

## Chapter 8: Air Quality Element

### I. Introduction

The South Coast Air Basin, which includes the majority of Los Angeles County, continues to have among the worst air quality ratings in the country. Additionally, climate change, which is primarily caused by an increase in greenhouse gas (GHG) emissions, is one of the most pressing environmental issues faced by all levels of government. Air pollution and climate change pose serious threats to the environment, economy, and public health.

The Air Quality Element summarizes air quality issues and outlines the goals and policies in the General Plan that will improve air quality and reduce greenhouse gas emissions. One sub element—the Community Climate Action Plan—supplements the Air Quality Element. This plan establishes actions for reaching the County's goals to reduce greenhouse gas emissions in the unincorporated areas.

### II. Background

#### Air Pollutants

The air quality in Southern California does not meet state and federal standards. The American Lung Association consistently gives Los Angeles County failing grades in the amount of ozone and particulate pollution in the air. Although smog levels are impacted by seasons and weather patterns, smog is visible in the air on most days.

Los Angeles County is a large basin with the Pacific Ocean to the west, and several mountain ranges with 11,000 foot peaks to the east and south. Frequent sunny days and low rainfall contribute to ozone formation, as well as high levels of fine particles and dust. In addition, Los Angeles County is home to many diverse industries and the largest goods movement hub on the West Coast. In spite of emission controls that are among the most stringent in the country, power generation and petroleum refining continue to be among the largest stationary sources of air pollution in Los Angeles County.

Poor air quality is a measurable environmental hazard that impacts public health, welfare and the economy. The California Air Resources Board (CARB) has identified diesel particulate matter (PM) as representing 70 percent of the known cancer risk from air toxics in California. Diesel PM is primarily emitted from trucks, trains and ships, which puts those who live near ports and distribution centers at greater risk. A 2008 report by the Institute of Economic and Environmental Studies at California State University Fullerton found that California loses about \$28 billion annually due to premature deaths and illnesses linked to ozone and particulates from sources in the South Coast and San Joaquin air basins. Most of those costs, about \$25 billion, are connected to roughly 3,000 smog-related deaths in the State each year. Additional impacts include work and school absences, emergency room visits, asthma attacks and other respiratory illnesses.

Poor air quality in the region is attributed to emissions from human activities and natural sources, as well as geography, local weather and climate. Specific contributors to poor air quality include: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g., changes in ocean circulation); human activities that change the atmosphere's composition (e.g., through the burning of fossil fuels); and human

activities that change the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Federal, state and regional agencies regulate air pollutants and contaminants that harm human health. Regulations can include standard-setting, ambient monitoring, developing permitting programs, enforcement activities, and establishing economic incentives to reduce air pollution. As shown in Figure 8.1, Los Angeles County is divided into air basins, which are areas with similar meteorological and geographic conditions. The majority of Los Angeles County is in the South Coast Air Basin, with the area north of the San Gabriel Mountains located in the Mojave Desert Air Basin.

**Figure 8.1: Air Basins Map**

**Criteria Air Pollutants**

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set national ambient air quality standards for six common air pollutants. These pollutants are called criteria air pollutants because the U.S. EPA has developed human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels:

- Ozone (O<sub>3</sub>)
- Particulate matter (PM)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO<sub>2</sub>)
- Sulfur dioxide (SO<sub>2</sub>)
- Lead (Pb)

Of the six identified criteria air pollutants, particle pollution and ground-level ozone have the most widespread health impacts. The levels of ozone, particulate matter, and carbon monoxide in Los Angeles County continually exceed federal and state ambient air quality standards. Table 8.1 is a summary of the primary sources and effects of the federally-identified criteria air pollutants.

**Table 8.1: Primary Sources and Effects of Criteria Pollutants**

Pollutants	Source	Los Angeles County Classification	Primary Health Effects
Ozone (O <sub>3</sub> )	Atmospheric reaction of organic gases with nitrogen oxides in sunlight (“smog”)	Extreme Non-Attainment Area	Aggravation of respiratory and cardiovascular diseases; reduced lung function; increased cough and chest discomfort
Fine Particulate Matter (PM <sub>10</sub> and PM <sub>2.5</sub> )	Stationary combustion of fuels; construction activities; industrial processes; atmospheric chemical reactions	Serious Non-Attainment Area	Reduced lung function; aggravation of respiratory and cardio-respiratory diseases; increased mortality rate; reduced lung function growth in children.

Carbon Monoxide (CO)	Incomplete combustion of fuels, such as motor vehicle exhaust	Serious Non-Attainment Area	Aggravation of some heart diseases.
Nitrogen Dioxide (NO <sub>2</sub> )	Motor vehicle exhaust; high temperature stationary combustion; atmospheric reactions	*Concentrations have not exceeded federal standards since 1991, but emissions remain a concern because of their contribution to O <sub>3</sub> and PM	Aggravation of respiratory diseases.
Sulfur Dioxide (SO <sub>2</sub> )	Combustion of sulfur containing fossil fuels; smelting of sulfur bearing metal ores; industrial processes	Attainment Area	Aggravation of respiratory diseases (eg., asthma, emphysema); reduced lung function.
Lead (Pb)	Contaminated soil	Attainment Area	Behavioral and hearing disabilities in children; nervous system impairment.

Source: South Coast Air Quality Management District, 2005.

## Air Quality Management Plans

The long-term trend of air quality in Southern California shows continuous improvement since the 1970s, as a direct result of a comprehensive, multi-year strategy of reducing air pollution from all sources as outlined in air quality management plans (AQMPs). To ensure continued progress toward clean air, the SCAQMD in conjunction with the CARB, SCAG, and the U.S. EPA, prepared the 2012 AQMP that employs the latest science and analytical tools, and incorporates a comprehensive strategy to meet all federal criteria pollutant standards within the timeframes allowed under the federal Clean Air Act. The AQMP is updated every three years. For more information, please visit <http://aqmd.gov/aqmp>.

## Toxic Air Contaminants

Many toxic air contaminants (TACs), such as formaldehyde and methanol, do not have federal or state ambient air quality standards. However, exposure to TACs is associated with elevated risk of cancer, birth defects, genetic damage, and other adverse health effects.

TACs are regulated by technology-based requirements that are enforced at the state and local level. In California, the Air Toxics Program and the Air Toxics “Hot Spots” Information and Assessment Act regulate TACs. In Los Angeles County, operators of certain types of facilities must submit emissions inventories. The Air Toxics Program categorizes each facility as being high, intermediate, and low-priority based on the potency, toxicity, quantity, and volume of its emissions. If the risks are above established levels, facilities are required to notify surrounding populations and to develop and implement a risk reduction plan.

## Greenhouse Gases

GHGs in the atmosphere affect the Earth’s heat balance by absorbing infrared radiation. This layer of gases prevents the escape of heat, similar to the function of a greenhouse. According to the U.S. EPA, the principal GHGs that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

GHGs contribute to the destruction of the Earth's naturally-occurring ozone, which provides protection from the damaging effects of solar ultraviolet radiation. The biggest contributors to ozone depletion are chlorofluorocarbons (CFCs), halons, carbon tetrachloride, methyl chloroform, and other halogenated compounds.

## **Climate Change**

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). While climate change is not solely the result of poor air quality, the two have many common causes and effects.

Scientists believe that the Earth is warming faster than at any time in the previous 1,000 years. According to the California Energy Commission, the average global surface temperature has increased by 1.1 degrees Fahrenheit since the 19th century, and the 10 warmest years of the last century have occurred within the last 15 years.

A large GHG contributor is carbon dioxide, and in California, more than 35 percent of the fossil fuel emissions of carbon dioxide are related to transportation uses. As Los Angeles County has some of the highest rates of single occupant vehicle use, traffic congestion, and VMTs in the country, it is a significant contributor to climate change in the region.

The impacts of climate change are exacerbated by increased emissions during warm weather. Warmer temperatures cause increased energy consumption through the use of air conditioners, which increases emissions from power plants and vehicles. Climate change causes warming, drying, and increased winds that result in hotter wildfires that are harder to control. These wildfires result in increased levels of fine particulate matter that could also exceed state and federal standards and harm the public.

## **Legislation**

The Global Warming Solutions Act of 2006 (AB 32) manages and reduces GHG emissions in California. AB 32 requires that CARB establish a comprehensive program of regulatory and market mechanisms to reduce GHG emissions to 1990 levels by the year 2020.

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), is one of many bills that implement AB 32, and requires CARB to develop regional GHG emission reduction targets for automobile and light trucks. It requires the 18 metropolitan planning organizations in California, such as the Southern California Association of Governments (SCAG), to coordinate land use, transportation and housing strategies, and prepare a Sustainable Communities Strategy (SCS) to reduce the amount of VMTs in their respective regions and demonstrate their ability to meet CARB's targets. SCAG adopted its SCS as part of its 2012 RTP. For more information on the 2012 RTP/SCS, please visit SCAG's web site at <http://www.scag.ca.gov>.

## **Los Angeles County Energy and Environmental Program**

In 2006, the Board of Supervisors adopted an Energy and Environmental Program (EEP) for the development and enhancement of energy conservation and environmental programs for County departments. These programs contribute to the County's efforts to reduce communitywide GHGs and GHGs from County operations. The EEP consists of the following programs:

### ***Energy and Water Efficiency***

The EEP establishes a reduction target of 20 percent by 2015, and implements conservation monitoring practices and water and energy shortage awareness programs for County buildings and departments.

### ***Green Building Construction and Operations***

The County's Green Building Program consists of the Green Building, Low-Impact Development, and Drought Tolerant Ordinances. For more information on the County's environmental and sustainability programs, please visit <http://green.lacounty.gov>.

### ***Environmental Stewardship***

The Environmental Stewardship Program measures and reduces the County's environmental footprint, including the amount of greenhouse gases produced through direct and indirect County operations, and develops climate change-related policies.

### ***Public Outreach and Education***

The Public Outreach and Education Program utilizes the County's communication and outreach channels to share utility industry information, facilitate implementation of subsidy and assistance programs, and spread energy conservation practices throughout the region.

### **Los Angeles County Community Climate Action Plan**

The Los Angeles County Community Climate Action Plan (CCAP) provides policy guidance for reducing GHG emissions generated within the unincorporated areas. The CCAP ensures that the County will be able to reduce its emissions to 1990 levels by 2020. The CCAP includes an emissions inventory for the unincorporated areas and an analysis of the reduction needed to achieve County goals. It analyzes specific actions that result in reduced emissions and lays out a plan for their use and implementation. It also provides a mechanism for tracking and evaluating the County's progress in achieving its climate change goals. The CCAP supports sustainable design and energy efficiency, as well as active and multi-modal transportation strategies to reduce VMT.

The purpose of the CCAP is to: 1) establish a baseline emissions inventory and reduction needed to meet County goals; 2) identify specific actions that will measurably reduce GHG emissions; 3) implement state and local level measures; and 4) provide a mechanism for ongoing tracking and updates to the CCAP. For more information, please visit <http://planning.lacounty.gov/ccap>.

## **III. Issues**

### **1. Coordinating Land Use, Transportation and Air Quality Planning**

Where and how land is developed can impact air quality, which impacts public health. People who live near major sources of air pollution are at a greater health risk. Sensitive receptors, or users of residences, schools, daycare centers, parks and playgrounds, or medical facilities, are particularly susceptible to the impacts of air pollution. Furthermore, CARB advises distancing requirements for sources of air pollution, including freeways, distribution centers, ports, rail yards, refineries, chrome platers, dry cleaners that use perchloroethylene, and gasoline dispensing facilities.

Studies indicate that residing near sources of traffic pollution is associated with adverse health effects, such as the exacerbation of asthma, onset of childhood asthma, non-asthma respiratory symptoms, impaired lung function, reduced lung development during childhood, and cardiovascular morbidity and mortality. These associations are diminished with distance from the pollution source. Given the association between traffic pollution and health, many recommend that residences, schools and other sensitive uses be sited at least 500 feet from freeways, in particular. The Health Effects Institute (HEI) indicates that exposure to traffic pollution may occur up to 300 to 500 meters (approximately 984 to 1640 feet). The range reported by HEI reflects the variable influence of background pollution concentrations, meteorological conditions, and seasons. In addition, siting parks and active recreational facilities near freeways may increase public exposure to harmful pollutants, particularly while exercising. Studies show that heavy exercise near sources of traffic pollution may have adverse health effects.

In addition, there is a direct link between transportation activities and air pollution. According to the SCAQMD, mobile sources of pollution, such as cars, trucks, buses, construction equipment, trains, ships and airplanes, account for 60 percent of all smog producing emissions in the region. Additionally, highly congested freeways and highways further contribute to the conditions that produce air pollution. The continued population growth that is projected for Los Angeles County could overwhelm these air quality gains unless careful attention is paid to voluntary and regulatory measures that reduce transportation-related emissions.

Developing land and transportation systems to reduce the need for vehicle trips and provide alternative modes of transportation can improve air quality. In addition, integrating land use plans, transportation plans, and air quality management plans can help minimize exposure to toxic air pollutant emissions from industrial and other stationary sources. The Mobility Element and Land Use Element provide transportation-based policies to reduce VMTs, such as improving the efficiency of the County roadway network; mobility management, such as increased ridesharing and vanpools; and improving the jobs-housing balance. In addition, the preservation of existing natural habitats and vegetation, as discussed in the Conservation and Natural Resources Element, can also reduce and mitigate air pollution impacts. Natural plant communities, especially woodlands and forests, contribute significant ecosystem service benefits that are extremely costly to replicate once they are gone.

## **2. Responding to Climate Change**

Climate change will have a number of adverse impacts on ecosystems and the economy. Various scenarios predict intense flooding or prolonged droughts, higher temperatures that can lead to frequent wildfires, and rising sea levels that will affect low-lying coastal areas. Therefore, it is critical to develop strategies to reduce greenhouse gas emissions, and also to address the impacts related to agriculture, public health, ecosystems and natural resources, energy, infrastructure, and emergency management. Development of climate change adaptation strategies in particular may be conducted sequentially, starting with the evaluation of threats, vulnerability and risk assessments, identification of mitigation actions, and implementation. The strategies may also investigate short and long-term funding mechanisms.

## IV. Goals and Policies

<b>Goal AQ 1: Protection from exposure to harmful air pollutants.</b>	
<b>Topic</b>	<b>Policy</b>
Air Pollutants	Policy AQ 1.1: Minimize health risks to people from industrial toxic or hazardous air pollutant emissions, with an emphasis on local hot spots, such as existing point sources affecting immediate sensitive receptors.
	Policy AQ 1.2: Encourage the use of low or no volatile organic compound (VOC) emitting materials.
	Policy AQ 1.3: Reduce particulate inorganic and biological emissions from construction, grading, excavation, and demolition to the maximum extent feasible.
	Policy AQ 1.4: Work with local air quality management districts to publicize air quality warnings, and to track potential sources of airborne toxics from identified mobile and stationary sources.
<b>Goal AQ 2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation and air quality planning.</b>	
<b>Topics</b>	<b>Policy</b>
Air Quality, Land Use, and Transportation	Policy AQ 2.1: Encourage the application of design and other appropriate measures when siting sensitive uses, such as residences, schools, senior centers, daycare centers, medical facilities, or parks with active recreational facilities within proximity to major sources of air pollution, such as freeways.
	Policy AQ 2.2: Participate in, and effectively coordinate the development and implementation of community and regional air quality programs.
	Policy AQ 2.3: Support the conservation of natural resources and vegetation to reduce and mitigate air pollution impacts.
	Policy AQ 2.4: Coordinate with different agencies to minimize fugitive dust from different sources, activities, and uses.
<b>Goal AQ 3: Implementation of plans and programs to address the impacts of climate change.</b>	
<b>Topic</b>	<b>Policy</b>
Climate Change	Policy AQ 3.1: Facilitate the implementation and maintenance of the Community Climate Action Plan to ensure that the County reaches its climate change and greenhouse gas emission reduction goals.
	Policy AQ 3.2: Reduce energy consumption in County operations by 20 percent by 2015.
	Policy AQ 3.3: Reduce water consumption in County operations.

	Policy AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions.
	Policy AQ 3.5: Encourage energy conservation in new development and municipal operations.
	Policy AQ 3.6: Support rooftop solar facilities on new and existing buildings.
	Policy AQ 3.7: Support and expand urban forest programs within the unincorporated areas.
	Policy AQ 3.8: Develop, implement, and maintain countywide climate change adaptation strategies to ensure that the community and public services are resilient to climate change impacts.

## V. Air Quality Element Implementation Program

- PACE Financing Program
- Climate Change Adaptation Program

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

### Air Quality Regulating Agencies

The following are federal, state and local agencies that regulate air quality in Los Angeles County:

#### U.S. Environmental Protection Agency

The U.S. EPA enforces the Clean Air Act through multiple programs, policies and regulations. The U.S. EPA focuses on pollution prevention and energy efficiency, indoor and outdoor air quality, industrial air pollution, pollution from vehicles and engines, radon, acid rain, stratospheric ozone depletion, climate change, and radiation protection. The U.S. EPA sets emissions standards for mobile sources, such as automobiles, aircraft, certain ships, and locomotives. Information on the programs and activities in U.S. EPA Region IX, which includes California, can be found on the U.S. EPA web site at <http://www.epa.gov/region9>.

#### California Air Resources Board

The California Air Resources Board is responsible for the implementation of the Clean Air Act, which establishes state ambient air quality standards, and several programs related to emission reduction activities. Per AB 32, CARB is also responsible for establishing a program to track and report GHG emissions, and to regulate, measure, and enforce the required GHG emission reductions. Information on CARB's programs and activities can be found on their web site at <http://www.arb.ca.gov>.

#### South Coast Air Quality Management District and the Antelope Valley Air Quality Management District

The SCAQMD and AVAQMD are responsible for monitoring air quality as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in Los Angeles County. The SCAQMD jurisdiction is approximately 10,743 square miles and includes Los Angeles County except for the Antelope Valley, which is covered by the AVAQMD. Information on air quality management districts can be found on the AQMD web site, located at <http://www.aqmd.gov>.



## **Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC)**

LARC is a network of leaders from government, the business community, academia, labor, and environmental and community groups dedicated to encouraging greater coordination and cooperation in addressing climate change at the local and regional levels. The purpose of this collaboration is to share information, foster partnerships, and develop systemwide strategies to address climate change and promote a green economy through sustainable communities.