



Air Quality Element

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Chapter 9

Air Quality Element

Introduction

“

Air quality attainment goals established by the South Coast Air Quality Management District have been more than met despite the substantial growth in the region in the last 20 years. Most of this is a result of significantly improved engine technology and the replacement of more polluting vehicles. However, local initiatives that expanded transit options, concentrated development more efficiently, and increased local employment opportunities have also contributed to air quality improvement.

”

- RCIP Vision

Why Is Air Quality Important?

The quality of the air we breathe directly affects our health, environment, economy and our quality of life. Because the inside of our bodies are in constant contact with the outside world through the oxygen we inhale, air pollutants make their way to our lungs and into our blood stream. Air pollutants are defined in the Clean Air Act as carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and inhalable airborne particulate matter smaller than ten microns (these are further broken down by size as those smaller than ten microns being called respirable particulate matter or PM₁₀, and those 2.5 microns or smaller being called fine particulate matter or PM_{2.5}). An overabundance of these pollutants in the air can cause mild to severe health effects, including increased hospitalization and emergency room visits, respiratory illnesses, increased risk of developing cancer, decreased breathing capacity, lung inflammation, and difficulty in exercising and even a reduction in life-span.

Just as we are affected by air pollution, so too are plants and animals. Animals must breathe the same air and are subject to the same types of negative health effects. Certain plants and trees may absorb air pollutants which can stunt their development or cause premature death. There are also numerous impacts to our economy including lost work days due to illness, a desire on the part of business to locate in areas with a healthy environment, and increased expenses from medical costs. Pollutants may also lower visibility and cause damage to property. Certain air pollutants are responsible for discoloring painted surfaces, eating away at stones used in buildings, dissolving the mortar that holds bricks together, and cracking tires and other items made from rubber.

What Can We Do About Air Quality

Air quality is a regional issue, effecting and affected by every city and county. Although Riverside County generates the lowest emissions of any county in the South Coast Air Basin, air quality in the County is among the

Basin's worst due to onshore winds transporting vast amounts of pollutants from Los Angeles and Orange Counties into the Inland Empire.



Ambient Air -
Outside air, any portion of the atmosphere not contained by walls and a roof.

While the County and the region have made great strides in reducing air pollution, it is committed to meeting state and federal air quality guidelines. Policies and programs addressed in this element will focus on the two main sources of air pollutant emissions: mobile sources and stationary sources. Mobile sources include automobiles, motorcycles, trucks and airplanes. Motor vehicles constitute the largest generator of air pollutant emissions in Riverside County. Stationary sources produce significant amounts of pollutants and include electrical power-generating facilities, manufacturing, fabrication, miscellaneous industrial processes and combustion of natural gas.

One of the intents of this Air Quality Element is to provide background information on the physical and regulatory environment affecting air quality in the County. This element also identifies goals, policies and programs that are meant to balance the County's actions regarding land use, circulation and other issues with their potential effects on air quality. This element in conjunction with local and regional air quality planning efforts addresses ambient air quality standards set forth by the Federal Environmental Protection Agency and the California Air Resources Board (CARB).

Specifically in California, more and more emphasis has been placed on reducing greenhouse gas emissions with specifically set reduction targets to curtail impacts associated with climate change. Thus, it is critical that the General Plan also include the policies needed for the County to systematically address climate change and greenhouse gas emissions reductions. The policies and programs set forth in this element are intended to protect the health and welfare of our residents by improving air quality, protect our natural resources through enhanced conservation efforts, and ensuring expected growth of our County does not occur at the cost of the global climate.



Santa Ana Winds -
Santa Ana winds are generally defined as warm, dry winds that blow from the east or northeast (offshore) occurring predominantly between the months of December and February. The winds develop when a region of high pressure builds over the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains including most of Nevada and Utah) and move locally across the Mojave Desert and then over and through passes in the San Gabriel, San Bernardino and San Jacinto Mountains.

The Setting

Riverside County is located within three air basins, as can be seen on Figure AQ-1, Riverside County Air Quality Basins They are the South Coast Air Basin (SCAB), Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). Air quality within each basin is not only affected by various emissions sources (mobile, industry, etc.), but also by atmospheric conditions such as wind speed, wind direction, temperature and rainfall. The following provides a description of each air basin and its relevant climate and meteorological conditions affecting air pollution.

South Coast Air Basin

Western Riverside County (west of the San Gorgonio Pass) is located within the South Coast Air Basin (SCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties. Air quality conditions in the SCAB are under the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

According to the Air Quality Management Plan (AQMP) adopted by the SCAQMD for the air basin, the worst air quality problem in the nation occurs in the SCAB. With very light average wind speeds, the basin atmosphere has a limited capability to disperse air contaminants horizontally. The dominant daily wind pattern is a daytime sea breeze (onshore breeze) and a nighttime land breeze (offshore breeze), broken only occasionally by winter storms and infrequent strong Santa Ana winds from the Great Basin, Mojave, and deserts to the north.

During the spring, most of the pollution produced during the day is moved inland out of the SCAB through mountain passes, or is lifted by the warm, vertical currents produced by the heating of mountain slopes. In this season, the basin can be “flushed” of pollutants by onshore breezes during the afternoon. From summer through the winter months, the flushing is less pronounced because of lower wind speeds, a persistent temperature inversion, and the earlier appearance of offshore winds. With extremely stagnant wind flows, the drainage winds may begin near the mountains by late afternoon. Remaining pollutants are trapped and begin to accumulate during the night and the following morning. A low average morning wind speed in pollution source areas is an important indicator of air stagnation potential.



Inversion layer -
A layer of warm air that traps the cooler air and any pollutants it carries below.

The vertical dispersion of air pollutants in the SCAB is hampered by the presence of a temperature inversion in the layers of the atmosphere near the surface of the Earth. In a normal situation, as temperatures decrease with altitude, air continues to rise as it remains warmer than the surrounding air. With an inversion layer, air cannot continue to expand upwards, as it is trapped by the warmer air above. Because of the limited vertical dispersion, the inversion holds air pollutants near the ground, which results in high concentrations of air pollution especially in the inland areas of the SCAB.

However, as the day progresses and the sun warms the ground, the surface layer of air approaches a temperature equal to that of the inversion layer. When these temperatures become equal, the inversion layer begins to erode at its lower edge. If enough warming takes place, the inversion layer becomes weaker and weaker and finally breaks. The surface air layers can then mix upward without limit.

This phenomenon is frequently observed in the middle of late afternoon on hot summer days when the smog appears to clear up suddenly. Winter inversions frequently break by mid-morning, thereby preventing contaminant build-up.

The combination of low wind speeds and low level inversions produces the greatest concentration of pollutants. On high wind days other air pollutants including particulate matter such as dust and soil are swept and carried in the air. On days of no inversion or on days of winds averaging over 15 miles per hour, there will be no important smog effects, during either summer or winter.

In the winter, the greatest pollution problems are fine particulate matter and oxides of nitrogen because of extremely low level inversions and air stagnation during the night and early morning hours. Ozone levels are much lower during this season due to the lack of strong inversion during the daylight hours and the lack of intense sunlight which is needed to produce photochemical reactions.



Smog - A combination of smoke, ozone, hydrocarbons, nitrogen oxides, and other chemically reactive compounds which, under certain conditions of weather and sunlight, may result in a murky brown haze that causes adverse health effects. The primary source of smog in California is motor vehicles.

In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form more smog. Carbon monoxide is not as great a problem in summer because inversions are not as low and intense in the surface boundary layer (within 100 feet of the ground) as in winter and because horizontal ventilation is better in summer.

The basin-wide average occurrence of inversion at the ground surface is 11 days per month; the averages vary from two days in June to 22 days in December and January. The potential for high concentration varies seasonally for many contaminants. During late spring, summer and early fall, light winds, low mixing heights and brilliant sunshine combine to produce conditions favorable for the maximum production of photochemical oxidants, mainly ozone. During the spring and summer, when fairly deep marine layers are frequently found in the Basin, sulfate concentrations are at their peak.

Salton Sea Air Basin



Subtropical High Cell -

An area of atmospheric high pressure located at approximately 30 degrees north and south latitude.

Air tends to sink near high-pressure centers, which inhibits precipitation and cloud formation. This is why high-pressure systems tend to bring bright, sunny days with calm weather.

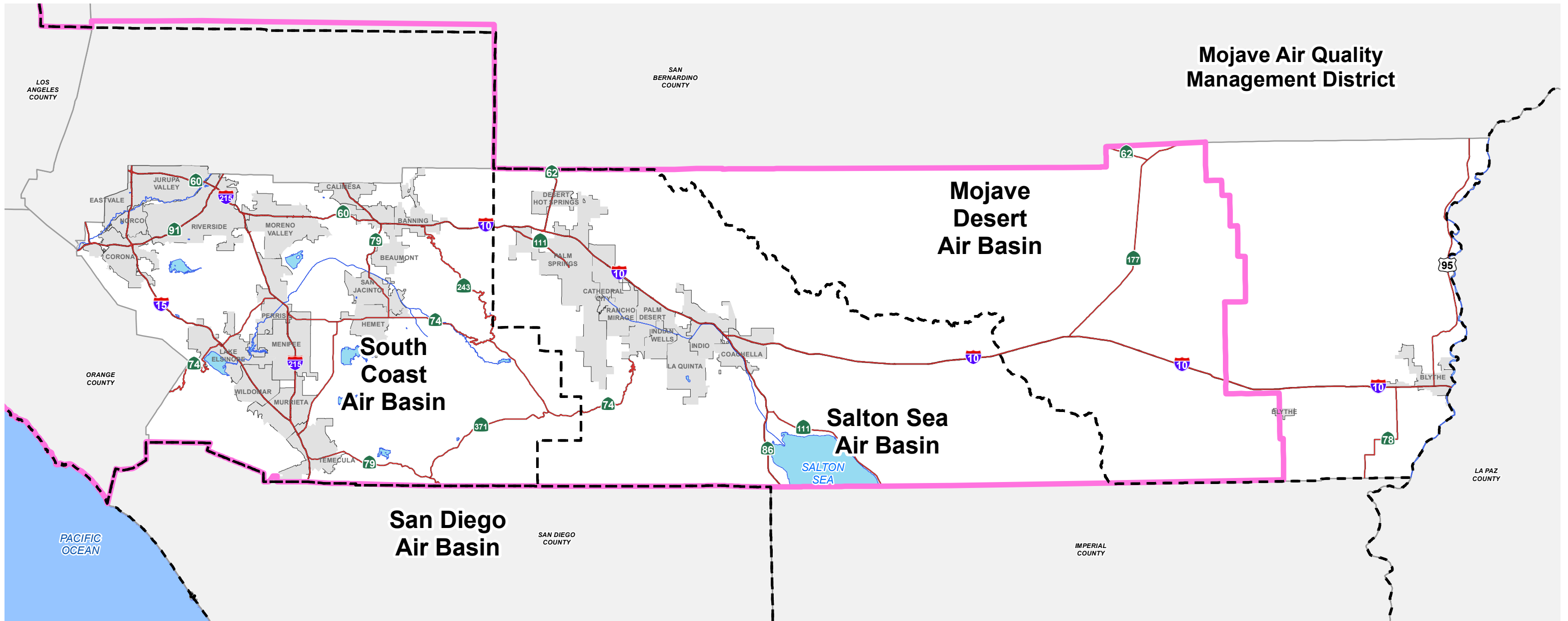
The middle part of Riverside County (between San Geronio Pass and Joshua Tree National Monument), belongs in the Salton Sea Air Basin (SSAB), along with Imperial County. Air quality conditions in this portion of the County, although in the SSAB, are also administered by the SCAQMD. The SCAQMD is responsible for the development of the regional Air Quality Management Plan and efforts to regulate pollutant emissions from a variety of sources.

The SSAB portion of Riverside County is separated from the SCAB region by the San Jacinto Mountains and from the Mojave Desert Air Basin to the east by the Little San Bernardino Mountains. During the summer, the SSAB is generally influenced by a Pacific Subtropical High Cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The SSAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. The SSAB averages between three and seven inches of precipitation per year.

Mojave Desert Air Basin

The Mojave Desert Air Basin (MDAB), comprised of 21,000 square miles, encompasses the eastern portion of Riverside County consisting of the Palo Verde Valley along with portions of Los Angeles, Kern and San Bernardino Counties. Air quality conditions in the Riverside County MDAB are partly under the jurisdiction of the SCAQMD and partly under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD).

The MDAB consists of an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the presence of the Sierra Nevada Mountains, which pose as a natural barrier to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB. The MDAB is separated from the Southern California coastal and central California valley regions by mountains whose passes from the main channels for these air masses.



Data Source: California Air Resources Board (2010)







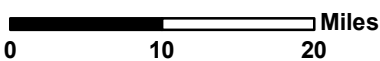
-  SCAQMD Jurisdiction
-  Air Quality Basins
-  Highways
-  Cities
-  Waterbodies

Figure AQ-1

 December 8, 2015

 Miles

Disclaimer: Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.



AIR QUALITY BASINS

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During the summer months, the MDAB is generally influenced by a Pacific Subtropical High Cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, with desert moisture arriving from infrequent warm, moist and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year.

Regulatory Restrictions

The combination of geographical features and high levels of pollutants produced in the region have resulted in the CARB and the Environmental Protection Agency (EPA) designating the air basins in Riverside County as non-attainment areas (Table AQ-2). This means that due to the high level of pollutants in the region, the area is not expected to meet State or National Ambient Air Quality Standards in the near future.

The Federal Clean Air Act (1977 Amendments) requires that designated agencies in any region of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards by December 31, 1987. In response, the Governor of California designated agencies to develop these plans.

Regional Air Pollution Regulations

For the South Coast Air Basin and the Salton Sea Air Basin, the agencies designated to develop regional air quality plans are the South Coast Air Quality Management District (SCAQMD) and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and have revised it several times subsequently, as earlier attainment forecasts were shown to be overly optimistic. Equivalent regional air quality plans were created for the Mojave Desert Air Basin by the Mojave Desert Air Quality Management Basin (MDAQMD) in conjunction with SCAG.

In 1988, the California Legislature enacted the California Clean Air Act (CCAA). The CCAA requires regional emissions to be reduced by 5% per year, averaged over a 3-year period, until attainment can be demonstrated. Each region that did not meet a national or state air quality standard was required to prepare a plan which demonstrated how the 5% reductions were to be achieved. In response, the SCAQMD and MDAQMD revised their air quality plans to meet CCAA requirements.

The latest AQMP, approved in 1997, was designed to meet both federal and state air quality planning guidelines. Strategies for controlling air pollutant emissions in the AQMP are grouped into three “tiers,” based on their anticipated timing for implementation. Tier 1 consists of the implementation of best available current technology and management practices that can be adopted within five years. Tier II is based on anticipated advancement in current technology and vigorous regulatory action, while Tier III controls consist of implementation measures which first require the development of new technologies.

The MDAQMD adopted its Air Quality Attainment Plan in 1995 to meet state ozone standards and the Attainment Demonstration Plan in 1996 to meet federal ozone standards. While the Mojave Desert Air Basin is



Indirect Source —
A facility, building, structure, installation, property, road, or highway which attracts, or may attract, mobile sources of pollution such as cars and trucks.

classified by the state as a non-attainment area for PM₁₀ (coarse particles larger than 2.5 but smaller than 10 micrometers), state law does not require an air quality plan to meet this standard, and as such, no plan has been adopted.

To achieve the goals and objectives of the air quality plans at the local level, all cities and counties must adopt air quality elements or other elements/plans that fully address air quality as well as implement these plans to achieve compliance with state and federal standards. Local responsibilities for achieving compliance primarily focus on measures that control Indirect Sources such as facilities, buildings, structures, installations, real property, roads or highways that attract mobile sources of pollution.

More specifically, in regards to the topic of greenhouse gas (GHG) emissions, in June of 2005, Governor Schwarzenegger signed Executive Order S-3-05 which requires California to reduce GHG emissions to 2000 levels by the year 2010, to 1990 levels by the year 2020 and to 80% below 1990 levels by 2050. The following year, the Global Warming Solutions Act of 2006 (Assembly Bill 32) was enacted that codified the 2020 goal set by the Governor’s prior Order and also imposed for the State of California certain milestones for reducing GHG emissions. AB 32 requires CARB to promulgate regulations which will, by 2020, reduce GHG emissions to those emission levels that existed in 1990.

In 2008, the California Legislature also enacted Senate Bill 375 (SB 375) to establish a mechanism for accounting for GHG emissions on a regional basis and provide a framework for collaboration among local land use jurisdictions in achieving regional GHG reductions. SB 375 connects land use, transportation and AB 32 implementation to address emissions related to passenger vehicle travel. The law directs “sustainable communities’ strategy” and other plans to be prepared at the regional level working with local jurisdictions. In particular, Southern California Association of Government’s (SCAG) reduction target for per capita vehicular emissions is 8% by 2020 and 13% by 2035 (CAP 2011).

Issues and Policies

Air Quality Standards

Six criteria air pollutants have been established for every air basin within the State of California. These are pollutants for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. As shown in Table AQ-1, Ambient Air Quality Standards, federal and state standards have been developed for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead and inhalable airborne particulates. Federal and state primary standards for air pollutants have been established to protect the public health, while secondary standards establish the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Table AQ-1 Ambient Air Quality Standards

Pollutant	Averaging Time	State	Federal	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm		Same as Primary Standard
	8 Hour	0.07 ppm	0.075 ppm	
Nitrogen Dioxide	Annual Arithmetic Mean	0.030 ppm	0.053 ppb	Same as Primary Standard
	1 Hour	0.18 ppm	100 ppb	
Carbon Monoxide	8 Hour	9.0 ppm	9.0 ppm	-
	1 Hour	20.0 ppm	35.0 ppm	-

Pollutant	Averaging Time	State	Federal	
			Primary	Secondary
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	B	
Fine Particulate Matter (PM _{2.5})	24 Hour	No Separate State Standard	35 µg/m ³	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m ³	15.0 µg/m ³	
Sulfur Dioxide	24 Hour	0.04 ppm	--	0.5 ppm
	3 Hour	--	--	
	1 Hour	0.25 ppm	75 ppb	
Lead	30 Day Average	1.5 µg/m ³	--	Same as Primary Standard
	Calendar Quarter	--	1.5 µg/m ³	
	Rolling 3-Month Average	--	0.15 µg/m ³	
Sulfates	24 Hour	25 µg/m ³	--	--
Hydrogen Sulfide	1 Hour	0.03 ppm	--	--
Vinyl Chloride	24 Hour	0.01 ppm	--	--

Notes: ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter of air.

Additionally, see CARB Rulemaking for specific standards for "Visibility Reducing Particles."

Source: California Air Resources Board, Ambient Air Quality Standards, September 8, 2010.

Riverside County has made great strides in achieving state and federal air quality standards. The following provides a description of the six criteria air pollutants and their attainment status in each of the three Riverside County air basins. The following table summarizes the attainment status for these six pollutants within each of the three air quality basins covering Riverside County.

Table AQ-2 Attainment of State and Federal Criteria Air Pollutant Standards

Air Basin	Ozone	Carbon Monoxide	Nitrogen Oxides	Sulfur Dioxide	Lead	Particulate Matter (PM ₁₀)	Particulate Matter (PM _{2.5})
SCAQMD	Non-attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (Maintenance) (Federal) Non-attainment (State)	Non-attainment (State and Federal)
SSAB	Non-attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Non-attainment (State and Federal)	Attainment (State) Unclassified Attainment (Federal)
MDAQMD	Unclassifiable/Attainment (Federal) Non-attainment (State)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Attainment (State and Federal)	Non-attainment (State) Attainment/ Unclassified (Federal)	Unclassified Attainment (Federal) Attainment Unclassified ¹ (State)

Notes:

1. After meeting attainment standards, the MDAQMD discontinued monitoring efforts; consequently it cannot be given full attainment status.

Source: Southern California Air Quality Management District and the Mojave Desert Air Quality Management District (February 2011)

Ozone

Ozone (O₃) is a pungent, colorless gas typical of Southern California smog. Elevated ozone concentrations result in reduced lung function, particularly during vigorous physical activity. Ozone levels peak during the summer and early fall months.

SCAB, SSAB and MDAB are all designated as a non-attainment area for federal, state or both ozone standards, meaning that air quality standards are being exceeded. The Environmental Protection Agency (EPA) has classified the entire Southern California Association of Governments region as an extreme non-attainment area,

and has mandated that the South Coast Air Quality Basin achieve attainment by 2010. The SSAB and MDAB are both designated as non-attainment areas for federal and state ozone standards.

Carbon Monoxide

Carbon monoxide (CO) is formed by the incomplete combustion of fossil fuels, almost entirely from automobiles. It is a colorless, odorless gas that can cause dizziness, fatigue and impairments to central nervous system functions.

SCAB, SSAB and MDAB are all designated as an attainment area for federal and state CO standards.

Nitrogen Oxides

Nitrogen dioxide (NO₂), a reddish brown gas, and nitric oxide (NO), a colorless odorless gas, are jointly referred to as nitrogen oxides or NO_x. NO_x is a primary component of ozone and also contributes to other pollution problems such as high concentration of fine particulate matter, poor visibility, and acid deposition. NO₂ decreases lung function and may reduce resistance to infection.

The SCAB has not exceeded either federal or state standards for nitrogen dioxides in the past seventeen years and was recently designated as attainment for federal and state standards. The SSAB and MDAB are designated as attainment areas for both federal and state NO₂ standards.

Sulfur Dioxide

Sulfur dioxide (SO₂) is a colorless irritating gas created mainly by industrial facilities. SO₂ irritates the respiratory tract, injures lung tissue when combined with fine particulate matter and reduces visibility and the level of sunlight.

The SCAB, SSAB and MDAB are all designated as attainment areas for both federal and state sulfur dioxide standards.

Lead

Lead (Pb) is a gray-white metal that is soft, malleable, and resistant to corrosion. Sources of lead resulting in concentrations in the air include industrial sources and weathering of soils, followed by fugitive dust emissions. Health effects from exposure to lead include brain and kidney damage, learning disabilities, seizures and death. Fetuses, infants and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands and a lower intelligence quotient.

The SCAB, SSAB and MDAB are all designated as attainment areas for both federal and state lead standards.

Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse but “respirable” particles (larger than 2.5 but smaller than 10 micrometers, or PM_{10}) come from a variety of sources, including windblown dust and grinding operations. Fine particles (less than 2.5 micrometers, or $PM_{2.5}$) often come from fuel combustion, power plants and diesel buses and trucks. Fine particles can also be formed in the atmosphere through chemical reactions. PM_{10} and its health effects are discussed in greater detail later in the Particulate Matter section of this Element.

The SCAB and SSAB are designated as non-attainment areas for both state and federal PM_{10} . The MDAB is designated as a non-attainment area for state PM_{10} standards, but as an attainment unclassified area for federal standards (after meeting attainment standards, the MDAQMD discontinued monitoring efforts; consequently it cannot be given full attainment status).

**Fugitive Dust -**

Dust particles that are introduced into the air through certain activities such as soil cultivation, off-road vehicles, or any vehicles operating on open fields or dirt roadways.

Visibility Reducing Particles

Visibility reducing particles are primarily the result of fugitive dust such that they impede visibility. They differ from the description of particulate matter in that the particle size is large enough to be seen, not respirable, and therefore, does not have the health effects of respirable and fine particulates. Visibility reducing particles are those particulates seen in a cloud of dust stirred up during earth moving activities, vehicles traveling on dirt roads, or dust produced during high wind events. The State of California has not assigned attainment status for the SCAB, SSAB, or MDAB of the Visibility Reducing Particles standard. They are currently shown as “unclassified” in state attainment maps.

Sulfates

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and / or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The California sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to fact that they are usually acidic, can harm ecosystems and damage materials and property. The SCAB, SSAB and MDAB are all designated as attainment areas for state sulfate standards.

Hydrogen sulfide (H_2S) gas is produced during the anaerobic decomposition of manure and waste as a byproduct of bacterial reduction of sulfur-containing compounds, including proteins. Concentrations of H_2S can form in sewers, septic tanks and confined areas of manure stockpiles. It is also a byproduct of oil extraction and refining. H_2S is colorless, with a characteristic odor of rotten eggs. Atmospheric H_2S is primarily oxidized to sulfur dioxide, which is eventually converted into sulfate, then sulfuric acid. When sulfuric acid is transported back to the earth through “acid rain,” it can damage plant tissue and aquatic ecosystems. H_2S can cause dizziness, irritation to eyes, mucous membranes, and the respiratory tract, nausea, and headaches at low concentrations. Exposure to higher concentrations (above 100 ppm), can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause loss of

consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory and poor motor function. H₂S can be detected by the nose at extremely low concentrations, as low as 1/400 the threshold for harmful human health effects. H₂S does not accumulate in the body, but is quickly excreted at normal exposure concentrations. Acute health effects don't occur until the exposure is greater than the body's ability to excrete the excess sulfur. Hydrogen sulfide can present a workplace hazard in confined spaces. Deaths due to breathing in large amounts of hydrogen sulfide have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools. California has ambient air standards for hydrogen sulfide. The SCAB, SSAB and MDAB are all designated as attainment areas for state hydrogen sulfide standards.

Vinyl Chloride

Vinyl chloride is a sweet smelling, colorless gas. Acute inhalation exposure to high levels of vinyl chloride has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches and giddiness. Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, lung and kidney irritation, and inhibition of blood clotting. Tests involving acute exposure of mice have shown vinyl chloride to have high acute toxicity from inhalation exposure including risk of contracting rare lung and brain cancers. A small percentage of individuals occupationally exposed long-term to high level of vinyl chloride in air have developed a set of symptoms termed "vinyl chloride disease," which is characterized by Reynaud's phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to the cold, changes in the bones at the end of the fingers, joint and muscle pain and scleroderma-like skin changes (thickening of the skin, decreased elasticity and slight edema). For these reasons, California has included ambient air quality standards for vinyl chloride. The SCAB, SSAB and MDAB are all designated as attainment areas for state vinyl chloride standards.



Additional information on climate change is available from other sources online. Two notable resources include: The Intergovernmental Panel on Climate Change (IPCC), which summarizes the latest scientific researches, at www.ipcc.ch. And, the California Climate Change Portal hosted by the State, which provides relevant links at: www.climatechange.ca.gov.

Greenhouse Gas Components

California has established programs aimed at reducing the emissions of greenhouse gases (GHGs). Unlike the criteria air pollutants discussed above, GHGs are not regulated because of their direct adverse effects on health, but rather for their role in global climate change. Some greenhouse gases, such as carbon dioxide occur naturally and are emitted to the atmosphere through both natural processes and human activities. Other GHGs, such as the fluorinated gases, are created and emitted solely through human activities. Under AB 32, Section 38505 of the California Health and Safety Code defines "greenhouse gases" as the four basic constituents following:

Carbon Dioxide

Carbon dioxide (CO₂) enters the atmosphere through the burning of fossil fuels, such as oil, coal and natural gas, solid waste decomposition, trees and wood products, and also through certain industrial processes, such as cement manufacturing. Carbon dioxide is the most important anthropogenic (human caused) GHG because it comprises the majority of total GHG emissions per year (approximately 77%) and is very long-lived in the atmosphere. Annual emissions of CO₂ have increased approximately 80% between 1970 and 2004.

Methane

Methane (CH₄) is the second largest component of human-emitted GHGs, accounting for approximately 14% of total emissions. Methane, however, is 21 times more potent than CO₂ in the atmosphere. In relative terms, one ton of methane has roughly the same environmental effect as 21 tons of CO₂. It is for this reason that the term “carbon dioxide equivalents” (CO₂e) is typically used when discussing GHG totals. Methane is emitted during the production and transportation of coal, oil and natural gas. It is also emitted by livestock and other agricultural practices, as well as decay of organic waste in landfills.

Nitrous Oxide

Nitrous oxide (N₂O), also commonly known as “laughing gas,” is the third principal GHG component, comprising approximately 8% of emissions. It is commonly emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste decay. In terms of carbon equivalency, one molecule of N₂O has roughly the same environmental effect as 310 molecules of CO₂.

Fluorinated Gases

In addition to the three principal components above, fluorinated gases also contribute to approximately 1% of total GHG emissions. These gases include: Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), chlorofluorocarbons (CFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). These compounds are powerful synthetic (man-made) GHGs that are emitted from a variety of industrial processes. They are used in refrigeration and semiconductor manufacturing, provide insulation for high-voltage industrial equipment, and also form as by-products of some metal refining processes, such as aluminum smelting. Since they are extremely potent and some may remain in the earth’s atmosphere for very long periods (e.g., 50,000 years), they are extremely important, despite their small percentage. They are also said to have “high global warming potential,” and as such are subject to increasingly stringent federal and state regulation.

Pollution Control Policies

Multi-jurisdictional Cooperation

Air pollutants are not limited to jurisdictional boundaries. Local land use patterns, emission sources, and airflow patterns throughout Southern California contribute to the air quality of Riverside County. While the County can enact policies that limit emissions within its boundaries, it is necessary to support efforts to decrease region-wide pollution emissions as surrounding jurisdictions significantly impact Riverside County’s air quality. The following policies are designed to establish a regional basis for improving air quality.



Carbon Dioxide Equivalents: By converting all GHG emissions to carbon dioxide equivalent units (CO₂e), values can be standardized despite the GHGs’ differing degrees of “Global Warming Potential,” that is, relative environmental potency. GHG potency varies based on their chemistry and their duration in the atmosphere. For example, methane is 21 times more powerful than carbon dioxide in its capacity to trap heat, so in terms of carbon dioxide equivalents, one ton of methane equals 21 tons CO₂e.



SCAG - Southern California Association of Governments -

A regional council of government for planning and policy efforts coordinating its 6 member counties:

Riverside, San Bernardino, Orange, Imperial, Los Angeles and Ventura Counties. Subregional Planning Agencies that coordinate with SCAG:

WRCOG - Western Riverside Council of Governments - Coordinates regional policy and planning among 16 cities in western Riverside County, as well as utility providers and others.

CVAG - Coachella Valley Association of Government - Coordinates regional planning and policy issues among 10 member cities, plus two Indian Tribes and various County agencies.



The General Plan policy and implementation item reference system:

Identifies which element contains the Policy, in this case the Land Use Element, and the sequential number.

LU 1.3: Neighborhood Commercial uses should be located near residential uses.

(AI 1 and AI 4): Reference to the relevant Action Items contained in the implementation Program

Policies:

- AQ 1.1 Promote and participate with regional and local agencies, both public and private, to protect and improve air quality. (AI 111)
- AQ 1.2 Support Southern California Association of Government's (SCAG) Regional Growth Management Plan by developing intergovernmental agreements with appropriate governmental entities such as the Western Riverside Council of Governments (WRCOG), the Coachella Valley Association of Governments (CVAG), sanitation districts, water districts, and those subregional entities identified in the Regional Growth Management Plan. (AI 111)
- AQ 1.3 Participate in the development and update of those regional air quality management plans required under federal and state law, and meet all standards established for clean air in these plans. (AI 110)
- AQ 1.4 Coordinate with the SCAQMD and MDAQMD to ensure that all elements of air quality plans regarding reduction of air pollutant emissions are being enforced. (AI 111)
- AQ 1.5 Establish and implement air quality, land use and circulation measures that improve not only the County's environment but the entire region. (AI 111)
- AQ 1.6 Establish a level playing field by working with local jurisdictions to simultaneously adopt policies similar to those in this Air Quality Element.
- AQ 1.7 Support legislation which promotes cleaner industry, clean fuel vehicles and more efficient burning engines and fuels. (AI 113)
- AQ 1.8 Support the introduction of federal, state or regional enabling legislation to permit the County to promote inventive air quality programs, which otherwise could not be implemented. (AI 113)
- AQ 1.9 Encourage, publicly recognize and reward innovative approaches that improve air quality. (AI 113)
- AQ 1.10 Work with regional and local agencies to evaluate the feasibility of implementing a system of charges (e.g., pollution charges, user fees, congestion pricing and toll roads) that requires individuals who undertake polluting activities to bear the economic cost of their actions where possible. (AI 111)

- AQ 1.11 Involve environmental groups, the business community, special interests, and the general public in the formulation and implementation of programs that effectively reduce airborne pollutants.

Sensitive Receptors

Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e. children, elderly and the sick) and to certain at-risk sensitive land uses such as schools, hospitals, parks, or residential communities. The intent of the following policies is to reduce the negative impacts of poor air quality on Riverside County's sensitive receptors.

Policies:

- AQ 2.1 The County land use planning efforts shall assure that sensitive receptors are separated and protected from polluting point sources to the greatest extent possible. (AI 114)
- AQ 2.2 Require site plan designs to protect people and land uses sensitive to air pollution through the use of barriers and/or distance from emissions sources when possible. (AI 114)
- AQ 2.3 Encourage the use of pollution control measures such as landscaping, vegetation and other materials, which trap particulate matter or control pollution. (AI 114)
- AQ 2.4 Consider creating a program to plant urban trees on an Area Plan basis that removes pollutants from the air, provides shade and decreases the negative impacts of heat on the air. (AI 114)

Mobile Pollution Sources

Mobile sources are subdivided into two categories: on-road (generally motorized vehicles like automobiles, motorcycles and trucks) and non-road sources (trains, boats, jet skis and all-terrain vehicles). Riverside County's land use distribution, proximity to Orange and Los Angeles Counties, and subsequent auto-generated traffic has had a tremendously detrimental impact on air quality. Vehicle miles traveled (VMT) have doubled over the past 20 years, with mobile pollution sources constituting approximately 60% of air pollution in the region.

Policies:

- AQ 3.1 Allow the market place, as much as possible, to determine the most economical approach to relieve congestion and cut emissions.
- AQ 3.2 Seek new cooperative relationships between employers and employees to reduce vehicle miles traveled.
- AQ 3.3 Encourage large employers and commercial/industrial complexes to create Transportation Management Associations. (AI 115)



Vehicle Miles Traveled (VMT):

Denote the distances traveled each day. VMT is also a prime indicator of the efficiency of the County's transportation network. And, since most motor vehicles directly emit greenhouse gases in operation, VMT also reflects air quality. Measures to reduce VMT usually improve air quality and lower greenhouse gas emissions too.

AQ 3.4 Encourage employee rideshares and transit incentives for employers with more than 25 employees at a single location.

Stationary Pollution Sources



Please see the **County Ordinance No. 742**, Fugitive Dust Control in Urban Areas of the Coachella Valley, for additional information.

Stationary pollution sources are generally divided into two subcategories for analysis: point sources (such as power plants and refinery boilers) and area sources (including small emission sources such as residential water heaters and architectural coatings). Agricultural and industrial land uses are generally the main stationary pollution sources in Riverside County, though most urbanized land areas and their associated activities also contribute to poor air quality in the region. While industrial sources are addressed here, agricultural source impacts, due to their primary emissions of PM₁₀, are addressed in the Particulate Matter section of this element.

Policies:

- AQ 4.1 Require the use of all feasible building materials/methods which reduce emissions.
- AQ 4.2 Require the use of all feasible efficient heating equipment and other appliances, such as water heaters, swimming pool heaters, cooking equipment, refrigerators, furnaces and boiler units.
- AQ 4.3 Require centrally heated facilities to utilize automated time clocks or occupant sensors to control heating where feasible.
- AQ 4.4 Require residential building construction to comply with energy use guidelines detailed in Part 6 (California Energy Code) and/or Part 11 (California Green Building Standards Code) of Title 24 of the California Code of Regulations.
- AQ 4.5 Require stationary pollution sources to minimize the release of toxic pollutants through:
 - Design features;
 - Operating procedures;
 - Preventive maintenance;
 - Operator training; and
 - Emergency response planning
- AQ 4.6 Require stationary air pollution sources to comply with applicable air district rules and control measures.
- AQ 4.7 To the greatest extent possible, require every project to mitigate any of its anticipated emissions which exceed allowable emissions as established by the SCAQMD, MDAQMD, SCAB, the Environmental Protection Agency and the California Air Resources Board.

- AQ 4.8 Expand, as appropriate, measures contained in the County's Fugitive Dust Reduction Program for the Coachella Valley to the entire County.
- AQ 4.9 Require compliance with SCAQMD Rules 403 and 403.1, and support appropriate future measures to reduce fugitive dust emanating from construction sites.
- AQ 4.10 Coordinate with the SCAQMD and MDAQMD to create a communications plan to alert those conducting grading operations in the County of first, second, and third stage smog alerts, and when wind speeds exceed 25 miles per hour. During these instances all grading operations should be suspended. (AI 111)

Energy Efficiency and Conservation

Recycling and conservation efforts established and encouraged by the County of Riverside can reduce the amount of pollutants emitted within Riverside County. Efforts to recycle wastes can reduce the amount of pollutants emitted from the production of new materials while preserving raw materials. Conservation measures minimize the impacts of not only the consumption of, but also the production of energy sources.

Policies

- AQ 5.1 Utilize source reduction, recycling and other appropriate measures to reduce the amount of solid waste disposed of in landfills.
- AQ 5.2 Adopt incentives and/or regulations to enact energy conservation requirements for private and public developments. (AI 62)
- AQ 5.3 Update, when necessary, the County's Policy Manual for Energy Conservation to reflect revisions to the County Energy Conservation Program.
- AQ 5.4 Encourage the incorporation of energy-efficient design elements, including appropriate site orientation and the use of shade and windbreak trees to reduce fuel consumption for heating and cooling.

Jobs and Housing

Imagine commuting in the morning and driving only a few short miles to work. There would be no commutes over an hour, no crowded freeways that resemble parking lots and no fighting traffic. This is the life of people who live near work. And as more residents are able to live and work within Riverside County, this will be the commuting pattern of most residents. This will save fuel, ease congestion, speed traffic, cut emissions and improve air quality. However, if nothing is done, the risks are great. SCAG predicts that by the year 2010 commutes between Riverside County and Los Angeles County may increase by 600% over 2000 levels.

Part of the solution to the region's air quality problems is a better jobs-to-housing ratio. The objective of the jobs to housing ratio concept is to reduce Vehicle Miles Traveled (VMT) by locating jobs and housing closer together. In the ideal situation, the appropriate numbers of housing units in various income categories are provided to house Riverside County's workforce.



A "household" consists of all the people occupying a dwelling unit, whether or not they are related.

While this does not ensure that residents will live and work within Riverside County, the likelihood of it occurring does increase.

As stated in the General Plan Housing Element, traffic patterns on the major east-west transportation routes indicate that Riverside County serves as a bedroom community that supplies approximately 18% of the labor pool for the Los Angeles-Orange County metropolitan area (Table AQ-3, Home County by Work County). Statistics for 1990 to 2000 show that Riverside County’s jobs-household ratio is slowly improving, however, from 0.80 jobs per household in 1990 to 0.90 in 1997 and 0.94 in 2000. The unincorporated area shows a severe shortage of jobs, however, with only 0.48 jobs per household in western Riverside County and 0.26 jobs per household in eastern Riverside County in 1997. This is the reverse of the jobs to housing ratio experienced in Los Angeles and Orange Counties where there were approximately 1.46 and 1.52 jobs per household respectively in the year 2000.

Whenever possible, the County of Riverside should offer incentives to businesses and individuals to control emissions and implement the AQMP. In job-poor areas, the County of Riverside should stress job creation and reductions in vehicle miles traveled to improve air quality over other less efficient methods. Among the positive approaches available to the County of Riverside to encourage job creation in job-poor areas are: education; job training and placement services; technical assistance to incoming businesses; reducing regulation and paperwork on businesses; fast-tracking and fee waivers; and low interest loans.

Table AQ-3 Home County by Work County

Work County	Home County					
	Los Angeles	Orange	Riverside	San Bernardino	Ventura	Imperial
Los Angeles	90%	17%	8%	16%	18%	0%
Orange	6	79	10	7	0	0
Riverside	0	0	68	9	0	1
San Bernardino	2	2	8	68	0	0
Ventura	2	0	1	0	80	1
San Diego	0	1	4	0	1	1
Imperial	0	0	1	0	0	97

Source: 1999 SCAG State of the Commute Report

Education and Job Training

To stay competitive, the business community requires an educated and trained work force. While Riverside County residents are among the most talented and skilled in Southern California, job training and education programs should be provided as an incentive for businesses to locate within Riverside County. This will help ensure residents are trained and qualified to meet the specific needs of the business community.

Policies:

- AQ 6.1 Assist small businesses by developing education and job training programs, especially in job-poor areas. (AI 124)
- AQ 6.2 Collaborate with local colleges and universities to develop appropriate educational programs to assist residents in obtaining job skills to meet market demands.

Business Development

To the extent possible, the Air Quality Element will be an economic development program designed to enhance employment opportunities in Riverside County. Attempts to improve air quality should not prevent business development, especially within job-poor areas. In fact, business development should be identified as a critical factor in increasing air quality. Increasing employment opportunities within Riverside County will allow residents to obtain jobs locally and decrease commute times. Decreased commute times mean less time spent in air polluting vehicles.

Policies:

- AQ 7.1 Provide incentives to encourage new firms to locate within the County and existing firms to expand operations. (AI 18)
- AQ 7.2 Work with SCAQMD and MDAQMD to develop a means to encourage the location of new commercial and industrial development in those localities where jobs are most needed. (AI 18)
- AQ 7.3 Create a loan program to encourage small businesses to locate within the County. (AI 18)
- AQ 7.4 Offer incentives to businesses to control emissions and implement the AQMP. (AI 18)
- AQ 7.5 Reduce regulations on small businesses wherever possible and thereby encourage small business development and job creation. The County shall set performance standards as well as design standards, thus giving small business owners as many options as possible to comply with County regulations. (AI 18)
- AQ 7.6 Adopt policies freeing small businesses from unnecessary and duplicative paperwork. (AI 18)
- AQ 7.7 Assemble information collected from County agencies and departments concerning the business community to develop programs that better serve their needs. (AI 18)

Jobs-to-Housing Ratio


One of the challenges facing Riverside County is to provide the appropriate quantity of residential and employment-generating uses within close proximity to each other in order to reduce the amount of vehicle miles traveled and minimize impacts on air quality. In addition to providing incentives for businesses to locate within Riverside County, it is important to consider the jobs-to-housing ratio when approving the construction of new developments, including the use of mixed-use land patterns and the placement of new public facilities.

Policies:

- AQ 8.1 Locate new public facilities in job-poor areas of the county. (AI 18)
- AQ 8.2 Emphasize job creation and reductions in vehicle miles traveled in job-poor areas to improve air quality over other less efficient methods. (AI 18)



Please see the **General Plan Land Use Element** Land Use Designation Policies section and Appendix J, Community Center Guidelines for additional information.

- AQ 8.3 Time and locate public facilities and services so that they further enhance job creation opportunities. (AI 18)
- AQ 8.4 Support new mixed-use land use patterns and community centers which encourage community self-sufficiency and containment, and discourage automobile dependency. (AI 14)
- 
- Please see the **General Plan Circulation Element Planned Circulation Systems** section for further policies regarding alternative modes of travel.
- AQ 8.5 Develop community centers in conformance with policies contained in the Land Use Element. (AI 14)
- AQ 8.6 Encourage employment centers in close proximity to residential uses. (AI 14)
- AQ 8.7 Implement zoning code provisions which encourage community centers, telecommuting and home-based businesses. (AI 1)
- AQ 8.8 Promote land use patterns which reduce the number and length of motor vehicle trips. (AI 26)
- AQ 8.9 Promote land use patterns that promote alternative modes of travel. (AI 26)

Multi-jurisdictional Coordination

The County of Riverside recognizes the regional context of the policies it creates. Because air pollutants do not recognize political boundaries, often the policies of one community may adversely impact residents of another. This is particularly true with respect to pollutants emitted by motor vehicles, which underscores the importance of regional and subregional cooperation.

Policies:

- AQ 9.1 Cooperate with local, regional, state and federal jurisdictions to reduce vehicle miles traveled and motor vehicle emissions through job creation. (AI 18)
- AQ 9.2 Attain performance goals and/or VMT reductions which are consistent with SCAG's Growth Management Plan. (AI 26)



Transportation Demand Management (TDM) - Low-cost ways to reduce demand by automobiles on transportation systems, such as programs to promote telecommuting, flextime and ridesharing.

Transportation Demand Management

Vehicles are an essential part of life in California. People use them to go to work, run errands and transport goods all across the state and nation. However, while they serve a valuable function, many streets and freeways are increasingly overburdened with traffic. Every day, cars and trucks jam onto the freeway at the beginning and end of each workday. Inching along the average twenty-two mile commute for Riverside County residents, automobiles spew pollutants into the air, while long sunny days change these pollutants into other noxious compounds. Most cars carry a single occupant,

adding to the congestion and smog. When traffic does move, accidents often involving large trucks bring traffic to a grinding halt.

The good news is that our commute times and distance traveled to and from work have been stable over the last decade. The bad news is that Riverside County residents drive the furthest distance and have some of the longest commute times in all of Southern California (Tables AQ-4, AQ-5 and AQ-6).

Transportation Demand Management (TDM) can help unclog freeways and reduce commute times, thereby improving air quality. However, it means planning driving patterns to reduce the number of cars and trucks using the roads at any one time; this in the essence of TDM.

As stated in the Circulation Element, TDM strategies help reduce work-related trips by encouraging individuals who now drive alone to form carpools and vanpools, and to take the bus or light rail. Alternatively, workers may work longer hours and so eliminate a trip to the office once or twice a week. Two other TDM strategies that eliminate work trips are telecommuting and work-at-home programs. When individuals must drive, TDM calls for changes in their work schedules to avoid peak traffic periods. A similar TDM strategy encourages large trucks to operate at night. Because traffic at night is lighter, accidents are less likely, and when they do occur, they may not tie up the freeway for hours as they would during the day.

TDM strategies for reducing trips that are not work related are also important. Among these are merchant transportation incentives, such as discounts to customers who use public transit and free bus passes. Some measures reduce both work and non-work related trips. For example, by pricing parking spaces and providing convenient parking for people who rideshare, parking management encourages the use of carpools, vanpools and public transit. It also eliminates on-street parking which adds to congestion.

Table AQ-4 Commute Distance by Home County

Home County	1991	1992	1993	1995	1997	1998	2005
Los Angeles	15.8 miles	13.3 miles	15.3 miles	14.6 miles	14.6 miles	15.3 miles	18.4 miles
Orange	14.9	14.0	15.8	15.7	14.2	16.1	16.7
Riverside	20.9	22.8	22.2	24.1	21.0	21.6	25.1
San Bernardino	20.4	20.0	21.3	25.0	22.4	21.3	23.3
Ventura	17.7	15.4	16.2	17.8	15.9	16.3	19.1
Imperial*	NA	NA	NA	11.8	12.1	14.5	16.8

* Imperial County was included for the first time in the 1996 study.
Source: 2006 SCAG State of the Commute Report

Table AQ-5 Commuting Time for Trip to Work by Home County

Home County	1991	1992	1993	1995	1997	1998	2005
Los Angeles	37 minutes	33 minutes	30 minutes	33 minutes	31 minutes	34 minutes	43 minutes
Orange	32	29	30	30	31	33	37
Riverside	38	37	36	38	36	37	46
San Bernardino	35	36	36	38	37	35	43
Ventura	28	26	28	28	26	27	38
Imperial*	NA	NA	NA	20	23	24	29

* Imperial County was included for the first time in the 1996 study.
Source: 2006 SCAG State of the Commute Report

Table AQ-6 Commuting Time for Return Trip Home by Home County

Home County	1991	1992	1993	1995	1997	1998	2005
Los Angeles	42 minutes	36 minutes	34 minutes	36 minutes	38 minutes	41 minutes	54 minutes

Orange	35	34	38	37	34	41	42
Riverside	41	43	43	46	40	38	55
San Bernardino	42	39	42	47	39	41	59
Ventura	32	30	31	32	30	33	43
Imperial*	NA	NA	NA	21	24	23	33

* Imperial County was included for the first time in the 1996 study.
Source: 2006 SCAG State of the Commute Report



Please see the **General Plan Circulation Element** Transportation Demand Management section for additional information.

TDM alone, however, is not the answer. Transit improvements and facility development must accompany these changes. Efforts to encouraging a shift to transit will fail unless transit operators make convenient, safe and reliable transit service available. Similarly, a lack of work centers now blocks the development of telecommuting. The County of Riverside can take steps to foster the development of such work centers. Changing transportation demand will also require facility development, such as park-n-ride lots, bus turnouts, off-site parking, and facilities for bicycles and pedestrians.

Riverside County’s Transportation Demand Management Ordinance for new developments, designed to meet the requirements of the Riverside County Congestion Management Program and the Air Quality Management Plan, promotes the development of TDM strategies early in the development review process. The ordinance sets goals for reducing vehicle trips generated by new developments, a minimum road level-of-service for all new development projects and a reduction in overall vehicle trips emanating from the County. This ordinance also establishes potential TDM measures to be used where appropriate including off-site telecommunications facilities, carpooling, alternative work schedules, transit ridership incentives, and an enhanced pedestrian and bikeway circulation system.

Trip Reduction

As the automobile is the major source of air pollution in the region, the County of Riverside recognizes the importance of reducing the number of vehicle trips and miles traveled. Policies in this section are not intended to create additional regulation, but to create incentives to reduce vehicle trips, encourage alternative schedules and conform to policies created by regional governments.

Policies:

- AQ 10.1 Encourage trip reduction plans to promote alternative work schedules, ridesharing, telecommuting and work-at-home programs, employee education and preferential parking. (AI 47)
- AQ 10.2 Use incentives, regulations and Transportation Demand Management in cooperation with surrounding jurisdictions when possible to eliminate vehicle trips which would otherwise be made. (AI 47)
- AQ 10.3 Assist merchants in encouraging their customers to shift from single occupancy vehicles to transit, carpools, bicycles, or foot. (AI 48)
- AQ 10.4 Continue to enforce the County’s Transportation Demand Management Ordinance and update as necessary.

Special Events

Temporary special events provide recreational and retail opportunities for residents. However, these events may also result in traffic congestion on roadways adjacent to the event. The following policies are designed to alleviate traffic congestion and the accompanying pollution caused by excess vehicle travel times.

Policies:

- AQ 11.1 Establish requirements for special event centers to provide off-site parking and park-n-ride facilities at remote locations. Remote parking should be as close to practicable to the event site and the operator should supply shuttle services. (AI 116)
- AQ 11.2 Promote the use of peripheral parking by increasing on-site parking rates and offering reduced rates to peripheral parking with tickets sold for non-ridesharing patrons. (AI 116)
- AQ 11.3 Encourage special event center operators to advertise and offer discounted transit passes with event tickets. (AI 116)
- AQ 11.4 Encourage special event center operators to advertise and offer discount parking incentives to carpooling patrons, with two or more persons per vehicle, for on-site parking facilities. (AI 116)

Transportation Systems Management

Transportation systems management improves traffic flow through modification in the operation of existing transit facilities and fleets. This increases mobility and thereby improves air quality. Commerce, industry and public welfare require adequate mobility. Poor transportation systems management, on the other hand, creates congested highways, perpetuates poorly maintained and polluting fleets, weakens Riverside County's economy and diminishes its citizens' health and well-being.

Riverside County's rapidly growing population combined with unsynchronized traffic signals, delays at grade-level rail crossings, non-uniform street widths, inadequate roadway maintenance and poor emergency response, has resulted in increased congestion. Increased congestion means stop-and-go traffic and longer travel and idling time for cars, buses and trucks. Congestion increases transportation costs and vehicle emissions, and frays nerves. Moreover, a lack of fleets using alternative fuels adds to poor air quality.

Because transportation systems management provides an important weapon for relieving congestion, improving mobility, and enhancing air quality, the County of Riverside should use it extensively in its fight for cleaner air.



An at-grade railroad crossing is one where the street and the rail line form an intersection, and physically cross one-another.

Traffic Flow

It is a goal of Riverside County to manage its transportation systems in a manner in which mobility and efficiency are enhanced. Improving the flow of traffic promotes mobility on our streets, resulting in decreased impacts on air quality.

Policies:

AQ 12.1 Manage traffic flow through signal synchronization, while coordinating with and permitting the free flow of mass transit vehicles, when possible. (AI 117)

**Channelization -**

Involves the separation or regulation of conflicting traffic movements into definite paths of travel by traffic islands or pavement markings, to facilitate the safe and orderly movement of vehicles and pedestrians.

AQ 12.2 Synchronize signals throughout the County with those of its cities, adjoining counties and the California Department of Transportation. (AI 117)

AQ 12.3 Construct and improve traffic signals with channelization and Automated Traffic Surveillance and Control systems at appropriate intersections. (AI 117)

AQ 12.4 Eliminate traffic hazards and delays through highway maintenance, rapid emergency response, debris removal, and elimination of at-grade railroad crossings, when possible. (AI 119)

AQ 12.5 Encourage business owners to schedule deliveries at off-peak traffic periods.

Transportation System Management Improvements**High Occupancy Vehicles (HOV) Lanes -**

Carpools, vanpools, buses and motorcycles are the only vehicles allowed to use HOV lanes. Generally, HOV lanes require two-person carpools, though there are some roadways that require a minimum of three (with the exception of super-ultra low-emission vehicles, which may use HOV lanes with a single occupant).

Proper management and oversight of the Riverside County-owned fleet can provide a highly effective tool for reducing direct and indirect impacts on air quality. It is therefore a goal of Riverside County to continually improve its own transportation system and cooperate with officials in all levels of government to enhance regional efforts to improve transportation systems management.

Policies:

AQ 13.1 Manage the County of Riverside transportation fleet fueling standards to achieve an appropriate alternate fuel fleet mix. (AI 118)

AQ 13.2 Cooperate with local, regional, state, and federal jurisdictions to better manage transportation facilities and fleets.

AQ 13.3 Encourage the construction of high-occupancy-vehicle (HOV) lanes whenever possible to relieve congestion, safety hazards and air pollution as described in the AQMP.

Transportation Facility Development

Regionally, transportation facility development means increasing capacity through the expansion of highway and transit systems to meet population and land use demand. Though major construction projects often require massive capital investment, mobility and capacity are increased. These projects include: major highways in high

growth regions, construction of high occupancy vehicle (HOV) lanes where severe traffic problems occur, and the construction of rapid transit corridors and facilities. Unfortunately, this strategy responds slowly to changing demands on the transportation system and may burden the region with debt.

Estimates for the development of additional facilities and systems over the next twenty years call for billions of dollars in investment. While federal government spending will account for a large portion of the funding required, additional revenues will have to be raised through a variety of means, including the gas tax, sales tax, user fees, tolls and bonds.

The costs of regional transportation projects also include growth in population, housing and services, and their impact on the transportation system. This raises traffic volume to or above the system's designed capacity while decaying air quality. When major transit corridors become congested, for example, daily commuters take alternate routes to avoid traffic delays. Once a new route becomes operational, commuters abandon these alternative routes for the new or improved systems until they too become congested. However, trying to build out of this situation does not solve the problem because it fuels an unbridled cycle of more growth, traffic, transportation facility development and smog. Continued transportation facility development results in increased growth, higher taxes, and minimal net gains in mobility for each dollar spent. All of this only lessens the chances for good air quality.

Just as there is a need regionally, capital improvements are also required locally to keep traffic moving and reduce emissions. It is the intent of the County of Riverside to continue such improvements. However, the County of Riverside recognizes that large construction projects are not always the best option for meeting transportation demands and that other, less expensive alternatives, are sometimes available. These alternatives include demand management, transportation systems management, and strategies to improve the job/housing ratio. While the County of Riverside cannot meet all of its mobility and air pollution challenges using these alternatives, they may supplement needed capital improvements to help meet Riverside County's transportation demands.

The transportation facility development required must improve mobility by encouraging multiple-occupancy vehicle use and alternative travel modes for both short and long trips. Therefore, the County of Riverside must emphasize construction projects such as single purpose, high occupancy vehicle lanes, park-n-ride lots, light rail and bus routes. It should also give priority to bicycle paths and trails, pedestrian overpasses, and bus turnouts. These projects improve mobility and air quality by encouraging efficient transportation use.

Policies:

- AQ 14.1 Emphasize the use of high occupancy vehicle lanes, light rail and bus routes, and pedestrian and bicycle facilities when using transportation facility development to improve mobility and air quality.
- AQ 14.2 When developing new capital facility improvement plans, also consider measures such as Transportation Demand Management, Transportation Systems Management, or job/housing balance strategies.
- AQ 14.3 Monitor traffic and congestion to determine when and where the County needs new transportation facilities to achieve increased mobility efficiency.



Please see the **General Plan Circulation Element**, Planned Circulation Systems section for additional information and policies.

- AQ 14.4 Preserve transportation corridors with high demand potential or regional significance for future expansion to meet project demand. (AI 53)

Particulate Matter

The Environmental Protection Agency (EPA) defines particulate matter (PM) as either airborne photochemical precipitates or windborne dust. Consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols, common sources of PM are manufacturing and power plants, agriculture, diesel trucks and other vehicles, construction sites, fire and windblown dust. Generally PM settles from atmospheric suspension as either particulate or acid rain and fog that has the potential to damage health, crops, and property. Particulate of 2.5 microns or smaller (2.5 microns is approximately equal to .000098 inches) may stay suspended in the air for longer periods of time and when inhaled can penetrate deep into the lungs. Among the health effects related to PM_{2.5} are premature death, decreased lung function and exacerbation of asthma and other respiratory tract illnesses.

Airborne particulate matter sized between 2.5 and 10 microns (10 microns is approximately equal to 0.0004 inches), known as PM₁₀ also pose a great risk to human health. PM₁₀ can easily enter the air sacs in the lungs where they may be deposited, resulting in an increased risk of developing cancer, potentially changing lung function and structure, and possibly exacerbating preexisting respiratory and cardiovascular diseases. It can also irritate the eyes, damage sensitive tissues, sometimes carry disease, and may even cause premature death. PM_{2.5} and PM₁₀ are especially hazardous to the old, young and infirm.

Although it produces less than 10% of the South Coast Air Basin's particulate matter, western Riverside County, which is part of the SCAB, exceeds federal standards more than any other urban area in the nation, and has the highest particulate concentration in the SCAB. These high levels of particulate matter are largely imported from the urbanized portions of Los Angeles and Orange Counties. This imported particulate is generally composed of photochemical precipitates rather than dust, smoke or soot. Riverside County is also responsible for generating large amounts of particulate matter from sources such as agriculture, warehousing operations, and truck traffic.

While Riverside County is dedicated to implementing policies to control particulate matter produced within its own boundaries, it has no control over particulate imported from beyond its boundaries. The solution to the problem of imported particulate matter in western Riverside County is the adoption of adequate control measures by those responsible jurisdictions in Los Angeles and Orange Counties. By adhering to the control measures contained in the AQMP, these jurisdictions can have a positive impact on particulate matter pollution in the SCAB portion of Riverside County.

The air quality concerns in the Salton Sea Air Basin (SSAB) portions of Riverside County differ somewhat from those in western Riverside County. Unlike the SCAB region, particulates in SSAB are primarily dust, smoke and soot. While in 1993 and 1994, PM₁₀ concentrations were under the federal standard, concentrations in 1995 were slightly above federal limits. The maximum annual average PM₁₀ concentration in 1995 was recorded at 4% above the federal standard; however, the measurement included one day with high winds without which the SSAB would have been under the federal standard. The far more stringent state standards were exceeded on 44% of the days in 1995.

The Mojave Desert Air Basin (MDAB), like the SCAB and SSAB, is designated as a non-attainment area for PM₁₀. Particulates in the MDAB are primarily fugitive caused by high winds or vehicle travel on unpaved roads. Particulates in the area are generally not caused by exhaust stacks or primary emission points.

While sources and severity of particulate pollution differ in subareas of Riverside County, it is Riverside County's objective to control particulate matter throughout all of Riverside County. However, where necessary, the County of Riverside shall tailor its control measures and implementation procedures to best address the unique situations found in each area. One example of such an area is the Mira Loma community, where particulate pollutant levels are among the worst in the nation. In such an area, strong measures must be taken immediately to protect the health and welfare of residents, especially children, the elderly and those with respiratory illnesses.

Monitoring

Air quality monitoring stations are located throughout Riverside County (Figure AQ-2). However, at times it may be necessary to locate additional monitors in those areas of the County suspected of producing excessively high levels of particulates. This more localized data may then assist control and law enforcement efforts in reducing and minimizing particulate matter levels.

Policies:

AQ 15.1 Identify and monitor sources, enforce existing regulations, and promote stronger controls to reduce particulate matter.

Multi-jurisdictional Cooperation

Particulate matter concentrations are a regional issue. In addition to those created in Riverside County, particulates originating in surrounding cities and counties are transported into Riverside County by prevailing winds. Therefore, any meaningful attempt to decrease particulate concentrations in Riverside County will involve cooperation with local and regional governments and a tightening of state and federal standards.

Policies:

AQ 16.1 Cooperate with local, regional, state and federal jurisdictions to better control particulate matter.

AQ 16.2 Encourage stricter state and federal legislation on bias belted tires, smoking vehicles, and vehicles that spill debris on streets and highways, to better control particulate matter. (AI 113)

AQ 16.3 Collaborate with the SCAQMD and MDAQMD to require and/or encourage the adoption of regulations or incentives to limit the amount of time trucks may idle. (AI 120)

AQ 16.4 Collaborate with the EPA, SCAQMD, MDAQMD, and warehouse owners and operators to create regulations and programs to reduce the amount of diesel fumes released due to warehousing operations. (AI 121)

Control Measures

Riverside County can implement simple control measures to reduce the amount of particulates produced within its borders. Strict enforcement of these and current regulations can then lead to a substantial decrease in particulate concentrations in the County of Riverside and neighboring areas.

Policies:

- AQ 17.1 Reduce particulate matter from agriculture, construction, demolition, debris hauling, street cleaning, utility maintenance, railroad rights-of-way, and off-road vehicles to the extent possible. (AI 123)
- AQ 17.2 Enforce regulations against illegal fires.
- AQ 17.3 Identify and create a control plan for areas within the County prone to wind erosion of soil.
- AQ 17.4 Adopt incentives, regulations and/or procedures to manage paved and unpaved roads and parking lots so they produce the minimum practicable level of particulates. (AI 111)
- AQ 17.5 Adopt incentives and/or procedures to limit dust from agricultural lands and operations, where applicable. (AI 123)
- AQ 17.6 Reduce emissions from building materials and methods that generate excessive pollutants, through incentives and/or regulations.
- AQ 17.7 Separate trucks from other vehicles in industrial areas of the County with the creation of truck-only access lanes to promote the free flow of traffic. (AI 43)
- AQ 17.8 Adopt regulations and programs necessary to meet state and federal guidelines for diesel emissions. (AI 121)
- AQ 17.9 Encourage the installation and use of electric service units at truck stops and distribution centers for heating and cooling truck cabs, and particularly for powering refrigeration trucks in lieu of idling of engines for power. (AI 120)
- AQ 17.10 Promote and encourage the use of natural gas and electric vehicles in distribution centers. (AI 146, 147)
- AQ 17.11 Create and implement street-sweeping plans, as appropriate, in areas of the County disproportionately affected by particulate matter pollution.

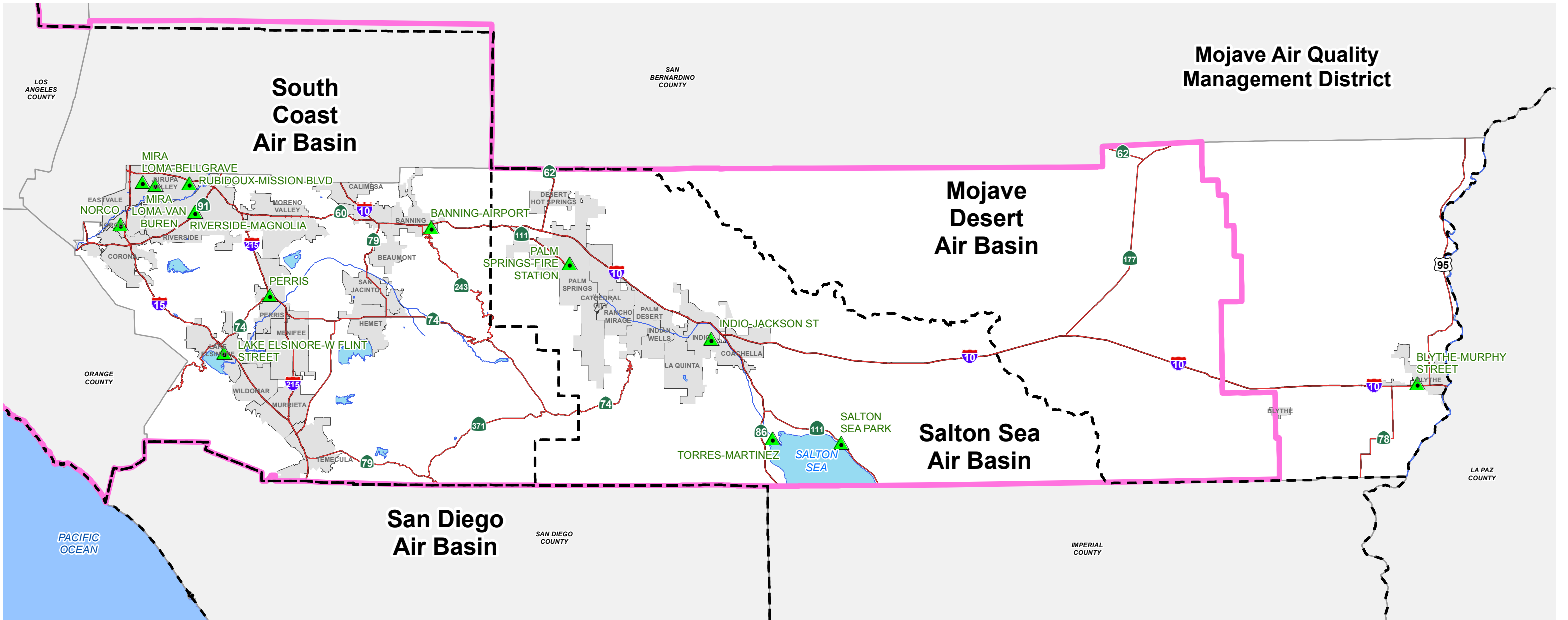
Riverside County Greenhouse Gas Emission Reduction Strategy

Riverside County is committed to providing a more livable, equitable, and economically vibrant community through the incorporation of sustainability features and reduction of greenhouse gas (GHG) emissions. In response to the growing regulatory requirements from both state and federal Governments, a GHG reduction strategy is developed for Riverside County to establish specific goals and policies that incorporate environmental responsibility into its daily management. The GHG reduction strategies outlined in this element will ensure that Riverside County activities and approvals occur to achieve that individual actions do not emit significant amounts of GHGs and that the emissions from the individual actions do not contribute to cumulatively significant GHG emissions. Thus, the following reduction strategies will eventually attain Riverside County's long-range GHG emission reduction goals as required by state and federal regulations.

Baseline Inventory of Greenhouse Gas Emissions

In order to achieve a better of understanding of Riverside County's reduction goals, a GHG emissions baseline inventory was conducted for unincorporated Riverside County in 2008. The following GHG emissions inventory identifies and categorizes the major sources and quantities of GHG emissions being produced by County residents, businesses, and government (County) operations currently. The total emissions from unincorporated Riverside County in 2008 totaled approximately 7.2 million metric tons of carbon dioxide equivalent (MMT CO_2e).


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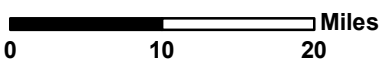


Data Source: California Air Resources Board (2010)

-  Monitoring Sites
-  SCAQMD Jurisdiction
-  Air Quality Basins
-  Highways
-  Cities
-  Waterbodies

Figure AQ-2

 December 8, 2015



Disclaimer: Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.



**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
AND CALIFORNIA AIR RESOURCES BOARD AIR
MONITORING NETWORK IN RIVERSIDE COUNTY**

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Table AQ-7 (2008 Baseline GHG Emissions Inventory for Unincorporated Riverside County) summarizes net 2008 County emissions of CO₂e as broken down by emissions category. The categories included in this inventory are: transportation, energy, area source, water and wastewater, solid waste, and agriculture. As expressed in Table AQ-7, transportation and agricultural activities currently generate the highest rate of GHG emissions within unincorporated Riverside County.

**Table AQ-7: 2008 Baseline GHG Emissions Inventory
for Unincorporated Riverside County**

Emissions Category	Metric Tons of CO ₂ e
Transportation	2,850,520
Energy	1,577,677
Area Source Emissions	269,181
Purchased Water/Wastewater Treatment	152,473
Solid Waste	132,666
Agriculture	2,030,431
Total	7,012,938

County of Riverside Climate Action Plan, 2011

GHG Emission Reduction Categories

While renewable energy sources, cleaner fuels and green technology will help reduce GHG emissions, significant changes are also needed in designing, constructing, and operating the built environment to meet the GHG reduction goals. Towards this end, the Riverside County has three main avenues in which to reduce GHG emissions.

- Riverside County Operations:** GHGs are emitted by Riverside County operations, buildings, fleet, equipment and other activities conducted in the functioning of county government. Since Riverside County has direct authority over these actions, they represent an area where proactive GHG reduction policies and programs may be most readily achieved.
- Riverside County Discretionary Approvals:** Riverside County approves private land use projects (such as residential, commercial and industrial development) and issues construction, mining and other permits through its discretionary approval process. All of these activities in turn result in GHG emissions, either directly (e.g., from construction equipment emissions and vehicle trips to the development) or indirectly (e.g., use of electricity for heating and cooling, water transport and treatment, irrigation, etc.).



**CAPCOA - The California
Air Pollution Control
Officers Association**

According to CAPCOA, improved planning and design can indirectly reduce GHG emissions associated with land use and transportation by significant amounts. As new planning policies are implemented, and transportation patterns and habits change in response, the reductions in the long run multiplies as it compounds every year.

- Emissions from Community Sources:** This category addresses emissions arising from private activities occurring within the geographic bounds of Riverside County. Although a range of private activities occurring within the community are beyond the realm of County of Riverside authority, voluntary reductions are still obtainable. The County of Riverside can further such voluntary reductions through a variety of non-mandatory efforts, such as public education classes, homeowner and business owner outreach or even the provision of financial incentives and rebates. Additionally, interagency coordination is another key element to

long-range efforts. This can include developing plans and programs in coordination with local water agencies, constituent cities, regional planning agencies, such as WRCOG and CVAG, as well as SCAG and state agencies.

Development of Riverside County Climate Action Plan (CAP)



Climate Action Plan “CAP” - Provides a programmatic plan by which the County will address the actions necessary to achieve greenhouse gas emissions reductions across the various sectors under County jurisdiction.

The efforts toward reducing GHG emissions in the County are closely related to the way in which Riverside County operates, makes its land use decisions, and provides incentives to retrofit existing communities as mentioned above. To this end, the main components of Riverside County’s vision for future decisions are founded in the General Plan policies and its programs. The General Plan provides direction to the Riverside County decision-makers on managing their resources and how future development should occur. It includes policies and programs within various elements and technical appendices that reduce GHG emissions in Riverside County. The current Riverside County General Plan reduces GHG emissions through sound planning measures, such as limiting water consumption, reducing waste, managing growth in a manner that accommodates growing populations without allowing urban sprawl, by reducing vehicle miles travelled and subsequently, emissions from motorized vehicles.

The General Plan includes Riverside County’s Climate Action Plan (CAP), which contains further guidance on Riverside County’s GHG inventory reduction goals, thresholds, policies, guidelines, and implementation programs. In particular, the CAP elaborates on the General Plan goals and policies relative to GHG emissions and provides a specific implementation tool to guide future decisions of the County of Riverside.

Through the CAP, the County of Riverside has made commitment to be in compliance with the changing GHG emissions reduction regulations of the federal and state governments. Following the state’s AB 32 GHG reduction target, Riverside County has set a goal to reduce emissions back to 1990 levels by the year 2020. The estimated community-wide emissions for the year 2020, based on population and housing growth projections associated with the assumptions used in the General Plan land use projections, are 10,268,937MT CO₂e. In order to reach the reduction target, Riverside County must offset this growth in emissions and reduce community-wide emissions to 6,036,971 MT CO₂e by the year 2020.

However, it is also important to note that in addition to the CAP, other existing state regulations will contribute to achieving GHG emissions reductions in Riverside County by the year 2020. Some of these regulations include updated building codes for energy efficiency, the low carbon fuel standard, Pavley I and II vehicle emissions standards, and the Renewable Portfolio Standard for utility companies. By supporting the State of California in the implementation of these measures, Riverside County will experience substantial GHG emissions reductions as well.

To be effective, the Riverside County CAP has addressed, and will continue implementation of, the following milestones and achieve the associated results, as outlined in the following policies:

Policies:

AQ 18.1 Baseline emissions inventory and forecast. Riverside County CAP has included baseline emissions inventory with data from the County’s CO₂e emissions, for specific sectors and specific years. The carbon inventory greatly aids the process of determining the type, scope and

number of GHG reduction policies needed. It also facilitates the tracking of policy implementation and effectiveness. The carbon inventory for the County consists of two distinct components; one inventory is for the County as a whole, as defined by its geographical borders and the other inventory is for the emissions resulting from the County's municipal operations.

- AQ 18.2 **Adopt GHG emissions reduction targets.** Pursuant to the results of the Carbon Inventory and Greenhouse Gas Analysis for Riverside County, future development proposed as a discretionary project pursuant to the General Plan shall achieve sufficient reductions in greenhouse gas emissions in order to be found consistent with the County's Climate Action Plan. (AI 26)
- AQ 18.3 **Develop a Climate Action Plan for reducing GHG emissions.** The Riverside County CAP has been developed to formalize the measure necessary to achieve County GHG emissions reduction targets. The CAP includes both the policies necessary to meet stated targets and objectives are met. These targets, objectives and Implementation Measures may be refined, superseded or supplemented as warranted in the future. (AI 146)
- AQ 18.4 **Implement policies and measures to achieve reduction targets.** The County shall implementation of the greenhouse gas reduction policies and measures established under the County Climate Action Plan for all new discretionary development proposals. (AI 23, 147)
- AQ 18.5 **Monitor and verify results.** The County shall monitor and verify the progress and results, and make any necessary revisions to, the CAP by 2020 and a minimum every four years thereafter. The progress and results of, and revisions to, the CAP will be made available to the public for review prior to approval. If monitoring reveals that the targets of the CAP are not being met, the CAP shall be revised to ensure that any changes needed to stay 'on target' with the stated goals are accomplished. (AI 26, 147)

General Plan Policies and Climate Action Plan

As indicated above, the CAP is an independent document that elaborates on the General Plan goals and policies relative to GHG emission and provides a specific implementation tool to guide decisions regarding Riverside County operations, retrofit programs for existing communities, as well as land use decisions. However, since the General Plan is the blueprint for future growth in Riverside County, the following policies provides additional guidance in review and discretionary approval of private land use projects (such as residential, commercial and industrial development).

Policies:

- AQ 19.1 Continue to coordinate with CARB, SCAQMD, and the State Attorney General's office to ensure that the milestones and reduction strategies presented in the General Plan and the CAP adequately address the county's GHG emissions. (AI 110, 111, 113)
- AQ 19.2 Utilize County's CAP as the guiding document for determining County's greenhouse gas reduction thresholds

“

The general planning process presents a powerful opportunity to carefully consider and shape future land use patterns and ensure that development is consistent with AB 32. As the Air Resources Board noted in its recent AB 32 Scoping Plan, 'local governments are essential partners in achieving California's goals to reduce greenhouse gas emissions.'

”

California Attorney General, Edmund G. Brown

and implementation programs. Implementation of the CAP and its monitoring program shall include the ability to expand upon, or where appropriate, update or replace the Implementation Measures established herein such that the implementation of the CAP accomplishes the greenhouse gas reduction targets. (AI 146)



Also see the following policies associated with Transportation-related greenhouse gas reductions:

Air Quality Element:

AQ 3.4, AQ 10.4, AQ 12.1-AQ 12.4, AQ 14.1, AQ 14.3

Circulation Element:

C 1.2, C 1.3, C 1.7, C 4.1-C 4.9, C 9.1, C 10.1, C 11.1-C 11.3, C 11.7, C 12.1-C 12.5, C 13.1-C 13.4, C 13.7, C 13.8, C 15.1-C 15.3, C 15.5, C 15.6, C 16.1-16.4, C 17.1-C 17.4, C 18.1, C 20.14

Healthy Communities Element:

HC 2.1, HC 6.1, HC 7.1, HC 13.2

Land Use Element:

LU 11.4, LU 13.3, LU 13.4, LU 13.7, LU 28.5

Multipurpose Open Space Element:

OS 16.3, OS 16.8

GHG Emission Reduction Focus Areas

For regulatory purposes, the activities that contribute to GHG emissions can be divided up into eight categories: transportation, land use, energy use, water and biota use, waste generation, municipal (i.e., Riverside County) operations and existing uses not otherwise covered. These eight focus areas are key to achieving the General Plan and CAP milestones. It is helpful to look at GHG emissions based on these categories for two reasons. First, measures appropriate for one area may vary markedly from those of another area. Secondly, this allows reduction measures to be appropriately focused. For example, 100% of available resources would not be best spent if it only achieved reductions in an area responsible for 2% of the overall GHG emissions of the County of Riverside. Thus, for the eight focus areas, the following summary of the policy objectives are established on key areas for achieving GHG reductions.

1. Transportation-Related Objectives

The transportation sector is typically the largest single area of emissions in a given area. Within California, carbon emissions resulting from gasoline-powered vehicles produce roughly 38% of the state's total GHGs. Broadly, there are three ways to reduce GHG emissions from the transportation sector. One way is to implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation. Another way is to utilize vehicles that release fewer greenhouse gases, such as hybrids, more fuel efficient vehicles and vehicles that run on alternative fuels. Lastly, reducing VMT is largely a function of how communities are planned and developed. As such, this aspect of VMT reduction is addressed through the Land Use decisions made by the County of Riverside.

Reducing vehicle miles traveled, a substantial indicator of GHG production from transportation, is the basis for the following policy objectives and the related new development Implementation Measures presented in the CAP.



Also see the following County Ordinances associated with Transportation-related greenhouse gas reductions:

Ordinance No. 706
"Mobile Source Air Pollution Reduction Programs (Funding)"

Ordinance No. 726
"Transportation Demand Management for New Development"

Ordinance No. 748
"Mitigation of Traffic Congestion through Signalization"

Ordinance No. 782 "Golf Cart Transportation Plan"

Ordinance No. 824
"Western Riverside County Traffic Uniform Mitigation Fee (TUMF) Program" (see also Ordinance No. 673)

Policies:

- AQ 20.1 Reduce VMT by requiring expanded multi-modal facilities and services that provide transportation alternatives, such as transit, bicycle and pedestrian modes. Improve connectivity of the multi-modal facilities by providing linkages between various uses in the developments. (AI 47, 53, 146)
- AQ 20.2 Reduce VMT by facilitating an increase in transit options. In particular, coordinate with adjacent municipalities, transit providers and regional transportation planning agencies to develop mutual policies and funding mechanisms to increase the use of alternative transportation. (AI 47, 53, 146)
- AQ 20.3 Reduce VMT and GHG emissions by improving circulation network efficiency. (AI 47, 53, 146)
- AQ 20.4 Reduce VMT and traffic through programs that increase carpooling and public transit use, decrease trips and commute times, and increase use of alternative-fuel vehicles. (AI 47, 146)
- AQ 20.5 Reduce emissions from standard gasoline vehicles, through VMT, by requiring all new residential units to install circuits and provide capacity for electric vehicle charging stations (AI 47, 53, 146)
- AQ 20.6 Reduce emissions from commercial vehicles, through VMT, by requiring all new commercial buildings, in excess of 162,000 square feet, to install circuits and provide capacity for electric vehicle charging stations.

2. Land Use-Related Objectives

Land use patterns play a significant role in affecting the number of VMT within a community. Thus, in addition to the transportation-related measures discussed above, it is important to encourage policies that promote efficient land use development. Since the efficient use of land can serve to reduce the amount of vehicle travel that results from commuting to jobs, shopping, entertainment and other destinations, reducing vehicle miles traveled through planning and more efficient land use can greatly contribute to reducing GHG emissions in Riverside County.

Reducing VMT through improved land use coordination and other planning efforts is the basis for the following policy objectives.

Policies:

- AQ 20.7 Reduce VMT through increased densities in urban centers and encouraging emphasis on mixed use to provide residential, commercial and employment opportunities in closer proximity to each other. Such measures will also support achieving the appropriate jobs-housing balance within the communities. (AI 47, 53, 117, 146)
- AQ 20.8 Reduce VMT by increasing options for non-vehicular access through urban design principles that promote higher residential densities with easily accessible parks and recreation opportunities nearby. (AI 115, 117, 146)



Also see the following County Ordinance associated with Land Use-related greenhouse gas reductions:

Ordinance No. 659
“Development Impact Fee (DIF) Program for Residential Development”

AQ 20.9 Reduce urban sprawl in order to minimize energy costs associated with infrastructure construction and transmission to distant locations, and to maximize protection of open space. (AI 26)



Also see the following policies associated with Land Use -related greenhouse gas reductions:

Air Quality Element: AQ 8.1-AQ 8.9

Circulation Element: C 12.6

Healthy Communities Element:

HC 2.2, HC 3.1, HC 4.2, HC 5.1- HC 5.3, HC 5.6, HC 9.1, HC 9.3, HC 9.4, HC 14.2

Land Use Element:

LU 2.1, LU 3.1, LU 3.4, LU 4.1, LU 8.1, 8.4, LU 8.8- LU 8.10, LU 8.12, LU 9.3, LU 11.1, LU 11.3, LU 13.1, LU 13.2, LU 20.2, LU 21.2, LU 21.4, LU 21.6, LU 21.7, LU 28.2, LU 32.1, LU 32.9

Multipurpose Open Space Element: OS 1.1

3. Energy Efficiency and Energy Conservation Objectives



Also see the following County Ordinance associated with Wind Energy Efficiency and Energy Conservation-related greenhouse gas reductions:

Ordinance No. 655
"Regulating Light Pollution"

Energy used in homes and business, such as for heating, cooling and lighting, is one of the largest sources of a community’s GHG emissions. Most of the GHG emissions from energy use come from the combustion of fossil fuels, such as coal, oil and natural gas, for electricity generation. Thus, increasing energy efficiency has potential to reduce GHG.

Reducing GHG emissions through improved energy efficiency and energy conservation is the basis for the following policy objectives.

Policies:

AQ 20.10 Reduce energy consumption of the new developments (residential, commercial and industrial) through efficient site design that takes into consideration solar orientation and shading, as well as passive solar design. (AI 147)

AQ 20.11 Increase energy efficiency of the new developments through efficient use of utilities (water, electricity, natural gas) and infrastructure design. Also, increase energy efficiency through use of energy efficient mechanical systems and equipment. (AI 147)

AQ 20.12 Support programs to assist in the energy-efficient retrofitting of older affordable housing units to improve their energy efficiency, particularly residential units built prior to 1978 when CCR Title 24 energy efficiency requirements went into effect. (AI 147)



Also see the following policies associated with Wind Energy Efficiency and Energy Conservation-related greenhouse gas reductions:

Air Quality Element Policies: AQ 4.2, AQ 5.3, AQ 5.4

Housing Element Policies: H 2.1, H 5.1

Multipurpose Open Space Element: OS 11.1, OS 16.1, OS 16.2, OS 16.5-OS 16.7

4. Water Conservation and Biota Conservation Objectives

Roughly 40% of a typical electric energy budget is used to transport (pump), treat and deliver potable water to serve communities. Substantial amounts of energy are also used for the treatment of wastewater, as well as for electricity generation itself. Thus, water conservation forms an essential element in both energy conservation and, ultimately, GHG emission reductions.

Conserving vegetative lands, particularly forest lands, facilitates biological carbon sequestration. When it comes to agricultural lands, their value in providing carbon sequestration must be weighed against the carbon releasing activities also associated with agricultural uses, such as livestock (which produce methane in their digestive systems), manure management (particularly for intensive uses like dairies), operation of agricultural equipment, fertilizer application and soil tillage (which release nitrous oxide), as well as emissions associated with the harvesting, processing and distribution of crops.

The need to reduce energy use through water conservation and the carbon sequestration benefits of biota preservation form the basis for the following policy objectives.

Policies:

- | | |
|----------|--|
| AQ 20.13 | Reduce water use and wastewater generation in both new and existing housing, commercial and industrial uses. Encourage increased efficiency of water use for agricultural activities. (AI 147) |
| AQ 20.14 | Reduce the amount of water used for landscaping irrigation through implementation of County Ordinance 859 and increase use of non-potable water. |
| AQ 20.15 | Decrease energy costs associated with treatment of urban runoff water through greater use of bioswales and other biological systems. |



Also see the following policies associated with greenhouse gas reductions from Water Conservation and Biota Conservation:

Air Quality Element:
AQ 2.4

Circulation Element:
C 5.2, C 20.1, C 20.10

Healthy Communities Element: HC 4.1

Land Use Element:
LU 9.1, LU 9.4, LU 18.1-18.6, LU 20.1, LU 20.4-LU 20.7, LU 20.9, LU 24.1

Multipurpose Open Space Element:

OS 1.4, OS 2.1-OS 2.5, OS 3.3, OS 3.3, OS 3.6, OS 3.7, OS 4.3, OS 4.5-OS 4.7, OS 4.9, OS 5.5, OS 5.6, OS 6.2, OS 7.3, OS 7.5, OS 8.1, OS 8.2, OS 9.3, OS 9.4, OS 18.1, OS 18.4, OS 20.1, OS 20.2

Safety Element: S 4.22

- AQ 20.16 Preserve and promote forest lands and other suitable natural and artificial vegetation areas to maintain and increase the carbon sequestration capacity of such areas within the County. Artificial vegetation could include urban forestry and reforestation, development of parks and recreation areas, and preserving unique farmlands that provide additional carbon sequestration potential.
- AQ 20.17 Protect vegetation from increased fire risks associated with drought conditions to ensure biological carbon remains sequestered in vegetation and not released to the atmosphere through wildfires.



Also see the following County Ordinances associated with greenhouse gas reductions from Water Conservation and Biota Conservation:

Ordinance No. 559 "Regulating the Removal of Trees"

Ordinance No. 625 "Agricultural Activities, Nuisance Defense ("Right to Farm Ordinance")"

Ordinance No. 663 "Riverside County Stephens' Kangaroo Rat Habitat Conservation Plan and Mitigation Fees"

Ordinance No. 695 "Requiring the Abatement of Hazardous Vegetation"

Ordinance No 754 "Stormwater/Urban Runoff Management and Discharge Control"

Ordinance No. 810 "Establishing an Interim Open Space Mitigation Fee"

Ordinance No. 859 "Establishing Water Efficient Landscaping Standards"

Ordinance No. 875 "Establishing Mitigation Fees for Coachella Valley Multi-Species Habitat Conservation Plan"



Also see the following policies associated with Alternative Energy Sources:

Land Use Element Policies:

LU 16.1

Multipurpose Open Space Element:

OS 11.1-OS 11.3, OS 12.1, OS 12.4, OS 13.1, OS 15.2, OS 16.9, OS 16.10



Also see the following policies and County Ordinances related to reducing greenhouse gas emissions through waste reduction:

Air Quality Element:

AQ 5.1

County Ordinances:

Ordinance No. 657
"Regulating Collection and Removal of Solid Waste"

Ordinance No. 718
"Medical Waste - Generation, Storage, Transportation"

Ordinance No. 745
"Comprehensive Collection and Disposal of Solid Waste"

5. Alternative Energy Objectives

Currently available sources of renewable energy amenable to development within Riverside County include solar, wind, water, biomass and geothermal. Renewable energy sources offer the potential for a clean, decentralized energy source that can significantly impact Riverside County's GHG emissions.

Increasing the use of alternative energy sources to reduce the amount of GHG is the basis for the following policy objectives.

Policies:

- AQ 20.18 Encourage the installation of solar panels and other energy-efficient improvements and facilitate residential and commercial renewable energy facilities (solar array installations, individual wind energy generators, etc.). (AI 147)
- AQ 20.19 Facilitate development and siting of renewable energy facilities and transmission lines in appropriate locations. (AI 147)

6. Waste Reduction Objectives

Although responsible for a relatively small portion of total community GHG emissions, solid waste management programs are important for GHG reduction. First, programs to increase the amount of solid waste that is "reduced, recycled or reused" decrease the number of truck trips necessary to dispose of such waste. Secondly, reducing the amount of solid waste entering a landfill expands the life of the facility. These result in less GHG emissions from the construction equipment used to build landfill sites. And, lastly, recycling and waste prevention programs make a significant contribution to reducing the energy and transportation needed to manufacture and ship virgin products and packaging.

Reducing the amount of waste generated, which indirectly reduces the over-consumption of a variety of natural resources, is the basis for the following policy objectives.

Policies:

- AQ 20.20 Reduce the amount of solid waste generation by increasing solid waste recycle, maximizing waste diversion, and composting for residential and commercial generators. Reduction in decomposable organic solid waste will reduce the methane emissions at County landfills. (AI 146)

7. Education, Coordination and Outreach Objectives

Although outside the realm of direct Riverside County control, existing uses, such as homes and businesses, represent a large area of ongoing GHG emissions. Unlike new discretionary permits and internal Riverside County operations, efforts to reduce emissions for these existing uses are mainly voluntary. Thus, education, community outreach and even incentive programs necessarily form an important element of the overall GHG reduction efforts of Riverside County.

The following policy objectives are based on efforts to indirectly reduce GHG emissions through voluntary efforts by the public and through programs developed in coordination with other agencies.

Policies:

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|----------|--|
| AQ 20.21 | Provide homeowner education programs on the various voluntary ways in which they may reduce their homes' GHG emissions, e.g., improving home insulation, adding solar energy capabilities, and providing information on energy saving landscaping techniques. (AI 147) |
| AQ 20.22 | Develop motorist education programs on reducing VMT, idling and vehicle maintenance, while increasing carpooling and public transit usage. (AI 147) |
| AQ 20.23 | Develop education programs about green purchasing and waste reduction measures, e.g., use of sustainable materials, recycling, and composting. (AI 147) |
| AQ 20.24 | Develop programs to improve job-housing balances, such as through small business development, for areas that are housing rich but jobs poor. (AI 146) |
| AQ 20.25 | Coordinate County GHG emissions reduction efforts with those of other regional agencies and plans, i.e., SCAG's Compass Blueprint, Regional Transportation Plan (RTP) and SCAQMD's Air Quality Management Plans. In addition, coordinate with cities and sub-regional planning agencies, particularly WRCOG and CVAG, on efforts that jointly affect the County and the cities. Also, coordinate with utility and service providers to develop programs to improve energy efficiency, water efficiency and delivery or structural improvements to reduce demand or better coordinate infrastructure development, as appropriate. (AI 111, 146) |
| AQ 20.26 | Voluntary GHG reduction objectives for the community sector shall be achieved through development and implementation of specific implementation measures, as determined appropriate and feasible by the County. (AI 147) |



Also see the following policies associated with greenhouse gas reductions through education, outreach and coordination:

Air Quality Element:

AQ 3.2, AQ 3.3, AQ 7.1-
AQ 7.5, AQ 17.6

Circulation Element:

C 11.4

Healthy Communities Element:

HC 1 4.3

Land Use Element:

LU 8.6, LU 20.11


Multipurpose Open Space Element:

OS 1.3, OS 2.4, OS1
6.11, OS 18.2

8. Municipal Operational Objectives

Built environment improvements include designing greater energy efficiency into new Riverside County buildings and retrofitting older facilities with upgrades to improve energy efficiency, such as additional insulation, low-emissive glass, cool roofs and programmable thermostats. Development of alternative energy sources powering Riverside County facilities can include solar collectors and, at Riverside County landfills, methane capture. Infrastructure improvements can include more efficient street and traffic signal lighting, use of low-emission surfacing materials and paints, and more energy efficient pumps and treatment plants. Water-efficient landscaping can be incorporated along roadways and Riverside County buildings, and urban runoff can be controlled through site design and the use of bioswales. And, in the transportation sector, the County of Riverside can directly reduce vehicle GHG emissions by transitioning its fleet to more fuel efficient vehicles, including the use of hybrid or other alternate fuels.

The various ways in which the County of Riverside can directly control the emission of GHG resulting from Riverside County operations form the basis for the following policy objectives.

 <p style="text-align: center;">Also see the following General Plan and County Board policies related to county operational greenhouse gas reductions:</p> <p style="text-align: center;">Multipurpose Open Space Element: OS 16.4, OS 16.12, OS 16.13</p> <p style="text-align: center;">Board of Supervisors-Board Policies: BOS A-64 “Environmental Purchasing” BOS H-4 “Energy Conservation” BOS H-25 “Water-Efficient Landscaping” BOS H-29 “Sustainable</p>	<p>Policies:</p> <p>AQ 20.27 Increase the average fuel efficiency of County-owned vehicles powered by gasoline and diesel through fleet transitioning programs. Also, reduce total vehicle miles traveled by County employees, both commuting to work sites and travel for the conduction of County activities. (AI 118, 146)</p> <p>AQ 20.28 Increase the energy efficiency of all existing and new County buildings and infrastructure operation (roads, water, waste disposal and treatment, buildings, etc.). Also, decrease energy use through incorporating renewable energy facilities (such as, solar array installations, individual wind energy generators, geo-thermal heat sources) on County facilities where feasible and appropriate. (AI 146)</p> <p>AQ 20.29 Establish purchasing and procurement policies that support the use of green products and services, minimize waste, and promote sustainability. (AI 146)</p> <p>AQ 20.30 Reduce potable water use, wastewater and solid waste generation, and urban runoff at both new and existing County facilities and operations. Also, increase the amount of materials recycled from County facilities. (AI146)</p> <p>AQ 21.1 The County shall require new development projects subject to County discretionary approval to incorporate measures to achieve 100 points through incorporation of the Implementation Measures (IMs) found in the Screening Tables within the Riverside County Climate Action Plan. One hundred points represent a project’s fare-share of reduction in operational emissions associated with the developed use needed to reduce emissions down to the CAP Reduction Target. (AI 147)</p>
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- a. For the purposes of this policy, the “operational life” of a new development shall be defined as a 30-year span with construction emissions amortized over the 30 years.
- b. For the purposes of this policy, “new development” refers to private development occurring pursuant to a discretionary land use approval issued by the County of Riverside and subject to binding Conditions of Approval. This definition generally corresponds to projects found non-exempt pursuant to the California Environmental Quality Act (CEQA), but is nevertheless subject to the sole discretion of the County of Riverside as lead agency.
- c. Other methods for showing GHG emissions reductions may be used provided such methods are both scientifically defensible and show actual emission reduction measures incorporated into project design, mitigation or alternative selection. That is, reductions must not be illusory “paper” reductions achieved merely through baseline manipulation.
- d. Nothing in this policy shall be construed as accepting any proposed discretionary project from any legally applicable CEQA requirements or explicitly limiting the scope any analyses required to show CEQA compliance.

AQ 21.2 Implementation Measures found necessary for a given project pursuant to the CAP Screening Tables shall be incorporated into a project’s Mitigation and Monitoring Programs as required mitigation measures under CEQA to ensure the measures are implemented appropriately. Such Implementation Measures may also be separately incorporated into the Conditions of Approval issued by the County. In the event no Mitigation and Monitoring Program is required for a project, the Implementation Measures shall be incorporated into a project’s Conditions of Approval issued by the County. (AI 147)

AQ 21.3 Discretionary Measures - Because of the varied nature of the private development proposals reviewed by the County, in some cases, the Implementing Measures in the CAP may not provide the most appropriate means for achieving the required Interim GHG reductions. In such cases, the following alternate measures may be utilized, at the County’s discretion:

- a. For large-scale developments, such as specific plans, business parks, industrial centers, and those triggering a full Environmental Impact Report, a custom GHG analyses may be warranted to both assure compliance with the applicable targets herein and to provide a customized array of appropriate reduction measures.
- b. In such cases, the resultant GHG analysis may be used to develop customized GHG reduction measures in place of the CAP’s Implementing Measures, provided they achieve the stated targets or implement all feasible mitigation short of achieving the applicable targets.
- c. Project-specific analysis may be particularly valuable when assessing large-scale mixed use developments. In such developments, significant energy efficiencies and VMT reductions can result from smart growth design features, such as provision of housing, jobs, services and recreation within a 5- to 10-minute walking radius. Project-specific analysis in these cases may result in the need for fewer add-on Implementing Measures and potentially yield substantial savings on construction costs.

AQ 21.4 Implementation of the Climate Action Plan (CAP) and monitoring progress toward the CAP reduction targets shall include the ability to expand upon or, where appropriate, update or

replace the Implementation Measures established herein such that the implementation of the CAP accomplishes the County's GHG reduction targets. (AI 146)

AQ 22.1

The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions associated with transportation (AI 110, 111, 120, 146, 147):

- a. Reduce vehicle miles traveled by providing or requiring expanded multi-modal facilities and services that provide transportation alternatives, such as transit, bicycle and pedestrian modes.
- b. Reduce vehicle miles traveled by facilitating an increase in transit options. In particular, coordinate with adjacent municipalities, transit providers and regional transportation planning agencies to develop mutual policies and funding mechanisms to increase the use of alternative transportation.
- c. Improve connectivity by requiring pedestrian linkages between developments and transportation facilities, as well as between residential and commercial, recreational and other adjacent land uses.
- d. Reduce air pollution and greenhouse gas emissions by improving circulation network efficiency.
- e. Reduce traffic through programs that increase carpooling and public transit use, decrease trips and commute times and increase use of alternative-fuel vehicles.
- f. Preserve transportation corridors for renewable energy transmission lines and for new transit lines, where appropriate.

AQ 23.1

The County shall implement programs and requirements to achieve the following objective related to reducing greenhouse gas emissions associated with land use patterns (AI 147):

- a. Reduce vehicle miles travelled (VMT) through increased densities in urban centers and emphasis on mixed use to provide localized residential, commercial and employment opportunities in closer proximity to each other.
- b. Prevent urban sprawl in order to minimize energy costs associated with infrastructure construction and transmission to distant locations and to maximize protection of open space, particularly forests, which provide carbon sequestration potential.
- c. Conserve energy by increasing the efficiency of delivery of services through the adoption and implementation of smart growth principles and policies.
- d. Reduce vehicle miles travelled by commuters through implementation of planning measures that provide appropriate jobs-housing balances within communities.
- e. Reduce vehicle miles travelled by increasing options for nonvehicular access through urban design principles that promote higher residential densities in attractive forms with easily accessible parks and recreation opportunities nearby.

- f. Improve energy efficiency through implementation of standards for new residential and commercial buildings that achieve energy efficiencies beyond that required under Title 24 of the California Code of Regulations.
- g. Reduce vehicle miles travelled by identifying sites for affordable housing for workers close to employment centers and encouraging development of such sites.

AQ 23.2 For discretionary actions, land use-related greenhouse gas reduction objectives shall be achieved through development and implementation of the appropriate Implementation Measures of the Climate Action Plan for individual future projects. County programs shall also be developed and implemented to address land use-related reductions for County operations and voluntary community efforts. (AI 147)

AQ 24.1 The County shall implement programs and requirements to achieve the following Objectives related to reducing greenhouse gas emissions achieved through improving energy efficiency and increasing energy conservation (AI 146):

- a. Require new development (residential, commercial and industrial) to reduce energy consumption through efficient site design that takes into consideration solar orientation and shading, as well as passive solar design. Passive solar design addressed the innate heating and cooling effects achieved through building design, such as selective use of deep eaves for shading, operable windows for cross-ventilation, reflective surfaces for heat reduction and expanses of brick for thermal mass (passive radiant heating).
- b. Require new development (residential, commercial and industrial) to design energy efficiency into the project through efficient use of utilities (water, electricity, natural gas) and infrastructure design.
- c. Require new development (residential, commercial and industrial) to reduce energy consumption through use of energy efficient mechanical systems and equipment.
- d. Establish or support programs to assist in the energy-efficient retrofitting of older affordable housing units.
- e. Actively seek out existing or develop new programs to achieve energy efficiency for existing structures, particularly residential units built prior to 1978 when Title 24 energy efficiency requirements went into effect.
- f. Balance additional upfront costs for energy efficiency and affordable housing economic considerations by providing or supporting programs to finance energy-efficient housing.

AQ 24.2 For discretionary actions, energy efficiency and conservation objectives shall be achieved through development and implementation of the appropriate Implementation Measures of the Climate Action Plan for all new development approvals. County programs shall also be developed and implemented to address energy efficiency and conservation efforts for County operations and the community.

AQ 25.1 The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions through water conservation (AI 146):

- a. Reduce water use in both new and existing housing, commercial and industrial uses.
- b. Reduce wastewater generation in both new and existing housing, commercial and industrial uses.
- c. Reduce the amount of water used for landscaping irrigation through implementation of County Ordinance No. 859.
- d. Increase use of non-potable water where appropriate, such as for landscaping and agricultural uses.
- e. Encourage increased efficiency of water use for agricultural activities.
- f. Decrease energy costs associated with treatment of urban runoff water through greater use of bioswales and other biological systems.

AQ 25.2

The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions through biota conservation:

- a. Conserve biota that provides carbon sequestration through implementation of the Multiple Species Habitat Conservation Plans for western and eastern Riverside County.
- b. Preserve forest lands and other suitable natural vegetation areas to maintain the carbon sequestration capacity of such areas within the County.
- c. Promote establishment of vegetated recreational uses, such as local and regional parks, that provide carbon sequestration potential in addition to opportunities for healthy recreation.
- d. Promote urban forestry and reforestation, as feasible, to provide additional carbon sequestration potential.
- e. Promote the voluntary preservation of farmlands for carbon sequestration purposes. In particular, protect important farmlands and open space from conversion and encroachment by urban uses. Also, seek to retain large parcels of agricultural lands to enhance the viability of local agriculture and prevent the encroachment of sprawl into rural areas.
- f. Promote the voluntary preservation of areas of native vegetation that may contribute to biological carbon sequestration functions.
- g. Protect vegetation from increased fire risks associated with drought conditions to ensure biological carbon remains sequestered in vegetation and not released to the atmosphere through wildfires. In particular, prevent unnecessary intrusion of people, vehicles and development into natural open space areas to lessen risk of wildfire from human activities.

AQ 25.3

For discretionary actions, greenhouse gas reduction objectives related to water and biota conservation shall be achieved through development and implementation of the applicable Implementation Measures of the Climate Action Plan. County programs shall also be developed and implemented to address conservation issues related to County operations and voluntary community efforts. (AI146)

- AQ 26.1 The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions derived from energy generation (AI 146, 147):
- a. Encourage the installation of solar panels and other energy-efficient improvements.
 - b. Facilitate residential and commercial renewable energy facilities (solar array installations, individual wind energy generators, etc.).
 - c. Facilitate development of renewable energy facilities and transmission lines in appropriate locations.
 - d. Facilitate renewable energy facilities and transmission line siting.
 - e. Provide incentives for development of local green technology businesses and locally-produced green products.
 - f. Provide incentives for investment in residential and commercial energy efficiency improvements.
 - g. Identify lands suitable for wind power generation or geothermal production and encourage development of these alternative energy sources.
- AQ 26.2 For discretionary actions, the objectives for greenhouse gas reduction through increased use of alternative energy sources shall be achieved through development and implementation of the applicable Implementation Measures of the Climate Action Plan. County programs shall also be developed and implemented to address use of alternative energy for County operations and within the community. (AI 147)
- AQ 27.1 The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions associated with wastes (AI 146, 147):
- a. Reduce the amount of solid waste generated.
 - b. Increase the amount of solid waste recycled by maximizing waste diversion, composting and recycling for residential and commercial generators.
 - c. Promote reductions in material consumption.
 - d. Decrease wastewater generation.
 - e. Reduce fugitive methane emissions and increase methane conversion to alternative energies at County landfills.
- AQ 27.2 Greenhouse gas reduction through the above waste reduction Objectives shall be achieved through development and implementation of the applicable Implementation Measures of the Climate Action Plan for new development. County programs shall also be developed and implemented to address waste reductions for County operations and voluntary community efforts. (AI 146)

- AQ 28.1 The County shall implement programs and requirements to achieve voluntary greenhouse gas emissions reductions through the following public education and outreach objectives (AI 147):
- a. Provide homeowner education programs on the various voluntary ways in which they may reduce their homes' GHG emissions.
 - b. Develop and implement motorist education programs on reducing vehicle miles travelled (VMT), idling, vehicle maintenance, etc.
 - c. Develop and implement incentive programs for increasing carpooling, public transit use and other similar means.
 - d. Develop and implement incentive programs for residential energy conservation, such as through retrofitting to improve insulation values, adding solar energy capabilities, planting deciduous trees to provide summer shade, etc.
 - e. Develop and implement programs designed to decrease transportation emissions, such as hybrid vehicle rebates, alternate fuel discounts, carpooling incentives, van pools, etc.
 - f. Develop and implement education programs about green purchasing and waste reduction measures, e.g., use of sustainable materials, composting and such.
 - g. Develop and implement programs to improve job-housing balances, such as through small business development, for areas that are housing rich but jobs poor.
 - h. Develop and implement programs to incentive recycling and other waste reduction programs.
- AQ 28.2 The County shall implement programs and requirements to achieve greenhouse gas emissions reductions through the following interagency coordination objectives (AI 146):
- a. Coordinate County regional GHG reduction efforts with those of other regional agencies and plans, i.e.:
 - SCAG Regional Blueprint Plan
 - SCAG Regional Transportation Plan (which will address SB375)
 - SCAQMD Air Quality Management Plans
 - SB 375 Coordination and "Sustainable Communities Strategies"
 - b. Coordinate with constituent cities and sub-regional planning agencies, particularly WRCOG and CVAG, on GHG reduction efforts that jointly affect the County and these cities.
 - c. Coordinate with utility and service providers serving the County to develop programs to improve energy efficiency, water efficiency and delivery or structural improvements to reduce demand or better coordinate infrastructure development, as appropriate.

- d. Coordinate with regional agencies responsible for developing utility corridors, particularly for electricity transmission, to ensure alternate energy sources available to Riverside County are used to their fullest extent.

AQ 28.3 Voluntary greenhouse gas reduction objectives for the community sector shall be achieved through development and implementation of specific implementation measures, as determined appropriate and feasible by the County.

AQ 29.1 The County shall implement programs and requirements to achieve the following Objectives related to reducing greenhouse gas emissions from County transportation, such as fleet composition, construction equipment, employee commuting and travel on County business (AI 146):

- a. Increase the average fuel efficiency of County-owned vehicles powered by gasoline and diesel.
- b. Increase use of alternative and lower carbon fuels in the County vehicle fleet.
- c. Reduce total vehicle miles traveled by County employees, both commuting to work sites and travel for the conduction of County activities.

AQ 29.2 The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions through improving energy efficiency for County facilities and operations (AI 146)

- a. Improve the energy efficiency of all existing and new County buildings.
- b. Improve the energy efficiency of County infrastructure operation (roads, water, waste disposal and treatment, buildings, etc.)
- c. Decrease energy use through incorporating renewable energy facilities (such as, solar array installations, individual wind energy generators, geothermal heat sources) on County facilities where feasible and appropriate.

AQ 29.3 The County shall implement programs and requirements to achieve the following objectives related to reducing greenhouse gas emissions through achieving waste reduction and resource efficiency for County facilities and operations (AI 146):

- a. Establish purchasing and procurement policies that support the use of green products and services, minimize waste and promote sustainability.
- b. Reduce potable water use at both new and existing County facilities and operations.
- c. Reduce wastewater generation and urban runoff in both new and existing County facilities and operations.
- d. Increase the amount of materials recycled from County facilities while decreasing the amount of solid waste generated by County facilities that requires landfill disposal.

- AQ 29.4 Greenhouse gas emissions reduction objectives for County operations and facilities shall be achieved through development and implementation of enforceable and binding internal County policies, programs or similar means.

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