformity, which is not discussed in these Guidelines, applies to federal actions related to transportation plans, programs, and projects under Title 23 U.S. Code or the Federal Transit Act.

The criteria and procedures required the District to adopt a general conformity rule and submit it to the U.S. EPA by November 30, 1994. The Ventura County Air Pollution Control Board adopted Rule 220, General Conformity, on May 9, 1995. Rule 220 incorporates U.S. EPA's general conformity criteria and procedures by reference. The U.S. EPA approved Rule 220 on April 23, 1999, and the rule became effective June 22, 1999.

8.2 RESPONSIBILITY FOR CONFORMITY DETERMINATIONS

Federal agencies are responsible for making conformity determinations for projects that require a federal action, as described below. The federal agency responsible for issuing the permit, approval, or funding should be contacted if an individual, group, or local agency thinks that a project might be subject to the general conformity regulation. The individual, group, or local agency can contact the District if the federal agency is unfamiliar with the federal general conformity requirement.

The APCD recommends that conformity analyses be conducted concurrently with any environmental review for the project required pursuant to CEQA.

8.3 APPLICABILITY

The CAA defines a federal action as any activity engaged in by a department, agency, or instrumentality of the federal government; or any activity that a department, agency or instrumentality of the federal government supports in any way, provides financial assistance for, licenses, permits, or approves. For general conformity, this definition excludes activities related to transportation plans, programs, and projects (including highway and transit actions) developed, funded or approved under Title 23 U.S.C. or the Federal Transit Act, which are subject to the transportation conformity rule. The federal transportation conformity rule is incorporated largely by reference into District Rule 221, Transportation Conformity.

The federal general conformity criteria and procedures contain provisions for making conformity determinations for federal health-based air quality standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulate matter 10 microns or less in diameter, and lead. The criteria and procedures apply in areas designated nonattainment for any federal air quality standard and to all air quality maintenance areas. Since Ventura County is nonattainment only for the federal one-hour ozone standard, conformity determinations apply only to reactive organic compounds (ROC) and oxides of nitrogen (NOx) emissions.

The rule specifies *de minimis* thresholds, based on the severity of the nonattainment problem, under which conformity determinations are not needed. If the total of direct and indirect emissions from an activity are projected to equal or exceed the *de minimis* thresholds, and if it is not an exempt activity or an activity that is presumed to conform under the federal rule, then the federal agency must conduct a general conformity analysis. Since Ventura County is designated a federal severe ozone nonattainment area, the applicable *de minimis* threshold is 25 tons per year of ROC or NOx.

Calculation of emissions from a federal activity includes direct and indirect emissions. Direct emissions are emissions of a criteria pollutant or its precursors that are caused or initiated by the federal action and occur at the same time and place as the action. Indirect emissions are emissions of a criteria pollutant or its precursors that: 1) are caused by the federal action, but may occur later in time and/or may be further removed in distance from the action itself, but are still reasonably foreseeable; and 2) the federal agency can practicably control and will maintain a control over due to a continuing program responsibility. The federal general conformity rule does not specify examples of indirect emissions, as it is up to the federal agency to make that determination.

The general preamble to the federal general conformity rule states that the following types of federal actions, among others, are likely to be subject to conformity review:

- Prescribed burning activities by federal agencies or on federal lands.

- Private actions taking place on federal land under an approval, permit, or leasing agreement, such as mineral extraction, timber harvesting, or ski resort construction.
- Direct emissions from Corps of Engineers (COE) permit actions.
- Wastewater treatment plant construction or expansion actions.
- Federal construction projects such as buildings, laboratories, and reservoirs on federal land.
- Project-level minerals management leasing activities.
- New airports or airport expansion actions.
- Actions taking place on federal lands or in federal facilities.

The general preamble to the federal general conformity rule states that the following types of federal actions are not covered by the conformity rule:

- Activities associated with property disposal at military closure and realignment bases through sale or other transfer of title.
- Leasing agreements associated with military base closure and realignment, where transfer of title is required to be conveyed upon satisfaction of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements, and where the military service leases the property without retaining continuing authority to control the property except as necessary to assure satisfaction of CERCLA requirements.
- Certain indirect emissions related to COE permits for discharging dredged or fill material.
- National Pollutant Discharge Elimination System (NPDES) permit actions since many of these actions are taken under State rules and, as such, are not federal actions.

8.4 SUMMARY OF CRITERIA FOR MAKING A POSITIVE CONFORMITY DETERMINATION

A federal agency can make a positive conformity determination by meeting any of several criteria in the rule. Criteria that relate to ozone conformity analyses are summarized below. For specific information about the requirements of the general conformity rule, see Title 40 of the CFR, Part 51, Subpart W; and Part 93, Subpart B.

- Emissions from the action are fully offset within the same area through a revision to the applicable SIP or a similarly enforceable measure that creates emissions reductions so that there is no net increase in emissions of that pollutant.
- Emissions for the project are specifically identified and accounted for in the applicable SIP attainment or maintenance demonstration (1995 Ventura County Air Quality Management Plan, Appendix E-95, *Emission Forecast Documentation*).

- The action (or portion thereof) is specifically included in a current transportation plan and transportation improvement program that have been found to conform to the applicable SIP under the transportation conformity regulation.
- Where a SIP has not been approved since 1990, the baseline emissions reflect historic activity levels that occurred in the geographic area.
- Regional water and/or wastewater projects are sized to meet only the needs of population projections that are in the applicable SIP.

8.5 REPORTING REQUIREMENTS AND PUBLIC PARTICIPATION

A federal agency conducting a conformity analysis must provide a 30-day notice describing the proposed action and a copy of the federal agency's draft conformity determination to the appropriate U.S. EPA Regional Office (Region IX), Land Managers, State and local air quality agencies (California Air Resource Board and the APCD), and the Metropolitan Planning Organization (i.e., Southern California Association of Governments (SCAG) and the Ventura Council of Governments (VCOG) or otherwise designated agency).

After making a final conformity determination, a federal agency must notify, within 30 days, the appropriate U.S. EPA Regional Office (Region IX), Land Managers, State and local air quality agencies (ARB and the APCD), and the Metropolitan Planning Organization (i.e., SCAG, VCOG, or otherwise designated agency).

Additionally, a federal agency must:

- Make draft conformity determinations and supporting materials available for public review.
- Place an advertisement in a daily newspaper in the area that would be affected by a proposed action before acting on a draft conformity determination.
- Provide opportunity for written public comments.
- Respond to comments received, making comments and responses available upon request.
- Place an advertisement in a daily newspaper in the area that would be affected by the action after making a final conformity determination.

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APPENDIX A GLOSSARY AND ACRONYMS

This appendix defines terms and acronyms used in these Guidelines.

Glossary

Aerosol - a particle of solid or liquid matter that can remain suspended in the air because of its small size (generally under one micron).

Air Basin - an area of the state designated by the ARB pursuant to Subdivision (a) of Section 39606 of the California Health and Safety Code (CH&SC).

Air Monitoring - the periodic or continuous sampling and analysis of air pollutants in ambient air or from individual pollutant sources.

Air Pollutants - substances that are foreign to the atmosphere or are present in the natural atmosphere to the extent that they may result in adverse effects on humans, animals, vegetation, and materials. Common air pollutants are ozone, nitrogen dioxide, particulate matter, sulfur dioxide, and carbon monoxide. Air pollution is defined in the CH&SC as any discharge, release, or other propagation into the atmosphere, and includes, but is not limited to, smoke, charred paper, dust, soot, grime, carbon, fumes, gases, odors, particulate matter, acids, or any combination thereof.

Air Pollution Control District (APCD) - a local agency with authority to regulate stationary sources of air pollution (such as refineries, manufacturing facilities, and power plants) within a given county, and governed by a District Air Pollution Control Board composed of the elected county supervisors and city representatives.

Air Pollution Control Officer (APCO) - the executive officer of the Air Pollution Control District appointed by the Air Pollution Control Board.

Air Quality Management Plan (AQMP) - a plan prepared by an air pollution control district or agency to comply with either the federal Clean Air Act or the California Clean Air Act. An AQMP contains measures that will be taken to attain and maintain federal and state ambient air quality standards. In California, air districts prepare air quality management plans that are included in the state's SIP that is required by the federal Clean Air Act. Such plans are also referred to as Clean Air Plans or Clean Air Attainment Plans.

Alternative Fuels - fuels such as methanol, ethanol, natural gas, and liquid petroleum gas that are cleaner burning with lower air emissions.

Ambient Air - air present at a particular time and place outside of structures. Often used interchangeably with outdoor air.

Anthropogenic - of, relating to, influenced, or caused by humans.

Area Sources - also known as “area-wide” sources, these include multiple stationary emission sources such as water heaters, gas furnaces, fireplaces, and woodstoves. The CCAA requires districts to include these area sources in AQMPs.

Attainment - achieving and maintaining the air quality standards (both state and federal) for a given air pollutant.

Attainment Area - an area that is in compliance with the National and/or California Ambient Air Quality Standards.

California Ambient Air Quality Standards (CAAQS) - specified concentrations of air pollutants, recommended by the California Department of Health Services and adopted into regulation by the Air Resources Board, which relate the intensity and composition of air pollution to undesirable effects. CAAQS are the standards that must be met per the requirements of the California Clean Air Act.

California Clean Air Act (CCAA) - a California law passed in 1988 that provides the basis for air quality planning and regulation independent of federal regulations, and which establishes new authority for attaining and maintaining California’s air quality standards by the earliest practicable date. A major element of the Act is the requirement that local APCDs in violation of the CAAQS must prepare attainment plans that identify air quality problems, causes, trends, and actions to be taken for attainment.

California Air Resources Board (ARB) - California’s lead air quality agency, consisting of a nine-member Governor-appointed board, responsible for motor vehicle air pollution control, and having oversight authority over California’s air pollution management program.

California Department of Transportation (Caltrans) - a state department that oversees the state’s transportation infrastructure.

California Environmental Quality Act (CEQA) - a state law intended to protect the environment of California. It is also known as the CEQA statutes, and is codified in Sections 21000 through 21177 of the Public Resources Code. CEQA establishes mandatory ways by which governmental (public agency) decision makers are informed about the potential significant environmental effects of proposed projects. CEQA also mandates the identification of ways to avoid or significantly reduce damage to the environment. After preliminary review or the completion of an Initial Study, the Lead Agency may decide to prepare an Environmental Impact Report (EIR) for a project.

CEQA Guidelines - regulations prescribed by the Secretary for Resources to be followed by all state and local agencies in California in the implementation of CEQA, beginning at Sec. 15000, California Code of Regulations (CCR).

CALINE4 - a California Department of Transportation air quality model for estimating pollutant concentrations (primarily carbon monoxide, nitrogen dioxide, and particulates) near a roadway.

Carbon Monoxide (CO) - a colorless, odorless gas resulting from the incomplete combustion of fossil fuels. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles. CO interferes with the blood's ability to carry oxygen to the body's tissues and results in numerous adverse health effects. CO is a criteria air pollutant.

CO Hot Spots - an area, usually an intersection or congested segment of a highway, that exceeds the federal or state carbon monoxide standard.

Clean Air Act (CAA) - federal law passed in 1970 and amended in 1977 and 1990 that sets primary and secondary National Ambient Air Quality Standards for major air pollutants and thus forms the basis for the national air pollution control effort.

Concentration - the amount of an air pollutant present in a unit sample, usually measured in parts per million (ppm) or micrograms per cubic meter.

Conformity - a requirement in the federal Clean Air Act that no department, agency, or instrumentality of the federal government shall engage in, support in any way, or provide financial assistance for, license, permit, or approve any activity that does not conform with the State Implementation Plan (SIP) by causing or contributing to an increase in air pollutant emissions, or violation of an air pollutant standard, or frequency of violating that standard.

Consistency - a term used in CEQA to determine if a project is consistent by furthering the goals and objectives of, and will not interfere with the implementation of, applicable regional plans.

Criteria Air Pollutant - an air pollutant for which acceptable levels of exposure can be determined and for which a federal or state Ambient Air Quality Standard has been set. Examples include: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and PM₁₀ (see individual pollutant definitions).

District - the Ventura County Air Pollution Control District is an air pollution control district as defined by the CH&SC Section 40150. The District encompasses all of Ventura County.

EMFAC - an ARB program of emission factors used for most California motor vehicle emissions models.

Emission Factor - the amount of a specific pollutant emitted from a specified polluting source per unit quantity of material handled, processed, or burned.

Emission - an air contaminant released to the atmosphere.

Emissions Inventory - an estimate of the quantity of pollutants emitted into the atmosphere over a specific period such as a day or a year. Considerations that go into an inventory include type and location of sources, the processes involved, and the level of activity.

Emission Standards - as used in these Guidelines, means United States Federal (EPA), State of California (ARB), or Ventura County Air Pollution Control District standards or limits for air contaminant emissions.

Environmental Impact Report (EIR) - a detailed report prepared under CEQA describing and analyzing the significant effects of a project and discussing ways to mitigate or avoid the effects [CCR §15362].

Environmental Protection Agency (EPA) - the federal agency charged with setting policy and guidelines, and carrying out legal mandates, for the protection of national environmental resources in the United States.

Exceedance - a monitored level of concentration of any air contaminant higher than the national or state ambient air quality standards.

Growth Area - a geographic subarea used in Ventura County population forecasts to refer to an area where urban development has already taken place or is expected to take place.

Indirect Source - facilities, buildings, structures, properties, and/or roads which, through their construction to their operation, indirectly contribute to air pollution. This includes projects and facilities that attract or generate mobile sources activity (autos and trucks) such as shopping centers, employment sites, schools, and housing developments, that result in emissions of any regulated air pollutant.

Level of Service (LOS) - a scale that is used to rate the service (i.e., speed and maneuverability) on roadways. An LOS of “A” means that traffic is flowing freely, while “F” refers to severely congested conditions.

Mitigated Negative Declaration (MND) - a type of negative declaration prepared for a project when the initial study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to

by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment [Public Resources Code §21064.5].

Mitigation - measures taken to avoid or reduce a significant effect including:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments [California Code of Regulations §15370].

National Ambient Air Quality Standards (NAAQS) - standards set by the EPA for the maximum levels of air pollutants that can exist in the ambient air without unacceptable effects on human health or public welfare.

New Source Review (NSR) - the mechanism to assure that new and modified stationary sources will not interfere with the attainment or maintenance of any ambient air quality standard, or prevent reasonable further progress towards the attainment or maintenance of any ambient air quality standard. A program used in a nonattainment area to permit or site new industrial facilities, or modifications to existing industrial facilities, that emit nonattainment criteria air pollutants. The two major requirements of NSR are best available control technology and emission offsets.

Negative Declaration - a written statement briefly describing the reasons that a proposed project will not have a significant effect on the environment and does not require the preparation of an environmental impact report [Public Resources Code §21064].

Nonattainment Area - an area identified by the EPA or ARB as not meeting the NAAQS or CAAQS for a given pollutant.

Non-growth Area - a geographic subarea used in Ventura County population forecasts to refer to an area where urban development is not expected to occur.

Ojai Planning Area - an area defined as the “Ojai Valley” in the Ventura County Non-Coastal Zoning Ordinance, Article 12, Section 8112-2 (Ojai Growth and Non-growth areas) plus the Ventura (Ojai) NGA.

Ojai Valley - an area defined as the “Ojai Valley” in the Ventura County Non-Coastal Zoning Ordinance, Article 12, Section 8112-2 (Ojai Growth and Non-growth Areas).

Oxides of Nitrogen - a reddish-brown gas with an odor similar to bleach. The major source of this pollutant is the high temperature combustion of fossil fuels. Health effects include irritation and damage to the lungs and lower resistance to respiratory infections.

Ozone - a pungent, pale blue (but often invisible), reactive, toxic gas consisting of three oxygen atoms. In the atmosphere, it is a product of the photochemical processes involving the solar radiation. Ozone exists in the stratosphere, as well as at the earth’s surface. Ozone in the stratosphere protects living organisms near the earth’s surface from ultraviolet rays from the Sun. Ozone at the earth’s surface is a criteria air pollutant and causes numerous adverse health effects.

Ozone Precursors - compounds such as reactive organic compounds and oxides of nitrogen, occurring either naturally or as a result of human activities, which contribute to the formation of ozone, the principal component of smog.

Particulate Matter - Fine (PM_{2.5}) - PM_{2.5} is a mixture of very small particles with an aerodynamic diameter equal to or less than 2.5 microns. PM_{2.5} consists of particles directly emitted into the air and particles formed in the air from the chemical transformation of gaseous pollutants. PM_{2.5} particles are emitted from activities such as industrial and residential combustion, and from vehicle exhaust. Particles 2.5 microns or smaller infiltrate deepest portions of the lungs, increasing the risks of long-term disease, including chronic respiratory disease, cancer, and increased and premature death.

Particulate Matter - Respirable (PM₁₀) - any particulate matter with an aerodynamic diameter equal to or less than 10 microns. PM₁₀ consists of particles directly emitted into the air and particles formed in the air from chemical transformations of gaseous pollutants. PM₁₀ particles are emitted from activities such as industrial and residential combustion, and from vehicle exhaust. PM₁₀ causes adverse health effects, atmospheric visibility reduction, and is a criteria air pollutant.

Pedestrian Oriented Development (POD) - any of a number of design strategies that emphasize pedestrian access over automobile access. They typically provide pedestrian amenities such as sidewalks, street trees, commercial at-street frontage, safe street crossings, etc.

Permit - written authorization from the Air Pollution Control District for the construction or operation of equipment that may create or control regulated air emissions.

Project - an activity that may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is any of the following:

- An activity directly undertaken by a public agency.
- An activity undertaken by a person that is supported, in whole or in part, through contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.
- An activity that involves the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies [Public Resources Code §21065].

Reactive Organic Compounds (ROC) - any organic compound containing at least one carbon atom except for specific exempt compounds (see District Rule 2) found to be non-photochemically reactive and thus not participating in smog formation. Sometimes referred to as reactive organic gases, non-methane organic compounds, or volatile organic compounds.

Sensitive Receptors - facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples include schools, hospitals, and daycare centers.

Significant Effect on the Environment - a phrase used to indicate that an environmental effect of a project is at a level requiring the detailed analysis of an EIR and that the effect is severe enough to consider disapproving or changing the project to avoid the effect. The terms “significant effect” and “significant impact” are interchangeable under CEQA [CCR §15382].

Soil stabilizers - chemical or other agents that are applied to soil surfaces to stabilize and mitigate PM₁₀ fugitive dust emissions by creating a wind-resistant crust. Typically applied to disturbed surface areas next to roadways, base ground areas, dirt parking lots and roadway shoulders, and exposed construction areas.

Southern California Association of Governments (SCAG) - the organization, known in federal law as the Council of Governments and Metropolitan Planning Organization, representing Los Angeles, Ventura, San Bernardino, Riverside, Orange, and Imperial Counties and the cities within those six counties. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality. Additional mandates exist at the state level.

Statement of Overriding Considerations - a written statement by a lead agency giving reasons for approving a project having environmental impacts that have not been mitigated to a level of insignificance.

State Implementation Plan (SIP) - a document prepared by each state, and subject to EPA approval, describing existing air quality conditions and measures that will be taken to attain and maintain National Ambient Air Quality Standards. A SIP is a compilation of all of a state's air quality plans and rules that have been approved by the U.S. Environmental Protection Agency (EPA). In California, air districts prepare nonattainment area plans that are included in the state's SIP. The applicable SIP in Ventura County is the most recent Ventura County Air Quality Management Plan (AQMP) approved by the U.S. EPA plus all Ventura County Air Pollution Control District (APCD) rules and regulations approved by the EPA.

Sulfur Dioxide - a colorless, extremely irritating gas or liquid whose chemical formula is SO₂. Sulfur dioxide enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal, and from chemical processes occurring at chemical plants and refineries. National Ambient Air Quality Standards and California State Air Quality Standards have been established for sulfur dioxide.

Telecommute - a work mode where individuals perform job requirements for part or all of the work week at off-site facilities, such as private residences or satellite work centers (rather than commuting to the primary worksite). This reduces vehicle trips (if telecommuting from a residence) or vehicle miles traveled (if telecommuting from a satellite center) and associated air emissions.

Toxic Air Contaminant - air pollutants (excluding ozone, carbon monoxide, PM₁₀, sulfur dioxide, nitrogen dioxide) that may reasonably be anticipated to cause cancer, developmental effects, reproductive dysfunctions, neurological disorders, heritable gene mutations or other serious or irreversible acute or chronic health effects in humans. Toxic air pollutants are regulated under different federal and state regulatory processes than ozone and the other criteria air pollutants. Health effects from exposure to toxic air pollutants may occur at extremely low levels.

Transit Oriented Development (TOD) - mixed-use neighborhoods, up to 160 acres in size, which are developed around a transit stop and core commercial area. The entire TOD must be within an average of a 2,000 foot walking distance of a transit stop. Secondary areas of lower density housing, schools, parks, and commercial and employment uses, surround TODs for up to one mile.

Transportation Control Measures (TCM) - air pollutant control measures in the AQMP that are directed at reducing air emissions by reducing vehicle travel. Both the federal and state law specify requirements for TCMs.

URBEMIS - a computer program used to estimate indirect source emissions from new and modified land uses (e.g., shopping centers, housing developments, and offices).

Ventura Council of Governments (VCOG) - a governmental organization comprised of the County of Ventura, and the ten cities in Ventura County. The purpose of VCOG is to provide a vehicle for the member entities and other interested persons, public and private, to engage in regional, cooperative, and comprehensive planning. VCOG has historically been under contract to the Southern California Association of Governments to identify and refine regionally significant transportation problems, needs, investments, and programs related to the development of the Regional Transportation Plan.

Volatile Organic Compounds (VOCs) - any organic compound containing at least one carbon atom except for specific exempt compounds (see District Rule 2) found to be non-photochemically reactive and thus not participating in smog formation. In this document, VOC is synonymous with reactive organic gases and reactive organic compounds.

Acronyms

ADT	average daily (motor vehicle) trips
APCB	Air Pollution Control Board
APCO	Air Pollution Control Officer
APCD	Air Pollution Control District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
CAA	federal Clean Air Act
CAAQS	California Ambient Air Quality Standard(s)
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations
CH&SC	California Health and Safety Code
CO	carbon monoxide
District	Ventura County Air Pollution Control District
DTIM	Direct Travel Impact Model
EIR	Environmental Impact Report
EMFAC	ARB's On-Road Motor Vehicle Emissions Model
EPA	United States Environmental Protection Agency
GUIDELINES	Ventura County Air Quality Assessment Guidelines
ISR	indirect source review
ITE	Institution of Transportation Engineers
LOS	level of service

MND	Mitigated Negative Declaration
ND	Negative Declaration
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO	nitrogen oxide
NO₂	nitrogen dioxide
NOP	Notice of Preparation
NOx	oxides of nitrogen
O₃	ozone
PM_{2.5}	fine particulate matter of 2.5 microns in diameter or smaller
PM₁₀	particulate matter of 10 microns in diameter or smaller
Pb	lead
Plan	Air Quality Management Plan
PPM	parts per million
PRC	Public Resources Code
ROC	reactive organic compounds
ROG	reactive organic gases
SCAG	Southern California Association of Government
SIP	State Implementation Plan
SO₂	sulfur dioxide
SOx	oxides of sulfur
TAC	toxic air pollutant
TCM	transportation control measures
µg/m³	microgram per cubic meter
URBEMIS	Urban Emissions Model
VCOG	Ventura Council of Governments
VMT	vehicle miles traveled
VOC	volatile organic compounds (see ROC)

**APPENDIX B
COMMON EQUIPMENT AND PROCESSES REQUIRING A
VENTURA COUNTY APCD PERMIT TO OPERATE**

This appendix contains a document available through the APCD Engineering and Enforcement Divisions of the Ventura County APCD that provides guidance for determining whether or not equipment and processes will require an APCD Permit to Operate.

**COMMON EQUIPMENT AND PROCESSES REQUIRING
A VENTURA COUNTY APCD PERMIT TO OPERATE**

Disclaimer: This list is intended to be used only as general guidance in determining equipment that requires an APCD Permit to Operate. For more detailed information, refer to APCD Rule 10, "Permits Required", and APCD Rule 23, "Exemptions from Permit", or call the APCD Engineering Section at 805/645-1401.

Combustion Equipment

- Boilers or process heaters with a maximum rated heat input of 1.0 MMBTU/Hr or greater
- Engines which are 50 HP or greater including but not limited to the following:
 - Oil well and water well drilling rigs
 - Portable electrical generators
 - Portable wood chippers
 - Portable air compressors

Note: Vehicle engines for autos, trucks, bulldozers, forklifts, etc. are exempt. Emergency electrical generators and emergency water pumps are exempt. Portable engines registered with the state PERP are exempt.
- Gas turbines
- Incinerators, including crematories
- Ovens and furnaces

Note: Restaurant barbecue equipment is exempt. Ovens or furnaces used in residential units are exempt.
- Burn-off ovens for auto engine parts
- Waste gas flares

Equipment Which Emits Dust or Other Particulate Matter

- Concrete batch plants
- Asphalt concrete plants
- Rock, sand, and aggregate plants
- Abrasive blasting and sand blasting operations

Note: Water blasting equipment using engines less than 50 HP is exempt.
- Metal melting furnaces

Equipment and Processes Which Emit Solvents or Other Reactive Organic Compounds

- Drycleaning machines using organic solvents
- Gasoline tanks and dispensing facilities

Note: Diesel tanks and waste oil tanks are exempt. Gasoline tanks less than 250 gallons in capacity are exempt.
- Contaminated soil or groundwater remediation systems including air stripping towers
- General painting and coating equipment if more than 200 pounds of solvents are emitted in a year (roughly 25 gallons)
- Any painting of automobiles, trucks, or mobile equipment
- Printing operations if more than 200 pounds of solvents are emitted in a year
- Use of adhesives or sealants if more than 200 pounds of solvents are emitted in a year
- Cold degreasers and vapor degreasers
- Cleaning operations if more than 200 pounds of solvents are emitted in a year
- Oil wells and oilfield storage and process tanks
- Other organic liquid storage tanks with a capacity of more than 5,000 gallons
- Semiconductor or electronic component manufacturing
- Expandable polystyrene foam manufacturing

Equipment and Processes Which Emit Air Toxics or May Cause a Nuisance

- Chrome plating operations
- Operations such as spa, bathtub or counter-top manufacturing which use polyester resins
- Wood stripping operations using methylene chloride
- Agricultural produce fumigation chambers using organic gases
- Ethylene oxide sterilizers (used in hospitals or food processing)

COMMON EQUIPMENT FOR WHICH AN APCD PERMIT TO OPERATE IS NOT REQUIRED IS LISTED BELOW:

- *Heating, air conditioning and ventilation (HVAC) equipment that is not used for air pollution control. The boilers or engines used with HVAC equipment must be evaluated separately using the combustion equipment information listed above.*
- *Vacuum cleaning systems for housekeeping purposes*
- *Refrigeration units not used for air pollution control*
- *Equipment for cutting, grinding or drilling metals or plastics*
- *Equipment for sawing, sanding or drilling wood*

IMPORTANT: Equipment and processes exempt from obtaining an APCD Permit to Operate may still need to be considered in an environmental document prepared pursuant to CEQA.

(Revised 03/00)

APPENDIX C
SECTIONS OF CEQA AND THE CEQA GUIDELINES RELEVANT TO
AIR QUALITY IMPACT ANALYSIS

This appendix contains sections of CEQA and the CEQA Guidelines that are relevant to air quality impact analysis. The complete text of CEQA and the CEQA Guidelines can be found on the CERES website at: http://ceres.ca.gov/topic/env_law/ceqq/.

Section 21000 - State agencies shall regulate to prevent environmental damage

Declares that the maintenance of a quality environment for the people of California now and in the future is a matter of statewide concern. Further declares that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage, while providing a decent home and satisfying living environment for every Californian.

Section 15063 - Initial Study

- (1) If the agency determines that there is substantial evidence that any aspect of the project, either individually or cumulatively, may cause a significant effect on the environment, regardless of whether the overall effect is adverse or beneficial, the lead agency shall do one of the following:
 - (A) Prepare an EIR, or
 - (B) Use a previously prepared EIR that the lead agency determines would adequately analyze the project at hand.
- (2) The lead agency shall prepare a Negative Declaration if there is no substantial evidence that the project or any of its aspects may cause a significant effect on the environment.

Section 15064 - Determining the Significance of the Environmental Effects Caused by a Project and Section 15358 - Effects

Provides guidance as to whether an effect is significant or not. In evaluating the significance of the environmental effect of a project, the lead agency shall consider the direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment caused by the project. Effects analyzed under CEQA must be related to a physical change.

Section 15065 - Mandatory Findings of Significance

Establishes criteria for the lead agency in determining whether a project may have a significant effect on the environment. If a project meets the criteria set forth in this section, an EIR should be prepared.

Section 15070 - Decision to Prepare a Negative Declaration or Mitigated Negative Declaration

Provides discussion of under what circumstances a public agency shall prepare or have prepared a ND or an MND. If an applicant can modify the project in such a manner that would avoid significant effects identified after submitting the application, an EIR may be avoided by preparation of an MND.

Section 15091 - Findings

- (a) No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:
 - (1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
 - (2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
 - (3) Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.
- (b) The findings required by subsection (a) shall be supported by substantial evidence in the record.
- (c) The finding in subsection (a)(2) shall not be made if the agency making the finding has concurrent jurisdiction with another agency to deal with identified feasible mitigation measures or alternatives. The finding in subsection (a)(3) shall describe the specific reasons for rejecting identified mitigation measures and project alternatives.

- (d) When making the findings required in subsection (a)(1), the agency shall also adopt a program for reporting on or monitoring the changes which it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects. These measures must be fully enforceable through permit conditions, agreements, or other measures.
- (e) The public agency shall specify the location and custodian of the documents or other material which constitute the record of the proceedings upon which its decision is based.
- (f) A statement made pursuant to Section 15093 does not substitute for the findings required by this section.

Section 15092 - Approval

- (a) After considering the final EIR and in conjunction with making findings under Section 15091, the lead agency may decide whether or how to approve or carry out the project.
- (b) A public agency shall not decide to approve or carry out a project for which an EIR was prepared unless either:
 - (1) The project as approved will not have a significant effect on the environment, or
 - (2) The agency has:
 - (A) Eliminated or substantially lessened all significant effects on the environment where feasible as shown in findings under Section 15091, and
 - (B) Determined that any remaining significant effects on the environment found to be unavoidable under Section 15091 are acceptable due to overriding concerns as described in Section 15093.
- (c) With respect to a project which includes housing development, the public agency shall not reduce the proposed number of housing units as a mitigation measure if it determines that there is another feasible specific mitigation measure available that will provide a comparable level of mitigation.

Section 15093 - Statement of Overriding Considerations

The Statement of Overriding Considerations requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered “acceptable.” The statement of overriding considerations shall be supported by substantial evidence in the record.

Section 15097 - Mitigation Monitoring or Reporting

This section applies when a public agency has made the findings required under paragraph (1) of subdivision (a) of Section 15091 relative to an EIR or adopted a MND in conjunction with approving a project. The public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects.

Section 15125 - Environmental Setting

States that, “An EIR must include a description of the physical environmental conditions in the vicinity of the project as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective.” An EIR “shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans,” such as the applicable air quality attainment or maintenance plan or State Implementation Plan.

Section 15126 - Consideration and Discussion of Environmental Impacts

Requires that, “All phases of a project must be considered when evaluating its impact on the environment: planning, acquisition, development, and operation.” Also requires that the following subjects be discussed in the EIR:

- (a) Significant environmental effects of the proposed project.
- (b) Significant environmental effects which cannot be avoided if the proposed project is implemented.
- (c) Significant irreversible environmental changes which would be involved in the proposed project should it be implemented.
- (d) Growth-inducing impact of the proposed project.
- (e) The mitigation measures proposed to minimize the significant effects.
- (f) Alternatives to the proposed project.

Section 15130 - Discussion of Cumulative Impacts

Cumulative impacts shall be discussed in an EIR when the project's incremental effect is cumulatively considerable, as defined in Section 15065(c). The elements necessary to provide an adequate discussion of cumulative impacts include:

- (1) Either:
 - (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or
 - (B) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency;
- (2) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available, and
- (3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects. Previously approved land-use documents such as general plans, specific plans, and local coastal plans may be used in cumulative impact analysis.

Section 15355 - Cumulative Impacts

Defines "cumulative impacts" as "two or more individual impacts which, when considered together, are considerable or which compound or increase other environmental impacts." States that the individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

Section 15370 - Mitigation

"Mitigation" includes:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.

- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environment.

Section 15382 - Significant Effect on the Environment

‘Significant effect on the environment’ means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Appendix G - Environmental Checklist Form

With respect to air quality, a project may be deemed to have a significant effect on the environment if it will:

- (a) Conflict with or obstruct implementation of the applicable air quality plan.
- (b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- (c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).
- (d) Expose sensitive receptors to substantial pollutant concentrations.
- (e) Create objectionable odors affecting a substantial number of people.

According to Appendix G, a “potentially significant impact” finding is appropriate if there is substantial evidence that an effect may be significant.

APPENDIX D

MAJOR TOXIC AIR CONTAMINANT REGULATIONS AND COMMON TOXIC AIR CONTAMINANT SOURCES AND SUBSTANCES

Appendix D presents the major federal and state programs and regulations to reduce toxic air contaminant (TAC) emissions. Appendix D also presents a list of common TAC sources and substances that may be encountered in Ventura County.

Table D-1, Common Sources of Toxic Air Contaminants, lists common land uses that may emit TACs. Table D-1 also lists the most common TACs associated with each listed land use. It should be noted that, because of the large number of land uses that may emit TACs, and the large number of TACs, Table D-1 is only a guide and, as such, is not all-inclusive. It does not list all land uses that may emit TACs. Moreover, not all listed land uses emit all of the listed toxic substances. Conversely, the listed land uses may emit TACs that are not included in Table D-1.

Table D-2, Toxic Air Contaminants, lists substances that the California Air Resources Board (ARB) has found to present a chronic or acute threat to public health when found in the ambient air.

Further information regarding TACs and the State of California's Air Toxics Program is available at the ARB's website (<http://www.arb.ca.gov/html/brochure/airtoxic.htm>). Further information about the District's Air Toxics Program can be found at the District website (http://www.vcapcd.org/air_toxics.htm). The District also publishes annual reports that summarize the District's TAC program. These reports rank facilities according to the cancer risk posed, identify the facilities posing non-cancer health risks, and describe the status of the development of control measures. These reports are available from the District's Air Toxics section. The District's 1999 TAC program report also can be downloaded from the District webpage.

Federal Clean Air Act Amendments of 1990

The federal Clean Air Act Amendments of 1990 (Title III, Section 112) mandate that the United States Environmental Protection Agency (U.S. EPA) issue emission standards on a specified schedule for certain categories of sources that emit one or more of the 188 TACs listed in Title III. The emission standards are being issued in two phases. In the first phase (1992 - 2000), the U.S. EPA is required to develop technology-based emission standards, called Maximum Achievable Control Technology (MACT). In the second phase, (2001 - 2008) the U.S. EPA is required to issue health risk-based emission standards to address risks remaining after implementation of the MACT standards.

The Tanner Toxic Act (Assembly Bill 1807)

The Tanner Act (Health & Safety Code §39650 et seq.) is a California law that established the framework for California's TAC identification and control program. The Tanner Act became effective in 1984 and requires the ARB to identify TACs and the appropriate measures to limit emissions of those substances. The ARB then adopts the appropriate degree of regulation and adopts Air Toxics Control Measures (ATCMs). The control measures are the minimum regulations that must be imposed by each air district in the state. The air districts must adopt rules that are at least as stringent as the ATCMs.

Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill 2588)

The Air Toxics "Hot Spots" Information and Assessment Act (Health & Safety Code §44300 et seq.) was adopted by the California Legislature in 1987 in response to increasing public concern about emissions of toxic chemicals in the air. It was known at that time that the majority of the United States population lived near at least one facility that released toxic chemicals into the air on a routine basis. Existing federal, state, and local air toxics programs looked at new sources only, or looked at existing sources one industry and one chemical at a time. Under AB 2588, stationary sources must submit a comprehensive inventory of routine releases of over 600 toxic compounds to the air from their facilities to the District. Based on the results of the inventories, the District requires facility owners to perform health risk assessments for the subject toxic emissions. If the emissions from a facility are determined through the risk assessment to pose a significant risk, the District requires the facility to notify people who are exposed of the results of the health risk assessment. Owners of facilities that pose a significant health risk also have to develop and implement a plan to reduce the risks to below significance levels. Further information regarding TACs and the State of California's AB 2588 Air Toxics Program is available at the ARB's website (<http://www.arb.ca.gov/html/brochure/airtoxic.htm>). Further information about the District's AB 2588 air toxics program can be found at the District website (http://www.vcapcd.org/air_toxics.htm). The District also publishes annual reports that summarize the District's AB 2588 TAC program. These reports rank facilities according to the cancer risk posed, identify the facilities posing non-cancer health risks, and describe the status of the development of control measures. These reports are available from the District's Air Toxics section. The Districts' 1999 AB 2588 program report also can be downloaded from the above District webpage.

Facility Toxic Air Contaminant Risk Reduction Audit and Plan (Senate Bill 1731)

Senate Bill 1731 (Health & Safety Code, §44390, et seq.) requires local air districts to establish a program to reduce risks from existing facilities in the AB 2588 air toxics program that are deemed by the District to pose a significant health risk.

Waters Bill (Assembly Bill 3205)

The Waters Bill (Health & Safety Code §§42301.6 - 42301.9) requires that an air district considering an application for a proposed new or modified source of TACs located within 1,000 feet of a school to prepare a public notice that fully describes the proposed project or modification. The air district must then distribute or mail the public notice to the parents or guardians of students enrolled in any school located within one-quarter mile of the proposed project and to each address within a 1,000 foot radius of the proposed project.

Air Monitoring of Disposal Sites (Assembly Bill 3374)

Assembly Bill 3374 (Health & Safety Code §41805.5, et seq.) requires owners of solid waste disposal sites, including inactive sites, to submit to local air pollution control districts a solid waste air quality assessment test report.

Ventura County Air Pollution Control District Toxic Air Contaminant Rules

In addition to the preceding federal and state air toxic programs, the District regulates TACs through several District rules: Rule 36, New Source Review - Hazardous Air Pollutants; Rule 62, Hazardous Materials and Airborne Toxics; Rule 62.1, Hazardous Materials; Rule 62.3, Hexavalent Chromium; Rule 62.5, Dioxins - Medical Waste Incinerators; Rule 62.6, Ethylene Oxide - Sterilization and Aeration; and Rule 62.7, Asbestos - Demolition and Renovation.

**TABLE D-1
COMMON SOURCES OF TOXIC AIR CONTAMINANTS**

Product, Process, or Facility	Substance	Product, Process, or Facility	Substance
Acoustic Ceiling, Asbestos Products, Caulk, and Gasket Manufacturing	Asbestos	Groundwater Clean-up	Benzene, Perchloroethylene, Trichloroethylene
Aerospace Manufacturing	Hexavalent Chromium	Hospital	Dioxins, Debenzofurans, Cadmium, Ethylene Oxide
Autobody Shop	Benzene, Toluene, Xylene	Industrial Heating and Steam Needs	Cadmium, Hexavalent Chromium
Auto Machine Shop	Asbestos	Landfill	Benzene, Vinyl Chloride
Biomedical Research Laboratory	Benzene, Carbon Tetrachloride, Chloroform, Formaldehyde, Methylene Chloride, Phenol, Xylenes	Medical Clinic & Laboratory	Ethylene Oxide
Boat Yard	Epoxy Resins, Toluene, Xylenes	Medical Equipment Sterilization	Ethylene Oxide
Brake Realignment & Manufacturing	Asbestos	Natural Gas Plant	Acetaldehyde, Benzene, Formaldehyde, Propylene, Toluene, Xylene
Brake Shoe Rebuilders and Recyclers	Asbestos	Medical Equipment Sterilization	Ethylene Oxide
Chemical Manufacturing	Various	Natural Gas Plant	Acetaldehyde, Benzene, Formaldehyde, Propylene, Toluene, Xylene
Chrome Plating	Hexavalent Chromium, Cadmium	Petroleum Refinery	Benzene, Cadmium
College/University	Cadmium, Hexavalent Chromium, Ethylene Oxide	Oil Production Facility	Acetaldehyde, Benzene, Formaldehyde, Propylene
Electrical Equipment Manufacturing	Cadmium, Chromium, Nickel, PCBs, Trichloroethylene, 1,4-Dioxane	Petroleum Tank	Benzene
Electronic Equipment Manufacturing	1,4-Dioxane, Cadmium, Chromium, Nickel, Trichloroethylene	Printing Services	1,2,4-Tri-methylbenzene, Ethyl Benzene, Ethylene glycol monobutyl ether, Methylene chloride, Propylene, Xylenes
Fiberglass Manufacturing	Styrene	Wastewater Treatment	Benzene, Carbon Tetrachloride, Ethylene Dichloride, Ethylene Dibromide, Chloroform, Perchloroethylene, Trichloroethylene,
Gasoline Station	Benzene, Methyl-tertiary butyl ether, Toluene, Xylene		
Graphite Manufacturing	Dioxins, Dibenzofurans		

**TABLE D-2
COMMON TOXIC AIR CONTAMINANTS**

Substance	CAS Number**	Substance	CAS Number**
Acenaphthene [PAH,POM]	83329	Benzene	71432
Acenaphthylene [PAH,POM]	208968	Benzidine (and its salts) [POM]	92875
Acetaldehyde	75070	Benzidene-based dyes	1020
Acetamide	60355	Benzo[a]pyrene [PAH, POM]	50328
Acetonitrile	75058	Benzo[b]fluoranthene [PAH, POM]	205992
Acetophenone	98862	Benzo[e]pyrene [PAH,POM]	192972
2-Acetylaminofluorene [PAH-Derivative, POM]	53963	Benzo[g,h,i]perylene	191242
Acrolein	107028	Benzo[j]fluoranthene [PAH, POM]	205823
Acrylamide	79061	Benzo[k]fluoranthene [PAH, POM]	207089
Acrylic Acid	79107	Benzofuran	271896
Acrylonitrile	107131	Benzoic trichloride (Benzotrichloride)	98077
Allyl chloride	107051	Benzoyl chloride	98884
Aluminum	7429905	Benzoyl peroxide	94360
Aluminum oxide (fibrous forms)	1344281	Benzyl chloride	100447
2-Aminoanthraquinone [PAH-Derivative, POM]	117793	Beryllium	7440417
4-Aminobiphenyl [POM]	92671	Beryllium Compounds	-----
Amitrole	61825	Biphenyl [POM]	92524
Ammonia	7664417	Bis(2-chloroethyl)ether {DCEE}	111444
Ammonium nitrate	6484522	Bis (chloromethyl) ether	542881
Ammonium sulfate	7783202	Bis(2-ethylhexyl) adipate	103231
Aniline	62533	Bromine	7726956
o-Anisidine	90040	Bromine Compounds (inorganic)	-----
Anthracene [PAH, POM]	120127	Bromine pentafluorid	7789302
Antimony	7440360	Bromoform	75252
Antimony Compounds, not elsewhere listed.	-----	1,3-Butadiene	106990
Antimony trioxide	1309644	Butyl acrylate	141322
Arsenic	7440382	n-Butyl alcohol	71363
Arsenic Compounds (inorganic)	1016	sec-Butyl alcohol	78922
Arsenic Compounds (other than inorganic)	1017	tert-Butyl alcohol	75650
Arsine	7784421	Butyl benzyl phthalate	85687
Asbestos	1332214	Cadmium	7440439
Barium	7440393	Cadmium Compounds	-----
Barium chromate	10294403	Calcium chromate	13765190
Barium Compounds	-----	Calcium cyanamide	156627
Benz[a]anthracene [PAH, POM]	56553	Caprolactam	105602

Substance	CAS Number**
Captafol	2425061
Captan	133062
Carbaryl [PAH-Derivative, POM]	63252
Carbon black extracts	1050
Carbon disulfide	75150
Carbon monoxide (A-II)	630080
Carbon tetrachloride	56235
Carbonyl sulfide	463581
Carrageenan (degraded)	1055
Catechol	120809
Chloramben	133904
Chlordane	57749
Chlorinated fluorocarbon 113 {CFC 113}	76131
Chlorinated paraffins (avg chain length C12)	108171262
Chlorine	7782505
Chlorine dioxide	10049044
Chloroacetic acid	79118
2-Chloroacetophenone	532274
p-Chloroaniline	106478
Chlorobenzene	108907
Chlorobenzenes, not elsewhere listed:	1058
Chlorobenzilate {Ethyl-4,4'-dichlorobenzilate}	510156
Chlorodifluoromethane {Freon 22}	75456
Chloroform	67663
Chloromethyl methyl ether (technical grade)	107302
Chlorophenols, not elsewhere listed.	1060
4-Chloro-o-phenylenediamine	95830
2-Chlorophenol	-----
Chloropicrin	76062
Chloroprene	126998
p-Chloro-o-toluidine	95692
Chromium	7440473
Chromium (hexavalent)	18540299
Chromium Compds. (other than hexavalent)	-----
Chromium trioxide	1333820
Chrysene [PAH, POM]	218019
Cobalt	7440484

Substance	CAS Number**
Cobalt Compounds	-----
Coke oven emissions	1066
Copper	7440508
Copper Compounds	-----
Creosotes	1070
p-Cresidine	120718
Cresols (mixtures of) {Cresylic acid}	1319773
m-Cresol	108394
o-Cresol	95487
p-Cresol	106445
Crotonaldehyde	4170303
Cumene	98828
Cumene hydroperoxide	80159
Cupferron	135206
Cyanide compounds, not elsewhere listed.	1073
Cyclohexane	110827
Cyclohexanol	108930
Cycloheximide	66819
Decabromodiphenyl oxide [POM]	1163195
Dialkylnitrosamines	1075
2,4-Diaminoanisole	615054
Diaminotoluenes (mixed isomers)	1078
2,4-Diaminotoluene {2,4-Toluenediamine}	95807
Diazomethane	334883
Dibenz[a,h]acridine [POM]	226368
Dibenz[a,h]anthracene [PAH, PAM]	53703
Dibenz[a,j]acridine [POM]	224420
7H-Dibenzo[c,g]carbazole	194592
Dibenzo[a,e]pyrene [PAH, POM]	192654
Dibenzo[a,h]pyrene [PAH, POM]	189640
Dibenzo[a,i]pyrene [PAH, POM]	189559
Dibenzo[a,l]pyrene [PAH, POM]	191300
Dibenzofuran [POM]	132649
1,2-Dibromo-3-chloropropane	96128
2,3-Dibromo-1-propanol	96139
Dibutyl phthalate	84742
1,2-Dichlorobenzene	95501

Substance	CAS Number**
1,3-Dichlorobenzene	541731
p-Dichlorobenzene {1,4-Dichlorobenzene}	106467
Dichlorobenzenes (mixed isomers)	25321226
3,3'-Dichlorobenzidine	91941
Dichlorodiphenyldichloroethylene (DDE) [POM]	72559
1,1-Dichloroethane {Ethylidene dichloride}	75343
Dichlorofluoromethane {Freon 12}	75434
2,4-Dichlorophenol	120832
Dichlorophenoxyacetic acid, salts and esters	94757
1,2-Dichloropropane {Propylene dichloride}	78875
1,3-Dichloropropene	542756
Dichlorovos (DDVP)	62737
Dicofof [POM]	115322
Diesel engine exhaust, particulate matter	9901
Diesel engine exhaust, total organic gas	9902
Diesel fuel (marine)	-----
Diethanolamine	111422
Di (2-ethylhexyl) phthalate	117817
Diethyl sulfate	64675
Diethylene glycol	111466
Diethylene glycol dimethyl ether	111966
Diethylene glycol monobutyl ether	112345
Diethylene glycol monoethyl ether	111900
Diethylene glycol monomethyl ether	111773
3,3'-Dimethoxybenzidine [POM]	119904
4-Dimethylaminoazobenzene [POM]	60117
N,N-Dimethylaniline	121697
7,12-Dimethylbenz[a]anthracene	57976
3,3'-Dimethylbenzidine {o-Tolidine} [POM]	119937
Dimethyl carbamoyl chloride	79447
N,N-Dimethyl formamide	68122
1,1-Dimethylhydrazine	57147
Dimethyl phthalate	131113
Dimethyl sulfate	77781
Dimethylamine	124403
4,6-Dinitro-o-cresol and salts	534521
2,4-Dinitrophenol	51285

Substance	CAS Number**
1,6-Dinitropyrene [PAH-Derivative, POM]	42397648
1,8-Dinitropyrene [PAH-Derivative, POM]	42397659
Dinitrotoluenes (mixed isomers)	25321146
2,4-Dinitrotoluene	121142
2,6-Dinitrotoluene	606202
1,4-Dioxane	123911
Dioxins/Dibenzofuran	-----
Diphenylhydantoin [POM]	630933
1,2-Diphenylhydrazine {Hydrazobenzene}	122667
Dipropylene glycol	25265718
Dipropylene glycol monomethyl ether	34590948
Direct Black 38 [PAH-Derivative, POM]	1937377
Direct Blue 6 [PAH-Derivative, POM]	2602462
Direct Brown 95 (technical grade) [POM]	16071866
Environmental tobacco smoke	1090
Epichlorohydrin	106898
1,2-Epoxybutane	106887
Epoxy Resins	1091
Erionite	12510428
Ethyl acrylate	140885
Ethyl benzene	100414
Ethyl chloride {Chloroethane}	75003
Ethylene	74851
Ethylene dibromide {1,2-Dibromoethane}	106934
Ethylene dichloride {1,2-Dichloroethane}	107062
Ethylene glycol	107211
Ethylene glycol diethyl ether	629141
Ethylene glycol dimethyl ether	110714
Ethylene glycol monobutyl ether	111762
Ethylene glycol monoethyl ether	110805
Ethylene glycol monoethyl ether acetate	111159
Ethylene glycol monomethyl ether	109864
Ethylene glycol monomethyl ether acetate	110496
Ethylene glycol monopropyl ether	2807309
Ethylene oxide	75218
Ethylene thiourea	96457
Ethyleneimine {Aziridine}	151564

Substance	CAS Number**
Fluoranthene [PAH, POM]	206440
Fluorene [PAH, POM]	86737
Fluorides and compounds	1101
Fluorocarbons (brominated/chlorinated)	1104/1103
Formaldehyde	50000
Furan	110009
Gasoline Engine exhaust, particulate matter	9910
Gasoline Engine exhaust, total organic gas	9911
Gasoline vapors	1110
Glasswool fibers	1111
Glutaraldehyde	111308
Glycol ethers and their acetates	1115
Heptachlor	76448
Hexachlorobenzene	118741
Hexachlorobutadiene	87683
Hexachlorocyclohexane	1120
alpha-Hexachlorocyclohexane	319846
beta-Hexachlorocyclohexane	319857
Hexachlorocyclopentadiene	77474
Hexachloroethane	67721
Hexamethylene-1,6,-diisocyanate	822060
Hexamethylphosphoramide	680319
Hexane	110543
Hydrazine	302012
Hydrochloric acid	7647010
Hydrocyanic acid	74908
Hydrogen bromide	10035106
Hydrogen fluoride	7664393
Hydrogen Selenide	7783075
Hydrogen sulfide	7783064
Hydroquinone	123319
Indeno[1,2,3,-cd]pyrene [PAH, POM]	193395
Iodine-131	24267569
Iron pentacarbonyl	13463406
Isocyanates	1125
Isophorone	78591
Isoprene, ex. from vegetative emission sources	78795

Substance	CAS Number**
Isopropyl Alcohol	67630
4,4'-Isopropylidenediphenol [POM]	80057
Lead	7439921
Lead compounds (inorganic)	1128
Lead acetate	301042
Lead chromate	7758976
Lead phosphate	7446277
Lead subacetate	1335326
Lead compounds (other than inorganic)	1129
Lindane (gamma-Hexachlorocyclohexane)	58899
Maleic anhydride	108316
Manganese	7439965
Manganese compounds	-----
Mercuric chloride	7487947
Mercury	7439976
Mercury compounds, not elsewhere listed:	-----
Methanol	67561
Methoxychlor [POM]	72435
Methyl bromide {Bromomethane}	74839
Methyl chloride {Chloromethane}	74873
Methyl chloroform {1,1,1-Trichloroethane}	71556
Methyl ethyl ketone {2-Butanone}	78933
Methyl hydrazine	60344
Methyl iodide {Iodomethane}	74884
Methyl isobutyl ketone {Hexone}	108101
Methyl isocyanate	624839
Methyl mercury {Dimethylmercury}	593748
Methyl methacrylate	80626
2-Methyl naphthalene [PAH, POM]	91576
Methyl tert-butyl ether	1634044
2-Methylaziridine {1,2-Propyleneimine}	75558
3-Methylcholanthrene [PAH-Derivative, POM]	56495
5-Methylchrysene [PAH-Derivative, POM]	3697243
4,4-Methylene bis (2-Chloroaniline)	101144
Methylene chloride {Dichloromethane}	75092
Methylene diphenyl isocyanate	101688
4,4-Methylenedianiline	101779

Substance	CAS Number**
2-Methylactonitrile {Acetone cyanohydrin}	75865
2-Methylpyridine	109068
Michler's ketone [POM]	90948
Mineral fibers (manmade/non-manmade)	1136/1135
Molybdenum trioxide	1313275
Naphthalene	91203
Nickel	7440020
Nickel compounds, not elsewhere listed:	-----
Nickel acetate	373024
Nickel carbonate	3333393
Nickel carbonyl	13463393
Nickel hydroxide	12054487
Nickel Oxide	1313991
Nickel refinery dust from the pyrometallurgical	1146
Nickel subsulfide	12035722
Nickelocene	1271289
Nitric Acid	7697372
Nitrilotriacetic acid	139139
Nitrobenzene	98953
4-Nitrobiphenyl [POM]	92933
6-Nitrochrysene [PAH-Derivative, POM]	7496028
2-Nitrofluorene [PAH-Derivative, POM]	607578
Nitrogen dioxide	10102440
Nitrogen mustard N-oxide	302705
4-Nitrophenol	100027
2-Nitropropane	79469
1-Nitropyrene [PAH-Derivative, POM]	5522430
p-Nitrosodiphenylamine [POM]	156105
N-Nitroso-N-methylurea	684935
N-Nitrosodi-n-butylamine	924163
N-Nitrosodi-n-propylamine	621647
N-Nitrosodiethanolamine	1116547
N-Nitrosodiethylamine	55185
N-Nitrosodimethylamine	62759
N-Nitrosomethylethylamine	10595956
N-Nitrosomorpholine	59892
N-Nitrosopiperidine	100754

Substance	CAS Number**
N-Nitrosopyrrolidine	930552
Ozone	10028156
PAHs, total, w/ind components reported	1150
PAHs, total, w/o ind components reported	1151
Parathion	56382
Particulate matter	-----
PCBs (Polychlorinated biphenyls) [POM]	1336363
Pentachloronitrobenzene {Quintobenzene}	82688
Pentachlorophenol	87865
Peracetic acid	79210
Perchloroethylene {Tetrachloroethene}	127184
Perylene [PAH,POM]	198550
Phenanthrene [PAH, POM]	85018
Phenol	108952
p-Phenylenediamine	106503
2-Phenylphenol [POM]	90437
Phosgene	75445
Phosphine	7803512
Phosphoric Acid	7664382
Phosphorus	7723140
Phosphorus oxychloride	10025873
Phosphorus pentachloride	10026138
Phosphorus pentoxide	1314563
Phosphorus trichloride	7719122
Phthalic anhydride	85449
Polychlorinated dibenzo-p-dioxins	1085/1086
2,3,7,8-Tetrachlorodibenzo-p-dioxin {TCDD}	1746016
1,2,3,7,8-Pentachlorodibenzo-p-dioxin [POM]	40321764
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin [POM]	39227286
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin [POM]	57653857
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin [POM]	19408743
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822469
1,2,3,4,5,6,7,8-Octachlorodibenzo-p-dioxin	3268879
Total Heptachlorodibenzo-p-dioxin [POM]	37871004
Total Hexachlorodibenzo-p-dioxin [POM]	34465468
Total Pentachlorodibenzo-p-dioxin [POM]	36088229
Total Tetrachlorodibenzo-p-dioxin [POM]	41903575

Substance	CAS Number**
Polychlorinated dibenzofurans {PCDF}	1080
2,3,7,8-Tetrachlorodibenzofuran [POM]	51207319
1,2,3,7,8-Pentachlorodibenzofuran [POM]	57117416
2,3,4,7,8-Pentachlorodibenzofuran [POM]	57117314
1,2,3,4,7,8-Hexachlorodibenzofuran [POM]	70648269
1,2,3,6,7,8-Hexachlorodibenzofuran [POM]	57117449
1,2,3,7,8,9-Hexachlorodibenzofuran [POM]	72918219
2,3,4,6,7,8-Hexachlorodibenzofuran [POM]	60851345
1,2,3,4,6,7,8-Heptachlorodibenzofuran [POM]	67562394
1,2,3,4,7,8,9-Heptachlorodibenzofuran [POM]	55673897
1,2,3,4,5,6,7,8-Octachlorodibenzofuran [POM]	39001020
Total Heptachlorodibenzofuran [POM]	38998753
Total Hexachlorodibenzofuran [POM]	55684941
Total Pentachlorodibenzofuran [POM]	30402154
Total Tetrachlorodibenzofuran [POM]	55722275
Polycyclic aromatic hydrocarbons	-----
Polycyclic organic matter	-----
Potassium bromate	7758012
1,3-Propane sultone	1120714
beta-Propiolactone	57578
Propionaldehyde	123386
Propoxur {Baygon}	114261
Propylene	115071
Propylene glycol monomethy ether	107982
Propylene glycol monomethyl ether acetate	108656
Propylene oxide	75569
Pyrene [PAH, POM]	129000
Pyridine	110861
Quinoline	91225
Quinone	106514
Radionuclides	1165
Radon and its decay products	1166
Reserpine [POM]	50555
Residual (heavy) fuel oils	-----
Rockwool fibers	1168
Selenium	7782492
Selenium compounds, not elsewhere listed:	-----

Substance	CAS Number**
Selenium sulfide	7446346
Silica, crystalline	1175
Silver	7440224
Silver compounds	-----
Slagwool fibers	1181
Sodium dichromate	10588019
Sodium hydroxide	1310732
Strontium chromate	7789062
Styrene	100425
Styrene oxide	96093
Sulfates	-----
Sulfur dioxide	7446095
Sulfuric Acid	7664939
Talc containing asbestiform fibers	1190
Terephthalic acid	100210
1,1,2,2-Tetrachloroethane	79345
2,3,4,6-Tetrachlorophenol	58902
Tetrachlorophenols	-----
Thallium	7440280
Thallium Compounds	-----
Thioacetamide	62555
Thiourea	62566
Titanium tetrachloride	7550450
Toluene	108883
Toluene diisocyanates, not elsewhere listed:	1204
Toluene-2,4-diisocyanate	584849
Toluene-2,6-diisocyanates	91087
o-Toluidine	95534
Toxaphene {Polychlorinated camphenes}	8001352
Tributyl phosphate	126738
1,2,4-Trichlorobenzene	120821
1,1,2-Trichloroethane {Vinyl trichloride}	79005
Trichloroethylene	79016
Trichlorofluoromethane {Freon 11}	75694
2,4,5-Trichlorophenol	95954
2,4,6-Trichlorophenol	88062
1,2,3-Trichloropropane	96184

Substance	CAS Number**
Triethyl phosphine	78400
Triethylamine	121448
Triethylene glycol dimethyl ether	112492
Trifluralin	1582098
Trimethyl phosphate	512561
1,2,4-Trimethylbenzene	95636
2,2,4-Trimethylpentane	540841
Triorthocresyl phosphate [POM]	78308
Triphenyl phosphate [POM]	115866
Triphenyl phosphite [POM]	101020
Urethane {Ethyl carbamate}	51796
Vanadium (fume or dust)	7440622
Vanadium Pentoxide	1314621
Vinyl acetate	108054
Vinyl bromide	593602

Substance	CAS Number**
Vinyl chloride	75014
Vinyl fluoride	75025
4-Vinylcyclohexene	100403
Vinylidene chloride	75354
Wood preservatives (arsenic and chromate)	1206
Xylene	1210
m-Xylene	108383
o-Xylene	95476
p-Xylene	106423
Zinc	7440666
Zinc compounds, not elsewhere listed:	-----
Zinc oxide	1314132

**CAS Registry Number: The Chemical Abstracts Service Registry Number (CAS) is designation assigned by the American Chemical Society's Chemical Abstract Service and uniquely identifies a specific compound regardless of the name or naming system used.

Source: Engineering Division, Ventura County APCD, May 2000.

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APPENDIX E

DEFINITION OF LAND USE CATEGORIES FOR TRIP GENERATION AND PROJECT EMISSION CALCULATION PURPOSES

Appendix E contains the land use codes and definitions of all of the land uses contained in ITE's *Trip Generation* (Sixth Edition - 1997). Not all of the land uses in ITE's *Trip Generation* are in URBEMIS. However, URBEMIS inputs can be modified so that emissions from land uses not in URBEMIS can be calculated using URBEMIS.

LAND USE: 010 - Waterport/Marine Terminal

A waterport, or marine terminal, is an area for the transfer of materials between land and sea and possibly for the storage of these materials.

LAND USE: 021 - Commercial Airport

A commercial airport accommodates commercial passenger service. The commercial airports surveyed also accommodated general aviation activities. Commercial airports are characterized by long runways for serving large jets, and extensive terminal facilities. However, some commercial airports have shorter runways and serve exclusively intrastate and commuter airlines.

LAND USE: 022 - General Aviation Airport

A general aviation airport is primarily designed for the use of small private and corporate aircraft, not for commercial passenger service. It is usually characterized by short runways, few or no terminal facilities, and many small aircraft.

LAND USE: 030 - Truck Terminal

Truck terminals are facilities where goods are transferred between trucks, trucks and railroads, or trucks and ports.

LAND USE: 090 - Park-and-Ride Lot with Bus Service

A bus park and ride station is a site used for the transfer of people between private vehicles and buses. It typically contains a bus passenger shelter, a parking lot, and circulation facilities for buses, as well as private motor vehicles. A significant number of passengers are dropped off.

LAND USE: 093 - Light Rail Transit Station with Parking

Light rail transit stations are transportation stations that provide park-and-ride activity. These stations are areas for the transfer of people between private vehicles and light rail transportation. They usually contain automobile parking areas; a transfer station; a passenger shelter; ticketing facilities; and ancillary amenities, such as rest rooms, vending machines, and coffee/newspaper stands. Drop off/pick-up and carpool areas may also be provided.

LAND USE: 110 - General Light Industrial

Light industrial facilities usually employ fewer than 500 persons and have an emphasis on activities other than manufacturing. Nevertheless, the distinction between light industrial and manufacturing is sometimes vague. Typical light industrial activities include printing plants, material testing laboratories, assemblers of data processing equipment, and power stations. All of the facilities surveyed were free-standing and devoted to a single use.

LAND USE: 120 - General Heavy Industrial

Heavy industrial facilities usually have a high number of employees per industrial plant and could also be categorized as manufacturing facilities. The distinction between heavy industrial and manufacturing is vague. However, heavy industrial uses would be limited to the manufacturing of large items.

LAND USE: 130 - Industrial Park

Industrial parks contain many industrial or related facilities. They are characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities, some with a large number of small businesses and others with one or two dominant industries.

LAND USE: 140 - Manufacturing

Manufacturing facilities are sites where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to production of goods, manufacturing facilities generally also have office, warehouse, research, and associated functions.

LAND USE: 150 - Warehousing

Warehouses are facilities that are primarily devoted to storage of materials. They may also include office and maintenance areas.

LAND USE: 151 - Mini-Warehouse

A mini-warehouse is a building in which a storage unit or vault is rented for the storage of goods. Each unit is physically separated from other units and access is usually provided through an overhead door or other common access point.

LAND USE: 152 - High-Cube Warehouse

High-cube warehouses are a new type of warehouse used for the storage of manufactured goods prior to their distribution to retail outlets. These facilities consist of large shells of steel buildings and large halls, often sub-divided for individual tenants, with a typical ceiling height of 24 to 26 feet. They are also characterized by a small employment count due to a high level of mechanization, truck activities frequently outside of the peak hour of the adjacent street system, and good freeway access.

LAND USE: 170 - Utilities

Utilities generally include offices space, electromechanical or industrial space, or parts and equipment storage areas.

LAND USE: 210 - Single Family Detached Housing

Any single family detached home on an individual lot is included in this category. A typical example is a home in a modern subdivision.

LAND USE: 220 - Apartment

An apartment is defined as a rental dwelling unit that is located within the same building as at least three other dwelling units. Examples of this category are quadruplexes and all types of apartment buildings. The apartments in this land use include both low-rise or 'walk-up' dwellings and high-rise multi-family dwellings.

LAND USE: 221 - Low-Rise Apartment

This land use includes apartments (rental dwelling units) in rental buildings that have one or two levels (floors), such as garden apartments.

LAND USE: 222 - High-Rise Apartment

This land use includes apartments (rental dwelling units) in rental buildings that have more than ten levels (floors), and most likely have one or more elevators.

LAND USE: 223 - Mid-Rise Apartment

This land use includes apartments (rental dwelling units) in rental buildings that have more than two levels (floors) and less than nine levels.

LAND USE: 224 - Rental Townhouse

This land use includes townhouse communities with rented rather than owned units, and a minimum of two attached units per building structure.

LAND USE: 230 - Residential Condominium/Townhouse

Residential condominiums are defined as single-family ownership units that have at least one other single family owned unit within the same building structure. Both condominiums and townhouses are included in this category.

LAND USE: 231 - Low-Rise Residential Condominium/Townhouse

This land use includes condominiums and townhouses in buildings that have one or two levels (floors).

LAND USE: 232 - High-Rise Residential Condominium/Townhouse

This land use includes condominiums and townhouses in buildings that have three or more levels (floors).

LAND USE: 233 - Luxury Condominium/Townhouse

This land use includes condominiums and townhouses in buildings with luxury facilities or services.

LAND USE: 240 - Mobile Home Park

Mobile home parks generally consist of trailers shipped, sited, and installed on permanent foundations. Typically, they have community facilities such as recreation rooms, swimming pools, and laundry facilities. Many such parks restrict occupancy to adults.

LAND USE: 250 - Retirement Community

Retirement communities - restricted to adults or senior citizens - contain residential units similar to apartments or condominiums and are usually self-contained villages. They may also contain special services such as medical services, dining facilities, and some limited supporting retail facilities.

LAND USE: 251 - Elderly Housing - Detached

Elderly housing (detached) - restricted to senior citizens - contain residential units similar to single family housing, and are sometimes self-contained villages. They may also contain special services such as medical facilities, dining facilities, and some limited supporting retail facilities.

LAND USE: 252 - Congregate Care Facility

A congregate care facility typically consists of one or more multi-unit buildings designed for elderly living. These facilities might also contain dining rooms, medical facilities, and recreational facilities.

LAND USE: 253 - Elderly Housing - Attached

Elderly housing (attached) - restricted to senior citizens - contain residential units similar to apartments and condominiums, and are sometimes self-contained villages. They may also contain special services such as medical facilities, dining facilities, and some limited supporting retail facilities.

LAND USE: 260 - Recreational Homes

Recreational homes are usually located in a resort containing local services and complete recreational facilities. These dwellings are often second homes used by the owner periodically or rented on a seasonal basis.

LAND USE: 270 - Residential Planned Unit Development

Residential planned unit developments, for the purposes of trip generation, are defined as containing any combination of residential land uses, and might also contain supporting services such as limited retail and recreational facilities. The description of a PUD is general in nature since these developments vary by density and type of dwelling. It is therefore recommended that when information on the number and type of dwellings is

known, the trip generation should be calculated on the basis of the known type of dwellings rather than on the basis of land use 270.

LAND USE: 310 - Hotel

A hotel is a place of lodging that provides sleeping accommodations, restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, and other retail and service shops. Some of the sites included in this land use category are actually large motels providing the facilities of a hotel noted above.

LAND USE: 311 - All Suites Hotel

All suites hotels are places of lodging that provide sleeping accommodations, a small restaurant and lounge, and a small amount of meeting space. Each suite includes a sitting room and separate bedroom; often, limited kitchen facilities are provided within the suite. These hotels are located primarily in suburban areas.

LAND USE: 312 - Business Hotel

Business hotels are places of lodging aimed toward the business traveler. They provide sleeping accommodations and other limited facilities, such as a breakfast buffet bar and an afternoon beverage bar (no lunch or dinner is served, and no meeting facilities are provided). Each unit is a large single room. All locations nationwide are in suburban areas.

LAND USE: 320 - Motel

A motel is a place of lodging providing sleeping accommodations and often, a restaurant. Motels generally offer free on-site parking and provide little or no meeting space.

LAND USE: 330 - Resort Hotel

Resort hotels are similar to hotels (land use 310) in that they provide sleeping accommodations, restaurants, cocktail lounges, retail shops, and guest services. The primary difference is that resort hotels cater to the tourist and vacation business, often providing a variety of recreational facilities, rather than convention and meeting business. Resort hotels are normally located in suburban or outlying locations on larger sites than conventional hotels.

LAND USE: 411 - City Park

City parks are owned and operated by a city. The city parks surveyed varied widely as to location, type, and number of facilities, including boating or swimming facilities, ball fields, camp sites, and picnic facilities. Because of the variety of facilities as well as local conditions such as weather, seasonal use of the individual sites is quite different. For example, some of the sites are used primarily for boating or swimming, while others are used for softball games.

LAND USE: 412 - County Park

County parks are owned and operated by a county. The county parks surveyed varied widely as to location, type, and number of facilities, including boating or swimming facilities, ball fields, camp sites, picnic facilities, and general open space. Because of the variety of facilities as well as local conditions such as weather, seasonal use of the individual sites is quite different. For example, some of the sites are used primarily for boating or swimming, while others are used for softball games.

LAND USE: 413 - State Park

State parks are owned and operated by a state. The state parks surveyed varied widely as to location and type and amount of facilities, including hiking trails, boating or swimming facilities, ball fields, camp sites, picnic facilities, and general open space. Because of the variety of facilities as well as local conditions such as weather, seasonal use of the individual sites is quite different. For example, some of the sites are used primarily for boating or swimming, while others are used for hiking or camping.

LAND USE: 414 - Water Slide Park

A water slide park contains water slides, wading pools, refreshment stands, and picnic areas.

LAND USE: 415 - Beach Park

A beach park contains a beach, and possibly other facilities such as changing rooms, rest rooms, picnic facilities, hiking, fishing, and camp sites. Often, in 'season' lifeguards are provided.

LAND USE: 416 - Campground/Recreational Vehicle Park

Campgrounds and recreational vehicle parks are recreational sites that accommodate campers, trailers, tents, and recreational vehicles. They are found in a variety of locations and provide a variety of facilities, often including restrooms with showers, recreational facilities such as a swimming pool, a convenience store, and a laundromat.

LAND USE: 417 - Regional Park

Regional parks are owned and operated by a regional park authority. The regional parks surveyed varied widely as to location and type and amount of facilities, including hiking trails, lakes, pools, ball fields, camp sites, picnic facilities and general open space. Because of the variety of facilities as well as local conditions such as weather, seasonal use of the individual sites is quite different. For example, some of the sites are used primarily for boating or swimming, while others are used for hiking or camping, etc.

LAND USE: 418 - National Monument

National monuments vary widely as to type of facilities and location. Many house scenic observation points or towers, or are historical monuments.

LAND USE: 420 - Marina

Marinas can include both public and private facilities. In addition to docks and berths for boats, some of the sites surveyed also had social and club activities, limited retail, and restaurants.

LAND USE: 430 - Golf Course

The golf courses included in this analysis were 9, 18, and 27 hole municipal courses and private country clubs. Some sites have driving ranges and clubhouses with a pro shop, and/or restaurant, lounge, and banquet facilities. Many of the municipal courses do not have any of these facilities.

LAND USE: 431 - Miniature Golf Course

Miniature golf courses are free-standing and consist of one or more individual putting courses, and may or may not include limited game rooms or refreshment services.

LAND USE: 432 - Golf Driving Range

Golf driving ranges are outdoor facilities containing driving tees for golfers to practice. These facilities may also provide individual or small group lessons; some sites have pro shops and/or small refreshments facilities.

LAND USE: 435 - Multipurpose Recreational Facility

Multipurpose recreational facilities contain two or more of the following land uses combined at one site: miniature golf, batting cages, video arcade, bumper boats, go-carts, and golf driving ranges.

LAND USE: 441 - Live Theater

Live theater is in a building or open air setting and includes a stage, a backstage area, dressing rooms, seats for the audience, and a lobby area.

LAND USE: 443 - Movie Theater without matinee

A movie theater consists of audience seating, single or multiple screens and auditoriums, and a lobby and refreshment stand. Movie theaters without matinees show movies on weekday evenings and weekends only; there are no weekday daytime showings.

LAND USE: 444 - Movie Theater with matinee

A movie theater consists of audience seating, single or multiple screens and auditoriums, and a lobby and refreshment stand. Movie theaters with matinees show movies on weekday afternoons and evenings, as well as on weekends.

LAND USE: 452 - Horse Racetrack

The horse racetrack where data was collected includes a spectator stadium, parking, track, stables, and housing for workers.

LAND USE: 453 - Automobile Racetrack

Automobile racetracks are facilities that contain a racetrack, spectator seating, parking, and restaurant/refreshment areas.

LAND USE: 454 - Dog Racetrack

Dog racetracks include a spectator stadium, parking, track, and possibly stables and housing for workers.

LAND USE: 460 - Arena

An arena is a large indoor structure in which spectator events are held. These events vary from professional ice hockey and basketball to non-sporting events such as concerts, shows, or religious services. Arenas are generally provided with large parking facilities, except when located in or around the downtown of a large city.

LAND USE: 465 - Ice Rink

Ice rinks are facilities used for ice-skating oriented sports and entertainment activities. They may contain spectator seating, refreshment areas, and amenities.

LAND USE: 473 - Casino/Video Lottery Establishment

Casino/video lottery establishments are businesses that provide electronic or manually controlled slot machines. Full food service is generally not provided at these facilities; however, refreshments and alcoholic beverages may be served.

LAND USE: 480 - Amusement Park

An amusement park contains rides, entertainment, refreshment stands, and picnic areas.

LAND USE: 481 - Zoo

A zoo contains wild animals, refreshment stands, and picnic areas.

LAND USE: 491 - Tennis Courts

Tennis courts are indoor or outdoor facilities specifically designed for playing tennis. Other on-site facilities may include limited spectator seating and a parking lot. Tennis courts can either be public or private facilities.

LAND USE: 492 - Racquet Club

Racquet clubs are privately-owned facilities with tennis courts, and other facilities often including swimming pools and whirlpools, saunas, racquetball and handball courts, exercise classes, and weightlifting equipment.

LAND USE: 493 - Health Club

Health clubs are privately-owned facilities that may include swimming pools, whirlpools, saunas, tennis, racquetball and handball courts, exercise classes, weightlifting and gymnastics equipment, locker rooms, and a restaurant or snack bar.

LAND USE: 494 - Bowling Alley

Bowling alleys are recreational facilities that include bowling lanes. A small lounge, restaurant and/or snack bar, video games and pool tables, may also be available.

LAND USE: 495 - Recreational Community Center

Recreational community centers are facilities similar to and including YMCAs, often including classes and clubs for adults and children, day care or a nursery school, meeting rooms, swimming pools and whirlpools, saunas, tennis, racquetball, and handball courts, exercise classes, weightlifting and gymnastics equipment, locker rooms, and a restaurant or snack bar.

LAND USE: 501 - Military Base

Most of the military bases surveyed were air force bases, containing offices, training facilities, housing facilities, dining facilities, and recreational facilities.

LAND USE: 520 - Elementary School

Elementary schools serve students between the kindergarten and middle school or junior high school levels. Usually, they are centrally located in residential communities in order to facilitate student access and have no student drivers.

LAND USE: 521 - Private School (K-12)

Private schools serve students between kindergarten and high school, students may travel a long distance to get to private schools.

LAND USE: 522 - Middle School/Junior High School

Middle schools or junior high schools serve students who have completed elementary school and have not yet entered high school.

LAND USE: 530 - High School

High schools are for students who have completed middle school or junior high school. The high schools analyzed were generally separated from other land uses and had exclusive access points and parking facilities. Acreage and floor space varied widely with populations served and the social and economic characteristics of the area.

LAND USE: 540 - Junior/Community College

This land use includes two-year junior colleges or community colleges. A number of two year institutions have sizable evening programs. The two year colleges analyzed were generally separated from other land uses and had exclusive access points, and parking facilities. Acreage, floor space, staff, and parking accommodations vary widely with populations served and the social and economic characteristics of the area; thus, the student enrollment seems to be the most consistent basis for establishing trip generation rates.

LAND USE: 550 - University/College

This land use includes four-year and graduate educational institutions. Acreage, floor space, staff, and parking accommodations vary widely with populations served and the social and economic characteristics of the area; thus, the student enrollment seems to be the most consistent basis for establishing trip generation rates.

LAND USE: 560 - Church

A church is a building providing public worship facilities, and generally houses an assembly hall or sanctuary, meeting rooms, classrooms, and occasionally dining, catering, or party facilities.

LAND USE: 561 - Synagogue

A synagogue is a building providing public worship facilities, and generally houses an assembly hall or sanctuary, meeting rooms, classrooms, and occasionally dining, catering, or party facilities. The Sabbath is celebrated on Friday evenings and all day Saturday. Reform, conservative, and orthodox synagogues each have different trip characteristics.

LAND USE: 565 - Day Care Center

A day care center is a facility where care for pre-school age children is provided, normally during the daytime hours. Day care facilities generally include classrooms, offices, eating areas, and playgrounds. Some centers also provide after-school care for older children.

LAND USE: 566 - Cemetery

A cemetery is a place for burying the dead, possibly including buildings used for funeral services, a mausoleum, and a crematorium.

LAND USE: 571 - Prison

A prison is a place for housing persons convicted of committing a crime or awaiting trial, usually including cells, dining and food preparation facilities, limited recreational facilities, work areas, and offices.

LAND USE: 590 - Library

A library can be either a public or private facility, and houses shelves containing books, reading rooms, or areas, and possibly, meeting rooms.

LAND USE: 591 - Lodge/Fraternal Organization

A lodge/fraternal organization typically includes a club house with dining and drinking facilities, recreational and entertainment facilities, and meeting rooms.

LAND USE: 610 - Hospital

The term hospital refers to an institution where medical or surgical care is given to non-ambulatory and ambulatory patients, and overnight accommodations are provided. The term does not, however, refer to medical clinics (facilities that provide diagnoses and

outpatient care only) or to nursing homes (facilities devoted to the care of persons unable to care for themselves).

LAND USE: 620 - Nursing Home

A nursing home is defined as any facility whose primary function is to care for persons unable to care for themselves. The term is applicable not only to rest homes, which are primarily for the aged, but also to chronic and convalescent homes. This type of facility is characterized by residents who do little or no driving. Traffic is primarily generated by employees, visitors, and deliveries.

LAND USE: 630 - Clinic

A clinic is defined as any facility that provides limited diagnostic and outpatient medical care, but is unable to provide prolonged in-house medical/surgical care.

LAND USE: 710 - General Office Building

A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organization, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers, and tenant services such as a bank or savings and loan, a restaurant or cafeteria, and service retail facilities.

LAND USE: 714 - Corporate Headquarters Building

A corporate headquarters building is a single tenant office building housing the corporate headquarters of a company or organization, and generally containing offices, meeting rooms, space for file storage and data processing, a restaurant or cafeteria, and other service functions.

LAND USE: 715 - Single Tenant Office Building

A single tenant office building generally contains the offices, meeting rooms, and space for file storage and data processing of a single business or company, and possible other service functions including a restaurant or cafeteria.

LAND USE: 720 - Medical-Dental Office Building

A medical office is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical/surgical care. A medical office is generally operated by one or more private physicians or dentists.

LAND USE: 730 - Government Office Building

A government office building is an individual building containing the entire function or simply one agency of a city, county, state, federal government or other governmental unit. It differs from a government office complex - land use 733 (formerly called a civic center) in that it is not a group of several buildings that are interconnected with pedestrian walkways.

LAND USE: 731 - State Motor Vehicles Department

The State Motor Vehicles Department is typically an office-type building housing driver license testing, vehicle registration, and related functions.

LAND USE: 732 - U.S. Post Office

A U.S. Post Office is a federal building housing service windows for mailing packages and letters, post office boxes, offices, and sorting and distributing facilities for mail, and vehicle storage areas.

LAND USE: 733 - Government Office Complex

A government office complex is a complex of buildings housing a variety of functions of a city, county, state, federal government or other governmental unit, or multiple governmental units. It differs from a government office building (land use 730) in that it is a group of buildings that are interconnected with pedestrian walkways. This land use was formerly called a civic center.

LAND USE: 750 - Office Park

Office parks are generally suburban subdivisions or planned unit developments containing general office buildings and support services such as banks, savings and loan institutions, restaurants, and service stations arranged in a park-like or campus-like atmosphere.

LAND USE: 760 - Research and Development Center

Research centers are facilities or groups of facilities devoted nearly exclusively to research and development activities. They may also contain offices and light fabrication areas.

LAND USE: 770 - Business Park

Business parks consist of a group of flex-type or incubator one-or two-story buildings served by a common roadway system. The tenant space is flexible to house a variety of uses; the rear side of the building is usually served by a garage door. Tenants may be start-up companies or small mature companies that require a variety of space.

LAND USE: 812 - Building Materials and Lumber Store

A building materials/lumber store is a small free-standing building that sells hardware, building materials, and lumber. The lumber may be in the main building or in a yard or storage shed. The storage areas are not included in the total gross floor areas reported. The buildings contained in this land use are less than 25,000 gross square feet in size.

LAND USE: 813 - Free-Standing Discount Superstore

The discount superstores in this category are similar to the free-standing discount stores described in land use 815 with the exception that they also contain a full service grocery department under the same roof that shares entrances and exits with the discount store area. They are free-standing stores with off-street parking. The stores usually offer a

variety of customer services, centralized cashiering, and a wide range of products. They typically maintain long store hours seven days a week. The stores included in this data are often the only store on a site, but can also be found in mutual operation with a related or unrelated garden center and/or service station. They also are sometimes found as separate parcels within a retail complex with their own dedicated parking area.

LAND USE: 814 - Specialty Retail Center

Specialty retail centers are generally small strip shopping centers containing a variety of retail shops, specializing in quality apparel, hard goods, services such as real estate office, dance studios, or florists, and small restaurants.

LAND USE: 815 - Free-Standing Discount Store

The discount stores in this category are free-standing with off-street parking. They usually offer a variety of customer services, centralized cashiering, and a wide range of products. They typically maintain long store hours seven days a week. The stores included in this data are often the only store on a site, but can also be found in mutual operation with a related or unrelated garden center or service station. They also are sometimes found as separate parcels within a retail complex with their own dedicated parking.

LAND USE: 816 - Hardware/Paint Store

Hardware and paint stores are generally free-standing buildings with off-street parking.

LAND USE: 817 - Nursery (Garden Center)

A nursery or garden center is a free-standing building with a yard of planting or landscape stock. The nurseries surveyed primarily serve the general public. Some have large greenhouses; some offer landscaping services. Most have office, storage, and shipping facilities. This type of business is characterized by seasonal variations in trip characteristics.

LAND USE: 818 - Nursery (Wholesale)

A wholesale nursery is a free-standing building with a yard of planting or landscape stock. The nurseries surveyed primarily serve contractors and suppliers. Some have large greenhouses; some offer landscaping services. Most have office, storage, and shipping facilities. This type of business is characterized by seasonal variations in trip characteristics.

LAND USE: 820 - Shopping Center

A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Its composition is related to its market area in terms of size, location, and type of store. Shopping centers provide on-site parking facilities. Surveys for this land use included neighborhood centers, community centers, regional centers, and super regional centers. They ranged in size from 1,700 to 2,200,000 square feet of gross leasable area. Some of the centers included non-merchandising uses

such as office buildings, movie theaters, post offices, banks, health clubs, and recreational facilities such as ice skating rinks or indoor miniature golf courses.

LAND USE: 823 - Factory Outlet Center

A factory outlet center is a type of shopping center that primarily houses factory outlet stores, attracting customers from a wide geographic area, very often even from a larger area than a regional shopping center.

LAND USE: 831 - Quality Restaurant

This land use consists of eating establishments of high quality and with turnover rates generally of at least one hour or longer. Generally, quality restaurants do not serve breakfast, some do not serve lunch; all serve dinner. Typically, the restaurants included in this land use are not a chain, and reservations are required.

LAND USE: 832 – High-Turnover (Sit-Down) Restaurant

This land use consists of sit-down eating establishments with turnover rates generally of one hour or less. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain. Generally, these restaurants serve lunch and dinner; they may also be open for breakfast and are sometimes open 24 hours per day. Some facilities contained within this land use may also contain a bar area for serving food and alcoholic drinks.

LAND USE: 833 - Fast-Food Restaurant without Drive-Through Window

This land use includes fast-food restaurants without drive-through windows. This type of restaurant is characterized by a large carryout clientele; long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours); and high turnover rates for eat-in customers.

LAND USE: 834 - Fast-Food Restaurant with Drive-Through Window

This land use includes fast-food restaurants with drive-through windows. This type of restaurant is characterized by a large carryout clientele; long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours); and high turnover rates for eat-in customers.

LAND USE: 835 - Fast-Food Restaurant with Drive-Through Window and No Indoor Seating

This category includes fast-food restaurants with drive-through service only. These facilities typically have very small building areas and may provide a limited amount of outside seating.

LAND USE: 836 - Drinking Place

A drinking place contains a bar where alcoholic beverages and snacks are served and possibly some type of entertainment such as music, television screens, video games, or pool tables.

LAND USE: 837 - Quick Lubrication Vehicle Shop

A quick lubrication vehicle shop is a business where the primary activity is to perform oil change services for vehicles. Other ancillary services provided may include preventative maintenance, such as fluid and filter changes. Automobile repair service is generally not provided.

LAND USE: 840 - Automobile Care Center

An automobile care center houses numerous tenants providing automobile related services, including a mix of repair and servicing facilities, automobile stereo installation, seat cover upholstery, etc.

LAND USE: 841 - New Car Sales

New car sales facilities are generally located as strip development along major arterial streets that already have a preponderance of commercial development. Generally included are automobile services and parts sales along with a sometimes substantial used-car sales operation. Some dealerships also include leasing activities and truck sales and servicing.

LAND USE: 843 - Automobile Parts Sales

Automobile parts facilities specialize in the sale of automobile parts for do-it-yourself maintenance and repair. Items sold at these facilities include items such as spark plugs, distributor caps, and batteries. These facilities are not equipped for on-site vehicle repair.

LAND USE: 844 - Gasoline/Service Station

Service stations generally are located at intersections or freeway interchanges and have facilities for fueling motor vehicles. They may also include facilities for servicing and repairing motor vehicles. This land use includes service stations without convenience stores or car washes. The independent variable “vehicle fueling position” is defined as the maximum number of vehicles that can be fueled simultaneously.

LAND USE: 845 - Gasoline/Service Station with Convenience Market

Service stations generally are located at intersections or freeway interchanges. This land use includes service stations with convenience markets where the primary business is the fueling of motor vehicles, although they may also have facilities for servicing and repairing motor vehicles. Some commonly sold convenience items are newspapers, coffee or other beverages, and snack items that are generally consumed in the car. This land use does not include stations with car washes. The independent variable “vehicle fueling position” is defined as the maximum number of vehicles that can be fueled simultaneously.

LAND USE: 846 - Gasoline/Service Station with Convenience Market and Car Wash

Service stations generally are located at intersections or freeway interchanges. This land use includes service stations with convenience markets and car washes where the primary

business is the fueling of motor vehicles, although they may also include facilities for servicing and repairing motor vehicles. The independent variable “vehicle fueling position” is defined as the maximum number of vehicles that can be fueled simultaneously.

LAND USE: 847 - Self Service Car Wash

The facilities surveyed are manual operations where the driver parks and washes a vehicle in a stall.

LAND USE: 848 - Tire Store

The tire stores surveyed sell tires, and provide installation and possibly other automobile maintenance functions and customer services. These stores generally do not contain large storage or warehouse areas.

LAND USE: 849 - Wholesale Tire Store

Wholesale tire stores are warehouse type facilities with the primary function of selling and installing tires for automobiles and small trucks. Other services provided may include automotive maintenance functions such as wheel alignment or shock and brake service, and customer services. A tire display, customer waiting lounge and restroom facilities, staff office space, and significant storage area are also provided. General mechanical repairs and body work are usually not conducted at these facilities.

LAND USE: 850 - Supermarket

Supermarkets are typically free-standing retail stores selling a complete assortment of food, food preparation and wrapping material, and household cleaning and servicing items. Supermarkets may also contain facilities such as money machines, photo centers, pharmacies, and video rental areas.

LAND USE: 851 - Convenience Market (Open 24 hours)

Convenience markets in this classification are usually open 24 hours per day, depending on the management and possibly the location. These markets sell convenience foods, newspapers, magazines, and often beer and wine, but do not have gasoline pumps.

LAND USE: 852 - Convenience Market (Open 15-16 hours)

Convenience markets are usually open 15 to 16 hours per day. These markets sell convenience foods, newspapers, magazines, and often beer and wine, but do not have gasoline pumps.

LAND USE: 853 - Convenience Market with Gasoline Pumps

The convenience markets surveyed sell gasoline, convenience foods, newspapers, magazines, and often beer and wine. This land use includes convenience markets with gasoline pumps where the primary business is the selling of convenience items, not the fueling of motor vehicles.

LAND USE: 854 - Discount Supermarket

Discount supermarkets are typically free-standing retail stores selling a complete assortment of food (often in bulk), food preparation and wrapping materials, and household cleaning and servicing items, at discounted prices.

LAND USE: 860 - Wholesale Market

Wholesale markets generally include large storage and distribution areas for receiving goods (such as produce) and shipping these goods to places such as grocery stores and restaurants. Generally, these markets are characterized by little drive-in business, and truck deliveries and pick-ups at all hours of the day.

LAND USE: 861 - Discount Club

A discount club is a discount store/warehouse whose shoppers pay a membership fee in order to take advantage of discounted prices on a wide variety of items including food, clothing, tires, appliances, etc. Many items are sold in bulk.

LAND USE: 862 - Home Improvement Superstore

Home improvement superstores are free-standing warehouse type facilities with off-street parking. Home improvement superstores generally offer a variety of customer services and centralized cashiering, and they specialize in the sale of home improvement merchandise. They typically maintain long store hours seven days a week. Examples of items sold in these stores include lumber, tools, paint, lighting, wallpaper and paneling, kitchen and bathroom fixtures, lawn equipment, and garden plants and accessories. The stores included in this data are often the only ones on the site, but they can also be found in mutual operation with a related or unrelated garden center. The buildings contained in this land use usually range in size from 25,000 to 150,000 square feet of gross floor area.

LAND USE: 863 - Electronics Superstore

Electronics superstores are free-standing warehouse type facilities with off-street parking. Electronics superstores generally offer a variety of customer services and centralized cashiering, and they specialize in the sale of home and vehicle electronic merchandise. They typically maintain long store hours seven days a week. Examples of items sold in these stores include televisions, compact disc and cassette tape players, compact discs and tapes, cameras, radios, videos, and general electronic accessories. Major home appliances may also be sold at these facilities. The stores included in this data may or may not be the only ones on the site.

LAND USE: 864 - Toy/Children's Superstore

Toy/children's superstores are free-standing warehouse type facilities with off-street parking. Toy/children's superstores generally offer a variety of customer services and centralized cashiering, and they specialize in the sale of child-oriented merchandise. They typically maintain long store hours seven days a week. Examples of items sold in these stores include board and video game systems, toys, bicycles/tricycles, wagons,

outdoor play equipment, and school supplies. Some may also carry children's clothing. The stores included in this data may or may not be the only ones on the site.

LAND USE: 870 - Apparel Store

An apparel store is an individual store specializing in the sale of clothing.

LAND USE: 880 - Pharmacy/Drugstore without Drive-Through Window

Pharmacies/drugstores are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products, and general merchandise. The drugstores in this category do not contain drive-through windows.

LAND USE: 881 - Pharmacy/Drugstore with Drive-Through Window

Pharmacies/drugstores are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products, and general merchandise. The drugstores in this category contain drive-through windows.

LAND USE: 890 - Furniture Store

A furniture store specializes in the sale of furniture, and often carpeting. Furniture stores are generally large, and include storage areas. The sites surveyed include both traditional furniture stores and warehouse stores with showrooms.

LAND USE: 895 - Video Arcade

A video arcade is a building or space in which video game units are played for a fee. Arcades generally contain 20 to 100 individual game units.

LAND USE: 896 - Video Rental Store

Video rental stores are businesses specializing in the rental of home movies and video games. Movies and video games may also be available for purchase. They typically maintain long store hours and are usually open seven days a week.

LAND USE: 911 - Walk-in Bank

Walk-in banks are generally freestanding buildings with their own parking lots. These banks do not have drive-in windows.

LAND USE: 912 - Drive-in Bank

Drive-in banks provide banking facilities for the motorist while in a vehicle; many also serve patrons who walk into the building.

Source: *Trip Generation*, Sixth Edition, Institute of Transportation Engineers, 1997.

APPENDIX F

PROJECT SCREENING ANALYSIS TABLES

Appendix F contains a series of tables of land uses, by project size and year of project completion, that will exceed at least one of the reactive organic compounds (ROC) and oxides of nitrogen (NOx) significance thresholds described in Chapter 3, Air Quality Significance Thresholds (see also Section 5.3.1, “Project Screening Analysis Tables”). Projects smaller than the applicable threshold values in Appendix F will not have a significant adverse impact on air quality with respect to ROC and/or NOx emissions. Although a project may fall below the applicable ROC or NOx threshold values in Appendix F, the project should still be assessed for other potential significant air quality impacts, such as fugitive dust, odors, toxic air contaminants, and consistency with the *Ventura County Air Quality Management Plan*.

If a project is a single land use type (e.g., single family detached housing), Appendix F can be used to determine whether the project is likely to exceed the significance thresholds. If the project size is near the size necessary to exceed the significance thresholds, the URBEMIS program should be run, using either the screening analysis mode (see Section 5.3.2, “URBEMIS Computer Program -Screening Analysis Mode”), or a detailed run (see Section 5.3.3, “URBEMIS Computer Program - Detailed Run”). Also, if there are unique conditions about a project that deviate from the Ventura County default values (see Section 5.3.3.1), the screening analysis tables are not appropriate, and either an URBEMIS screening analysis run or detailed run should be performed.

The information presented in the following tables is based on URBEMIS2002 for Windows and EMFAC2002, since these are the most recent versions of the computer programs at the current time. APCD recommends that lead agencies use the most recent version of URBEMIS adopted by the California Air Resources Board and the corresponding version of EMFAC. Therefore, if a more current version of URBEMIS is available, the District recommends using the more current version of URBEMIS instead of these tables.

The tables in this appendix were generated using the default values for Ventura County, and the default trip generation rates in URBEMIS. These trip generation rates are from the Institute of Transportation Engineers *Trip Generation*, Sixth edition, and other sources, as documented in the User’s Guide for URBEMIS. The “pass-by trip” option was selected for all land use categories. Emissions from area sources (e.g., natural gas usage, landscaping equipment, and consumer products) have also been included in the tables.

The project screening analysis mode in the URBEMIS program and the project screening analysis tables in Appendix F of this Guidelines use the default vehicle fleet mix for calculating estimated project emissions. Therefore, for projects where the fleet mix includes a greater percentage of heavy-duty vehicle trips than the default fleet mix, project emissions may be significantly underestimated in the screening analysis mode and the screening analysis tables. An example of this situation might be a warehouse facility

where the vehicle trips are predominantly heavy-duty diesel trips. The District recommends that if a lead agency determines that the expected vehicle fleet mix for a project will include more heavy duty vehicles than the default fleet mix, project screening analyses are not appropriate.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2003

Significance Threshold: 25 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	99 dwelling units
211	Low-Rise Apartment	127 dwelling units
230	Condominium/Townhouse, General	171 dwelling units
270	Residential Planned Unit Development	199 dwelling units
---	Nursing Home	338 dwelling units
565	Day-Care Center	25,900 sq. ft.
831	Quality Restaurant	23,800 sq. ft.
832	High Turnover (Sit-Down) Restaurant	15,800 sq. ft.
833	Fast-food Restaurant without Drive-through Window	2,900 sq. ft.
834	Fast-food Restaurant with Drive-through Window	4,200 sq. ft.
863	Electronics Superstore	46,500 sq. ft.
862	Home Improvement Superstore	61,900 sq. ft.
---	Strip Mall	52,500 sq. ft.
816	Hardware/Paint Store	40,900 sq. ft.
850	Supermarket	19,000 sq. ft.
851	Convenience Market (Open 24 hours)	2,900 sq. ft.
853	Convenience Market with Gasoline Pumps	2,520 sq. ft.
844	Service Station	13 fueling positions
710	General Office Building	123,000 sq. ft.
750	Office Park	97,900 sq. ft.
720	Medical Office Building	54,200 sq. ft.
110	General Light Industrial	201,400 sq. ft.
130	Industrial Park	148,700 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2003

Significance Threshold: 5 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	18 dwelling units
211	Low-Rise Apartment	15 dwelling units
230	Condominium/Townhouse, General	26 dwelling units
270	Residential Planned Unit Development	35 dwelling units
---	Nursing Home	67 dwelling units
565	Day-Care Center	5,200 sq. ft.
831	Quality Restaurant	4,000 sq. ft.
832	High Turnover (Sit-Down) Restaurant	3,200 sq. ft.
833	Fast-food Restaurant without Drive-through Window	600 sq. ft.
834	Fast-food Restaurant with Drive-through Window	900 sq. ft.
863	Electronics Superstore	9,300 sq. ft.
862	Home Improvement Superstore	17,300 sq. ft.
---	Strip Mall	10,500 sq. ft.
816	Hardware/Paint Store	8,200 sq. ft.
850	Supermarket	3,800 sq. ft.
851	Convenience Market (Open 24 hours)	580 sq. ft.
853	Convenience Market with Gasoline Pumps	510 sq. ft.
844	Service Station	3 fueling positions
710	General Office Building	15,400 sq. ft.
750	Office Park	9,400 sq. ft.
720	Medical Office Building	15,000 sq. ft.
110	General Light Industrial	46,100sq. ft.
130	Industrial Park	7,900 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2004

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	108 dwelling units
211	Low-Rise Apartment	144 dwelling units
230	Condominium/Townhouse, General	187 dwelling units
270	Residential Planned Unit Development	239 dwelling units
---	Nursing Home	345 dwelling units
565	Day-Care Center	28,000 sq. ft.
831	Quality Restaurant	26,000 sq. ft.
832	High Turnover (Sit-Down) Restaurant	17,100 sq. ft.
833	Fast-food Restaurant without Drive-through Window	3,130 sq. ft.
834	Fast-food Restaurant with Drive-through Window	4,510 sq. ft.
863	Electronics Superstore	50,500 sq. ft.
862	Home Improvement Superstore	66,500 sq. ft.
---	Strip Mall	56,500 sq. ft.
816	Hardware/Paint Store	44,200 sq. ft.
850	Supermarket	20,600 sq. ft.
851	Convenience Market (Open 24 hours)	3,130 sq. ft.
853	Convenience Market with Gasoline Pumps	2,730 sq. ft.
844	Service Station	14 fueling positions
710	General Office Building	137,000 sq. ft.
750	Office Park	110,000 sq. ft.
720	Medical Office Building	58,300 sq. ft.
110	General Light Industrial	218,000 sq. ft.
130	Industrial Park	175,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2004

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	19 dwelling units
211	Low-Rise Apartment	16 dwelling units
230	Condominium/Townhouse, General	29 dwelling units
270	Residential Planned Unit Development	37 dwelling units
---	Nursing Home	69 dwelling units
565	Day-Care Center	5,600 sq. ft.
831	Quality Restaurant	4,400 sq. ft.
832	High Turnover (Sit-Down) Restaurant	3,500 sq. ft.
833	Fast-food Restaurant without Drive-through Window	630 sq. ft.
834	Fast-food Restaurant with Drive-through Window	910 sq. ft.
863	Electronics Superstore	10,100 sq. ft.
862	Home Improvement Superstore	18,200 sq. ft.
---	Strip Mall	11,300 sq. ft.
816	Hardware/Paint Store	8,900 sq. ft.
850	Supermarket	4,100 sq. ft.
851	Convenience Market (Open 24 hours)	630 sq. ft.
853	Convenience Market with Gasoline Pumps	550 sq. ft.
844	Service Station	3 fueling positions
710	General Office Building	17,100 sq. ft.
750	Office Park	10,200 sq. ft.
720	Medical Office Building	15,800 sq. ft.
110	General Light Industrial	49,000 sq. ft.
130	Industrial Park	8,600 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2005

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	117 dwelling units
211	Low-Rise Apartment	160 dwelling units
230	Condominium/Townhouse, General	203 dwelling units
270	Residential Planned Unit Development	256 dwelling units
---	Nursing Home	354 dwelling units
565	Day-Care Center	30,100 sq. ft.
831	Quality Restaurant	28,200 sq. ft.
832	High Turnover (Sit-Down) Restaurant	18,400 sq. ft.
833	Fast-food Restaurant without Drive-through Window	3,370 sq. ft.
834	Fast-food Restaurant with Drive-through Window	4,860 sq. ft.
863	Electronics Superstore	54,000 sq. ft.
862	Home Improvement Superstore	70,900 sq. ft.
---	Strip Mall	60,600 sq. ft.
816	Hardware/Paint Store	47,500 sq. ft.
850	Supermarket	22,100 sq. ft.
851	Convenience Market (Open 24 hours)	3,360 sq. ft.
853	Convenience Market with Gasoline Pumps	2,940 sq. ft.
844	Service Station	15 fueling positions
710	General Office Building	150,000 sq. ft.
750	Office Park	120,500 sq. ft.
720	Medical Office Building	62,200 sq. ft.
110	General Light Industrial	233,500 sq. ft.
130	Industrial Park	199,500 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2005

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	21 dwelling units
211	Low-Rise Apartment	17 dwelling units
230	Condominium/Townhouse, General	31 dwelling units
270	Residential Planned Unit Development	39 dwelling units
---	Nursing Home	70 dwelling units
565	Day-Care Center	6,100 sq. ft.
831	Quality Restaurant	4,800 sq. ft.
832	High Turnover (Sit-Down) Restaurant	3,700 sq. ft.
833	Fast-food Restaurant without Drive-through Window	671 sq. ft.
834	Fast-food Restaurant with Drive-through Window	970 sq. ft.
863	Electronics Superstore	10,800 sq. ft.
862	Home Improvement Superstore	19,100 sq. ft.
---	Strip Mall	12,100 sq. ft.
816	Hardware/Paint Store	9,500 sq. ft.
850	Supermarket	4,500 sq. ft.
851	Convenience Market (Open 24 hours)	680 sq. ft.
853	Convenience Market with Gasoline Pumps	590 sq. ft.
844	Service Station	3 fueling positions
710	General Office Building	18,700 sq. ft.
750	Office Park	11,000 sq. ft.
720	Medical Office Building	16,600 sq. ft.
110	General Light Industrial	52,000 sq. ft.
130	Industrial Park	9,200 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2006

Significance Threshold: 25 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	126 dwelling units
211	Low-Rise Apartment	176 dwelling units
230	Condominium/Townhouse, General	220 dwelling units
270	Residential Planned Unit Development	225 dwelling units
---	Nursing Home	358 dwelling units
565	Day-Care Center	32,300 sq. ft.
831	Quality Restaurant	30,400 sq. ft.
832	High Turnover (Sit-Down) Restaurant	19,700 sq. ft.
833	Fast-food Restaurant without Drive-through Window	3,610 sq. ft.
834	Fast-food Restaurant with Drive-through Window	5,210 sq. ft.
863	Electronics Superstore	57,900 sq. ft.
862	Home Improvement Superstore	75,400 sq. ft.
---	Strip Mall	64,900 sq. ft.
816	Hardware/Paint Store	50,900 sq. ft.
850	Supermarket	23,700 sq. ft.
851	Convenience Market (Open 24 hours)	3,610 sq. ft.
853	Convenience Market with Gasoline Pumps	3,150 sq. ft.
844	Service Station	16 fueling positions
710	General Office Building	163,000 sq. ft.
750	Office Park	131,600 sq. ft.
720	Medical Office Building	66,300 sq. ft.
110	General Light Industrial	249,500 sq. ft.
130	Industrial Park	226,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2006

Significance Threshold: 5 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	22 dwelling units
211	Low-Rise Apartment	18 dwelling units
230	Condominium/Townhouse, General	34 dwelling units
270	Residential Planned Unit Development	41 dwelling units
---	Nursing Home	71 dwelling units
565	Day-Care Center	6,500 sq. ft.
831	Quality Restaurant	5,100 sq. ft.
832	High Turnover (Sit-Down) Restaurant	4,000 sq. ft.
833	Fast-food Restaurant without Drive-through Window	730 sq. ft.
834	Fast-food Restaurant with Drive-through Window	1,050 sq. ft.
863	Electronics Superstore	11,600 sq. ft.
862	Home Improvement Superstore	20,000 sq. ft.
---	Strip Mall	13,000 sq. ft.
816	Hardware/Paint Store	10,200 sq. ft.
850	Supermarket	4,800 sq. ft.
851	Convenience Market (Open 24 hours)	720 sq. ft.
853	Convenience Market with Gasoline Pumps	630 sq. ft.
844	Service Station	4 fueling positions
710	General Office Building	20,500 sq. ft.
750	Office Park	11,800 sq. ft.
720	Medical Office Building	17,400 sq. ft.
110	General Light Industrial	54,500 sq. ft.
130	Industrial Park	9,900 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2007

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	134 dwelling units
211	Low-Rise Apartment	192 dwelling units
230	Condominium/Townhouse, General	222 dwelling units
270	Residential Planned Unit Development	235 dwelling units
---	Nursing Home	365 dwelling units
565	Day-Care Center	34,400 sq. ft.
831	Quality Restaurant	32,600 sq. ft.
832	High Turnover (Sit-Down) Restaurant	21,000 sq. ft.
833	Fast-food Restaurant without Drive-through Window	3,850 sq. ft.
834	Fast-food Restaurant with Drive-through Window	5,550 sq. ft.
863	Electronics Superstore	61,600 sq. ft.
862	Home Improvement Superstore	79,800 sq. ft.
---	Strip Mall	69,100 sq. ft.
816	Hardware/Paint Store	54,200 sq. ft.
850	Supermarket	25,200 sq. ft.
851	Convenience Market (Open 24 hours)	3,850 sq. ft.
853	Convenience Market with Gasoline Pumps	3,360 sq. ft.
844	Service Station	17 fueling positions
710	General Office Building	176,500 sq. ft.
750	Office Park	142,400 sq. ft.
720	Medical Office Building	70,300 sq. ft.
110	General Light Industrial	265,500 sq. ft.
130	Industrial Park	251,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2007

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	24 dwelling units
211	Low-Rise Apartment	19 dwelling units
230	Condominium/Townhouse, General	37 dwelling units
270	Residential Planned Unit Development	42 dwelling units
---	Nursing Home	72 dwelling units
565	Day-Care Center	6,860 sq. ft.
831	Quality Restaurant	5,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	4,200 sq. ft.
833	Fast-food Restaurant without Drive-through Window	770 sq. ft.
834	Fast-food Restaurant with Drive-through Window	1,110 sq. ft.
863	Electronics Superstore	12,300 sq. ft.
862	Home Improvement Superstore	20,900 sq. ft.
---	Strip Mall	13,800 sq. ft.
816	Hardware/Paint Store	10,850 sq. ft.
850	Supermarket	5,050 sq. ft.
851	Convenience Market (Open 24 hours)	770 sq. ft.
853	Convenience Market with Gasoline Pumps	670 sq. ft.
844	Service Station	4 fueling positions
710	General Office Building	22,200 sq. ft.
750	Office Park	12,600 sq. ft.
720	Medical Office Building	18,200 sq. ft.
110	General Light Industrial	57,500 sq. ft.
130	Industrial Park	10,600 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2008

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	145 dwelling units
211	Low-Rise Apartment	211 dwelling units
230	Condominium/Townhouse, General	257 dwelling units
270	Residential Planned Unit Development	244 dwelling units
---	Nursing Home	371 dwelling units
565	Day-Care Center	37,000 sq. ft.
831	Quality Restaurant	35,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	22,700 sq. ft.
833	Fast-food Restaurant without Drive-through Window	4,150 sq. ft.
834	Fast-food Restaurant with Drive-through Window	5,990 sq. ft.
863	Electronics Superstore	66,500 sq. ft.
862	Home Improvement Superstore	85,400 sq. ft.
---	Strip Mall	74,300 sq. ft.
816	Hardware/Paint Store	58,300 sq. ft.
850	Supermarket	27,200 sq. ft.
851	Convenience Market (Open 24 hours)	4,140 sq. ft.
853	Convenience Market with Gasoline Pumps	3,620 sq. ft.
844	Service Station	19 fueling positions
710	General Office Building	194,000 sq. ft.
750	Office Park	156,500 sq. ft.
720	Medical Office Building	75,300 sq. ft.
110	General Light Industrial	285,500 sq. ft.
130	Industrial Park	282,500 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2008

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	26 dwelling units
211	Low-Rise Apartment	21 dwelling units
230	Condominium/Townhouse, General	40 dwelling units
270	Residential Planned Unit Development	44 dwelling units
---	Nursing Home	74 dwelling units
565	Day-Care Center	7,400 sq. ft.
831	Quality Restaurant	5,950 sq. ft.
832	High Turnover (Sit-Down) Restaurant	4,520 sq. ft.
833	Fast-food Restaurant without Drive-through Window	830 sq. ft.
834	Fast-food Restaurant with Drive-through Window	1,200 sq. ft.
863	Electronics Superstore	13,250 sq. ft.
862	Home Improvement Superstore	22,000 sq. ft.
---	Strip Mall	14,850 sq. ft.
816	Hardware/Paint Store	11,650 sq. ft.
850	Supermarket	5,450 sq. ft.
851	Convenience Market (Open 24 hours)	830 sq. ft.
853	Convenience Market with Gasoline Pumps	725 sq. ft.
844	Service Station	4 fueling positions
710	General Office Building	24,400 sq. ft.
750	Office Park	13,500 sq. ft.
720	Medical Office Building	19,170 sq. ft.
110	General Light Industrial	60,700 sq. ft.
130	Industrial Park	11,400 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2009

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	158 dwelling units
211	Low-Rise Apartment	224 dwelling units
230	Condominium/Townhouse, General	244 dwelling units
270	Residential Planned Unit Development	252 dwelling units
---	Nursing Home	377 dwelling units
565	Day-Care Center	40,150 sq. ft.
831	Quality Restaurant	38,850 sq. ft.
832	High Turnover (Sit-Down) Restaurant	24,600 sq. ft.
833	Fast-food Restaurant without Drive-through Window	4,510 sq. ft.
834	Fast-food Restaurant with Drive-through Window	6,510 sq. ft.
863	Electronics Superstore	71,900 sq. ft.
862	Home Improvement Superstore	92,050 sq. ft.
---	Strip Mall	80,560 sq. ft.
816	Hardware/Paint Store	63,250 sq. ft.
850	Supermarket	29,500 sq. ft.
851	Convenience Market (Open 24 hours)	4,500 sq. ft.
853	Convenience Market with Gasoline Pumps	3,930 sq. ft.
844	Service Station	20 fueling positions
710	General Office Building	214,700 sq. ft.
750	Office Park	172,600 sq. ft.
720	Medical Office Building	81,250 sq. ft.
110	General Light Industrial	309,600 sq. ft.
130	Industrial Park	320,600 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2009

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	28 dwelling units
211	Low-Rise Apartment	23 dwelling units
230	Condominium/Townhouse, General	43 dwelling units
270	Residential Planned Unit Development	46 dwelling units
---	Nursing Home	75 dwelling units
565	Day-Care Center	8,020 sq. ft.
831	Quality Restaurant	6,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	4,910 sq. ft.
833	Fast-food Restaurant without Drive-through Window	910 sq. ft.
834	Fast-food Restaurant with Drive-through Window	1,300 sq. ft.
863	Electronics Superstore	14,350 sq. ft.
862	Home Improvement Superstore	23,240 sq. ft.
---	Strip Mall	16,090 sq. ft.
816	Hardware/Paint Store	12,630 sq. ft.
850	Supermarket	5,900 sq. ft.
851	Convenience Market (Open 24 hours)	900 sq. ft.
853	Convenience Market with Gasoline Pumps	785 sq. ft.
844	Service Station	4 fueling positions
710	General Office Building	27,150 sq. ft.
750	Office Park	14,700 sq. ft.
720	Medical Office Building	20,400 sq. ft.
110	General Light Industrial	64,900 sq. ft.
130	Industrial Park	12,400 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2010

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	173 dwelling units
211	Low-Rise Apartment	236 dwelling units
230	Condominium/Townhouse, General	255 dwelling units
270	Residential Planned Unit Development	262 dwelling units
---	Nursing Home	383 dwelling units
565	Day-Care Center	43,900 sq. ft.
831	Quality Restaurant	42,900 sq. ft.
832	High Turnover (Sit-Down) Restaurant	26,900 sq. ft.
833	Fast-food Restaurant without Drive-through Window	4,950 sq. ft.
834	Fast-food Restaurant with Drive-through Window	7,120 sq. ft.
863	Electronics Superstore	78,500 sq. ft.
862	Home Improvement Superstore	99,900 sq. ft.
---	Strip Mall	88,000 sq. ft.
816	Hardware/Paint Store	69,100 sq. ft.
850	Supermarket	32,250 sq. ft.
851	Convenience Market (Open 24 hours)	4,930 sq. ft.
853	Convenience Market with Gasoline Pumps	4,300 sq. ft.
844	Service Station	22 fueling positions
710	General Office Building	239,600 sq. ft.
750	Office Park	191,700 sq. ft.
720	Medical Office Building	88,300 sq. ft.
110	General Light Industrial	338,000 sq. ft.
130	Industrial Park	366,500 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2010

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	31 dwelling units
211	Low-Rise Apartment	25 dwelling units
230	Condominium/Townhouse, General	45 dwelling units
270	Residential Planned Unit Development	48 dwelling units
---	Nursing Home	76 dwelling units
565	Day-Care Center	8,770 sq. ft.
831	Quality Restaurant	7,200 sq. ft.
832	High Turnover (Sit-Down) Restaurant	5,370 sq. ft.
833	Fast-food Restaurant without Drive-through Window	990 sq. ft.
834	Fast-food Restaurant with Drive-through Window	1,430 sq. ft.
863	Electronics Superstore	15,700 sq. ft.
862	Home Improvement Superstore	24,820 sq. ft.
---	Strip Mall	17,600 sq. ft.
816	Hardware/Paint Store	13,800 sq. ft.
850	Supermarket	6,450 sq. ft.
851	Convenience Market (Open 24 hours)	990 sq. ft.
853	Convenience Market with Gasoline Pumps	860 sq. ft.
844	Service Station	5 fueling positions
710	General Office Building	30,400 sq. ft.
750	Office Park	16,100 sq. ft.
720	Medical Office Building	21,800 sq. ft.
110	General Light Industrial	70,000 sq. ft.
130	Industrial Park	13,600 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2015

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	247 dwelling units
211	Low-Rise Apartment	294 dwelling units
230	Condominium/Townhouse, General	310 dwelling units
270	Residential Planned Unit Development	308 dwelling units
---	Nursing Home	410 dwelling units
565	Day-Care Center	71,500 sq. ft.
831	Quality Restaurant	73,700 sq. ft.
832	High Turnover (Sit-Down) Restaurant	44,000 sq. ft.
833	Fast-food Restaurant without Drive-through Window	8,150 sq. ft.
834	Fast-food Restaurant with Drive-through Window	11,700 sq. ft.
863	Electronics Superstore	126,700 sq. ft.
862	Home Improvement Superstore	156,800 sq. ft.
---	Strip Mall	141,600 sq. ft.
816	Hardware/Paint Store	111,800 sq. ft.
850	Supermarket	52,700sq. ft.
851	Convenience Market (Open 24 hours)	8,100 sq. ft.
853	Convenience Market with Gasoline Pumps	7,070 sq. ft.
844	Service Station	36 fueling positions
710	General Office Building	429,000 sq. ft.
750	Office Park	328,500 sq. ft.
720	Medical Office Building	140,100 sq. ft.
110	General Light Industrial	551,000 sq. ft.
130	Industrial Park	704,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2015

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	47 dwelling units
211	Low-Rise Apartment	40 dwelling units
230	Condominium/Townhouse, General	56 dwelling units
270	Residential Planned Unit Development	57 dwelling units
---	Nursing Home	81 dwelling units
565	Day-Care Center	14,300 sq. ft.
831	Quality Restaurant	12,400 sq. ft.
832	High Turnover (Sit-Down) Restaurant	8,780 sq. ft.
833	Fast-food Restaurant without Drive-through Window	1,650 sq. ft.
834	Fast-food Restaurant with Drive-through Window	2,340 sq. ft.
863	Electronics Superstore	25,300 sq. ft.
862	Home Improvement Superstore	36,100 sq. ft.
---	Strip Mall	28,300 sq. ft.
816	Hardware/Paint Store	22,350 sq. ft.
850	Supermarket	10,600 sq. ft.
851	Convenience Market (Open 24 hours)	1,620 sq. ft.
853	Convenience Market with Gasoline Pumps	1,420 sq. ft.
844	Service Station	8 fueling positions
710	General Office Building	55,800 sq. ft.
750	Office Park	37,200 sq. ft.
720	Medical Office Building	32,100 sq. ft.
110	General Light Industrial	106,600 sq. ft.
130	Industrial Park	22,500 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2020

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	284 dwelling units
211	Low-Rise Apartment	331 dwelling units
230	Condominium/Townhouse, General	345 dwelling units
270	Residential Planned Unit Development	339 dwelling units
---	Nursing Home	428 dwelling units
565	Day-Care Center	103,200 sq. ft.
831	Quality Restaurant	110,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	63,770 sq. ft.
833	Fast-food Restaurant without Drive-through Window	11,850 sq. ft.
834	Fast-food Restaurant with Drive-through Window	17,100 sq. ft.
863	Electronics Superstore	181,000 sq. ft.
862	Home Improvement Superstore	220,500 sq. ft.
---	Strip Mall	202,000 sq. ft.
816	Hardware/Paint Store	160,200 sq. ft.
850	Supermarket	76, 300sq. ft.
851	Convenience Market (Open 24 hours)	11,820 sq. ft.
853	Convenience Market with Gasoline Pumps	10,320 sq. ft.
844	Service Station	52 fueling positions
710	General Office Building	644,000 sq. ft.
750	Office Park	475,000 sq. ft.
720	Medical Office Building	199,100 sq. ft.
110	General Light Industrial	798,000 sq. ft.
130	Industrial Park	1,099,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2020

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	54 dwelling units
211	Low-Rise Apartment	51 dwelling units
230	Condominium/Townhouse, General	64 dwelling units
270	Residential Planned Unit Development	64 dwelling units
---	Nursing Home	85 dwelling units
565	Day-Care Center	20,600 sq. ft.
831	Quality Restaurant	18,600 sq. ft.
832	High Turnover (Sit-Down) Restaurant	12,750 sq. ft.
833	Fast-food Restaurant without Drive-through Window	2,370 sq. ft.
834	Fast-food Restaurant with Drive-through Window	3,410 sq. ft.
863	Electronics Superstore	36,200 sq. ft.
862	Home Improvement Superstore	48,700 sq. ft.
---	Strip Mall	40,300 sq. ft.
816	Hardware/Paint Store	32,000 sq. ft.
850	Supermarket	15,220 sq. ft.
851	Convenience Market (Open 24 hours)	2,360 sq. ft.
853	Convenience Market with Gasoline Pumps	2,060 sq. ft.
844	Service Station	11 fueling positions
710	General Office Building	86,200 sq. ft.
750	Office Park	67,700 sq. ft.
720	Medical Office Building	43,800 sq. ft.
110	General Light Industrial	149,500 sq. ft.
130	Industrial Park	65,400 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2025

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	322 dwelling units
211	Low-Rise Apartment	367 dwelling units
230	Condominium/Townhouse, General	378 dwelling units
270	Residential Planned Unit Development	369 dwelling units
---	Nursing Home	445 dwelling units
565	Day-Care Center	150,000 sq. ft.
831	Quality Restaurant	166,600 sq. ft.
832	High Turnover (Sit-Down) Restaurant	93,400 sq. ft.
833	Fast-food Restaurant without Drive-through Window	17,520 sq. ft.
834	Fast-food Restaurant with Drive-through Window	25,200 sq. ft.
863	Electronics Superstore	259,400 sq. ft.
862	Home Improvement Superstore	311,400 sq. ft.
---	Strip Mall	288,200 sq. ft.
816	Hardware/Paint Store	230,400 sq. ft.
850	Supermarket	111,400 sq. ft.
851	Convenience Market (Open 24 hours)	17,500 sq. ft.
853	Convenience Market with Gasoline Pumps	15,260 sq. ft.
844	Service Station	77 fueling positions
710	General Office Building	944,500 sq. ft.
750	Office Park	677,000 sq. ft.
720	Medical Office Building	285,500 sq. ft.
110	General Light Industrial	1,180,000 sq. ft.
130	Industrial Park	1,705,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2025

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	62 dwelling units
211	Low-Rise Apartment	61 dwelling units
230	Condominium/Townhouse, General	71 dwelling units
270	Residential Planned Unit Development	70 dwelling units
---	Nursing Home	88 dwelling units
565	Day-Care Center	30,000 sq. ft.
831	Quality Restaurant	28,200 sq. ft.
832	High Turnover (Sit-Down) Restaurant	18,640 sq. ft.
833	Fast-food Restaurant without Drive-through Window	3,500 sq. ft.
834	Fast-food Restaurant with Drive-through Window	5,040 sq. ft.
863	Electronics Superstore	51,800 sq. ft.
862	Home Improvement Superstore	66,700 sq. ft.
---	Strip Mall	57,600 sq. ft.
816	Hardware/Paint Store	46,000 sq. ft.
850	Supermarket	22,250 sq. ft.
851	Convenience Market (Open 24 hours)	3,490 sq. ft.
853	Convenience Market with Gasoline Pumps	3,050 sq. ft.
844	Service Station	16 fueling positions
710	General Office Building	131,500 sq. ft.
750	Office Park	110,000 sq. ft.
720	Medical Office Building	61,000 sq. ft.
110	General Light Industrial	215,500 sq. ft.
130	Industrial Park	170,100 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2030

Significance Threshold: 25 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	343 dwelling units
211	Low-Rise Apartment	386 dwelling units
230	Condominium/Townhouse, General	397 dwelling units
270	Residential Planned Unit Development	388 dwelling units
---	Nursing Home	457 dwelling units
565	Day-Care Center	193,100 sq. ft.
831	Quality Restaurant	219,700 sq. ft.
832	High Turnover (Sit-Down) Restaurant	121,100 sq. ft.
833	Fast-food Restaurant without Drive-through Window	23,000 sq. ft.
834	Fast-food Restaurant with Drive-through Window	33,000 sq. ft.
863	Electronics Superstore	329,700 sq. ft.
862	Home Improvement Superstore	392,000 sq. ft.
---	Strip Mall	365,000 sq. ft.
816	Hardware/Paint Store	293,800 sq. ft.
850	Supermarket	144,000 sq. ft.
851	Convenience Market (Open 24 hours)	22,900 sq. ft.
853	Convenience Market with Gasoline Pumps	20,000 sq. ft.
844	Service Station	101 fueling positions
710	General Office Building	1,193,000 sq. ft.
750	Office Park	850,000 sq. ft.
720	Medical Office Building	364,500 sq. ft.
110	General Light Industrial	1,547,000 sq. ft.
130	Industrial Park	2,290,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2030

Significance Threshold: 5 lbs/day

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	66 dwelling units
211	Low-Rise Apartment	66 dwelling units
230	Condominium/Townhouse, General	75 dwelling units
270	Residential Planned Unit Development	74 dwelling units
---	Nursing Home	90 dwelling units
565	Day-Care Center	38,600 sq. ft.
831	Quality Restaurant	37,300 sq. ft.
832	High Turnover (Sit-Down) Restaurant	24,200 sq. ft.
833	Fast-food Restaurant without Drive-through Window	4,580 sq. ft.
834	Fast-food Restaurant with Drive-through Window	6,600 sq. ft.
863	Electronics Superstore	65,900 sq. ft.
862	Home Improvement Superstore	82,600 sq. ft.
---	Strip Mall	72,900 sq. ft.
816	Hardware/Paint Store	58,700 sq. ft.
850	Supermarket	28,800 sq. ft.
851	Convenience Market (Open 24 hours)	4,600 sq. ft.
853	Convenience Market with Gasoline Pumps	3,990 sq. ft.
844	Service Station	21 fueling positions
710	General Office Building	172,000 sq. ft.
750	Office Park	146,000 sq. ft.
720	Medical Office Building	76,600 sq. ft.
110	General Light Industrial	279,000 sq. ft.
130	Industrial Park	271,500 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2035

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	351 dwelling units
211	Low-Rise Apartment	395 dwelling units
230	Condominium/Townhouse, General	405 dwelling units
270	Residential Planned Unit Development	399 dwelling units
---	Nursing Home	465 dwelling units
565	Day-Care Center	226,700 sq. ft.
831	Quality Restaurant	261,600 sq. ft.
832	High Turnover (Sit-Down) Restaurant	142,900 sq. ft.
833	Fast-food Restaurant without Drive-through Window	27,300 sq. ft.
834	Fast-food Restaurant with Drive-through Window	39,200 sq. ft.
863	Electronics Superstore	383,100 sq. ft.
862	Home Improvement Superstore	452,800 sq. ft.
---	Strip Mall	423,200 sq. ft.
816	Hardware/Paint Store	342,300 sq. ft.
850	Supermarket	169,600 sq. ft.
851	Convenience Market (Open 24 hours)	27,200 sq. ft.
853	Convenience Market with Gasoline Pumps	23,800 sq. ft.
844	Service Station	121 fueling positions
710	General Office Building	1,369,000 sq. ft.
750	Office Park	976,000 sq. ft.
720	Medical Office Building	425,200 sq. ft.
110	General Light Industrial	1,844,500 sq. ft.
130	Industrial Park	2,565,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2035

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	68 dwelling units
211	Low-Rise Apartment	68 dwelling units
230	Condominium/Townhouse, General	77 dwelling units
270	Residential Planned Unit Development	77 dwelling units
---	Nursing Home	92 dwelling units
565	Day-Care Center	45,300 sq. ft.
831	Quality Restaurant	44,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	28,600 sq. ft.
833	Fast-food Restaurant without Drive-through Window	5,440 sq. ft.
834	Fast-food Restaurant with Drive-through Window	7,820 sq. ft.
863	Electronics Superstore	76,500 sq. ft.
862	Home Improvement Superstore	94,700 sq. ft.
---	Strip Mall	84,500 sq. ft.
816	Hardware/Paint Store	68,400 sq. ft.
850	Supermarket	33,900 sq. ft.
851	Convenience Market (Open 24 hours)	5,420 sq. ft.
853	Convenience Market with Gasoline Pumps	4,740 sq. ft.
844	Service Station	24 fueling positions
710	General Office Building	201,700 sq. ft.
750	Office Park	172,000 sq. ft.
720	Medical Office Building	88,600 sq. ft.
110	General Light Industrial	330,500 sq. ft.
130	Industrial Park	353,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

APPENDIX F
PROJECT SCREENING ANALYSIS TABLES

Analysis Year: 2040

Significance Threshold: 25 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	351 dwelling units
211	Low-Rise Apartment	395 dwelling units
230	Condominium/Townhouse, General	406 dwelling units
270	Residential Planned Unit Development	401 dwelling units
---	Nursing Home	467 dwelling units
565	Day-Care Center	250,600 sq. ft.
831	Quality Restaurant	291,500 sq. ft.
832	High Turnover (Sit-Down) Restaurant	158,500 sq. ft.
833	Fast-food Restaurant without Drive-through Window	29,400 sq. ft.
834	Fast-food Restaurant with Drive-through Window	42,400 sq. ft.
863	Electronics Superstore	420,500 sq. ft.
862	Home Improvement Superstore	494,900 sq. ft.
---	Strip Mall	463,700 sq. ft.
816	Hardware/Paint Store	376,500 sq. ft.
850	Supermarket	190,000 sq. ft.
851	Convenience Market (Open 24 hours)	29,150 sq. ft.
853	Convenience Market with Gasoline Pumps	25,450 sq. ft.
844	Service Station	127 fueling positions
710	General Office Building	1,483,400 sq. ft.
750	Office Park	1,061,000 sq. ft.
720	Medical Office Building	468,500 sq. ft.
110	General Light Industrial	1,877,000 sq. ft.
130	Industrial Park	2,630,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.

Analysis Year: 2040

Significance Threshold: 5 lbs/day

Project Size That Will
Exceed ROC or NOx
Significance Threshold

Code*	Land Use	Project Size That Will Exceed ROC or NOx Significance Threshold
210	Single Family Detached Housing	68 dwelling units
211	Low-Rise Apartment	68 dwelling units
230	Condominium/Townhouse, General	77 dwelling units
270	Residential Planned Unit Development	77 dwelling units
---	Nursing Home	93 dwelling units
565	Day-Care Center	50,100 sq. ft.
831	Quality Restaurant	49,700 sq. ft.
832	High Turnover (Sit-Down) Restaurant	31,500 sq. ft.
833	Fast-food Restaurant without Drive-through Window	5,800 sq. ft.
834	Fast-food Restaurant with Drive-through Window	8,350 sq. ft.
863	Electronics Superstore	84,100 sq. ft.
862	Home Improvement Superstore	103,000 sq. ft.
---	Strip Mall	92,600 sq. ft.
816	Hardware/Paint Store	75,200 sq. ft.
850	Supermarket	37,500 sq. ft.
851	Convenience Market (Open 24 hours)	5,750 sq. ft.
853	Convenience Market with Gasoline Pumps	5,290 sq. ft.
844	Service Station	27 fueling positions
710	General Office Building	288,500 sq. ft.
750	Office Park	189,500 sq. ft.
720	Medical Office Building	97,200 sq. ft.
110	General Light Industrial	368,000 sq. ft.
130	Industrial Park	414,000 sq. ft.

* Institute of Transportation Engineers, *Trip Generation*, Fifth Edition, 1991, and 1995 Update, and Sixth Edition, 1997.