Chapter 3

Statewide Trends and Forecasts -- Criteria Pollutants

Introduction
Emission Trends and Forecasts

The most current emissions data available are from 2002. Any data prior to this year are derived from historical emissions data. Future year data are forecasted from the 2002 base year and control measures reported through September 2002. Forecasts take into account emissions data, projected growth rates, and future control measures to calculate emissions in future years.

On a statewide basis, emissions of NO_x increased between 1975 and 1985, but are declining between 1985 and 2010. Emissions of ROG have decreased significantly between 1975 and 2010. In addition to being ozone precursors, both NO_x and ROG are secondary contributors to PM_{10} and $PM_{2.5}$. Direct PM_{10} emissions show a slight increase from 1975 to 1990, a slight decrease in 1995 and 2000, and then a slow increase after 2000. Directo $PM_{2.5}$ emissions show a slight decrease from 1975 to 2000 and a steady increase after 2000.

Statewide Emissions (tons/day, annual average)								
	1975	1980	1985	1990	1995	2000	2005	2010
NOx	4957	5130	5010	4971	4163	3595	3000	2496
ROG	6833	6467	5916	4512	3514	2857	2330	2096
PM_{10}	2175	2166	2210	2300	2141	2110	2141	2170
$PM_{2.5}$	875	848	831	853	772	761	773	780
CO	40729	37016	34929	29004	21626	16299	12786	10510

Table 3-1

Emissions of CO have decreased since 1985. The recent decrease in NO_x, ROG, and CO is occurring even with increases of VMT and population levels.

Statewide Population and VMT

Airborne pollutants result in large part from human activities, and growth generally has a negative impact on air quality. California is fortunate in that it boasts the world's most progressive emission controls. These controls have resulted in significant air quality improvements, despite substantial growth.

During 1982 through 2001, statewide peak 1-hour ozone values decreased 55 percent, and peak 8-hour carbon monoxide values dropped 54 percent. These air quality improvements occurred at the same time the State's population increased 40 percent and the average daily number of vehicle miles traveled (VMT) increased 97 percent. Ambient annual average PM_{10} values in the non-desert areas also show improvement: a 33 percent decrease from 1988 to 2001. While the air quality improvements are impressive, additional emission controls will be needed to offset future growth.

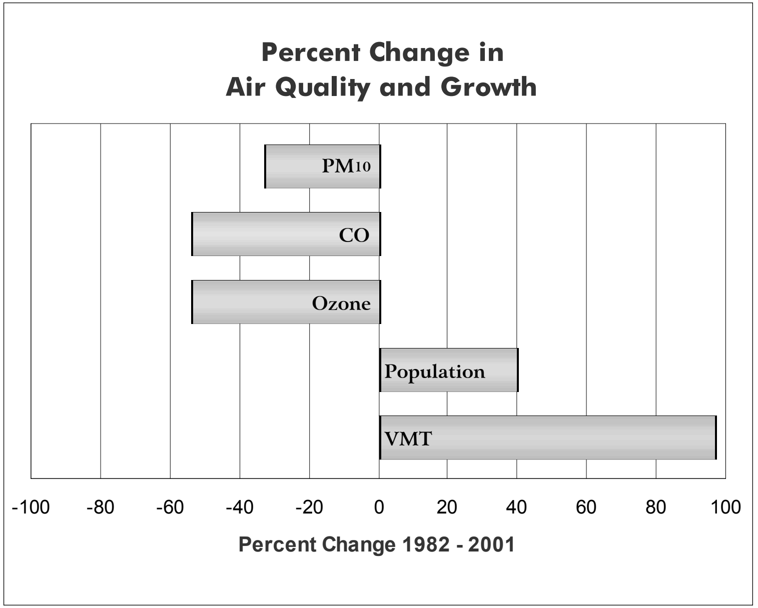

Figure 3-1

Ozone

Emission Trends and Forecasts - Ozone Precursors

NO_x Emission Trends and Forecasts

NO_x emission standards for on-road motor vehicles were introduced in 1971 and followed in later years by the implementation of more stringent standards and the introduction of three-way catalysts. NO_x emissions from on-road motor vehicles have declined by over 31 percent from 1990 to 2000, and NO_x emissions are projected to decrease by an additional 42 percent between 2000 and 2010. This has occurred as vehicles meeting more stringent emission standards enter the fleet, and all vehicles use cleaner burning gasoline and diesel fuel or alternative fuels. Stationary source NO_x emissions dropped by 40 percent between 1980 and 1995. This decrease has been largely due to a switch from fuel oil to natural gas, the implementation of combustion controls such as low-NO_x burners for boilers, and catalytic converters for both external and internal combustion stationary sources. State Implementation Plan (SIP) and conformity inventory forecasts may differ from the forecasts presented in this almanac. For additional information on these forecasts, please refer to the ARB SIP web page at *www.arb.ca.gov/planning/sip/sip.htm*.

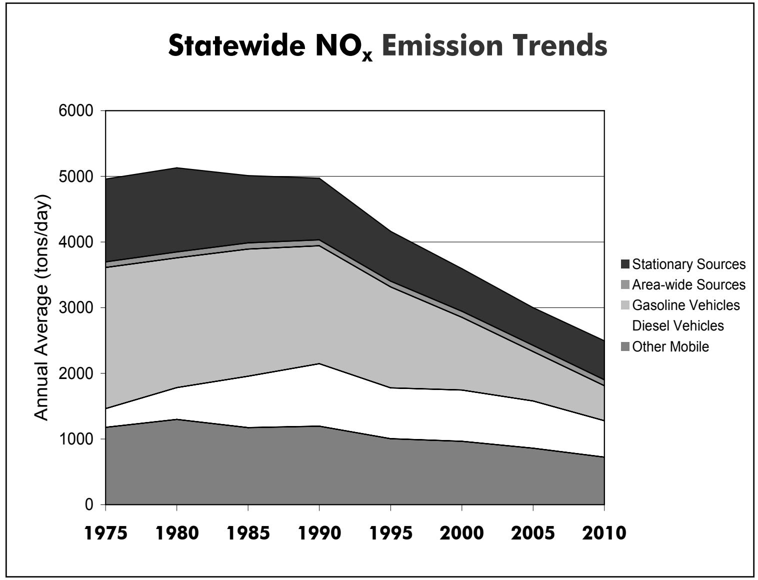

Figure 3-2

ROG Emission Trends and Forecasts

ROG emissions in California are projected to decrease by over 69 percent between 1975 and 2010, largely as a result of the State's on-road motor vehicle emission control program. This includes the use of improved evaporative emission control systems, computerized fuel injection, and engine management systems to meet increasingly stringent California emission standards, cleaner gasoline, and the Smog Check program. ROG emissions from other mobile sources are projected to decline between 1995 and 2010 as more stringent emission standards are adopted and implemented. Substantial reductions have also been obtained for area-wide sources through the vapor recovery program for service stations, bulk plants, and other fuel distribution operations. There are also on-going programs to reduce overall solvent ROG emissions from coatings, consumer products, cleaning and degreasing solvents, and other substances used within California. Again, State Implementation Plan (SIP) and conformity inventory forecasts may differ from the forecasts presented in this almanac. For additional information on these forecasts, please refer to the ARB SIP web page at *www.arb.ca.gov/planning/sip/sip.htm*.

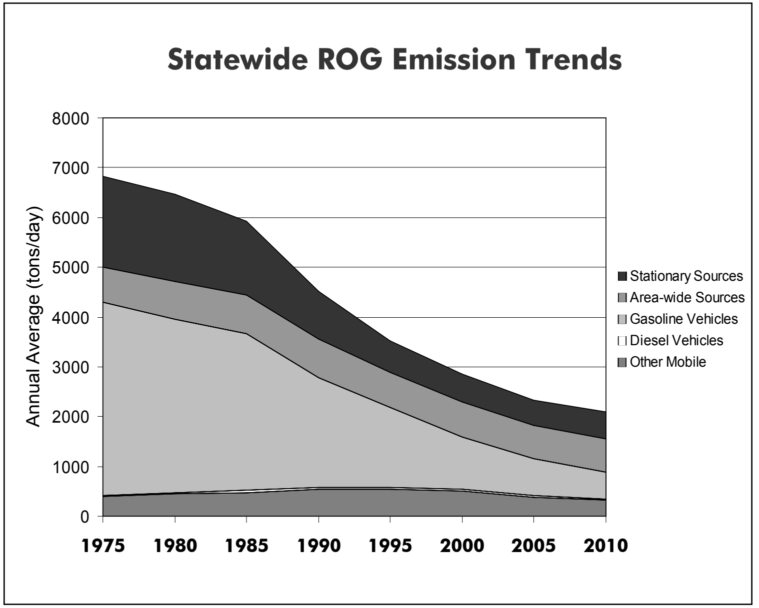

Figure 3-3

Emission Trends and Forecasts - Ozone Precursors

NOx Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***4957***	***5130***	***5010***	***4971***	***4163***	***3595***	***3000***	***2496***
Stationary Sources	1261	1282	1024	938	759	650	575	594
Area-wide Sources	85	90	93	90	89	92	94	90
On-Road Mobile	2435	2459	2721	2748	2311	1888	1470	1088
Gasoline Vehicles	2149	1975	1936	1797	1538	1108	753	533
Diesel Vehicles	286	484	784	951	774	780	717	555
Other Mobile	1177	1299	1173	1196	1004	966	860	724

ROG Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***6833***	***6467***	***5916***	***4512***	***3514***	***2857***	***2330***	***2096***
Stationary Sources	1833	1762	1480	954	631	556	514	546
Area-wide Sources	707	755	775	769	705	706	667	673
On-Road Mobile	3896	3506	3186	2254	1635	1092	767	553
Gasoline Vehicles	3880	3475	3138	2206	1598	1060	737	528
Diesel Vehicles	17	31	48	48	37	31	30	25
Other Mobile	396	445	475	534	543	503	382	324

Table 3-2

Statewide Air Quality - Ozone

Air quality, as it relates to ozone, has improved greatly in all areas of California over the last 20 years, despite significant growth. The statewide trend, which reflects values for the South Coast Air Basin, shows that the maximum peak 1-hour indicator declined 55 percent from 1982 to 2001. During this same time period, the statewide population grew by 40 percent and the number of vehicle miles traveled each day was up more than 97 percent. Motor vehicles are the largest source category of ozone precursor emissions, and reducing their emissions will continue to be the cornerstone of California's ozone control efforts. New vehicles must meet the ARB's low emission vehicle standards, which equate to about 95 percent fewer smog-forming emissions than vehicles produced in the 1970s. However, increases in population and driving are partially offsetting the benefits of cleaner vehicles. In addition to motor vehicle controls, the ARB is establishing controls for other sources of ozone precursor emissions, such as consumer products. The ARB and other agencies are also looking at new and more efficient ways of doing business and implementing incentive programs to improve air quality.

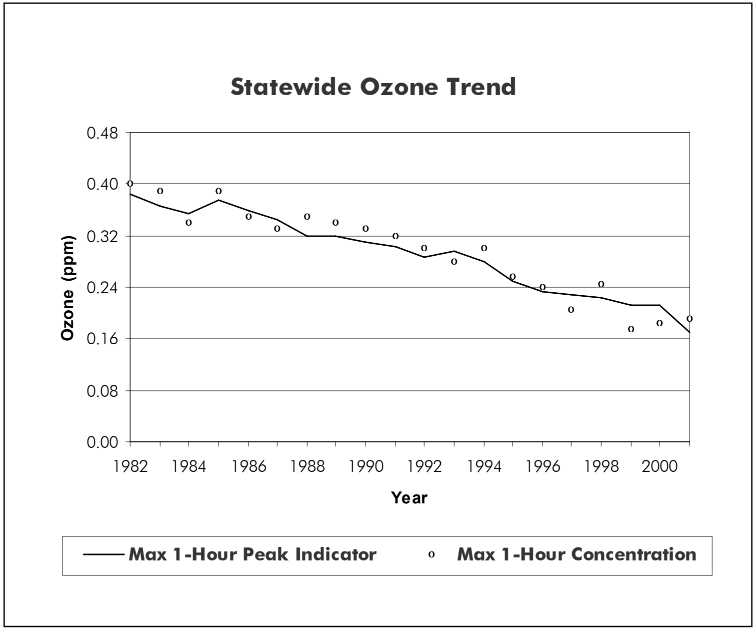

Figure 3-4

Population-Weighted Exposures Over the State Ozone Standard

There are a number of ways to look at how ozone levels have changed over the years. Though simple indicators are most commonly used, complex indicators can offer additional insight concerning air quality. One such indicator is the *population-weighted exposure* indicator. As used here, an "exposure" occurs when a person experiences a one-hour ozone concentration outdoors that is higher than 0.09 ppm, the level of the State standard. The population-weighted exposure indicator considers both the level and the duration of ozone concentrations above the State standard. The annual exposure is the sum of all the hourly exposures during the year and presents the result as an average per exposed person.

In contrast to the peak indicator, which provides an indication of the potential for acute adverse health impacts, the population-weighted exposure provides an indication of the potential for chronic adverse health impacts. For the purposes of computing the exposures in this almanac, individuals are presumed to have been exposed to concentrations measured by the ambient air quality monitoring network. However, daily activity patterns (for example, being inside a building or exercising outdoors) may diminish or increase exposures to some outdoor concentrations that exceed the State standard. While many indicators characterize air quality at an individual monitoring location, the exposure indicator provides an integrated regional perspective. For each hour, the calculations simultaneously consider ozone data from all of the monitors in a region. People living in areas where ozone exceeds the standard are then included in the population-weighted exposure for that hour.

The examples below show two simple exposure calculations. First, a measured ozone concentration of 0.11 ppm for one hour represents an exposure of 0.02 ppm-hours above the State ozone standard of 0.09 ppm:

$$(0.11 \text{ ppm} - 0.09 \text{ ppm}) \times 1 \text{ hour} = 0.02 \text{ ppm-hours}$$

Second, a measured concentration of 0.10 ppm for two hours also equals an exposure of 0.02 ppm-hours:

$$(0.10 \text{ ppm} - 0.09 \text{ ppm}) \times 2 \text{ hours} = 0.02 \text{ ppm-hours}$$

In contrast to these examples, when the concentration is equal to or below the level of the State standard of 0.09 ppm, the exposure is zero. These "zero" exposures are not included in the exposure calculations in this almanac because including the zero exposures dilutes the real impact of the ozone concentrations that are above the State standard and are, therefore, adversely affecting public health. In all cases, an exposure calculation that excludes the zero values will be higher than one incorporating concentrations at or below the level of the standard (areas of zero exposure).

The population-weighted exposures in Table 3-3 are listed for each year, from 1982 through 2001, for the five most populated areas of California: the South Coast Air Basin, the San Francisco Bay Area Air Basin, the San Joaquin Valley Air Basin, the San Diego Air Basin, and the Sacramento Metropolitan Area (the southern, urbanized portion of the Sacramento Valley Air Basin). While these areas do not encompass all of California's ozone nonattainment areas, they do include the major urban areas where the majority of the State's population lives.

The exposure values listed in Table 3-3 are presented in parts per million to be consistent with the units in which the State standard is expressed. In addition to the exposure values, Table 3-3 also lists the percent of the total population represented in the exposure value. The percent value reflects the percent of the total population in the area that was exposed to an ozone concentration above the level of the State standard for at least one hour during the year. Because the exposure result is an average, it may not accurately portray the exposure of any particular individual or sub-area. Some people in the region experience higher exposure while others experience lower exposure. Nevertheless, this method provides a reasonable approach for comparing exposures among various regions and for assessing trends in exposure reductions.

The calculations for the exposure indicators are based on all concentrations measured in the area that satisfy the specified data requirements. Exposures for the years 1982 through 1999 use census information for 1990, while exposures for the years 2000 and 2001 use census information for the year 2000. General details about the computational procedure can be found in the ARB publication entitled: "*Guidance for Using Air Quality-Related Indicators in Reporting Progress in Attaining the State Ambient Air Quality Standards*" (September 1993).

Ozone Exposures Over the State Standard: Population-Weighted (ppm-hours / person)																				
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
South Coast Air Basin																				
Exposure	31.94	40.60	35.97	36.89	34.68	30.18	33.24	29.21	21.88	22.24	21.96	17.82	18.77	13.19	10.59	6.46	4.97	2.07	2.80	3.38
% Population Represented*	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97%	100%	92%	66%	72%	71%	58%
San Francisco Bay Area Air Basin																				
Exposure	0.81	2.28	2.28	1.45	0.85	1.80	1.24	0.68	0.47	0.48	0.54	0.41	0.26	1.06	1.02	0.10	0.96	0.57	0.31	0.27
% Population Represented	57%	97%	100%	73%	46%	72%	73%	54%	41%	45%	50%	72%	40%	81%	60%	48%	34%	37%	11%	33%
San Joaquin Valley Air Basin																				
Exposure	8.22	5.95	7.59	8.45	10.66	11.07	9.93	7.64	5.72	6.49	5.89	6.41	6.48	6.12	6.90	3.73	6.55	4.45	4.64	4.71
% Population Represented	98%	97%	97%	97%	94%	98%	99%	96%	96%	96%	96%	99%	99%	99%	99%	99%	99%	99%	99%	99%
San Diego Air Basin																				
Exposure	7.22	10.04	6.97	8.27	5.24	5.65	7.44	7.34	6.50	3.97	3.34	2.75	2.28	2.41	1.19	0.83	1.91	0.60	0.52	0.69
% Population Represented	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	79%	100%	98%	100%	84%	70%	71%	95%
Sacramento Metropolitan Area																				
Exposure	2.29	2.32	3.12	2.88	2.57	3.20	4.23	1.83	2.15	2.46	2.41	1.08	1.76	2.19	1.84	0.52	1.95	1.41	0.80	0.95
% Population Represented	100%	94%	100%	93%	94%	100%	100%	100%	100%	99%	100%	100%	95%	100%	100%	99%	100%	100%	99%	100%

* *% Population Represented* is the percent of the total population in the area exposed to an ozone concentration above the level of the State standard for at least one hour during the year.

Table 3-3

Ozone Transport

Since 1989, the ARB staff has evaluated the impacts of the transport of ozone and ozone precursor emissions from upwind areas to the ozone concentrations in downwind areas. These analyses demonstrate that the air basin boundaries are not true boundaries of air masses. All urban areas are upwind contributors to their downwind neighbors with the exception of San Diego. Figure 3-5 shows the flow of pollutants throughout the State. The ozone problem in some rural areas is caused almost solely by transported pollutants. These areas, although designated as nonattainment, are not required to adopt an air quality plan because local control strategies in these areas would not be effective in reducing ozone concentrations. However, these areas are subject to many statewide control strategies, such as cleaner fuels and low emission vehicles. More detailed information about ozone transport is available on the web at: *www.arb.ca.gov/aqd/transport/transport.htm*.

Figure 3-5

Directly Emitted Particulate Matter (PM_{10})

Emission Trends and Forecasts - Directly Emitted PM_{10}

PM_{10} emissions increase from 1975 to 1990, then decrease slightly in 1995 and 2000, and slowly increase after 2000. PM_{10} emissions are dominated by area-wide sources. Emissions from paved road dust more than double between 1975 and 2000. Unpaved road dust emissions increase slightly, while other area-wide sources decrease slightly. The increase in emissions of unpaved and paved road dust are due to increases in vehicle miles traveled (VMT) over these roads. Exhaust emissions from diesel vehicles dropped by 45 percent from 1990 to 2000 due to more stringent emissions standards and the introduction of cleaner burning diesel fuel. PM_{10} emissions from stationary sources are expected to increase slightly in the future due to industrial growth.

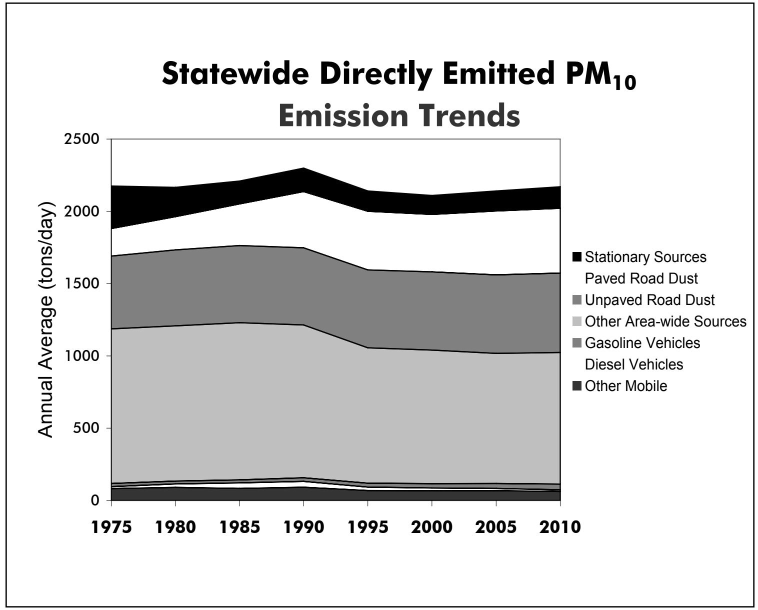

Figure 3-6

Emission Trends and Forecasts - Directly Emitted PM_{10}

Directly Emitted PM10 Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***2175***	***2166***	***2210***	***2300***	***2141***	***2110***	***2141***	***2170***
Stationary Sources	294	203	158	163	141	132	138	149
Area-wide Sources	1764	1829	1909	1980	1880	1862	1886	1909
Paved Road Dust	190	230	288	389	405	397	442	448
Unpaved Road Dust	504	525	533	534	539	541	543	550
Other Area-wide Sources	1070	1074	1087	1057	936	925	900	911
On-Road Mobile	36	43	60	66	51	48	49	50
Gasoline Vehicles	22	19	21	25	27	30	34	39
Diesel Vehicles	14	24	38	41	24	18	15	12
Other Mobile	82	90	83	91	69	68	68	63

Table 3-4

Directly Emitted Particulate Matter ($PM_{2.5}$)

Emission Trends and Forecasts - Directly Emitted $PM_{2.5}$

$PM_{2.5}$ emissions decrease from 1975 to 1985 as a result of reduced stationary source emissions. Emissions increase slightly between 1995 and 2010. $PM_{2.5}$ emissions are dominated by area-wide sources. Emissions from paved road dust almost double between 1975 and 2000. Unpaved road dust emissions increase slightly, while other area-wide sources decrease slightly. The increase in emissions of unpaved and paved road dust are due to increases in vehicle miles traveled (VMT) over these roads. Exhaust emissions from diesel vehicles dropped by 45 percent from 1990 to 2000 due to more stringent emissions standards and the introduction of cleaner burning diesel fuel. $PM_{2.5}$ emissions from stationary sources are expected to increase slightly in the future due to industrial growth.

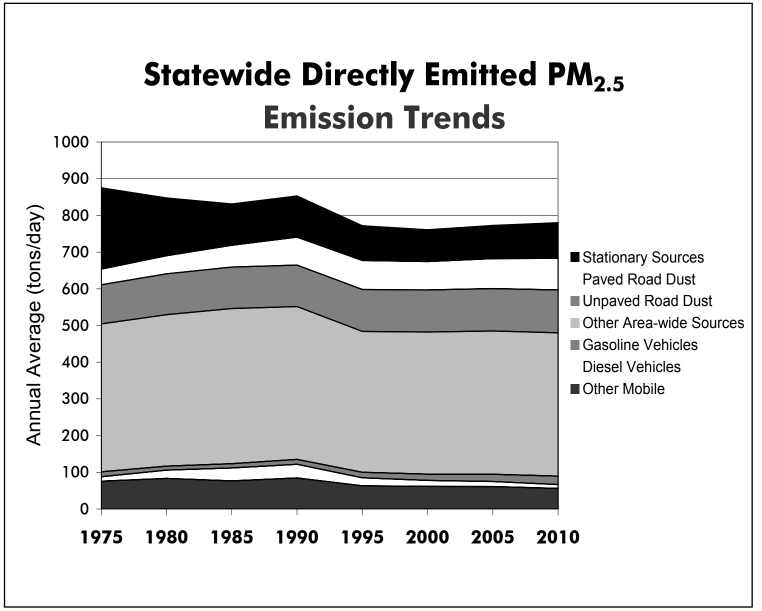

Figure 3-7

Emission Trends and Forecasts - Directly Emitted $PM_{2.5}$

Directly Emitted $PM_{2.5}$ Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***875***	***848***	***831***	***853***	***772***	***761***	***773***	***780***
Stationary Sources	222	157	113	112	95	86	90	97
Area-wide Sources	552	573	595	606	577	579	588	594
Paved Road Dust	43	49	59	76	79	77	82	86
Unpaved Road Dust	107	111	113	113	114	115	115	117
Other Area-wide Sources	403	413	423	417	384	387	391	391
On-Road Mobile	26	33	47	51	37	33	34	34
Gasoline Vehicles	13	11	12	13	15	17	20	23
Diesel Vehicles	12	22	35	37	22	16	14	11
Other Mobile	76	83	77	84	63	62	61	56

Table 3-5

Statewide Air Quality - PM_{10}

In contrast to ozone and carbon monoxide, PM_{10} concentrations do not relate as well to growth in population or vehicle usage, and high PM_{10} concentrations do not always occur in high population areas. Activities that contribute directly to high PM_{10} include wood burning, agricultural activities, and driving on unpaved roads. In addition, emissions from stationary sources and motor vehicles form secondary particles that contribute to PM_{10} in some areas. Figure 3-8 shows the maximum statewide annual average PM_{10} concentrations for a non-desert area. The trend line reflects the South Coast Air Basin. The line shows a fairly steady decline over the period, reflecting an overall decrease of about 33 percent. However, there is a great deal of variability, especially during the latter years. Much of this variability may be due to meteorology rather than changes in emissions. Several more years of data are needed before making any judgement about the direction of the trend. Currently, over 99 percent of Californians breathe air that violates the State PM_{10} standards during at least part of the year. As a result, particulate matter is commanding greater attention, and much effort will be needed to attain the standards for this pollutant.

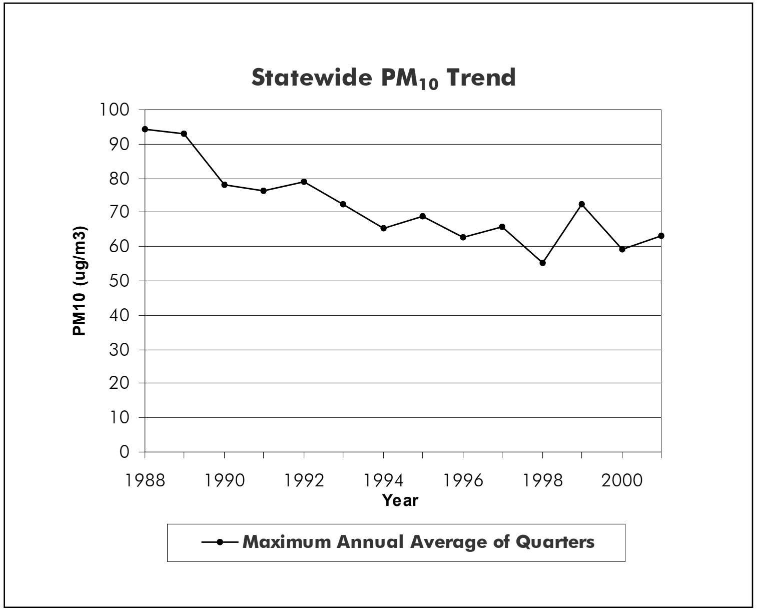

Figure 3-8

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Carbon Monoxide (CO)

Emission Trends and Forecasts - Carbon Monoxide

Since 1975, even though motor vehicle miles traveled (VMT) have continued to climb, the adoption of more stringent motor vehicle emissions standards has dropped statewide CO emissions from on-road motor vehicles by over 68 percent in 2000. With continued vehicle fleet turnover to cleaner vehicles, including super ultra low emitting vehicles (SULEVs) and electric vehicles (EVs), and the incorporation of cleaner burning fuels, CO emissions are forecast to continue decreasing through the year 2010. CO emissions from other mobile sources are also projected to decrease through 2010 as more stringent emissions standards are implemented. CO emissions from area-wide sources are expected to increase slightly due to increased waste burning and additional residential fuel combustion resulting from population increases.

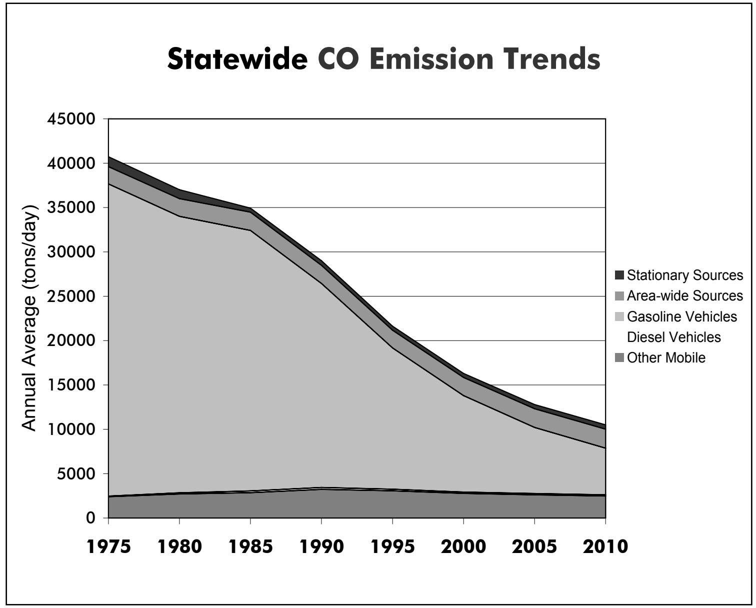

Figure 3-9

Emission Trends and Forecasts - Carbon Monoxide

CO Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***40729***	***37016***	***34929***	***29004***	***21626***	***16299***	***12786***	***10510***
Stationary Sources	1116	1012	452	519	458	450	460	499
Area-wide Sources	1943	1992	2061	2036	1995	2056	2111	2145
On-Road Mobile	35269	31295	29565	23227	16106	11019	7593	5375
Gasoline Vehicles	35199	31171	29359	23004	15930	10872	7458	5256
Diesel Vehicles	69	124	205	223	176	146	136	119
Other Mobile	2402	2717	2851	3223	3067	2774	2622	2491

Table 3-6

Statewide Air Quality - Carbon Monoxide (CO)

Similar to ozone, carbon monoxide concentrations in all areas of California have decreased substantially over the last 20 years, despite significant growth. Statewide, the maximum peak 8-hour indicator declined about 40 percent from 1982 to 2001. During 2001, measured carbon monoxide concentrations exceeded the State and national standards only in the city of Calexico, in Imperial County. In contrast, measured CO concentrations during 2001 did not exceed the standards at Lynwood, in Los Angeles County. However, more years of data are needed to see if this trend will continue. The introduction of cleaner fuels has helped bring the rest of the State into attainment. While cleaner fuels will have a continuing impact on carbon monoxide levels, additional emission reductions will be needed in the future to keep pace with increases in population and vehicle usage. These reductions will come from continued fleet turnover, expanded use of low emission vehicles, and measures to promote less polluting modes of transportation.

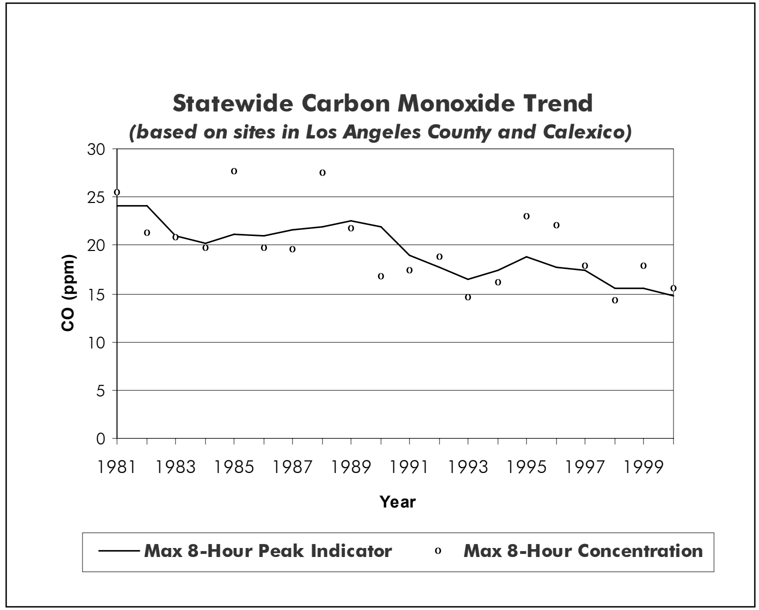

Figure 3-10

Success Stories

Statewide Air Quality - Lead

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have virtually eliminated all lead from the gasoline now sold in California. All areas of the State are currently designated as attainment for the State lead standard (the United States Environmental Protection Agency does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, the ARB identified lead as a toxic air contaminant in 1997.

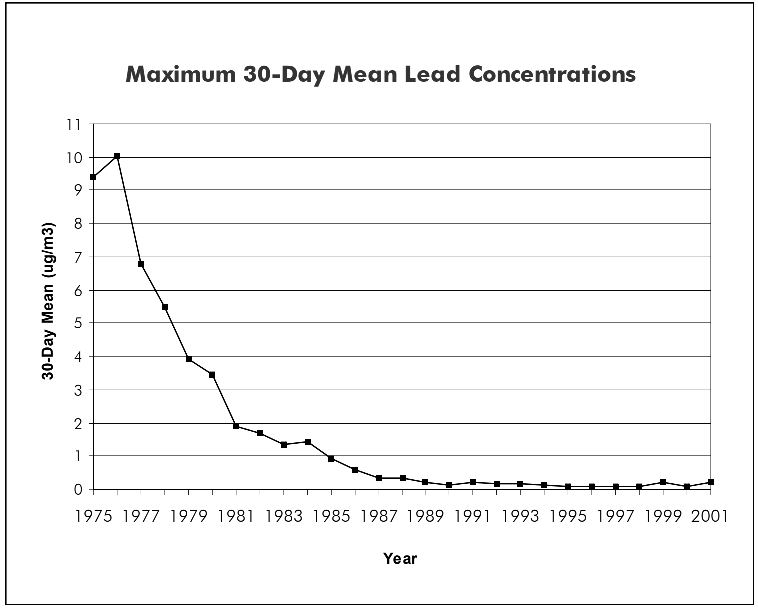

Figure 3-11

Nitrogen Dioxide

Emission Trends and Forecasts - Oxides of Nitrogen

Nitrogen dioxide (NO_2) is a colorless, tasteless gas that can cause lung damage, chronic lung disease, and respiratory infections. Nitrogen dioxide is a component of NO_x, and its presence in the atmosphere can be correlated with emissions of NO_x. Statewide emissions of NO_x are projected to decrease by almost 50 percent from 1990 to 2010 as a result of more stringent emissions standards for stationary source combustion and motor vehicles, and cleaner burning fuels. The introduction of lower emitting vehicles will continue to further reduce NO_x emissions.

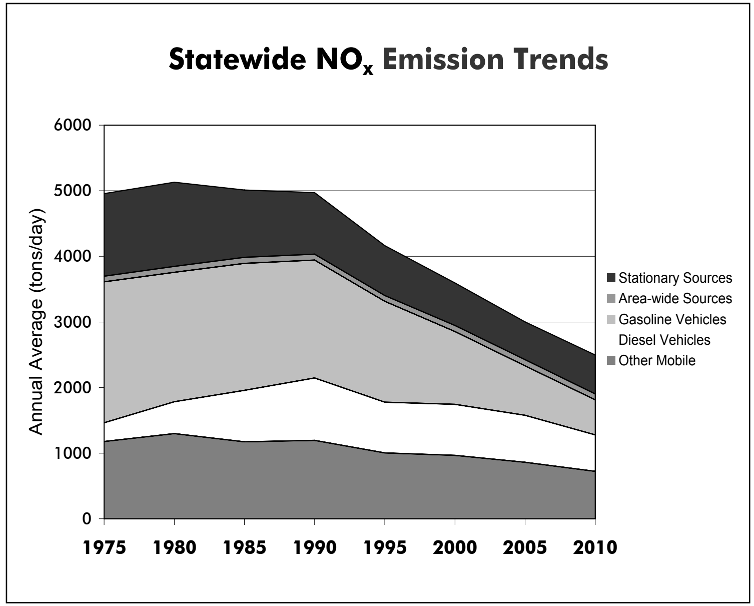

Figure 3-12

Emission Trends and Forecasts - Oxides of Nitrogen

NOx Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***4957***	***5130***	***5010***	***4971***	***4163***	***3595***	***3000***	***2496***
Stationary Sources	1261	1282	1024	938	759	650	575	594
Area-wide Sources	85	90	93	90	89	92	94	90
On-Road Mobile	2435	2459	2721	2748	2311	1888	1470	1088
Gasoline Vehicles	2149	1975	1936	1797	1538	1108	753	533
Diesel Vehicles	286	484	784	951	774	780	717	555
Other Mobile	1177	1299	1173	1196	1004	966	860	724

Table 3-7

Statewide Air Quality - Nitrogen Dioxide

Oxides of nitrogen (NO_x) emissions are a by-product of combustion from both mobile and stationary sources, and they contribute to ambient nitrogen dioxide (NO_2) concentrations. Since 1975, maximum NO_2 concentrations have decreased more than 50 percent, due primarily to the implementation of tighter controls on both mobile and stationary sources. Although many of these controls were implemented to reduce ozone, they also benefited NO_2. All areas of California are currently designated as attainment for the State nitrogen dioxide standard and unclassified/attainment for the national nitrogen dioxide standard. Projections show NO_x emissions will continue to decline, thereby assuring continued attainment.

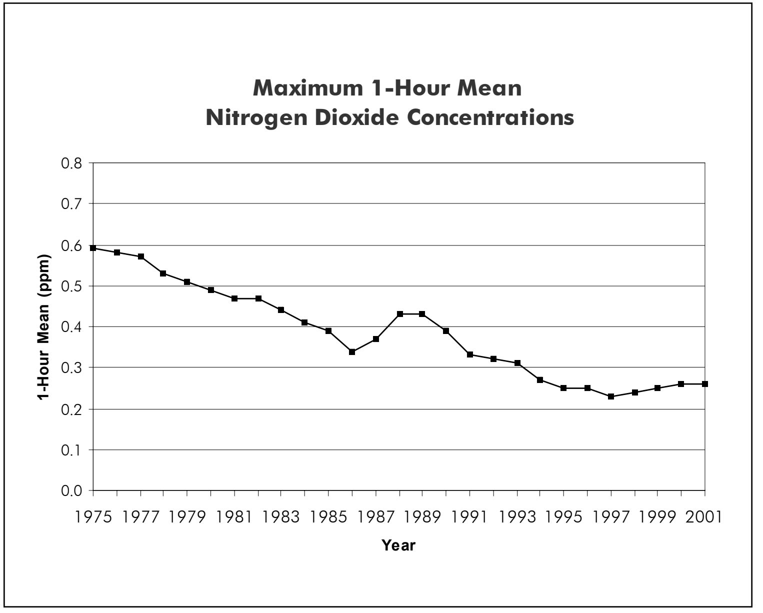

Figure 3-13

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Sulfur Dioxide

Emission Trends and Forecasts - Oxides of Sulfur

SO_x (oxides of sulfur) is a group of compounds of sulfur and oxygen. A major constituent of SO_x is sulfur dioxide (SO_2). Emissions of SO_x declined tremendously in California between 1975 and 2000. Emissions in 2000 are about 85 percent less than emissions in 1975. Sulfur dioxide emissions from stationary sources were decreased between 1975 and 2000 due to improved industrial source controls and switching from fuel oil to natural gas for electric generation and industrial boilers. The SO_x emissions from both gasoline and diesel vehicle exhaust have also decreased due to lower sulfur content in the fuel.

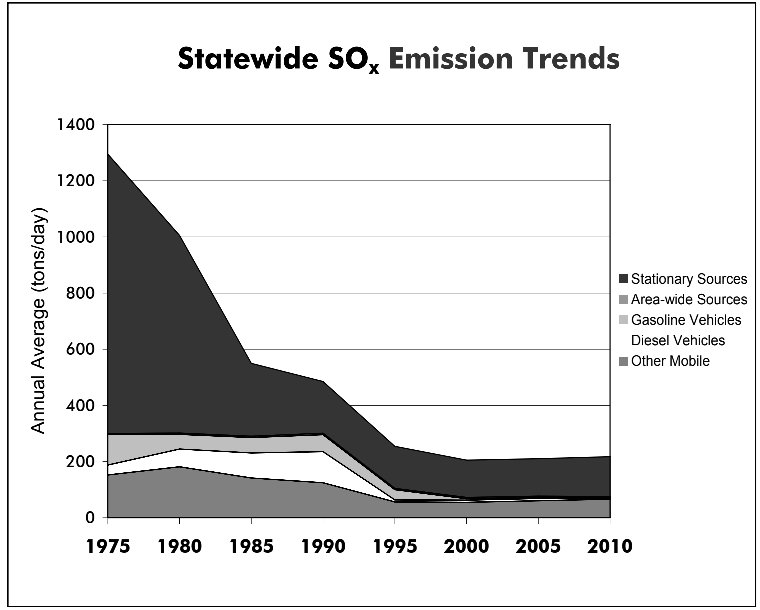

Figure 3-14

Emission Trends and Forecasts - Oxides of Sulfur

SOx Emission Trends (tons/day, annual average)								
Emission Source	**1975**	**1980**	**1985**	**1990**	**1995**	**2000**	**2005**	**2010**
All Sources	***1295***	***1006***	***550***	***485***	***254***	***205***	***210***	***217***
Stationary Sources	995	704	259	184	150	133	133	142
Area-wide Sources	4	5	5	5	5	5	5	4
On-Road Mobile	144	115	144	171	43	12	12	5
Gasoline Vehicles	108	52	55	60	36	5	4	4
Diesel Vehicles	35	63	89	111	7	7	8	1
Other Mobile	152	182	141	125	57	55	61	66

Table 3-8

Statewide Air Quality - Sulfur Dioxide

Similar to oxides of nitrogen, oxides of sulfur (SO_x) emissions come from both mobile and stationary sources. These SO_x emissions contribute to ambient sulfur dioxide (SO_2) concentrations. While SO_2 poses significant problems in other parts of the nation, SO_x emissions in California have been reduced sufficiently over the last 25 years so that all areas of California now attain the State standards for sulfur dioxide. Many of the major urban areas are also designated as attainment for the national sulfur dioxide standards. However, most of California is designated as unclassified. With current and anticipated SO_x emission control measures, all areas of the State are expected to remain attainment for SO_2.

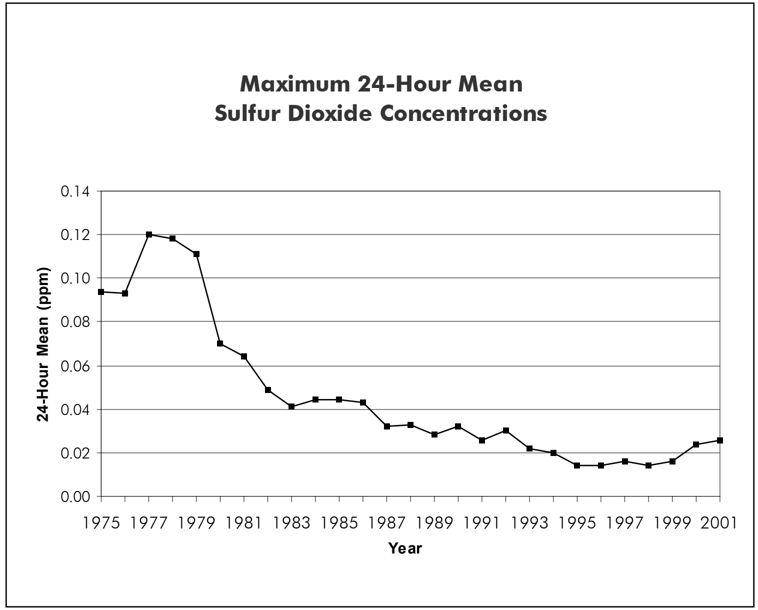

Figure 3-15