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 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_3)
- Particulate matter (PM)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Sulfur dioxide (SO_2)
- 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_3)	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 (PM10 and PM 2.5)	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_2)	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_3 and PM	Aggravation of respiratory diseases.
Sulfur Dioxide (SO_2)	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 2022 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://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan.

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 Los Angeles County, more than 52 percent of the fossil fuel emissions of carbon dioxide equivalent gases 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 the Connect SoCal (2020-2045 RTP/SCS). For more information on the Connect SoCal, please visit SCAG's web site at http://www.scag.ca.gov.

In 2016, global leaders signed the Paris Agreement, a plan to limit the global average temperature increase to 1.5 degrees Celsius above pre-industrial levels. In 2016, then–California Governor Jerry Brown signed Senate Bill 32, which established a 2030 target to reduce GHG emissions by 40 percent below 1990 levels. In 2018, Governor Brown issued Executive Order B-55-18, which established a new statewide goal to reach carbon neutrality by 2045 and achieve and maintain net negative emissions thereafter.

In September 2022, Governor Newsom signed AB 1279, which codified Executive Order B-55-18 by requiring that the state achieve net zero GHG emissions no later than 2045 and reduce direct anthropogenic GHG emissions 85 percent below 1990 levels by 2045. In December 2022, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality, which lays out a path to achieve the statewide goals codified in AB 1279.

Los Angeles County Climate Action Plan

The Los Angeles County Climate Action Plan (CAP) provides policy guidance for reducing GHG emissions generated within the unincorporated areas. The CAP is a roadmap for the County to reduce its emissions for the 2030, 2035, and 2045 targets and strive for a long-term aspirational goal for carbon neutrality by 2045. The CAP 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 implementation. It also provides a mechanism for tracking and evaluating the County's progress in achieving its climate change goals.

The objective of the CAP is to: 1) identify detailed programs, actions, and performance goals to achieve the climate action policies of the General Plan; 2) identify GHG emissions reduction targets tailored to the unincorporated County that closely align with state and County climate goals; 3) provide a road map for reducing GHG emissions to achieve the County's GHG emissions reduction targets; 4) encourage sustainable housing production at all levels of affordability, including increasing housing densities near transit to the extent allowed in the General Plan; and 5) demonstrate a level of GHG emissions below which the County would have less than cumulatively considerable GHG impacts for future environmental review projects and provide California Environmental Quality Act (CEQA) streamlining for development projects (serve as a "qualified CAP") via the 2045 Climate Action Plan CEQA Streamlining Checklist (2045 CAP Checklist). For more information, please visit https://planning.lacounty.gov/long-range-planning/climate-action-plan/.

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

Goal AQ 1: Protection from exposure to harmful air pollutants.	
Topic	**Policy**
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.
Goal AQ 2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation and air quality planning.	
Topics	**Policy**
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: Coordinate with local, regional, state, and federal agencies to develop and implement community and regional air quality plans and 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.
	Policy AQ 2.5: Encourage land use development and design that integrates GHG emission reduction strategies through increasing residential density and infill development, especially affordable housing and diversity of destinations near High-Quality Transit Areas.
	Policy AQ 2.6: Expand infrastructure to accommodate transit and alternative modes of transportation to serve residential, employment, and recreational trips.
	Policy AQ 2.7: Explore the feasibility of parking strategies that limit or remove parking minimums to reduce vehicular trips.
	Policy AQ 2.8: Encourage and support the development and implementation of Zero-Emission technology and infrastructure in an equitable manner to ensure access to all County residents.
	Policy AQ 2.9: Electrify entire County light-duty and bus and shuttle fleet vehicles.
	Policy AQ 2.10: Encourage the use of zero-emission and near-zero-emission construction, agriculture, and manufacturing equipment and freight decarbonization technologies, such as charging infrastructure for freight vehicles.
Goal AQ 3: Address the impacts of climate change and reduce greenhouse gas emissions through climate action and mitigation.	
Topic	**Policy**

Climate Action and Mitigation	Policy AQ 3.1: Facilitate the implementation and maintenance of the Climate Action Plan to ensure that the County reaches its climate action and greenhouse gas emission reduction goals.
	Policy AQ 3.2: Reduce energy consumption in existing buildings and County operations through energy efficiency retrofits.
	Policy AQ 3.3: Encourage carbon sequestration through sustainable agricultural practices and conservation of agricultural and working lands, forest lands, and wildlands.
	Policy AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions.
	Policy AQ 3.5: Phase in the decarbonization of existing and new development.
	Policy AQ 3.6: Support local solar power generation on new and existing buildings and parking lots.
	Policy AQ 3.7: Support and expand urban forest programs within the unincorporated areas.
	Policy AQ 3.8: Develop a sunset strategy for all oil and gas operations that prioritizes disproportionately affected communities.
	Policy AQ 3.9: Ensure the availability of zero-carbon electricity to serve unincorporated Los Angeles County.
	Policy AQ 3.10: Reduce the lifecycle carbon intensity of building materials and phase out the use of high-global warming potential refrigerants.
	Policy AQ 3.11: Promote sustainable waste practices through public outreach, educational programs, and mandates.
	Policy AQ 3.12: Ensure and promote the availability of organics waste and recyclable materials diversion services for beneficial use, such as composting, energy production, and upcycling.
	Policy AQ 3.13: Collaborate with environmental organizations, businesses, schools, and the general public to promote the importance of climate action.

V. Air Quality Element Implementation Program

- Efficient Goods Movement

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.