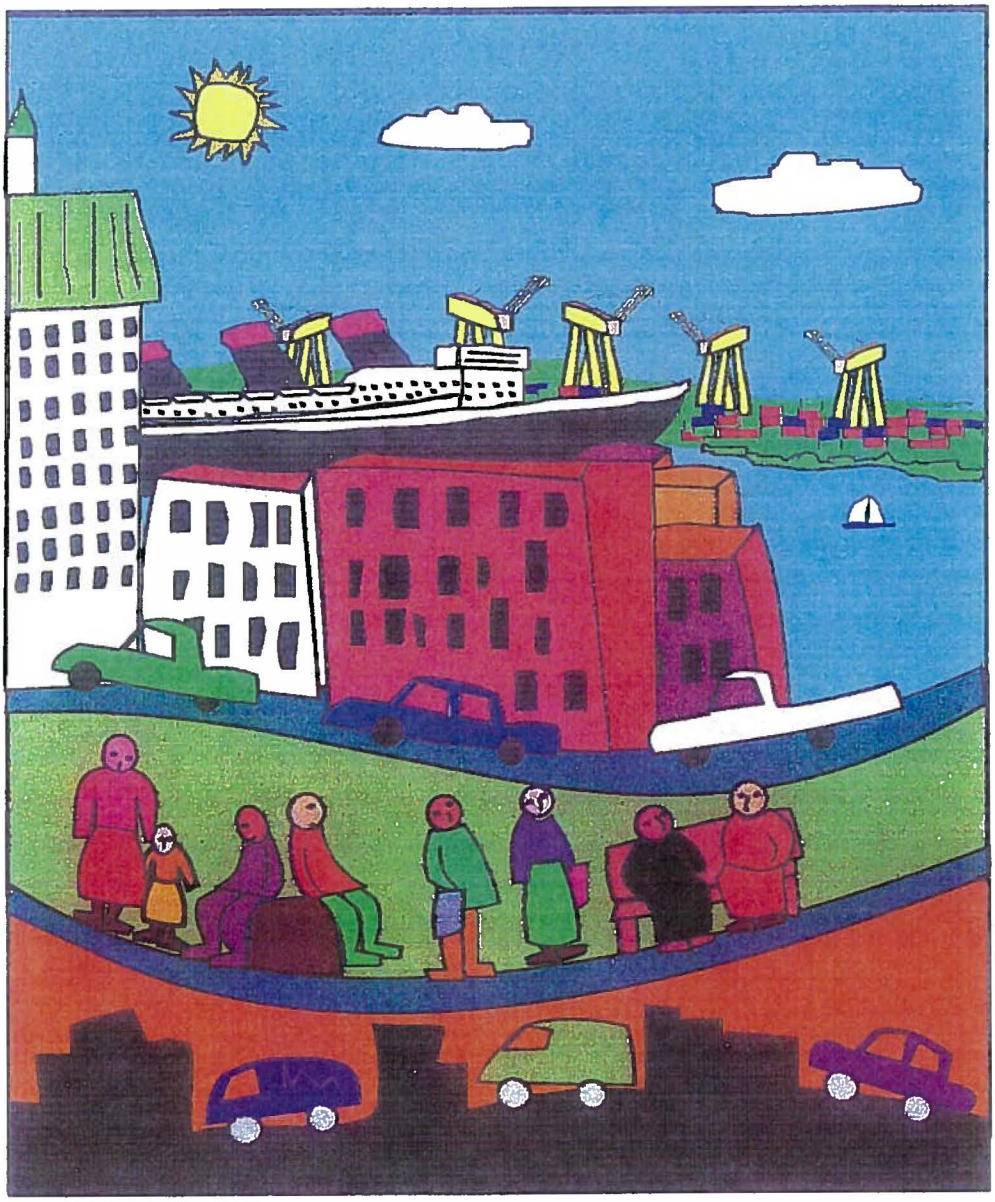
City of Long Beach

Air Quality Element



December, 1996

CITY OF LONG BEACH

AIR QUALITY ELEMENT

An optional Element of the City's General Plan

Adopted on December 3, 1996
Resolution Number 26119

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EXECUTIVE SUMMARY

LONG BEACH: A LEADER IN CLEAN AIR

Long Beach was the first California city to be designated a "Clean City" by the United States Department of Energy. With its own Gas Department and significant investment in providing and using Compressed Natural Gas (CNG) fuel, the City of Long Beach has been recognized as a leader in the fight to improve air quality in Southern California.

The City's efforts have not been confined to using cleaner fuels. Long Beach has also invested in a telebusiness center, where office space is available to businesses having employees living in the Greater Long Beach area who would benefit from a shorter commute to work. The City makes its CNG-powered rideshare vans available to employees of Downtown businesses. The City of Long Beach has an adopted Trip Reduction Ordinance and has promoted Transportation Demand Measures, such as the Downtown Parking Management Plan and the efforts of the Long Beach Airport Area Transportation Management Association (LBA2TRA).

Continuous efforts have been made by local elected officials since the early 1990s to address the issue of particulate pollution in the downtown area and Westside. A key victory occurred in 1994, when the Port of Los Angeles and the South Coast Air Quality Management District (SCAQMD or AQMD) agreed to implement a number of air quality control measures and to conduct perimeter monitoring for a proposed petroleum coke storage facility near the City of Long Beach within the Port of Los Angeles.

It is within this context of a history of clean air efforts that the City of Long Beach has prepared an *Air Quality Element,* an optional element of the City's *General Plan.*

AIR QUALITY TRENDS

Although the air quality in the Los Angeles area has improved substantially over the past several decades, it remains the worst in the nation. The federal standards are exceeded more frequently in the South Coast Air Basin than in any other area of the United States. The combination of emissions from the second largest urban area in the United States with poor atmospheric ventilation results in the high levels of air pollution in our region.

Much of the improvements which have been made in air quality over the past decade and a half have occurred through technological advances, Transportation Control Measures (TCMs), and increased coordination of transportation, land use, and air quality planning. The Environmental Protection Agency and Federal Department of

Transportation reported that air quality, as measured in terms of carbon monoxide (CO), hydrocarbons, and oxides of nitrogen (NO_x) emissions, substantially improved between 1982 and 1991. These reductions in emissions are almost entirely from automobiles, or mobile sources. The emissions improvements are attributable to improvements in technology, and occurred despite continued increases in vehicle travel. Stationary source emissions have increased for certain emissions during the same time period.

While the region relies on Federal, state and regional agencies to regulate industrial emissions and enforce stringent emission standards for vehicles, the local government can contribute through wise land use decisions and congestion management/trip reduction provisions for new development. Emissions from coastal areas contribute to air quality degradation of inland areas, as a result of off shore breezes. Future reductions in emissions from Long Beach, therefore, will provide health and economic benefits for the region as well as for the City.

ENVIRONMENTAL SETTING

The South Coast Air Basin encompasses all of Orange County, most of Los Angeles and Riverside Counties, and the western portion of San Bernardino County. The South Coast Air Basin is subject to some of the worst air pollution in the county, attributable mainly to its topography, climate, meteorological conditions, a large population base, and highly dispersed urban land use patterns.

The climate of the South Coast Air Basin is generally characterized by mild, sunny winters with occasional rain, plus warm, dry summers. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter.

The Basin experiences inversion layers that strongly affect regional air quality. An inversion is a reversal of the usual temperature distribution in the atmosphere, where temperature normally decreases with height. Because of relatively cool surface air temperatures (the effect of an upswelling of cool ocean air at the coast) and warm, dry subsiding air aloft, inversions occur in about ninety percent of the days in the early morning hours.

Pollution is introduced into the inversion layer by the return flow from the mountains, and by emissions into the layer from tall stacks. As the day progresses, the surface layer is heated until it reaches the potential temperature of the inversion layer. The inversions cause air pollutants emitted into the surface air layer to increase in concentration resulting in photo-chemical smog episodes. The inversion eventually breaks, allowing greater vertical dispersion of pollutants.

Secondary pollutants are created by reactions taking place within the atmosphere rather than being emitted directly into the air. Periods of intense sunlight activate

photochemical mechanisms that produce secondary pollutants. One such secondary pollutant is ozone, which is formed via photochemical reactions driven by the sun and fed primarily by two precursor emissions, reactive organic gases (ROG) and oxides of nitrogen (NO_x). Sunshine combined with a persistent shallow marine layer and light winds provide an ideal environment for the production of photochemical smog.

CRITERIA POLLUTANTS

There are six "criteria pollutants" that are regulated by federal standards. Of these six, ozone, carbon monoxide and PM_{10} (particulates) were recorded at levels which exceeded federal standards. The federal standards for nitrogen dioxide, sulfur dioxide and lead concentrations were not exceeded in 1993. The state nitrogen dioxide standard, which is more stringent than the federal, was exceeded on one occasion in 1993.

Ozone (O_3) is a pungent, colorless toxic gas which is produced through photochemical processes and is the main ingredient of smog. In the upper atmosphere a natural ozone layer screens us from harmful ultraviolet radiation, while ozone near the surface of the earth can impair our health. Photochemical smog is caused by complex atmospheric reactions involving oxides of nitrogen and reactive organic gases with ultraviolet energy from sunlight. Motor vehicles are the major source of oxides of nitrogen and reactive organic gases in the basin. The common manifestations of photochemical oxidants are damage to vegetation and cracking of untreated rubber. In high concentrations, they can also directly affect the lungs, causing respiratory irritation and possible changes in lung function.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced through the incomplete combustion of fossil fuels. Automobiles are the primary source, although various industrial processes also produce CO emissions. CO passes through the lungs directly to the blood stream and deprives sensitive tissues of oxygen.

Nitrogen Dioxide (NO_2) is a reddish-brown gas and nitric oxide (NO) is a colorless, odorless gas. Both Nitrogen Oxides (NO_x) are formed from fuel combustion under high temperature and pressure. NO_x is an important air pollutant in the region because it is a primary receptor of ultraviolet light, which initiates the reactions producing photochemical smog.

PM_{10}, particulate matter, is the overall category name for dirt, dust or soot in the air. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the air sacs deep in the lungs. Suspended particulate matter in the air has been associated with exacerbation of symptoms in people with respiratory illnesses, and a decline in lung function in sensitive populations including children.

Sulfur Dioxide (SO_2) is a strong smelling, colorless gas that is formed by the combustion of fossil fuels. Power plants, which may use coal or oil high in sulfur content, can be

major sources of SO_2. The SO_2 and other sulfur oxides contribute to the problem of acid deposition, and can also cause broncho-constriction with symptoms such as shortness of breath and chest tightness during exercise.

Lead (Pb), a heavy metal, can impair blood formation and nerve conduction. Lead in the air can be traced to gasoline additives, metal smelters, and other industrial sites such as battery plants. Lead concentrations have not exceeded state or federal standards at any regular monitoring station since 1982.

LONG BEACH

The South Coast Air Quality Management District (SCAQMD) monitors ambient air quality in the South Coast Air Basin. The Long Beach air monitoring station monitors all of the six criteria pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, suspended particulates and lead. The maximum levels of primary automotive exhaust pollutants such as carbon monoxide and nitrogen oxides minimally exceed allowable levels a few times each year in Long Beach. Ozone, a secondary pollutants, recorded the highest levels in the more inland areas with Long Beach monitoring lower levels and exceeding much fewer days. The maximum concentration of respirable particulates in Long Beach exceeded state standards but was below federal standards. Generally, Long Beach recorded relatively low levels of all pollutants due to its coastal proximity.

The SCAQMD monitoring station for Long Beach is located in North Long Beach. An increased number of monitoring stations in the future may yield more specific information regarding local air quality conditions, particularly in those areas of Long Beach impacted by port-related operations.

AIR QUALITY ELEMENT

This *Air Quality Element* is an Element of the City's *General Plan.* It is one of several Elements or "chapters" which must be reviewed when new policies or regulations are being formulated, and when development applications that require discretionary approvals are being reviewed. The *Air Quality Element* identifies a series of policies, programs, and strategies that encourage fewer vehicle trips, increased opportunities for alternative transportation modes and fuels, and land use patterns that can be efficiently served by a diversified transportation system.

The purpose of the *Air Quality Element* is to promote healthful air for all residents of Long Beach. The *Air Quality Element* bridges the *Land Use* and *Transportation Elements* of the *General Plan,* to better recognize the relationship between land use patterns, transportation planning, and air quality. The *Air Quality Element* acknowledges the functions which are already performed by federal, state, and regional agencies, and strives to maximize the use of tools available to local governments to promote clean air.

The Long Beach *Air Quality Element* will serve several objectives, including:

- Establish policy that will guide future land use and transportation decisions in the city;
- Implement regional air quality plans;
- Heighten awareness of air quality efforts and impacts in the community.
- Promote greater collaboration among all levels of government to solve air quality problems, particularly with regard to interstate and international commerce.

The Air Quality policies include, but are not limited to:

- Eliminate vehicle trips;
- Reduce vehicle miles traveled;
- Promote the increased use of compressed natural gas (CNG), electric vehicles, and other alternative fuels;
- Regulate land use and promote development in a manner that will support established transit services and reduce the need for the automobile in daily trip-making;
- Minimize particulate emissions from the construction and operation of roads and buildings;
- Promote increased monitoring of local air quality conditions;
- Reduce emissions through reduced energy consumption;
- Educate City residents concerning air quality, energy, and congestion issues, and the need to modify present travel behavior and energy consumption patterns.

FUTURE

The future air quality of the region will affect our economy, our ability to attract new residents and employers, the health of our elderly and young populations, and perhaps our own longevity. The adage of the early 1980s "Think Globally, Act Locally," could be modified for our regional air quality: "Plan for Air Quality with Local Actions." It will be through the combination of behavior modification and the aggressive pursuit of new technologies that we are able to continue to improve air quality in the region, while at the same time sustaining or increasing future economic growth.

AIR QUALITY ELEMENT

TABLE OF CONTENTS

	EXECUTIVE SUMMARY	3
I.	**INTRODUCTION**	13
	• *Purpose*	16
	• *Principals*	16
II.	**EXISTING AIR QUALITY**	19
	A. The Environmental Setting	21
	• *General Climate*	23
	• *Meteorology*	24
	B. Baseline Air Quality	26
	• *Ambient Air Quality Standards*	26
	• *Baseline Air Quality and Trends*	26
	C. Pollutant Sources and Effects	36
	• *Local Sources of Air Contaminants*	36
	• *Effects of Air Pollution*	37
	D. Toxic Air Pollutants	40
	E. Benefits Derived From Meeting Air Quality Standards	40
III.	**INTER-GOVERNMENTAL REQUIREMENTS**	43
	A. Requirement for Action	45
	• *Federal Clean Air Act*	45
	• *Intermodal Surface Transportation Efficiency Act*	46
	• *Energy Policy Act of 1992*	47
	• *California Clean Air Act*	47

B. Inter-Governmental Responsibilities 48

- *Regional Agencies* 48
- *Air Resources Board* 49
- *Air Quality Management Plan (AQMP)* 49
- *Carbon Monoxide Plan* 50
- *Local Government Requirements and Options Under the AQMP* 50

C. General Plan Consistency 51

IV. AIR QUALITY PLANNING 55

A. Air Quality Planning in Long Beach 57

- *Multi-Jurisdictional Context* 57
- *Congestion Management* 58
- *Southern California Economic Partnership* 60

B. Previous City Efforts 61

- *Clean Cities* 61
- *CNG Conversions* 61
- *Air Quality Monitoring* 62
- *City Council Efforts/LAXT-Pier 300* 62
- *Rideshare* 64
- *Planning and Zoning* 65
- *Transportation Demand Measures* 65
- *Long Beach Airport* 66
- *Alternative Modes* 66
- *Port of Long Beach* 67
- *Other City Departments* 72
- *Telecommuting* 72

V. GOALS AND POLICIES 75

A. Principles 77

B. Goals, Policies & Actions 77

VI. IMPLEMENTATION 97

VII. APPENDICES

A. Glossary of Air Quality Terms and Acronyms 105

B. Transportation Demand Measures and Trip Reduction Ordinance

C. Congestion Management Program: Local Implementation Report

LIST OF FIGURES

1. Regional Location Map 22

2. Predominant Wind Pattern 25

3. Air Quality Monitoring Stations: Southeast Los Angeles County 28

4. Ozone: Number of Days Exceeding Federal Standard in 1993 30

5. Carbon Monoxide: Number of Days Exceeding Federal Standard in 1993 32

6. Nitrogen Dioxide: Number of Days Exceeding State Standard in 1993 33

7. PM10: 1993 Annual Average Concentrations Compared to Federal Standard 34

8. Sensitive Receptor Locations: Southeast Los Angeles County 38

LIST OF TABLES

1. Ambient Air Quality Standards 27

2. Southeast Los Angeles Cities Within Source/Receptor Areas 29

3. Southeast Los Angeles County Ambient Air Quality Summary, 1991 31

4. Carbon Monoxide: Days 8-Hour Concentration Exceeded 32

5. Average Daily Carbon Monoxide Concentration Comparison 33

6. Implementing Control Measure Responsibilities 58

INTRODUCTION

INTRODUCTION

Air quality in Southern California is improving.

Between 1976 and 1993, the number of days the federal air quality standard was exceeded in the South Coast Air Basin decreased by forty-seven percent. Ozone levels have been reduced in half over the past thirty years, sulfur dioxide and lead standards have been met, and other criteria pollutant concentrations have significantly declined.

Air quality in Long Beach continues to be relatively healthy, primarily as a result of the on-shore breezes which continually push our pollutants inland.

Why did the City prepare an *Air Quality Element*? Don't the Environmental Protection Agency, California Air Resources Board, and South Coast Air Quality Management District already regulate emissions? What can local governments do?

Although the air quality in the Los Angeles area has improved substantially over the past several decades, our air quality remains the worst in the nation. The federal standards are exceeded more frequently in the South Coast Air Basin than in any other area of the United States. While the region relies on federal, state and regional agencies to regulate industrial emissions and enforce more stringent emission standards for vehicles, the local governments can contribute through wise land use decisions and congestion management/trip reduction provisions for new development.

The Long Beach *Air Quality Element* will serve several objectives:

- Establish policy that will guide future land use and transportation decisions in the city.
- Heighten awareness of air quality impacts and community efforts;
- Continue to encourage and support clean air efforts by local citizens, associations, and businesses;
- Promote efforts to increase monitoring of local air quality conditions and seek collaborative solutions through inter-agency co-ordination;
- Strengthen local grant applications for air quality-related funding;
- Provide leadership on a regional level to reduce pollutants which typically collect at the base of the mountains resulting in adverse inland air quality and unsightly "smog";

- Co-ordinate and integrate voluntary and mandated actions by City agencies; and
- Implement regional air quality plans.

Purpose

The purpose of the *Air Quality Element* is to promote healthful air for all residents of Long Beach. The *Air Quality Element* bridges the *Land Use* and *Transportation Elements* of the *General Plan* to better recognize the relationship between land use patterns, transportation planning, and air quality. The *Air Quality Element* acknowledges the functions which are already performed by federal, state, and regional agencies, and strives to maximize the use of tools available to local governments to promote clean air.

The *Air Quality Element* identifies a series of policies, programs, and strategies that encourage fewer vehicle trips, increased opportunities for alternative transportation modes and fuels, and land use patterns that can be efficiently served by a diversified transportation system. It is the intent of the City of Long Beach to participate fully in national, regional and sub-regional efforts for clean air.

Principles

The following principles are included to provide overall direction to the goals, policies, and programs of this Element.

1. Achieve air quality improvements in such a manner that sustains current economic development while encouraging future growth.
2. Improve the quality of life for our citizens by providing greater opportunities, convenience, and choices.
3. Reinforce local mobility goals by reducing peak-hour traffic congestion.
4. Foster behavior change through public information and education, incentives and pricing that reflects total societal costs for administration and enforcement.

The *Air Quality Element* is an optional Element of the General Plan as authorized by Section 65303 of the Government Code. Much of this *Element* consists of an inventory of existing air quality conditions, and current rules and regulatory agencies working toward improved air quality. This information is a "snapshot" in time of the air quality and the regulatory environment. Technologies intended to improve air quality are constantly evolving as a result of new information, revisions to laws, and changes in political leadership. While it is the intent of the Department of Planning and Building to regularly update the *Air Quality Element*, changes in the inventory conditions do not in and of themselves warrant immediate corrections to this *Element*.

The core of the *Air Quality Plan* is found in the Goals, Policies, and Actions section. The goals and policies reflect other adopted regional and City policies, as well as current and future efforts specific to Long Beach. These policies are designed to identify a broad range of actions that could contribute to cleaner air. Not all of the identified actions, however, may be undertaken.

The *Air Quality Element* is adopted on the local level by the City Council of Long Beach. The goals and policies are implemented through the review of discretionary projects, and through other city-wide programs, including the Capital Improvement Program, Trip Reduction Program, and other efforts.

EXISTING AIR QUALITY

EXISTING AIR QUALITY

A. THE ENVIRONMENTAL SETTING

The quality of the air in the Los Angeles Basin is determined by a complex interaction of natural dispersion phenomena and atmospheric pollutants that derive mainly from human activities. These activities, combined with meteorological factors, produce unique local and regional air quality conditions.

Significant improvements have been made in air quality in the South Coast Air Basin. The number of days in which the federal standard was exceeded decreased by forty-seven percent between 1976 and 1993. Of the standards which were exceeded in 1993, the ozone standard was violated most frequently, followed by carbon monoxide and particulates.

Air quality levels continue to show improvement. In 1995, for example, ozone levels peaked at 0.26 parts per million, the lowest level since the district was established. The federal air quality standard for ozone was exceeded at one or more locations in the Basin on ninety-eight days. While this is the lowest number of days since record keeping began, it is still more frequent than any other area of the nation. Federal 24-hour standards for PM10 were exceeded on seven percent of the days sampled, while carbon monoxide exceeded federal standards on only four percent of the days.

The federal air quality standards are exceeded more frequently in the Basin than in any other area of the United States. Most federal standard exceedances in the Basin are caused by ozone. The Basin's most affected monitoring location (Glendora) exceeded the federal ozone standard on 118 days in 1992, compared to nine days of exceedances at the next highest area outside California (Houston, Texas). Southern California has the lowest summertime mean maximum mixing height (a measure of how effectively air pollutants will be dispersed vertically) in the United States.

- The region receives abundant sunshine which can drive photochemical reactions that produce air pollutants such as ozone. Of the ten largest urban areas in the nation, the South Coast Air Basin has the lowest average wind speed. The combination of poor atmospheric ventilation and emissions from the second largest urban area in the U.S. give the South Coast Air Basin the worst air pollution problem in the nation. The Basin has the highest recorded concentrations of ozone, carbon monoxide, nitrogen dioxide, and PM_{10} in the country.

- Much of the improvement that has been made in air quality over the past decade and a half, has occurred through technological advances, Transportation Control Measures

(TCMs), and increased coordination of transportation, land use, and air quality planning. The Environmental Protection Agency and the U.S. Department of Transportation reported that air quality, as measured in terms of carbon monoxide (CO), hydrocarbons, and oxides of nitrogen (NO_x) emissions, substantially improved between 1982 and 1991 (*"Clean Air Through Transportation: Challenges in Meeting National Air Quality Standards,"* August 1993.) These reductions in emissions are almost entirely from automobiles, or mobile sources. The emissions improvements are attributable to improvements in technology, and occurred despite continued increases in vehicle travel. Stationary source emissions have increased for certain emissions during the same time period.

The air quality trends in the Los Angeles area mirror those reported by the federal government. Significant advances have been made in many aspects of air quality, largely as a result of technological advances and transportation control measures such as pricing mechanisms, traffic flow improvements, and flexible work schedules and telecommuting. Despite these advances, the Los Angeles area continues to experience the worst air quality in the nation, which results in deleterious health effects, visibility impairment, and reduced life of certain products. Additional and continued efforts are needed at all levels of government and from communities to ensure that further improvements are made and previous gains are not lost.

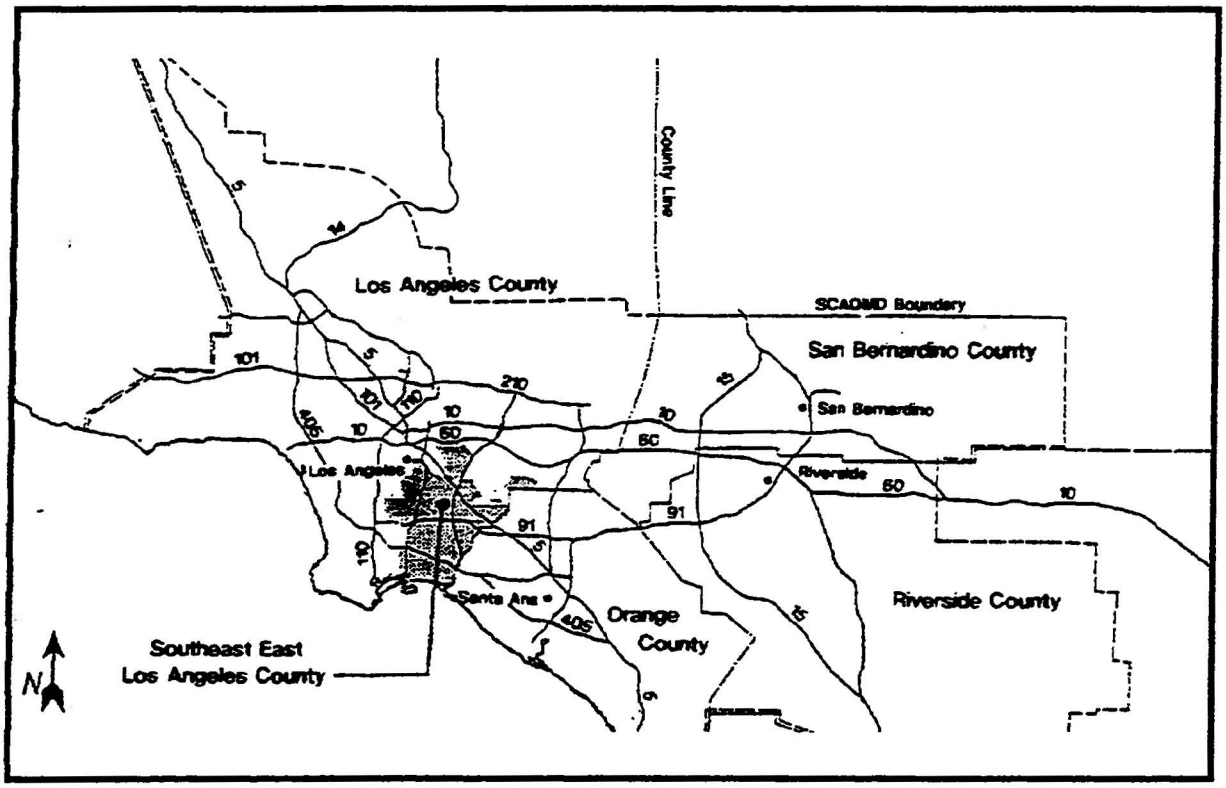


FIG. 1. REGIONAL LOCATION MAP

General Climate

The City of Long Beach is located within the South Coast Air Basin, a 12,000 square mile basin encompassing all of Orange County, most of Los Angeles and Riverside Counties, and the western portion of San Bernardino County. (See Figure 1) The South Coast Air Basin is subject to some of the worst air pollution in the country, attributable mainly to its topography, climate, meteorological conditions, a large population base, and highly dispersed urban land use patterns.

The climate of the South Coast Air Basin is generally characterized by mild, sunny winters with occasional rain, plus warm, dry summers. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant, with mountains forming the remainder of the perimeter.

The Pacific Ocean is the primary moderating influence on the weather patterns, but the coastal mountain ranges lying along the north and east sides of the Los Angeles Basin act as a buffer to the extreme summer heat and winter cold occurring in the interior desert and plateau areas. The region lies in the semi-permanent high pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild climatological pattern is occasionally interrupted by periods of extremely hot weather, winter storms, and "Santa Ana winds." The annual average temperatures vary little throughout the Basin, averaging seventy-five degrees Fahrenheit, and generally increasing further inland. Although the Basin has a semi-arid climate, the air near the surface is moist because of the presence of the shallow marine layer. Annual average relative humidity is seventy percent at the coast.

The Los Angeles metropolitan area can experience pronounced differences in temperature, cloudiness, fog, rain, and sunshine over fairly short distances. Long Beach is located along the coast in southeast Los Angeles County. Its coolest months are November through March with a mean monthly minimum temperature of 46.4 degrees Fahrenheit. The warmest months are July through September, with a mean monthly maximum temperature of 83.1 degrees Fahrenheit. Mean annual precipitation for the 30 year period 1958-1987 was 10.94 inches. Ninety-nine percent of the annual precipitation occurs between September through May. Northeasterly winds and sea/land breezes are prevalent in the County, with dry Santa Ana winds intermittent from mid-October to March.

Inversions

The Los Angeles Basin is subject to inversion layers which strongly affect regional air quality. An inversion is a reversal of the usual temperature distribution in the

atmosphere, where temperature normally decreases with height. Because of relatively cool surface air temperatures (the effect of an upswelling of cool ocean water at the coast) and warm, dry subsiding air aloft, inversions occur in about ninety percent of the days in the early morning hours.

Pollution is introduced into the inversion layer by the return flow from the mountains, and by emissions into the layer from tall stacks. As the day progresses, the surface layer is heated until it reaches the potential temperature of the inversion layer. The inversions cause air pollutants emitted into the surface air layer to increase in concentration resulting in photo-chemical smog episodes. The inversion eventually breaks, allowing greater vertical dispersion of pollutants.

Morning fog and low stratus clouds are common as a result of persistent low inversion and cool coastal ocean water. Nevertheless, seventy-three percent of the potentially available ultraviolet radiation reaches downtown Los Angeles. This is an important factor considering the necessary role of ultraviolet radiation in the process of producing photochemical smog, ninety percent of which is primarily ozone.

Sunlight

Secondary pollutants are created by reactions taking place within the atmosphere rather than being emitted directly into the air. Periods of intense sunlight activate photochemical mechanisms that produce secondary pollutants. One such secondary pollutant is ozone, which is formed via photochemical reactions driven by the sun and fed primarily by two precursor emissions, reactive organic gases (ROG) and oxides of nitrogen (NO_x).

Sunshine combined with a persistent shallow marine layer and light winds provide an ideal environment for the production of photochemical smog. Reactions between air molecules produce ozone when pollutants absorb ultraviolet radiation, and cause secondary reactions in the lower atmosphere. These reactions also can produce a brown cast to the sky, attributed to the absorption of light by nitrogen dioxide molecules. Oxidant levels for Long Beach and other coastal areas are relatively low, but emissions from these areas contribute to air quality degradation of inland areas.

Meteorology

Temperature

Temperature is a critical meteorological parameter since the local sea and land breezes in the Basin are the product of temperature differentials between the constant ocean air temperature, and the uneven heating and cooling that takes place over the land. These sea and land breezes are the primary means of pollutant transport throughout the Basin.

Temperature also controls the extent of vertical mixing. This mixing, or upward dispersion, reduces the concentration of pollutants in the air layer next to the earth's surface. As the land is heated by the sun, updrafts are created that disperse the polluted air and dilute ambient surface air concentration levels. Temperature is therefore interrelated with many other factors in affecting the air quality of Southern California.

Wind

Wind patterns limit the horizontal dispersion and transport of pollutants throughout the Basin. When wind speeds are low, as they are much of the time, pollutant levels can become very high. This is particularly so when air stagnation is combined with strong, persistent temperature inversions.

Light surface winds average less than six miles per hour in downtown Los Angeles. In the Long Beach area, predominant daily winds consist of morning on shore air flow from the southwest at a mean speed of 7.3 miles per hour, and afternoon and evening

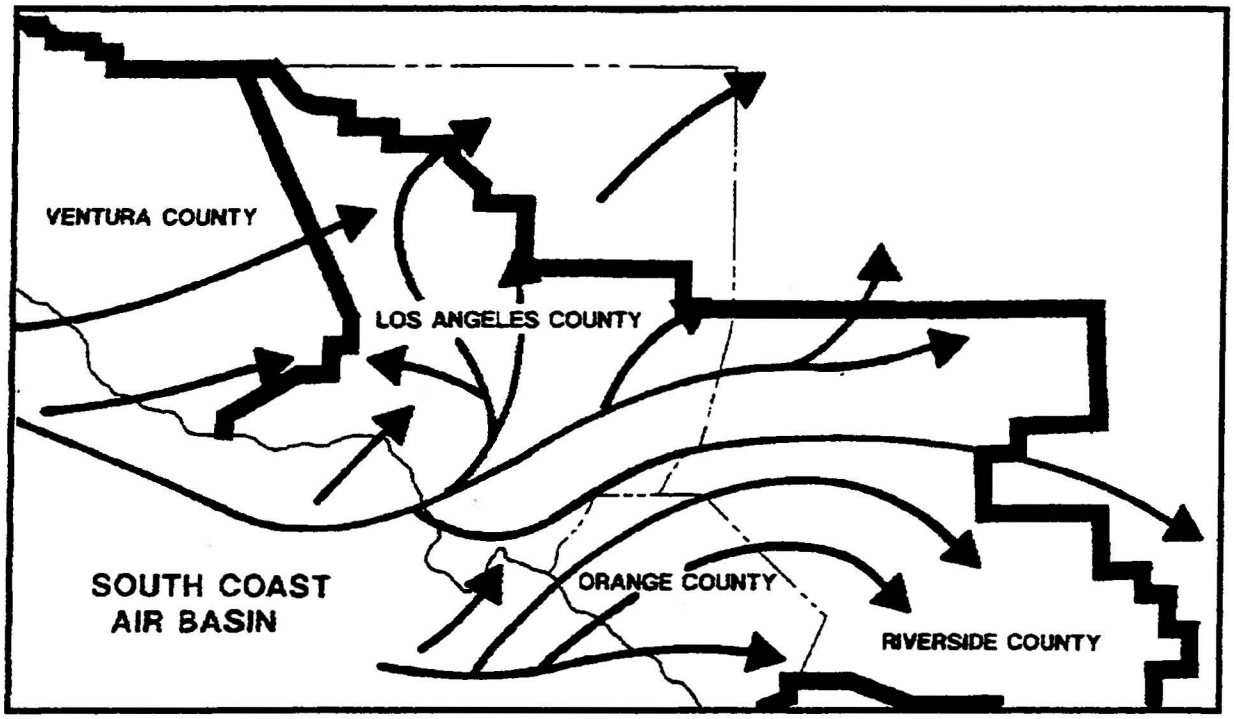


FIG. 2. PREDOMINANT WIND PATTERN

off-shore air flow from the northwest at 0.2 to 4.7 miles per hour with little variability between seasons. Summer wind speeds average slightly higher than winter wind speeds. The prevailing winds carry air contaminants northward and then eastward over Whittier, Covina, Pomona and Riverside during daylight hours.

The daytime sea breezes and nighttime land breezes or drainage flows dominate the wind patterns during the dry summer months, and can result in some pollution produced in the western area of the basin being pushed up against the San Gabriel and San Bernardino Mountains. Some of this pollution is trapped, and some is transported out through the mountain passes or lifted by the vertical currents produced by heating on the mountain slopes.

During the winter rainy season, the sea-land regime is broken by wind flows associated with storms moving through the area from the northwest, and by Santa Ana wind conditions. Santa Ana conditions occur when a large high pressure system builds over the Great Basin, and the system pushes air southward over the San Gabriel and San Bernardino Mountains, into the Los Angeles Basin, and then out to sea. The air is warmed by compression as it descends the mountainsides into the basin. Sustained wind speeds of 10-60 miles per hour, with higher gusts, are not uncommon, resulting in increased pollution dispersion and transport out to sea.

Wind data taken throughout Southern California can be used to characterize horizontal airflow. Figure 2 shows the predominant wind flow patterns for the region.

B. BASELINE AIR QUALITY

Ambient Air Quality Standards

Both the federal government and the State of California have adopted air quality standards to protect the public from the detrimental effects of air pollution. Table 1 lists the state clean air standards and the National Ambient Air Quality Standards (NAAQS). The NAAQS are divided into two categories: primary and secondary. The primary standards are those that protect the public health, while the secondary standards are those that protect the public welfare. The state standards are more stringent than the NAAQS as they are designed to protect the public health with an additional margin of safety for sensitive populations (e.g., children, elderly, infirm). Sensitive populations are also known as "sensitive receptors."

Baseline Air Quality and Trends

The South Coast Air Quality Management District (SCAQMD) is responsible for monitoring ambient air quality in the South Coast Air Basin (SCAB), and has divided its jurisdiction into thirty Source/Receptor Areas (SRAs). The communities within an SRA are expected to have similar climatology and subsequently, similar ambient air pollutant concentrations.

The SCAQMD operates four air quality monitoring stations within Southeast Los Angeles County: Long Beach (SRA 4), Whittier (SRA 5), Pico Rivera (SRA 11), and Lynwood (SRA 12). Figure 3 identifies the locations of the four air quality stations. Table 2 identifies the cities within each of these SRA's.

TABLE 1
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	AVERAGING TIME	CALIFORNIA STANDARDS	NATIONAL STANDARDS	
			PRIMARY	SECONDARY
Ozone	1 Hour	0.09 ppm (180 µg/m3)	0.12 ppm (235) µg/m3)	Same as Primary Std.
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m3)	9.0 ppm (10 mg/m3)	Same as Primary Stds.
	1 Hour	20 ppm (23 mg/m3)	35 ppm (100 µg/m3)	Same as Primary Stds.
Nitrogen Dioxide	Annual Average	-	0.053 ppm (100 µg/m3)	Same as Primary Stds.
	1 Hour	0.25 ppm (470 µg/m3)	-	Same as Primary Stds.
Sulfur Dioxide	Annual Average	-	80 ug/m3 (0.03 ppm)	-
	24 Hour	0.05 ppm (131 µg/m3)	365 ug/m3 (0.14 ppm)	-
	3 Hour	-	-	1300 ug/m3 (0.5 ppm)
	1 Hour	0.25 ppm (655 µg/m3)	-	-
Suspended Particulate Matter (PM_{10})	Annual Geometric Mean	30 µg/m3	-	-
	24-Hour	50 µg/m3	150 µg/m3	Same as Primary Stds.
	Annual Arithmetic Mean	-	50 µg/m3	Same as Primary Stds.
Sulfates	24-Hour	25 µg/m3	-	-
Lead	30-Day Average	1.5 µg/m3	-	-
	Calendar Quarter	-	1.5 µg/m3	Same as Primary Std.
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m3)	-	-
Visibility Reducing Particles	8-Hour Average (9 am to 5pm)	In sufficient amount to reduce the visual range to less than 10 miles when the relative humidity is less than 70 percent		

Source: 1991 Air Quality Summary, ARB

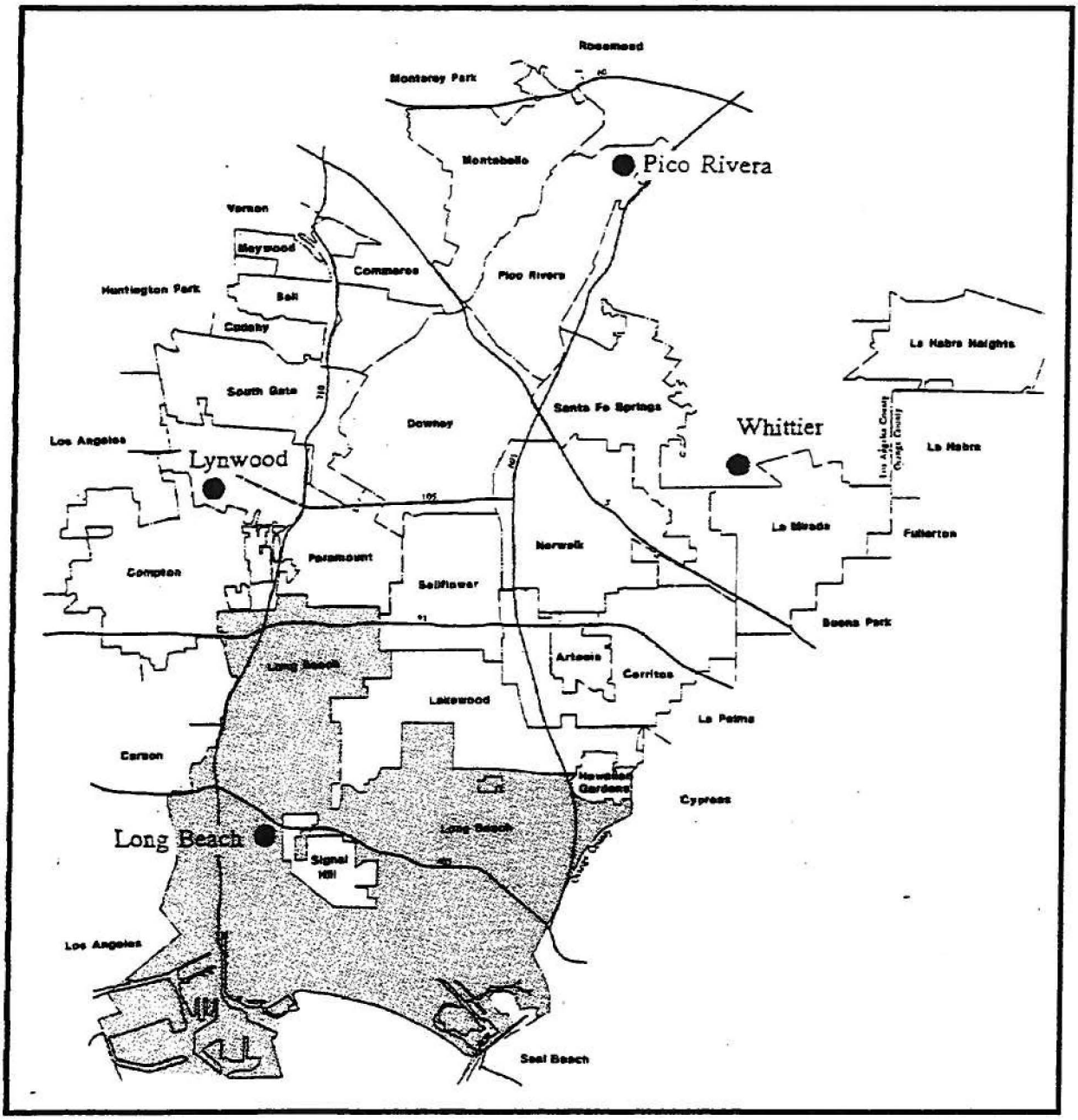


FIG. 3. AIR QUALITY MONITORING STATIONS: SOUTHEAST LOS ANGELES COUNTY

The Long Beach air monitoring station in SRA 4 monitors all of the six criteria pollutants: carbon monoxide, ozone, nitrogen dioxide, sulfur dioxide, suspended particulates (PM10), and lead. While the other stations do not monitor all seven pollutants, they will be monitored if local levels of these pollutants become a concern to the SCAQMD or the California Air Resources Board. Other air pollutants for

TABLE 2
SOUTHEAST LOS ANGELES COUNTY CITIES WITHIN THE SOURCE RECEPTOR AREAS

Long Beach SRA 4	Whittier SRA 5	Pico Rivera SRA 11	Lynwood SRA 12
Long Beach	Montebello	Pico Rivera	Maywood
Lakewood	Bell Gardens	La Habra Heights	Bell
Signal Hill	Downey		South Gate
Artesia	Paramount		Lynwood
Cerritos	Bellflower		Compton
Hawaiian Gardens	Norwalk		
	Santa Fe Springs		
	La Mirada		

which standards exist are considered local problems and are handled through the District's permitting process for stationary sources.

The maximum levels of primary automotive exhaust pollutants such as carbon monoxide (CO) and nitrogen oxides (NO_x) minimally exceed allowable levels a few times each year in Long Beach, Whittier, and Pico Rivera. Ozone a secondary pollutant, recorded the highest levels in the more inland areas of Pico Rivera and Whittier, with Lynwood and Long Beach monitoring lower levels and exceeding much fewer days. Respirable particulates (PM_{10}) were only measured in Long Beach, where the maximum concentration exceeded state standards but was below federal standards.

The Long Beach monitoring station recorded relatively low levels of all pollutants due to its coastal proximity. The SCAQMD monitoring station for Long Beach is located in the vicinity of the Long Beach Airport. An increased number of monitoring stations in the future may yield more specific information regarding local air quality conditions, particularly in those areas of the city impacted by Port-related operations

Ozone

Ozone is a pungent, colorless toxic gas which is produced through photochemical processes. Photochemical smog is caused by complex atmospheric reactions involving oxides of nitrogen and reactive organic gases with ultraviolet energy from sunlight. Motor vehicles are the major source of oxides of nitrogen and reactive organic gases in the basin. The common manifestations of photochemical oxidants are damage to

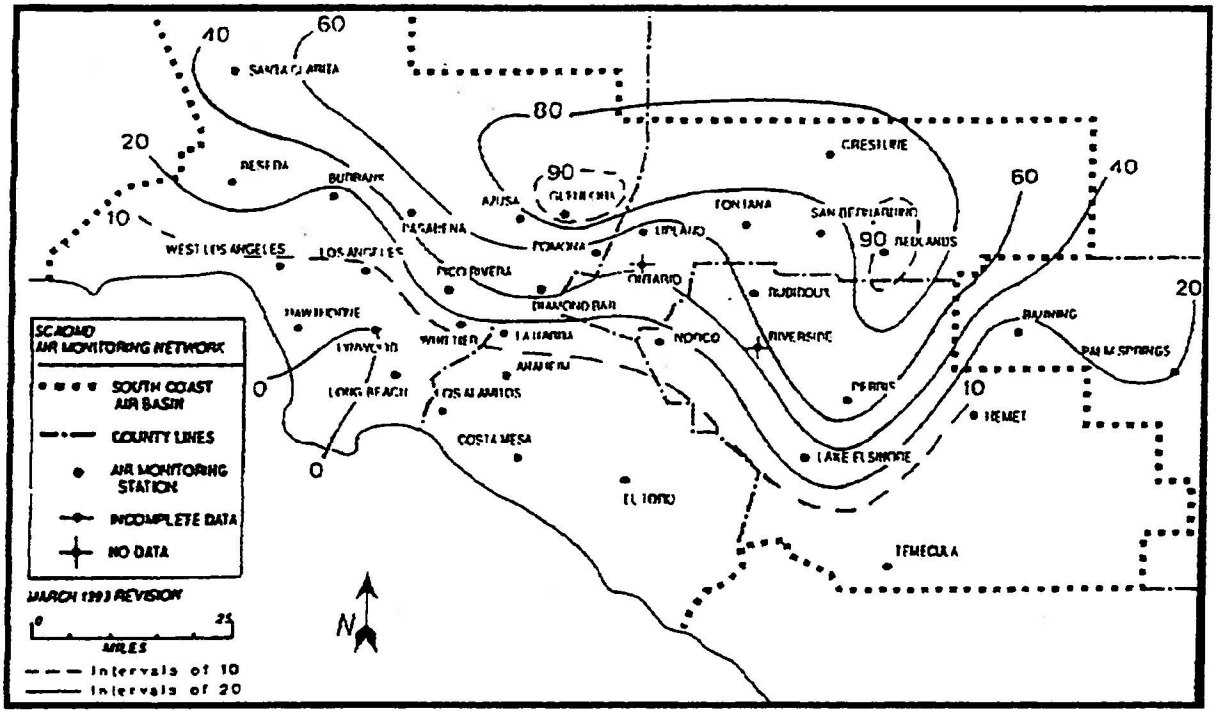


FIG. 4. OZONE: NUMBER OF DAYS EXCEEDING FEDERAL STANDARDS IN 1993

vegetation and cracking of untreated rubber. In high concentrations, they can also directly affect the lungs, causing respiratory irritation and possible changes in lung functions.

Ozone concentrations are highest in inland locations since it is formed through the photochemical combination of upwind precursor pollutants. As expected, the inland monitoring stations recorded the highest ozone levels. In 1993, SCAQMD monitored ozone at 35 sites. The federal standard was exceeded at all but one location (Lynwood). The state standard was exceeded at all locations. The Stage I Episode level (1-hour average ozone equal to or greater than 0.20 ppm) was exceeded at 13 location. The Long Beach monitoring station recorded one exceedance of federal standards, and 15 exceedances of state standards for ozone. No second or third stage episodes were called in Southeast Los Angeles County during the past several years.

Carbon Monoxide

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced through the incomplete combustion of fossil fuels. Automobiles are the primary source, although various industrial processes also produce CO emissions. CO does not irritate the respiratory tract; it passes through the lungs directly to the blood stream and deprives sensitive tissues of oxygen.

TABLE 3

SOUTHEAST LOS ANGELES COUNTY
AMBIENT AIR QUALITY SUMMARY, 1991
(Days Standards Were Exceeded and Maximum Concentrations)

POLLUTANT	STANDARD	LONG BEACH	WHITTIER	PICO RIVERA	LYNWOOD
Ozone	1-Hour > 0.09 ppm	4.0	59.0	86.0	20.0
	1-Hour > 0.12 ppm	0.0	23.0	48.0	1.0
	Max. 1-Hour Conc. (ppm)	0.11	0.19	0.26	0.16
Carbon Monoxide	1-Hour > 20. ppm	0.0	0.0	0.0	4.0
	8-Hour > 9.1 ppm	1.0	0.0	1.0	41.0
	Max. 1-Hour Conc. (ppm)	14.0	13.0	11.0	30.0
	Max. 8-Hour Conc. (ppm)	9.3	7.5	9.1	17.4
Nitrogen Dioxide	1-Hour > 0.25 ppm	2.0	0.0	0.0	2.0
	Max. 1-Hour Conc. (ppm)	0.28	0.22	0.25	0.26
Respirable Particulates (PM_{10})	24-Hour > 50 ug/m3	11.0*	NM	NM	NM
	24-Hour > 150 ug/m3	0.0*	NM	NM	NM
	Max. 24-Hour Conc. (ug/m3)	92.0*	NM	NM	NM

*Data presented is valid, but incomplete.
NM = Not measured at this station.

Source: California Air Resources Board Annual Summary of 1991 Air Quality Data

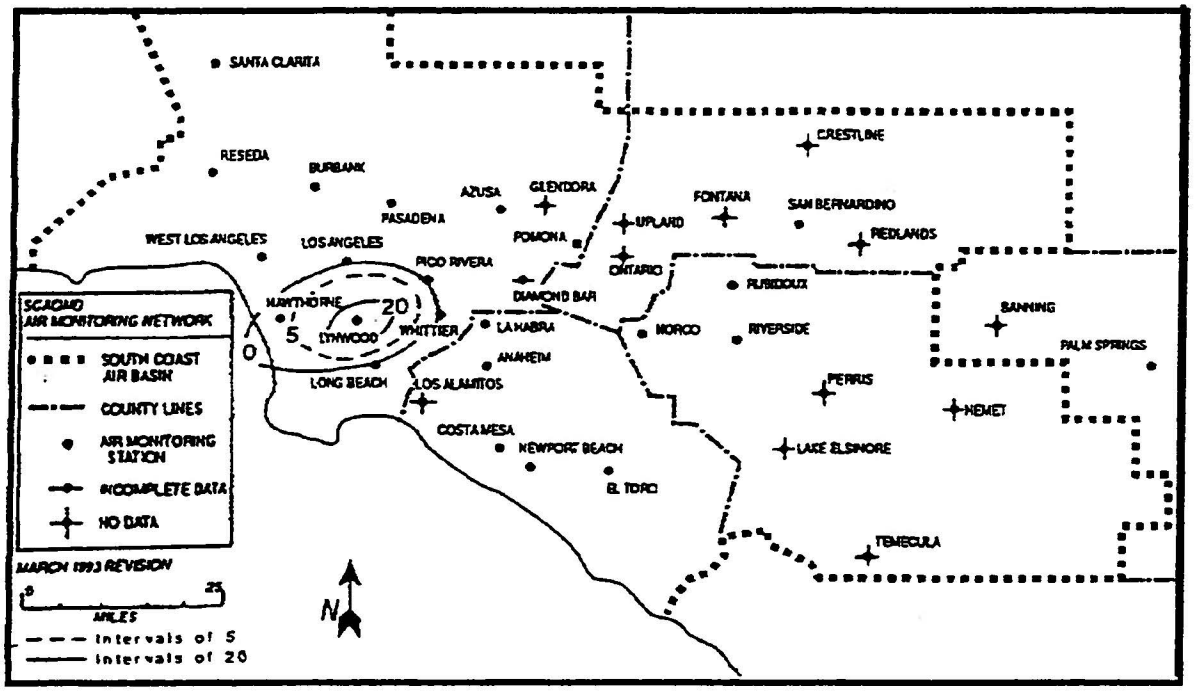
Whereas ozone is a regional pollutant with sources distant and upwind from their ultimate location, primary pollutants such as carbon monoxide are a better indicator of any change in pollutant emission distributions within a subregion. Ambient air quality standards for CO are most frequently exceeded in the winter due to weather patterns that inhibit the vertical dispersion of pollutants. However, because nocturnal winds are offshore when CO accumulates, inland communities generally have lower CO levels than along the ocean. The predominant factor for CO levels is proximity to automobile sources since on-road motor vehicles account for approximately ninety-eight percent of basin-wide CO emissions.

In 1992, Los Angeles County recorded more exceedances of the federal carbon monoxide standard than any other area of the United States. Exceedances of the federal standard in 1993 were limited to coastal/central Los Angeles County. Of the twenty-four monitoring locations for carbon monoxide, two locations recorded exceedances of federal and state 8-hour standards. The Long Beach station did not record any carbon monoxide exceedances in 311 days of monitoring in 1993.

TABLE 4
CARBON MONOXIDE:
DAYS 8-HOUR CONCENTRATION EXCEEDED

LOCATION	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Long Beach	3	6	7	4	6	5	1	2	2	1	1
Whittier	9	8	6	1	4	0	1	0	0	0	0
Pico Rivera	7	7	4	0	5	1	2	3	2	2	1
Lynwood	53	54	34	51	35	43	47	57	61	44	41

FIG. 5. CARBON MONOXIDE: NUMBER OF DAYS EXCEEDING FEDERAL STANDARD



IN 1993 (1-HOUR AVERAGE CONCENTRATION GREATER THAN 0.25 PPM)

Although air quality is improving, the combination of growing traffic volumes at lower speeds has generally offset the advantages of a cleaner vehicle fleet as mandated by state law. Table 5 shows the average daily maximum CO concentration (ppm) for 1982-86 compared to the 1987-90 period.

TABLE 5
AVERAGE DAILY CARBON MONOXIDE CONCENTRATION COMPARISON

	LONG BEACH	WHITTIER	PICO RIVERA	LYNWOOD
1982-86	4.13	4.34	3.97	6.65
1987-90	3.62	3.82	4.05	7.07
Percent Change	-12.3	-12.0	+2.0	+6.3

Source: SCAQMD, Summary of 1981 through 1991 air quality data.

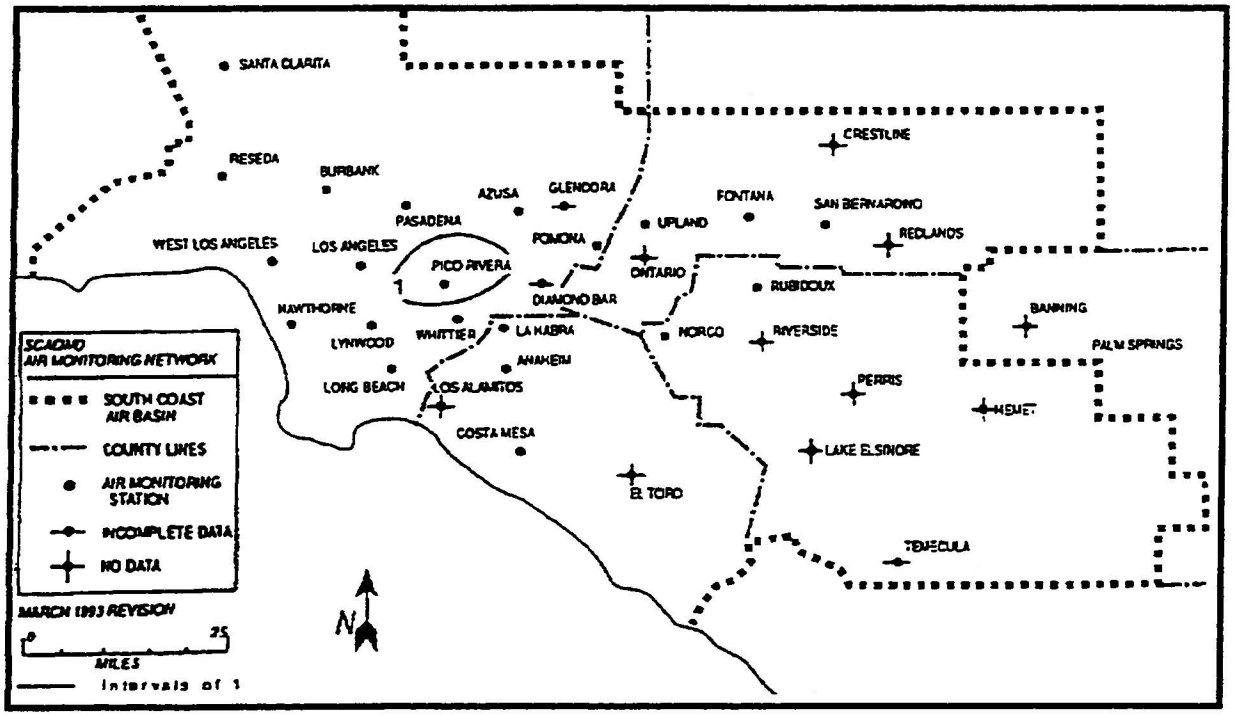


FIG. 6. NITROGEN DIOXIDE: NUMBER OF DAYS EXCEEDING STATE STANDARD IN 1993 (1-HOUR AVERAGE CONCENTRATION GREATER THAN 0.25 PPM)

Nitrogen Oxides (NO_x)

Nitrogen dioxide, a reddish-brown gas (NO_2), and nitric oxide (NO), a colorless, odorless gas, are formed from fuel combustion under high temperature and pressure. The compounds are referred to as nitrogen oxides or NO_x. NO_x is an important air pollutant in the region because it is a primary receptor of ultraviolet light, which initiates the reactions producing photochemical smog.

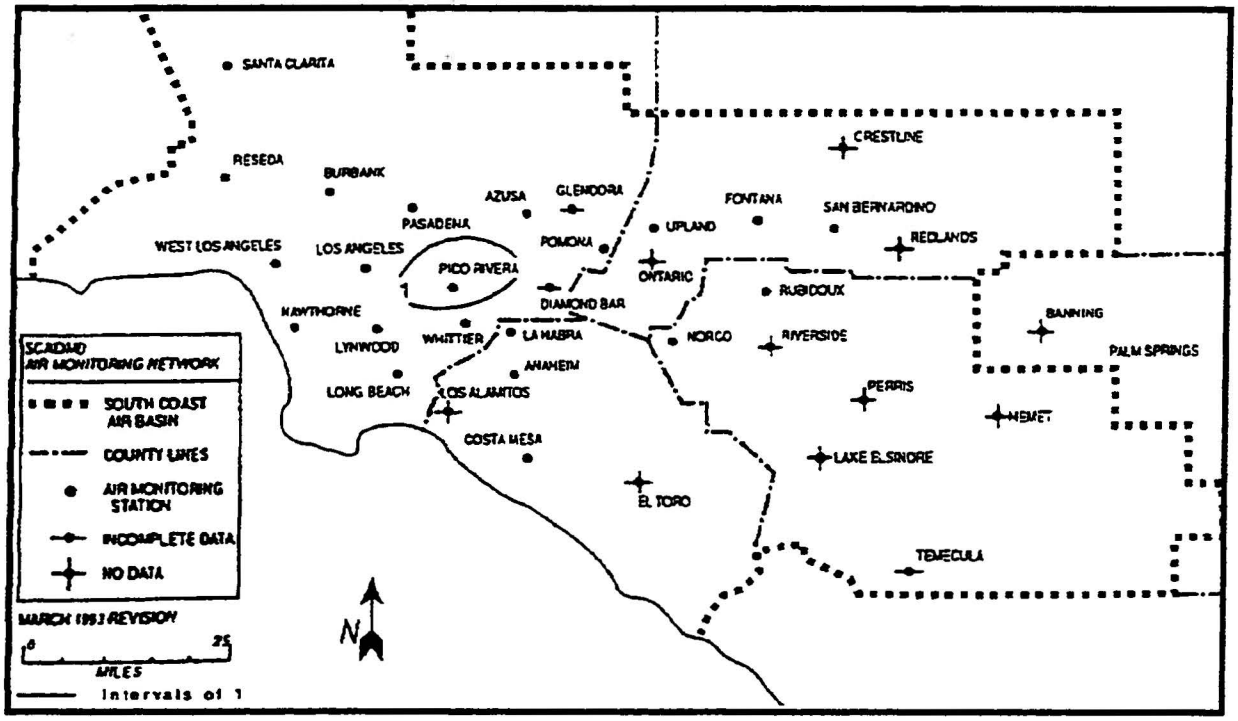


FIG. 7. PM10: 1993 ANNUAL AVERAGE CONCENTRATIONS COMPARED TO FEDERAL STANDARD (AVERAGE ARITHMETIC MEAN CONCENTRATION GREATER THAN 50 mg/m^3)

Concentrations of nitrogen dioxide decreased over the period between 1976 and 1993. By 1991, exceedances of the federal standard were limited to one location in Los Angeles County, the only county in the country which still did not meet the federal nitrogen dioxide standard. In 1992 and 1993, no basin location exceeded the federal standard; however, the state standard continued to be exceeded.

The Long Beach air quality monitoring station is located in North Long Beach. Additional monitoring stations would be necessary in order to track conditions in specific subareas of the city. Downtown Long Beach and the City's west side are more directly impacted by particulate emissions relating to the activities at the Ports of Los Angeles and Long Beach. Particulate emissions can be the result of diesel trucks, ship engine exhaust, train engine exhaust, truck and car tire wear, entrained roadway dust, and the movement and storage of products such as coal and petroleum coke.

PM10

In 1993, the federal standards for fine particles (PM10) were exceeded in many areas of the basin, and the more stringent state standards were exceeded in most areas.

Suspended particulate matter in the air has been associated with exacerbation of symptoms in people with respiratory illnesses, and in children, who may experience a decline in lung function.

Concentrations averaged lowest near the coast and highest in the inland valleys. At the Long Beach monitoring station, 19.7 percent of the samples taken in 1993 exceeded state standards. There were no samples that violated federal standards.

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Sulfur Dioxide and Sulfates

Sulfur dioxide can cause broncho-constriction with symptoms such as shortness of breath and chest tightness during exercise. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions in emissions of sulfur oxides are needed to attain compliance with standards for other pollutants, such as sulfates and PM_{10}. Sulfur dioxide concentrations did not exceed federal or state standards in 1993.

In 1993, no Basin locations exceeded the state sulfates standard. Sulfate concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of sulfur dioxide and limits on the sulfur content of fuels.

Lead

Lead concentrations once exceeded the state and federal standards by a wide margin, but have not exceeded state or federal standards at any regular monitoring station since 1982. Special monitoring sites immediately downwind of sources identified very localized violations of the state standard in 1993. Lead emissions can impair blood formation and nerve conduction.

Visibility

The effect of air pollution on visibility is not limited to simply reducing the distance a person can see, but also includes negative aesthetic impacts on the color, form, and contrast of the scene being viewed. In 1993, the state visibility standard was violated by a significant margin. Visibility data were obtained for two locations in 1993, both of which violated the standard.

C. POLLUTANT SOURCES AND EFFECTS

Local Sources of Air Contaminants

Two general sources of air pollutants contribute to decreased air quality in the study area and the Basin as a whole, mobile sources and stationary sources. Stationary source emissions include those from point and area sources. A point source has one or more permitted pieces of equipment in a fixed, identified location (i.e., power plants, refinery boilers, etc.). Area sources consist of numerous small facilities (e.g., gasoline-dispensing facilities), pieces of equipment (e.g., residential water heaters), or other sources of emissions (e.g., architectural coatings), which are distributed across the region and whose emissions may be calculated using socio-economic data. Mobile sources are subdivided into "on-road vehicles" and "other mobile sources." The former includes automobiles, trucks, and motorcycles, while the latter includes trains, ships, aircraft, and mobile equipment.

Stationary source emissions result primarily from the combustion of fuels, evaporation of solvents or fuels, and processing of materials. The SCAQMD has identified almost one-thousand major source facilities within the Basin that generate twenty-five tons or more per year. These stationary sources include automotive services, dry cleaners, hospitals, waste management facilities, and industrial/manufacturing plants. Products manufactured include medical devices, home furnishings, business forms, semiconductors, and power generators.

On-road mobile sources generate a substantial amount of air pollution within the study area. Motor vehicle emissions generally decrease with increasing speeds. Therefore, the highest levels of mobile emissions are found near congested intersections.

As a percentage of regional emissions, on-road mobile sources currently contribute 41 percent of the ROG, 61 percent of the NO_x, and 88 percent of the CO on a daily basis as shown in Figure 6. The emissions relate to 51 percent of the ozone precursor emissions. In comparison, stationary sources contribute 19 percent of the ROG, 17 percent of the NO_x and one percent of the CO emissions. This constitutes 18 percent of the regional ozone precursor emissions.

The majority of control measures for off-road mobile sources focus on the EPA adoption of nationwide emission standards. For example, control measures proposing emission standards for new aircraft engines, new and rebuilt locomotive engines, diesel powered off-road industrial equipment and some types of industrial equipment, all fall to the EPA. A control measure proposing nationwide emission standards implemented by the U.S. EPA in conjunction with international standards, is also the most viable approach for reducing marine vessel emissions since many of these vessels are not based in California or the United States.

Effects of Air Pollution

The California Air Resource Board (ARB) has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over sixty-five years of age; children under fourteen years; athletes during athletic exercise; and people with cardiovascular and chronic respiratory diseases, such as asthma, emphysema, and bronchitis. These "sensitive receptors" represent over fifty percent of the total California population.

After exposure to air pollution, minor symptoms such as wheezing and sore throat begin to subside and eventually disappear. This occurrence has been viewed by some as an indication that the effects of exposure to air pollution are reversible and harmless. Recent studies, however, showed that minor responses to air pollution may be warnings of tissue injury that develops over a lifetime of repeated exposures.

In a 20-year study conducted by scientists at Loma Linda University in California , smog was recently linked to increased cancer risks, particularly among women. Men and women living in the Los Angeles Basin, the smoggiest in the nation, have more than twice the risk of getting lung cancer because of ozone pollution. The cancer study tracked 6,000 non-smoking people for a six year period. Two-thirds lived in the Los Angeles Basin, while the remainder was a control group living in less smoggy areas across the state. The study concluded that those living in the smoggiest areas had the highest rates of cancer.

Air pollution poses the greatest threat to people who already suffer from respiratory or heart diseases. That includes angina, emphysema, bronchitis and asthma. Demonstrated effects of specific air contaminants on health are briefly summarized below.

Ozone

The young and elderly, people that are predisposed to lung infections, and those who have an infection or immune system problem are most likely to be harmed by high levels of ozone. It is advisable for those who are most susceptible to stay indoors during ozone episodes. Those not in either of these categories are recommended to avoid exercise during ozone periods, particularly when combined with high temperatures.

The common effects of ozone are:

- Coughing, wheezing, chest pain or tightness, dry throat, headache, or nausea
- Shortness of breath or pain during deep breaths
- Lung damage
- Reduced resistance to infection
- Tired feeling
- Impaired athletic performance
- Linkage to increased cancer rates in women.

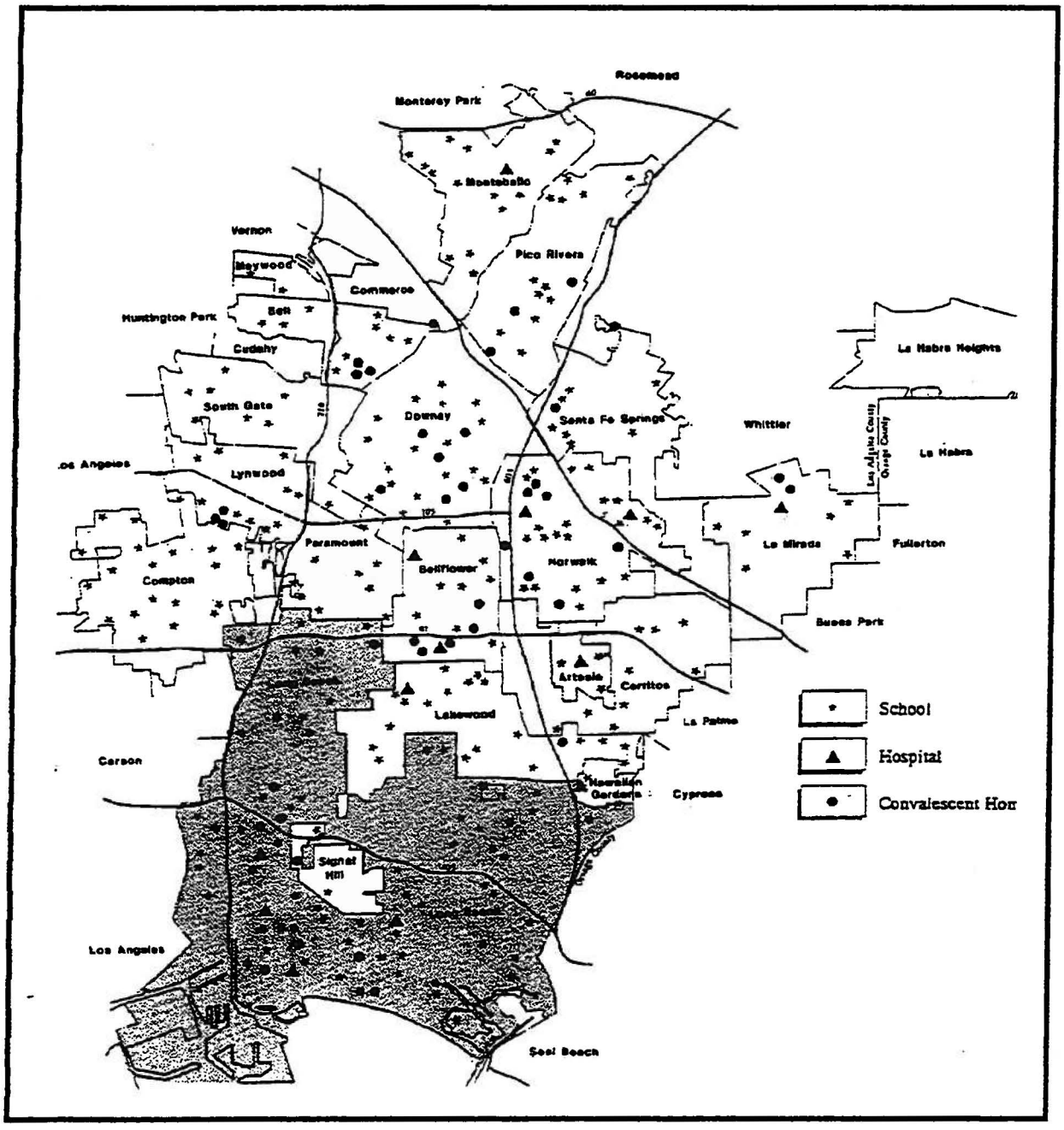

FIG. 8. SENSITIVE RECEPTOR LOCATIONS, SOUTHEAST LOS ANGELES COUNTY

Carbon Monoxide

Individuals with deficient blood supply to the heart are more susceptible to the adverse effects of CO exposure. Exposure to carbon monoxide particularly endangers people with coronary artery disease, anemia or abnormal hemoglobin, fetuses or young infants, or people taking certain medicines, drinking alcoholic beverages or visiting high altitudes.

Carbon monoxide can cause:

- Reduced vigilance, visual perception, and manual dexterity
- Reduced exercise, learning, and driving ability
- More chest pain in angina patients
- Tired feeling

A nationwide study published in October, 1995, linked carbon monoxide to a rise of nearly 40 percent in cases of congestive heart failure among elderly Los Angeles County residents, on days when the air pollution reached peak levels (*Los Angeles Times*). Reduction in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO.

Particulates

Fine particles (PM_{10}) in the air may enter the lungs and cause breathing problems or pain, and potential lung damage. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life-span, and the possibility of an increased incidence of cancer. A growing consensus exists among the scientific community that the fine fraction of PM_{10} is relatively more toxic than the coarse fraction, and is responsible for the majority of PM_{10} effects observed. The EPA has recommended additional $PM_{2.5}$ National Ambient Air Quality Standards.

Nitrogen Dioxide

Populations-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children, is associated with long-term exposures to NO_2. In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possible due to the observed changes in cells involved in maintaining immune functions.

Sensitive Receptors

Local governments have the responsibility for determining the type of land uses and densities of use within jurisdictional boundaries. They also must insure land use

compatibility between air pollutant generators and new sources of sensitive receptors or appropriate locations for new stationary sources. The District establishes criteria for analyzing air quality impacts at sensitive receptor locations and developing mitigation to reduce impacts to insignificant levels. The local government, in turn, uses District criteria to assist in making land use decisions. The City of Long Beach identifies sensitive receptors through the environmental review process.

Figure 8 identifies the existing sensitive receptors within the study area. The sensitive receptors depicted include approximately 231 schools, 15 hospitals, and 40 convalescent homes. Residential areas, also considered sensitive, are scattered throughout Southeast Los Angeles County.

Sensitive receptors are especially affected by air pollution in areas where major sources (industry, freeway, etc.) are located upwind. The term "hotspot" has been utilized to identify localized areas of high pollutant levels proximate to major sources. As emission reductions occur at these source locations, the levels of air contaminants at the sensitive receptor will also be reduced.

D. TOXIC AIR POLLUTANTS

Toxic air pollutants are often termed "non-criteria" because ambient air standards have not been established for them. The effects of toxic pollutants tend to be local rather than regional, and they may cause or contribute to an increase in mortality or an increase in serious illness, or may pose a present or potential hazard to human health.

The regulatory approach used in controlling toxic air pollutant levels relies on a quantitative risk assessment process to determine allowable emissions from the source, rather than on ambient air concentrations. For carcinogenic air pollutants, there is no safe concentration in the atmosphere. Local concentrations can pose a significant health risk and are termed "toxic hot spots."

E. BENEFITS FROM MEETING AIR QUALITY STANDARDS

The purpose of the 1991, 1994 and 1997 Air Quality Management Plans for the South Coast Air Basin (SCAB) is to bring the Basin into compliance with the National Ambient Air Quality Standards and to meet California Clean Air Act Requirements. Since the basin exceeds ambient air quality standards on approximately seventy percent of the days, health benefits and others related to agriculture, visibility, building materials, traffic congestion and energy conservation would accrue through implementation of the AQMP. The following discussion focuses on the expected benefits through the implementation of measures to attain the NAAQS.

Health Benefits

Significant health benefits would result from better regional air quality. In the Southeast Los Angeles County area where severe exceedances of CO and NO_x occur, decreases in pollutant emissions are expected to reduce respiratory irritation and distress while increasing workers' productivity. It has been determined that achieving NAAQS for ozone and PM_{10} throughout the SCAB would result in a health benefit valued at $9.8 billion in 1990 dollars. This estimate was calculated based on the number of ozone related symptom occurrences (including cough, headache, eye irritation, sore throat, and chest congestion) and premature deaths attributed to PM_{10} pollution. The study showed that about one sixth of the ozone related coughs, headaches, sore throat, and chest congestion, and about one twelfth of the eye irritation avoided would be in Los Angeles County. PM_{10} related deaths were not discussed on an individual county basis.

A study released in May, 1996 by the Natural Resources Defense Council estimated that 5,873 people in the Los Angeles-Long Beach area are dying annually from breathing particulates. Particulates were blamed for shortening the lives of thousands of people in cities across the county by one to three years, with the greatest impacts affecting the elderly and people afflicted with asthma, angina, pneumonia or other lung and heart ailments. The six urban areas with the most severe particulate pollution were (all in California): Visalia, Riverside-San Bernardino, Bakersfield, Fresno, Stockton, and Los Angeles-Long Beach. The Anaheim-Santa Ana area ranked 12th worst in the nation. (*LA Times*, May 9, 1996)

Since carbon monoxide concentrations can vary greatly from site to site, studies of this pollutant would not necessarily be able to specify carbon monoxide (CO) exposures experienced by individuals. For example, a resident of Long Beach may work in Lynwood, thereby spending one third of his day in higher CO concentrations. As with nitrogen dioxide, a lack of data may hinder efforts to quantify benefits related to reductions of this pollutant. Since substantial concentrations of CO and NO_2 are present in Southeast Los Angeles County, however, a reduction in local emissions of this pollutant should result in increased learning potential and productivity and resistance to infection within sensitive populations.

Agricultural Benefits

Ozone damage has been quantitatively assessed for certain crops, including grapes, oranges, lemons, limes, beans, corn, melons, potatoes, spinach, tomatoes, turnips, cotton, grass hay, alfalfa, wheat, avocados, and grapefruits. Meeting federal ozone standards by the year 2010 could lead to approximately $0.7 million (1987 dollars) in increased yields in Los Angeles County and $88.1 million Basin-wide. Several other categories of crops and decorative plants have been demonstrated to visibly improve when ozone levels are reduced; however, quantitative estimates of these improvements are not yet

available. In addition, unquantified benefits to livestock production, as well as wildlife and the natural environment, are also likely.

Visibility Benefits

The haze in the air above the Los Angeles area results from ozone, NO_x and particulates. The NO_x levels in particular, result in the reddish-brown color common to the Los Angeles skyline. The SCAQMD has analyzed visibility benefits of air quality improvement using the public's willingness to pay as estimated through housing prices. This study determined that Los Angeles County would experience a benefit of approximately $1,478 million through the implementation of Tier I controls identified in the 1991 AQMP, and approximately $250 million additional benefit through the implementation of Tier II controls.

Materials Benefits

Man-made materials can also be damaged by air pollutants. Ozone and sulfur dioxide have been linked to premature paint erosion, metal deterioration, and paint soiling on stationary surfaces. Damage also occurs to surfaces such as glass, concrete, brick, rubber, and tile. In the 1960s and 1970s when ozone reached its highest local levels, rubber on tires, around windows, and on buildings was notably oxidized, sharply decreasing the lifespan of these items. The benefits of reduced damage to these materials that would occur from reducing air pollutant concentrations have not yet been quantified.

Traffic Congestion Relief

As measures are enacted to reduce pollutant emissions from motor vehicles, vehicle trips and vehicle miles traveled should correspondingly decrease. Especially during peak hour conditions, these reductions will decrease congestion and increase average vehicle speeds on the regional transportation network. A SCAQMD study has estimated that compliance with SCAG's transportation control measures will result in $127 million (in 1987 dollars) of benefits in congestion relief throughout the South Coast Air Basin by the year 2010. This estimate is based on a savings of 14.6 million vehicle hours traveled and 65.2 million vehicle miles traveled, and includes both the value of time and motor vehicle maintenance and gas savings.

INTERGOVERNMENTAL REQUIREMENTS

INTER-GOVERNMENTAL REQUIREMENTS

A. Requirement for Action

The quality of the air in the Los Angeles area had deteriorated so significantly by the end of World War II, that the hospitalization and premature deaths of thousands of Southern California residents was attributed to the ozone concentrations from severe inversion patterns. The first Air Pollution Control District was created by the County Board of Supervisors in 1946. Since then, multiple agencies at the federal, state, regional, district, and local level have devoted significant efforts to the regulation of air pollution and the improvement of air quality in Southern California.

Federal Clean Air Act

The first Federal Clean Air Act (FCAA or CAA) was adopted in 1955 in response to worsening air quality in the nation's cities. While the Air Pollution Control District created almost a decade earlier had focused on the visible soot, smoke, and dustfall from industry, by the mid-1950s the automobile was also recognized as a major contributor to air pollution. The Clean Air Act was updated in 1977, 1987, and in 1990, and identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and attainment, and incorporates more stringent sanctions for failure to attain or to meet interim milestones.

The U.S. Environmental Protection Agency (EPA) is responsible for ensuring that air quality requirements are met. Review and approval of State Implementation Plans (SIPs), adoption of rules and regulations, and promulgation of national standards are all within EPA's purview.

Under the Clean Air Act, the SIP is the means by which a state monitors, controls, maintains, and enforces compliance with the National Ambient Air Quality Standards, or NAAQS. The SIP is intended to set realistic numerical goals for each emissions sector and enforceable measures to attain them with input from those responsible for development of emission reduction plans, as well as implementation of those plans.

The EPA reviews plans from each state that must demonstrate in turn how each region of the state will achieve the federal air quality standards. The Clean Air Act requires the EPA to implement its own measures, or Federal Implementation Plan (FIP), in regions failing to demonstrate attainment of clean air by certain target dates. This lack of attainment occurred in the Southern California region in 1982. Continuing battles between EPA, environmentalists, and industries in Southern California delayed the adoption of a final FIP.

On February 14, 1994, the EPA Administrator signed the draft FIP for the South Coast region. The FIP was prepared by the EPA under a court order that required EPA to promulgate a plan to demonstrate compliance with the Clean Air Act's ozone and carbon monoxide standards.

The FIP was re-released in February of 1995, in a somewhat diluted form. The EPA had dropped many controversial requirements, including: the proposed fees on ships that dock at the Ports of Los Angeles and Long Beach, a one-stop limit on out-of-state trucks in the Los Angeles Basin, a thirty-five to forty-five percent reduction in emissions from commercial airlines, a mandate that Ventura County and Sacramento industries cut emissions forty-five percent, and weekly "no-drive days" on Sacramento highways. Several other sources of pollution, including small aircraft, boats, and dairy farms, were not required to address air pollution because officials could not develop or agree upon economic ways to curb their emissions.

The federal government rescinded the FIP in the Spring of 1995, effectively restricting the EPA's review authority regarding air quality measures and attainment demonstration methods to the SIP. The EPA is currently reviewing the SIP, which includes the Air Quality Management Plans from each of the Air Districts. In light of new epidemiological and other health data, the EPA is currently reevaluating the federal standards for particulate matter and ozone. It is expected that new standards will be promulgated in 1997.

Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) has substantially increased the coordination requirements for transportation and air quality decision making. The federal Clean Air Act and ISTEA provide complementary approaches to decreasing transportation-related emission. The CAA and its amendments bring transportation decision-making into the context of achieving and maintaining cleaner air. It establishes air quality requirements and milestones, mandates further improvements to vehicles and fuels, requires greater integration of transportation and air quality planning procedures, and establishes penalties for failing to meet its requirements. The ISTEA, on the other hand, provides increased funding levels and the flexibility to use the funding to improve air quality through the development of a balanced transportation program.

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program is an innovative $6 billion program established by ISTEA, which allocates funds to states that may use them for transportation control measures (TCMs) and programs designed to help states implement their transportation/air quality plan. State programs may be eligible to receive CMAQ funds for conversion of public fleet vehicles to alternative fuels, including electricity.

Energy Policy Act of 1992

The Energy Policy Act of 1992 imposes mandatory requirements for the acquisition of alternatively-fueled vehicles (AFVs) by federal fleets, state government fleets, and fleets operated by "providers" of alternative fuels. The Energy Policy Act also provides tax incentives for the purchase of electric vehicles (EVs) and the installation of refueling property.

California Clean Air Act

The California Clean Air Act (CCAA), adopted in 1988, requires each region of the state to adopt a plan to attain state standards for clean air, that are generally higher than federal standards. The California Clean Air Act is generally more stringent than the corresponding National Ambient Air Quality Standards (NAAQS) adopted in the 1990 federal Clean Air Act Amendments, and also incorporates additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

The California Air Resources Board (ARB) is responsible for preparing the State air quality plan, which consists of a compilation of regional air quality plans. The South Coast Air Quality Management District (SCAQMD) and Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP) for Southern California. The goal of the AQMP is to bring the region into compliance with federal clean air standards by the end of the year 2007.

The Air Resources Board regulates mobile emissions and oversees the activities of county Air Pollution Control Districts (APCDs) and regional Air Quality Management Districts (AQMDs) in California. The Air Resources Board has designated six basins within the state based on similar meteorological and geographic conditions. The City of Long Beach is located within the South Coast Air Basin (SCAB), which is within the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The latter entity was created by the California Legislature in 1976, for the purpose of promoting comprehensive air pollution control within the South Coast Air Basin.

The Board also reviews regional plans for compliance with state law, in the areas of toxic air emissions, global warming, and ozone depletion in addition to clean air standards. The Air Resources Board is also responsible for overseeing statewide vehicle emission standards, fuel specifications, and standards for consumer products such as gasoline lawnmowers, paints, etc. The ARB had required that, beginning in 1998, two percent (approximately 20,000) of the vehicles offered for sale in the state by manufacturers with volumes over 35,000 (the seven largest) be Zero Emission Vehicles (ZEVs). Currently, only Electric Vehicles (EVs) qualify as zero-emission. The ZEV requirement was scheduled to apply to ten percent of all vehicles offered for sale in the

state by 2003. The short-term requirements for Zero Emission Vehicles have since been postponed, but the ten percent standard by 2003 remains in effect.

B. Intergovernmental responsibilities

Regional Agencies

The South Coast Air Quality Management District prepares the Air Quality Management Plan (AQMP) for the region in conjunction with SCAG. It also implements regulations to achieve federal and state clean air standards, maintains a network of over thirty air monitoring stations, keeps the public informed of pollution levels and potential health effects, and responds to air pollution nuisances identified through citizen complaints. The District is also noted for its important role in the research and assessment of new technologies. Although the SCAQMD was originally authorized to regulate only stationary emission sources, in 1978 the state granted the District the ability to regulate mobile and area sources of air pollution as well. For example, Rule 1501, the District's first mobile source regulation, required employers of 100 or more persons to offer an incentive rideshare program to reduce commute trips, thereby reducing vehicle emissions.

The state legislature recently replaced Rule 1501 with Rule 2202 (SB 772). With this new rule, employers are required to submit an emission reduction plan as opposed to a trip reduction plan. Incentive rideshare programs are one of several options available to employers. Other choices include vehicle scrapping programs and remote sensing programs that identify gross polluting vehicles. The Air Quality Districts are currently refining the implementation of the new law.

The Clean Air Act requires that the plans, programs, and projects contained in regional transportation plans and improvement programs "conform" to the purpose of the SIP. Transportation plans and programs must ensure that the transportation sector contributes its planned share of emission reductions. If they fail to do so, either they must be modified or the SIP must be modified to offset the disparity in projected emissions. The Southern California Association of Governments determines conformity with national air quality standards, a function necessary for final project approval by the federal government or release of federal funds. SCAG also develops the Regional Transportation Improvement Program (RTIP), a seven-year multimodal program of regional transportation improvements for highways and transit, and prepares the Regional Mobility Element (RME) that serves as the federal and state-required long-range transportation plan for the six-county region through the year 2015.

The Metropolitan Transportation Authority (MTA) provides another layer of regional involvement in regional air quality through the regional Congestion Management Plan (CMP). The MTA implements a "deficiency" plan for eighty-eight local jurisdictions,

whereby congestion created by new development is required to be offset by congestion-reducing strategies, improvements or programs. Congestion relief is one of many strategies in the AQMP to attain healthful air in the region. For example, by reducing congestion, reactive organic gases and carbon monoxide from idling vehicles can be reduced. The majority of AQMP transportation control measures, however, are directed toward strategies that reduce miles traveled. The CMP focuses on the Level of Service of streets, whereas the AQMP emphasizes vehicle miles traveled, vehicle trips, increased vehicle occupancy rates, and emission reductions.

Air Resources Board

One of the most important functions of the Air Resources Board is the establishment of rules for motor vehicle fuels. The ARB has mandated that a minimum percent of cars sold by major manufacturers be exhaust-free, culminating in a minimum of 10 percent of annual sales by 2003. General Motors Corporation has announced that it will produce and market a sporty two-seat electric car called EV-1 for sale in the Fall of 1996. EV-1 will have a range of 70-90 miles between charges, and will be available for lease. Although manufacturers will market EVs to individual consumers, it's expected that most of the cars will first be used by fleet and transit operators, where routes are easy to predict. Some electric school buses are currently in service in the Santa Barbara school district, and other models which will be available will include vans, pickups, transit buses, and off-road vehicles. Continuing advances in battery technology, particularly with regard to range before requiring a recharge, will make electric vehicles more viable for consumers.

The Air Resources Board issued a rule in 1991 requiring California's ten oil companies to manufacture cleaner blends of gasoline. California refineries began producing the new gasoline on March 1, 1996, and service stations converted entirely by June 1, 1996. The new gasoline reformulation is expected to be twice as clean as the low-benzene gasoline required by the Environmental Protection Agency last year, and should remove 215 tons of hydrocarbons and nitrogen oxides from California skies. The combination of the two measures is predicted to reduce smog-causing gases from autos by fifteen percent, cut sulfur emissions by eighty percent, and lower the risk of human cancer posed by gasoline fumes by half.

Air Quality Management Plan (AQMP)

The purpose of the Air Quality Management Plan is to promote a comprehensive program which will result in compliance with all federal and state air quality standards. The AQMP sets forth programs requiring the cooperation of all levels of government, and each agency or jurisdiction has specific planning and implementation responsibilities.

The Federal Clean Air Act prohibits federal agencies, or the local Metropolitan Planning