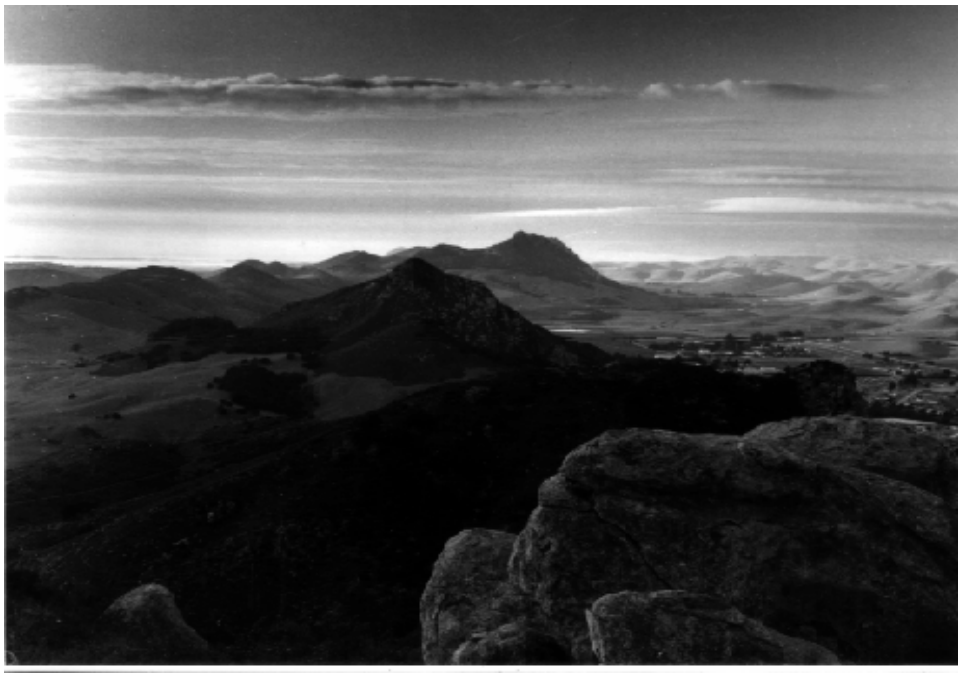
2001
CLEAN AIR PLAN
SAN LUIS OBISPO COUNTY



December 2001

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN LUIS OBISPO

2001 CLEAN AIR PLAN
SAN LUIS OBISPO COUNTY

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SAN LUIS OBISPO COUNTY

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LIST OF ACRONYMS

AAQS	Ambient Air Quality Standard
AB	Assembly Bill
ADT	Average Daily Trips
APCB	Air Pollution Control Board
APCD	Air Pollution Control District
AQAMP	Air Quality Attainment and Maintenance Plan
ARB	Air Resources Board (California State)
AVR	Average Vehicle Ridership
BACT	Best Available Control Technology
BAR	Bureau of Automotive Repair
BARCT	Best Available Retrofit Control Technology
CAAQS	California Ambient Air Quality Standards
CALTRANS	California Department of Transportation
CAL POLY	California Polytechnic State University, San Luis Obispo
CAP	Clean Air Plan
CAPCOA	California Air Pollution Control Officers Association
CBD	Central Business District
CCAA	California Clean Air Act of 1988
CEQA	California Environmental Quality Act.
CO	Carbon Monoxide

LIST OF ACRONYMS

EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ISR	Indirect Source Review
LEV	Low Emission Vehicle
MOU	Memorandum of Understanding
MVCP	Motor Vehicle Control Program
MVIP	Motor Vehicle Inspection Program
NAAQS	National Ambient Air Quality Standards
NO_x	Oxides of Nitrogen.
NSR	New Source Review
O_3	Ozone
PM_{10}	Particulate Matter 10 microns or less in diameter
PPM	Parts per Million
RACT	Reasonably Available Control Technology
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SB	Senate Bill
SCCAB	South Central Coast Air Basin
SCM	Stationary Source Control Measure

LIST OF ACRONYMS

SIP	State Implementation Plan
SLOCOG	San Luis Obispo Council Of Governments
SOV	Single occupancy vehicle
SO2	Sulfur Dioxide
TCM	Transportation Control Measure
TDA	Transportation Development Act
TLEV	Transitional Low Emission Vehicle
TMA	Transportation Management Association
TOG	Total Organic Gases
TRP	Trip Reduction Program
TSP	Total Suspended Particulate
ULEV	Ultra Low Emission Vehicle
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VRP	Visibility Reducing Particles
ZEV	Zero Emission Vehicle

Air Basin **-** An area of the state, often comprising several counties, which is designated by the Air Resources Board (ARB) based on similar meteorological and geographical conditions, with consideration given to political boundary lines when practical. Using these criteria, the ARB has divided the state into 14 air basins.

Air Pollutant - Any discharge, release, or propagation into the atmosphere of smoke, charred paper, dust, soot, grime, carbon, fumes, noxious or toxic gases, odors, particulate matter, acids, or any combination thereof.

Air Pollution Control District - The local agency governing air quality issues.

Air Resources Board - State of California oversight agency responsible for air quality issues.

Alternate (Clean) Fuels - Blends and/or substitutes for gasoline and diesel fuels. These include ethanol, methanol, compressed natural gas, liquid petroleum gas and electricity.

Ambient Air - Any portion of the atmosphere that is not confined by a structure; i.e., outside air.

Ambient Air Quality Standard - Concentrations of pollutants established by the state or federal government which are set to protect public health and welfare.

Anthropogenic Emissions - Emissions related to human activity or devices.

Area Source - Any source of emissions which, in itself, does not emit a significant amount of emissions, but when considered collectively become significant. Paint and residential wood stoves are examples of area sources.

Attainment - Achieving and not exceeding air quality standards.

Authority to Construct (A/C) - Provides the project applicant with the authority to begin construction. An A/C is normally valid for two years, depending on the District's rule. The A/C is only the first step of approval. The project applicant must construct the project and have it operate within the specified A/C conditions prior to the issuance of a Permit to Operate.

Average Vehicle Ridership - The total number of employees reporting to a worksite, divided by the number of automobiles used to reach the site.

Best Available Control Technology - The technology which gives the maximum degree of reduction of each pollutant emitted from a given type of new emission source, taking into consideration environmental, energy and economic impacts.

Best Available Retrofit Control Technology - An emission limitation based on the maximum degree of reduction achievable by existing sources, taking into consideration environmental, energy and economic needs.

Biogenic Emissions - Emissions originating from natural sources such as vegetation and oil seeps.

California Clean Air Act of 1988 - The amendments to the California Health and Safety Code resulting from the passage of Assembly Bill 2595. This Act directs Districts, which are nonattainment for the State AAQS, to achieve attainment of these standards by the earliest feasible date.

California Environmental Quality Act - A law which requires that governmental decision makers be provided with adequate information about the potentially significant environmental impacts of proposed projects. CEQA also mandates ways to avoid or significantly reduce damage to the environment.

Clean Air Plan - A collection of emission control strategies and implementation mechanisms intended to achieve attainment of the AAQS.

Congestion Management Plan - Required for all counties which have a city with a population of > 50,000, this plan contains standards for traffic level of service, transit trip reduction, analysis of land use impacts and a seven year capitol improvement program.

Contingency Measures - Measures which will not be implemented by the District unless interim goals are not achieved.

Control Measure - The means by which air contamination is regulated. Such controls may be legal or technical. Legal Controls are laws and regulations adopted to prevent or abate emissions into the atmosphere. Technical Controls are processes, equipment or devices designed to eliminate or reduce pollutants.

Criteria Pollutants - Named after the process by which standards are set at the National level. Criteria pollutants include: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM_{10} (a general category of airborne particles 10 microns or less in diameter), and lead, a specific particulate pollutant.

Demand Management - The implementation of measures which encourage people to change their mode of travel, or not to make the trip at all, e.g., ridesharing, pricing incentives and negative incentives, parking management and telecommuting.

Emissions Bank - District repository for ownership-transferable emissions reductions.

Emissions Inventory - A list of the type and quantity of pollutants emitted into a community's atmosphere, water, or land.

Emission Forecasting - A estimation of pollutant emissions in future years using population, economic and control projections.

Environmental Impact Report - A document discussing the potential adverse environmental impacts of a project.

Environmental Protection Agency - The federal agency governing air quality and other environmental issues.

Episode Day - A day demonstrating higher than usual ozone formation or activity.

Exceedance - Ambient pollutant concentrations above the ambient air quality standards.

Headways - The waiting period between bus arrivals.

Indirect Source - Any facility, building, structure or installation, or combination thereof which generates or attracts mobile source activity that results in the emissions of any pollutant for which there is a state ambient air quality standard.

Indirect Source Review - A process by which Indirect Sources are evaluated for their potentially adverse environmental impacts with the intent of minimizing those impacts to the maximum extent feasible.

Infrastructure - The underlying foundation or basic framework of a system or organization; Manmade structures, machines, processes, utilities, etc., that serve to support human activities.

Low Emission Vehicle - Passenger cars designed to achieve a 70 percent reduction in gasoline-equivalent hydrocarbon and a 50 percent reduction in NO_x from 1993 standards.

Metropolitan Planning Organization - A regional planning agency which prepares and implements a Congestion Management Plan.

Mitigation - A change or alternative to the proposed project which reduces or eliminates its significant adverse environmental impacts. Mitigation can be in the form of traditional offsets, transportation-based mitigation measures not directly associated with the project under consideration, or mitigation fees to be used to secure offsite mitigation.

Mobile Source - Anything that moves and emits pollutants, such as cars, trucks, buses and airplanes.

Nonattainment - Not achieving ambient air quality standards.

New Source Review - Review process conducted by the APCD for new and modified emission sources intended to insure minimal air quality impact.

Oxides of Nitrogen - A precursor pollutant of ozone produced from fossil fuel combustion by a variety of sources; includes nitrogen oxide and nitrogen dioxide.

Ozone - A secondary pollutant formed from the reaction of oxides of nitrogen and reactive organic gases in presence of sunlight. Ozone is the main component of photochemical smog.

Photochemical - Of, relating to, or resulting from the chemical action of radiant energy, especially sunlight.

Pm_{10} - Particulate Matter 10 microns or less in diameter.

Parts per Million - The number of parts (either by weight or volume) of a given pollutant in a million parts of air; a measure of concentration.

Precursor - A pollutant, that when emitted into the atmosphere, may undergo either a chemical or physical change which then produces another pollutant.

Reactive Organic Gases - Compounds of principally carbon and hydrogen which are precursors to ozone.

Reasonably Available Control Technology - Process changes and/or devices to minimize air pollution from mobile and stationary sources that are cost-effective and readily available.

Receptor - A person, or detector or monitoring device.

Rideshare - The activity of sharing rides and having more than one person per vehicle while commuting to work.

Secondary Pollutants - Pollutants not emitted directly, but formed in the atmosphere through chemical reactions or transformation of other pollutants.

GLOSSARY OF TERMS

Single Occupant Vehicle - A motor vehicle occupied by one person for commute purposes, including motorcycles.

Smog Check - An informal term for a vehicle inspection and maintenance exam.

Solvent - A substance that dissolves another to form a solution.

Stationary Source - A fixed source (not mobile) which emits pollutants.

Stationary Source Control Measures - Measures designed to limit the kind and amount of pollutants emitted from stationary sources.

Stratosphere - The region of the upper atmosphere extending upward from the troposphere to about 15 miles above the earth.

Total Organic Gases - ROG plus nonreactive gases.

Transportation Control Measure - Any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions.

Transitional Low Emission Vehicle - A vehicle designed to emit 50 percent less hydrocarbon emissions than 1993 model-year conventional gasoline vehicles.

Transport - Emissions from one source being carried by wind to other locations.

Troposphere - Lowest layer of the atmosphere, extending from the earth's surface to a height about 6 to 12 miles above the earth.

Ultra Low Emission Vehicle - Vehicles designed to reduce gasoline equivalent emissions of ROG by 85% percent, CO by 50%, and NO_x emissions by 50%, from 1993 levels.

Volatile Organic Compounds - Generic all encompassing term for any organic compound containing at least one atom of carbon. TOG and ROG are a subset of this.

Vehicle Miles Traveled - Number of miles traveled by a given vehicle in a specified time period. This number is sometimes estimated for the entire fleet of on road vehicles.

Zero Emission Vehicle - A vehicle designed to maintain zero emissions throughout its lifetime.

EXECUTIVE SUMMARY

BACKGROUND

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BASELINE EMISSIONS INVENTORY

CONTROL MEASURES

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THE TASKS AHEAD

BACKGROUND

Clean air is a valuable and essential resource which affects many aspects of our daily lives. It is vital to our health and welfare, to the local agricultural economy, and to the aesthetic beauty and quality of life enjoyed by county residents. Unfortunately, it is a resource that is all too often taken for granted.

National and state air quality standards have been adopted to protect public health, vegetation, materials and visibility. State standards for ozone and fine particulate matter (PM_{10}) are currently exceeded in San Luis Obispo County. As a result, the state Air Resources Board (ARB) has designated the county a nonattainment area for these pollutants. The California Clean Air Act (CCAA) requires the development of plans to achieve and maintain the state ozone standard by the earliest practicable date. Updates to these plans must be performed every three years until attainment is reached. The San Luis Obispo County Air Pollution Control District (District) is the agency charged with developing and updating the attainment plan for this county.

The 2001 Clean Air Plan (CAP or Plan) is the third update to the 1991 CAP adopted by the Air Pollution Control District Board in January, 1992. The 1991 Plan contained a comprehensive set of control measures designed to reduce ozone precursor emissions from a wide variety of stationary and mobile sources. The 1995 CAP was an extensive update of the 1991 Plan, but with fewer control strategies recommended for adoption in response to changes in State law. This 2001 CAP, similar to the 1998 CAP, is primarily a continuation of the 1995 Plan and proposes no new control measures for adoption. Ongoing implementation of the control measures adopted through previous plans is expected to bring the county into attainment of the State ozone standard within a three year timeframe.

Ozone, a primary constituent of smog, is formed in the lower atmosphere through complex chemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NOx) in the presence of sunlight. Because of this relationship, ROG and NOx are often referred to as ozone "precursors". Ozone can cause such effects as damage to vegetation and cracking of rubber when present in relatively low concentrations. Exposure to higher concentrations can adversely impact public health by directly affecting the lungs, causing respiratory irritation and changes in lung function. Recent health effects studies have established that long-term exposure to ozone can result in permanent lung damage to children and adults, causing loss of respiratory capacity.

The stringency of the emission controls required to attain the ozone standard is based on the severity of the nonattainment problem. The CCAA classifies nonattainment areas as moderate, serious, severe or extreme depending on the concentration and frequency of ozone measurements exceeding the state standard. San Luis Obispo County is designated a moderate nonattainment area for ozone. As a result, the CCAA requires that the 2001 Plan include the following components:

- Application of Best Available Control Technology, and a District permitting program designed to allow no net increase in emissions from new or modified stationary sources which emit or have the potential to emit 25 tons per year or more of nonattainment pollutants or their precursors.
- Application of Best Available Retrofit Control Technology to existing sources which emit 5 tons or more per day, or 250 tons or more per year; application of Reasonably Available Control Technology for all other existing emission sources

- Implementation of reasonably available transportation control measures sufficient to substantially reduce the growth rate of motor vehicle trips and miles traveled.

- Development of control programs for area sources and indirect sources of emissions.

- Sufficient control strategies to achieve at least a 5% per year reduction in both ROG and NOx emissions countywide, averaged every consecutive 3-year period, with at least a 20% overall reduction in both pollutants compared to 1991 emission levels.

- Preparation of annual progress reports for submittal to ARB, with a comprehensive plan update every three years until attainment is reached.

The 2001 Clean Air Plan for San Luis Obispo County is designed to meet these requirements.

EXISTING AIR QUALITY

Ozone levels are measured continuously at six different monitoring locations in the county. Concentrations approaching or exceeding the state standard are observed more frequently at some sites than others; most recent exceedances of the state ozone standard in the county have been measured at monitoring stations in Paso Robles or Atascadero. In the period 1989 through 1999, 61 days during which the state one-hour standard was exceeded have been measured at one or more locations in the north county. In that same period, only seven days exceeding that standard have been measured in coastal and/or southern areas of the county.

Although such variability is natural, the analysis of several long-term trend indicators all show the same dichotomy: ozone air quality in the coastal and southern areas of the county appears to be improving while air quality in the north county is declining. This may be due, in part, to long term changes in meteorology intensifying the differences in coastal vs. inland climate patterns. Changes in patterns and levels of local emissions may also be a significant contributor to this trend. For instance, population and business growth in the North County is occurring at nearly three times the average rate countywide, bringing with it a corresponding increase in local emissions. Transport of pollutant-laden air from the San Joaquin Valley and Bay Area may also play a significant role, both in the high variation of measured ozone levels from one year to the next, and in the apparent declining air quality trend in the last decade. The Central Coast Ozone Study was conducted by the Air Resources Board in the summer of 2000. When the final analysis is completed it should allow for a better understanding of ozone transport throughout California. Further study is still needed to provide a more definitive answer.

BASELINE EMISSIONS INVENTORY

Effective control strategies cannot be developed without an understanding of the type and number of emission sources contributing to the air quality problem. An emissions inventory is a comprehensive description of the sources of air pollution in a given region and a quantitative estimate of their emissions. In cooperation with ARB, the District updates its emissions inventory every few years to incorporate recent emissions data and to account for any changes in emission calculation methods. A comprehensive update was performed for the District's 1991 emissions inventory. The 2001 CAP uses this inventory as the reference year for forecasting future year emissions.

The reference year emissions inventory contains estimates of emissions which occurred in calendar year 1991, categorized by various source classifications. Two different reporting formats are used in this document. An annual inventory is presented which summarizes emissions of all pollutants in units of tons per year for each source category. This is the method typically used by the District for most reporting purposes. For attainment planning, however, the CCAA requires that the inventory be adjusted to reflect seasonal variations in emissions. This "planning inventory" is designed to more accurately represent emissions that occur during the ozone season (May through October), when violations of the standard are more likely to occur. The

planning inventory reports emissions in units of tons per day and includes data for only the pollutants ROG and NOx, the primary precursors of ozone.

Total emissions of ROG countywide were calculated at 40.4 tons per day for the 1991 planning inventory (14,480 tons annually). Figure ES-1 shows that about 56% of daily ROG emissions are attributable to on-road vehicles, primarily automobiles. Other mobile sources, such as off-road vehicles and mobile equipment, contribute another 15% of these emissions. Solvent use, cleaning and surface coatings, and petroleum related activities constitute most of the remaining ROG emissions.

During 1991, total NOx emissions countywide were estimated to be 49.9 tons per day (16,166 tons of NOx annually). As shown in Figure ES-1, on-road vehicles and stationary fuel combustion sources are the most significant NOx generators, with contributions totaling over 73% of the daily NOx emissions in 1991. Most of the remaining NOx emissions were produced by other mobile sources.

CONTROL MEASURES

No new control measures are proposed for adoption in this Clean Air Plan that were not contained in previous Plans. A thorough evaluation of all recommended control measures was performed prior to adoption of those plans; all but one of those measures has been implemented to date. Thus, evaluation of control measures for this update primarily involved an analysis of emission reductions achieved by measures already implemented since 1991, and potential reductions expected from the one measure remaining to be adopted from the 1998 CAP. Several measures recommended for deferral/contingency in 1998 CAP are also recommended for continued deferral in this Plan. One measure previously recommended for deferral has been deleted in this Plan.

Following are examples of the primary emission control techniques used by many of the control measures described in this Plan:

- Vapor Recovery: Many of the ROG controls rely on the capture and recovery of vapors from industrial and commercial operations and equipment.

- Solvent Content Reduction: A reduction in the amount of reactive organic gases contained in paints, cleaning solvents and other products will reduce evaporative emissions from these sources.

- Improved Transfer Efficiency: Improved methods in the application of coatings (paints, primers, and other finishes) to various surfaces can substantially reduce ROG emissions from these sources.

- Improved Fuel Combustion: Adjusting fuel/air mixtures, retarding engine timing, use of low-NOx burners and other improvements in fuel burning can substantially reduce emissions of NOx from combustion sources.

- Fuel-Switching or Electrification: Retrofitting of gasoline or diesel burning internal combustion engines to burn cleaner fuels, or replacement with electric motors, can significantly reduce emissions of NOx and ROG from selected stationary sources.

- Chemical or Catalytic Reduction: Injection of ammonia or urea during combustion processes or the use of catalysts in the combustion exhaust stream can promote reactions which substantially reduce NOx emissions from large combustion sources.

- Reduced Vehicle Use: Use of carpooling, public transit, compressed work weeks, bicycling and other methods to reduce the number of trips made by private auto will reduce NOx, ROG and PM_{10} emissions throughout the region.

- New Source Review: New or modified sources requiring District permits must apply Best Available Control Technology; larger sources must also offset (reduce emissions at another source) all remaining ROG and NOx emissions from the proposed facility.

- Indirect Source Review: A series of proposed land use planning strategies and ongoing project review through the California Environmental Quality Act (CEQA) will reduce the increase in emissions from new commercial and residential development.

As stated above, all but one of the control strategies described in this Plan has already been implemented. Adoption of a District rule for this measure will occur in early Spring 2002. These controls, combined with measures implemented by ARB, are expected to reduce over 5 tons per day of ROG emissions by the year 2003, with NOx reductions projected at over 12 tons per day.

EMISSION FORECASTS

Emission forecasts are estimates of future year emissions. These estimates are developed by examining the effects of economic growth, existing regulations, and proposed control measures on future year emission inventories. The resulting projections can be used for a variety of purposes, including modeling of future air quality, assessing the effectiveness of proposed control measures, analyzing new source impacts, and tracking future progress in reducing emissions.

The 1991 planning inventory was used to generate ROG and NOx emission forecasts for the years 1997, 2000, 2003, 2006 and 2015. Figures ES-2 and ES-3 present a comparison between the emission reduction targets set by ARB, and the future ROG and NOx emission levels projected after implementation of this Plan. As shown in Figure ES-2, the 40.1 tons/day of total ROG emissions in 1991 are projected to decline steadily to about 27.7 tons/day in the year 2015 by implementing the ROG controls described in this Plan. This represents an overall reduction of about 32% compared to ROG emissions in 1991. As shown in the graph, this reduction will more than meet the targets set by the ARB, thus providing a buffer for contingencies.

Figure ES-3 compares the projected future NOx emissions after CAP implementation to the ARB emission reduction goals for our area. As shown in this chart, implementing the proposed NOx controls will provide a substantial decrease in NOx emissions through the year 2015, with a peak reduction of nearly 16 tons/day expected within that timeframe. This represents a 34% reduction in NOx emissions overall compared to 1991 levels. As shown in the graph, this reduction also exceeds the targets established by the CCAA.

The emission reductions shown in these charts will result primarily from already implemented controls on motor vehicles, electric utilities and other fuel combustion, the petroleum industry, and various types of solvent use. Emissions from stationary and area-wide sources are expected to be reduced approximately 64% for NOx but will remain static for ROG, compared to 1991 levels. Emissions from mobile sources are expected to decline 47% for ROG and 20% for NOx compared to 1991 emission levels. It is interesting to note that stationary source NOx reductions overshadow mobile source NOx reductions while the opposite is true for ROG, where mobile source reductions are significantly greater than those expected from stationary sources. This further supports the need to realize reductions from both source types to achieve the overall balance required to reduce ozone levels throughout the county.

FUTURE AIR QUALITY

As described earlier, the ARB has determined that an overall 20% reduction in ROG and NOx emissions from 1991 levels is necessary to attain the state ozone standard in this county. State law establishes December 31, 1997, as the attainment deadline for moderate nonattainment areas. Failure to meet the deadline could result in the District's severity classification and control requirements being 'bumped up' to that of a serious nonattainment area. To do so, ARB must determine that such action would substantially increase our ability to attain the standard by the earliest practical date.

Figures ES-2 and ES-3 compare the projected emission reductions from implementing the Plan to the emission reduction targets established by the State. As shown in this chart, reductions achieved by 1997 from measures already implemented have exceeded the 20% minimum reduction targets for both ROG and NOx emission sources. However, attainment of the State ozone standard has not yet been accomplished. In evaluating the reasons for this it is important to note that ARB's estimate of emission reductions needed to meet the standard was provided in the form of guidance, and is based on photochemical modeling analyses conducted elsewhere in California. Because the reduction estimate is generic in nature, it provides no guarantee of actually attaining the standard once the reductions are achieved. Thus, the 20% reduction goal provides a minimum target to aim for, rather than an absolute demonstration of attainment.

ARB has determined that a bump-up to ‘serious’ nonattainment is not appropriate; their reasons include the potential influence of upwind pollutant transport from areas outside the county, and the substantial emission reductions already achieved by District implementation of adopted control strategies. Although the 2001 CAP proposes no new control measures, Figures ES-2 and ES-3 show emissions of ROG and NOx continuing to decline substantially through the year 2015. These reductions are due to ongoing implementation and enforcement of adopted measures by the District, as well as the introduction of progressively cleaner cars and continual turnover in the vehicle fleet. Thus, attainment of the State ozone standard is expected in the near term.

Implementation of the Plan will also have beneficial effects on other types of air pollution. For instance, in addition to being precursors to ozone, ROG and NOx emissions can also cause the formation of fine particles (PM_{10}) in the atmosphere. These particles can cause adverse health impacts and contribute to reduced visibility. Limiting emissions of ROG and NOx to reduce ozone concentrations will therefore provide a corresponding decrease in secondary PM_{10} formation and should also improve regional visibility. Also, reducing vehicle use through transportation controls will reduce the generation of suspended dust caused by vehicle travel on paved and unpaved roads, a major source of PM_{10}. Thus, measures which reduce vehicle trips and miles traveled will also provide a reduction in direct PM_{10} emissions.

Emissions of 'greenhouse gases' and 'toxic air contaminants' will also be reduced by implementing this Plan. Greenhouse gases trap heat in the earth's atmosphere and can alter global weather patterns if they continue to increase in concentration. Toxic air contaminants are of concern due to their suspected ability to cause long-term health effects such as cancer, reproductive damage and/or other problems. Many of the control measures in this Plan will help reduce emissions and ambient concentrations of both types of pollutants.

THE TASKS AHEAD

Implementation of the 2001 Clean Air Plan relies on a multilevel partnership between the public, private industry and various government agencies. At the federal level, the EPA and other agencies are charged with reducing emissions from federally controlled sources, such as airplanes. The ARB bears primary

responsibility for controlling emissions from motor vehicles, fuels and consumer products at the state level. The District is the regional agency charged with the overall development and implementation of the Plan, as well as adopting and enforcing emission controls for industries, indirect sources, and some mobile sources. Most of the identified control measures have already been adopted as District rules. At the local level, city and county governments, the San Luis Obispo Council of Governments, and local and regional transportation agencies play an important role. These entities are responsible for implementation and oversight of most of the transportation control measures and land use planning strategies.

Successful implementation of this Plan also requires the understanding and support of the private sector and the general public. Some of the control measures may require lifestyle changes by individuals and economic investment by the business community. A well planned public information and education program is essential to increase awareness of local issues and to emphasize the importance of individual, group, and community efforts towards improving and preserving the air quality of San Luis Obispo County.

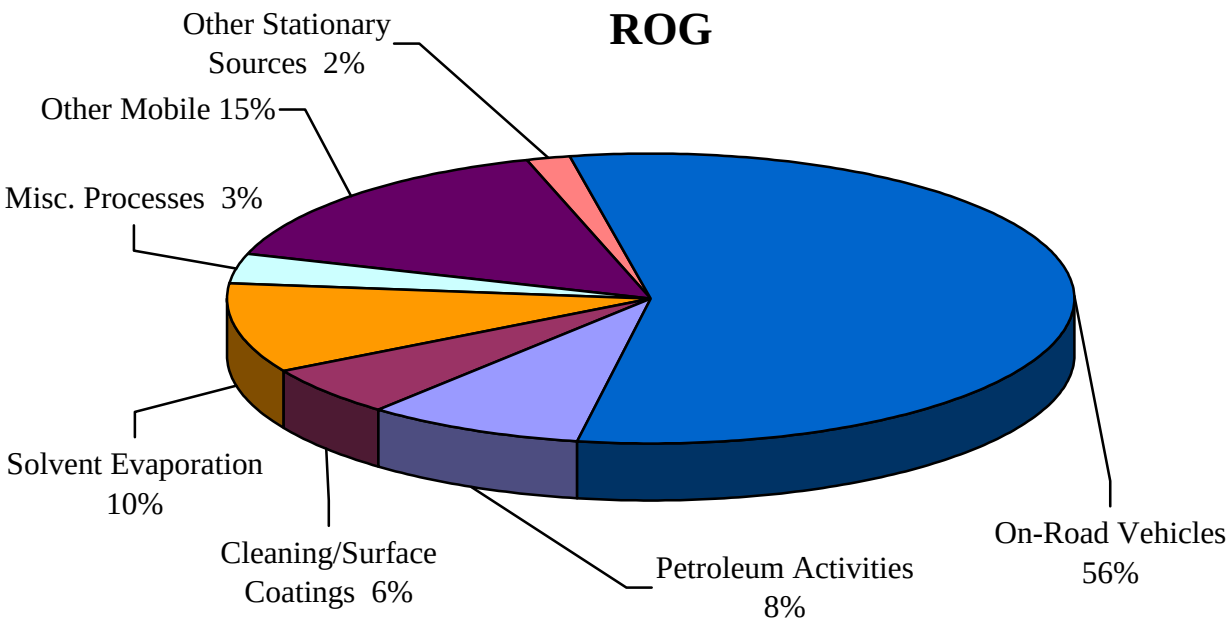
The District has endeavored to make development and adoption of the Plan a public process. The 2001 Clean Air Plan for San Luis Obispo County is the result of these efforts.

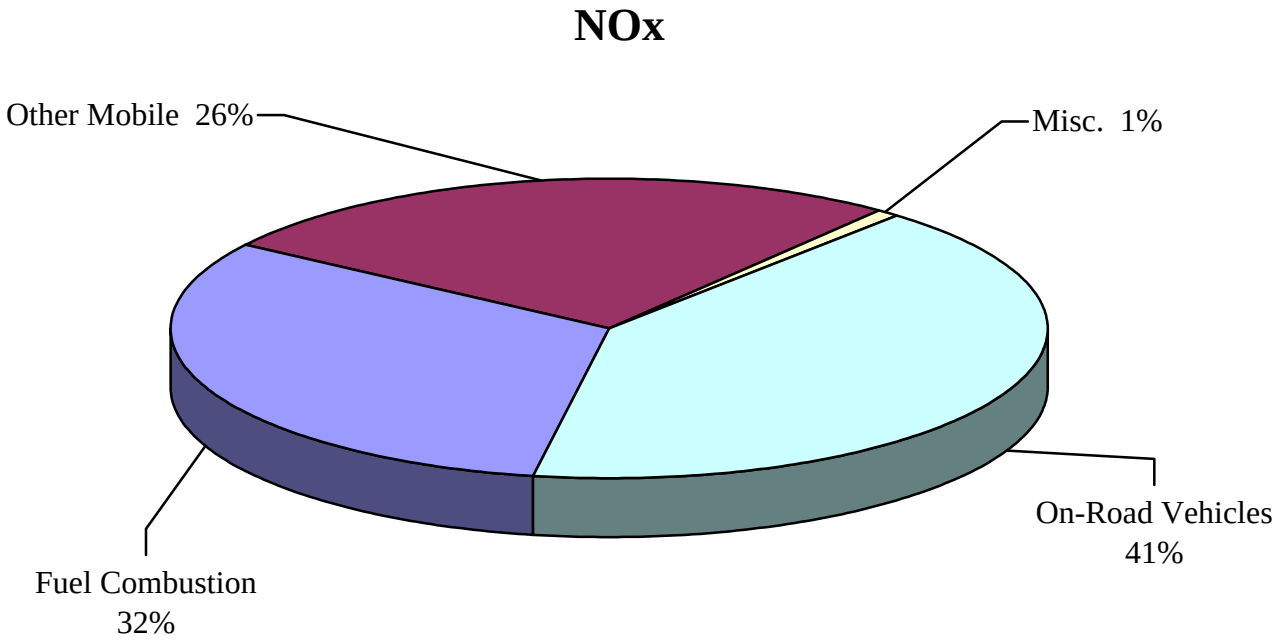
Table ES-1

STATIONARY SOURCE CONTROL MEASURE EVALUATION

#	1991 CAP CONTROL MEASURES	ADOPTED RULE	PROPOSED ADOPTION	DEFER	DELETE
ARB	Phase II Vapor Recovery	X			
R-1	Agricultural Burning	X			
R-3	Architectural Coatings		X		
R-4	Asphalt Roofing Kettles				X
R-5	Bulk Gasoline Loading	X			
R-6	Commercial Degreasing			X	
R-8	Petrol Storage Tank Seals	X			
R-9	Landfill Gas Control	X			
R-10	Marine Vessel Coatings			X	
R-11	Marine Tanker Loading	X			
R-12	Oil/Water Separators	X			
R-13	Non-Ag Open Burning	X			
R-14	Consumer Products (ARB)	X			
R-15	Adhesives/Industrial Coatings			X	
R-17	Sumps	X			
R-18	Wood Furniture Coatings			X	
R-19	Metal Parts Coatings	X			
R-20	Auto Refinishing	X			
R-21	Fugitive Emissions	X			
R-22	Cleaning of Organic Product Storage Tanks			X	
R-23	Cutback Asphalt	X			
R-24	Dry Cleaners	X			
N-1	Coke Calcining	X			
N-2	Commercial Fuel Combustion	X			
N-3	Commercial Marine Vessel Fuel Combustion			X	
N-5	Energy Conservation Measures	X			
N-10	Onshore Drilling Rigs			X	
N-11	Utility Fuel Combustion	X			
N-12	Residential NG Combustion	X			
N-14	Stationary IC Engines	X			
MP-1	Residential Wood Combustion	X			

Figure ES-1
1991 PlANNING EMISSIONS INVENTORY *
San Luis Obispo County





Note: * The Planning Emissions Inventory presents representative daily emissions during ozone season (May through October).

Figure ES-2
FORECAST ROG EMISSIONS COUNTYWIDE

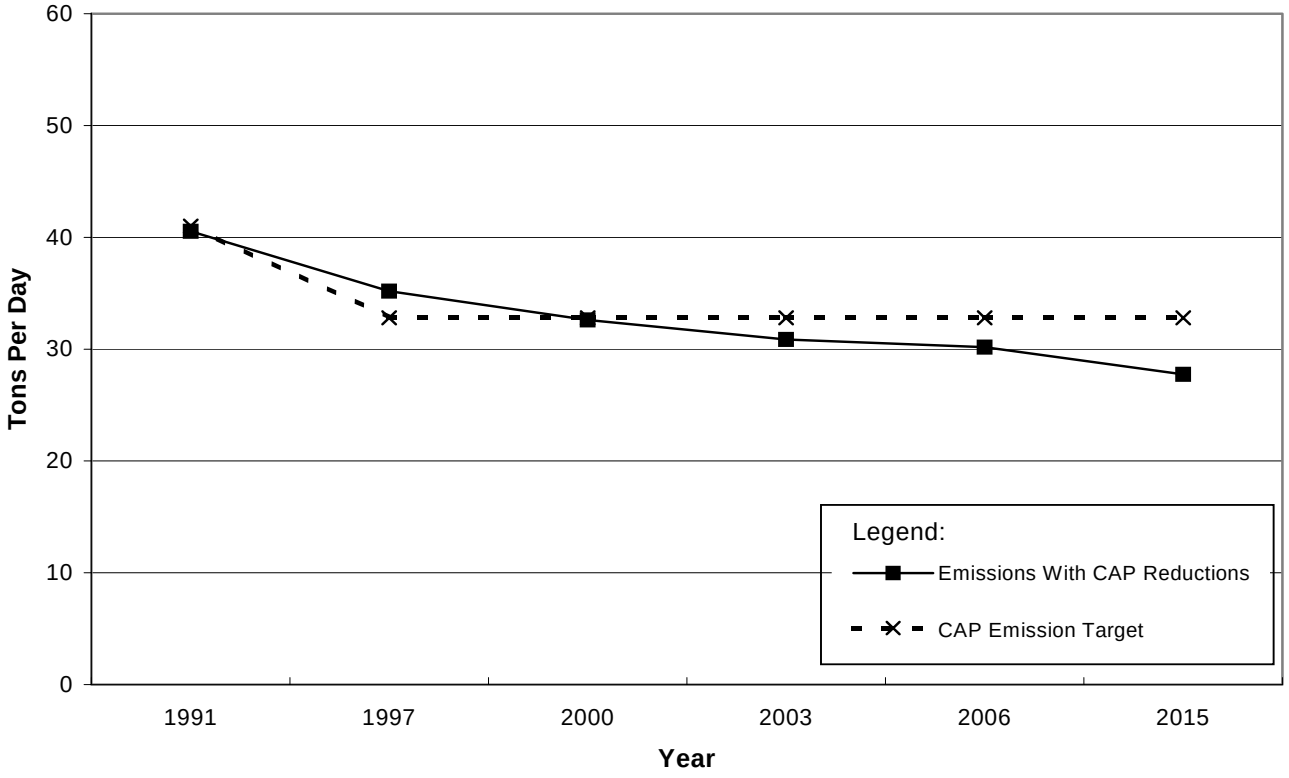
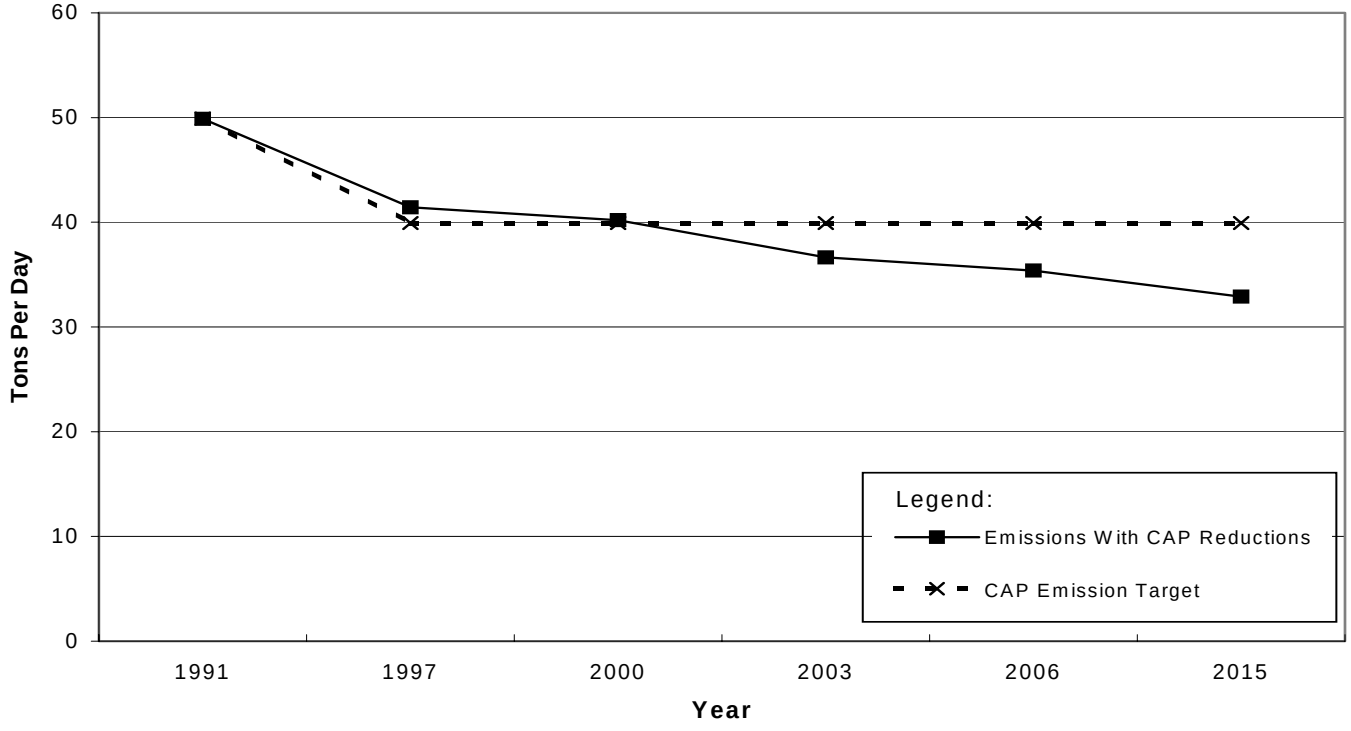


Figure ES-3
FORECAST NOx EMISSIONS COUNTYWIDE



CHAPTER 1
INTRODUCTION

PURPOSE

PREVIOUS PLANNING EFFORTS

AUTHORITY FOR CURRENT AIR QUALITY PLANNING

RESPONSIBILITIES OF AFFECTED AGENCIES

DEVELOPMENT AND ORGANIZATION OF THE 2001 CLEAN AIR PLAN

1.1 PURPOSE

Clean air is a valuable and essential resource which affects many aspects of our daily lives. It is vital to our health and welfare, to the local agricultural economy, and to the aesthetic beauty and quality of life enjoyed by county residents. The capacity of the air to absorb environmental contaminants is limited, however, and must be managed wisely to avoid significant deterioration of the resource.

The 2001 Clean Air Plan (CAP or Plan) for San Luis Obispo County addresses the attainment and maintenance of state and federal ambient air quality standards. These standards are adopted to protect public health, vegetation, materials and visibility. State standards for ozone and fine particulate matter (PM10) are currently exceeded within the District, and violation of federal standards may occur in future years without adequate planning and air quality management.

Ozone is a colorless and highly reactive gas. It is created naturally in the stratosphere, high above the earth, where it forms a protective shield which absorbs damaging ultra-violet radiation from the sun before it reaches the ground. However, in the lower atmosphere ozone is a serious pollutant, formed through complex chemical reactions involving reactive organic gases (ROG) and oxides of nitrogen (NOx) in the presence of sunlight. In San Luis Obispo County, the primary sources of ROG are motor vehicles, organic solvents, the petroleum industry and pesticides. Major sources of NOx are motor vehicles, public utility power generation and fuel combustion by various industrial sources.

Ozone can damage vegetation and cause rubber to crack at relatively low concentrations. At higher concentrations, ozone can impact public health by directly affecting the lungs, causing respiratory irritation and changes in lung function. Asthma, bronchitis and other respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to ozone. When ozone levels are high, people with respiratory and cardiac difficulties, the elderly and children are advised to remain indoors. Outdoor exercise by healthy adults is also discouraged since strenuous activity may cause shortness of breath and chest pains.

Although breathing impairment is the primary and most noticeable health effect, symptoms of sore throat, nausea or dizziness, coughing and headaches may occur in healthy individuals exposed to high ozone concentrations. Such effects are generally temporary if the duration of exposure is limited. However, recent studies have shown that routine exposure to lower concentrations of ozone can cause chronic lung damage in children; permanent reductions in lung capacity of up to 50% have been measured.

Ozone is also a serious threat to California agriculture and native vegetation due to its pervasive nature. Many sensitive plant species are known to suffer damage at concentrations below human health standards. Ozone interferes with photosynthesis by attacking leaves, causing them to yellow, develop dead areas and drop prematurely. With many crop varieties ozone stunts growth, reduces yields, or causes aesthetic damage which lowers market value. Many of the crops grown within this county are particularly sensitive to ozone injury, including orchard crops, lettuce and several grape varieties. The state Air Resources Board (ARB) has determined that ozone pollution costs California farmers and consumers over $500 million each year in reduced crop yields.

Atmospheric particulate matter is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes and mists. The particles of primary concern are fine particulate matter less than ten microns in diameter (PM10). These small particles have the greatest likelihood of being inhaled deep into the lungs. A variety of human activities can generate PM10 emissions including agricultural operations, industrial processes, combustion of fossil fuels, construction and demolition operations, and entrainment of road dust into the atmosphere. Natural sources of PM10 include wind blown dust, wildfire smoke, and salt from sea spray.

The 2001 Plan primarily addresses the ozone nonattainment problem. It is a comprehensive planning document intended to provide guidance to the Air Pollution Control District, the county, and other local agencies on how to attain and maintain the state standard for ozone. The Plan presents a detailed description of the sources and pollutants which impact the county, future air quality impacts to be expected under current growth trends, and an appropriate control strategy for reducing ozone precursor emissions, thereby improving air quality.

Most of the ozone control measures described in this Plan have already been implemented through previous planning efforts. Many of these measures provide a secondary benefit of reducing ambient PM10 levels by reducing ROG and NOx emissions. ROG and NOx can be transformed in the atmosphere to aerosols, a major constituent of PM10. The District expects to formally address PM10 nonattainment in future planning efforts .

1.2 PREVIOUS PLANNING EFFORTS

In 1978 San Luis Obispo County was designated a federal nonattainment area due to periodic violations of the 0.08 parts per million (ppm) federal oxidant standard; the Salinas River Valley portion of the county was further designated nonattainment for the federal secondary standard for particulate matter. With the San Luis Obispo Area Council of Governments acting as lead agency, the County prepared an Air Quality Attainment and Maintenance Plan (AQAMP) in 1979 as required by federal law. This Plan was the first comprehensive air quality planning effort in San Luis Obispo county. It proposed the adoption and implementation of an extensive set of stationary source and transportation control measures designed to attain the primary federal oxidant standard by the end of 1987.

Just after adoption of the 1979 AQAMP, the federal Environmental Protection Agency (EPA) changed the 0.08 ppm oxidant standard to a 0.12 ppm ozone standard. Because there had been no violations of the revised standard within the previous three years, San Luis Obispo County then qualified for redesignation as an attainment area for ozone. The Area Council of Governments and the ARB agreed that adoption and implementation of the AQAMP was still important to maintain attainment in view of the projected increase in population and industrial emissions. However, without a regulatory mandate for implementation, less than half of the proposed stationary source controls were adopted. Only 4 of the 18 recommended transportation controls were implemented, primarily through state or local programs.

In 1989, San Luis Obispo County was designated a nonattainment area for the state ozone and PM10 standards. State law requires the District to develop a plan designed to achieve the state standards by the earliest practical date; this plan must be updated every three years. The 1991 Clean Air Plan (CAP) was adopted by the Air Pollution Control District Board in January, 1992, and was approved by the Air Resources Board in August of 1992. The 1991 CAP contained 44 control measures designed to reduce ozone precursor emissions from a wide variety of stationary and mobile sources and bring the county into attainment of the state ozone standard by the end of 1997. Comprehensive updates of the CAP were completed in 1995 and 1998.

1.3 AUTHORITY FOR CURRENT AIR QUALITY PLANNING

Federal Clean Air Act Amendments

Air quality protection at the national level is provided through the federal Clean Air Act Amendments (CAAA). The most current version was signed into law by President Bush on November 15, 1990. These amendments represent the fifth major effort by the U.S. Congress to improve air quality. The 1990 CAAA is generally less stringent than the California Clean Air Act. However, unlike the California law, the CAAA sets statutory deadlines for attaining federal standards.

The 1990 Amendments added several new sections to the law, including requirements for the control of toxic air contaminants; reductions in pollutants responsible for acid deposition; development of a national strategy for stratospheric ozone and global climate protection; and requirements for a national permitting system for major pollution sources. In addition, the 1990 CAAA transfers authority for regulation of air quality on the Outer Continental Shelf from the Minerals Management Service to the EPA. The law allows local APCDs to apply to EPA for delegation of that authority. Our District applied for and was granted such authority in 1994.

San Luis Obispo County has been designated as attainment or unclassified for the federal air quality standards and is not mandated to develop a federal nonattainment plan. However, some rules and regulations adopted by the District are submitted to the ARB for inclusion in the State Implementation Plan (SIP), which defines the measures to be implemented throughout the state to ensure expeditious attainment of the national ambient air quality standards. Thus, some of the control strategies proposed in this document may ultimately become part of the SIP following their adoption as District rules.

California Clean Air Act

The California Clean Air Act (CCAA) was signed into law in September of 1988. It requires all areas of the state to achieve and maintain the California ambient air quality standards by the earliest practicable date. These standards are generally more stringent than the federal standards; thus, emission controls to comply with the state law are more stringent than necessary for attainment of the federal standard. State and federal standards for ozone and other pollutants are presented in Table 3-1.

The ARB has formally designated all air pollution control districts as attainment or nonattainment for each state air quality standard. Nonattainment designations are further categorized into four levels of severity: moderate, serious, severe and extreme. For districts identified as receptors of transported pollutants from other areas, these definitions are based on violations which would still occur without the transport contribution. San Luis Obispo was classified as a serious ozone nonattainment area for the 1991 planning effort. However, amendments to the CCAA enacted in January of 1993 resulted in our reclassification to a moderate nonattainment status.

Districts designated nonattainment for the state ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards must prepare attainment plans or attainment plan updates every three years and submit them to the ARB for approval. Areas designated nonattainment for PM10, sulfates, lead, hydrogen sulfide, or visibility are not expressly required to develop attainment plans for those pollutants. However, the mandate to achieve and maintain the standards applies to all nonattainment pollutants and their precursors. Thus, all reasonable actions possible should be taken to meet those pollutant standards not specifically addressed in the attainment plans.

Under the Act, the ARB and APCD's share primary responsibility for improving air quality. Regulatory agencies are to pursue new and better controls of pollution sources in their respective jurisdictions. The extent of the planning effort depends on the severity classification, with higher classifications having progressively more stringent requirements. As a moderate nonattainment area for ozone, San Luis Obispo county is required to implement the following:

- Application of Best Available Control Technology for any new or modified stationary source with the potential to emit 25 pounds/day of any nonattainment pollutants or their precursor. The District's permitting program must also be designed to allow no net increase in emissions of nonattainment pollutants or their precursors from new or modified stationary sources which emit or have the potential to emit 25 tons per year or more of nonattainment pollutants or their precursors. (Health & Safety Code 40918(a)(1)).

- Application of Best Available Retrofit Control Technology to existing sources which emit 5 tons or more per day, or 250 tons or more per year; application of Reasonably Available Control Technology for all other existing emission sources (H&SC 40918(a)(2)).
- Implement reasonably available transportation control measures sufficient to substantially reduce the growth rate of motor vehicle trips and miles traveled (H&SC 40918(a)(3)).
- Development of control programs for area sources (e.g., industrial coatings and solvents) and indirect sources (e.g., increased automobile emissions from new residential and commercial development) (H&SC 40918(a)(4)).
- Sufficient control strategies to achieve at least a 5% per year reduction in both ROG and NOx emissions countywide, averaged every consecutive 3-year period; at least a 20% overall reduction in both pollutants compared to 1990 emission levels (H&SC 40914).
- Preparation of annual progress reports for submittal to ARB, with a comprehensive plan update in December 1994 and every three years thereafter until attainment is reached (H&SC 40924).
- Moderate nonattainment areas that are not below the pollutant concentrations for a moderate classification by December 31, 1997, shall comply with the control requirements for a serious nonattainment area if the ARB demonstrates that the additional requirements will substantially expedite the district's attainment of the state ambient air quality standards. (H&SC 40918(b)). (ARB has determined that such additional requirements will not substantially expedite our attainment efforts.)

These requirements must be implemented to the extent necessary to achieve and maintain the state ozone standard by the earliest practicable date. The 2001 Clean Air Plan for San Luis Obispo County is designed to meet these requirements.

San Luis Obispo County Resource Management System

Air quality has been identified as a limiting resource in the Resource Management System (RMS) of the San Luis Obispo County General Plan. The RMS is an information tool used by the County to balance land development with the resources necessary to sustain such development. The focus of the RMS is on data collection, problem identification and development of appropriate solutions. When a deficiency becomes evident, three courses are available to avoid jeopardizing public health or welfare: the resource capacity may be expanded; the rate of depletion may be slowed using conservation measures; or, development may be restricted or redirected to areas with remaining resource capacity.

The RMS utilizes three alert levels to identify the severity of a resource deficiency. Level I occurs when sufficient lead time exists to either expand the capacity of the resource or decrease its rate of depletion. Level II identifies the crucial point at which some moderation of the rate of resource use must occur to prevent exceeding the resource capacity. Level III indicates that the demand for the resource equals or exceeds the supply.

The formal designation of the county as a nonattainment area for the state ozone standard triggered an RMS Level II alert, based on criteria adopted by the San Luis Obispo County Board of Supervisors. Level II status requires the development of a resource capacity study. The Clean Air Plan serves as the resource capacity study for air quality by identifying the causes and extent of the existing problem and by recommending appropriate corrective actions.

1.4 RESPONSIBILITIES OF AFFECTED AGENCIES

Numerous agencies with direct and indirect interest in air quality participate in the planning process.

Environmental Protection Agency

The EPA administers the federal Clean Air Act and other related legislation. As a regulatory agency, EPA's principal functions include setting federal ambient air quality standards; preparing guidance for and approval of State Implementation Plans to meet and/or maintain those standards; establishing national emission limits for major sources of air pollution; inspecting and monitoring emission sources, enforcing federal air quality laws, and promulgating new regulations; and, providing financial and technical support for air quality research and development programs.

The federal Clean Air Act requires EPA to review and approve state implementation plans. The California SIP is a compilation of individual plans developed at the regional or local level. Each of these plans is independently reviewed and approved by EPA prior to incorporation into the SIP.

California Air Resources Board

The California Air Resources Board is the state agency responsible for the coordination and administration of both state and federal air pollution control programs in California. The ARB undertakes research, sets state ambient air quality standards, provides technical assistance to local districts, compiles emission inventories, develops suggested control measures, and provides oversight of district control programs.

A key function of the ARB is to coordinate and guide regional and local air quality planning efforts required by the California Clean Air Act, and to prepare and submit the SIP to EPA. The ARB also establishes emission standards for motor vehicles. The federal Clean Air Act allows California to adopt more stringent vehicle emission standards than the rest of the nation due to our severe air pollution problem.

San Luis Obispo County Air Pollution Control District

The San Luis Obispo County Air Pollution Control District shares responsibility with the ARB for ensuring that all state and federal ambient air quality standards are achieved and maintained within the county. State law assigns to local districts the primary responsibility for control of air pollution from stationary sources, while reserving an oversight role for the ARB. This is typically accomplished through the adoption and implementation of rules and regulations. Generally, the districts must meet minimum state and EPA program requirements; in most instances, districts can implement more stringent regulations than EPA or the State require. The District is also responsible for the inspection of stationary sources, monitoring of ambient air quality, development and updating of attainment plans, and maintenance of the emission inventory. Districts in state nonattainment areas must also develop and implement reasonably available transportation control measures.

San Luis Obispo Council of Governments

The San Luis Obispo Council of Governments (SLOCOG) is a regional agency representing San Luis Obispo County and the incorporated cities. SLOCOG participates in the development of numerous regional plans, including housing and hazardous waste management. They also prepare employment and population forecasts which are used in regional planning programs. As the designated Metropolitan Planning Organization and Regional Transportation Planning Agency for San Luis Obispo County, SLOCOG is also responsible for developing and implementing the regional transportation plan, including coordination with the District on transportation control measures.

Cities and County

While the cities and county do not participate directly in developing the Clean Air Plan, local land use decisions affect air quality. This Plan contains several transportation control measures and land use management strategies designed to reduce the air quality impacts of urban development. The success of many of these measures is dependent on their adoption and implementation by the cities and county.

Another important function of these agencies is the preparation of population forecasts based on expectations of local growth and development. This data is used by the District to forecast population-related emissions (i.e. motor vehicles, gasoline dispensers, etc.). City and county planning agencies are required by law to determine that new development is consistent with the CAP prior to granting project approval.

Other Agencies and Organizations

Several other agencies and organizations also play important roles, directly or indirectly, in the air quality planning and implementation process. The California Department of Transportation (Caltrans) is responsible for many aspects of transportation planning and roadway development and maintenance in California. Caltrans has oversight over the Regional Transportation Plans and Congestion Management Plans developed by MPOs. SLO Regional Rideshare provides carpool and vanpool match-listing services and has a strong outreach program to inform and educate the business community and the general public on various transportation alternatives to the private vehicle. Several public and private transportation providers are currently operating in this county and offer convenient and safe alternatives to private vehicle travel; these include the local and regional transit agencies, Dial-a-Ride, Ride-On TMA and the Consolidated Transportation Services Agency (CTSA).

1.5 DEVELOPMENT AND ORGANIZATION OF THE 2001 CLEAN AIR PLAN

The 2001 Clean Air Plan is an update of the 1998 CAP and a status report on progress toward attainment of the state ozone standard. Many of the control measures identified in previous Plans have already been adopted and implemented. Thus, preparation of this update primarily involved re-analysis of long-term air quality trends to see where we stand; updating the baseline emissions inventory and emissions forecasts to incorporate the most current emission factors, growth projections and control information; and evaluating the effectiveness of measures already implemented to determine the potential timeframe for reaching attainment.

This 2001 Clean Air Plan is organized into chapters covering the general sequence of Plan development:

CHAPTER 2 - PLANNING AREA AND AIR BASIN DESCRIPTION: Physical geography, land use and population distributions, and local and regional meteorology.

CHAPTER 3 - EXISTING AIR QUALITY: The nature and extent of the ozone problem in San Luis Obispo County.

CHAPTER 4 - 1991 REFERENCE YEAR EMISSIONS INVENTORY: Sources and distribution of ozone precursor (ROG and NOx) emissions.

CHAPTER 5 - STATIONARY SOURCE CONTROL PROGRAM: Methods for controlling emissions of ROG and NOx from these sources.

CHAPTER 6 - TRANSPORTATION AND LAND USE MANAGEMENT STRATEGIES: Methods for reducing motor vehicle emissions and use.

CHAPTER 7 - EMISSION FORECASTS: Forecasts of ozone precursors to the year 2010 that include the effects of urban growth and proposed emission controls.

CHAPTER 8 - PLAN IMPLEMENTATION: Agency responsibilities for Plan implementation and related issues.

CHAPTER 9 - PUBLIC INFORMATION AND EDUCATION: Development schedule for annual reports, Plan updates and an enhanced public education program.

APPENDICES - Technical Appendices were prepared for various topics, providing supporting information for the body of the Plan. A list of the appendices is provided in the table of contents at the front of this document.

CHAPTER 2
PLANNING AREA AND AIR BASIN DESCRIPTION

PHYSICAL DESCRIPTION OF PLANNING AREA

LAND USE AND POPULATION

LOCAL AND REGIONAL METEOROLOGY

2.1 PHYSICAL DESCRIPTION OF PLANNING AREA

San Luis Obispo County constitutes a land area of approximately 3,316 square miles with varied vegetation, topography and climate. The diversity of environmental conditions found in the county is greater than its size would suggest. It is bordered by Monterey County to the north, Santa Barbara County to the south, and Kern County to the east, with the Pacific Ocean as the western border. From a geographical and meteorological standpoint, the county can be divided into three general regions: the Coastal Plateau, the Upper Salinas River Valley, and the East County Plain (Figure 2-1). Air quality in each of these regions is characteristically different, although the physical features which divide them provide only limited barriers to transport of pollutants between regions. Predominant features of each region are discussed in the following section.

Geographical Regions in the County

About 75% of the county population and a corresponding portion of the commercial and industrial facilities are located within the coastal plateau. With higher population density and closer spacing of urban areas, emissions of air pollutants per unit area are generally higher here than in other regions of the county.

The coastal plateau is about five to ten miles wide and varies in elevation from sea level to about 500 feet. It is bounded on the northeast by the Santa Lucia Mountain Range, which extends almost the entire length of the county. Rising sharply to about 3,000 feet at its northern boundary, the Santa Lucia Range gradually winds southward away from the coast, finally merging into a mass of rugged features on the north side of Cuyama Canyon.

Point Buchon juts into the Pacific just south of Morro Bay to form the protective harbor of San Luis Obispo Bay. The Irish Hills are the dominant feature on this knob of land, rising abruptly from the shore to form steep cliffs and generally complex terrain from the Los Osos/Montana de Oro State Park area to Pismo Beach. These headlands have a pronounced influence on local windflow patterns. Winds on the lee side of the point often flow perpendicular to the prevailing winds and funnel back and forth through Price Canyon and the Highway 101 corridor. This effect is markedly reduced south of Grover Beach.

South of Point Buchon lies the Nipomo Dune system, which begins in the vicinity of Pismo Beach and extends to Mussel Rock, near Point Sal. This natural landmark plays host to a large number of endemic and rare plant species, as well as an unparalleled array of dune uplands, lakes and wetlands. The Nipomo Mesa is an old dune sheet that rises precipitously from the Santa Maria River floodplain on the south, and the Arroyo Grande Creek floodplain to the north.

Estuaries are also a notable feature of the coastal areas, occurring wherever flowing streams meet the ocean. Morro Bay contains the region's largest estuary, with a saltwater marsh located on the east side where Chorro and Los Osos creeks enter the bay. This is one of the most significant wetlands remaining on the California coast and has been designated part of the National Estuary Program. It provides nesting habitat for blue herons, cranes and other important types of woodland birds and wildlife. Smaller coastal lagoons and marshes are also scattered along the county's shoreline.

The Upper Salinas River Valley, located in the northern one-third of the county, houses 25% of the county's population. Historically, this region has experienced the highest ozone and particulate levels in the county. Transport of ozone precursors from the coastal plateau and from the San Joaquin Valley may contribute to this condition.

This area of plains and low rolling hills is bounded on the west by the Santa Lucia Range and to the east by the Cholame Hills, a northern extension of the Temblor Range. Southward, the La Panza Range gradually rises east of Santa Margarita and runs roughly parallel to the coast, merging with the Caliente Range near the southern border of the county. Caliente Mountain, the highest peak in the county at 5,104 feet, is found in this range.

The Upper Salinas River Valley is characterized by a variety of vegetation communities including riparian, oak woodlands, wetlands, native and nonnative grasslands, and chaparral. Coastal Live Oak and Blue Oak are dominant features of the landscape, with a wide variety of wildlife supported by the oak woodlands scattered throughout the area. Riparian trees such as cottonwoods and willows are common along drainage channels, streams, reservoirs, and marshes. Grassland vegetation is widespread on the rolling hills and flat areas that are either too dry to support oak woodland or have been cleared of oaks in the past.

The East County Plain is the largest region by land area, but only one percent of the county population resides there. Dryland farming and unpaved roads in this region contribute to county totals for particulate emissions, but these emissions rarely affect other regions of the county.

A significant portion of this area is a landlocked drainage basin called the Carrizo Plain, which lies between the La Panza and Caliente Ranges on the west and the Temblor Range to the east. These mountains join together to close the basin at the southeastern tip of the county. The Diablo Range occupies the extreme northeastern portion of this region and, like the Temblors, lies adjacent to the San Joaquin Valley.

The basin of the Plain is a dry, salt lake with alkali flats and saltbush-scrub as the principal vegetation. The upland areas are characteristic of an arid prairie, with little vegetation except dry grass. This region is best described as a steppe, a dry grass covered area with wide temperature fluctuations.

2.2 LAND USE AND POPULATION

Land Use

The predominant land use in San Luis Obispo County is agriculture, with the production and processing of vegetable crops, wine grapes, dryland grains and livestock as the major components. The southern and coastal areas of the county are primarily devoted to the production of row crops (lettuce, broccoli, peas and other vegetables), although cattle ranching prevails along the north coast. Vineyards, grain production, livestock grazing, and show and thoroughbred horse ranching are the dominant land uses in the Upper Salinas River Valley; the East County Plain supports some cattle ranches and dryland grain farms. Much of the county's agricultural land is property committed to agricultural use for periods of up to 20 years under the Williamson Act. In 1999, agricultural acreage totaled approximately 1,198,771 acres, with a gross crop value of $393,023,000. Production in the animal industry was valued at $36,031,000 for the same period. The largest change in agricultural uses in recent years has been a substantial increase in vineyard plantings for wine grapes. In 1998 there were 11,897 bearing acres; this increased to 16,272 bearing acres in 1999, with an additional 24,660 acres planted that year.

As the income from agricultural production is dispersed through other sectors of the local economy, its value to the region multiplies two to four times. Thus, the involvement of related businesses such as production equipment and products, agricultural financing, energy usage, packaging and marketing is estimated to have contributed between $786 million and $1.6 billion dollars in local agribusiness-related commerce in 1999.

The county's urban areas exist as separate and uniquely distinct clusters of development. San Miguel, Templeton, Atascadero, Cambria, Cayucos, Los Osos, Oceano and Nipomo are primarily residential communities; of these Atascadero is the only incorporated city. In contrast, San Luis Obispo, Morro Bay, the Five Cities area and Paso Robles have a much broader mix of commercial and residential uses. Residential development has been limited in some areas of the county as a result of moratoriums, growth management issues, and resource constraints.

The City of San Luis Obispo is the county seat and commercial center of the region, with 21.6% of the employment opportunities and a commercial airport located there. Commercial and industrial development has been growing steadily in the northern areas of the county, particularly in Atascadero which now boasts 11.9% of the employment opportunities and Paso Robles which follows with 8%. Industrial and commercial activities important to the region include agriculture, tourism, trade and services, government agencies, power generation, petroleum production, construction, and commercial fishing.

Institutional uses occupy significant portions of the regional land area and are important to the economic well-being of the county. Higher education facilities include California Polytechnic State University and Cuesta Community College. The County Office of Education provides special education for handicapped children as well as an Environmental Education Center for use by various groups to foster better understanding of the environment. Major institutional facilities include Atascadero State Hospital, California Mens Colony, Paso Robles Boys School, and National Guard facilities at Camp San Luis and Camp Roberts. Industrial land uses include a 1,000 megawatt fossil-fuel fired power plant in Morro Bay, a 2,000 megawatt nuclear power plant at Diablo Canyon, a petroleum refinery and coke calcining complex on the Nipomo Mesa, several large oil fields and tank farms, and many smaller industrial operations described in further detail in Chapter 5.

A substantial amount of land in San Luis Obispo County is dedicated to open space and recreational uses. The county boasts several state and regional parks, the Morro Bay Wildlife Refuge, the Nipomo Dunes, the Los Padres National Forest, and many coastal and inland recreation areas. The Hearst San Simeon State Historical Monument contains a large portion of open space land in addition to Hearst Castle, and is a significant generator of revenue for the state and local economies.

Population

San Luis Obispo County had a 1999 population of approximately 241,600 people, an increase of about 14,375, or 6%, since 1995. Over 75% of the residents live along the Highway 101 corridor, which services six of the county's seven incorporated cities and five unincorporated communities. Most of the remaining populace lives to the west of that corridor. The estimated median age in San Luis Obispo County has increased from about 29.9 years in 1980, to 33.3 years in 1990, to 37.3 years in 2000. Cambria, Cayucos, Morro Bay and Pismo Beach have the highest percentage of residents aged 65 and above; Oceano, Nipomo and most north county communities have the highest percentage of residents less than 17 years old. The City of San Luis Obispo has the lowest median age in the county, primarily due to a large resident population of college students attending Cal Poly and Cuesta College.

Table 2-1 shows the distribution of county population between incorporated cities and unincorporated county areas, together with projections of their growth. Growth projections are based on the SLO County Planning Department and San Luis Obispo Council of Governments population estimates for January 1, 1999; local evaluation of historical growth rates; national, state, and local economic forecasts; and the availability of resources to support additional growth. Estimates for incorporated cities are based on growth projections and policies provided by the cities. Figure 2-2 shows the location of the planning

areas listed in the population tables. These geographic boundaries are used by the County for land use planning purposes and for monitoring population and demographic trends.

Between 1990 and 1999, the county's population grew 11% or at an average rate of 1.3% per year. Current estimates project the number of county residents to increase 25% by the year 2015, with rate of growth in the unincorporated rural areas out pacing incorporated cities. Table 2-2 ranks the cities, unincorporated communities and planning areas by the projected percent increase in population from 1995 to the year 2015. As shown in the table, Nipomo, Cambria, Paso Robles, Nacimiento and Templeton are projected to experience the highest percent increase in population. The cities of Pismo Beach and Atascadero are also expected to show significant growth during this period.

The region's top three employment sectors - retail trade, government, and services - account for 25%, 25% and 24% of total employment, respectively. Employment growth is expected to continue in most sectors of the local economy, with most new jobs occurring in retail trade, education and health services. Employment in the farming industry has also been on the rise over the past several years due to the ongoing expansion of the wine grape and production industry. Although the recession in the early 1990s had significant impacts throughout the region, our overall unemployment rate remains among the lowest in the state.

2.3 LOCAL AND REGIONAL METEOROLOGY

The climate of the county can be generally characterized as Mediterranean, with warm, dry summers and cooler, relatively damp winters. Along the coast, mild temperatures are the rule throughout the year due to the moderating influence of the Pacific Ocean. This effect is diminished inland in proportion to distance from the ocean or by major intervening terrain features, such as the coastal mountain ranges. As a result, inland areas are characterized by a considerably wider range of temperature conditions. Maximum summer temperatures average about 70 degrees Fahrenheit near the coast, while inland valleys are often in the high 90s. Minimum winter temperatures average from the low 30s along the coast to the low 20s inland.

Regional meteorology is largely dominated by a persistent high pressure area which commonly resides over the eastern Pacific Ocean. Seasonal variations in the strength and position of this pressure cell cause seasonal changes in the weather patterns of the area. The Pacific High remains generally fixed several hundred miles offshore from May through September, enhancing onshore winds and opposing offshore winds. During spring and early summer, as the onshore breezes pass over the cool water of the ocean, fog and low clouds often form in the marine air layer along the coast. Surface heating in the interior valleys dissipates the marine layer as it moves inland.

From November through April the Pacific High tends to migrate southward, allowing northern storms to move across the county. About 90% of the total annual rainfall is received during this period. Winter conditions are usually mild, with intermittent periods of precipitation followed by mostly clear days. Rainfall amounts can vary considerably among different regions in the county. In the Coastal Plain, annual rainfall averages 16 to 28 inches, while the Upper Salinas River Valley generally receives about 12 to 20 inches of rain. The Carrizo Plain is the driest area of the county with less than 12 inches of rain in a typical year.

Airflow around the county plays an important role in the movement and dispersion of pollutants. The speed and direction of local winds are controlled by the location and strength of the Pacific High pressure system and other global patterns, by topographical factors, and by circulation patterns resulting from temperature differences between the land and sea. In spring and summer months, when the Pacific High

attains its greatest strength, onshore winds from the northwest generally prevail during the day. At night, as the sea breeze dies, weak drainage winds flow down the coastal mountains and valleys to form a light, easterly land breeze.

In the Fall, onshore surface winds decline and the marine layer grows shallow, allowing an occasional reversal to a weak offshore flow. This, along with the diurnal alternation of land-sea breeze circulation, can sometimes produce a "sloshing" effect. Under these conditions, pollutants may accumulate over the ocean for a period of one or more days and are subsequently carried back onshore with the return of the sea breeze. Strong inversions can form at this time, "trapping" pollutants near the surface.

This effect is intensified when the Pacific High weakens or moves inland to the east. This may produce a "Santa Ana" condition in which air, often pollutant-laden, is transported into the county from the east and southeast. This can occur over a period of several days until the high pressure system returns to its normal location, breaking the pattern. The breakup of a Santa Ana condition may result in relatively stagnant conditions and a buildup of pollutants offshore. The onset of the typical daytime seabreeze can bring these pollutants back onshore, where they combine with local emissions to cause high pollutant concentrations. Not all occurrences of the "post Santa Ana" condition lead to high ambient pollutant levels, but it does play an important role in the air pollution meteorology of the county.

Atmospheric Stability and Dispersion

Air pollutant concentrations are primarily determined by the amount of pollutant emissions in an area and the degree to which these pollutants are dispersed into the atmosphere. The stability of the atmosphere is one of the key factors affecting pollutant dispersion. Atmospheric stability regulates the amount of vertical and horizontal air exchange, or mixing, that can occur within a given air basin. Restricted mixing and low wind speeds are generally associated with a high degree of stability in the atmosphere. These conditions are characteristic of temperature inversions.

In the atmosphere, air temperatures normally decrease as altitude increases. At varying distances above the earth's surface, however, a reversal of this gradient can occur. This condition, termed an inversion, is simply a warm layer of air above a layer of cooler air, and it has the effect of limiting the vertical dispersion of pollutants. The height of the inversion determines the size of the mixing volume trapped below. Inversion strength or intensity is measured by the thickness of the layer and the difference in temperature between the base and the top of the inversion. The strength of the inversion determines how easily it can be broken by winds or solar heating.

Several types of inversions are common to this area. Weak, surface inversions are caused by radiational cooling of air in contact with the cold surface of the earth at night. In valleys and low lying areas this condition is intensified by the addition of cold air flowing downslope from the hills and pooling on the valley floor. Surface inversions are a common occurrence throughout the county during the winter, particularly on cold mornings when the inversion is strongest. As the morning sun warms the earth and the air near the ground, the inversion lifts, gradually dissipating as the day progresses.

During the late spring and early summer months, cool air over the ocean can intrude under the relatively warmer air over land, causing a marine inversion. These inversions can restrict dispersion along the coast, but they are typically shallow and will dissipate with surface heating.

In contrast, in the summertime the presence of the Pacific high pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms it to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion, is common to all of coastal California and can act as a nearly impenetrable lid to the vertical mixing of pollutants. The base of the

inversion typically ranges from 1000 to 2500 feet above sea level; however, levels as low as 250 feet, among the lowest anywhere in the state, have been recorded on the coastal plateau in San Luis Obispo county. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion.

Figure 2-3 provides a visual representation of inversions at the surface and aloft.

Table 2-1

SAN LUIS OBISPO COUNTY
POPULATION PROJECTIONS - JULY 1999

PLANNING AREA	1995	2000	2005	2010	2015
ADELAIDA	3060	3226	3441	3634	3801
EL POMAR/ESTRELLA	6832	7555	8341	9119	9872
ESTERO	27764	28996	30796	32535	34105
Morro Bay	9221	9662	10145	10552	10959
Cayucos	2876	3312	3657	3959	4202
Los Osos	14444	14768	15676	16639	17488
Estero (Rural)	1223	1254	1318	1385	1456
HUASNA-LOPEZ	773	850	871	889	902
LAS PILITAS	1355	1398	1491	1575	1647
LOS PADRES	322	330	345	359	372
NACIMIENTO	2700	2955	3426	3895	4385
NORTH COAST	6265	7497	8400	9411	10545
Cambria	5401	6599	7394	8284	9282
North Coast (Rural)	864	898	1006	1127	1263
SALINAS RIVER	55544	60462	68142	75219	79499
Atascadero[1]	23982	25516	28588	31150	31150
Paso Robles	20020	22170	25701	29220	32579
San Miguel	1200	1252	1389	1526	1660
Santa Margarita	1208	1291	1343	1391	1433
Templeton	3173	3992	4364	4724	5064
Salinas River (Rural)	5961	6241	6757	7208	7613
SAN LUIS BAY	45583	49077	53249	57301	59970
Arroyo Grande[1]	14719	16122	17626	18988	18988
Avila Beach	379	385	415	443	470
Grover Beach	11905	12781	13426	14104	14816
Oceano	6300	6741	7262	7785	8304
Pismo Beach	7922	8567	9693	10807	11873
San Luis Bay (Rural)	4358	4481	4827	5174	5519
SAN LUIS OBISPO	43252	45420	47718	50093	52567
San Luis Obispo (City)	39814	41774	43905	46145	48499
San Luis Obispo (Rural)	3438	3646	3813	3948	4068
SHANDON-CARRIZO	2470	2565	2804	3036	3255
SOUTH COUNTY	16786	19243	22097	25020	27907
Nipomo	8416	10074	12023	14006	15924
Nipomo (Rural)	8370	9169	10074	11014	11983
COUNTY TOTAL (Households Only)	213375	229574	251121	272086	288827
Incorporated Cities	128185	136592	149084	160966	168864
Unincorporated Areas	85190	92982	102037	111120	119963
GROUP QUARTERS[2]	14519	15109	15723	16362	17027
Incorporated Cities	3174	3303	3437	3577	3722
Unincorporated Cities	11345	11806	12286	12785	13305
COUNTY TOTAL (Hsehds + Grp Qtrs)	227894	244683	266844	288448	305854

Source: San Luis Obispo County Department of Planning and Building - July 1999

[1] No increase indicated beyond 2010 for Atascadero and Arroyo Grande in recognition of city buildout policies.
[2] Group Quarters includes nursing homes, school dormitories, military barracks, prisons, jails, hospitals, etc.

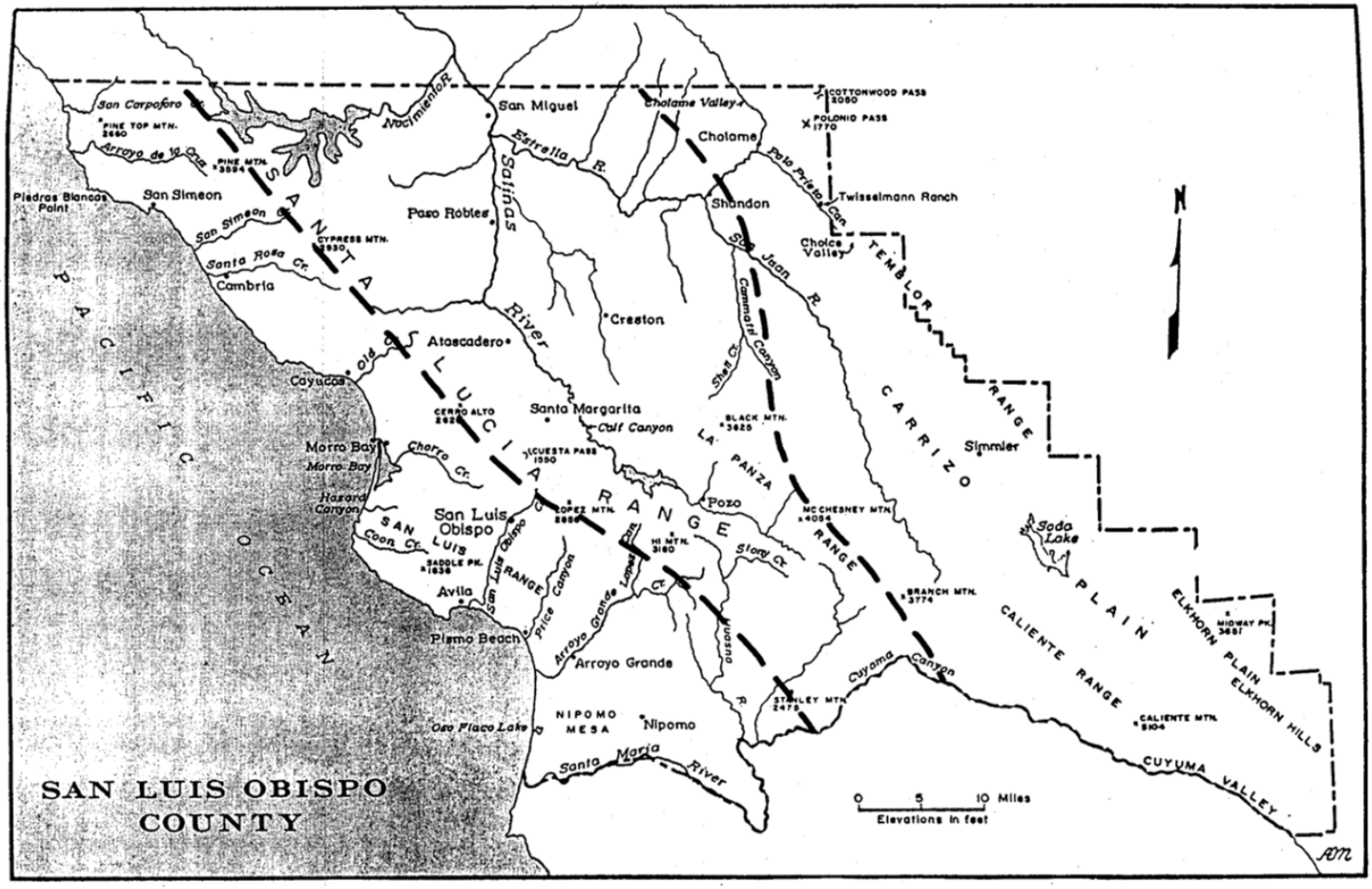
Table 2-2

SAN LUIS OBISPO COUNTY
PROJECTED POPULATION RATE OF GROWTH

PLANNING AREA/COMMUNITY	1995	2015	GROWTH
Nipomo	8416	15924	89%
Cambria	5401	9282	72%
Paso Robles	20020	32579	63%
Nacimiento	2700	4385	62%
Templeton	3173	5064	60%
Pismo Beach	7922	11873	50%
North Coast (Rural)	864	1263	46%
Cayucos	2876	4202	46%
El Pomar/Estrella Planning Area	6832	9872	44%
Nipomo (Rural)	8370	11983	43%
San Miguel	1200	1660	38%
Shandon – Carrizo Planning Area	2470	3255	32%
Oceano	6300	8304	32%
Atascadero	23982	31350	31%
Arroyo Grande	14719	18988	29%
Salinas River (Rural)	5961	7613	28%
San Luis Bay (Rural)	4358	5519	27%
Adelaida Planning Area	3060	3801	24%
Grover Beach	11905	14816	24%
Avila Beach	379	470	24%
Las Pilitas Planning Area	1355	1647	22%
San Luis Obispo	39814	48499	22%
Los Osos	14444	17488	21%
Estero (Rural)	1223	1456	19%
Santa Margarita	1208	1433	19%
Morro Bay	9221	10959	19%
San Luis Obispo (Rural)	3438	4068	18%
Huasna – Lopez Planning Area	773	902	17%
Group Quarters	14519	17027	17%
Los Padres Planning Area	322	372	16%

Note: "(Rural)" indicates the rural portion of the planning area, not including incorporated cities or unincorporated communities recognized by the U.S. Census.

Figure 2-1
GEOGRAPHICAL REGIONS OF SAN LUIS OBISPO COUNTY



Source: Hoover, Robert.
Vascular Plants of San Luis Obispo County, California
Copyright (c) 1970. University of California Press. P.27

Figure 2-2
San Luis Obispo County Planning Area Maps

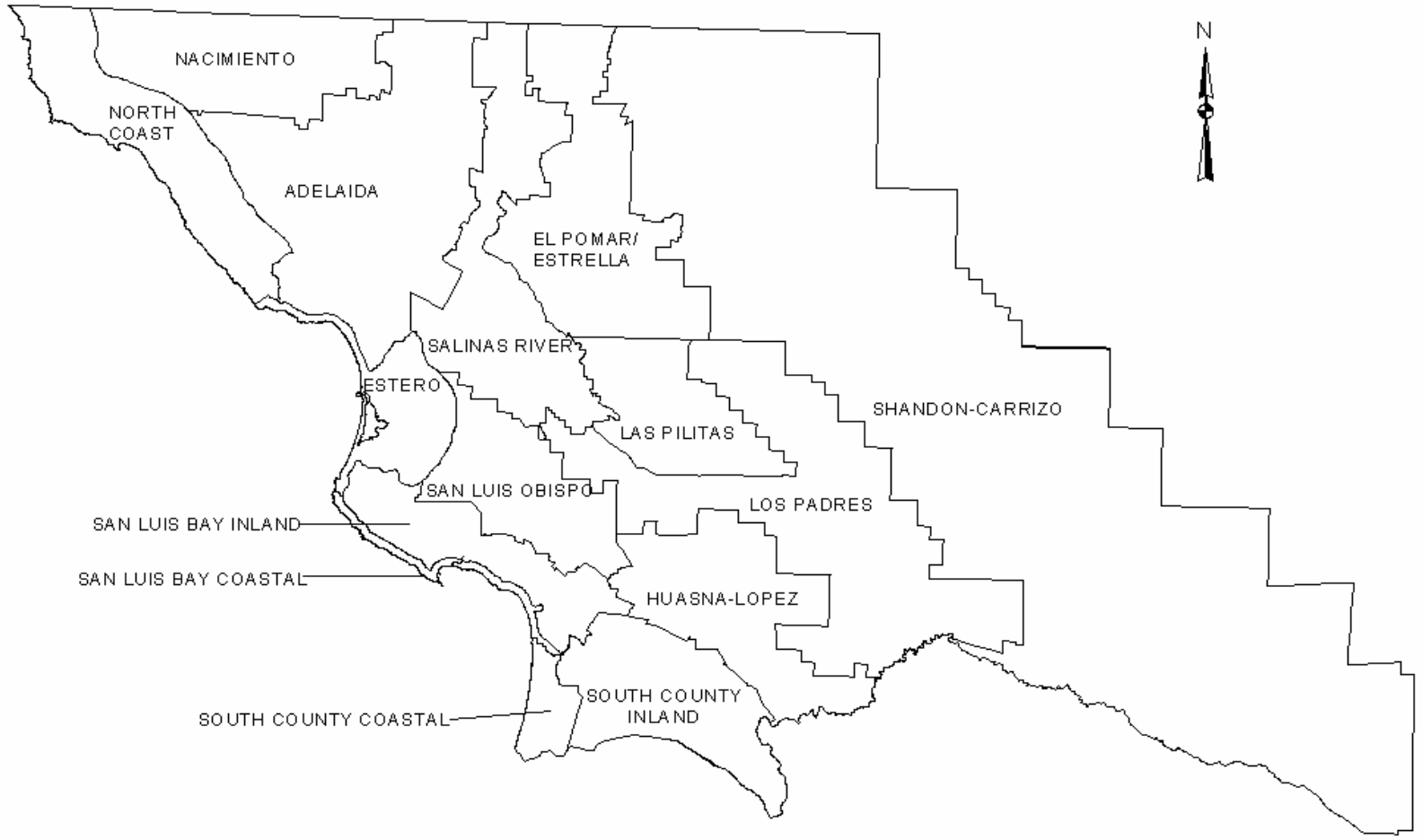
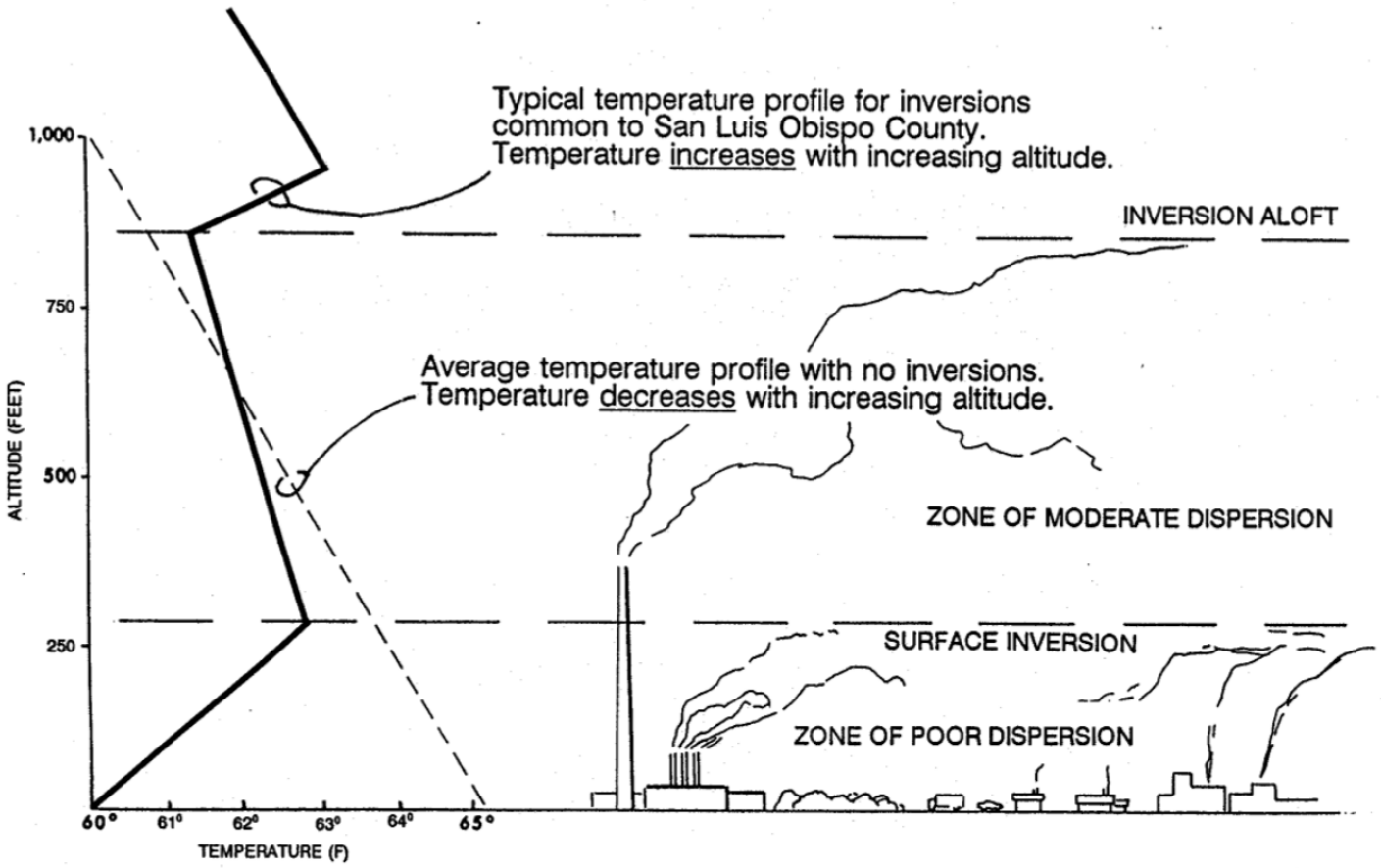


Figure 2-3

INVERSION CHARACTERISTICS



CHAPTER 3
EXISTING AIR QUALITY

AIR QUALITY STANDARDS

AIR QUALITY MONITORING

LOCAL POLLUTANT MEASUREMENTS

NONATTAINMENT POLLUTANT TRENDS

LOCAL AND REGIONAL POLLUTANT TRANSPORT

NONATTAINMENT SEVERITY CLASSIFICATION

3.1 AIR QUALITY STANDARDS

California and the federal EPA have adopted air quality standards for pollutants of primary public health concern. Achieving and maintaining these standards is the chief focus of air quality management activities by agencies around the nation, and most air quality regulations address their emissions. By a variety of other control methods, the emissions and impacts of other air pollutants without ambient standards are also managed by those agencies.

At the state and national level, air quality standards are set or revised after careful review of all scientific studies which relate airborne pollutant levels to public health and welfare. Standards are typically set at levels intended to provide a reasonable margin of safety to protect the health of the most sensitive individuals in the population.

Pollutants for which national standards have been set on the basis of the 'criteria' studies noted above are known as 'criteria pollutants'. These include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, fine particulate matter and lead, a specific particulate pollutant. Different standards for these criteria pollutants and for several others listed below have been set by California and several other states. California standards tend to be more restrictive and health-protective than national standards. The CCAA requires all districts in California to adopt all control measures necessary to meet the state ambient air quality standards.

In determining compliance with the California standards, ARB distinguishes between an 'exceedance' and a 'violation' of a standard. An exceedance occurs whenever a measured pollutant concentration is higher than the applicable air quality standard for a given averaging time, such as an hour. That exceedance will be classified as a violation of the standard unless it is determined that the concentration was affected by a highly irregular event, or the monitored level occurs so infrequently that it is outside the bounds of normally expected air quality variation at that location. Exceedances affected by highly irregular or infrequent events are not considered to be violations of a state standard and are not used as a basis for making nonattainment designations.

In addition to standards for the criteria pollutants listed above, California has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Table 3-1 shows all California and national ambient standards which are currently in effect. The narrative in Section 3.3 below describes the criteria pollutants in more detail. Chapter 8 presents a detailed discussion of visibility and other air quality issues.

3.2 AIR QUALITY MONITORING

In San Luis Obispo County, continuous air monitoring began in 1970. Since then, monitoring has been performed by the District, by the ARB and by private industry. Air monitoring is typically done either in locations which are representative of where people live and work, or near industrial sources to document their specific impacts on air quality. For most pollutants, continuous monitoring is performed 24 hours a day, and usually for periods of many years at any one location. The duration and continuity of this normal monitoring allow the identification of long-term trends, and of pollutant levels or patterns which differ from the norm.

To produce valid and accurate monitoring data, close attention by experienced technicians is required. Stringent quality assurance procedures for instrument operation and for data validation must be followed before monitoring data can be accepted into the county's air quality record. Because monitoring is expensive and labor intensive, the variety of pollutants monitored and number of stations operated in most regions of the state is, of necessity, limited. The air monitoring network in San Luis Obispo County has evolved over the years to meet growing and changing needs. While air quality in some parts of the county remains undocumented, the current network of stations and measured parameters provides a good database for determining the ambient pollutant levels experienced by most county residents, and for tracking compliance with state and federal health standards.

Most air monitoring in the county has occurred on the coastal plain and along the Highway 101 corridor, where residential, commercial and industrial activities are concentrated. The number of operating stations and the variety of analyzers in service at each station changes periodically as new needs are identified. As of December, 1999, nine public agency and private air monitoring stations were in operation in the county. The map in Figure 3-1 shows these locations along with other sites where monitoring has been performed in the past.

3.3 LOCAL POLLUTANT MEASUREMENTS

Pollutant concentrations at any one location tend to vary widely over time due to changing meteorological conditions and variations in source emission rates. As a result, air monitoring produces highly variable data sets which are difficult to characterize with a few simple numbers. Statistical descriptors of air quality data can range from simple averages and single highest measured values to more involved indicators. The simplest measure, cited in the narrative below, is to note the highest levels for a pollutant observed at different locations each year. Maximum values are used for evaluating compliance with air quality standards and for defining the time periods when highest pollutant concentrations are most likely to occur. These values characterize the most adverse air quality conditions observed during a year, and are important as a measure of public health protection.

The sections below describe the highest pollutant levels recorded in recent years at monitoring stations around the county. Table 3-2 presents maximum concentrations of criteria pollutants measured during the period 1989 through 1999.

Ozone

Ozone levels are measured at most monitoring sites in the county, and ozone remains a pollutant of highest concern countywide. The health effects of ozone are described in Chapter 1. Health concerns played a major role in recent revisions to the national ambient air quality standard for ozone. In 1997, the standard was changed from a 0.12 ppm hourly average to 0.08 ppm averaged over 8 hours, to address concerns over prolonged exposure to ozone. Later that same year, a legal challenge to the process by which EPA set the new standard resulted in a stay in its implementation. That legal challenge was resolved by the U. S. Supreme Court, but implementation has not yet begun. Until that legal challenge is resolved, the earlier national 0.12 ppm hourly average standard remains in effect. The existing state one hour ozone standard of 0.09 ppm is more stringent than the

national hourly average ozone standard, and roughly equivalent to the 8-hour 0.08 ppm standard in terms of areas of the state and nation that may be classed as attainment or nonattainment.

The two highest ozone measurements on record in the county have both occurred at Paso Robles. A single hourly average of 0.16 ppm was observed at the Paso Robles monitoring station in 1975, and another single hour at that concentration was measured in 1984. On that same day in 1984, an hourly average of 0.13 ppm was measured at San Luis Obispo, the highest ozone level on record at that location. In Grover Beach and Morro Bay, highest hourly ozone values of 0.15 ppm were measured at both sites on the same day in 1989. Several successive hours of 0.13 ppm ozone were monitored at Grover Beach on one day in 1987. The highest ozone value measured at Atascadero, where monitoring began in late 1988, was an hourly average of 0.12 ppm observed once in 1989. More detailed descriptions of most of these specific ozone events can be found in Appendix F to the 1991 edition of the Clean Air Plan. Appendix F, entitled Characterization of Recent Ozone Excursions in San Luis Obispo County, is incorporated by reference in this current document. Copies of it are available from the APCD.

Ozone levels exceeding the national 0.12 ppm one-hour standard have occurred on average less than one day per year at any one monitoring site in the county. As a result, San Luis Obispo County is classified as 'attainment' for the one-hour national ozone standard. However, as shown in Table 3-3, exceedances of the state 0.09 ppm one-hour ozone standard are recorded periodically at monitoring sites throughout the county. As a result, the county is classified as 'nonattainment' for this standard.

Ozone levels approaching or exceeding the state standard are observed most frequently at our north county sites. In the period 1989 through 1999, 61 days during which the state one-hour standard was exceeded have been measured at one or more locations in the north county. In that same period, only seven days exceeding that standard have been measured in coastal and/or southern areas of the county.

Figure 3-3 shows the number of days each year when exceedances of the state ozone standard were recorded at monitoring locations around the county during the period 1989 through 1999. As shown in the chart, the majority of exceedance days are measured at our north county stations; however there is considerable variation in the frequency of occurrence from year to year. For example, the standard was exceeded at Paso Robles on 25 different days in 1998, the highest number of exceedance days in any one year since monitoring began in the county. This immediately followed 1997, which was the cleanest year on record for monitored ozone, with no exceedances of the state standard measured anywhere in the county. And in 1999, the year following the highest year on record, only two exceedance days were monitored countywide, one at Paso Robles and one at Morro Bay. Such dramatic year-to-year changes demonstrate the pronounced effect of meteorology variations on ozone formation and transport.

PM_{10} and $PM_{2.5}$

State and federal standards have been set for PM_{10}, which includes all particles 10 microns (Φ) or less in diameter. Particulate matter in this size range can be inhaled deeply into the respiratory tract and lungs, posing a significant health threat, as described in Chapter 1. In July, 1997, the federal EPA added new standards for $PM_{2.5}$, particulate matter with sizes of 2.5Φ or less in diameter. In this size range, all particles which enter the lungs remain lodged there, causing a greater threat to

respiratory illness and contributing to premature death. Different monitoring methods and different samplers are required for sampling PM_{10} and $PM_{2.5}$.

Sampling for $PM_{2.5}$ began here in January, 1999 at San Luis Obispo and Atascadero. Since then, no single sample has exceeded the federal standard, nor have average levels at either location exceeded the federal annual average standard. As for PM_{10}, compliance with the 24-hour $PM_{2.5}$ standard is measured by taking a 24-hour sample every sixth day throughout the year. Compliance with the federal annual average $PM_{2.5}$ standard is determined by a simple arithmetic mean of all of the samples taken that year. Available data indicates that the county will be in attainment for the new standards.

PM_{10} monitoring has been performed at several locations around the county since 1987, and is currently monitored at seven sites. State and federal air quality standards for PM_{10} are set for both a 24-hour and an annual average period, as shown in Table 3-1. The county is currently in attainment of the federal PM_{10} standards, but does not meet the more stringent state standards. Compliance with the state annual average PM_{10} standard is determined by calculating the geometric mean (somewhat like an arithmetic mean) of all 24-hour samples taken throughout the year.

As shown in Table 3-4, the highest PM_{10} measurements in the county, and the most frequent exceedances of the state 24-hour standard of 50 $\Phi g/m^3$ (micrograms per cubic meter), have occurred at three special-purpose monitoring sites on the Nipomo Mesa (UCD1, UCD2 and Ralcoa Way). The highest 24-hour PM_{10} sample taken in the county to date was a value of 141 $\Phi g/m^3$ measured in 1993 at the Ralcoa Way station. Two similar 24-hour values of 136 and 135 $\Phi g/m^3$ were also measured at Ralcoa Way in 1990 and 1992. Since 1994, PM_{10} measurements have not exceeded 100 $\Phi g/m^3$ at any monitoring site in the county.

Figure 3-4 depicts the number of measured exceedances of the state 24-hour PM_{10} standard recorded at specific monitoring sites and countywide, from 1990 through 1999. As shown in both this figure and Table 3-4, concentrations exceeding the state 24-hour PM_{10} standard occur at least several times a year at each site where sampling is performed. The frequency of exceedances recorded at the Ralcoa Way station is significantly higher than at any other monitoring location. Because data from the special-purpose stations may not be representative of typical community exposure levels, the lower graphic in Figure 3-4 shows countywide PM_{10} levels both with and without that data.

The state annual PM_{10} standard of 30 $\Phi g/m^3$ has been exceeded at several locations around the county over the years, as noted in Table 3-4. However, all but one of the values listed represent only partial years of monitoring at a given location and are not considered representative of the annual concentration at those sites. For annual values which exceed the state standard, only the full year of Ralcoa Way data for 1995 meets all representativeness criteria. The annual value for that year was 30.5 $\Phi g/m^3$, qualifying as a violation of the State annual average PM_{10} standard. Annual average PM_{10} concentrations at most other locations in the county are less than 25 $\Phi g/m^3$.

In certain areas of the county, higher PM_{10} levels show a seasonal pattern of occurrence. Figure 3-5 depicts, for each monitoring location, the average monthly incidence of PM_{10} samples which violate the state 24-hour standard. As shown in this chart, most violations at the north county stations of Atascadero and Paso Robles are measured during winter months. This may be linked to seasonal

emissions from open burning and the use of wood stoves and fireplaces, combined with seasonal changes in meteorology which minimize dispersion of pollutants from these and other sources.

Figure 3-5 shows a different pattern for the Nipomo Mesa, where PM_{10} violations at Ralcoa Way and UCD1/2 occur more frequently in the spring. This may be due to typically higher spring winds acting on the significant fugitive dust sources in that region.

Sulfur Dioxide

Sulfur dioxide (SO_2) adversely affects the upper respiratory tract. When SO_2 (or particulate matter on which SO_2 is adsorbed) contacts moist respiratory surfaces, an acid is formed, causing the body to react in a way that interferes with normal breathing. In contrast to the regional nature of ozone and PM_{10}, higher SO_2 levels are usually very localized and source-specific. Thus, monitoring for SO_2 has occurred primarily in the southern coastal part of San Luis Obispo County, where an industrial source of SO_2 emissions, the Santa Maria Refinery, is located. This facility performs preliminary refining and sulfur removal from the high-sulfur crude oil produced in Central California.

Violations of the state 1-hour SO_2 standard have been measured several times in the past on the Nipomo Mesa. In the first two years after a new monitoring station began operation on the Mesa in late 1984, nine violations of the state 0.25 ppm hourly average SO_2 standard were recorded. This station and others subsequently installed nearby are adjacent to the refinery in key downwind locations. In mid-1986, new SO_2 emission controls were installed at the Unocal refinery, reducing ambient levels in the area substantially. Two hours of breakdown-related standard violations occurred in 1990, and one hour of breakdown-related violation was measured in 1993. With the exception of these incidents, no further exceedances of SO_2 standards have been observed since the refinery modifications were completed. No violations of any national SO_2 standard have ever been measured in the county. Because of this improvement in air quality, the ARB redesignated this area of San Luis Obispo County as attainment for the state SO_2 standard in November, 1990.

Even though emission controls and nearby SO_2 levels have improved significantly, monitoring stations on the Nipomo Mesa continue to register what are sometimes the highest SO_2 levels in the state for a given period. The highest hourly average recorded to date in the county occurred in September, 1990, when a refinery breakdown resulted in an hourly average concentration of 0.75 ppm SO_2 measured at a nearby monitoring station. This represents the third highest hourly average ever measured in the state. In June, 1993, another breakdown led to a single hour of 0.57 ppm SO_2 at the same station. Typically, however,SO_2 levels near these sources are much lower than these extreme values, with the highest levels in any year being less than half of the state standard. Analyzers at stations near the refinery often show long, continuous periods with SO_2 levels at or near zero ppm.

Nitrogen Dioxide

Monitoring for oxides of nitrogen occurs at several locations around the county, primarily to acquire information about NOx as a precursor of ozone. Ambient standards have been set at the state and national levels for one of the gaseous oxides of nitrogen, nitrogen dioxide (NO_2). Like sulfur dioxide, the health effects of NO_2 relate to its propensity to inflame moist respiratory surfaces.

Local ambient NO_2 levels tend to be highest in the winter, when morning temperature inversions create a low ceiling over pollutants emitted close to ground level. In the county's monitoring record, the highest hourly average of 0.11 ppm NO_2 was measured at San Luis Obispo and Morro Bay in 1981; this is less than half of the state one-hour standard of 0.25 ppm. Highest annual averages at all monitoring locations have historically measured less than half of the 0.05 ppm national annual average standard.

Carbon Monoxide

Carbon monoxide (CO) interferes with the ability of blood to carry oxygen to the body's tissues. Short-term exposure to CO at concentrations above the health standards can cause impairment of the central nervous system and other disorders. Exposure to concentrations substantially above established standards can be fatal. CO concentrations at these very high levels are not normally found in the outdoor environment.

CO monitoring in this county has only occurred in downtown San Luis Obispo. An hourly average concentration of 13 ppm was measured in 1983, and remains the highest value recorded since that date. Typically, highest hours observed in recent years average less than half of the state 20 ppm hourly standard. Similarly, maximum 8-hour average CO levels are generally less than half of the state and national eight-hour standard of 9 ppm. This represents a significant improvement from the early 1970's, when higher CO levels were measured and the state and national eight-hour standards were occasionally exceeded. The last violations of these standards in the county were recorded in 1975.

3.4 NONATTAINMENT POLLUTANT TRENDS

Evaluation of air quality data collected over several years at different monitoring locations is an important tool for determining progress toward attainment of standards. Air quality trend analyses can be used to judge the effectiveness of adopted control strategies, and are thus particularly useful for planning purposes. The following sections describe the data analyses performed for both ozone and PM_{10}.

Ozone

Trends have been evaluated using two indicators of ozone levels at each station- the highest hourly concentration measured annually, and the number of hours each year which equal or exceed 0.07 ppm ozone. The maximum yearly value represents one hour out of the roughly 3,000 daytime hours annually when elevated ozone concentrations might normally occur. The number of hours at or above 0.07 ppm is a more robust trend indicator because it is based on a greater number of data

points, giving a more reliable picture of pollutant activity over the assessment period. Also, data analysis shows that ozone levels of 0.07 ppm and greater are indicative of meteorological and emission conditions under which exceedances of the state standard can occur. It should be emphasized that no ozone standards have been set at the level of 0.07 ppm, and adverse health effects are not implied by tracking this statistic. However, impacts on plant physiology, especially in leaf crops and grapes, are known to result from longer-term exposure to ozone levels above 0.06 ppm.

Figure 3-6 presents the annual count of hours at or above 0.07 ppm ozone for six key stations during the ten year period 1990 through 1999. The trend lines behind the bars represent best-fit linear regression analyses of the annual totals. As shown in the charts, hourly averages exceeding the 0.07 ppm threshold typically occur less than 100 times each year at stations on the coastal side of the Santa Lucia Range. The slope of the trend lines for these stations generally show a steady decline during this period. The occurrence of higher concentration ozone activity measured at San Luis Obispo, Morro Bay, and Grover Beach has been particularly low for the past five years or more. In contrast, ozone hours at or above 0.07 ppm occur much more frequently north of the Cuesta Grade, as evidenced by the bar charts for Paso Robles and Atascadero. The trend line for Paso Robles shows a pronounced increase in higher ozone level activity since 1992, primarily due to levels measured in 1998.

Figure 3-7 presents the highest hourly ozone concentrations recorded each year for the six key stations used in this analysis, for the sixteen year period 1984 through 1999. This statistic reflects the concentration of the single highest hour monitored at each site during a year, and is a less reliable trend indicator than one more broadly based on a larger number of constituent hours. It is, however, still of some value in assessing trends. As shown in the charts, there is quite a bit of variability in maximum ozone levels observed from one year to the next, and at different locations. This variability tends to obscure any trends in the data set. This statistic indicates some overall improvement in ozone levels at each monitoring site throughout the county.

Figure 3-3 shows that most recent exceedances of the state ozone standard in the last decade in the county have been measured at monitoring stations in Paso Robles or Atascadero. Differences in overall ozone activity at these stations can be attributed to a variety of factors. These include differences in local meteorological conditions such as inversions, which contribute to ozone formation; differences in topography, which can amplify the effects of adverse meteorology; and the proximity of stationary, mobile or urban sources of ozone precursor emissions. Ozone formation is highly dependent on sunlight intensity, air temperature, and the timing of precursors emitted into the existing pollutant mix. All of these factors affect the concentration and geographic extent of any ozone formed and measured on a given day. As a result, higher ozone levels tend to vary, sometimes dramatically, from one year to the next and from station to station.

Transport of pollutant-laden air from the San Joaquin Valley and Bay Area may also play a significant role, both in the high variation of measured ozone levels from one year to the next, and in the apparent declining air quality trend in the last decade. The 2001 ARB triennial review of pollutant transport in California specifically studied the transport of pollutants from distant urban sources to San Luis Obispo has been in that update. Their analysis found that, depending on meteorology, a range of ozone formation scenarios can occur in San Luis Obispo County. Exceedances of the state ozone standard in the North County can result entirely from locally emitted

precursors, or from a combination of local emissions and pollutants transported into the county from adjacent areas. In certain situations, overwhelming transport of precursors and ozone from major urban areas outside of the county can be the cause of a standard exceedance. Distant urban sources for those transported pollutants may include the San Joaquin Valley and/or the San Francisco Bay area.

PM_{10}

Reliable analysis of PM_{10} trends is difficult to accomplish, for a variety reasons: (1) One 24-hour PM_{10} sample is typically collected every sixth day, leaving much uncertainty about what levels of PM_{10} might have occurred on the unsampled days; (2) PM_{10} levels at any one location may reflect region-wide influences as well as very local, diverse, and sometimes transient sources of airborne particles, such as regionwide burning, nearby dirt roads, or short-term grading projects; and (3) A full year of PM_{10} data contains roughly 60 sample values, compared to about 8,400 hourly values in a year of monitoring for a gaseous pollutant. With fewer data points, distinguishing unusual values from routine ones can be difficult.

For these reasons, no substantive analysis of PM_{10} trends is presented here. However, a review of Figure 3-4 indicates that some improvement in PM_{10} air quality appears to have occurred over the past decade.

3.5 LOCAL AND REGIONAL POLLUTANT TRANSPORT

Ozone is a "secondary" pollutant, formed in the atmosphere by a series of chemical reactions between oxides of nitrogen and reactive organic gases. These reactions are driven by sunlight (thus the term 'photochemical') and proceed at varying rates. Under the stable, somewhat stagnant meteorology that leads to the highest local ozone levels, a pollutant-laden air mass may drift away from its source area with ozone formation taking place as the air mass moves. This results in ozone levels downwind that are often higher than those found in the source area itself.

On the local level, ozone 'transport' from one area to another is common. As described above, this is why ozone levels in a rural location of the county can be higher than levels in a more congested urban area. On a different scale, ozone and ozone precursors can also be transported over long distances, with travel times up to several days, and can cause impacts in areas far from the point of origin. Ozone transport over distances of several hundred miles has often been documented in California.

In this county, higher ozone levels have occasionally been traced to emissions which originated in other air basins, such as the San Francisco Bay Area or the San Joaquin Valley. In fact, the ARB has acknowledged that pollutant transport may be an important factor in the declining ozone air quality experienced in our North County in recent years. However, documentation for such transport is often incomplete. Verification of the actual long-distance origin of ozone or ozone precursors for any given day requires an extensive, focused technical effort, and considerable supporting data. As a result, the real frequency of long-range pollutant transport affecting local ozone air quality has not been definitively established. However, the Central California Ozone Study (CCOS) in 2000 collected extensive field data from the northern half of the state to support photochemical modeling

for the 2003 State attainment plans. This future modeling effort will provide a much better understanding of pollutant transport impacts in our region.

It is important to note that previous ARB studies have shown that emission sources and meteorology that exist in this county are sufficient to generate the levels of ozone we monitor. In addition, the several hundred miles that separate the county from major urban source areas make transport over this distance an infrequent event. Appendix F to the 1991 Clean Air Plan, Characterization of Recent Ozone Excursions in San Luis Obispo County, presents case histories of several suspected transport events.

3.6 NONATTAINMENT SEVERITY CLASSIFICATION

Section 40913 of the CCAA requires district plans to identify and provide commitments to implement control measures designed to achieve the state standards by the earliest practical date. The severity of the ozone problem in each nonattainment area is based on the ozone "design value" for each area. This value is determined by identifying the highest ozone level recorded at each monitoring location in the district within the last three years, excluding extreme values; values that result from exceptional events; or values attributable to overwhelming transport from an upwind district. Nonattainment severity classifications are as follows:

Ozone Design Value	Classification
0.09 - 0.12 ppm	Moderate
0.13 - 0.15 ppm	Serious
0.16 - 0.20 ppm	Severe
> 0.20 ppm	Extreme

There is a similar federal nonattainment severity classification based on the federal ozone standard. Since San Luis Obispo County does not exceed the federal ozone standard, or any other federal standard, the federal classification scheme has not been included here.

The control requirements applicable to nonattainment areas are based on the design value and severity classification. Districts must incorporate sufficient emission control strategies in their attainment plan to reduce the design value to the level of the state standard by a specified target date. The design value for our county has been determined by ARB to be 0.10 ppm. As a result, we are classified as a "moderate" ozone nonattainment area. The CCAA establishes December 31, 1997, as the attainment deadline for moderate nonattainment areas. Failure to meet the deadline could result in the District's severity classification and control requirements being 'bumped up' to that of a serious nonattainment area, if the ARB determines that such action would substantially increase our ability to attain the standard by the earliest practical date.

As shown in Figure 3-3, no violations of the State ozone standard were measured at any location in the county in 1997, and only two were measured in 1999; however, twelve violations were recorded in 1996 and 25 in 1998. Redesignation to attainment status requires three consecutive years with no recorded violations. Thus, we have not met the 1997 CCAA attainment deadline. ARB has evaluated the situation and determined that a bump-up to the “serious” category would not result in more expeditious attainment of the standard. This determination is based on the potential influence of upwind pollutant transport contributing to the continuing exceedances in the North County, and

the substantial emission reductions achieved through control strategies already implemented or proposed for implementation (see Chapter 7).

Table 3-1

STATE AND NATIONAL AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards (primary)
Ozone (0_3)	1 Hour	0.09 ppm	0.12 ppm
	8 Hour		0.08 ppm
PM_{10}	Annual Geometric Mean	30 $\mu g/m^3$	
	24 Hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Arithmetic Mean		50 $\mu g/m^3$
$PM_{2.5}$	24 Hour		65 $\mu g/m^3$
	Annual Arithmetic Mean		15 $\mu g/m^3$
Carbon Monoxide (CO)	8 Hour	9.0 ppm	9 ppm
	1 Hour	20 ppm	35 ppm
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean		0.053 ppm
	1 Hour	0.25 ppm	
Lead	30 days average	1.5 $\mu g/m^3$	
	Calendar Quarter		1.5 $\mu g/m^3$
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean		0.030 ppm
	24 Hour	0.04 ppm	0.14 ppm
	3 Hour		0.5 ppm (secondary)
	1 Hour	0.25 ppm	
Visibility Reducing Particles	8 Hour (10 am to 6 pm, PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer-visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.	
Sulfates	24 Hour	25 $\mu g/m^3$	
Hydrogen Sulfide	1 Hour	0.03 ppm	

Table 3-2
MAXIMUM POLLUTANT CONCENTRATIONS MEASURED IN SAN LUIS OBISPO COUNTY 1989-1999

Pollutant/Monitoring Station	Averaging Time++	Units of Measure	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Ozone (O3)													
San Luis Obispo	1-hour	ppm	0.12	0.08	0.09	0.08	0.09	0.07	0.08	0.08	0.07	0.07	0.09
Nipomo	1-hour	ppm	0.12	0.09	0.09	0.09	0.10	0.09	0.07	0.07	***	***	0.09
Grover Beach	1-hour	ppm	0.15	0.09	0.09	0.11	0.08	0.07	0.08	0.08	0.07	0.07	0.09
Morro Bay	1-hour	ppm	0.15	0.09	0.10	0.10	0.08	0.06	0.08	0.10	0.06	0.07	0.10
Paso Robles	1-hour	ppm	0.09	0.08	0.09	0.09	0.09	0.10	0.11	0.14	0.08	0.13	0.10
Atascadero	1-hour	ppm	0.12	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.09	0.10	0.09
Carbon Monoxide (CO)													
San Luis Obispo	1-hour	ppm	10	10	8	8	9	6	6	5	7	4	5
	8-hour	ppm	6.3	4.1	3.3	3.1	3.2	3.2	3.1	2.9	2.6	2.3	3.1
Nitrogen Dioxide (NO2)													
San Luis Obispo	1-hour	ppm	0.09	0.07	0.07	0.06	0.10	0.07	0.07	0.06	0.07	0.06	0.06
	annual	ppm	0.016	0.014	0.014	0.013	0.010	0.014	0.013	0.013	0.014	0.012	0.013
Nipomo	1-hour	ppm	0.05	0.05	0.08	0.04	0.10	0.05	0.06	0.04*	**	0.04	0.07
	annual	ppm	0.009	0.010	0.011	0.010	0.010	0.010	0.008	0.008*	**	0.008	0.007
Grover City	1-hour	ppm	0.07	0.06	0.05	0.05	0.10	0.05	0.04	0.05	0.04	0.05	0.05
	annual	ppm	0.007	0.008	0.007	0.007	0.010	0.010	0.007	0.007	0.008	0.007	0.008
SLO-Lewis Lane	1-hour	ppm	0.04	0.04	0.05	0.03	0.10	0.04	0.02*	**	**	**	**
	annual	ppm	0.007	0.008	0.008	0.006	0.010	0.000	0.003*	**	**	**	**
Atascadero	1-hour	ppm	--	0.07	0.07	0.06	0.10	0.07	0.06	0.06	0.07	0.06	0.07
	annual	ppm	--	0.020	0.017	0.015	0.010	0.010	0.012	0.012	0.012	0.011	0.013
Sulfur Dioxide (SO2)													
Nipomo	1-hour	ppm	0.04	0.03	0.03	0.04	0.03	0.03	0.024	0.031	**	**	**
	24-hour	ppm	0.006	0.005	0.01	0.01	0.01	0.01	0.004	0.005	**	**	**
	annual	ppm	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001*	**	**	**
Grover City	1-hour	ppm	0.03	0.08	0.03	0.03	0.04	0.03	0.04	0.05	0.04	0.02	0.04
	24-hour	ppm	0.008	0.01	0.005	0.004	0.01	0.02	0.004	0.005	0.006	0.004	0.005
	annual	ppm	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001
Morro Bay	1-hour	ppm	0.02	0.02	0.01	0.01	0.01	0.01	0.038	**	**	**	**
	24-hour	ppm	0.01	0.003	0.003	0.000	0.000	0.000	0.005	**	**	**	**
	annual	ppm	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**	**	**	**
SLO-Lewis Lane	1-hour	ppm	0.02	0.01	0.08	0.02	0.02	0.02	0.01*	**	**	**	**
	24-hour	ppm	0.006	0.010	0.010	0.004	0.010	0.000	0.000*	**	**	**	**
	annual	ppm	0.000	0.001	0.000	0.000	0.000	0.000	0.000*	**	**	**	**
Nipomo Mesa	1-hour	ppm	0.22	0.14	0.12	0.17	0.14	**	**	**	**	**	**
	24-hour	ppm	0.021	0.02	0.022	0.017	0.02	**	**	**	**	**	**
	annual	ppm	0.004	0.003	0.003	0.003	0.000	**	**	**	**	**	**
PM-10													
San Luis Obispo	24-hour	ug/m3	55	42	52	36*	57	37	51	39	55	32	44
	annual	ug/m3	23.9	19.4	22.9	18.8*	19.1	19.1	17.6	15.2	17.2	16.0	17.6
Atascadero	24-hour	ug/m3	63	79	62	44*	78*	44	52	44	70	47	43
	annual	ug/m3	26.3	23.4*	23.5*	22.3*	20.7*	21.1	20.8	16.1	18.7	16.3	19.4
Nipomo	24-hour	ug/m3	--	64	47	46	59*	52	62	48	**	**	72
	annual	ug/m3	--	24.6*	21.5	22.9	19.2*	20.8	17	18.1*	**	**	22.3
Morro Bay	24-hour	ug/m3	--	40	51	38	64	48*	40	42	57	33	39
	annual	ug/m3	--	24.1*	20.0*	17.8	18.6	18.3*	17.5	15.8	18.2	14.6	15.6
Paso Robles	24-hour	ug/m3	--	41	67	53*	54*	30*	56	46	75	55	58
	annual	ug/m3		21.5*	34.5*	22.8*	16.3*	19.5*	18.7	17.4	19	17.4	22.7

Notes:
-- Indicates data not available;
* Data are valid but incomplete and may not be representative;
** Monitoring Terminated;
*** No monitoring data for 1997 & 1998 due to relocation of station
++ Annual arithmetic mean for SO_2 and NO_2, annual geometric mean for TSP and PM_{10}.

Table 3-3

MAXIMUM 1-HOUR OZONE CONCENTRATION (PPM) IN SAN LUIS OBISPO COUNTY
Maximum Concentrations (Violations) *

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
NIPOMO	0.12(5)	0.09	0.09	0.09	0.10(1)	0.09	0.08	0.10(1)**	***	***	0.09
PASO	0.09	0.08	0.09	0.09	0.09	0.10(2)	0.11(6)	0.14(9)	0.08	0.13(25)	0.10(1)
SLO	0.12(6)	0.08	0.09	0.08	0.09	0.07	0.08	0.08	0.07	0.07	0.09
MORRO	0.15(6)	0.09	0.10(2)	0.10(1)	0.08	0.06	0.07	0.07	0.06	0.07	0.10(1)
GROVER	0.15(6)	0.09	0.09	0.11(6)	0.08	0.07	0.08	0.08	0.07	0.07	0.09
ATASCADERO	0.12(2)	0.11(8)	0.10(3)	0.10(2)	0.10(4)	0.10(4)	0.10(1)	0.11(7)	0.09	0.10(2)	0.09

Note: * Numbers in parenthesis refer to the number of hours measured which exceeded the state ozone standard.
** Data incomplete and not representative
*** No monitoring in 1997 & 1998 due to station relocation

OZONE STANDARDS

AVERAGING TIME	STATE	NATIONAL
1-hour average (ppm)	0.09	
8-hour average (ppm)		0.08

Notes:

- National standard is not to be exceeded and is a three-year average of the fourth-highest daily maximum eight-hour average of continuous ambient air monitoring data.
- State standards are not to be exceeded. Thus, every hour above 0.095 ppm ozone is a violation of the state standard.

Table 3-4:
PM_{10} LEVELS IN SAN LUIS OBISPO COUNTY

MAXIMUM 24-HOUR CONCENTRATION (ug/m3)
Concentration (Violations)*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
MORRO BAY	40**	51(1)**	38	64(2)	48**	40	48	57(1)	33	37
SLO	42	52(1)	36**	57(1)**	37	51(1)	39	55(2)	32	42
ATASCADERO	79(3)**	62(3)**	44	78(5)**	44	75(4)	44	70(1)	47	43
UCD2#	86(8)	119(7)**	+++	+++	+++	+++	+++	+++	+++	+++
UCD1#	--	75(3)**	114(7)	121(8)	97(6)	90(4)	84(4)	71(5)	65(4)	72(4)
NIPOMO	64(3)**	47	46	59(1)**	52(1)	62(1)	47**	+*+	+*+	41
RALCOA WAY	136(12)**	90(10)**	135(9)**	141(19)	107(10)	99(15)	98(12)	99(16)	73(13)	90(5)
PASO ROBLES	41**	67(4)**	53(2)**	54(1)**	30**	56(3)	46	75(1)	57(1)	56(1)

ANNUAL GEOMETRIC MEAN CONCENTRATION (ug/m^3)
Concentration (Violation)***

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
MORRO BAY	24.1**	20.0**	17.8	18.6	18.3**	17.5	15.8	18.2	14.6	15.6
SLO	19.4	22.9	18.8**	19.1**	19.1	17.6	15.2	17.2	16.0	17.6
ATASCADERO	23.4**	23.5**	22.3**	20.7**	21.1	20.8	16.1	18.7	16.3	19.4
UCD2#	26.0	**(37.4)****	+++	+++	+++	+++	+++	+++	+++	+++
UCD1#	--	23.1**	25.6	24	23.8	19.9	20.8	20.5	27.3	22.3
NIPOMO	24.6**	21.5	22.9	19.2**	20.8	17.1	18.1**	+*+	+*+	17.3
RALCOA WAY	--	--	(**37.2**)**	(**36.8**)**	(**35.9**)	30.5	29.1	**(33.2)**	(30.3)	27.2
PASO ROBLES	21.5**	(**34.5**)**	22.8**	16.3**	19.5**	18.7	17.4	19.0	17.4	22.7

AIR QUALITY STANDARDS FOR PM_{10} AND $PM_{2.5}$

POLLUTANT	AVERAGING TIME	STATE STANDARD	NATIONAL STANDARD
PM_{10}	24-Hour (ug/m^3)	50	150
	Annual (ug/m^3)	30 (geometric mean)	50 (arithmetic mean)
$PM_{2.5}$	24-Hour (ug/m^3)		65
	Annual (ug/m^3)		15 (arithmetic mean)

Notes:
The UCD1 and UCD2 monitoring stations are located on the Nipomo Mesa.
* Numbers in parenthesis refer to number of sample days in violation of the state hourly PM_{10} standard.
** Data are incomplete and may not be representative.
*** Bold values in parenthesis indicate a violation of the state annual PM_{10} standard.
\+ The sampler size-selective inlet was changed at SLO during 1988 resulting in two data values (before and after).
++ The Paso Robles monitoring station was relocated from 10th street to Santa Fe Avenue in 1991.
+++ Monitoring terminated.
+*+ No monitoring in 1997 & 1998 due to station relocation

Figure 3-1

AIR MONITORING STATIONS IN SAN LUIS OBISPO COUNTY

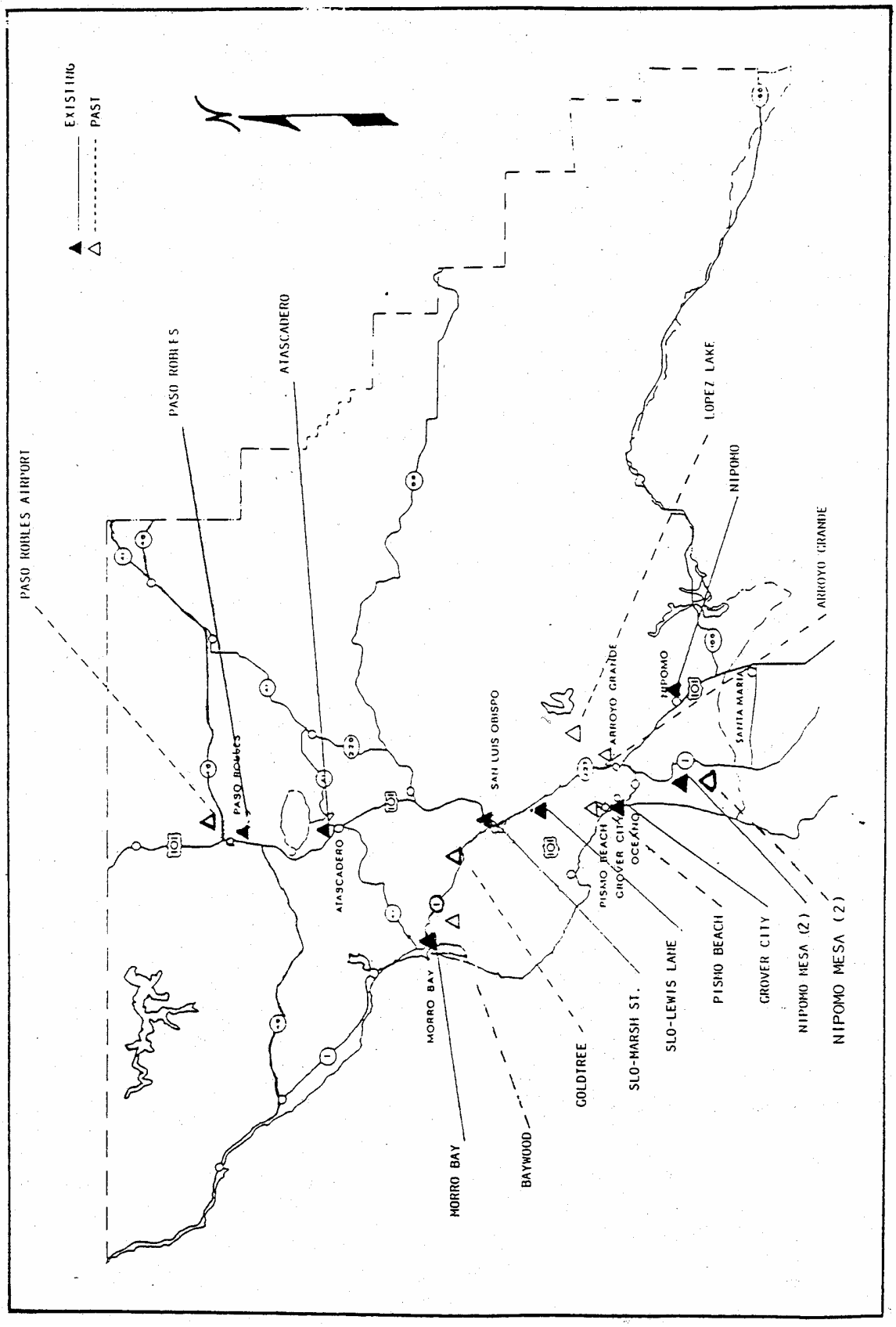
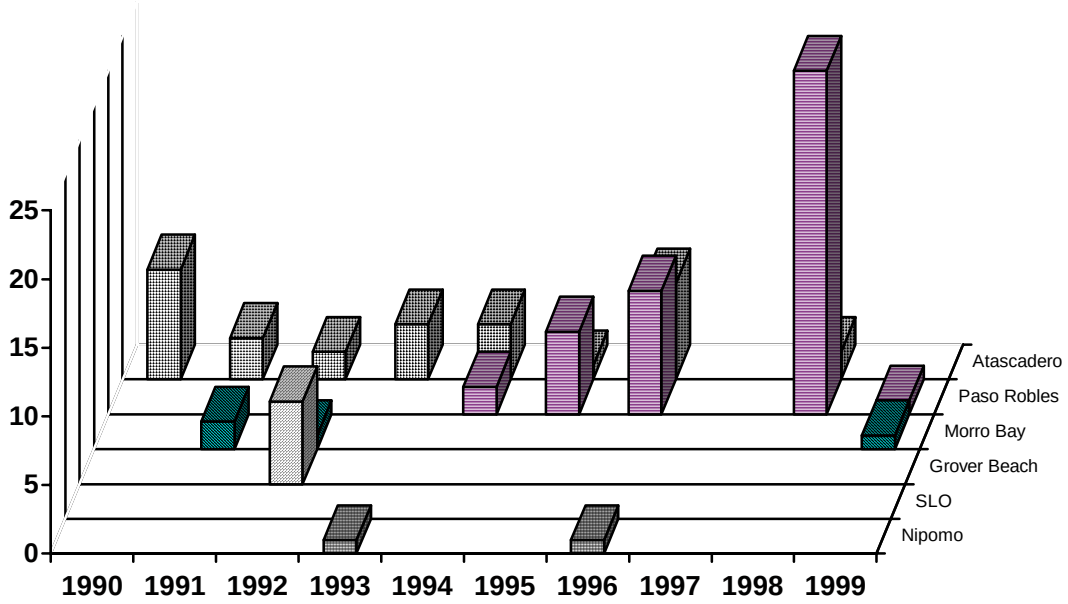


Figure 3-3

DAYS EXCEEDING THE STATE OZONE STANDARD: 1990-1999

STATION-BY-STATION OZONE EXECEEEDANCE DAYS



COUNTYWIDE OZONE EXCEEDANCE DAYS

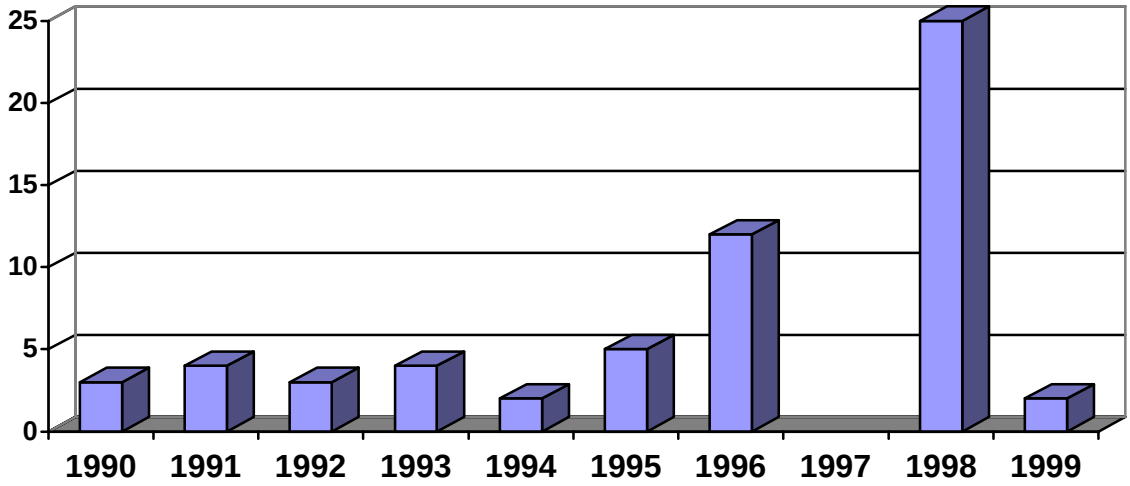
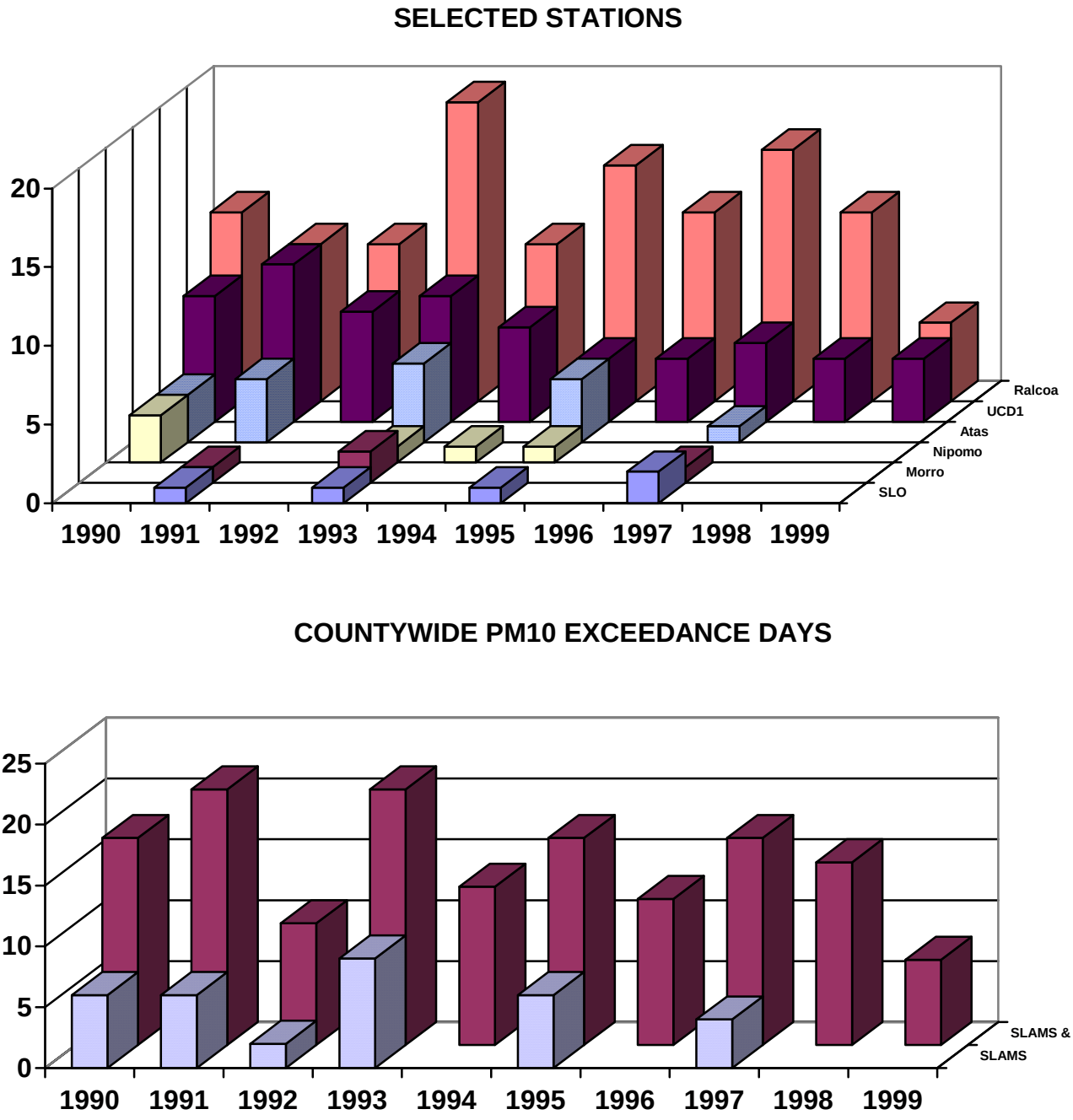


Figure 3-4
DAYS EXCEEDING THE PM_{10} STANDARD: 1990-1999



Note: *The location of the UCD1 particulate sampler was changed in 1991
**SLAMS – State and Local Air Monitoring Stations
SPMS – Special Purpose Monitoring Stations

Figure 3-5

PM_{10} VIOLATIONS BY MONTH

San Luis Obispo County
1987 - 1999

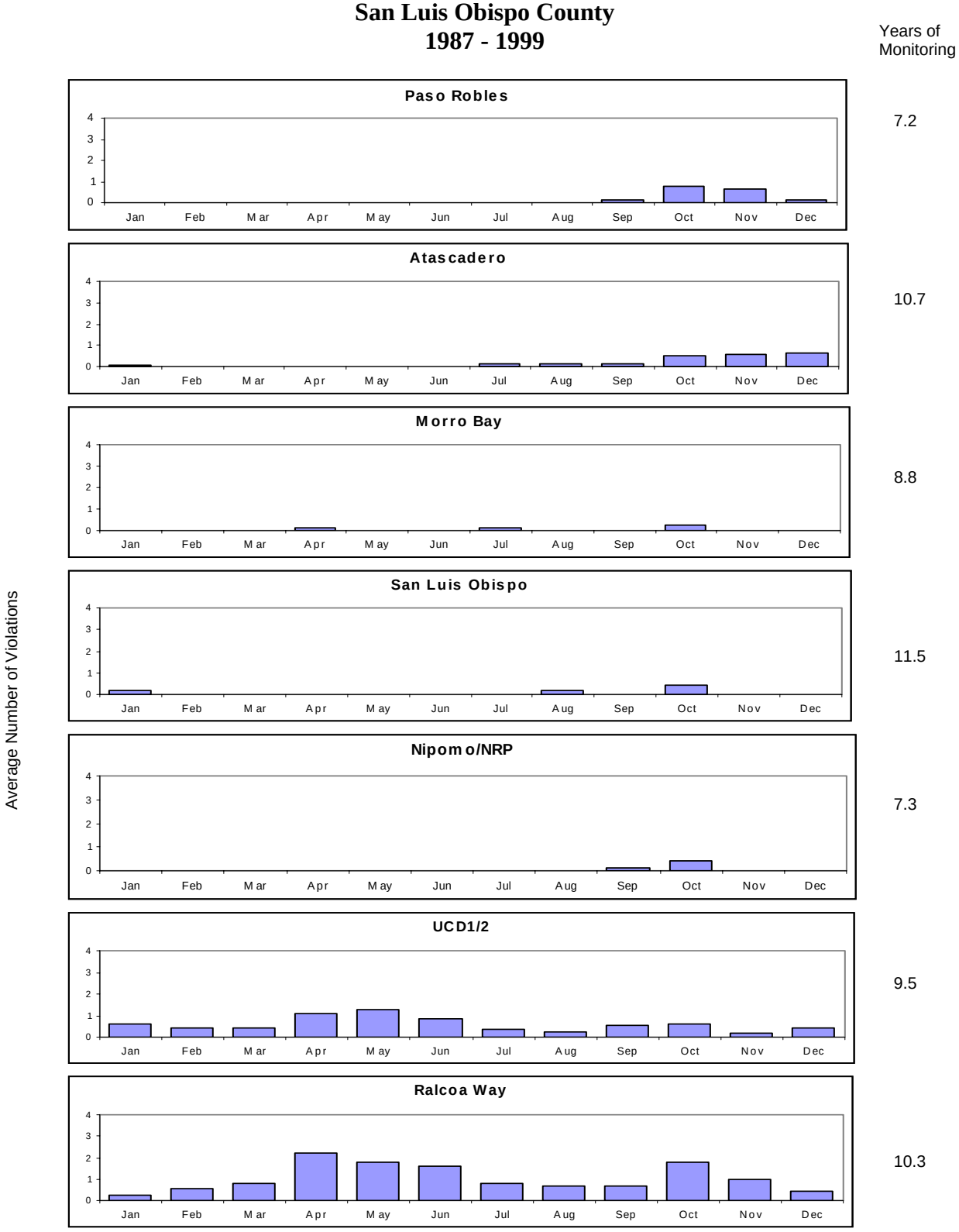
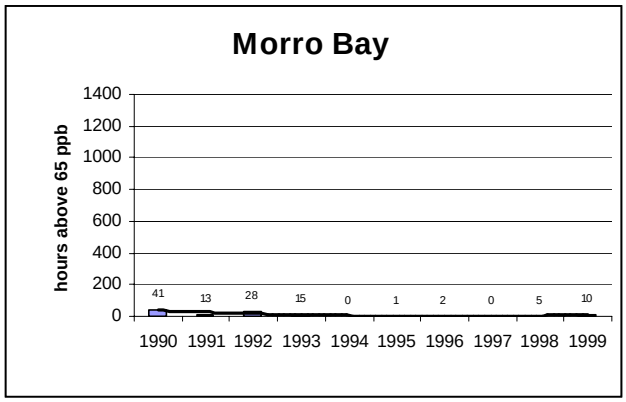
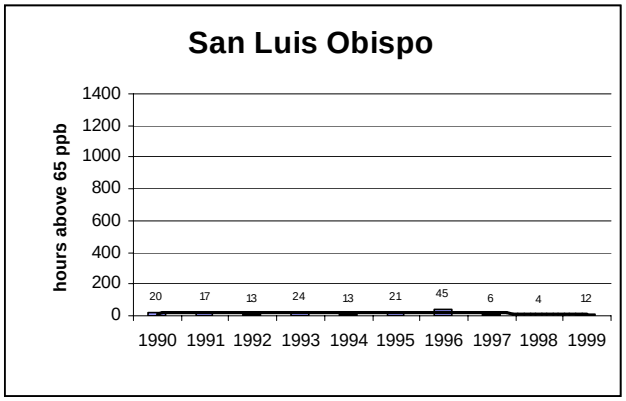
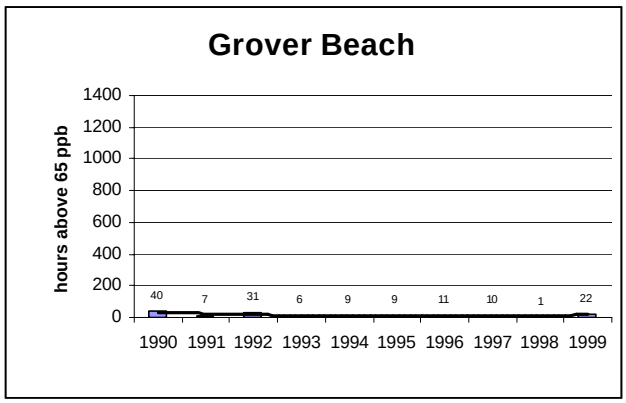


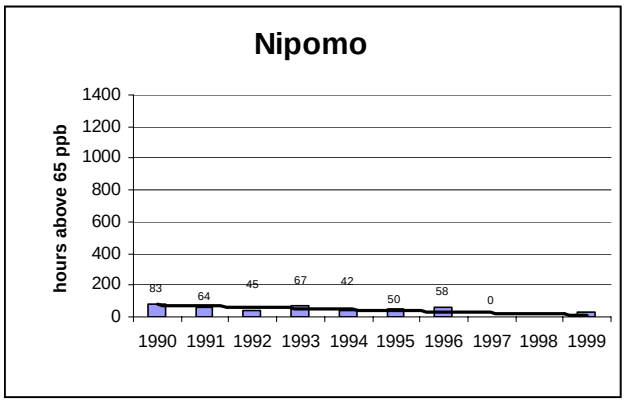
Figure 3-6

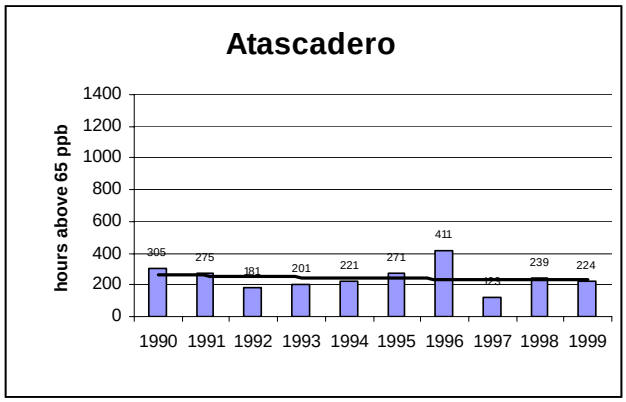
NUMBER OF HOURS ≥ 0.07 PPM OZONE : 1990-1999

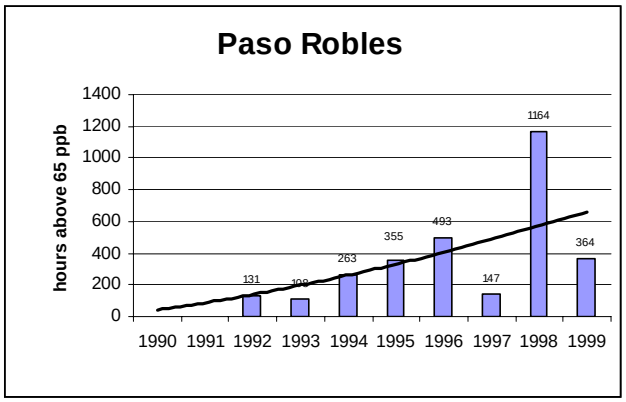








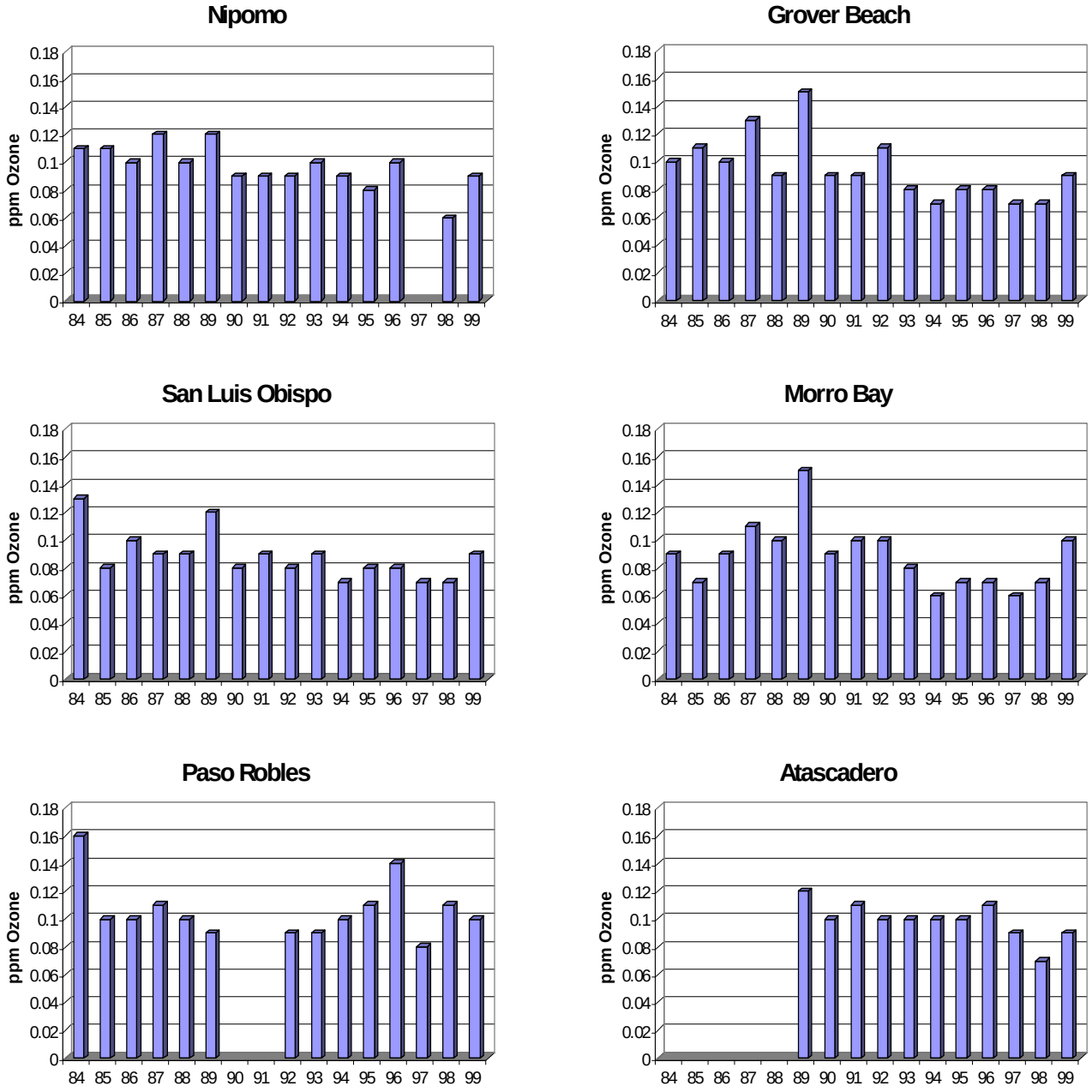




Note: Monitoring at Nipomo was discontinued from September 1996 to June 1998

Figure 3-7

HIGHEST ANNUAL HOURLY OZONE VALUE 1984-1999



Note: Monitoring at Paso Robles discontinued from 1990 to 1991
Atascadero station installed in 1989
Monitoring at Nipomo discontinued from September 1996 to June 1998.

CHAPTER 4
1991 REFERENCE YEAR EMISSION INVENTORY

INTRODUCTION

EMISSION SOURCE CLASSIFICATION SYSTEM

EMISSION INVENTORY CATEGORIES

DEVELOPMENT OF THE 1991 REFERENCE YEAR INVENTORY

COMPARISON OF ANNUAL AND PLANNING INVENTORIES

HIGHLIGHTS OF THE 1991 REFERENCE YEAR INVENTORY

4.1 INTRODUCTION

Effective control strategies cannot be developed without an understanding of emission sources that add to the degradation of air quality. An emission inventory is a comprehensive summary of air pollution sources with an estimate of their pollutant emissions. The inventory tracks emissions over designated time periods and aids in the development and evaluation of emission reduction strategies. It also provides data for air quality modeling studies and is used to estimate future year emissions.

The CCAA originally designated 1987 as the year against which progress toward attainment of the state ozone standard would be measured. Subsequent annual emissions were to be compared to emissions projected from 1987 to estimate the degree of progress. The 1991 CAP estimated impacts of control strategies by projecting future emissions and then calculating emission reductions these strategies could have on future emissions. The 1995 CAP update used a 1991 inventory for future year projections, but compared projected emissions with the 1987 baseline. Due to changes in the CCAA, the 1998 and the 2001 updates use the 1991 inventory for both projections and comparisons. This is called the reference year inventory

The reference year inventory estimates criteria pollutant emissions which occurred during 1991, organized by specific categories. Criteria pollutants include total organic compounds (TOG); reactive organic compounds (ROG) or TOG minus methane, ethane, and exempt compounds); carbon monoxide (CO); oxides of nitrogen (NOx); sulfur dioxide (SO2); and particulate matter ten microns or less in diameter (PM_{10}). Emissions listed in the annual inventory are in units of tons per year.

For attainment planning, the CCAA requires that the inventory reflect seasonal emission variations. The planning inventory is designed to more accurately represent emissions occurring during the ozone season (May through October), when state ozone standard violations are more likely to occur. The planning inventory reports emissions in tons per day and only for pollutants ROG and NOx, the primary ozone precursors. The planning inventory is key to implementing the CAP and forms the basis for the emission reduction strategies presented in Chapters 5 and 6.

Emissions from some sources vary greatly from one year to the next. Other may be stable over an extended period. As a whole, individual facility or source group effects are largely muted by emissions from the large number and diversity of sources. Therefore, the 1991 reference year inventory is likely representative of average emissions that might occur in any given year, discounting population growth and regulatory controls. The 1991 inventory is appropriate for planning purposes.

4.2 EMISSION SOURCE CLASSIFICATION SYSTEM

The ARB established a system of emission source categories. Sources are classified as stationary, area-wide, or mobile. Stationary sources are subdivided into point and aggregated area categories, depending on their size and emission characteristics. Point sources are generally of significant size, such as the power plant and rock quarries, and are required to have a District Permit to Operate. Aggregated area sources do not necessarily emit pollutants from a single stack or point, but emit a significant amount of pollution as a group, such as wine production.

Area-wide sources are groups of similar emission sources that may not be individually significant, but, when added together, contribute substantial amounts of pollutants. Examples include agricultural burning, architectural coatings, and asphalt paving. In contrast to aggregated area sources, most area-wide sources are not required to obtain a District permit.

Mobile sources include on-road vehicles like cars and trucks, and other mobile sources such as off-road vehicles, airplanes, and ships. Mobile sources are regulated at the state or federal level.

Emissions are calculated in a variety of ways. One method, referred to as mass balance, is based on the amount of materials used or consumed. Other calculations require an emission factor and activity level. For stationary point and aggregated area sources, emission factors can be derived from measurements taken during source testing or obtained from reference literature. The most common reference for emission factors is EPA's Compilation of Air Pollutant Emission Factors, AP-42.

Activity indicators for larger stationary sources are based on source-specific data such as fuel usage or hours of operation. One technique for estimating area-wide emissions, such as architectural coatings, is to apportion statewide data (such as coating usage) to different geographical areas based on regional population. A more refined approach would be to estimate emissions for a single source, such as a water heater, and estimate the total number of water heaters in the county.

The mobile source emission inventory was compiled by the ARB. Emission factors for on-road vehicles were developed using the EMFAC emissions model, briefly described in section 4.4. Vehicle use data from Caltrans, such as number of trips and miles traveled for each vehicle type, were then combined with emission factors to calculate emissions. Emission calculations for other mobile sources were performed by ARB using the OFFROAD emissions model.

4.3 EMISSION INVENTORY CATEGORIES

Emission sources are grouped into stationary, area-wide, or mobile sources; they are then differentiated by activity, such as burning fuel or processing petroleum. Different source types often occur at the same facility. Therefore, a company's emissions may be divided among two or more source categories. The following is an explanation of each activity category and the percent of daily emissions it represents in the Planning Inventory.

Fuel Combustion: This category includes sources that burn fuels such as natural gas and diesel to do work or produce heat useable in other processes. Combustion processes are a significant source of NOx emissions due to the thermal oxidation of nitrogen in air and in the fuel. Examples are internal combustion engines, electric utility boilers, and process heaters. These sources represent 31.7% of the NOx emissions and less than 1.1% of the ROG, as noted in Table 4-2.

Waste Disposal: This category includes landfill gas releases, soil remediation projects, and sewage treatment plants. ROG emissions from this category represent 0.08% of the planning inventory.

Cleaning and Surface Coating: Organic solvents are used in a variety of industrial processes and are ingredients in many household and commercial products. Most solvents volatilize as ROG, which becomes available to form ozone, as noted in section 1.1. Processes include dry cleaning, degreasing, and printing. These sources emit about 5.6% of the ROG emissions.

Petroleum Production and Marketing: Typical sources in this category include oil fields, petroleum pumping stations, truck loading and unloading, and oil refining. Other activities include retail and commercial gasoline marketing and combustion emissions that do not qualify for the Fuel Combustion category. This category accounts for 8.4% of the ROG emissions and 0.2% of NOx.

Industrial Processes: The sources and activities found in this category emit PM_{10} and/or ROG. Examples are feed and grain mills, wineries, rock quarries, sand and gravel operations, and concrete batch plants. The ROG emissions are less than 0.4% of the inventory**.**

Solvent Evaporation: These area-wide sources include ROG emissions from consumer products, architectural coatings, commercial and residential pesticide applications, and asphalt paving. They constitute 9.8% of 1991 ROG emissions.

Miscellaneous Processes: This area-wide category contains stationary source emissions which cannot be classified into those source groups already described. Typical sources include residential fuel combustion, waste burning, small utility equipment, smoke from wildfires, and fugitive dust from activities such as agricultural tilling, unpaved roads, and building construction. These sources combined are responsible for approximately 3.5% of the ROG in the planning inventory.

On-Road Motor Vehicles: This category includes vehicles from motorcycles to heavy-duty trucks. Emissions come primarily from fuel combustion and fuel evaporation. This category represents a major portion of the ROG and NOx emissions, contributing 55.9% of the ROG and 41.4% of the NOx on a daily basis.

Other Mobile Sources: Sources include trains, ships, aircraft, off-road recreational vehicles, farm vehicles, and construction equipment that do not used paved roads. Some sources, such as motorcycles, travel on and off the road, but only emissions resulting from the latter activity are in this section. Emissions represent 15.3% of the ROG and 26.1% of the NOx.

Appendix A has a more detailed description of the background data, calculation methods, and emission source profiles used to tabulate the emissions for each source category in the inventory.

4.4 DEVELOPMENT OF THE 1991 REFERENCE YEAR INVENTORY

Emission factors and calculation methods used to develop the 1998 emission inventory were also used to reconstruct the 1991 inventory to ensure consistency between the reference year and future year projected inventories. The point source emissions were determined using 1991 facility process and mass balance data.

The District used ARB-derived data for aggregated area, area-wide, and mobile source emissions. ARB backcasted year 2000 emissions data to reconstruct these 1991 emissions by using growth factors in reverse. Growth factors were based on socioeconomic studies and population projections to show how much any given business sector could "grow" from one time period to the next.

EMFAC2000 was used to estimate on-road emissions. "EMFAC" is an acronym used for ARB's mobile source EMission FACtor model; "2000" represents the model version. This model included categories for heavy duty vehicles and several new emission factors for different operating modes. EMFAC2000 incorporated updated emission reductions expected from State implemented mobile source controls, including requirements for introducing Low, Ultra-Low, and Zero Emission Vehicles into the statewide vehicle fleet, and the use of reformulated gasoline and diesel fuels. Only vehicles controls that were in place in 1991 are included in the "back casting" calculations.

4.5 COMPARISON OF ANNUAL AND PLANNING INVENTORIES

The 1991 planning inventory was derived from the annual inventory but excluded emissions from natural sources, such as wildfires and biogenic emissions (organic compounds emitted by trees and plants). Emissions from natural sources are large and beyond the District's ability to control. The planning inventory differs from the annual inventory in four significant areas:

1. The planning inventory focuses on pollutants for which the District is non-attainment. Only NOx and ROG are included, as they are the primary precursors to ozone, the focus of this CAP update. The annual inventory includes NOx, ROG, TOG, CO, SO2, and PM_{10}.

2. Point source emissions in the planning inventory are calculated based on an "average annual operating day", which discounts periods of non-operation such as weekends; the emissions are presented as tons per day. The annual inventory totals emissions over the entire year and presents them in units of tons per year.

3. The planning inventory aggregated area and area-wide source emissions were calculated using ARB's "average seasonal operating day". Monthly and weekly operating profiles were used to apportion annual emissions into the ozone and non-ozone seasons.

4. ARB calculated on-road motor vehicle planning inventory emissions for a typical "episode day". This accounted for higher temperatures and the resulting increased evaporative emissions that occurred on hot summer days when elevated ozone levels are most likely. The annual inventory used the "average annual day" for this calculation.

4.6 HIGHLIGHTS OF THE 1991 REFERENCE YEAR INVENTORY

The 1991 annual and planning inventories are summarized in Tables 4-1 and 4-2 and graphically displayed in Figures 4-1 and 4-2. The tables and charts provide the following information:

- Total countywide ROG planning inventory emissions were calculated at 40.4 tons per day (14,480 tons annually). Figure 4-2 shows that about 56% of daily ROG emissions are from on-road vehicles, primarily automobiles. Other mobile sources, such as off-road vehicles and mobile equipment, contribute 15%. Solvent use, cleaning and surface coatings, and petroleum related activities constitute most of the remaining ROG emissions.
- Total NOx emissions countywide were about 49.9 tons per day (16,166 tons annually). As shown in Figure 4-2, on-road vehicles and stationary fuel combustion sources are the most significant NOx generators, with contributions totaling over 73% of the daily NOx emissions in 1991. The remaining NOx emissions were produced mostly by other mobile sources.
- Bulk terminals loading crude oil from marine tankers comprised the two largest point sources of ROG emissions in the county, over 1.9 ton/day in 1991. By 1999, both terminals were out of business.
- The largest stationary source of NOx emissions countywide was the Morro Bay Power Plant, with 1991 planning inventory emissions estimated at 13.2 tons per day. A District rule adopted in 1993 will reduce emissions by 60% in 2000 and over 80% by the year 2003.

Table 4-1

1991 REFERENCE YEAR
ANNUAL EMISSIONS INVENTORY SUMMARY
(tons per year) Revised 12-26-00

	TOG	ROG	CO	NOx	SO2	PM	PM-10
STATIONARY SOURCES							
FUEL COMBUSTION							
Electric Utilities	166.04	83.95	1,262.63	3,453.35	123.10	129.34	126.59
Cogeneration	3.00	0.33	23.60	42.32	0.00	0.00	0.00
Oil and Gas Production	20.51	4.75	130.16	166.96	6.12	3.11	3.11
Petroleum Refining	20.74	10.16	108.51	139.50	761.57	9.59	9.59
Manufacturing and Industrial	17.69	3.73	98.58	164.41	2.90	2.91	2.89
Food and Agriculture Processing	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Services and Commercial	49.62	21.27	68.08	246.87	4.18	7.28	6.96
Fuel Combustion Subtotal	277.60	124.20	1,691.56	4,213.40	897.86	152.22	149.13
WASTE DISPOSAL							
Sewage Treatment	0.95	0.71	0.00	0.00	0.00	0.00	0.00
Landfills	6,501.91	10.34	0.00	0.00	0.00	0.00	0.00
Incinerators	0.01	0.01	0.17	0.22	0.10	0.21	0.21
Soil Remediation	1.10	1.10	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Disposal Subtotal	6,503.97	12.16	0.17	0.22	0.10	0.21	0.21
CLEANING AND SURFACE COATING							
Laundering and Dry Cleaning	6.91	6.91	0.00	0.00	0.00	0.00	0.00
Degreasing	186.94	128.82	0.00	0.00	0.00	0.00	0.00
Coatings and Related Proc. Solvents	477.57	439.39	0.00	0.00	0.00	2.39	2.29
Printing	28.13	28.13	0.00	0.00	0.00	0.00	0.00
Other	142.11	125.74	0.00	0.00	0.00	0.00	0.00
Cleaning/Surface Coating Subtotal	841.67	729.00	0.00	0.00	0.00	2.39	2.29
PETROLEUM PRODUCTION AND MARKETING							
Oil and Gas Production	147.63	78.11	0.00	0.00	0.00	0.00	0.00
Petroleum Refining	291.58	237.39	9.13	37.51	4,083.96	20.01	12.46
Petroleum Marketing	458.35	425.17	0.00	0.00	0.00	83.53	41.77
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Petroleum Prod. and Mark. Subtotal	897.56	740.67	9.13	37.51	4,083.96	103.54	54.22
INDUSTRIAL PROCESSES							
Chemical	18.37	15.22	0.00	0.00	0.00	0.00	0.00
Food and Agriculture	31.03	31.03	0.00	0.00	0.00	38.94	21.51
Mineral Processes	0.12	0.05	1.77	4.56	2.94	202.01	61.64
Metal Processes	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wood and Paper	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Glass and Related	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electronics	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00	0.00	0.50	0.25
Industrial Processes Subtotal	49.51	46.29	1.77	4.56	2.94	241.45	83.40
TOTAL STATIONARY SOURCES	8,570.31	1,652.33	1,702.62	4,255.70	4,984.86	499.80	289.25

Table 4-1 continued

	TOG	ROG	CO	NOx	SO2	PM	PM-10
AREA-WIDE SOURCES							
SOLVENT EVAPORATION							
Consumer Products	1,033.14	860.67	0.00	0.00	0.00	0.00	0.00
Arch. Coatings/Related Proc. Solv.	271.20	254.77	0.00	0.00	0.00	0.00	0.00
Pesticides/Fertilizers	284.34	284.34	0.00	0.00	0.00	0.00	0.00
Asphalt Paving	84.32	84.32	0.00	0.00	0.00	0.00	0.00
Refrigerants	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Solvent Evaporation Subtotal	1,672.98	1,484.09	0.00	0.00	0.00	0.00	0.00
MISCELLANEOUS PROCESSES							
Residential Fuel Combustion	508.45	223.02	3,488.56	186.94	9.86	528.03	494.08
Farming Operations	0.00	0.00	0.00	0.00	0.00	1,436.28	652.62
Construction and Demolition	0.00	0.00	0.00	0.00	0.00	2,379.80	1,163.99
Paved Road Dust	0.00	0.00	0.00	0.00	0.00	2,879.49	1,316.19
Unpaved Road Dust	0.00	0.00	0.00	0.00	0.00	5,378.28	3,195.94
Fugitive Wind Blown Dust	0.00	0.00	0.00	0.00	0.00	1,258.16	584.37
Fires	1.83	1.46	16.79	0.37	0.00	2.19	2.19
Waste Burning and Disposal	1,604.18	734.38	8,310.32	5.84	1.10	1,144.28	1,124.57
Other	12.41	8.76	0.00	0.00	0.00	36.87	25.92
Miscellaneous Processes Subtotal	2,126.86	967.62	11,815.67	193.15	10.95	15,043.35	8,559.85
TOTAL AREA-WIDE SOURCES	3,799.84	2,451.71	11,815.67	193.15	10.95	15,043.35	8,559.85
MOBILE SOURCES							
ON-ROAD MOTOR VEHICLES							
Light Duty Passenger	4,961.45	4,565.42	37,547.55	2,611.21	93.08	54.39	52.93
Light Duty Trucks	2,119.92	1,926.11	23,111.44	1,787.41	50.74	40.88	39.42
Medium Duty Trucks	798.99	723.43	8,585.90	496.04	20.44	10.95	10.95
Light Heavy Duty Gas Truck	582.91	531.08	8,234.04	419.02	5.84	1.83	1.83
Medium Heavy Duty Gas Trucks	420.12	379.97	6,498.46	265.72	2.56	0.37	0.37
Heavy Heavy Duty Gas Trucks	157.32	141.26	2,829.12	80.30	1.10	0.00	0.00
Light Heavy Duty Diesel Trucks	4.75	4.38	14.24	58.40	13.14	3.29	3.29
Medium Heavy Duty Diesel Trucks	10.59	9.49	67.16	251.49	35.04	14.60	14.60
Heavy Heavy Duty Diesel Trucks	125.20	109.87	533.63	1,199.76	190.53	81.40	81.40
Motorcycle	227.40	215.35	784.39	22.63	0.37	1.10	1.10
Heavy Duty Diesel Urban Buses	2.56	2.19	13.87	50.37	8.40	1.10	1.10
Heavy Duty Gas Urban Buses	6.94	5.84	144.18	6.94	0.00	0.00	0.00
School Buses	17.52	15.70	379.60	57.31	5.11	1.46	1.46
Motor Homes	40.88	35.41	684.38	63.88	1.46	0.37	0.37
On-Road Motor Vehicles Subtotal	9,476.50	8,665.47	89,427.92	7,370.45	427.78	211.70	208.78
OTHER MOBILE SOURCES							
Aircraft	154.03	137.24	1,723.17	24.46	3.29	0.00	0.00
Trains	26.65	23.36	85.05	785.48	31.39	19.35	19.35
Ships and Commercial Boats	28.11	24.82	83.59	342.74	46.72	27.74	27.74
Recreational Boats	743.14	716.86	3,456.19	86.51	2.56	33.95	30.66
Off-Road Recreational Vehicles	99.28	88.33	682.92	10.95	1.46	1.10	1.10
Off-Road Equipment	582.54	533.63	5,310.75	1,584.10	137.61	114.61	114.61
Farm Equipment	210.97	186.52	1,318.02	1,512.93	147.83	103.66	103.66
Other Mobile Sources Subtotal	1,844.71	1,710.76	12,659.66	4,347.15	370.84	300.40	297.11
TOTAL MOBILE SOURCES	11,321.21	10,376.22	102,087.58	11,717.60	798.62	512.10	505.89
TOTAL ALL SOURCES	23,691.35	14,480.25	115,605.87	16,166.44	5,794.43	16,055.24	9,354.99

Table 4-2

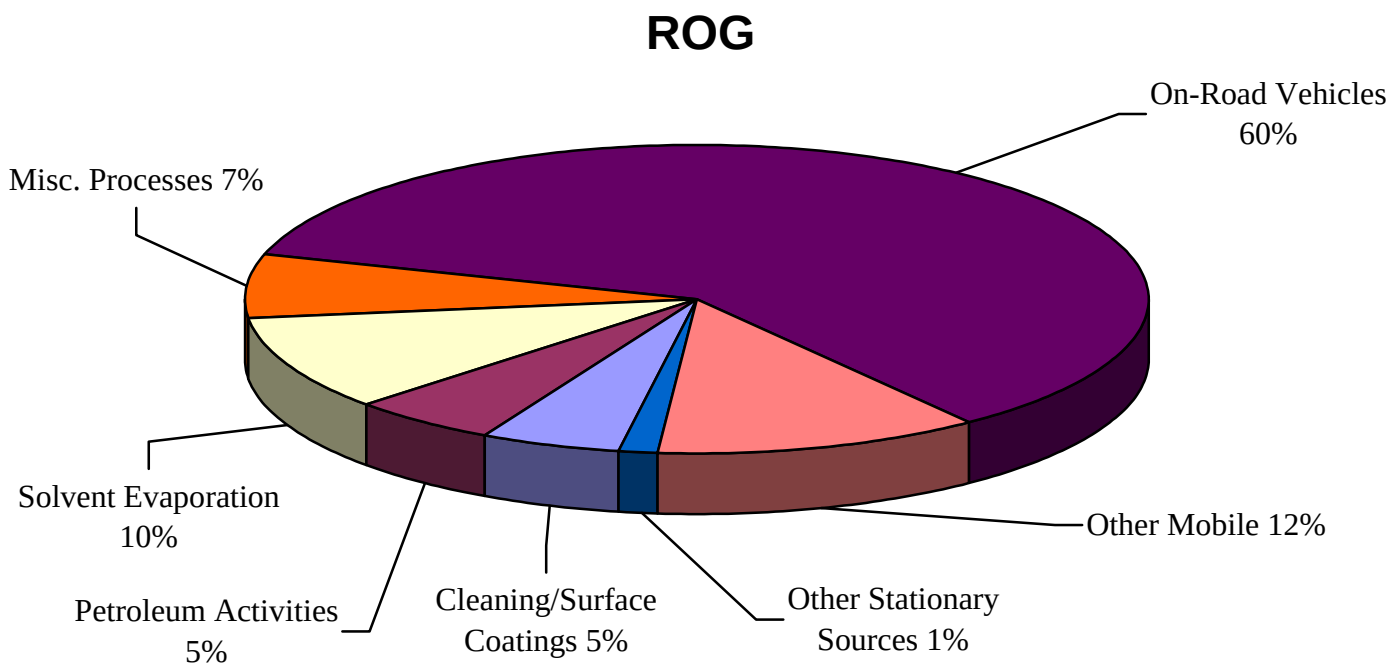
1991 REFERENCE YEAR
PLANNING EMISSIONS INVENTORY SUMMARY
(tons per day) Revised 12-26-00

	ROG	NOx
STATIONARY SOURCES		
FUEL COMBUSTION		
Electric Utilities	0.322	13.230
Cogeneration	0.001	0.098
Oil and Gas Production	0.013	0.457
Petroleum Refining	0.027	0.383
Manufacturing and Industrial	0.012	0.558
Food and Agriculture Processing	0.000	0.000
Services and Commercial	0.079	1.101
Fuel Combustion Subtotal	0.454	15.827
WASTE DISPOSAL		
Sewage Treatment	0.002	0.000
Landfills	0.028	0.000
Incinerators	0.000	0.001
Soil Remediation	0.003	0.000
Other	0.000	0.000
Waste Disposal Subtotal	0.033	0.001
CLEANING AND SURFACE COATING		
Laundering and Dry Cleaning	0.027	0.000
Degreasing	0.360	0.000
Coatings and Related Process Solvents	1.420	0.000
Printing	0.103	0.000
Other	0.365	0.000
Cleaning/Surface Coating Subtotal	2.274	0.000
PETROLEUM PRODUCTION AND MARKETING		
Oil and Gas Production	0.216	0.000
Petroleum Refining	0.650	0.103
Petroleum Marketing	2.513	0.000
Other	0.000	0.000
Petro. Prod. and Mark. Subtotal	3.380	0.103
INDUSTRIAL PROCESSES		
Chemical	0.059	0.000
Food and Agriculture	0.098	0.000
Mineral Processes	0.000	0.017
Metal Processes	0.000	0.000
Wood and Paper	0.000	0.000
Glass and Related	0.000	0.000
Electronics	0.000	0.000
Other	0.000	0.000
Industrial Processes Subtotal	0.157	0.017
TOTAL STATIONARY SOURCES	6.298	15.948

Table 4-2 continued

	ROG	NOx
AREA-WIDE SOURCES		
SOLVENT EVAPORATION		
Consumer Products	1.782	0.000
Architectural Coatings/Related Proc. Solv.	0.848	0.000
Pesticides/Fertilizers	1.036	0.000
Asphalt Paving	0.293	0.000
Refrigerants	0.000	0.000
Solvent Evaporation Subtotal	3.959	0.000
MISCELLANEOUS PROCESSES		
Residential Fuel Combustion	0.121	0.270
Farming Operations	0.000	0.000
Construction and Demolition	0.000	0.000
Paved Road Dust	0.000	0.000
Unpaved Road Dust	0.000	0.000
Fugitive Wind Blown Dust	0.000	0.000
Fires	0.004	0.001
Waste Burning and Disposal	1.250	0.005
Other	0.024	0.000
Miscellaneous Processes Subtotal	1.399	0.276
TOTAL AREA-WIDE SOURCES	5.358	0.276
MOBILE SOURCES		
ON-ROAD MOTOR VEHICLES		
Light Duty Passenger	11.861	7.293
Light Duty Trucks	5.030	4.988
Medium Duty Trucks	1.879	1.388
Light Heavy Duty Gas Trucks	1.403	1.160
Medium Heavy Duty Gas Trucks	0.994	0.731
Heavy Heavy Duty Gas Trucks	0.371	0.223
Light Heavy Duty Diesel Trucks	0.034	0.166
Medium Heavy Duty Diesel Trucks	0.026	0.717
Heavy Heavy Duty Diesel Trucks	0.301	3.402
Motorcycle	0.549	0.064
Heavy Duty Diesel Urban Buses	0.006	0.144
Heavy Duty Gas Urban Buses	0.017	0.020
School Buses	0.040	0.163
Motor Homes	0.095	0.181
On-Road Motor Vehicles Subtotal	22.606	20.640
OTHER MOBILE SOURCES		
Aircraft	0.376	0.066
Trains	0.064	2.152
Ships and Commercial Boats	0.068	0.946
Recreational Boats	3.196	0.385
Off-Road Recreational Vehicles	0.284	0.034
Commercial/Industrial Mobile Equipment	1.572	4.363
Farm Equipment	0.623	5.062
Other Mobile Sources Subtotal	6.183	13.008
TOTAL MOBILE SOURCES	28.789	33.648
TOTAL ALL SOURCES	40.445	49.872

Figure 4-1.1
1991 ANNUAL EMISSIONS INVENTORY
San Luis Obispo County



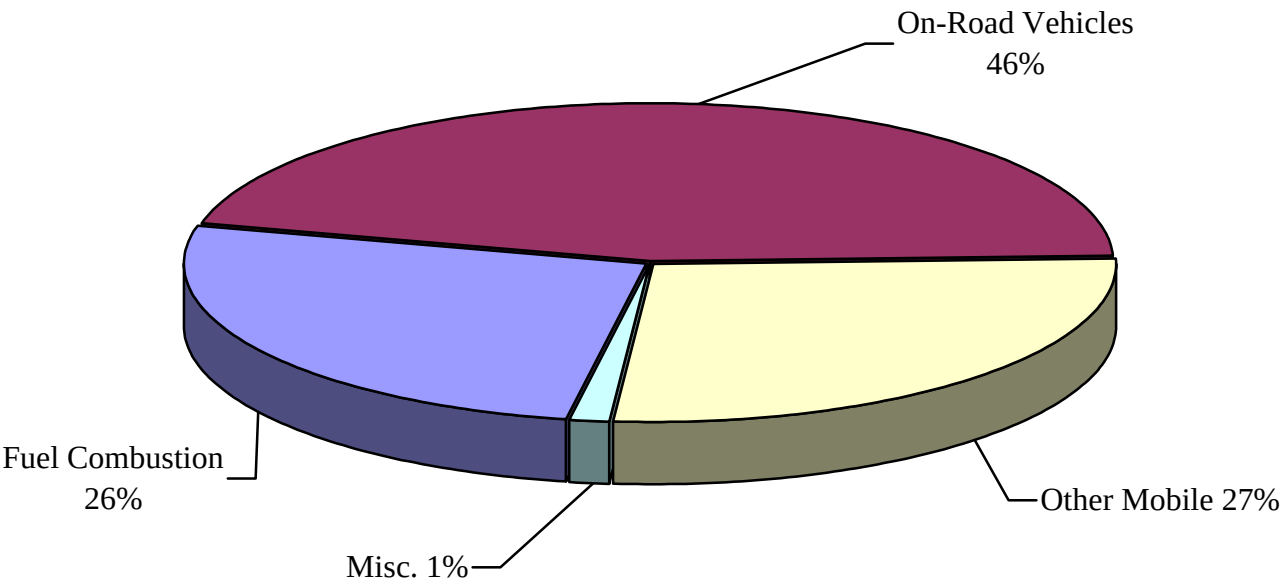
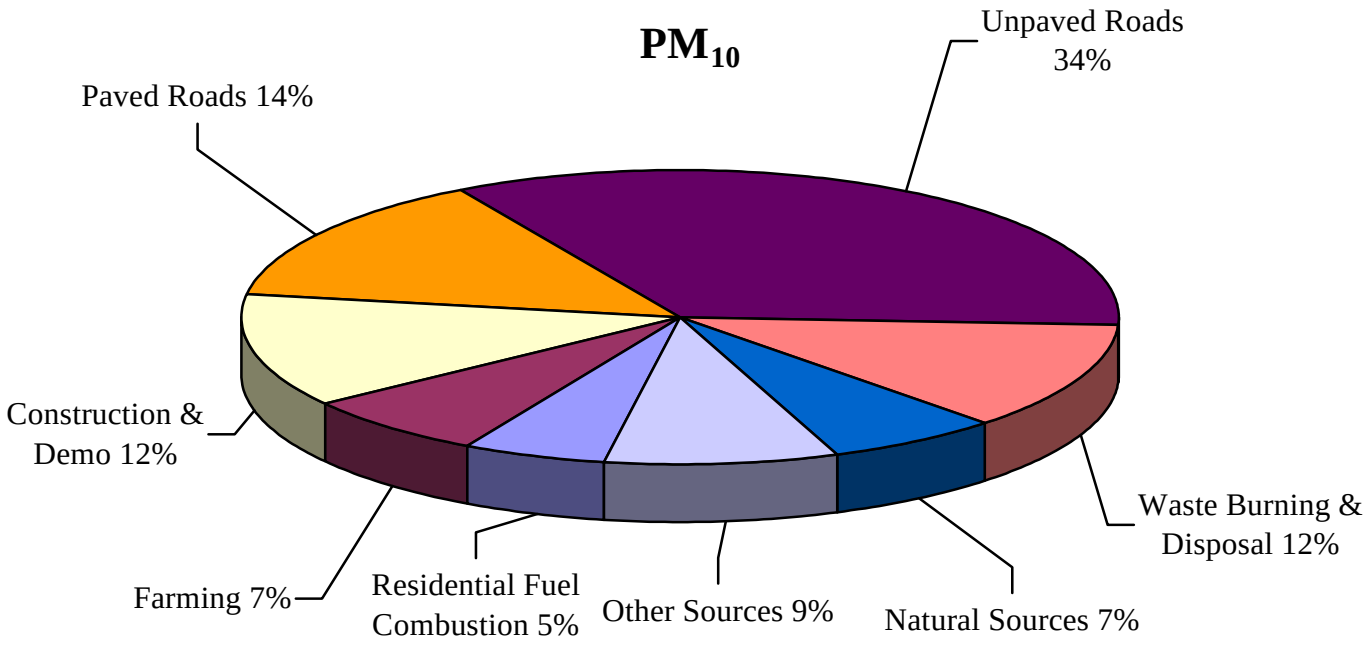


Figure 4-1.2
1991 ANNUAL EMISSIONS INVENTORY
San Luis Obispo County



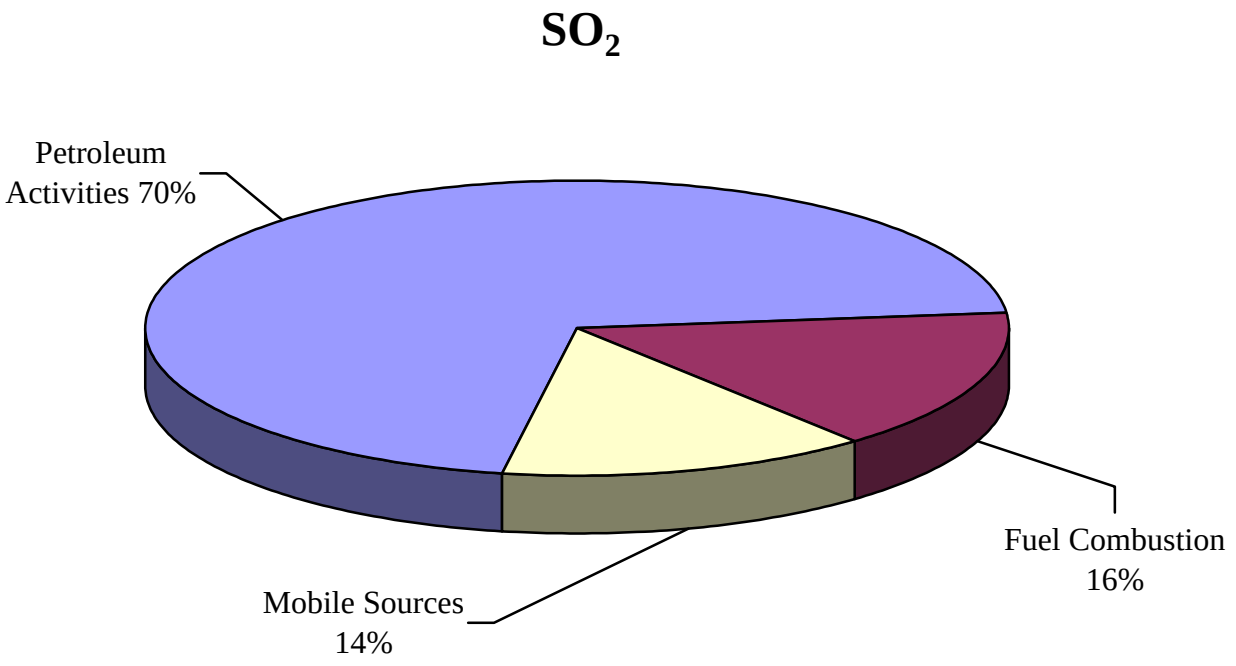
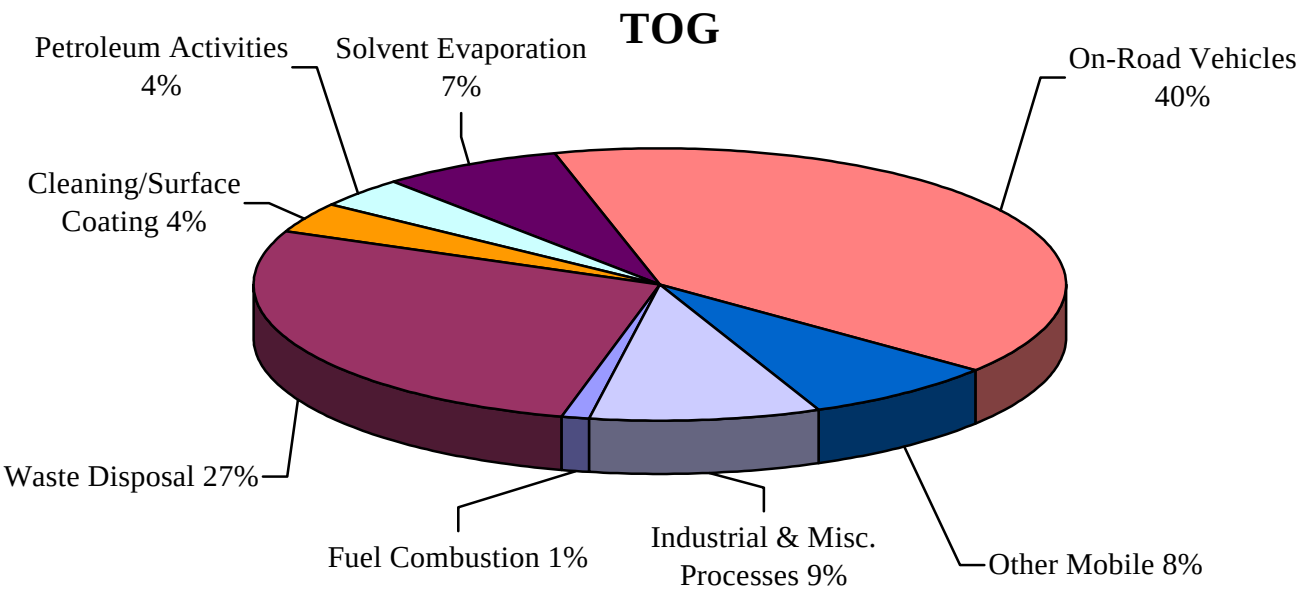


Figure 4-1.3
1991 ANNUAL EMISSIONS INVENTORY
San Luis Obispo County



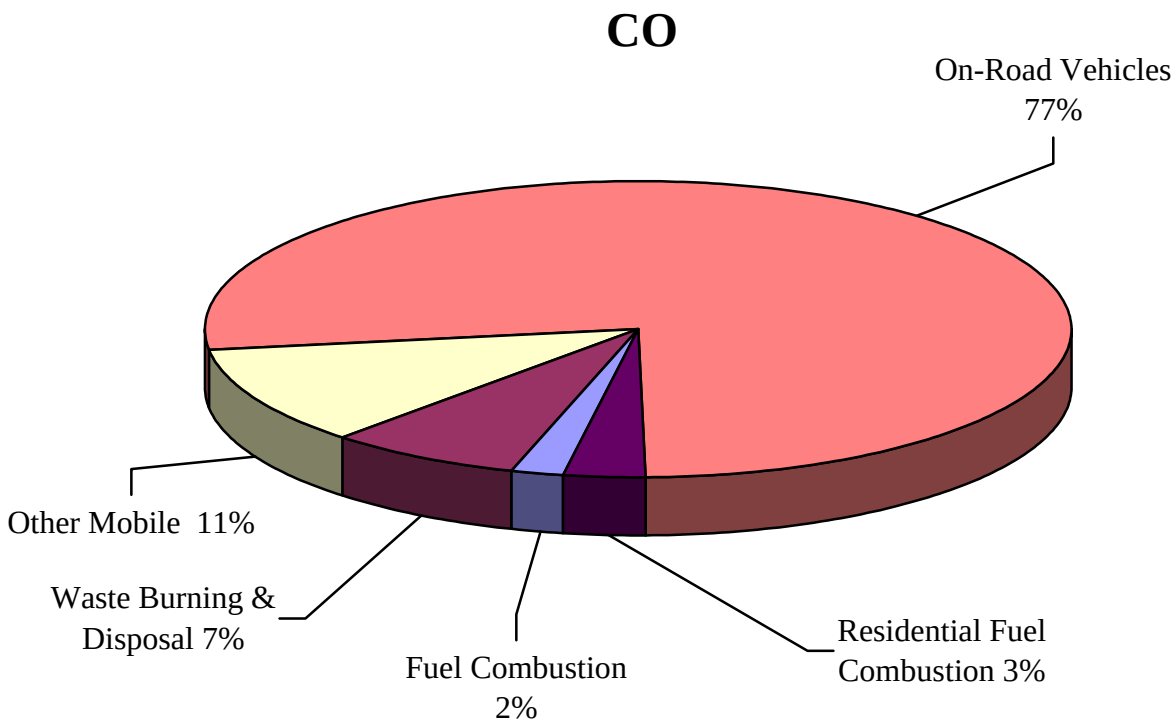
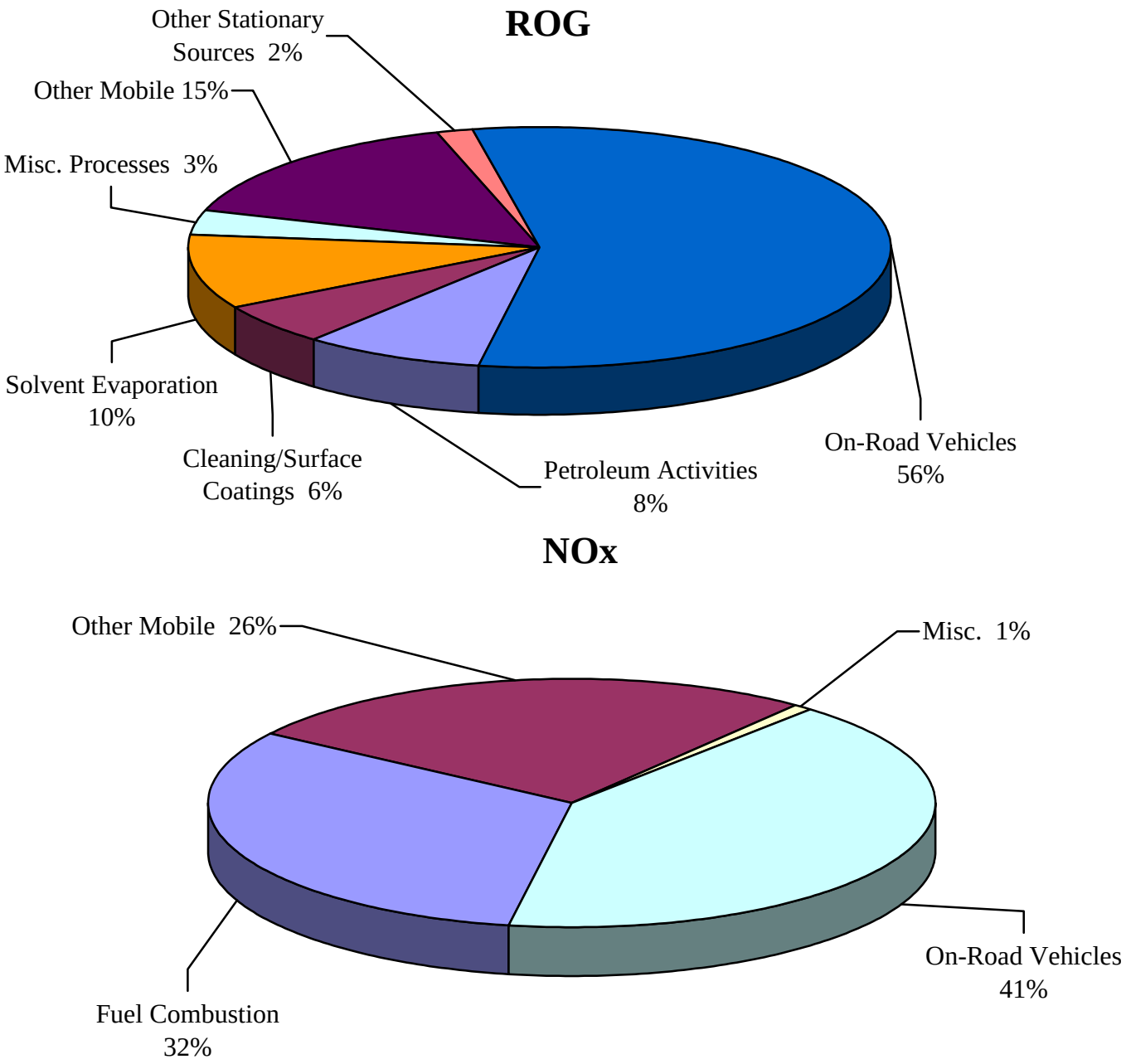


Figure 4-2
1991 PlANNING EMISSIONS INVENTORY *
San Luis Obispo County



Note: * The Planning Emissions Inventory presents representative daily emissions during ozone season (May through October).

CHAPTER 5
STATIONARY SOURCE CONTROL PROGRAM

INTRODUCTION

CONTROL MEASURE EVALUATION

CONTROL MEASURE RECOMMENDATIONS

MEASURES ALREADY IMPLEMENTED

MEASURES PROPOSED FOR RETENTION AND ADOPTION

MEASURES PROPOSED FOR DEFERRAL/CONTINGENCY

5.1 INTRODUCTION

This chapter presents the stationary source control measure recommendations for the 2001 Clean Air Plan. Stationary sources are nonmobile emission sources such as dry cleaning equipment, petroleum processing and production facilities, commercial and industrial boilers, and surface coating facilities and operations.

San Luis Obispo County is classified as a 'moderate' nonattainment area for the state ozone standard. The California Clean Air Act (CCAA) requires that moderate nonattainment areas implement the following control requirements for stationary sources:

- Application of Best Available Control Technology (BACT), and a District permitting program designed to allow no net increase in emissions of nonattainment pollutants or their precursors from new or modified stationary sources which emit or have the potential to emit 25 tons per year or more of nonattainment pollutants or their precursors. (Health & Safety Code 40918(a)(1)).

- Application of Best Available Retrofit Control Technology (BARCT) to existing sources which emit 5 tons or more per day, or 250 tons or more per year; application of Reasonably Available Control Technology (RACT) for all other existing emission sources (H&SC 40918(a)(2)).

- Development of control programs for area sources, such as coatings and solvents (H&SC 40918(a)(4)).

- Sufficient control strategies to achieve at least a 5% per year reduction in both ROG and NOx emissions countywide, averaged every consecutive 3-year period (H&SC 40914). For moderate nonattainment areas where ozone modeling is not performed, ARB has determined that at least a 20% total reduction in both pollutants compared to 1991 emission levels is required.

The following sections discuss how the stationary source control measures (SCMs) were evaluated and provide descriptions of measures already implemented, those proposed for adoption in the near term, and other measures proposed for deferral. Transportation and indirect source control programs are described in detail in Chapter 6. Ranking and implementation of the control measures is presented in Chapter 9.

5.2 CONTROL MEASURE EVALUATION

No new control measures are proposed for adoption in this Plan that were not contained in the 1991, 1995 and 1998 CAP. A thorough evaluation of all recommended control measures was performed prior to adoption of those plans; all but one of those measures have been implemented to date. Thus, evaluation of control measures for this update primarily involved an analysis of emission reductions achieved by measures already implemented since 1991, and potential reductions expected from the one control measure soon to be adopted. The criteria used in the comprehensive control measure evaluations for the 1991, 1995 and 1998 CAP included feasibility and applicability of available control technology, emission reduction potential, cost effectiveness of the measure, and status of controls for similar sources in neighboring districts. Public acceptability and relative impacts to small businesses were also considered as important factors. The following is a discussion of how those criteria were used in the development of the control measures.

Control Technology Analysis

The CCAA mandates different levels of emissions control on existing sources, depending on the nonattainment status of the District. Reasonably Available Control Technology is required for sources located in moderate nonattainment areas. In order to be found "reasonably available", RACT must be currently achieved and demonstrated feasible for a reasonable period of time. For any source permitted to

emit five tons or more per day or 250 tons or more per year, Best Available Retrofit Control Technology is required. The law defines BARCT as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." (H&SC 40406).

The majority of stationary source measures already implemented, and the remaining measure proposed for adoption in this Plan, are designed to meet the RACT level of control. In a few cases, BARCT controls have been adopted for larger sources in order to meet the CCAA uniformity requirements for consistency with neighboring districts, or the 250 ton/year requirement mentioned earlier. In many instances no clear distinction between RACT and BARCT can be made; the available control technology is the same for both. This is especially true for measures designed to reduce ROG emissions.

The development and implementation of control technology are dynamic and interactive processes. Thus, control measures proposed for adoption in this Plan may be refined and/or modified during the rulemaking process as new information becomes available.

Emission Reduction Potential

The effectiveness of any control strategy is a function of the efficiency of the control, the size and number of sources affected, and the level of compliance achieved. For example, a control technology is said to be 90% efficient if it can reduce emissions by 90% from a specific source. The total amount of potential emissions reduced by the measure, however, depends on the size and number of affected sources and their expected compliance with the measure. If only one or a few small sources are controlled, or compliance is poor, then the overall effectiveness of the measure may be limited. However, if one or more large sources or many small sources are subject to and comply with the control, then the effectiveness of the measure is proportionately increased. Thus, a control that is 90% efficient but affects only 10% of the emission sources may be less effective than a control that is only 75% efficient but affects 95% of the sources.

Cost Effectiveness

The CCAA requires the District Board to determine that this Plan is a cost-effective strategy that will achieve attainment of the state ozone standard by the earliest practicable date (H&SC 40913(b)). In addition, the Plan must include an assessment and ranking of the cost-effectiveness of each individual control measure (H&SC 40922).

Cost-effectiveness is typically stated as the total cost of a measure, divided by the total emissions reduced, over a specified time frame. It is usually expressed as a rate, in dollars per pound, or ton, of pollutants reduced. The use of rates makes comparison between different control measures possible. This is important because, in the air quality arena, "cost-effectiveness" has come to have a relative meaning. A measure may be deemed cost-effective if it reduces emissions at a cost per ton comparable to other measures recently adopted or proposed for that pollutant. The following table, published by the ARB, presents an updated list of the typical " rates" for adopted stationary source control measures in California (expressed in year 2000 dollars):

Pollutant	Average Rate	Highest Rate
Reactive Hydrocarbons	$4,800 - 12,000/ton	$26,000/ton
Oxides of Nitrogen	$2,400 - 12,000/ton	$28,000/ton
Carbon Monoxide	$ 240/ton	$ 2,400/ton
Particulate Matter	----	$12,000/ton

The cost information developed for adopted or proposed measures typically included amortized capital, operating costs and maintenance costs. These values were either calculated or extracted from applicable

references. Because of the generalized assumptions necessary to such an analysis, the values presented are useful primarily for planning and comparison purposes. Specific cost impacts to individual sources affected by the measures can only be determined through analysis on a case by case basis. The District spends considerable effort gathering more detailed cost information from the regulated community, ARB, other districts and other experts in the field during the rule development process. Note that cost effectiveness dollar amounts have been updated and expressed in terms of year 2000 present value.

While cost-effectiveness is an important consideration in evaluating these measures, it is neither the sole nor the dominant criterion for decision making. The primary mandate is to achieve the state standards by the earliest practicable date. Thus, the CCAA also requires the consideration of other important factors to develop an adoption and implementation schedule. Those factors include technological feasibility, emission reduction potential, rate of reduction, public acceptability, and enforceability. Nonetheless, our evaluations place a strong emphasis on eliminating or deferring those measures with relatively high costs compared to their emission reduction potential.

Uniformity

For regional pollutants such as ozone, the CCAA requires that control measures for the same emission sources be uniform throughout the air basin to the maximum extent feasible, unless a district can demonstrate that adoption of a measure within its jurisdiction is not necessary to achieve or maintain the state ambient air quality standard (H&SC 41503(b)). Uniform rules do not necessarily mean identically worded rules, and some exceptions to the uniformity requirement may be allowed. However, in general, rules developed by San Luis Obispo, Santa Barbara and Ventura APCDs for similar sources should have equally effective emission reduction requirements, require compliance in the same time frame, and be equally enforceable.

5.3 CONTROL MEASURE RECOMMENDATIONS

The technical working papers developed for the stationary source control measures in the 1998 CAP were reviewed and summarized here to reflect updated emissions and implementation information. The working papers provide specific details on the available control technologies, sources affected, cost, potential emission reductions, and implementation strategies for all SCMs discussed in this 2001 Plan. Summaries of each measure evaluated are found in the remaining sections of this chapter.

The control measures evaluated through this process have been separated into four categories:

1. **Measures Already Implemented:** Section 5.4 describes measures that have been adopted and implemented as rules since the original 1987 baseline emissions year. Emission reductions from these measures are included as part of the attainment strategy for this Plan.

2. **Measures Proposed for Retention and Adoption:** Section 5.5 presents one control measure, Architectural Coatings, that has not yet been adopted. This measure has been deemed reasonable and necessary for attainment and is recommended for adoption in the 2001 Plan.

3. **Measures Proposed for Deferral/Contingency:** These are measures proposed for adoption in the 1991 CAP but found unnecessary to meet the emission reduction goals of the 1998 Plan or this 2001 CAP. They are again recommended for deferral, to be implemented only in the event that reductions from adopted measures are insufficient to achieve attainment within the required time frame. Section 5.6 describes each measure and provides a brief description of the rationale for recommending deferral.

4. **Measures Proposed for Deletion:** There is one measure proposed for deletion, Asphalt Roofing Kettles, which was determined to have negligible potential for controls or actual emission reductions. Section 5.7 describes this measure and provides a brief description of the rationale for recommending deletion.

Table 5-1 depicts the District's recommendations for the control measures in each category described above. No new measures have been proposed for adoption that were not previously identified in the 1991 CAP. As shown, 22 SCMs have been implemented as District rules or requirements since adoption of the 1991 CAP; one remaining measure from the 1998 CAP is recommended for adoption and implementation; seven measures are being deferred; and one measure is proposed for deletion.

Emission reductions expected for the years 1997, 2000, 2003, 2006 and 2015 through implementation of recently adopted measures and those proposed for adoption are presented in Table 5-2 and Figures 5-1 and 5-2. The bar charts depict the relative emission reductions achieved by each control measure. The first chart shows that the largest reductions in ROG emissions have been or will be achieved from measures R-11 (Marine Tanker Loading), R-1 (Agricultural Burning), R-14 (Consumer Products) and R-8 (Petroleum Storage Tanks). Figure 5-2 shows that measure N-11 (Utility Fuel Combustion) will provide by far the largest NOx reduction, followed by N-2 (Commercial Fuel Combustion) and N-14 (Internal Combustion Engines).

Table 5-2 presents proposed adoption dates for the measures and projected reductions in ROG and NOx emissions for each planning year through the year 2015. It should also be pointed out that controls implemented prior to the preparation of this Plan update have generated and will continue to provide substantial emission reductions into the future. Reductions for some of these measures are already accounted for in the emissions inventory forecasts and have therefore not been tabulated in the projected emission reduction tables and charts.

The estimated cumulative ROG and NOx reductions are also presented in Table 5-2. The significance of these emission reduction totals compared to the reductions required by the Act is discussed in Chapter 8. Table 5-3 provides relative data on cost-effectiveness, control efficiency and year 2003 emission reductions for all measures proposed for retention and adoption or deferral, to allow comparison of these measures.

The remainder of this chapter presents summary descriptions of all the stationary and large mobile source control measures evaluated for this Plan. Greater detail on all of the measures is provided in the technical working papers presented in Appendix C of the 1998 Update.

(Note: throughout the remainder of this chapter, the acronyms ROG (reactive organic gases) and VOC (volatile organic compound) are used interchangeably to describe organic compounds which, when released to the atmosphere, participate in photochemical reactions to create ozone.)

5.4 MEASURES ALREADY IMPLEMENTED

This section describes measures that have been adopted and implemented as rules since the original 1987 baseline emissions year. The projected future year emission reductions have been revised to reflect more refined information obtained during the rule development and implementation process. Emission reductions from these measures are included as part of the attainment strategy for this Plan.

Implemented Measures for Reactive Organic Gases

Phase II Vapor Recovery

Phase II vapor recovery for gasoline dispensing facilities was adopted in 1989 through Rule 424, Storage and Transfer of Gasoline, and implemented in 1991 as a result of the District's efforts to reduce public exposure to the carcinogen benzene. Facilities dispensing 240,000 gallons or more of gasoline per year are required to install Phase II control equipment, which captures gasoline vapors emitted during motor vehicle refueling and returns them to the underground gasoline storage tank. The organic compounds captured are photochemically reactive and contribute to ozone formation. Approximately 139 of the 144 dispensing facilities under District permit were affected by this regulation and have installed Phase II systems. Vapor capture is 95% efficient, thus significant reductions in ROG emissions are achieved by this control. (Note: Those reductions have already been accounted for in the baseline emissions inventory projections and are therefore not presented in the control strategy charts and tables at the end of this chapter.)

Rule Adoption Date: 1989
Applicable APCD Rule: 424
Year 2003 Emission Reduction: Included in baseline emissions projections

R-1 Agricultural Burning

The burning of agricultural waste is a major source of ROG emissions. The burning of sugar pea vines is the largest contributor, constituting nearly 80% of these emissions in 1987. District Rule 502 requires that a burn permit be obtained and limits the type and amount of material to be burned. While complete prohibition of agricultural burning is not allowed under state law, alternatives to burning are available. These alternatives vary with the type of waste and include soil incorporation, feed for livestock, use as commercial by-products, composting, chipping and landfilling, waste-to-energy conversion, gasification, pyrolysis, and enzymatic or acid hydrolysis. A voluntary control program for sugar peas was implemented in 1988 and has resulted in over 80% of the sugar pea vines in the county now being baled and sold or disked into the soil, achieving a significant reduction in emissions. It is recommended that the existing program for sugar pea vines be continued. The other control options identified in this measure should be studied further to determine their applicability and feasibility for the other crops grown in this county. No viable alternatives currently exist for controlling emissions from range improvement and habitat management burns.

Rule Adoption Date: Voluntary compliance
Applicable APCD Rule: Not applicable
Year 2003 Emission Reduction: 0.522 tons/day ROG

R-5 Bulk Gasoline Loading Racks

Bulk gasoline plants typically consist of storage and loading equipment for redistribution of gasoline to small, non-retail gasoline tanks. Emissions from these plants occur primarily when tanker trucks are filled at the loading rack. Gasoline entering the tanks displaces gasoline vapors to the atmosphere. These vapors contain volatile organic compounds (VOC) which react in the atmosphere to create air pollution in the form of ozone. In addition, vapors released during gasoline loading operations contain benzene and other toxic components which have been determined to be a health hazard.

Rule 407, Organic Material Emission Standards, was amended to remove sections which refer to gasoline bulk plants and terminals. No new requirements were added to Rule 407. Rule 424, Storage and Transfer of Gasoline (formerly titled Gasoline Dispensing Facilities), was revised to include requirements for bulk plants. Four bulk gasoline loading operations in the county were required to have their vapor recovery systems certified by the California Air Resources Board. The operation of gasoline dispensing facilities, storage containers and delivery vessels are also regulated by the rule.

Rule Adoption Date: 1996
Applicable APCD Rule: 424

Year 2003 Emission Reduction: 0.244 tons/day ROG

R-8 Petroleum Storage Tank Seals

Petroleum storage tanks contain organic liquid which can volatilize and contribute to ozone formation. Rule 425, Storage of Volatile Organic Compounds, was adopted to implement 1991 CAP control measure R-8. New Rule 425 is applicable to equipment used to store crude oil or volatile organic compounds (VOCs) with a vapor pressure greater than or equal to 0.50 psia. Storage tanks with a capacity greater than or equal to 40,000 gallons are required to have a vapor loss control device. Vapor loss control devices include external floating roofs, internal floating roofs, vapor recovery systems, or any other device approved by the District. Storage tanks with a capacity of less than 1,500 gallons are exempt from the requirements of the rule.

Rule Adoption Date: 1994
Applicable APCD Rule: 425
Year 2003 Emission Reduction: 0.377 tons/day ROG

R-9 Municipal Landfill Gas Control

Methane, carbon dioxide, water, VOCs, and a variety of toxic and odorous compounds are formed in landfills as a result of the decomposition of waste materials. These gases escape to the atmosphere through the porous earthen covers of landfills. Rule 426, Landfill Gas Emissions, was adopted to implement 1991 CAP control measure R-9. Rule 426 is targeted at controlling VOC emissions, but the associated methane control is desirable since methane is considered a major contributor to the global warming effect. This rule is applicable to existing solid waste disposal sites with more than 500,000 tons of waste-in-place and all new sites constructed after July 26, 1995. Affected landfills are required to quantify emissions of VOCs by performing testing or emissions modeling. If VOC emissions are found to be greater than 15 tons per year, installation and operation of a landfill gas collection system is required within 18 months of that determination. Collected gas would be cleaned and sold, incinerated, or used to generate electricity.

Rule Adoption Date: 1995
Applicable APCD Rule: 426
Year 2003 Emission Reduction: 0.014 tons/day ROG

R-11 Marine Tanker Loading

Emissions from marine tanker loading facilities occur when vapors from the tankers are displaced to the atmosphere as the tanks are filled. Rule 427, Marine Tanker Loading, was adopted to implement 1991 CAP control measure R-11. This rule was applicable to the offshore marine vessel loading terminal at the Chevron Corporation's Estero Bay facility which shut down in 1999. The rule requires that emissions of VOCs from the facility be limited to two (2) pounds per 1,000 barrels loaded; or, be reduced by at least 98 percent by using combustion control; or, be reduced by at least 95 percent by using recovery control; or, that equivalent emission reductions be provided to offset the emissions from the loading event.

To meet a 1997 implementation requirement, Chevron chose to use emission reduction credits (ERCs) instead of installing marine vessel controls. Those credits came from a combination of projects: a car crushing program, installation of a clean-burn tug boat engine, and the installation of catalytic converters on several large, internal combustion engines. The ERCs were temporary in nature.

Rule Adoption Date: 1995
Applicable APCD Rule: 427
Year 2003 Emission Reduction: .161 tons/day ROG

R-12 Oil/Water Separators and
R-17 Oil Production Sumps

Wastewater separators are devices used in oil production and refining that separate produced water from petroleum fluids. The devices rely on the immiscibility of oil and water and the difference in their densities to accomplish the separation (i.e. the oil floats, the water sinks). Oil production sumps are typically depressions in the ground used to separate oil and water by gravity settling, or to store produced fluids. Reactive organic gases from uncovered separators and sumps are released to the atmosphere through evaporation. Rule 419, Petroleum Pits, Ponds, Sumps, Well Cellars, and Wastewater Separators, was adopted on July 12, 1994, to implement 1991 CAP control measures R-12 and R-17. Rule 419 is applicable to facilities where crude oil or petroleum material is produced, gathered, separated, processed or stored.

Several emission control methods are available; they primarily rely on a reduction of exposed liquid surface area. These methods include the use of flexible floating covers, rigid floating covers RFCs, and domes (or fixed covers). Alternative methods include replacement with tanks designed to restrict emissions. Control methods described in Rule 425, Storage of Volatile Organic Compounds, would also apply to these tanks.

Rule Adoption Date: 1994
Applicable APCD Rule: 419
Year 2003 Emission Reduction:
Oil/Water Separators: 0.379 tons/day ROG
Oil Production Sumps: 0.282 tons/day ROG

R-13 Non-Agricultural Open Burning

Open burning of non-agricultural waste can release significant quantities of ROG, PM and other pollutants to the atmosphere through incomplete combustion. Rule 501, General Burning Provisions, was revised in January 2000 and July 2001 to implement a multi-phased program which prohibits backyard burning in areas established by Urban and Village Reserve Lines. The first phase focused on areas with existing burning prohibitions. The next phases were established for urban areas with existing garbage and green waste collection services. Future implementation depends on the development of alternatives to burning and the establishment and public acceptance of garbage and green waste collection. Available alternatives vary with the type of waste and include waste collection for use as commercial by-products, composting, chipping and landfilling, waste-to-energy conversion, gasification, pyrolysis, and enzymatic or acid hydrolysis.

Initial implementation efforts focused on public education and development of viable alternatives to burning including expanded green waste and garbage collection services. A program was established which required District Permits for anyone in a non-prohibited area wishing to burn within 1,000 feet of smoke sensitive sites such as schools, day care centers, parks, hospitals, nursing homes and health care facilities. In addition, burning household rubbish in burn barrels is prohibited inside all areas defined by Urban or Village Reserve Lines. Potentially all non-agricultural sources could be controlled; however, it may be necessary to establish potential exemption thresholds for specific situations where collection services are not available or cost-effective.

Rule Revision Date: 2000
Applicable APCD Rule: 501
Year 2003 Emission Reduction: 0.282 tons/day ROG

R-14 Consumer Products

Many non-aerosol and aerosol products contain reactive organic compounds which either evaporate or are propelled into the air as ROG. The CCAA requires the ARB to adopt regulations to reduce ROG emissions from consumer products by 50% by the year 2000. The ARB is in the process of requiring product reformulation, product substitution, alternative application techniques, and consumer education programs for several classes of consumer products. These include deodorants, hair sprays, air fresheners, domestic cleaning products, engine degreasers, aerosol insect repellents and other consumer products. Current projections by the state estimate a 24.7% ROG reduction from these products by the year 2000.

Rule Adoption Date: 1992 (ARB)
Applicable APCD Rule: Not applicable
Year 2003 Emission Reduction: 1.305 tons/day ROG

R-19 Metal Parts Coatings

Metal parts coatings refer to specialty coatings for metal products which are formulated to meet specific performance requirements. These types of coatings can contribute ROG compounds to the atmosphere as they dry. District Rule 411, Surface Coating of Metal Parts and Products, establishes VOC limits for coatings and requires at least 65 percent transfer efficiency with exemptions and thresholds specified. Rule 411 was revised to reduce emissions by requiring the use of VOC compliant coatings, enclosed gun washers or low vapor pressure clean-up solvents, good housekeeping procedures, and other practices which minimize the evaporation of coatings and solvents.

Rule Adoption Date: 1998
Applicable APCD Rule: 411
Year 2003 Emission Reduction: 0.037 tons/day ROG

R-20 Automobile Refinishing

Surface coatings used in automobile refinishing contain a variety of volatile organic compounds. These compounds escape to the atmosphere and contribute to ozone formation when the coatings dry. Rule 423, Motor Vehicle Coating Operations, was revised in 1991 to implement 1991 CAP control measure R-20. The rule requires the use of an approved spray booth for application of paint to vehicles. The November 1991 revision modified Rule 423 to set specific VOC limits for various types of coatings used in auto refinishing according to a phased implementation schedule; to require the use of equipment that achieves a 65% transfer efficiency; to require cleanup of spray equipment in an enclosed system; and to specify other housekeeping procedures. Modifications to the rule in 1993 and 1995 were necessary to reflect the BARCT guidelines developed by ARB and are consistent with rules adopted in Santa Barbara and Ventura counties.

Rule Adoption Date: 1991; revised 1993 and 1995
Applicable APCD Rule: 423
Year 2003 Emission Reduction: 0.137 tons/day ROG

R-21 Fugitive Emissions

ROG emissions are considered fugitive when they originate from an unintended opening or leak. The industrial processes primarily responsible for these emissions are petroleum production, refining, and pumping operations, as well as the manufacture of synthetic organic chemicals. The types of equipment that have the potential for fugitive emissions include valves, flanges, pump and compressor seals, storage tank hatch covers, and oil well polished rods. Rule 417, Control of Fugitive Emissions of Volatile Organic Compounds, was adopted to implement 1991 CAP control measure R-21. This rule establishes thresholds of unacceptable leak rates for various types of equipment, and requires affected sources to implement a

comprehensive inspection and maintenance program to ensure compliance with the thresholds. Periodic reports are submitted by the sources to the District describing monitoring activities and measured leak rates. Exemptions are allowed for situations where components are used exclusively for handling natural gas; for handling low volatile or high boiling point fluids; are buried underground; or are used exclusively under negative pressure.

Rule Adoption Date: 1993
Applicable APCD Rule: 417
Year 2003 Emission Reduction: 0.247 tons/day ROG

R-23 Cutback Asphalt

Asphalts used in paving and roadway maintenance include cutback asphalt, road oils, paving asphalt and emulsified asphalt. Each of these materials contain reactive organic compounds which release ROG to the atmosphere through evaporation during the curing process. Rule 420, Cutback Asphalt Paving Materials, was modified to restrict the solvent content of cutback asphalt and road oil to 0.5% by volume of VOCs that evaporate at 500EF or less. Exemptions for medium-cure cutback asphalt were eliminated to be consistent with measures adopted by Santa Barbara and Ventura counties.

Rule Adoption Date: 1997
Applicable APCD Rule: 420
Year 2003 Emission Reduction: 0.220 tons/day ROG

Implemented Measures for Oxides of Nitrogen

N-1 Coke Calcining

Calcining is a high temperature impurity removal process in which hot combustion gases flow over and through "green" petroleum coke, a by-product of the crude oil refining process. The high combustion temperatures in the calciner result in the formation of NOx, which is emitted with the combustion gases through an elevated stack. This control measure was designed to achieve 50% control of thermal NOx emissions from the one coke calciner in the District. The refinery made process changes to the calciner in 1989 which reduced NOx emissions by 50% from previous levels. This was accomplished by reducing the amount of excess air for combustion. The District added a condition to the refinery's operating permit in 1997 to assure that the change would be permanent.

Implementation Date: 1989
Applicable APCD Rule: None
Year 2003 Emission Reduction: 0.061 tons/day NOx

N-2 Commercial Fuel Combustion

NOx emissions are generated by industrial, commercial and institutional fuel combustion sources including boilers, process heaters, steam generators and space and water heaters. Rule 430, Control of Oxides of Nitrogen from Boilers, Steam Generators, and Process Heaters was adopted on July 26, 1995, to implement 1991 CAP control measure N-2. This rule is applicable to boilers, steam generators, and process heaters with rated heat input capacities of greater than or equal to five (5) million BTU per hour. Affected units with annual heat inputs of greater than or equal to 90,000 therms must comply with specific oxides of nitrogen (NOx) and carbon monoxide (CO) emission limits. Available NOx reduction strategies for these sources include: low excess air combustion, low-NOx burners, ceramic fiber burners, flue gas recirculation, ammonia-based SNCR (selective noncatalytic reduction), urea-based SNCR and SCR (selective catalytic reduction).

Affected units with an annual heat input of less than 90,000 therms for each of the three previous calendar years have lesser requirements, typically involving annual tuneups and/or oxygen trim controls.

Rule Adoption Date: 1995
Applicable APCD Rule: 430
Year 2003 Emission Reduction: 0.624 tons/day NOx

N-5 Energy Conservation Measures

Energy conservation measures effectively reduce the amount of energy consumed by buildings, thereby reducing the amount of fuel used for space and water heating. NOx emissions are directly related to the amount of fuel burned. Therefore, burning less fuel for heating requirements translates into fewer emissions of ozone forming compounds. There are currently no APCD regulations specifying energy efficiency or energy conservation requirements.

Potential energy conservation measures include retrofit weatherproofing and insulation of existing homes; incorporation of passive solar features in new construction; improving heating, ventilation and air conditioning system efficiency in government buildings; replacing natural gas water heaters with solar water heaters; and adding flue gas dampers to existing residential water heaters. In 1995, the San Luis Obispo County Board of Supervisors (BOS) adopted an Energy Element as part of their General Plan update. The Energy Element addresses all categories of energy use, including transportation, and recommends design and conservation strategies for reducing energy consumption in new and existing development. It is recommended that the District develop outreach programs to encourage similar actions by the incorporated cities and other jurisdictions in the county.

Implementation Date 1995 (BOS)
Applicable APCD Rule: Not applicable
Year 2003 Emission Reduction: Not calculated

N-11 Utility Fuel Combustion

Historically, utility fuel combustion generated nearly 40% of the total NOx emissions in the County. Rule 429, Oxides of Nitrogen and Carbon Monoxide Emissions from Electric Utility Boilers, was adopted in 1993 and revised in 1995, 1996 and most recently in November of 1997 to implement 1991 CAP control measure N-11. The four boilers at the Morro Bay Power Plant are the only sources affected by this rule. Boilers 1 and 2 are 170 megawatt (MW) boilers which discharge into a single exhaust stack. Boilers 3 and 4 are rated at 345 MW's each and have separate stacks.

Rule 429 specifies emission reductions in stages. The final stage is a facility-wide NOx limit of 2.5 tons per day for all the boilers combined. The 2.5 tons per day limit represents an emission reduction of greater than 90% when compared to historic emissions from the facility. Although, the rule was originally written assuming all four boilers would be equipped with selective catalytic reduction systems, the recent revisions have made alternative strategies more feasible while maintaining the emission reduction goals.

Rule Adoption Date: 1993; revised 1997
Applicable APCD Rule: 429
Year 2003 Emission Reduction: 11.003 tons/day NOx

N-12 Residential (Natural) Gas Combustion

Current residential water heaters and furnaces emit about 0.1 pounds of NOx per million BTU of heat output. Water heaters range in size from 30,000 to 50,000 BTU/hour, while furnaces average between 40,000 - 60,000 BTU/hour. Rule 428, Control of Oxides of Nitrogen from Residential Natural Gas-Fired Water Heaters and Furnaces, was adopted on July 26, 1995, to implement 1991 CAP control measure N-12. Rule 428 requires that all residential natural gas-fired water heaters and furnaces sold and/or installed in San Luis Obispo County be certified to meet a NOx emission limit. In addition, manufacturers are required to display the model number of the unit and a statement of compliance with the emission limit on the shipping carton and rating plate. Most manufacturers offer energy-efficient, low-NOx units which can meet this limit. Existing water heaters and furnaces that were installed prior to the adoption of this rule are exempt.

Adoption Date: 1995
Applicable APCD Rule: 428
Year 2003 Emission Reductions: 0.081 tons/day NOx

N-14 Stationary Internal Combustion Engines (ICEs)

Rule 431, Stationary Internal Combustion Engines, was adopted in 1996 to implement CAP control measure N-14. The rule limits NOx and CO emissions from stationary internal combustion engines rated at greater than 50 brake horsepower. This category primarily includes large, heavy-duty general utility reciprocating engines (internal combustion engines, or ICEs). These engines may be either natural gas or diesel fired and generate large quantities of NOx. Most stationary IC engines are used to generate electric power, to pump gas, oil, water or other fluids, or to compress air for pneumatic machinery. Emission reductions can be achieved through operational modifications such as adjusting the air-fuel ratio, derating engines to limit the power output, and retarding engine timing. Non-selective catalytic reduction, similar to the catalysts used on automobiles, is a very effective control method for natural gas fired, spark-ignited engines.

Rule Adoption Date: 1996
Applicable APCD Rule: 431
Year 2003 Emission Reductions: 0.515 tons/day NOx

Implemented Measures for Multiple Pollutants

MP-1 Residential Wood Burning

Emissions from woodheaters and fireplaces are the result of incomplete combustion of wood. PM_{10} and CO are the dominant pollutants produced, although ROG emissions are also significant. Rule 504, Residential Wood Combustion, was adopted on October 19, 1993, to implement 1991 CAP control measure MP-1. The rule restricts the sale and installation of new woodburning devices to allow only devices meeting EPA Phase II emission standards in new or remodel construction. Retrofit or replacement of existing fireplaces is not required. Implementation of a voluntary woodburning curtailment program is currently being studied. (Note: this measure is primarily focused on PM_{10} emissions which occur during winter months. Thus, estimated emission reductions are listed below in tons/year and are not included in the ROG and NOx control measure tables and charts at the end of the chapter.)

Rule Adoption Date: 1993
Applicable APCD Rule: 504
Year 2003 Emission Reduction: PM_{10}: 52 tons/year
ROG: 30 tons/year
NOx: 4 tons/year

5.5 MEASURES PROPOSED FOR RETENTION AND ADOPTION

This section presents control measures proposed for adoption in the 1998 CAP that have not yet been adopted. They have been deemed reasonable and still necessary for attainment, and are recommended for retention and adoption in this 2001 CAP.

Retained Measures for Reactive Organic Gases

R-3 Architectural Coatings

Many architectural coatings are oil based paints. Solvents contained in these paints evaporate into the atmosphere as the paint dries, contributing to ozone formation. District Rule 407 currently limits the sale of paints containing specific photochemically reactive solvents. This measure originally recommended that the rule be modified to be consistent with regulations in Santa Barbara and Ventura Counties, which were modeled after the 1989 ARB-CAPCOA Suggested Control Measure for Architectural Coatings. However, on June 22, 2000, the ARB approved a new Suggested Control Measure for Architectural Coatings which was subsequently adopted by the Sacramento Metropolitan Air Quality Management District (SMAQMD) as Rule 442. The SMAQMD Rule 442 has been endorsed by CAPCOA and is now the model rule which air districts in California have committed to adopt in the 2001/2002 timeframe. District adoption of the new model rule will achieve consistency with architectural coating regulations throughout the state, including Santa Barbara and Ventura Counties, as originally intended.

The model rule limits the overall Volatile Organic Compound (VOC) content of coatings manufactured, sold, or applied with different limits for different coatings. Limits would range from 100 to 730 grams VOC per liter for all architectural coatings, effective January 1, 2003. The proposed rule includes a sell-through period to allow existing inventories to be sold and replaced with lower VOC coatings.

Proposed Rule Adoption Date: 2002
Applicable APCD Rule: None
Cost-Effectiveness: $4,900/ton (SCAQMD estimate)
to $6,380/ton (ARB estimate)
Control Efficiency: 20%
Year 2003 Projected Emission Reduction: 0.235 tons/day ROG

5.6 MEASURES PROPOSED FOR DEFERRAL/CONTINGENCY

The measures described in this section were proposed for adoption in the 1991 CAP, but were found unnecessary to meet the emission reduction goals of the 1995 and 1998 Plans or this 2001 Update. Primary considerations for placing measures in this category included impacts to small businesses, limited emission reductions, potential implementation difficulties, or a need for further research due to a change in conditions. These measures are recommended for deferral, to be implemented only in the event that reductions from adopted measures are insufficient to achieve attainment within the required timeframe.

Deferred Measures for Reactive Organic Gases

R-6 Commercial Degreasing Operations

Degreasing operations are common in the automotive and electronics industries and typically involve dipping dirty parts into a cleaning solvent. Emissions can occur from the liquid surface of the cleaning solvent, or after parts are removed from the tank and the solvent on them evaporates. District Rule 416, Degreasing Operations, prohibits the use of photochemically reactive solvents in degreasing operations unless emissions are reduced at least 85%. Options for modifying the rule vary by the type of degreaser affected.

Recommendations for improving the effectiveness of the rule include restricting the solvent content in waste materials; requiring that excess solvent on cleaned parts be returned to the solvent bath; restricting ventilation rates; requiring that no water be visually detectable in the solvent exiting the water separator; requiring carbon adsorption or refrigerated chillers; and applying good housekeeping practices to all degreasing operations.

Cost Effectiveness:	Unknown
Control Efficiency:	2 - 10%
Potential Emission Reduction:	0.06 tons/day ROG

Discussion: Re-evaluation of this control measure determined that the potential emission reductions originally estimated for the 1991 CAP were assumed to result from large, conveyerized degreasing operations. It has since been found that no conveyer degreasing systems are currently operated in this county. Furthermore, it is likely that many of the smaller sources affected, such as automobile repair shops and small manufacturers, are already using lower emitting degreasing systems as a result of other environmental requirements. Thus, expected emission reductions are uncertain and require further research.

R-10 Marine Vessel Coatings

Marine coatings are specialty paints applied to the hulls and other exposed surfaces of recreational boats, commercial work boats, and fishing vessels. These coatings must be extremely durable, quick drying and have high adhesive properties to provide adequate protection under harsh conditions. There are currently no regulations that apply to marine vessel coatings in the county. The primary method of control is to limit the ROG content of reformulated coatings, similar to measure R-3.

Cost-Effectiveness:	Wide range, from savings of $5350/ton to cost of $3500/ton
Control Efficiency:	15%
Potential Emission Reduction:	0.002 tons/day ROG

Discussion: Expected emissions reductions from this measure are very small. However, existing emissions data for this source category is very poor and needs further study. This measure is recommended for deferral to allow additional research on this source category.

R-15 Industrial Adhesives and Coatings

Reactive organic gas (ROG) emissions are associated with solvent-based adhesives. Solvents are part of both the adhesive formulation and media for transferring the adhesive to the substrate. They suspend the other ingredients in the adhesive, and in some cases, dissolve the substrate. The solvent eventually evaporates into the atmosphere from adhesive application and/or curing, resulting in ROG emissions. There are currently no regulations that apply to these products. Recommendations in this measure for controlling emissions from adhesives include reformulation to low-VOC or aqueous-based coatings, improved transfer efficiency, and the use of vapor recovery equipment on certain operations. In December of 1998, the ARB completed a Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Adhesives and Sealants (RACT/BARCT Guidance) which includes guidelines for low-VOC adhesives and solvents. Industrial coatings are now included in the Architectural Coating SCM.

Cost Effectiveness:	$2400/ton
Control Efficiency:	40%
Potential Emission Reduction:	0.003 - 0.187 tons/day ROG

Discussion: The RACT/BARCT Guidance and model rule for this source category contain many exemptions for small sources. District staff found that although control efficiency is substantial, the penetration or

number of actual sources subject to the rule would be limited. In addition, to implement a "prohibition of sale" clause would be staff and resource intensive. Expected emission reductions from this measure without a "prohibition of sale" would only be 0.003 tons per day. This measure is recommended for deferral until a significant emission reduction potential can be demonstrated.

R-18 Wood Furniture Manufacturing

Surface coatings used in wood furniture manufacturing and refinishing contain a variety of reactive organic compounds. These compounds escape to the atmosphere and contribute to ozone formation when the coatings dry. There are no existing rules that specifically address emissions from wood furniture manufacturing. Rule 407, part D.1 regulates general sources of organic emissions. Nonexempt sources must control ROG emissions by 85%.

The recommended control measure would require specific limits on the VOC content of various coatings based on the limits used in Santa Barbara and Ventura counties. The implementation schedule would be phased over 5 years, with various coatings required to meet successively lower limits during the phase-in period. Control options to meet the VOC limits include coating reformulation, improved transfer efficiency, and vapor recovery with thermal destruction or carbon adsorption.

Cost Effectiveness:	Wide range, from savings of $9,450/ton to cost of $14,050/ton
Control Efficiency:	50%
Potential Emission Reduction:	16 tons/day ROG

Discussion: This measure would affect a large number of small businesses while achieving only a small reduction in emissions. However, the emissions data on which the potential reductions and cost effectiveness are based is weak and should be further developed. Regulations in other areas are forcing low VOC products onto the market which are already being used to some degree by these sources. In addition, the USEPA has proposed a federal regulation that would regulate the manufacture, sales and import of architectural coatings which are closely related to wood products coatings. This measure is recommended for deferral to allow further research on this source category and the development of federal or statewide legislation.

R-22 Cleaning of Organic Product Storage Tanks

Tanks containing liquid petroleum products must be cleaned periodically to prevent the buildup of sludge, which can affect product quality, tank capacity, and ease of product removal from the tank. ROG emissions result when empty tanks are vented to the atmosphere to allow maintenance personnel to safely enter the tank for cleaning. There are no existing rules that specifically address emissions from the cleaning of storage tanks. This measure would require 90% control of ROG emissions when petroleum storage tanks 500 gallons or larger are cleaned. Methods of compliance include the use of liquid balancing, negative pressure displacement, incineration, carbon adsorption and/or refrigeration technologies. Alternative control technologies could include venting to vapor recovery, closed-loop refrigeration devices, incineration or catalytic oxidizers. Some of these control technologies would require external power sources, which may not be readily available in petroleum tank farms.

Cost Effectiveness:	$3,750/ton
Control Efficiency:	90%
Potential Emission Reduction:	0.13 tons/day ROG

Discussion: The emissions data on which the potential reductions and cost effectiveness are based is weak and should be further developed. Also, although relatively cost effective, this measure affects a large number of sources. Considerable opposition was expressed by sources facing a similar rule in Santa Barbara County.

Staff recommends this measure be deferred until better emissions data is developed and specific concerns of affected sources can be identified and resolved.

Deferred Measures for Oxides of Nitrogen

N-3 Commercial Marine Vessels - Combustion of Fuels

This category encompasses a broad spectrum of vessel types, including commercial fishing vessels, mooring tenders, research vessels, tour boats, commercial sport fishing vessels, and crew and supply boats used in offshore energy development. A wide variety of gasoline and diesel fueled engines are used to power the vessels. NOx emission rates are greater for diesel fuel than gasoline and are higher in four-stroke (inboard) engines than two-stroke (outboard) engines. There are currently no NOx regulations for this category. The recommended control measure would require a NOx emissions limit of 8.4 g/hp-hr for vessels with a combined total engine power rating of 1000 horsepower and above. Alternatives to the emission limit would require operators to retard engine timing by 4 degrees and install turbocharging and separate circuit intercooling (cooling of intake air or manifold to reduce combustion temperatures). Engine replacement is also an option. Vessels burning less than 20,000 gallons of fuel per year would be exempted from the regulation.

Cost Effectiveness:	Wide range ($200/ton - $22,000/ton)
Control Efficiency:	30% overall
Potential Emission Reductions:	0.08 tons/day NOx

Discussion: Although a wide variety of vessel types could be subject to the rule, only a small number of the larger boats in this county have engines above the recommended size threshold. Thus, it would achieve a relatively small NOx reduction and has the potential to be costly. In addition, unresolved jurisdictional issues have the potential to impede implementation and enforcement. In the event that offshore oil or gas production is proposed for this area, this measure should be revisited as an emission reduction strategy for crew and supply vessels that service such facilities. In the interim, state funds provided through the Carl Moyer program and local funds provided as mitigation for large projects have been used to replace old diesel engines with new, cleaner burning engines in a number of commercial marine vessels home-ported in this county.

N-10 Onshore Drilling and Workover Rigs

Onshore drilling rigs typically consist of large diesel engines that supply power for drilling wells. There are currently no local regulations governing NOx emissions from this category. The measure recommends utilizing electric power for drilling operations when available and adjusting engines to reduce NOx by 25% when electrification is infeasible. This could be achieved through operational modifications such as adjusting the air-fuel ratio, derating engines to limit the power output, and retarding engine timing.

Cost Effectiveness:	$250/ton - $4,800/ton for lo-NOx adjustments, <$20,000 ton for electrification (within 3,132 ft.)
Control Efficiency:	75% overall
Potential Emission Reduction:	0.01 tons/day NOx

Discussion: Emissions data for this source category is weak and needs further refinement. However, well drilling activities in this county have significantly decreased over the past several years, limiting the potential emission reductions available from this measure. In addition, a statewide portable equipment regulation may require controls on this equipment when drilling activities increase in the future.

5.7 MEASURES PROPOSED FOR DELETION

The measure described in this section was proposed for adoption in the 1991 CAP, but was found unnecessary to meet the emission reduction goals of the 1995 and 1998 Plans or this 2001 Update. This measure has limited potential for any type of source control that would result in actual emission reductions. This measure is recommended for deletion.

Deleted Measures for Reactive Organic Gases

R-4 Asphalt Roofing Kettles

Asphalt roofing kettles are portable wheeled vats containing liquid asphalt used in roofing operations. These kettles are typically towed to the jobsite and are heated by a gas flame. Emissions occur both from combustion of the gas used for heating and through volatilization of organic compounds in the molten asphalt. There are currently no regulations controlling emissions from asphalt kettles. This control measure recommends the installation of close fitting covers and lowering the kettle temperature to reduce emissions from volatilization.

Cost-Effectiveness:	$20/ton - $650/ton
Control Efficiency:	Needs further research
Potential Emission Reduction:	Needs further research

Discussion: Although low in cost, this measure would be difficult to enforce due to the mobile nature of the source. In addition, the method used to calculate the control efficiency of the measure did not account for evaporative emissions that occur once the asphalt is applied to the roof. Putting a cover on the roofing kettles would not eliminate emissions, but would simply delay the emissions until the asphalt material was ultimately applied to the roof. This measure has been recommended for deletion because the potential emission reductions are considered negligible.

Table 5-1

STATIONARY SOURCE CONTROL MEASURE EVALUATION

#	1991 CAP CONTROL MEASURES	ADOPTED RULE	PROPOSED ADOPTION	DEFER	DELETE
ARB	Phase II Vapor Recovery	X			
R-1	Agricultural Burning	X			
R-3	Architectural Coatings		X		
R-4	Asphalt Roofing Kettles				X
R-5	Bulk Gasoline Loading	X			
R-6	Commercial Degreasing			X	
R-8	Petrol Storage Tank Seals	X			
R-9	Landfill Gas Control	X			
R-10	Marine Vessel Coatings			X	
R-11	Marine Tanker Loading	X			
R-12	Oil/Water Separators	X			
R-13	Non-Ag Open Burning	X			
R-14	Consumer Products (ARB)	X			
R-15	Adhesives/Industrial Coatings			X	
R-17	Sumps	X			
R-18	Wood Furniture Coatings			X	
R-19	Metal Parts Coatings	X			
R-20	Auto Refinishing	X			
R-21	Fugitive Emissions	X			
R-22	Cleaning of Organic Product Storage Tanks			X	
R-23	Cutback Asphalt	X			
R-24	Dry Cleaners	X			
N-1	Coke Calcining	X			
N-2	Commercial Fuel Combustion	X			
N-3	Commercial Marine Vessel Fuel Combustion			X	
N-5	Energy Conservation Measures	X			
N-10	Onshore Drilling Rigs			X	
N-11	Utility Fuel Combustion	X			
N-12	Residential NG Combustion	X			
N-14	Stationary IC Engines	X			
MP-1	Residential Wood Combustion	X			

Table 5-2
ESTIMATED EMISSION REDUCTIONS
FROM STATIONARY SOURCE CONTROL MEASURES

		YEAR OF ADOPTION, REVISION, PROPOSED ADOPTION	FULL IMPLEMEN-TATION YEAR	EMISSION REDUCTIONS (tons/day)				
				1997	2000	2003	2006	2015
ROG CONTROL MEASURES								
R-1	Agricultural Burning (Rule 502)	n/a	1988	0.500	0.513	0.522	0.532	0.586
R-3	Architectural Coatings	2002	2004	0.000	0.000	0.235	0.252	0.310
R-5	Bulk Gasoline Loading (Rule 424)	1996	1997	0.237	0.239	0.244	0.250	0.273
R-8	Petroleum Storage Tanks (Rule 425)	1994	1996	0.299	0.367	0.377	0.387	0.406
R-9	Landfill Gas Control (Rule 426)	1995	1998	0.009	0.013	0.014	0.015	0.018
R-11	Marine Tanker Loading (Rule 427)	1995	1997	0.138	1.161	1.161	1.161	1.161
R-12	Oil/Water Separators (Rule 419)	1994	1996	0.357	0.373	0.379	0.378	0.372
R-13	Non-Ag Open Burning (Rule 501)	2000	2003	0.000	0.000	0.282	0.303	0.366
R-14	Consumer Products (ARB)	1992	2000	0.302	0.875	1.305	1.401	2.616
R-17	Sumps in Oil Fields (Rule 419)	1994	1996	0.230	0.270	0.302	0.335	0.388
R-19	Metal Parts Coating (Rule 411)	1998	1998	0.000	0.033	0.037	0.040	0.056
R-20	Auto Refinishing (Rule 423)	1996	1996	0.110	0.126	0.137	0.149	0.181
R-21	Fugitive Emissions (Rule 417)	1993	1994	0.220	0.237	0.247	0.254	0.262
R-23	Cutback Asphalt (Rule 420)	1997	1997	0.200	0.208	0.220	0.238	0.269
	TOTAL ROG REDUCTIONS			**2.602**	**4.415**	**5.462**	**5.695**	**7.264**
NOx CONTROL MEASURES								
N-1	Coke Calcining (by permit)	1989	1989	0.057	0.060	0.061	0.061	0.060
N-2	Commercial Fuel Combustion (Rule 430)	1995	1997	0.274	0.588	0.624	0.656	0.708
N-11	Utility Fuel Combustion (Rule 429)	1993	2002	7.857	7.933	11.003	11.335	12.726
N-12	Residential Nat. Gas Combustion (428)	1995	1996	0.035	0.063	0.081	0.087	0.107
N-14	Internal Combustion Engines (Rule 431)	1996	2000	0.108	0.491	0.515	0.541	0.582
	TOTAL NOx REDUCTIONS			**8.331**	**9.135**	**12.284**	**12.680**	**14.183**

Table 5-3

COMPARISON OF STATIONARY SOURCE CONTROL MEASURES

CONTROL MEASURE		COST EFFECTIV E-NESS ($/ton)	CONTROL EFFI-CIENCY	YEAR 2003 REDUCTION		OTHER FACTORS
				ROG (t / d)	NOx (t / d)	
MEASURES PROPOSED FOR RETENTION AND ADOPTION						
R-3	Architectural Coatings	4900 to 6380	20%	0.235	-	SCM adopted by CARB; statewide consistency
MEASURES PROPOSED FOR DEFERRAL/CONTINGENCY						
R-6	Commercial Degreasing	unknown	2-10%	0.01-0.06	-	Affects many small sources; reductions uncertain
R-10	Marine Vessel Coatings	Wide Range +, -	15%	0.002	-	Emissions info weak; could combine with other coatings measures
R-15	Adhesives	2400	40%	0.003-0.187	-	Limited reductions; few sources not exempt
R-18	Wood Furniture Manufacturing	Wide Range +, -	50%	0.16	-	Small business impacts
R-22	Cleaning Organic Product Tanks	3750	90%	0.13	-	safety issues; needs more research
N-3	Commercial Marine Vessels-Combustion of Fuels	200 to 22000	30%	-	0.08	Reserve for potential offshore energy development
N-10	Onshore Drilling Rigs	250 to 20000	75%	-	0.01	State regulation possible; future emissions may increase
MEASURES PROPOSED FOR DELETION						
R-4	Asphalt Roofing Kettles	20 to 650	unknown	unknown	-	Difficult to enforce; reductions uncertain

Figure 5-1

ROG CONTROL MEASURE

ESTIMATED EMISSION REDUCTIONS

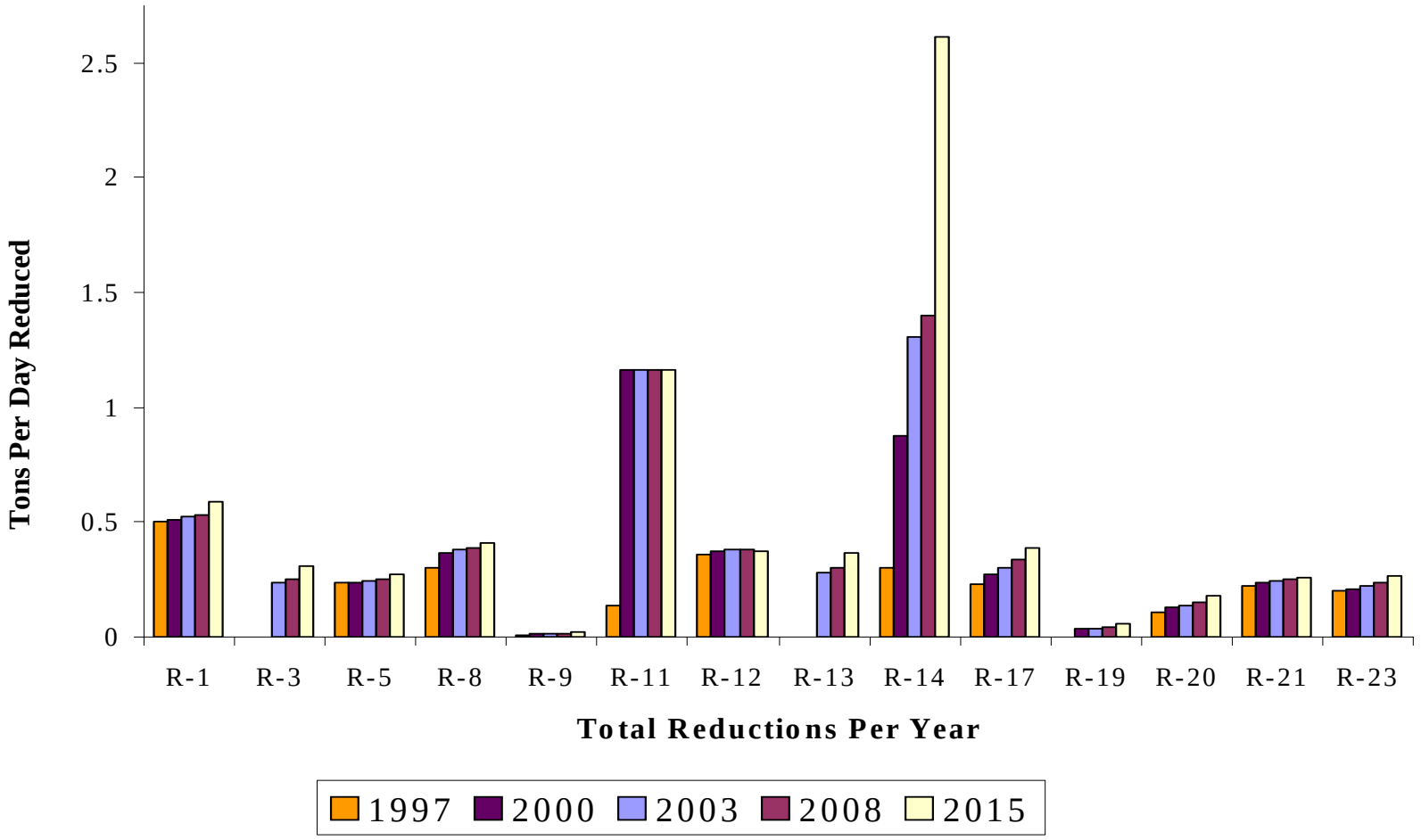
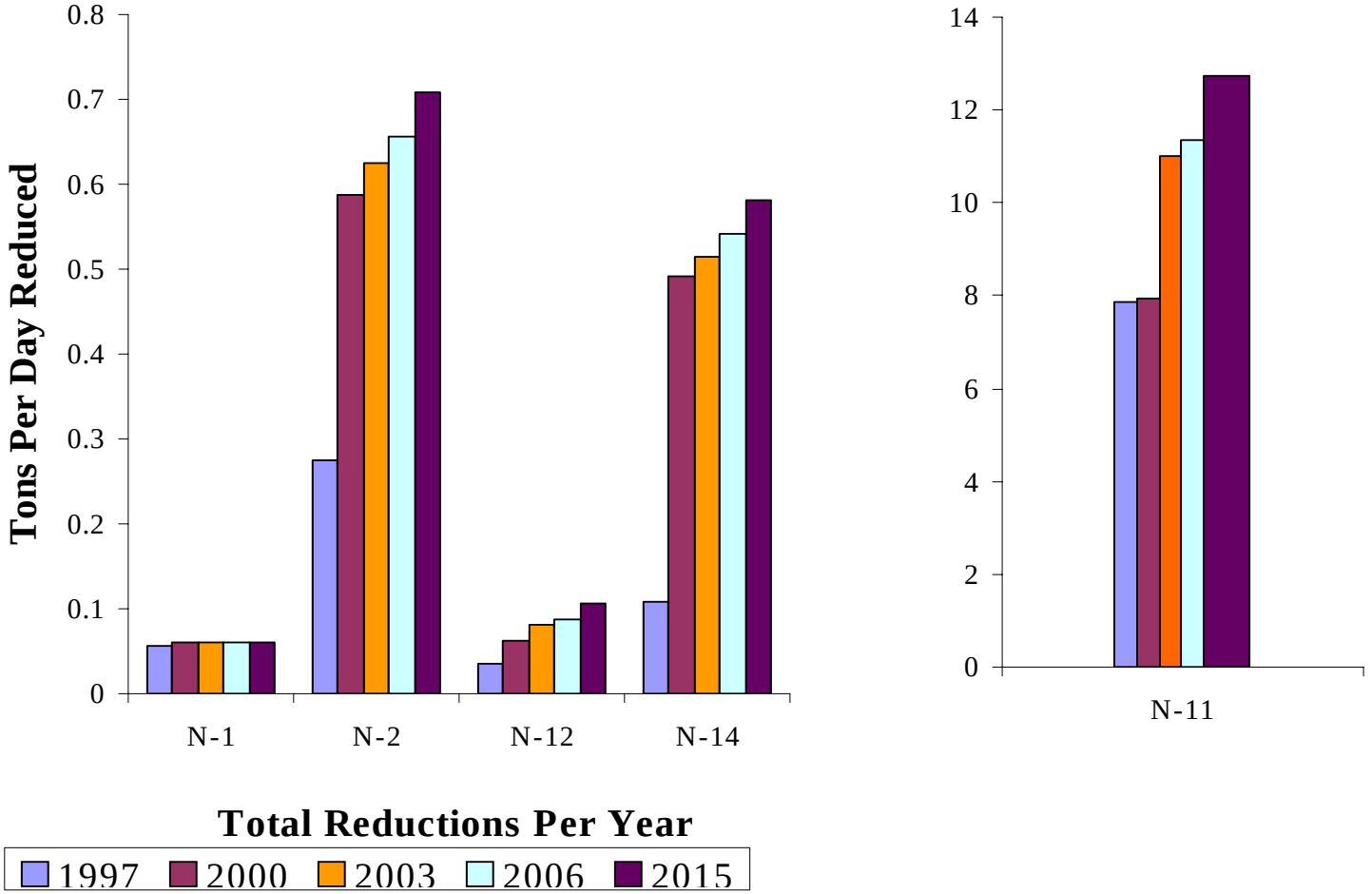


Figure 5-2

NOx CONTROL MEASURES

ESTIMATED EMISSION REDUCTIONS



CHAPTER 6
TRANSPORTATION AND LAND USE MANAGEMENT STRATEGIES

INTRODUCTION

TRANSPORTATION CONTROL OPTIONS

DESCRIPTION OF EXISTING PROGRAMS

FUNDING FOR TRANSPORTATION MEASURES

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ADOPTED CONTROL MEASURES

MEASURES PROPOSED FOR DEFERRAL/FURTHER STUDY

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SUMMARY

6.1 INTRODUCTION

In San Luis Obispo County, as with much of the state, motor vehicles account for over 50% of the emissions of the smog forming pollutants ROG and NOx. State controls on vehicles and the use of cleaner, alternative fuels will continue to provide significant reductions in vehicle emissions. Even with these technological advances, however, California cannot solve its air pollution problems if the growth in vehicle use and congestion experienced over the last three decades continues into the 21st century. According to the EPA, about 90 million Americans live in areas that do not meet federal air quality standards, in large measure the consequence of car and truck emissions.

Since the end of World War II, private auto use has been institutionally supported at all levels of government, with limited development of other transportation alternatives. While this has helped society achieve unprecedented mobility, significant air pollution has also resulted. In recognition of this, the CCAA requires all nonattainment districts to adopt and implement all "reasonably available transportation control measures sufficient to substantially reduce the rate of increase in passenger vehicle trips and miles traveled per trip..." (H&SC Sec. 40918). The California Air Resources Board has defined a 'substantial reduction' as holding the rate of growth of vehicle travel in urban areas to the rate of population growth. Thus, the transportation goal of the CAP is to reduce the growth of vehicle trips and vehicle miles traveled (VMT) to the rate of population growth within San Luis Obispo County. Recent data are showing the District is well on its way to achieving this goal.

Transportation Control Measures (TCMs) are controls implemented at the local or regional level to reduce emissions resulting from the use of motor vehicles. TCMs are primarily intended to reduce vehicle use by promoting and facilitating the use of alternative transportation options. In contrast, the vehicle emission control program implemented by the state reduces emissions through manufacturer's improvements for new motor vehicles.

In designing effective control strategies, it is important to understand that vehicle emissions vary with different operating conditions. For instance, starting and driving a cold engine produces higher ROG emissions than any other phase of vehicle operation, because the catalytic converter does not work effectively until normal operating temperatures are reached. In contrast, NOx emissions are highest when the vehicle is warm and operating at freeway speeds. Slow speeds and congestion tend to increase emissions of most pollutants.

Because of these and other factors, short trips (five miles or less) create disproportionately large amounts of ROG emissions, independent of vehicle speed. A five mile trip produces almost as much air pollution as a trip twice as long (14 grams vs. 17 grams). District surveys indicate that over half of all trips made by county residents are less than or equal to 5 miles. Therefore, strategies to induce a shift to less polluting modes for short trips can provide substantial air quality benefits. NOx emissions, however, tend to increase in proportion to trip length and vehicle speed. Thus, measures to reduce miles traveled for longer trips are also important.

A number of recent studies have revealed important information about the transportation choices made by travelers in San Luis Obispo County. Surveys performed by the San Luis Obispo Regional Transit Authority (SLORTA) in 1995 and 1997 documented and Average Vehicle Ridership (AVR) during morning commute hours on all roads in the county of about 1.1 persons per car. This means that approximately 90% of the vehicles driven for those trips have only one occupant. A third, and similar survey, conducted in 2000 reported a countywide AVR of 1.3, a noticeable improvement over the two previous surveys. Likewise, the Highway 101 Major Investment Study (Sept. 1997), commissioned by SLOCOG to explore alternatives to widening State Highway 101 from South County to the City of San Luis Obispo reported a range of peak commute period AVR along the Highway 101 corridor of 1.30 to 1.42. Taken together, the data from the

various surveys seems to indicate growth in the use of alternative commute modes and increasing AVR rates countywide.

While use of alternate transportation modes is increasing, most people today still choose the convenience and apparent economy of the private auto. Research has revealed that the private motor vehicle has long been subsidized. Revenues based on vehicle use cover only 60 percent of the costs of building and maintaining the nation's roads and bridges. John Meyer, Professor of Economics at Harvard University, has estimated that commuters going to work in central business districts in American cities in their own cars directly pay for only about 25 percent of the total cost of their transportation. The other 75 percent is typically borne by society through increased taxes, provision of free parking, lost time due to traffic congestion, accident mitigation, and air pollution.

Development of the highway system has also impacted land use by making rural lands accessible to development, which has led to longer commutes and increased dependence on automobiles. Up to two-thirds of urban land is devoted to the automobile for purposes such as roads, parking lots, driveways, and garages. However, it is very difficult to quantify the social costs of direct and indirect subsidies with any precision because subsidies vary from one region to the next and because some of the costs involve the incalculable loss of human life, health, and lost opportunities.

Any program to reduce motor vehicle emissions must include a comprehensive strategy to reduce the overall number of trips, VMT, and congestion. The TCMs described in this Plan focus on reducing the number of short trips and limiting the growth of VMT to the rate of population increase. Additional long-term reductions are available through implementation of recommended land use planning strategies designed to help reduce dependence on automobiles. Planning documents published by the ARB, the Local Government Commission, and others estimate motor vehicle usage can be reduced by 15% to 30% with implementation of appropriate land use and circulation management programs. In addition, TCMs and land use strategies have benefits beyond emission reductions by improving energy efficiency and relieving traffic congestion.

6.2 TRANSPORTATION CONTROL OPTIONS

While the CCAA gives authority to adopt TCMs, districts cannot levy taxes to provide for capital improvements or directly regulate land use decisions. Three implementing mechanisms are available to influence travel behavior:

- Market-based programs created by district rules
- Command and control measures implemented and enforced by a district
- Local agency adoption and implementation of measures under their jurisdiction

Market-based programs: operate on the premise that changes in the free market economy can modify individual behavior more effectively and for less cost than government regulation. Market-based controls require little monitoring once in place and can reduce emissions from almost the entire vehicle fleet. Parking pricing is a good example, and one of the primary tools available. Studies of parking fees at private employers show that, in programs where solo drivers are charged the most and carpools pay less or nothing to park, solo driving decreased by 18% to 83%. Monies collected from parking fees can be used to subsidize and expand transit service, or for improvements such as purchasing clean fuel buses. Unfortunately, this approach runs counter to the views of many people, who have come to expect free parking at their destination.

In the mid-1990's the ARB conducted a study to assess the feasibility of implementing market based strategies for reducing vehicle trips and miles traveled. The study concluded that five specific measures held promise for equity among the various economic groups in the state, generating revenue to fund alternative transportation and modifying travel behavior. The options presented include:

- *Congestion Pricing*, where fees would be charged for peak period travel on congested routes;
- *VMT Fees*, which would be collected based on the number of miles driven annually;
- *Emissions Fees*, based on emission levels measured at the biennial smog check;
- *Parking Charges*, imposed on all parking, or only on commuter parking, and applied throughout the day or during peak use periods;
- *Fuel Tax Increases*, would increase the cost of gasoline to the point some drivers would begin to link trips, take more public transit, or buy more fuel-efficient cars.

Of these, parking charges is the only measure that has been implemented to date and that has only been applied in limited regions.

Command and control: Command and control measures use a different approach, usually targeting a specific group of people. The most common examples are trip reduction measures, which require employers, schools, or other major trip attractors to reduce trips to their facilities. This approach has also proven effective, but may impose significant costs on the implementing agency and the targeted groups. State law currently prohibits any air district or other jurisdiction from adopting and/or implementing mandatory employer based trip reduction programs unless specifically required by federal law. There is no federal requirement for San Luis Obispo to implement a mandatory program.

Local agencies: Local agencies can adopt and implement capital improvement and transit programs recommended in the Plan. Construction of new facilities such as Park and Ride lots, transit stops and bike lanes provide modest, immediate emission reductions by helping people shift from private vehicles to other travel modes. Changes to local land use policies can also provide important air quality benefits in the future by improving the regional jobs/housing balance, planning compact communities, and providing for mixed-use development.

Transportation control measures generally fall into three broad categories:

- ***Demand Management:*** Measures in this category are designed to modify individual travel behavior through incentive programs. Such programs usually focus on motivational methods (financial, convenience, regulatory, etc.) to increase the use of ridesharing, public transit, bicycling, walking and other alternatives to the single occupant vehicle. Implementation can be through district programs, inclusion of applicable strategies in Regional Transportation Plans, improvements in public transit and rideshare matching services, and other supporting strategies.

- ***System Management:*** These strategies emphasize the use of engineering methods to improve traffic flow and the overall performance of the existing transportation system. Typical measures include synchronization of traffic signals, intersection channelization, designation of one-way streets, transit system enhancements, improved parking management, expanded bikeway systems, and development of Park and Ride lots. Implementation is by local and regional transportation providers (local government, transit districts, Caltrans, etc.).

- ***Land Use Planning:*** These measures suggest ways to change the arrangement and distribution of land uses to reduce trips and VMT and make alternative forms of transportation more attractive. They address issues of jobs/housing balance, location of major new traffic generators, and basic travel relationships that exist between the various land use types within and between communities. Implementation is through city and county general plans and ordinances.

6.3 DESCRIPTION OF EXISTING PROGRAMS

Land Use Planning: The County of San Luis Obispo and the Cities of Arroyo Grande, Atascadero, Grover Beach, Pismo Beach, San Luis Obispo and Paso Robles have each adopted air quality goals, policies and programs in their General Plans. The land use planning policies include concepts such as mixed-use development, improving jobs/housing balances and planning compact communities.

State law requires that each jurisdiction adopt and maintain a General Plan for future development. Each Plan is required to contain a Circulation Element, among other Elements. Historically, these Elements have focused on the local street and roadway system and did not give equal emphasis to all transportation modes. Increasing public concern over air pollution and support of alternate modes has caused some jurisdictions to place more focus on improving infrastructure for all transportation modes. To this end, the City of San Luis Obispo's Circulation Element of their General Plan now includes measurable mode split objectives, and SLOCOG has added a similar system to the Regional Transportation Plan.

CEQA Mitigation Programs: The APCD reviews numerous types of new development projects referred by local jurisdictions, as well as state and federal agencies. Development projects are evaluated for potential air quality impacts, and the District provides mitigation recommendations where appropriate. Typical recommendations include: pedestrian- and bicycle-friendly site design; mixing residential and commercial land uses to reduce vehicle trips; encouraging compact development within existing Urban Reserve Lines; installation of bus turnouts, benches and shelters; density and circulation design modifications; and other measures designed to reduce reliance on motor vehicles. Large development projects and General Plan updates are further evaluated for consistency with the land use planning principles contained in the Clean Air Plan. District staff typically review over 200 urban development projects each year.

"MOVER" Program: The District's Motor Vehicle Emission Reduction (MOVER) program is funded through a clean air surcharge on motor vehicle registration fees (AB-2766). Projects eligible for funding must demonstrate that they will reduce air pollution in San Luis Obispo County from motor vehicles, reduce vehicle trips, increase vehicle occupancy, augment existing public education efforts in support of alternative transportation, or otherwise implement the transportation related provisions of the California Clean Air Act of 1988. Project proposals are ranked according to their air quality benefit, cost effectiveness, availability of matching funds, feasibility, and other desirable factors. A screening committee composed of volunteers representing various segments of the community evaluate, rank, and develop funding recommendations. The funding recommendations are then passed on to the District's Board of Directors for final approval.

MOVER funds were originally distributed on an annual cycle. However, the District now distributes MOVER funds every other year to maximize the amount of available funding during a given funding cycle and to reduce program administration overhead. Typical projects funded include transit subsidies, new buses, bike lanes, engine retrofits, clean fuel conversions, ridesharing incentives, electric vehicles and public information projects. As of the date of this document, the District has conducted four MOVER Program Grant cycles as follows:

Grant Cycle	AB2766 Funds	Total Emissions Reduced (Tons)* (ROG/NOx/PM_{10})	Average Cost Effectiveness ($/Ton)
96/97	$99,700	30	$3,323
97/98	$155,386	17	$9,140
98-00	$361,600	44	$8,216
00-02	$600,000	70	$8,571

*****These emission reductions have not been credited as controls in this Plan

"CARL MOYER" Program: The Carl Moyer Program was established during the 1998 legislative session as a bipartisan effort to reduce NOx and PM_{10} emissions from heavy-duty diesel engines. The program provides grant funds to help finance emission reduction projects targeting heavy duty diesel engines used in on-road, off-road, marine, locomotive, stationary agricultural engines, and other heavy-duty engine applications throughout the state. Participating Districts are required to provide a $1 match for every $2 in Carl Moyer Program funding received; money already spent or obligated by districts on projects that would otherwise qualify for Moyer funds can be used to fulfill the match requirement. Eligible projects must meet a NOx emission reduction cost effectiveness requirement of $13,000 per ton or less. The San Luis Obispo County Air Pollution Control District has participated in all four Carl Moyer Program funding cycles as shown in the table below:

Funding Cycle	Moyer Funds	SLOAPCD Match	Total Emissions Reduced (Tons)* (ROG/NOx/PM_{10})	Average Cost Effectiveness ($/Ton)
98/99	$157,900	$104,000	27	$9,700
99/00	$83,196	$41,998	45	$2,782
00/01	$176,750	$88,250	60	$4,417
01/02	~$75,000	$37,500	Undetermined	Undetermined

Typical projects funded through this grant program include replacing diesel buses with new natural gas powered buses, re-powering marine vessels with cleaner burning diesel engines, replacement of agricultural pump engines, and purchase new LPG school buses. Overall program cost effectiveness is estimated at under $5,000 per ton of NOx reduced. In addition, the program has resulted in significant reductions of diesel PM, listed by the State in August 1998 as a toxic air contaminant.

Regional Ridesharing Program: San Luis Obispo Regional Rideshare is one of many organizations statewide that provide transportation demand management (TDM) and rideshare services. The main elements of the program include assisting in the formation of carpools and vanpools through a match list program, coordinating an employer outreach program, transit promotion and marketing activities, the development of Park and Ride lots, and a program that matches students at Cuesta College and Cal Poly for ridesharing.

Public Transit Systems: Currently there are 10 public transit operators in San Luis Obispo County. These include five fixed route providers: Central Coast Area Transit [CCAT], South County Area Transit [SCAT], San Luis Obispo Transit [SLO Transit], Paso Robles Community Area Transit [PRCATS] and Cambria's fixed route system, the "Otter". In addition, there are five demand responsive services: Atascadero Dial-A-Ride (DAR), Paso Robles DAR, Morro Bay DAR, South Bay DAR and Runabout, the regional ADA service provider. Almost all County residents have access to at least one of those services. Private contractors to the public agencies operate most of these services in order to maximize operation efficiencies. Funding agencies typically administer service contracts, oversee service planning and allocate funds among the various providers or contractors.

Over one million rides per year (i.e. the number of boardings) are made on publicly operated systems. Another estimated 800,000 rides are made on privately operated systems managed by social service agencies, non-profit organizations and senior's groups. Those privately run operations supplement the public systems for meeting more specialized travel needs. In addition to the above, several private sector bus companies offer inter-regional fixed-route services; also four private taxi companies provide local and countywide on call services..

Transit operators periodically modify routes and services to more effectively meet the needs of their customers. Such changes are made in response to requests for improved local and regional mobility, better time-efficiency, and greater comfort, as well as from the operator's standpoint to lower costs on the least productive lines. The challenge lies in providing efficient transit services while satisfying these requirements

– especially at a time when transit operating budgets are not necessarily keeping pace with growth in the transit market.
Cal Poly State University provides subsidies to its employees and students enabling discounted or free access to the SLO Transit and CCAT transit systems. Cuesta Community College also provides subsidies to CCAT to allow for enhanced service to that facility. The District has historically co-sponsored the Summer Youth Bus Pass Program, aimed at encouraging youngsters to use public transit.

Transportation Management Associations (TMA): A TMA is generally considered a public/private partnership with a strong emphasis on private sector participation. The mission of most TMAs nationwide is to implement various types of TDM strategies, usually aimed at reducing traffic congestion and improving air quality. Ride-On TMA is a non-profit cooperative that works throughout San Luis Obispo county with other transit operators, social service agencies, businesses and the public to provide alternative transportation options, including an on-demand shuttle and vanpool services. Other services include shuttle service to the airport and the train station. The District has provided a number of grants over the years to Ride-On to enhance services capable of reducing automobile use in the County.

Consolidated Transportation Services Agency (CTSA): In addition to forming the TMA, Ride-On has served as the local Consolidated Transportation Services Agency (CTSA) since 1991. The CTSA is a cooperative effort of local care facilities for the developmentally disabled that, prior to the CTSA, were all running separate programs to transport their clients to work or therapy. Ride-On consolidated these transportation services under one management umbrella and now provides over 1000 rides per day in an efficient and economical operation. They also deliver contract door-to-door services with advance reservations for social services entities, private groups and businesses.

Parking Management: The only entities that currently charge for parking are the City of San Luis Obispo and the two public colleges. Parking fees, restrictions, and reduced parking availability are tangible disincentives to auto driving, which encourage the use of alternate transportation. The current parking fees range from $20/semester at Cuesta College and $51/quarter at California Polytechnic State University, to $120/quarter at the downtown parking garages. Short-term parking at the street meters in downtown San Luis Obispo averages about $1.00/hour.

System Improvements: Caltrans, the County, and cities currently utilize a variety of engineering methods to avoid or reduce automobile congestion. These improvements include the use and synchronization of traffic signals, intersection channelization, designation of one-way streets, left and right turn lanes, additional passing lanes, road widening, and elimination or restriction of on-street parking during certain hours on congested streets. These types of improvements are currently being implemented by each jurisdiction on a programmed (project-by-project) basis. The District supports system improvements that also include facilities for transportation modes other than automobiles, such as pedestrian walkways, bike lanes, railways, and transit systems.

6.4 FUNDING FOR TRANSPORTATION MEASURES

Funding for transportation projects is derived from federal and state fuel taxes, as well as a percentage of the state sales tax which is redistributed to cities and the county. Funds for transportation control measures and land use planning strategies may be available from the following sources. SLOCOG, as Regional Transportation Planning Agency, is responsible for local programming and allocation of the following federal and state funding sources:

Federal Funding Sources:

- ***Regional Surface Transportation Program (RSTP):*** The RSTP was established by California State Statute utilizing Surface Transportation Program Funds identified in Section 133 of Title 23 of the

United States Code. Approximately 76% ($225 million per year) of the State's RSTP funds must be obligated to projects which are located within the 11 urbanized areas of California with populations greater than 200,000 people. The apportionment and distribution of funds is based on relative population.

- ***Transportation Enhancement Activities (TEA) Program:*** The Transportation Equity Act for the 21st Century was enacted June 9, 1998 as Public Law 105-178. TEA-21 authorizes the Federal surface transportation programs for highways, highway safety, and transit for the 6-year period 1998-2003. TEA-21 builds on the initiatives established in the Intermodal Transportation Efficiency Act of 1991 (ISTEA), which was the last major authorizing legislation for surface transportation.

- ***Federal Aid Highway Acts of 1973 and 1976:*** Caltrans may appropriate money for construction of pedestrian and bike paths crossing federal lands. Bike projects funded with Federal Aid Highway Act funds are to be commuter transportation oriented rather than for recreation.

- ***FTA Section 5303:*** Provides funding for development of transportation plans and programs in urban areas of the state. The City of San Luis Obispo receives about $700,000 per year for transit purposes.

- ***FTA Section 5307:*** Is a block grant program which provides financial assistance to operators of urban public transportation systems. As the only designated urban area, the City of San Luis Obispo is the only eligible jurisdiction in the county for these funds.

- ***FTA Section 5309:*** Is a discretionary grant program under the Federal Transit Act to fund projects and programs to support mass transportation.

- ***FTA Section 5310:*** Provides grants to assist private nonprofit corporations and public agencies in providing transportation services to meet the needs of elderly persons and persons with disabilities for whom public mass transportation services are otherwise unavailable, insufficient, or inappropriate.

- ***FTA Section 5311:*** Is a discretionary grant program for public transportation systems in non-urbanized areas, and includes funds for inter-city bus service.

State Funding Sources:

- ***State Transportation Improvement Program:*** The state program to fund transportation projects (STIP) was substantially reformed as a result of legislation in 1997 (SB45, Kopp). The new process aims to empower local and regional agencies with greater flexibility over the use of transportation funding. While decision-making on transportation project approval has "devolved" to regional agencies, the same statutory parameters governing project funding eligibility continue to focus funding on highway, street, road, bikeway, and pedestrian-type projects (per Article XIX) of the state constitution.

- ***Transportation Development Act (TDA):*** In recent years, the county has received about $8.9 million annually in TDA funds. TDA funds include Local Transportation Funds which originate from a 1/4 of one percent tax on retail sales in the county, as well as State Transportation Assistance (STA) funds derived from the state gasoline tax. STA provides the county up to $800,000 per year for transit operations. By state law, TDA monies must first be used to provide transit services for "Unmet Needs"; local jurisdictions may then spend the rest on streets and roads. About 20 percent of TDA money is generally used for streets and roads. Since fiscal year 1990/91, two percent of the county's TDA program funds have been allocated specifically for bike and pedestrian projects. In the past five years, nearly $600,000 has been allocated for bicycle and pedestrian projects.

- ***Bicycle Lane Account (BLA):*** with the passage of AB 1020, the amount of funds available statewide annually in the BLA has steadily increased from $360,000 to $1,000,000 in 1998, $2,000,000 in 2001, $3,000,000 in 2003, and $5,000,000in 2004 and annually thereafter.

Local Funding Sources:

- ***General Fund:*** These monies come from the local sales tax, transit occupancy taxes (bed taxes), property taxes, and other sources. Cities may provide matching funds for state and federal grants, conduct joint projects with other local agencies, or construct projects alone.

- ***Developer Fees:*** Fees could be required to mitigate future air quality impacts from new development, based upon the expected increase in auto emissions. An example of developer fees is the "South County Air Quality Mitigation Fee." These fees are charged to new residential development in the unincorporated areas of the South County Planning Area.

- ***Local Option Gas Tax and Local Sales Tax:*** These taxes must be approved by local voters by a two-thirds vote.

- ***Tax Increment Financing:*** Implemented through the creation of Redevelopment agencies and preparation of a plan for a targeted redevelopment area, these funds become available through the excess tax revenues generated by new development. Projects are financed from other public funds or bonds, then repaid from the increasing amount of newly generated taxes.

- ***Vehicle Registration Fees:*** Assembly Bill 2766 authorized air pollution control districts to collect a clean air surcharge of up to $4 per registered motor vehicle. In San Luis Obispo County, one-fourth of these funds are redistributed annually by the District on a competitive grant basis to eligible recipients through the MOVER program for projects to reduce motor vehicle emissions.

Recent state policies will force local jurisdictions to pay an increasing portion of the costs of highway improvements necessitated by local growth. Despite the numerous revenue sources identified above, resources are projected to fall short of overall needs. Using some of these limited funds to aggressively support TCMs could reduce or delay the need for some of the projected roadway improvements.

6.5 CONTROL MEASURE EVALUATION AND RECOMMENDATIONS

Slowing the rate of growth in private vehicle use is a major goal of this Plan. Substantial reductions in these trips cannot be achieved, however, without adequate transportation alternatives. Thus, a considerable effort must continue to be made to increase the availability and viability of safe and convenient alternatives to the private auto. To that end, the transportation control measures described in this Plan are all linked, with each measure designed to strengthen and reinforce the other measures.

All TCMs adopted in the 1998 CAP are currently being implemented. Thus, evaluation of the TCMs for this Plan primarily involved a re-examination of the control measures and implementation schedule in the 1998 CAP. Emission reductions from these measures were tabulated to estimate progress achieved since implementation was begun. As shown in the following sections, implementation of the adopted transportation control measures is on-going, and will continue to provide mobile source emission reductions necessary to achieve the state air quality standards.

The control measures evaluated through this process fall into three categories:

1. **Adopted Control Measures:** All TCMs proposed for adoption in the 1998 CAP are currently being implemented and are described further in Section 6.6. Emission reductions already achieved or projected to occur are included as part of the attainment strategy for this Plan.

2. **Measure Proposed for Deferral/Contingency:** This section includes one measure found unnecessary to meet the immediate emission reduction goals of the 2001 Plan. Implementation of this measure was also deferred in the 1998 Plan. The measure will be reconsidered only in the event that reductions from adopted measures are insufficient to achieve attainment within the required time frame. This measure is described in Section 6.7.

3. **Measure Proposed for Deletion from Consideration:** The 2001 Clean Air Plan does not propose deletion of any of the transportation control measures adopted in the 1998 Clean Air Plan.

Anticipated reductions in Average Daily Trips and VMT expected for the years 1997, 2000, 2003, 2006 and 2015 are presented in Table 6-1. Expected emission reductions from implemented and proposed measures for the same years are shown in Table 6-2. Figure 6-1 is a graphic presentation of the relative emission reductions estimated for each measure in the year 2003. Tailpipe emission controls implemented by ARB have generated and will continue to provide substantial emission reductions into the future. These reductions are already accounted for in the baseline emissions inventory forecasts and are therefore not addressed in these graphics.

The remainder of this chapter presents summary descriptions of all the transportation control measures evaluated for this Plan. Greater detail on each the measure is provided in the technical working papers presented in Appendix D.

6.6 ADOPTED CONTROL MEASURES

This section includes measures adopted in previous Clean Air Plans. Emission reductions from these measures are included as part of the attainment strategy for this Plan.

Transportation Control Measures

T-1B Campus Trip Reduction Program

This program is designed to reduce student commute trips to Cal Poly State University and Cuesta Community College. Major program components for each campus include: on-site Transportation Coordinators and transportation information centers, annual surveys of student commute behavior, specific AVR goals for each campus, and implementation of program incentives and disincentives designed to reduce private vehicle trips to campus. Examples of incentives include subsidized transit passes, preferential parking for carpoolers, providing storage facilities to walkers and cyclists, and preferential registration for those who do not drive alone. Typical disincentives are parking pricing and access. Trip reduction efforts for high school students will focus on the public education and information program described in Chapter 9.

Cal Poly has already made significant progress in implementing a student trip reduction program. The University has appointed a full-time “Commuter Services Coordinator” for the campus, designated a transportation information center, and has developed and implemented a Trip Reduction Plan, including transit subsidies, bicycle and pedestrian facility improvements, and telecommuting programs. According to the 1997 Staff/Student Transportation Survey conducted by the Cal Poly Commuter Services Office, Cal Poly met their student AVR goal of 2.0 in 1997 with a very admirable AVR of 3.16. A follow-up survey conducted in the spring of 2001 indicated the student AVR had dropped to 2.49 though still in general compliance with AVR goals. The Cal Poly faculty 2001 workweek AVR was determined to be 1.33, a bit above the county wide average. The District's focus for Cal Poly is to help maintain and improve existing student AVR rates and to improve faculty/staff use of alternative forms of transportation.

Cuesta College is in the initial stages of implementation; progress to date includes transit subsidies and rearrangement of class schedules to better fit bus schedules. The results of the Cuesta Student Commute Survey conducted in the spring of 2000, indicate a student commute AVR of 1.316, just below the year 2000 target for the campus of 1.5. The District will be focusing on efforts to assist Cuesta College meet the AVR goals presented in this Plan.

Phasing and Implementation Schedule for Schools:

	Cal Poly		Cuesta	
Year	**Goal**	**Actual**	**Goal**	**Actual**
1997	2.0	3.16	1.35	n/a
2000	2.5	2.49	1.5	1.32
2005	3.0	n/a	2.0	n/a

Note: n/a stands for data Not Assessed

Implementing Agencies: APCD, Cal Poly, Cuesta
Date of Implementation: On-going
Cost-Effectiveness: Not calculated.
Year 2003 Reductions (daily):
Emissions (tons per day) - ROG: 0.021 NOx: 0.020 PM_{10}: 0.001
Vehicle Miles Traveled - 26,595
Average Daily Trips - 3,011

T-1C Voluntary Commute Options Program

This measure is designed to reduce the number of commute and other trips made with single occupant vehicles (SOVs) through an outreach effort to employers to encourage voluntary participation in a worksite trip reduction program. Implementation of this measure was begun in 1997, with the development of (1) a marketing plan to identify appropriate strategies for the outreach effort and (2) mechanisms for defining and targeting employers with the highest potential for successful participation. Called the *Transportation Choices Program* (TCP), success is dependent in part on Strategic Partners like Regional Rideshare and Ride-On Transportation jointly promoting transportation options to targeted employers. Alliances with essential and supplemental Service Providers has also been initiated to enhance the viability and convenience of alternative commuting. The primary goal of the measure is to achieve an average AVR of 1.35 at 20% of facilities in the county with 50 or more employees.

Primary program elements include:
- Contact all employers in the county with more than 20 employees via direct mail to explain program and gauge interest.
- Site visits to all employers with more than 50 employees over 5 year period to explain services offered and benefits of participation.
- Site visits to business clusters with a combined total of greater than 50 employees in one geographic location
- Develop and promote incentives, including a “Lucky Bucks” program, to encourage program participation by employers and their employees.
- Conduct employee surveys, assist in plan development and provide training, promotional materials and ongoing assistance to participating employers.
- Develop and implement a media and public relations plan to reinforce program message with the general public. Radio, television and print media will be used where effective.

Implementing Agencies: APCD, Regional Rideshare, Ride-On Transportation

Date of Implementation:	On-going
Cost-Effectiveness:	Not calculated
Year 2003 Reductions (daily):	
Emissions (tons per day) -	ROG: 0.028 NOx: 0.025 PM_{10}: 0.001
Vehicle Miles Traveled -	39,689
Average Daily Trips -	3,101

T-2A Local Transit System Improvements

The focus of this measure is on improving local transit service and infrastructure to increase ridership by enhancing the convenience and overall viability of the system. Key elements of the measure include an ongoing improvements to bus boarding areas, development of multi-modal centers, service expansion, and replacement of older diesel transit buses with new diesel-powered vehicles meeting ARB's October 31, 2002 emission certification standards or CNG vehicles meeting one of ARB's optional emission credit standards. The main goal of this measure is to maintain the rate of transit ridership growth throughout the county above the countywide population growth rate. Between 1990 and 1999, the County population grew by 11.3% from 217,163 to 241,600. Between 2000 and 2010, the population of the County is projected to increase by approximately 15%. As described below, the ridership of all three of the local fixed route transit systems operating in the county exceeded county population growth over the past decade.

San Luis Obispo Transit, operated by the City of San Luis Obispo, is the largest transit system in the county with an annual ridership of around one million passengers per in 2000. Between 1991 and 2000, SLO Transit ridership increased by 61% from 651,620 to 1,047,054. Much of the ridership increase and high patronage experienced by SLO Transit is the result of effective transit subsides that target the students and faculty of Cal Poly State University. In addition, SLO Transit has added two CNG-powered buses to its fleet. The District has, and will continue to work with Cal Poly to ensure the continuance of the transit subsidies into the future.

The South County Area Transit system (SCAT) services the Five Cities area of southern San Luis Obispo County. Between 1991 and 2000, annual system ridership increased by 59% from 90,265 in 1991 to 143,602 in 2000. During the school year, south-county area high school students account for a considerable portion of the morning and afternoon commuter ridership. SCAT and the regional transit system CCAT are both administered by the San Luis Obispo Regional Transit Authority (SLORTA).

Operation of the Paso Robles Community Area Transit (PRCAT) was initiated August 1, 1994. Between 1995 and 2000, annual system ridership increased by 38% from 30,532 in 1995 to 42,087 in 2000. Ridership peaked in 1997 at 61,133 but declined to its current level due in part to significant farebox increases that have since been repealed. System ridership is anticipated to increase in the future as long as farebox rates remain competitive.

Emissions reductions shown below are for new trips captured through implementation of this measure only, not those expected to occur as a result of T-1B and T-1C.

Implementing Agencies:	SLO Transit, SCAT, PRCAT
Date of Implementation:	On-going
Cost-Effectiveness:	Few additional costs are expected to result from adoption of this measure. Implementation costs are part of the existing programs for the local transit system budgets.
Year 2003 Reductions (daily):	
Emissions (tons per day)-	ROG: 0.008 NOx: 0.005 PM_{10}: 0.001
Vehicle Miles Traveled -	5,492
Average Daily Trips -	1,373

T-2B Regional Public Transit Improvements

San Luis Obispo Regional Transit Authority (SLORTA) operates the regional fixed route system, Central Coast Area Transit (CCAT). The focus of this measure is to improve regional transit service and infrastructure with the goal of increasing ridership rates in excess of countywide population growth rates. CCAT's ridership has risen by over 95% from 143,871 in 1991 to 281,504 in 2000. Over that same time period, the county population grew by just over 11%. System improvements include infrastructure improvements, service expansion, and operational changes.

In addition, the measure recognizes inter-city rail improvements as a trip reduction strategy. The key recommendations include boarding area improvements, better service to statewide transportation providers (such as Amtrak), increasing bus frequency during commute hours, providing service to northern Santa Barbara County, and developing express runs to major destinations such as Cuesta College.

The measure supports the voluntary trip reduction program by providing commuters with a practical alternative to driving, and is consistent with the Regional Transportation Plan. Reductions shown here are for new trips captured as a result of implementing this measure, and not those expected to occur as a result of T-1B and T-1C.

Implementing Agencies:	SLOCOG, SLORTA, and Caltrans
Date of Implementation:	On-going
Cost-Effectiveness:	Few additional costs are expected to result from adoption of this measure. Implementation costs are part of the existing programs for the local transit system budgets.
Year 2003 Reductions (daily):	
Emissions (tons per day)-	ROG: 0.004 NOx: 0.003 PM_{10}: 0.000
Vehicle Miles Traveled -	5,683
Average Daily Trips -	444

T-3 Bicycling and Bikeway Enhancements

The goal of this measure is to achieve a county-wide average bicycle mode share of 5% by 2005. To effectively encourage the modal shift to bicycles, a comprehensive program to promote bicycle use was adopted in the 1991 Clean Air Plan. Since adoption, the following progress has been made to construct needed bikeways and provide support facilities throughout the county:

- Several funding sources have provided critical resources for bikeway construction, including $6 million of Proposition 116 funds, and 2% of all TDA funds (approximately $80,000 per year).

- Caltrans has installed bicycle lockers at most of the eleven park and ride lots in the county, and CCAT and SLO Transit have installed bicycle racks on all buses.

- Bicycle plans have been prepared and adopted by San Luis Obispo County, as well as the Cities of San Luis Obispo and Paso Robles.

- Sections of the Bob Jones City to the Sea Bikeway linking the City of San Luis Obispo, Avila Beach, and areas in between, have been completed with significant financial resources identified for remaining portions awaiting construction. Avila Beach attracts approximately 1,000,000 visitors a year and the bike path is seen as an integral element in the overall bicycle infrastructure in the area.

This measure supports the Voluntary Trip Reduction Program (T1C) by providing a safe and inexpensive way for employees to commute to work or school. In addition, bike infrastructure improvements will increase safety and convenience for those riders not affected by T-1C. The measure also facilitates cycling for shopping and other trip purposes.

This measure provides the largest expected reductions in emissions from any TCM, supports T-1B and T-1C, and is consistent with the Regional Transportation Plan.

Implementing Agencies:	Cities, County, and Caltrans.
Date of Implementation:	On-going
Cost-Effectiveness:	Not calculated
Year 2003 Reductions (daily):	
Emissions (tons per day)-	ROG: 0.120 NOx: 0.067 PM_{10}: 0.051
Vehicle Miles Traveled -	46,201
Average Daily Trips -	25,667

T-4 Park and Ride Lots

Park and Ride (P&R) lots provide a staging area for ridesharing activities. The most common use of P&R lots in San Luis Obispo County is as a meeting point for car- and vanpoolers. Transit connections are available at some lots within a short walk, and bike lockers are available at most lots; however, the primary use is for automobile parking.

In San Luis Obispo County, P&R lots are administered by Caltrans and SLOCOG. In 1998 there were eleven Park and Ride lots in the County providing 255 spaces. Today, there are fourteen Park and Ride lots with 372 total available spaces. The three new lots constructed since 1998 have been developed along the Highway 101 corridor north of Cuesta Grade to help mitigate congestion impacts associated with the Cuesta Grade widening project.

Use of a park and ride lot will generally reduce the length of a commute trip, but not eliminate the trip. This reduces running exhaust and evaporative emissions, which make up about 44% of ROG emissions and 72% of NOx emissions from light duty vehicles and trucks. However, if a P&R lot is served by commuter transit or shuttle service, and adequate bicycle storage facilities are available on-site, P&R lots can reduce both VMT and motor vehicle trips. Therefore, the goal of this measure is to improve the trip reduction potential of P&R lots by providing commuter transit service and adequate bicycle storage to existing and future P&R lots in the county.

Implementing Agencies:	Caltrans, SLOCOG, and local jurisdictions.
Date of Implementation:	On-going
Cost-Effectiveness:	Not calculated
Year 2003 Emission Reduction:	Expected emission reductions have been accounted for in T-1B and T-1C, which assume development of support facilities. Since this is primarily a supporting measure, no separate emission reductions are credited here.

T-5 Motor Vehicle Inspection and Control Programs

The Motor Vehicle Inspection Program (MVIP) is a biennial, comprehensive inspection and testing program of emissions control devices on privately owned gasoline powered motor vehicles. Commonly known as the "Smog Check" program, it is designed to ensure that emission control devices on motor vehicles continue to function properly. Inspection of vehicle emission control systems is required as a condition of vehicle re-

registration. This program was adopted by the District Board in 1989 and began its first phase of implementation in July, 1990.

The Motor Vehicle Control Program (MVCP) is a statewide program of phased tailpipe and evaporative emission controls which have and will continue to significantly reduce motor vehicle emissions in coming years. No actions are required of the District to implement this program; the ARB is charged with this responsibility. The CCAA requires the ARB to adopt all controls necessary to reduce mobile source ROG emissions by 55% and NOx emissions by 15% by the year 2000. The Act also provides the ARB with the additional authority to regulate in-use vehicle performance; motor vehicle fuel specifications; and emission standards for light, medium, and heavy-duty on-road motor vehicles, motorcycles, off-highway equipment greater than 175 hp and non-preempted off-road equipment smaller than 175 hp. Table 6-3 lists ARB's adopted, proposed, and planned regulations for reducing emissions from mobile sources.

Implementing Agency:	MVIP is administered by the Bureau of Automotive Repair. The MVCP is administered by the ARB.
Date of Implementation:	Implementation of both programs began in 1990.
Cost-Effectiveness:	N/A.
Year 2003Emission Reduction:	Included in baseline emission projections.

T-6 Traffic Flow Improvements

This control measure focuses on traffic flow improvements and "traffic-calming" to improve the flow of all transportation modes. Traffic-calming refers to a full range of methods designed to improve the flow of non-motorized transportation by slowing down the speed of motorized traffic. Traffic-calming is generally used in residential areas on non-arterial local streets and roads.

The goal of this measure is to improve the road system and infrastructure in a way that increases its efficiency, reduces emissions, and supports the other Transportation Control Measures in this Plan. Traffic flow improvements help keep traffic moving smoothly during peak hours when the road system is near its capacity, such as during commute periods or on holidays. The County and local jurisdictions can implement changes that may reduce stop-and-go conditions and associated vehicle emissions on roads lacking efficient channelization, signalization, one-way streets, and/or synchronized signals. Peak hour traffic management should also increase pedestrian and bicyclist safety.

Traffic congestion is often a disincentive to driving, and can cause mode shifts to transit, especially when trip times become equalized because of priority treatment for transit. However, intentionally causing congestion is not recommended here. On the contrary, this measure focuses on reducing localized emission problems by reducing congestion. Research does show that adding significant additional capacity to the road system, such as freeway widening, can actually increase rather than reduce emissions. Therefore, large road widening projects are discouraged until all strategies to reduce trips and VMT are implemented.

Expected reductions have been accounted for in T-2A, T-2B and T-3, which assume development of support facilities. Since this is primarily a supporting measure, no separate emission reductions are credited here.

Implementing Agency:	Local Public Works Departments and Caltrans
Date of Implementation:	On-going
Cost-Effectiveness:	Not calculated
Year 2003 Emission Reduction:	N/A.

T-8 Teleworking, Teleconferencing, and Telelearning

Rapid advances in personal computer capability and the advent of video and on-line services have made these technologies ideal trip reduction strategies. As more homes have personal computers, and more businesses provide information services to their customers, it has become practical for employees to work from their homes or a satellite facility near their home. The strategy of "moving the work, not the worker" will have far-reaching and positive effects on air quality and congestion. This control measure seeks to reduce emissions by promoting telecommuting for any employee whose job can accommodate working from home.

Video-conferencing also provides far-reaching positive impacts for air quality and congestion. Through computer technology, business travel can be reduced by conducting meetings via video hook-up with colleagues across town or across the country. Telelearning can reduce travel to campuses by making educational courses available locally and to students who are too far away to attend classes. Two-way, interactive video can allow an instructor to conduct classes with a nation-wide, or worldwide audience without the students needing to travel to the campus. In 2000, the District's Board of Directors approved a $70,000 grant through the Guadalupe Air Quality Mitigation Fund to the City of Guadalupe to develop and implement a telelearning/teleconferencing system as means of reducing automobile trips.

Many employers in San Luis Obispo County already have, or are experimenting with teleworking programs for their employees. The District coordinates with SLOCOG, Regional Rideshare, Caltrans, and other agencies to promote and inform the general public of the benefits of teleworking, provide businesses with educational information on developing and implementing teleworking programs, and training for employees and managers on how to run a teleworking program. Since this is primarily a supporting measure, no separate emission reductions are credited here.

Implementing Agency:	APCD
Date of Implementation:	On-going
Year 2003 Emission Reduction:	N/A

Land Use Planning Strategies

Several important resources have allowed cities to grow as they have: abundant land, convenient automobile transportation, and cheap energy. However, these resources are becoming scarce. Clean air, for example, is not an unlimited resource, and traffic congestion cannot be solved simply by building more and wider roads.

To plan urban growth in a way that protects clean air and permits convenient travel within and among communities requires a new way of looking at the urban growth process. In particular, we must recognize that air quality, land use, and circulation cannot be considered as separate issues. The relationship among them must be reflected in plans and programs administered by cities, the County and the District.

As urban development is spread out over the landscape, the distance between home and work, school, medical care, shopping facilities, recreation and personal services becomes greater. A dispersed development pattern increases our reliance on automobile travel which, combined with longer trips, results in more air pollution.

Land use and circulation management programs can reduce dependence on the automobile and enhance the viability of transit, ridesharing, biking and walking. The following policy recommendations are strategies designed to achieve these objectives. Detailed descriptions of these measures, including specific implementation mechanisms, are provided in Appendix E to this document. Emission reductions and cost-effectiveness have not been quantified due to the long lead times and funding commitments required by each implementing agency.

L-1 Planning Compact Communities

Spread-out communities require longer travel distances between home, work, school and shopping. In general, the more compact a community is, the lower its number of vehicle trips and miles traveled. Maintaining compact city and village areas reduces reliance on the automobile by enhancing the viability of public transit and maximizing the potential for walking and bicycling to work, shopping, and other destinations. In the end, vehicle use and emissions are reduced.

It is not envisioned that communities should become uniformly dense. Instead, dwelling units for those who prefer higher density living should be clustered in urban core areas and village centers, thus creating a market for convenience retailing and services that contribute to the richness of an urban life-style. As commercial facilities become integrated into residential areas in a mixed-use development pattern, the need to use an automobile for routine trips diminishes. The challenge is to encourage development at densities high enough to support these goals without causing undue congestion.

Policies:

– Cities and unincorporated communities should be developed at higher densities that reduce trips and travel distances and encourage the use of alternative forms of transportation.

– Urban growth should occur within the urban reserve lines of cities and unincorporated communities. Rural areas of the county should be maintained as open space, agricultural lands and very low density residential development (20 acre or larger parcel size).

– Local planning agencies should encourage transit use by planning neighborhoods and commercial centers at densities to allow for convenient access to and use of local and regional transit systems.

L-2 Providing for Mixed Land Use

Segregation of land uses often increases reliance on the private vehicle, unless the segregated uses are in close proximity and safe pedestrian and bicycle paths exist. Locating residential, commercial and service facilities in close proximity to one another encourages walking and other nonpolluting forms of transportation. This decreases trips, VMT and associated vehicle emissions. Communities should allow a mixture of land uses that enables people to walk or bicycle to work or to purchase necessary household items or service, at locations convenient to their neighborhood. Even in some predominantly residential areas, allowing or even mandating some commercial uses can reduce the number and length of auto trips without significantly altering the character of the neighborhood.

Mixed land use is also a strategy for achieving compactness in urban development. While conventional zoning typically results in the spatial separation of different land uses, mixed use recognizes that some land uses are functionally compatible with one another and need not be physically separated. An example of mixed-use development is a ground level commercial use with residential uses above.

Policy:

– The mixing of compatible commercial and residential land uses should be encouraged when it will reduce dependence on the automobile, or it improves the balance between jobs and housing.

L-3 Balancing Jobs and Housing

Travel from home to work accounts for about one-quarter of all private vehicle trips in a typical urban area; in rural areas this travel component is even higher. The length and location of these trips are important factors

in determining the type of transportation alternatives available to the commuter and the quantity of air pollutants generated. If the average travel distance between the home and workplace is relatively long, emissions from private vehicles increase and non-motorized travel alternatives are less viable.

In cities and unincorporated communities in this county, there are local imbalances between job availability and housing opportunities. Job-rich communities, such as San Luis Obispo, have more land allocated for jobs than for housing all those who work there. Conversely, housing-rich communities, such as Los Osos, do not have enough land allocated to provide jobs for all residents. An imbalance between jobs and housing results in longer travel distances between home and work and, consequently, more air pollution from cars.

It may not be possible to achieve a jobs-housing balance in all communities because of their size, population characteristics or limited resources. However, it is desirable to narrow the gap between jobs and housing, or at least make sure that it does not increase.

A Jobs/Housing Balance Study completed by SLOCOG identified key issues and recommended strategies to support the goal of reducing VMT through balancing the economic environment and the supply of affordable housing within the region. In addition, the study provides a good source of baseline information for jurisdictions' efforts to achieve the goals of this measure.

Policy:

– Within cities and unincorporated communities, the gap between the availability of jobs and housing should be narrowed and should not be allowed to expand.

L-4 Circulation Management

The primary goal of the recommended Circulation Management Policies and Programs is to encourage the design and construction of the county's transportation system in a manner that supports alternative travel modes and decreases reliance on single occupant motor vehicles. To this end, improving accessibility for all travelers, not just drivers, is the primary transportation objective.

Policies:

– Jurisdictions should adopt the concept of <u>improved accessibility</u> as a planning goal and as a means to coordinate land use and transportation planning efforts.

– Agencies should focus transportation funds on facilities and promotional programs that support transit, ridesharing, bicycling, and walking <u>before</u> focusing funds on capacity expansion for congestion relief.

– Local planning agencies should encourage walking by planning for existing and new residential and commercial areas to include a safe and interconnected street system with adequate sidewalks and/or pedestrian trails.

– Local planning agencies should develop pedestrian- and bicycle-friendly design standards that apply to all residential and commercial projects.

– Local planning agencies should endorse the concept of managing the supply of automobile parking as a means to support and promote the use of alternative transportation modes.

– Jurisdictions should support actions to reduce single occupant vehicle trips by adopting programs which encourage or require new commercial and industrial development projects to provide facilities and amenities which reduce reliance on private vehicle use and support the use of alternative transportation.

– Local jurisdictions, the APCD and the Council of Governments should coordinate actions and cooperate in pursuing the implementation of the land use and circulation management programs proposed in this document. The Clean Air Plan and local General Plans should be used as a means to achieve coordinated implementation of these programs.

L-5 Communication, Coordination and Monitoring

Changes in land use and circulation planning will be necessary to maintain clean air in the county over the long term. These same changes, however, will also provide benefits in reduced traffic congestion. It is very important to the long-term success of the Clean Air Plan that local and regional jurisdictions and the District work together to achieve these mutual goals. The measures in this section provide a framework for reducing the growth of VMT and maintaining clean air. Implementing them requires close coordination and cooperation among jurisdictions.

Policy:

– Local jurisdictions, the APCD and the Council of Governments should coordinate actions and cooperate in pursuing the implementation of the land use and circulation management programs proposed in this document. The Clean Air Plan and local General Plans should be used as a means to achieve coordinated implementation of these programs.

6.7 MEASURES PROPOSED FOR DEFERRAL/FURTHER STUDY

One further study measure from the 1995 CAP was found unnecessary to meet the emission reduction goals of the 1998 Plan and was recommended for deferral. This measure is still recommended for deferral, to be reconsidered only in the event that reductions from adopted measures are insufficient to achieve attainment within the required time frame.

T-12 Fleet Operator Clean Fuels Program

Regulations adopted by the state require the integration of 'clean fueled' vehicles into the vehicle fleets in southern California according to a set schedule. Such vehicles would likely be fueled by natural gas, methanol, or electricity. This control measure would require replacement vehicles purchased for commercial and government vehicle fleets to include a set percentage of clean-fueled vehicles.

Discussion: This measure is proposed for deferral because the availability of clean fueled vehicles and support facilities for moderate nonattainment areas like San Luis Obispo county is uncertain at this time.

6.8 MEASURES PROPOSED FOR DELETION FROM CONSIDERATION

There are no transportation or land use control measures proposed for deletion under the 2001 Plan.

6.9 SUMMARY

The effectiveness and level of emission reduction accomplished by any one transportation control measure depends on several factors. Implementation by responsible agencies may vary for reasons beyond the direct control of planners and engineers. Changes in external factors such as the rate of population growth, the mix

of employment type, funding availability and transportation costs (especially fuel) will influence the effectiveness of the measures.

In general, a well designed package of TCMs will increase the effectiveness of each individual measure because they tend to function synergistically. This is because each measure is at least partially dependent on other measures in the Plan. For example, subsidized transit passes resulting from the trip reduction programs (T-1B, T-1C) are expected to increase transit ridership. The transit improvement measures (T-2A, T-2B) are designed to provide the facilities necessary to serve these and other new riders. To achieve the emission reductions required by the CCAA, it is necessary to continue the implementation of the integrated program of complementary measures described in this Plan.

Table 6 - 1

EXPECTED REDUCTIONS IN AVERAGE DAILY TRIPS (ADT) AND DAILY VEHICLE MILES TRAVELED (VMT)

CONTROL MEASURE	ADT						VMT				
	1997	2000	2003	2006	2015		1997	2000	2003	2006	2015
T-1B	1,805	2,237	3,011	3,968	8,103		11,329	17,166	26,595	35,942	71,095
T-1C	843	2,381	3,101	3,211	3,500		10,788	30,480	39,689	41,106	42,593
T-2A	1,142	1,298	1,373	1,593	2,371		4,569	5,192	5,492	6,370	9,485
T-2B	352	392	444	509	702		4,503	5,012	5,683	6,515	8,991
T-3	5,943	6,337	25,667	37,896	45,767		10,698	11,407	46,201	68,213	82,381
Total Reduced	10,089	12,645	33,596	47,177	60,443		41,887	69,257	123,660	158,146	214,545
Travel Without CAP	957,768	1,039,848	1,128,066	1,211,290	1,462,891		5,398,000	5,803,000	6,235,000	6,675,000	7,999,000
% Reduced	1.1%	1.2%	3.0%	3.9%	4.1%		0.8%	1.2%	2.0%	2.4%	2.7%

Note: 'Travel Without CAP' is the projected ADT and VMT for light duty autos (LDA) and light duty trucks (LDT) that would have occurred without the influence of the CAP.

Table 6 - 2

EXPECTED EMISSION REDUCTIONS FROM TRANSPORTATION CONTROL MEASURES IN TONS PER DAY

CONTROL MEASURE	ROG					NOx					PM_{10}				
	1997	2000	2003	2006	2015	1997	2000	2003	2006	2015	1997	2000	2003	2006	2015
T-1B	0.017	0.019	0.021	0.023	0.019	0.015	0.017	0.020	0.025	0.028	0.0003	0.0004	0.0006	0.0008	0.0014
T-1C	0.011	0.026	0.028	0.024	0.013	0.011	0.026	0.025	0.024	0.018	0.0002	0.0006	0.0007	0.0008	0.0008
T-2A	0.009	0.009	0.008	0.008	0.005	0.007	0.006	0.005	0.005	0.005	0.0001	0.0001	0.0001	0.0001	0.0002
T-2B	0.005	0.004	0.004	0.004	0.002	0.005	0.004	0.003	0.003	0.002	0.0001	0.0001	0.0001	0.0001	0.0001
T-3	0.037	0.036	0.120	0.146	0.084	0.022	0.021	0.067	0.088	0.060	0.0002	0.0002	0.0010	0.0014	0.0016
Total Reductions	0.079	0.094	0.181	0.205	0.123	0.060	0.074	0.120	0.145	0.113	0.0009	0.0014	0.0025	0.0032	0.0041
Emissions w/o CAP	7.31	6.17	4.92	3.76	1.84	9.03	7.80	6.61	5.64	4.30	0.17	0.17	0.17	0.19	0.21
% Reduced	1.1%	1.5%	3.7%	5.5%	6.7%	0.7%	0.9%	1.8%	2.5%	2.6%	0.5%	0.8%	1.5%	1.7%	2.0%

Notes:

1. Measures T-4 and T-6 primarily support the Trip Reduction Program. Emission reductions from these measures are accounted for in T-1B and T-1C.

2. Emissions reductions for T-5 are calculated by ARB and included in the baseline emissions inventory. These reductions are therefore not quantified here.
3. PM10 emission reductions are based only on exhaust, tire wear, and break wear and do not account for reduced entrained roadway dust.

Table 6-3

ARB MOBILE SOURCE CONTROL STRATEGIES

	Description	Agency	Adoption	Implementation	Emission Reductions
M2	**LEV II:** Further emission reductions from cars, light-trucks, sport utility vehicles and minivans. Long-term measure with statewide benefits. Only South Coast took credit in the SIP.	ARB	2000	2004-2007	Large
M3	**Medium-Duty Vehicles:** Accelerated introduction of medium-duty ULEVs.	ARB	1995	1998-2002	Medium
M4	**Incentives for Clean Engines:** Incentives for early intro of clean heavy-duty engines.	ARB	----	1998-2002	Small
M5	**CA Heavy-Duty NOx Standard:** Lower NOx standard for heavy-duty trucks and buses in California.	ARB	1998	2004	Large
M6	**National Heavy-Duty NOx Standard:** Lower NOx standard for federal heavy-duty trucks and buses.	U.S. EPA	1998	2004	Large
M8	**Heavy-Duty Gasoline Vehicle Standard:** Tighter standards on heavy-duty gas vehicles (e.g. RVs).	ARB	1995	2004	Small
M9	**CA Heavy-Duty Off-Road Diesel Equipment:** Tighter standards for off-road diesel equipment. Long-term measure only credited in South Coast.	ARB	2000	2000-2005	Large
M10	**National Heavy-Duty Off-Road Diesel Equipment:** Tighter standards for off-road diesel equipment preempted from state control. Long-term measure only credited in South Coast.	U.S. EPA	1998	2000-2005	Large
M11	**CA Heavy-Duty Off-Road Gas/LPG Equipment:** Standards for off-road gas/LPG equipment.	ARB	1998	2001-2004	Large
M12	**National Heavy-Duty Off-Road Gas/LPG Equipment:** Standards for off-road gas/LPG equipment preempted from state control.	U.S. EPA	2002 (anticipated)	2004	Large
M13	**Marine Vessel Standards:** Federal assignment to reduce emissions from marine vessels.	U.S. EPA	1999	2000	Medium
M14	**Locomotive Engine Standards:** Federal assignment to reduce emissions from locomotives and establish a fleet average for locomotives in the South Coast.	U.S. EPA	1997	2000-2010	Large
M15	**Aircraft Standards:** Federal assignment to reduce aircraft emissions. Only credited in South Coast.	U.S. EPA	---	---	Small

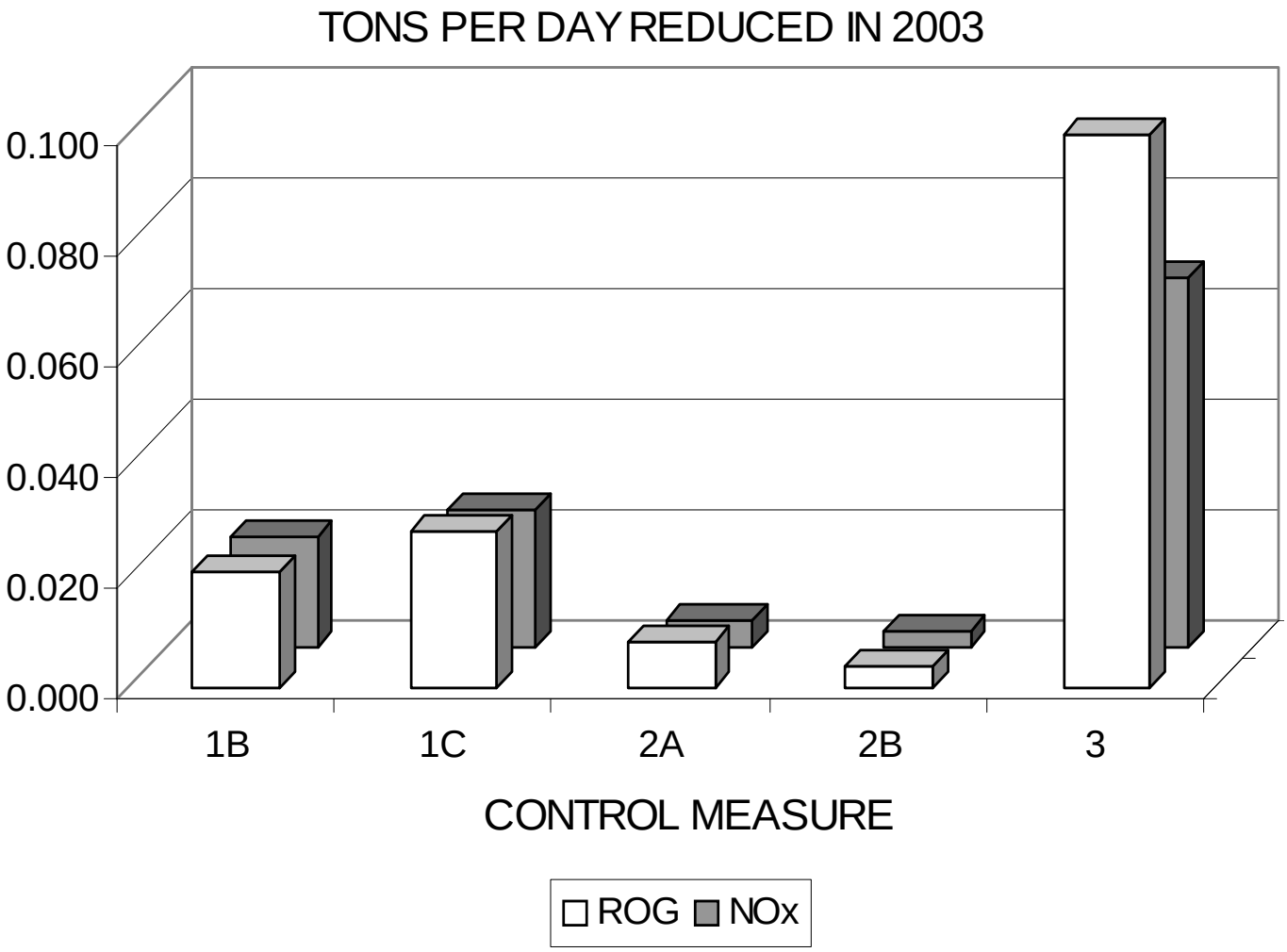
	Description	Agency	Adoption	Implementation	Emission Reductions
M16	**Marine Pleasurecraft Standards:** Federal assignment to reduce emissions from marine pleasurecraft (outboard motors, jet skis and jet boats).	U.S. EPA	1996	1998-2006	Medium
M17	**Additional Reductions from Heavy-Duty Vehicles:** Additional reductions through in-use compliance programs or incentives. Only credited in South Coast.	ARB	2004 (anticipated)	2005-2010	Small
CP2	**Mid-Term Consumer Products:** New emission standards for consumer products which were not previously regulated.	ARB	1997 1999	2000-2005	Small/ Medium
CP3	**Aerosol Paint Standards:** Emission standards for aerosol paints.	ARB	1995 1998	1996 2002	Small
CP4	**Long-term Measures:** Long-term strategies for emission reductions from consumer products and aerosol paints. Only credited in South Coast.	ARB	2005 (anticipated)	2009	Large
	Enhanced Inspection and Maintenance: Implementation of Smog Check II program.	BAR	1995	1996-2002	Large
	Pesticides: Reduce VOC emissions from agricultural and commercial/structural pesticides.	DPR		through 2005	varies by District
New	**Combustion Chamber Deposits:** Emission reductions as a result of fewer combustion chamber deposits due to the use of additives in cleaner-burning gasoline.	ARB	1998	----	Large
New	**Heavy-Duty Off-Cycle Settlement:** Settlement with six heavy-duty diesel engine manufacturers.	ARB	----	----	Large
New	**Marine Pleasurecraft:** Additional reductions from marine pleasurecraft beyond national standard.	ARB	1998	2001-2008	Large
New	**Motorcycle Standards:** Adopt more stringent on-road motorcycle standards.	ARB	1998	2000-2004	Small
New	**Phase 3 Gasoline Specifications**	ARB	1999	2003	Medium
New	**Lower-Emission School Bus Replacement and Retrofit Program**	ARB	2000	2001	Small
New	**Low-Sulfur Diesel Fuel Requirements**	U.S. EPA/ ARB	pending	consistent with U.S. EPA	Large
New	**Heavy-Duty Diesel Truck Emission Standards**	U.S EPA/ ARB	pending	2007	Large
New	**Inboard Marine Engine Standards**	ARB	2001	2006	Small

Settlement	**Gas Spillage:** Reduce spillage associated with fueling lawn and garden equipment.	ARB	1999	2001	Large

	Description	Agency	Adoption	Implementation	Emission Reductions
Settlement	**Consumer Products:** Phase 2 of Mid-Term Measures.	ARB	1999	2003	Medium
Settlement	**Urban Transit Buses:** Require new urban transit buses to meet tighter emission standards.	ARB	2000	2000	Small
Settlement	**Enhanced Vapor Recovery:** Enhance existing gasoline nozzle vapor recovery systems	ARB	2000	2004	Medium
Settlement	**Architectural Coatings:** Suggested Control Measure for architectural coatings.	ARB	2000	2001-2003	Small
Settlement	**Medium/Heavy-Duty Gasoline Vehicles:** Adopt more stringent standards.	ARB	2000	2005	Small
Settlement	**Clean Fuel for Locomotives:** Require the use of cleaner fuel for locomotives in California.	ARB	pending	pending	Small

Figure 6-1

ESTIMATED EMISSIONS REDUCTIONS
FROM TRANSPORTATION CONTROL MEASURES



Note: Most of the reductions for measures 2A and 2B are accounted for in measures 1B and 1C.

CHAPTER 7
EMISSION FORECASTS

INTRODUCTION

FORECAST METHODS AND ASSUMPTIONS

COMPARISON OF FORECAST EMISSION SCENARIOS

SUMMARY

CHAPTER 7 EMISSION FORECASTS

7.1 INTRODUCTION

Emission forecasts are estimates of future year emissions. These estimates are developed by examining the effects of economic growth, existing regulations, and proposed control measures on future year emission inventories. The resulting projections can be used for a variety of purposes, including modeling of future air quality, assessing the effectiveness of proposed control measures, analyzing new source impacts, and tracking progress towards clean air.

The 1991 annual and planning emissions inventories presented in Chapter 4 represent the most up-to-date, comprehensive data available to forecast future year emissions. Since this Plan primarily addresses ozone, only emission forecasts of ROG and NOx, the precursors to ozone, are presented. The 1991 planning inventory was used as the reference year from which emission forecasts were generated for the years 1997, 2000, 2003, 2006, and 2015. Two different regulatory scenarios were used in developing the emission forecasts for this Plan:

- The first forecast scenario is presented in Table 7-1 and reflects projected future emissions assuming none of the control measures described in this Plan are implemented. This forecast accounts for future year socioeconomic growth and the emission reductions anticipated from District rules adopted prior to 1989. Emission reductions from existing and anticipated future control measures adopted by the state ARB for consumer products, utility engines, on-road and off-road motor vehicles, and other mobile sources are also included in this forecast.

- The second forecast is a projection of future emissions assuming all control strategies adopted since 1989, and those proposed for adoption in this Plan, are fully implemented. Table 7-2 displays these projections, which integrate the estimated emission reductions from the proposed controls and recently adopted rules into the forecast described above. Emission reductions from measures recommended for further study or deletion from consideration are not included in this forecast.

7.2 FORECAST METHODS AND ASSUMPTIONS

Emission forecasts are generated by applying emission growth and control estimates to the reference year emissions inventory. Emission growth estimates are derived by estimating the relationship between economic growth and sources of ROG and NOx emissions; developing or compiling economic projections; and applying these economic activity data to the emissions inventory. Emission control estimates were developed through the control strategy evaluation process described in Chapters 5 and 6. The following sections provide an overview of how economic growth and emission controls are used in developing the emission forecasts, as well as the uncertainties associated with the methodology.

Economic Growth

The inventory consists of individual emission categories, each with its own socioeconomic activity indicator and emission-generating characteristics. To account for future growth, each of the baseyear emission categories is assigned a related activity indicator for which there are known future estimates. For example, the emission category "Residential Fuel Combustion" is an aggregation of fuel burning devices from residential units, such as water heaters, furnaces and woodstoves. The emissions in this category are directly proportional to the number of residences in the county. Thus, a dwelling unit activity indicator is assigned to these emissions. It is assumed that future growth in the number of dwelling units is a reasonable indicator of future growth in residential fuel usage. Each emission inventory category is assigned a similar activity indicator to predict the change in ROG and NOx emissions in relation to projected future socioeconomic conditions.

For most emission categories, socioeconomic trends are the driving force behind the growth assumptions used in the forecasts. Some categories, however, such as on-road motor vehicles, oil production, electric utilities and others, may use more specific trend assumptions. For example, vehicle emissions were projected using the information in ARB's own mobile source data bank. Their forecast methodology for motor vehicle emissions is probably the most comprehensive in the world; it includes changes resulting from new emission controls, ongoing turnover in the vehicle fleet, changes in fuel characteristics and other considerations, along with socioeconomic growth factors. On the other hand, emissions from utility boilers were projected based on forecast energy needs over the next two decades. Thus, in addition to population growth, fuel prices, conservation and other factors are accounted for in these estimates. Most of the socioeconomic trend data used here was developed for ARB by Data Resources Inc. (DRI) through a study which concentrated on employment data for 77 industry sectors. Some growth projections were also developed by ARB based on population and dwelling unit forecasts by the Department of Finance (DOF), and forecasts by Caltrans of vehicle miles traveled. A detailed description of the activity indicators used and their application to each source category is presented in Appendix B, Reference Year Projected Planning Emissions Inventory.

Emission Controls

In addition to changes in socioeconomic conditions, emissions will change over time due to the implementation of control measures. This can occur if an existing control measure is strengthened or if uncontrolled emission sources are affected by new control measures. In order to quantify the emission reductions associated with the implementation of control measures, the effectiveness of each measure needs to be evaluated.

For example, using the emission category of 'Residential Fuel Combustion' again, control measures N-12 (Residential Natural Gas Combustion) and MP-1 (Residential Wood Combustion) affect the future emissions in this category. To account for these controls, the portion of emissions due to residential water heaters and wood combustion devices is determined. Next, the implementation schedule of the control measure is evaluated to estimate the rate at which it will affect emissions in future years. For instance, the implementation schedule for residential water heaters is dependent upon the rate at which new residences are added, and the rate at which homeowners replace old water heaters with new, less polluting units. The emission reduction efficiency of the control equipment is then taken into account. For residential water heaters, the control efficiency is based on combustion modifications to new models. Finally, the overall compliance rate for the control measure is estimated.

The estimated overall effectiveness of each control measure, the documentation of how the control measures are applied to emission activities, and projected emission reductions by control measure are presented in Appendices B, C, and D.

Uncertainties in Forecasting

As with any forecasting scheme, the one used for the emission projections presented in this Plan can only be a best estimate. The economy may not be as healthy in the future as was forecast at the time DRI performed their analysis. This may translate into less of an employment increase in one sector or another, which could result in fewer emissions than projected. Conversely, if the actual effectiveness of control measures proposed in the Plan is less than was assumed in the emission forecasts, then future emissions would be higher than the forecast for that source category. Also, unforeseen technology changes could alter the accuracy of the emission forecasts.

Likewise, population projections prepared by city and county officials are only best estimates of future growth patterns. They are based on DOF projections of past growth trends, as well as potential resource constraints or other limitations to growth, but the assumptions used are general by nature. Thus, the projected future emissions for source categories that are population-dependent may be underestimated or

overestimated if population grows faster or slower than the forecast rate. Chapter 2 presents the population projections used in this Plan.

Development of the reference year and forecast inventories is a dynamic process. Changes in emission factors for individual sources or source categories occur periodically and must be incorporated in the inventory. Also, the effectiveness of the control measures must be evaluated after they are implemented, and the inventory revised as needed to reflect actual performance. Activity indicators (population, fuel consumption, etc.) must also be adjusted occasionally to reflect current socioeconomic conditions. Thus, refinement of the emission estimates is an ongoing process as new and better data become available. This third update to the 1991 CAP includes revised estimates for both the reference year and forecast emissions. The original baseline emissions data for 1987 is no longer included, as described in Chapter 4.

7.3 COMPARISON OF FORECAST EMISSION SCENARIOS

Tables 7-1 and 7-2 present the projected future ROG and NOx emissions for the two forecast scenarios described above: future emissions without implementing the Clean Air Plan, and future emissions when the Plan is fully implemented. This data was used for the graphical comparison of the two scenarios presented in Figures 7-1 through 7-4.

Forecasts By Source Category

Projected ROG and NOx emissions for the two forecast scenarios are presented in Table 7-3 and graphically displayed in Figures 7-1 and 7-2 for the major source category groups. Table 7-3 and Figure 7-1 shows that, without the controls proposed in the Clean Air Plan, ROG emissions will decrease from about 41 tons/day in 1991 to 37 tons/day in the year 2006. Most of this decrease is due to a substantial reduction in ROG emissions expected from the state motor vehicle control program during this period. ROG emissions from most of the other source categories are projected to remain relatively constant or increase slightly during this period, with the exception of solvents and surface coatings. Anticipated population growth is predicted to cause a considerable increase in emissions from these sources.

After accounting for measures already implemented or proposed for retention and adoption in this Plan, ROG emissions are expected to further decrease to about 30 tons/day in the year 2006. As shown in Table 7-3 and Figure 7-1, most of the reductions will occur in the on-road motor vehicles and petroleum processing source categories. Emissions from petroleum production and marketing operations in particular will be reduced by 79% from 1991 levels. This is due primarily to reformulated fuels combined with evaporative controls on service stations, storage tanks, bulk transfer plants and marine tanker loading. The substantial reductions in motor vehicle emissions previously discussed will also be enhanced through implementation of several transportation control measures. Other control measures, such as those requiring reformulation and increased transfer efficiency for solvent-based products, will help reduce the expected increase in emissions from sources directly affected by population growth.

NOx emissions overall were projected to remain relatively constant at about 50 tons/day from 1991 through the year 2006 if the measures in the Plan had not been implemented. Table 7-3 and Figure 7-2 show that in the absence of the CAP, significant NOx reductions are from implementation of the state motor vehicle control program would be offset by increased NOx emissions from other mobile sources, as well as increased emissions from utility fuel combustion.

NOx controls already implemented and those proposed for retention and adoption in this Plan will provide substantial additional reductions in future emissions levels. As shown in Table 7-3 and Figure 7-2, implementation of the Clean Air Plan is expected to further reduce NOx emissions to about 35 tons/day in the year 2006. The bar chart shows that most of the projected reductions will occur in the stationary source fuel combustion category, as well as the on-road motor vehicle reductions previously

discussed. Existing and projected future controls on the Morro Bay power plant account for the majority of the reductions achieved through CAP control strategies. However, NOx emissions from industrial boilers, process heaters, utility engines and residential fuel combustion will also be significantly reduced in future years by the measures described in this Plan.

It is important to note that the 1990 Amendments to the federal Clean Air Act pre-empt state and local control of many of the sources in the 'other mobile sources' emission category. In particular, new construction equipment, farm equipment and locomotives are specifically exempt from California regulatory authority. As shown in Figures 7-1 and 7-2, emissions from this source category represent a significant portion of both the ROG and NOx reference year and forecast inventories for this county. These emissions are projected to remain relatively constant during the forecast period due to the uncertainty of the federal rulemaking schedule and the lack of regulatory control at the state and local level. Grant programs have been implemented by the District in recent years to fund voluntary emission reduction projects targeting these uncontrolled sources. These efforts are beginning to provide substantial emission reductions that have not been accounted for in the CAP. Those reductions will be described and tabulated in the next update to this Plan.

Countywide Emission Forecasts

Figures 7-3 and 7-4 present a comparison between the emission reduction targets set by ARB, and the future ROG and NOx emission levels expected after implementation of this Plan. As shown in Figure 7-3, the 41 tons/day of total ROG emissions in 1991 are projected to decline steadily to about 28 tons/day in the year 2015 by implementing the ROG controls described in this Plan. This represents an overall reduction of about 32% compared to ROG emissions in 1991. As shown in the graph, this reduction will more than meet the targets set by the ARB, thus providing a buffer for contingencies.

Figure 7-4 compares the projected future NOx emissions after CAP implementation to the ARB emission reduction goals for our area. As shown in this chart, implementing the proposed NOx controls will provide a substantial decrease in NOx emissions, falling from 50 tons/day of NOx in 1991 to about 33 tons/day in the year 2015. This represents a 34% reduction in NOx emissions overall compared to 1991 levels. As shown in the graph, this reduction also exceeds the targets established by the CCAA.

7.4 SUMMARY

Implementation of the 2001 Clean Air Plan will produce a steady decline in ROG and NOx emissions through the year 2015. These emission reductions will result primarily from existing and proposed application of controls on motor vehicles, electric utilities and other fuel combustion, the petroleum industry, and various types of solvent use. NOx emissions from stationary and area-wide sources are expected to be reduced approximately 64% compared to 1991 levels. However, ROG emissions from stationary and area-wide sources are projected to remain static over that same period due to increased emissions from population growth offsetting the emission reductions achieved by CAP controls.

Emissions from mobile sources are expected to decline 47% for ROG and 20% for NOx compared to 1991 emission levels. It is interesting to note that stationary source NOx reductions overshadow mobile source NOx reductions while the opposite is true for ROG, where mobile source reductions are significantly greater than those expected from stationary sources. This further supports the need to realize reductions from both source types to achieve the overall balance required to reduce ozone levels throughout the county.

Cumulatively, overall emissions by the year 2015 from all sources countywide are expected to be reduced approximately 32% for ROG and 34% for NOx compared to 1991 levels.

Table 7-1
UNCONTROLLED PROJECTED ROG AND NOx EMISSIONS
(tons per day)

revised 12-26-00

	ROG						NOx					
	1991	1997	2000	2003	2006	2015	1991	1997	2000	2003	2006	2015
STATIONARY SOURCES												
FUEL COMBUSTION												
Electric Utilities	0.322	0.330	0.333	0.340	0.349	0.383	13.230	13.570	13.708	13.998	14.341	15.753
Cogeneration	0.001	0.002	0.001	0.001	0.001	0.001	0.144	0.166	0.144	0.144	0.144	0.144
Oil and Gas Production	0.013	0.035	0.044	0.050	0.055	0.064	0.457	1.203	1.443	1.610	1.789	2.068
Petroleum Refining	0.027	0.039	0.042	0.042	0.042	0.042	0.383	0.555	0.599	0.609	0.608	0.598
Manufacturing and Industrial	0.012	0.015	0.016	0.017	0.018	0.021	0.558	0.631	0.651	0.667	0.681	0.743
Food and Agriculture Processing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services and Commercial	0.079	0.100	0.109	0.116	0.124	0.145	1.101	1.323	1.416	1.494	1.576	1.798
Fuel Combustion Subtotal	0.454	0.521	0.546	0.567	0.589	0.656	15.873	17.447	17.961	18.522	19.140	21.104
WASTE DISPOSAL												
Sewage Treatment	0.002	0.002	0.002	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Landfills	0.028	0.030	0.033	0.036	0.038	0.046	0.000	0.000	0.000	0.000	0.000	0.000
Incinerators	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Soil Remediation	0.003	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Waste Disposal Subtotal	0.033	0.035	0.038	0.041	0.044	0.052	0.001	0.001	0.001	0.001	0.001	0.001
CLEANING AND SURFACE COATING												
Laundering and Dry Cleaning	0.027	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Degreasing	0.360	0.506	0.567	0.618	0.672	0.835	0.000	0.000	0.000	0.000	0.000	0.000
Coatings and Related Process Solvents	1.419	2.053	2.309	2.534	2.766	3.773	0.000	0.000	0.000	0.000	0.000	0.000
Printing	0.103	0.151	0.173	0.191	0.206	0.267	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.365	0.531	0.597	0.656	0.719	1.007	0.000	0.000	0.000	0.000	0.000	0.000
Cleaning/Surface Coating Subtotal	2.274	3.270	3.646	3.999	4.364	5.882	0.000	0.000	0.000	0.000	0.000	0.000
PETROLEUM PRODUCTION/MARKETING												
Oil and Gas Production	0.216	0.562	0.661	0.737	0.819	0.947	0.000	0.000	0.000	0.000	0.000	0.000
Petroleum Refining	0.650	0.769	0.805	0.818	0.816	0.802	0.103	0.122	0.127	0.129	0.129	0.127
Petroleum Marketing	2.513	2.550	2.555	2.565	2.575	2.620	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Petroleum Prod./Marketing Subtotal	3.380	3.881	4.021	4.119	4.210	4.368	0.103	0.122	0.127	0.129	0.129	0.127
INDUSTRIAL PROCESSES												
Chemical	0.059	0.087	0.098	0.108	0.119	0.166	0.000	0.000	0.000	0.000	0.000	0.000
Food and Agriculture	0.098	0.134	0.146	0.156	0.166	0.204	0.000	0.000	0.000	0.000	0.000	0.000
Mineral Processes	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.026	0.027	0.029	0.031	0.039
Metal Processes	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood and Paper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Industrial Processes Subtotal	0.157	0.221	0.245	0.264	0.285	0.370	0.017	0.026	0.027	0.029	0.031	0.039
TOTAL STATIONARY SOURCES	6.298	7.929	8.496	8.990	9.492	11.329	15.994	17.596	18.116	18.681	19.301	21.271

Table 7-1, continued

	ROG						NOx					
	1991	1997	2000	2003	2006	2015	1991	1997	2000	2003	2006	2015
AREA-WIDE SOURCES												
SOLVENT EVAPORATION												
Consumer Products	2.357	2.517	2.734	2.965	3.184	3.847	0.000	0.000	0.000	0.000	0.000	0.000
Architectural Coatings/Related Proc. Solv.	0.848	1.007	1.088	1.173	1.261	1.549	0.000	0.000	0.000	0.000	0.000	0.000
Pesticides/Fertilizers	1.036	1.150	1.179	1.201	1.224	1.348	0.000	0.000	0.000	0.000	0.000	0.000
Asphalt Paving	0.293	0.422	0.438	0.464	0.502	0.567	0.000	0.000	0.000	0.000	0.000	0.000
Refrigerants	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Solvent Evaporation Subtotal	4.534	5.096	5.439	5.803	6.171	7.310	0.000	0.000	0.000	0.000	0.000	0.000
MISCELLANEOUS PROCESSES												
Residential Fuel Combustion	0.121	0.144	0.155	0.167	0.180	0.221	0.270	0.321	0.346	0.373	0.401	0.493
Farming Operations	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Construction and Demolition	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Paved Road Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unpaved Road Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Wind Blown Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fires	0.004	0.004	0.004	0.004	0.004	0.005	0.001	0.001	0.001	0.001	0.001	0.001
Waste Burning and Disposal	1.250	1.353	1.414	1.472	1.529	1.742	0.005	0.006	0.006	0.007	0.007	0.009
Other	0.024	0.033	0.036	0.038	0.041	0.050	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous Processes Subtotal	1.399	1.533	1.609	1.682	1.754	2.017	0.276	0.327	0.353	0.381	0.410	0.503
TOTAL AREA-WIDE SOURCES	5.933	6.630	7.049	7.485	7.924	9.328	0.276	0.327	0.353	0.381	0.410	0.503
MOBILE SOURCES												
ON-ROAD VEHICLES												
Light-Duty Passenger	11.861	7.777	6.583	5.444	4.197	1.424	7.293	5.219	4.672	3.927	3.265	1.610
Light Duty Trucks	5.030	3.735	3.452	3.150	2.784	1.279	4.988	4.176	4.020	3.547	3.185	1.737
Medium Duty Trucks	1.879	1.721	1.506	1.322	1.151	0.529	1.388	1.658	1.606	1.439	1.319	0.758
Light Heavy Duty Gas Trucks	1.403	1.281	1.049	0.743	0.661	0.267	1.160	1.014	0.941	0.729	0.698	0.454
Medium Heavy Duty Gas Trucks	0.995	0.831	0.641	0.374	0.352	0.102	0.731	0.593	0.500	0.338	0.299	0.122
Heavy Heavy Duty Gas Trucks	0.370	0.256	0.145	0.100	0.060	0.012	0.223	0.151	0.088	0.070	0.040	0.012
Light Heavy Duty Diesel Trucks	0.011	0.016	0.019	0.020	0.020	0.016	0.166	0.205	0.250	0.240	0.213	0.159
Medium Heavy Duty Diesel Trucks	0.025	0.033	0.036	0.037	0.036	0.029	0.717	0.767	0.829	0.800	0.711	0.485
Heavy Heavy Duty Diesel Trucks	0.301	0.242	0.175	0.186	0.124	0.072	3.402	2.960	2.332	2.548	1.720	0.999
Motorcycle	0.549	0.302	0.233	0.197	0.166	0.082	0.064	0.037	0.035	0.035	0.038	0.033
Heavy-Duty Diesel Urban Buses	0.006	0.006	0.007	0.007	0.007	0.008	0.144	0.132	0.134	0.131	0.129	0.122
Heavy Duty Gas Urban Buses	0.017	0.017	0.016	0.017	0.017	0.017	0.020	0.025	0.025	0.027	0.028	0.032
School Buses	0.039	0.027	0.023	0.022	0.020	0.013	0.163	0.157	0.167	0.167	0.165	0.160
Motor Homes	0.095	0.097	0.101	0.106	0.107	0.074	0.181	0.226	0.241	0.261	0.280	0.303
On-Road Vehicle Subtotal	22.581	16.341	13.986	11.725	9.702	3.924	20.640	17.320	15.840	14.259	12.090	6.986
OTHER MOBILE												
Aircraft	0.376	0.512	0.544	0.589	0.646	0.752	0.066	0.087	0.092	0.099	0.109	0.127
Trains	0.064	0.076	0.076	0.077	0.077	0.076	2.152	2.554	2.554	2.582	2.582	2.554
Ships and Commercial Boats	0.068	0.077	0.078	0.078	0.077	0.064	0.946	1.238	1.265	1.265	1.265	1.118
Recreational Boats	3.196	4.049	4.480	4.902	5.311	6.474	0.385	0.483	0.534	0.585	0.633	0.773
Off-Road Recreational Vehicles	0.284	0.285	0.303	0.322	0.339	0.387	0.034	0.036	0.038	0.040	0.043	0.049
Commercial/Industrial Mobile Equipment	1.572	2.069	2.200	2.327	2.461	2.752	4.363	6.151	6.490	6.887	7.328	8.959
Farm Equipment	0.623	0.671	0.699	0.722	0.752	0.831	5.062	5.394	5.596	5.748	5.955	6.471
Other Mobile Subtotal	6.183	7.739	8.380	9.016	9.663	11.336	13.008	15.943	16.569	17.206	17.915	20.050
TOTAL MOBILE SOURCES	28.764	24.080	22.366	20.741	19.365	15.260	33.648	33.263	32.409	31.465	30.005	27.036
TOTAL UNCONTROLLED SOURCES	40.995	38.639	37.910	37.216	36.782	35.917	49.918	51.186	50.879	50.528	49.716	48.810

Table 7-2
CONTROLLED PROJECTED ROG AND NOx EMISSIONS
(tons per day)

revised 12-26-00

	ROG						NOx					
	1991	1997	2000	2003	2006	2015	1991	1997	2000	2003	2006	2015
STATIONARY SOURCES												
FUEL COMBUSTION												
Electric Utilities	0.322	0.323	0.326	0.333	0.341	0.375	13.230	5.277	5.329	2.541	2.541	2.543
Cogeneration	0.001	0.002	0.001	0.001	0.001	0.001	0.144	0.058	0.056	0.056	0.056	0.056
Oil and Gas Production	0.013	0.031	0.039	0.044	0.049	0.056	0.457	0.912	0.647	0.722	0.802	0.927
Petroleum Refining	0.027	0.018	0.020	0.021	0.021	0.020	0.383	0.182	0.205	0.208	0.208	0.204
Manufacturing and Industrial	0.012	0.013	0.013	0.014	0.015	0.019	0.558	0.493	0.285	0.299	0.314	0.379
Food and Agriculture Processing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services and Commercial	0.079	0.078	0.086	0.093	0.101	0.122	1.101	0.861	0.895	0.970	1.049	1.261
Fuel Combustion Subtotal	0.454	0.465	0.486	0.506	0.528	0.594	15.873	7.782	7.417	4.795	4.970	5.370
WASTE DISPOSAL												
Sewage Treatment	0.002	0.002	0.002	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Landfills	0.028	0.021	0.020	0.022	0.023	0.028	0.000	0.000	0.000	0.000	0.000	0.000
Incinerators	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Soil Remediation	0.003	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Waste Disposal Subtotal	0.033	0.026	0.025	0.027	0.029	0.034	0.001	0.001	0.001	0.001	0.001	0.001
CLEANING AND SURFACE COATING												
Laundering and Dry Cleaning	0.027	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Degreasing	0.360	0.506	0.567	0.618	0.672	0.835	0.000	0.000	0.000	0.000	0.000	0.000
Coatings and Related Process Solvents	1.409	1.912	2.102	2.308	2.523	3.472	0.000	0.000	0.000	0.000	0.000	0.000
Printing	0.103	0.151	0.173	0.191	0.206	0.267	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.365	0.531	0.597	0.656	0.719	1.007	0.000	0.000	0.000	0.000	0.000	0.000
Cleaning/Surface Coating Subtotal	2.274	3.129	3.439	3.774	4.121	5.581	0.000	0.000	0.000	0.000	0.000	0.000
PETROLEUM PRODUCTION/MARKETING												
Oil and Gas Production	0.216	0.222	0.245	0.274	0.304	0.351	0.000	0.000	0.000	0.000	0.000	0.000
Petroleum Refining	0.650	0.164	0.171	0.174	0.174	0.171	0.054	0.064	0.067	0.068	0.068	0.067
Petroleum Marketing	2.513	1.251	0.181	0.184	0.187	0.202	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Petroleum Prod./Marketing Subtotal	3.380	1.637	0.597	0.631	0.665	0.724	0.054	0.064	0.067	0.068	0.068	0.067
INDUSTRIAL PROCESSES												
Chemical	0.059	0.087	0.098	0.108	0.119	0.166	0.000	0.000	0.000	0.000	0.000	0.000
Food and Agriculture	0.098	0.134	0.146	0.156	0.166	0.204	0.000	0.000	0.000	0.000	0.000	0.000
Mineral Processes	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.026	0.027	0.029	0.031	0.039
Metal Processes	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wood and Paper	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Industrial Processes Subtotal	0.157	0.221	0.245	0.264	0.285	0.370	0.017	0.026	0.027	0.029	0.031	0.039
TOTAL STATIONARY SOURCES	6.288	5.478	4.792	5.203	5.627	7.304	15.945	7.873	7.512	4.894	5.070	5.477

Table 7-2, continued

	ROG						NOx					
	1991	1997	2000	2003	2006	2015	1991	1997	2000	2003	2006	2015
AREA-WIDE SOURCES												
SOLVENT EVAPORATION												
Consumer Products	2.357	2.215	1.859	1.660	1.783	1.231	0.000	0.000	0.000	0.000	0.000	0.000
Architectural Coatings/Related Proc. Solv.	0.848	1.007	1.088	0.938	1.009	1.239	0.000	0.000	0.000	0.000	0.000	0.000
Pesticides/Fertilizers	1.036	1.150	1.179	1.201	1.224	1.348	0.000	0.000	0.000	0.000	0.000	0.000
Asphalt Paving	0.293	0.221	0.230	0.244	0.264	0.298	0.000	0.000	0.000	0.000	0.000	0.000
Refrigerants	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Solvent Evaporation Subtotal	4.534	4.594	4.356	4.043	4.279	4.116	0.000	0.000	0.000	0.000	0.000	0.000
MISCELLANEOUS PROCESSES												
Residential Fuel Combustion	0.121	0.144	0.155	0.167	0.180	0.221	0.270	0.286	0.283	0.293	0.315	0.387
Farming Operations	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Construction and Demolition	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Paved Road Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unpaved Road Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Wind Blown Dust	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Fires	0.004	0.004	0.004	0.004	0.004	0.005	0.001	0.001	0.001	0.001	0.001	0.001
Waste Burning and Disposal	0.799	0.852	0.901	0.668	0.693	0.789	0.005	0.006	0.006	0.003	0.004	0.004
Other	0.024	0.033	0.036	0.038	0.041	0.050	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous Processes Subtotal	0.948	1.033	1.096	0.877	0.918	1.065	0.276	0.292	0.290	0.297	0.319	0.392
TOTAL AREA-WIDE SOURCES	5.482	5.627	5.453	4.921	5.197	5.181	0.276	0.292	0.290	0.297	0.319	0.392
MOBILE SOURCES												
ON-ROAD VEHICLES												
Light-Duty Passenger	11.861	7.777	6.583	5.444	4.197	1.424	7.293	5.219	4.672	3.927	3.265	1.610
Light Duty Trucks	5.030	3.735	3.452	3.150	2.784	1.279	4.988	4.176	4.020	3.547	3.185	1.737
Medium Duty Trucks	1.879	1.721	1.506	1.322	1.151	0.529	1.388	1.658	1.606	1.439	1.319	0.758
Light Heavy Duty Gas Trucks	1.403	1.281	1.049	0.743	0.661	0.267	1.160	1.014	0.941	0.729	0.698	0.454
Medium Heavy Duty Gas Trucks	0.995	0.831	0.641	0.374	0.352	0.102	0.731	0.593	0.500	0.338	0.299	0.122
Heavy Heavy Duty Gas Trucks	0.370	0.256	0.145	0.100	0.060	0.012	0.223	0.151	0.088	0.070	0.040	0.012
Light Heavy Duty Diesel Trucks	0.011	0.016	0.019	0.020	0.020	0.016	0.166	0.205	0.250	0.240	0.213	0.159
Medium Heavy Duty Diesel Trucks	0.025	0.033	0.036	0.037	0.036	0.029	0.717	0.767	0.829	0.800	0.711	0.485
Heavy Heavy Duty Diesel Trucks	0.301	0.242	0.175	0.186	0.124	0.072	3.402	2.960	2.332	2.548	1.720	0.999
Motorcycle	0.549	0.302	0.233	0.197	0.166	0.082	0.064	0.037	0.035	0.035	0.038	0.033
Heavy-Duty Diesel Urban Buses	0.006	0.006	0.007	0.007	0.007	0.008	0.144	0.132	0.134	0.131	0.129	0.122
Heavy Duty Gas Urban Buses	0.017	0.017	0.016	0.017	0.017	0.017	0.020	0.025	0.025	0.027	0.028	0.032
School Buses	0.039	0.027	0.023	0.022	0.020	0.013	0.163	0.157	0.167	0.167	0.165	0.160
Motor Homes	0.095	0.097	0.101	0.106	0.107	0.074	0.181	0.226	0.241	0.261	0.280	0.303
On-Road Vehicle Subtotal	22.581	16.341	13.986	11.725	9.702	3.924	20.640	17.320	15.840	14.259	12.090	6.986
OTHER MOBILE												
Aircraft	0.376	0.512	0.544	0.589	0.646	0.752	0.066	0.087	0.092	0.099	0.109	0.127
Trains	0.064	0.076	0.076	0.077	0.077	0.076	2.152	2.554	2.554	2.582	2.582	2.554
Ships and Commercial Boats	0.068	0.077	0.078	0.078	0.077	0.064	0.946	1.238	1.265	1.265	1.265	1.118
Recreational Boats	3.196	4.049	4.480	4.902	5.311	6.474	0.385	0.483	0.534	0.585	0.633	0.773
Off-Road Recreational Vehicles	0.284	0.285	0.303	0.322	0.339	0.387	0.034	0.036	0.038	0.040	0.043	0.049
Commercial/Industrial Mobile Equipment	1.572	2.069	2.200	2.327	2.461	2.752	4.363	6.151	6.490	6.887	7.328	8.959
Farm Equipment	0.623	0.671	0.699	0.722	0.752	0.831	5.062	5.394	5.596	5.748	5.955	6.471
Other Mobile Subtotal	6.183	7.739	8.380	9.016	9.663	11.336	13.008	15.943	16.569	17.206	17.915	20.050
TOTAL MOBILE SOURCES	28.764	24.080	22.366	20.741	19.365	15.260	33.648	33.263	32.409	31.465	30.005	27.036
TOTAL CONTROLLED SOURCES	40.534	35.185	32.611	30.864	30.190	27.745	49.870	41.429	40.212	36.656	35.395	32.906

Table 7-3
CLEAN AIR PLAN EMISSION PROJECTIONS
revised 12-26-00
(tons per day)

	ROG						NOx					
	1991	1997	2000	2003	2006	2015	1991	1997	2000	2003	2006	2015
STATIONARY SOURCES												
Fuel Combustion												
Without CAP Reductions	0.454	0.521	0.546	0.567	0.589	0.656	15.873	17.447	17.961	18.522	19.14	21.104
With CAP Reductions	0.454	0.465	0.486	0.506	0.528	0.594	15.873	7.782	7.417	4.795	4.970	5.370
Gross Emission Reductions	0.000	0.056	0.059	0.060	0.061	0.062	0.000	9.666	10.544	13.727	14.170	15.734
Waste Disposal												
Without CAP Reductions	0.033	0.035	0.038	0.041	0.044	0.052	0.001	0.001	0.001	0.001	0.001	0.001
With CAP Reductions	0.033	0.026	0.025	0.027	0.029	0.034	0.001	0.001	0.001	0.001	0.001	0.001
Gross Emission Reductions	0.000	0.009	0.013	0.014	0.015	0.018	0.000	0.000	0.000	0.000	0.000	0.000
Cleaning and Surface Coating												
Without CAP Reductions	2.274	3.270	3.646	3.999	4.364	5.882	0.000	0.000	0.000	0.000	0.000	0.000
With CAP Reductions	2.264	3.129	3.439	3.774	4.121	5.581	0.000	0.000	0.000	0.000	0.000	0.000
Gross Emission Reductions	0.010	0.141	0.208	0.225	0.244	0.301	0.000	0.000	0.000	0.000	0.000	0.000
Petroleum Production/Marketing												
Without CAP Reductions	3.380	3.881	4.021	4.119	4.210	4.368	0.103	0.122	0.127	0.129	0.129	0.127
With CAP Reductions	3.380	1.637	0.597	0.631	0.665	0.724	0.054	0.064	0.067	0.068	0.068	0.067
Gross Emission Reductions	0.000	2.245	3.424	3.488	3.545	3.644	0.048	0.057	0.060	0.061	0.061	0.060
Industrial Processes												
Without CAP Reductions	0.157	0.221	0.245	0.264	0.285	0.370	0.017	0.026	0.027	0.029	0.031	0.039
With CAP Reductions	0.157	0.221	0.245	0.264	0.285	0.370	0.017	0.026	0.027	0.029	0.031	0.039
Gross Emission Reductions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL STATIONARY SOURCES												
Without CAP Reductions	6.298	7.929	8.496	8.990	9.492	11.329	15.994	17.596	18.116	18.681	19.301	21.271
With CAP Reductions	6.288	5.478	4.792	5.203	5.627	7.304	15.945	7.873	7.512	4.894	5.070	5.477
Gross Emission Reductions	0.010	2.452	3.704	3.788	3.865	4.025	0.048	9.723	10.604	13.788	14.230	15.794
AREA-WIDE SOURCES												
Solvent Evaporation												
Without CAP Reductions	4.534	5.096	5.439	5.803	6.171	7.310	0.000	0.000	0.000	0.000	0.000	0.000
With CAP Reductions	4.534	4.594	4.356	4.043	4.279	4.116	0.000	0.000	0.000	0.000	0.000	0.000
Gross Emission Reductions	0.000	0.502	1.083	1.760	1.892	3.195	0.000	0.000	0.000	0.000	0.000	0.000
Miscellaneous Processing												
Without CAP Reductions	1.399	1.533	1.609	1.682	1.754	2.017	0.276	0.327	0.353	0.381	0.410	0.503
With CAP Reductions	0.948	1.033	1.096	0.877	0.918	1.065	0.276	0.292	0.290	0.297	0.319	0.392
Gross Emission Reductions	0.451	0.500	0.513	0.805	0.835	0.953	0.000	0.035	0.063	0.084	0.090	0.111
TOTAL AREA WIDE SOURCES												
Without CAP Reductions	5.933	6.630	7.049	7.485	7.924	9.328	0.276	0.327	0.353	0.381	0.410	0.503
With CAP Reductions	5.482	5.627	5.453	4.921	5.197	5.181	0.276	0.292	0.290	0.297	0.319	0.392
Gross Emission Reductions	0.451	1.002	1.596	2.564	2.727	4.147	0.000	0.035	0.063	0.084	0.090	0.111
MOBILE SOURCES												
On-Road Vehicles												
Without CAP Reductions	22.581	16.341	13.986	11.725	9.702	3.924	20.640	17.320	15.840	14.259	12.090	6.986
With CAP Reductions	22.581	16.341	13.986	11.725	9.702	3.924	20.640	17.320	15.840	14.259	12.090	6.986
Gross Emission Reductions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Other Mobile Sources												
Without CAP Reductions	6.183	7.739	8.380	9.016	9.663	11.336	13.008	15.943	16.569	17.206	17.915	20.050
With CAP Reductions	6.183	7.739	8.380	9.016	9.663	11.336	13.008	15.943	16.569	17.206	17.915	20.050
Gross Emission Reductions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL MOBILE SOURCES												
Without CAP Reductions	28.764	24.080	22.366	20.741	19.365	15.260	33.648	33.263	32.409	31.465	30.005	27.036
With CAP Reductions	28.764	24.080	22.366	20.741	19.365	15.260	33.648	33.263	32.409	31.465	30.005	27.036
Gross Emission Reductions	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL ALL SOURCES												
Emissions Without CAP Reductions	40.995	38.639	37.910	37.216	36.782	35.917	49.918	51.186	50.879	50.528	49.716	48.810
Emissions With CAP Reductions	40.534	35.185	32.611	30.864	30.190	27.745	49.870	41.429	40.212	36.656	35.395	32.906
Net Emission Reductions	0.461	3.454	5.299	6.352	6.592	8.172	0.048	9.758	10.667	13.872	14.321	15.905
*CAP Emission Target		32.796	32.796	32.796	32.796	32.796		39.934	39.934	39.934	39.934	39.934
**Percent Emission Reductions	1.1%	14.2%	20.5%	24.7%	26.4%	32.3%	0.1%	17.0%	19.4%	26.6%	29.1%	34.1%

* Assumes 15% reduction by 1994; 20% reduction for subsequent years
** 100 x (1991 emissions without CAP reductions - year of interest emission with CAP reductions)/1991 emissions without CAP reductions

Figure 7-1
FORECAST ROG EMISSIONS BY SOURCE GROUP

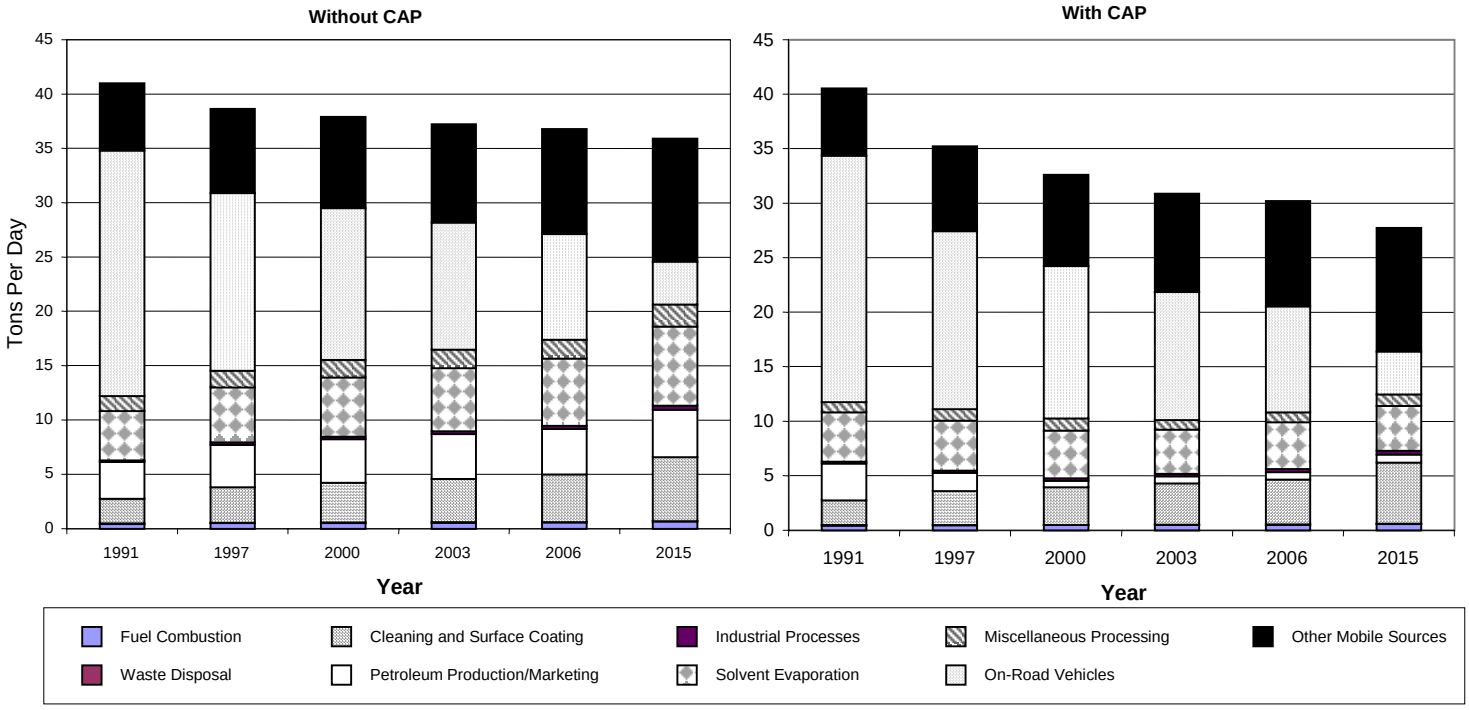


Figure 7-2
FORECAST NOx EMISSIONS BY SOURCE GROUP

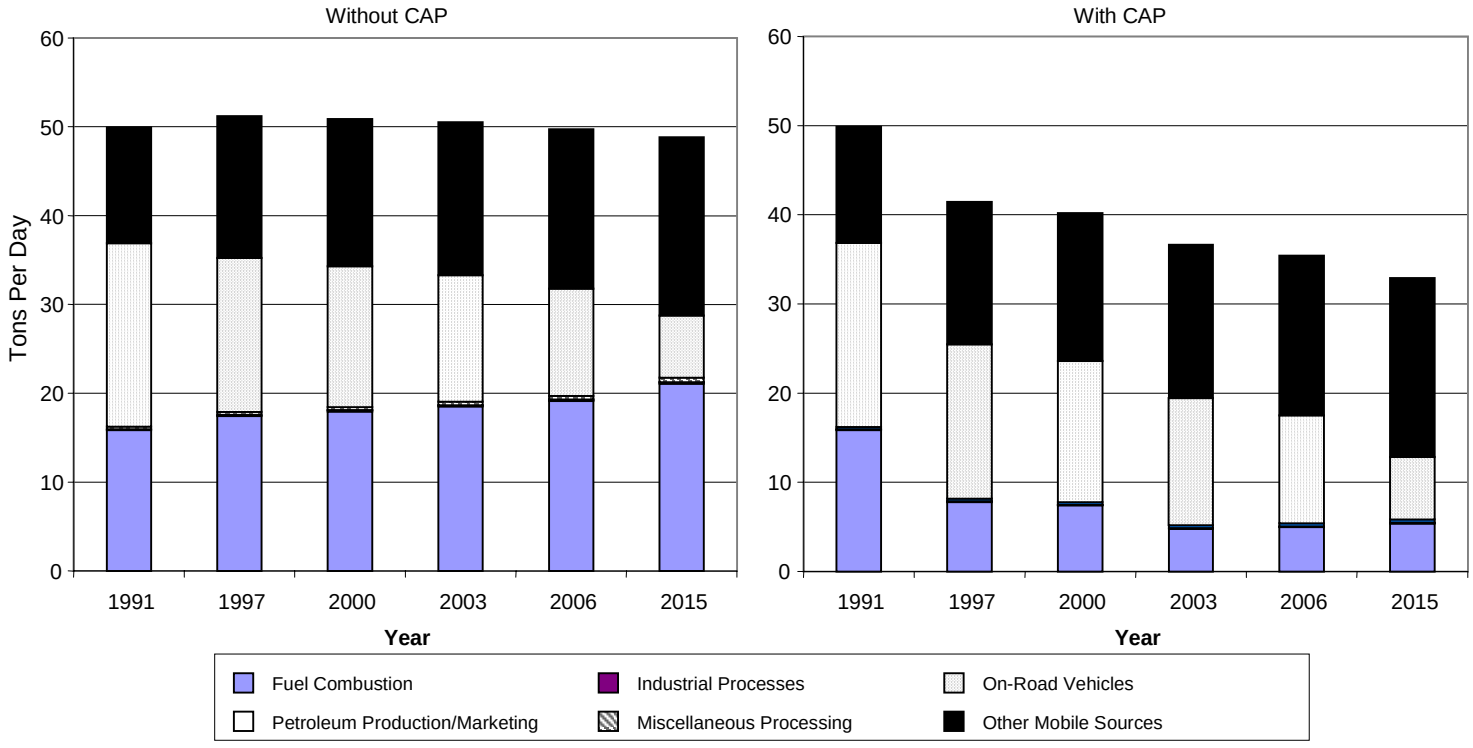


Figure 7-3
FORECAST ROG EMISSIONS COUNTYWIDE

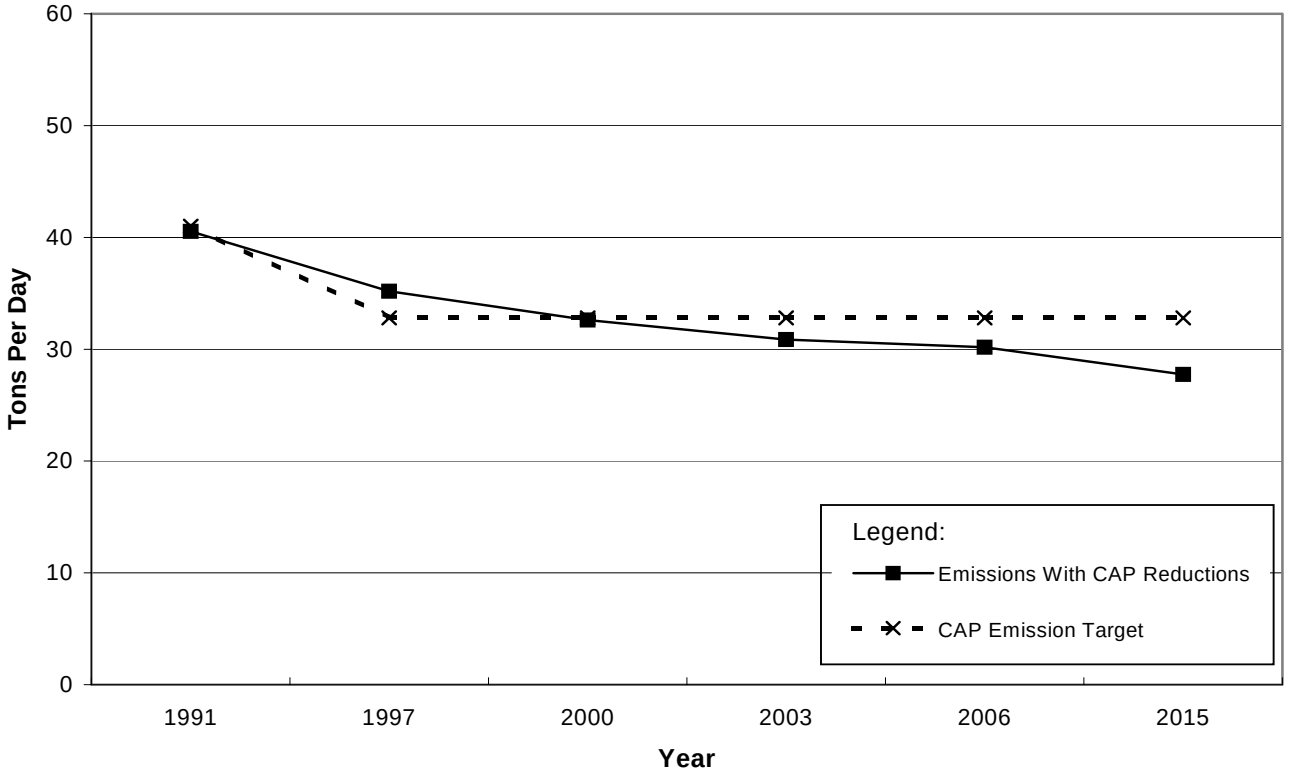
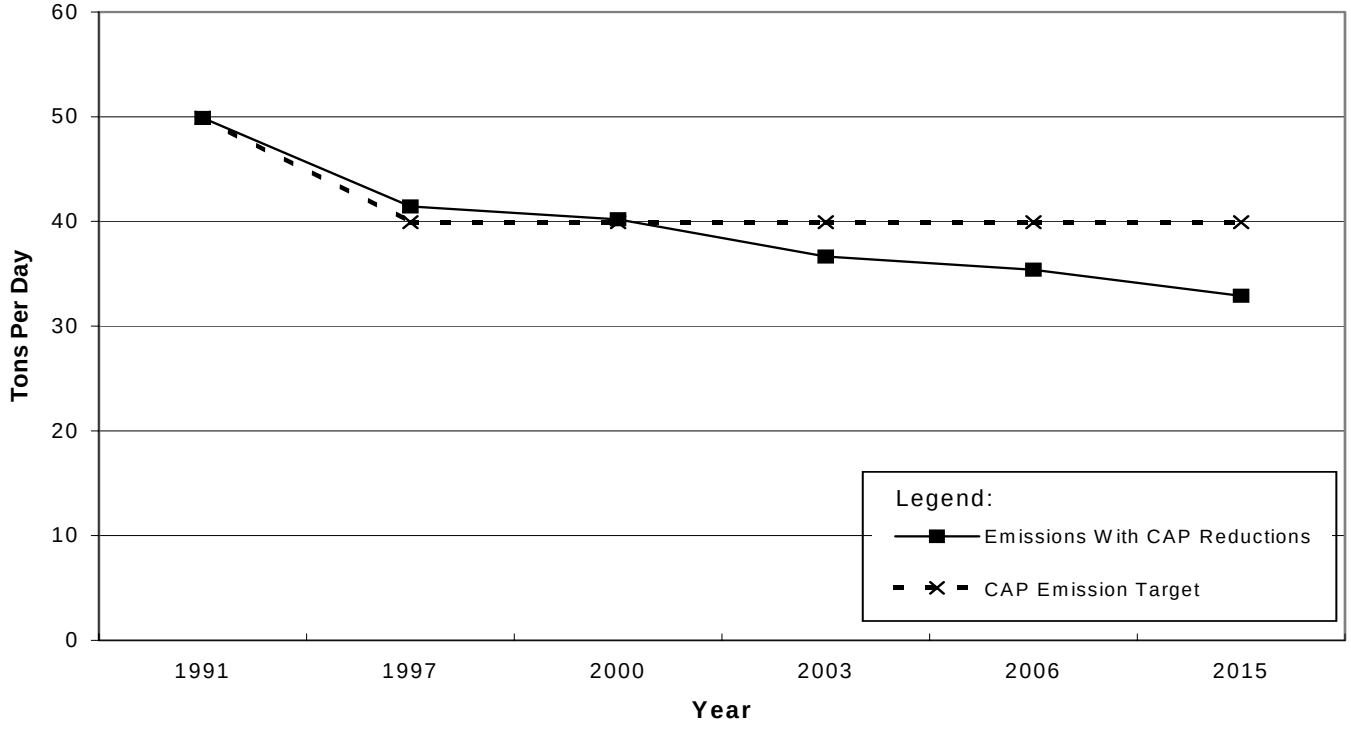


Figure 7-4
FORECAST NOx EMISSIONS COUNTYWIDE



CHAPTER 8
PLAN IMPLEMENTATION

INTRODUCTION

REQUIREMENTS FOR PLAN APPROVAL

IMPLEMENTING AGENCIES AND RESOURCES

PUBLIC AND PRIVATE SECTOR IMPLEMENTATION

TIMEFRAME FOR IMPLEMENTATION

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DETERMINATION OF PROJECT CONSISTENCY

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DISTRICT STAFF AND RESOURCES FOR IMPLEMENTATION

8.1 INTRODUCTION

The CCAA establishes a legal mandate to achieve the state ambient air quality standards by the earliest practicable date. Determination of the earliest practicable attainment date is dependent upon the severity of the nonattainment problem. State law sets December 31, 1997 as the deadline for moderate nonattainment areas to reach attainment. Failure to achieve that goal may result in a requirement to implement the more stringent controls specified for serious nonattainment areas.

Chapters 5 and 6 of the Plan discuss emission control strategies that will accommodate urban growth and provide for improved air quality. Achieving and maintaining clean air is dependent upon implementing those strategies. Implementation involves adoption by the enforcing agency of the necessary statutes, rules, regulations, and/or ordinances that provide for compliance, monitoring and enforcement of the control measures. The purpose of this chapter is to identify the requirements, methods, responsible agencies and timeframe for implementing the controls proposed in this Plan.

8.2 REQUIREMENTS FOR PLAN APPROVAL

Upon adoption by the District Board, this plan will be submitted to the California Air Resources Board for review and approval. The CCAA establishes criteria for plan evaluation which requires the ARB to:

- Determine whether the projected attainment date represents the earliest practicable date, and whether the measures contained in the plan are sufficient to attain and maintain the state standards.

- Where regional pollutants are involved, compare the plan with other plans in the air basin to determine uniformity. The CCAA requires that the control measures proposed by different districts within the same air basin be uniform to the extent feasible.

- For Districts where pollutant transport is a factor, the plan should be reviewed for the inclusion of transport mitigation to satisfy the requirements of the law. San Luis Obispo county has not been identified as a transport contributor.

- If no attainment date can be specified, or if the 5% per year emission reduction requirement cannot be met, determine whether the plan contains every feasible control strategy or measure available to insure progress toward attainment.

The ARB must notify the District in writing regarding the results of its evaluation. If the plan is found to be deficient, the District will be required to make the necessary changes and resubmit the plan. A conflict resolution procedure exists to mediate any problems which may occur during the plan approval process. Final approval by ARB will be at a public hearing of their Board.

8.3 IMPLEMENTING AGENCIES AND RESOURCES

Implementation of the 2001 Clean Air Plan relies on a multilevel partnership between the public, private industry and various government agencies at the federal, state, regional, and local levels. At the federal level, the EPA and other agencies are charged with reducing emissions from federally controlled sources, such as aircraft. The ARB is the state agency charged with controlling emissions from motor vehicles, fuels and consumer products. The District is the regional agency responsible for the overall development and implementation of the Plan, as well as adopting and enforcing emission controls for industries, indirect sources, and some mobile sources. At the local level are city and county government and the San

Luis Obispo Council of Governments. These entities are responsible for implementing some of the transportation control measures and land use planning strategies.

In many cases, each of these government agencies is empowered with authority unique to that agency and, as such, may be the only feasible party to implement a measure. Agencies responsible for implementing the recommended control measures are identified in Tables 9-1 through 9-4. A description of these agencies and their responsibilities is provided below.

Federal Agencies

The federal EPA is responsible for regulating the emissions of many sources, including planes, ships, trains, most construction and farm equipment, off-highway vehicles, federal facilities, and future offshore oil operations. Federally regulated sources, excluding motor vehicles, contribute about 6% of total ROG emissions and 19% of NOx emissions in the District.

It should be noted that motor vehicles originating out of state could also be characterized as "federally regulated" sources. Currently, these vehicles constitute approximately 20% of the in-use vehicle fleet statewide. Since emissions standards for these vehicles are less stringent than California vehicles, they contribute a disproportionately larger share of the emissions.

State Agencies

Many of the on-road mobile source emission reductions projected for future years result from the ARB's strict motor vehicle exhaust emission standards and fuel quality requirements. The ARB is also responsible for adopting off-road mobile source emission standards for source categories not regulated by EPA. Emissions from marine vessels and certain off-highway vehicles can also be regulated by ARB if a waiver is obtained from EPA. Finally, ARB responsibilities also include the implementation of control measures to reduce emissions from consumer products.

There are several other state agencies that play important roles in implementing measures which reduce emissions, including the Bureau of Automotive Repair (BAR) and Caltrans. The BAR is responsible for operating the motor vehicle inspection and maintenance program (Smog Check), while Caltrans plays a role in several of the transportation measures dealing with systems improvements and circulation.

Air Pollution Control District

The San Luis Obispo County Air Pollution Control District is responsible for implementing control measures for stationary, indirect, and some mobile emission sources. The stationary source control measures are implemented through the development, adoption and enforcement of District rules and regulations.

Rulemaking involves developing a proposed rule or rule revision; coordinating with other Districts to ensure uniformity with similar rules; consulting with the ARB and EPA to ensure consistency with state and federal policy; holding public workshops to inform the public and affected industry of the proposed rule; and presenting the proposed rule to the San Luis Obispo County Air Pollution Control Board for adoption. The rules are then implemented through the District's source permitting and public outreach process. Each affected facility is reviewed, and controls and operating parameters specified, prior to approval of construction or operation. Subsequent facility inspections are conducted periodically by District enforcement staff to ensure that all permit conditions are being met. To inform the public about new or modified rules that affect them, workshops are held, public information and education outreach is conducted and assistance brochures are developed."

The Transportation Choices program for schools and employers is implemented through a cooperative partnership between the District, Regional Rideshare and Ride-On Transportation. Most of the other transportation, land use planning and indirect source controls are implemented by local government, with the District playing a support role. In these instances the District will primarily function as a coordinator rather than as lead agency.

The development and implementation of public information and education programs is also an important element in District implementation of the Plan. These programs are discussed in detail in Chapter 9.

Regional and Local Government

The San Luis Obispo Council of Governments (SLOCOG), as the Regional Transportation Planning Agency, is responsible for conducting regional transportation studies to support the various land use and transportation control strategies in the CAP. SLOCOG also guides and oversees the implementation of recommended improvements to public transit, bikeways and facilities, and transportation systems. This responsibility is managed primarily through implementation of the Regional Transportation Plan.

The San Luis Obispo Regional Transit Authority (SLORTA) directs the operations of the regional transit system and is the agency responsible for implementing the planned improvements described in this Plan for the regional system. The cities of San Luis Obispo and Paso Robles both operate local, fixed-route transit systems and will be the implementing agencies for the local transit improvements identified in Chapter 6. The San Luis Obispo Regional Rideshare office offers carpool and vanpool matching services and is one of our strategic partners in promoting voluntary trip reduction efforts among the business community and general public.

City and county governments continue to have primary responsibility for land use and circulation management, and their decisions will affect the success of the District's attainment plan. Pursuant to the requirements of the CCAA, incorporation of the land use and circulation strategies outlined in Chapter 6 should occur to the maximum extent possible. Implementation of these measures requires cooperation among participating agencies to ensure their success. This is particularly important when a measure could place a jurisdiction at a competitive disadvantage if not applied consistently across the region. Local governments thus play an important role in reducing emissions from motor vehicles by implementing the land use planning strategies and some of the transportation control measures. They may also assist with enforcement and data collection for monitoring effectiveness of the measures.

8.4 PUBLIC AND PRIVATE SECTOR IMPLEMENTATION

Effective implementation of the measures proposed in this Plan will require the understanding and support of the private sector and the public. Although a substantial effort was made to reduce the economic impacts of this Plan, many businesses are affected by the measures, and significant costs to private industry are incurred as the Plan is implemented. In addition, the general public is called upon to make choices that involve changes in life-style, particularly regarding how and when we use our private vehicles. These economic burdens and personal inconveniences are hard to accept unless we all share in the commitment and effort to achieve and preserve clean air in San Luis Obispo County. Thus, a strong community partnership must be forged so that those affected can be involved in the process at every level. The key to this partnership is communication.

Many opportunities are available for involvement by private industry and the public. The public workshops and formal hearings before the Board allow all groups to present their views and concerns prior to formal adoption of the Plan. During rule development, workshops and hearings are held to allow for additional input at that stage of the process. A well planned public information and education

program is also essential to increase awareness of local issues and to emphasize the importance of individual, group, and community efforts towards improving the air quality of San Luis Obispo County.

8.5 TIMEFRAME FOR IMPLEMENTATION

As shown in Tables 8-1 through 8-3, all but one of the measures described in this Plan have already been adopted and implemented. The implementation schedule was dependent on many factors: availability and cost of the control technology; operational and timing limitations at affected sources; and staffing, resources and other logistical considerations governing the timeframe under which the regulatory agency could develop the necessary rules and implementing mechanisms. Table 8-4 organizes the measures and adoption schedule by implementing agency.

In some cases, full implementation does not occur until after year 2000. For instance, the land use planning strategies proposed in this Plan will be gradually implemented over an extended period of time as the cities and county update and modify their General Plans. These measures will play a greater role in reducing the increase in emissions from new development rather than reducing existing emissions.

8.6 CONTINGENCY MEASURES

The CCAA (H&SC Sections 40915 & 41503.3) requires that each plan contain contingency measures to be implemented if the District fails to achieve interim goals or maintain adequate progress toward attainment. Table 8-5 lists the stationary and transportation control measures proposed for contingency status in this Plan. Most of these measures were approved for implementation in the 1991 CAP, but were found unnecessary to meet the revised emission reduction goals of the 1995 CAP or this Plan. They are still considered feasible and cost-effective, and could be adopted if implementation of this Plan fails to result in expeditious attainment of the state ozone standard.

Implementation of one or more of the contingency measures can be required by the ARB if they make a finding that the District has not achieved the minimum rate of progress toward attainment. A decision on which contingency measures to implement, however, would be made by the District Board during a noticed public hearing to provide affected businesses or organizations the opportunity to participate and provide input to the process. Sections 5.6 in Chapter 5 and 6.8 in Chapter 6 describe the measures proposed for contingency in further detail.

8.7 DETERMINATION OF PROJECT CONSISTENCY

The California Environmental Quality Act (CEQA) requires that governmental agencies evaluate the environmental impacts of proposed projects under their jurisdiction, and that consistency of projects with regional plans, such as air quality plans, be addressed. Furthermore, the California Government Code section 65402 requires consistency of virtually all public and private projects with local general plans. Thus, if CAP requirements are incorporated into the general plans, the process of determining project consistency is greatly simplified. The agency responsible for making consistency determinations varies according to the project.

A consistency analysis is generally required for a Program Level Environmental Impact Report (EIR), and may be necessary for a Project Level EIR, depending on the project being considered. Examples of projects and programs requiring a consistency analysis include: General Plan Updates and Amendments, Specific Plans, Area Plans, large residential developments and large commercial or industrial developments. The consistency analysis should evaluate the following questions:

– -Are the population projections used in the plan or project equal to or less than those used in the CAP (chapter 2) for the same area?

– -Is rate of increase in vehicle trips and miles traveled less than or equal to the rate of population growth for the same area?

– -Have all applicable land use and transportation control measures from the CAP been included in the plan or project to the maximum extent feasible?

If the answer to all of the above questions is yes, then the proposed project or plan is considered to be consistent with the CAP. If the answer to any one of the questions is no, then the emissions reductions projected in the CAP may not be achieved, which could delay or preclude attainment of the state ozone standard. This would be considered inconsistent with the Clean Air Plan.

Stationary and area sources subject to District permit must comply with all applicable District rules and regulations. Consistency is determined by assessing whether the emission source is in compliance with District requirements. Emissions from sources not subject to APCD permit are considered to be consistent with this Plan if such emissions have been included in the Plan forecast emissions inventory found in Chapter 7.

Evaluation of transportation projects for consistency with this Plan is determined on a case-by-case basis. An effective assessment involves consideration of project consistency with adopted transportation control measures; consistency of land-use adjacent to the proposed project with land use planning strategies adopted pursuant to this Plan; and, consistency of project population projections with Plan projections.

8.8 EMISSIONS GROWTH AND THE CLEAN AIR PLAN

The preceding sections of this Plan have discussed existing emission sources and proposed control measures, as well as the effect of those controls on projected emissions in future years. Emissions growth in excess of that projected in this Plan, however, could result in failure to accomplish clean air goals. There are three types of emissions growth which require further consideration: permitted growth regulated by the District; growth which is regulated by the county or cities; and growth that is essentially unregulated.

Permitted growth pertains to new emission sources subject to District regulation and operating permits through the New Source Review rule (NSR). In general, these are commercial and industrial facilities with equipment or operations that emit pollutants at fixed locations, including facilities located offshore on the Outer Continental Shelf. The District's NSR rule requires the application of Best Available Control Technology for sources with the potential to emit 25 pounds/day or more of NOx, ROG, SO2 or PM_{10}; emission offsets are also required for sources that may emit 25 tons/year or more of the same pollutants. These requirements ensure that the permitting of new sources will not interfere with attainment and maintenance of the state ambient air quality standards.

Emissions growth that is exempt from District rules may still be subject to regulation by cities and the county through provisions in CEQA, or through local city or county ordinances. In general, sources in this category are exempt from District regulation due to their small size, or are sources of indirect emissions related to certain types of land use, such as vehicle trips generated or attracted by residential or commercial developments. This type of emissions growth is governed by local general plans and ordinances. The potential impacts associated with that growth are addressed through the CEQA review process.

CEQA requires preparation of a detailed Environmental Impact Report on projects which may have significant adverse impacts on the environment, which includes proposed projects which are inconsistent with this Plan. The District reviews all types of new development proposals referred by local, state and federal agencies. Pursuant to CEQA regulations, projects are evaluated for potential air quality impacts and recommendations for mitigation are provided where appropriate.

The incorporation of Air Quality Elements into city and county general plans will ensure that land use planning strategies will support recommendations in this Plan. The County and the Cities of Arroyo Grande, Grover Beach, Pismo Beach, San Luis Obispo and Paso Robles have adopted air quality goals, policies and programs in their General Plans. To ensure future compatibility with growth assumptions made here, it is important that future actions be evaluated for consistency with this Plan.

To date, little attention has been paid to growth of unregulated sources; however, it is anticipated that these sources will play an increasingly significant role in future emissions inventories. Unregulated growth is development in various economic categories that the District or other local planning agencies are unable to control for logistical or legislative reasons. Unregulated growth includes sources such as agricultural pesticides, off-road vehicles, through-county vehicle travel, consumer solvents, domestic and commercial use of natural gas, and other similar sources and activities.

The CCAA gives ARB limited powers to control emissions from certain classes of previously unregulated consumer goods. It is expected that unregulated sources will be the last categories subject to air pollution control requirements at the local level.

8.9 ANNUAL PROGRESS REPORTS AND TRIENNIAL UPDATE

The District is required to submit annual reports to the ARB summarizing progress in developing, adopting or implementing the control strategies proposed in this Plan. Every third year after approval of the Plan, the District must prepare and submit a triennial update to ARB. This update is to assess the overall effectiveness of the plan, quantify actual emissions reductions achieved to date, and document current population and vehicle use rates. Comparison of these data will be made with all assumptions used in the plan. The triennial update provides the District with the opportunity to make any necessary modifications to existing emission reduction strategies to ensure progress in achieving state standards. The 2001 CAP is the third update in this process.

If a district falls short of the annual emission reduction target stipulated in its Plan, the ARB will assess the reason for the shortfall and take appropriate action. If insufficient progress was made as a result of control technology not developing as quickly as expected, that will be taken into account. However, if a shortfall occurs because a district failed to follow through on proposed measures, the ARB will direct the district to fulfill its commitments, and may adopt its own control measures for the area in question.

Emission reduction strategies must continue until the state standard is attained. Once attainment of the standard is achieved, it is the responsibility of the district to maintain that standard. All applicable control measures must remain in effect in order to assure continued attainment of the state ambient air quality standards.

8.10 AIR QUALITY MONITORING

The CCAA amended certain sections of the California Health and Safety Code necessitating a program of adequate ambient air monitoring. A means of demonstrating progress toward attaining clean air goals is to document that both the number of violations of an air quality standard and maximum concentrations measured is decreasing.

The District has an established network of ambient air monitoring stations located in the following areas: Paso Robles, Atascadero, San Luis Obispo, Morro Bay, Grover Beach, Nipomo (town) and the Nipomo Mesa (rural). This network is described in further detail in Chapter 3 and provides a good record of air quality at those locations. However, as described in that chapter, air quality in some parts of the county remains undocumented. These gaps in the existing monitoring network cannot be filled without significant additional expenditure of financial and staff resources. Such resources are not expected to be available in the near future.

8.11 DISTRICT STAFF AND RESOURCES FOR IMPLEMENTATION

Implementation of this Plan will require a continuation of the significant efforts undertaken to implement the previously adopted Plans. Funding for these efforts is provided by District fees on existing and new permitted sources and by a portion of the motor vehicle registration fees allocated to APCDs by state law. It is not anticipated that additional staff will be needed to implement this Plan. Future staff and funding needs may increase, however, as we begin to develop and implement a plan to attain the state PM_{10} standards, or comply with other new programs required by state and federal laws.

Table 8 - 1

STATIONARY SOURCE CONTROL MEASURES ADOPTION AND IMPLEMENTATION SCHEDULE

#	TITLE OF MEASURE	ACTION REQUIRED	ADOPTION DATE	FULL IMPLEMENTATION
R-1	Agricultural Burning	Voluntary	n/a	1988
ARB	Phase II Vapor Recovery	Adopted	1989	1991
N-1	Coke Calcining	Adopted	1989	1989
NSR	New Source Review	Adopted	1991	1991
R-20	Auto Refinishing	Adopted	1996	1996
R-14	Consumer Products (ARB)	Adopted	1992	2000
N-11	Utility Fuel Combustion	Adopted	1993	2002
MP-1	Woodstoves	Adopted	1993	1993
R-21	Fugitive Emissions	Adopted	1993	1994
R-8	Storage Tanks	Adopted	1994	1996
R-17	Sumps in Oilfields	Adopted	1994	1996
R-12	Oil/Water Separators	Adopted	1994	1996
R-9	Landfill Gas Control	Adopted	1995	1998
R-11	Marine Tanker Loading	Adopted	1995	1997
N-2	Commercial Fuel Combustion	Adopted	1995	1997
N-5	Energy Conservation	Adopted	1995	Ongoing
N-12	Residential Natural Gas Combustion	Adopted	1995	1996
R-5	Bulk Gasoline Loading Racks	Adopted	1996	1997
N-14	Internal Combustion Engines	Adopted	1996	2000
R-23	Cutback Asphalt	Adopted	1997	1997
R-19	Metal Parts Coating	Adopted	1998	1998
R-13	Non-Ag Open Burning	Adopted	2000	2003
R-3	Architectural Coatings	Adopt new rule	2002	2004

Table 8 - 2

TRANSPORTATION CONTROL MEASURES ADOPTION AND IMPLEMENTATION SCHEDULE

NUMBER	TITLE	AGENCY	ACTION	ADOPTION	IMPLEMENTATION
T-1C	Voluntary Commute Options Program	APCD, Regional Rideshare, Ride-On Transportation	Employer Outreach	1996	on-going
T-1B	Campus-Based Trip Reduction Program	APCD, Cal Poly, Cuesta College	District and School Agreements	1996	on-going
T-2A	City Transit Improvements	City of SLO City of Paso Robles	Implement Short Range Transit Plan	1992	on-going
T-2B	Regional Transit	SLORTA/SLOCOG	Implement RTP, Short-Range Transit Plan	1992	on-going
T-3	Bicycling and Bikeway Enhancements	Local Government, Caltrans, SLOCOG	RTP, Bikeway Plans, Circulation Elements	1992	on-going
T-4	Park and Ride Lots	Local Government, Caltrans, SLOCOG	RTP, Bikeway Plans, Circulation Elements	1992	on-going
T-5	Motor Vehicle Control/ Inspection Program	Air Resources Board, Bureau of Automotive Repair	Statewide program	1989	on-going
T-6	Traffic Flow Improvements	Caltrans, Local Government	Construct needed facilities	1992	on-going
T-8	Telecommuting, Teleconferencing, and Tele-learning	APCD, Local Government, Public Schools, Caltrans, SLOCOG	Voluntary program	1997	on-going

Table 8 - 3

LAND USE PLANNING STRATEGIES ADOPTION AND IMPLEMENTATION SCHEDULE

#	TITLE OF MEASURE	AGENCY	ACTION	ADOPTION	IMPLEMENTATION
L1	Planning Compact Communities	Local Government	General Plan and Land Use Ordinance Amendments	1993	on-going
L2	Providing for Mixed Land Use	" "	" "	1993	on-going
L3	Balancing Jobs and Housing	" "	" "	1994	on-going
L4	Circulation Management	Caltrans, SLOCOG, and Local Government	Land Use Elements and Ordinances, Regional Transportation Plans	1993	on-going
L5	Communication, Coordination, and Management	APCD, SLOCOG, Caltrans, and Local Government	Improved Consultation and Coordination on Programs, Plans and Projects	1992	on-going

Table 8 - 4

MEASURE ADOPTION AND IMPLEMENTATION SCHEDULE BY AGENCY

AGENCY	Pre-91	1991	1992	1993	1994	1995	1996	1997	1998	2000	2002
Air Pollution Control District	R-1	NSR	R-14	R-21	R-8	R-9	R-5	R-23	R-19	R-13	R-3
	N-1		L-5	N-11	R-12	R-11	N-14				
				MP-1	R-17	N-2	T-1C				
						N-5		T-8			
						N-12	R-20				
Local Government			T-2A	L-1	L-3			T-8			
			T-4	L-2							
			L-5	L-4							
			T-3								
			T-6								
SLO Council of Governments			T-2A	L-4	L-3			T-8			
(SLOCOG)			T-2B								
			T-3								
			T-4								
			T-6								
			L-5								
Caltrans			T-4	L-4							
			L-5								
			T-3								
			T-6								
SLO Regional Transit Agency (SLORTA)			T-2B								
College and University							T-1B	T-8			

Table 8 - 5

CONTINGENCY AND FURTHER STUDY MEASURES

STATIONARY SOURCE CONTROL MEASURES		ACTION REQUIRED	POTENTIAL REDUCTION
N-3	Commercial Marine Vessels - Fuel Combustion	Adopt New Rule	0.08 tons/day NOx
N-10	Onshore Drilling and Workover Rigs	Adopt New Rule	0.01 tons/day NOx
R-4	Asphalt Roofing Kettles	Adopt New Rule	Needs further research
R-6	Commercial Degreasing	Modify Rule 416	0.24 tons/day ROG
R-10	Marine Vessel Coatings	Adopt New Rule	0.002 tons/day ROG
R-15	Industrial Adhesives and Coatings	Adopt New Rule	0.17 tons/day ROG
R-18	Wood Furniture Manufacturing	Modify Rule 407	0.02 tons/day ROG
R-22	Cleaning of Organic Product Storage Tanks	Adopt New Rule	0.13 tons/day ROG
TRANSPORTATION CONTROL MEASURES			
T-12	Fleet Operator Clean Fuels Program	Adopt New Rule	0.04 tons/day ROG, NOx

CHAPTER 9
PUBLIC INFORMATION AND EDUCATION

INTRODUCTION

DESCRIPTION OF EXISTING PROGRAMS

NEW PROGRAMS PROPOSED FOR ADOPTION

IMPLEMENTATION AND FUNDING

9.1 INTRODUCTION

Providing public information and education to the individuals throughout San Luis Obispo (SLO) County is a integral component of the District's efforts to achieve California's air quality standards. Its importance is recognized in our mission statement, *"As stewards of healthful air, our mission is to realize and preserve clean air, promote community and individual responsibility for air quality through education, and to provide efficient and cost-effective service,"* and is a guiding principle for District activities. By increasing public awareness on the air quality issues occurring throughout SLO County, the District's goal is to motivate more individuals and organizations throughout our communities to assist in developing solutions to those issues.

In order to gather public support for the Clean Air Plan and to achieve the stated goals, the need for individual, group, and community responsibility to improving local air quality is emphasized. A key component of the CAP is a well-planned and effective Public Outreach Strategy and Action Plan. In fact, section 40918 (f) of the California Health & Safety Code requires that the CAP include: "Provisions for public education programs to promote actions to reduce emissions from transportation and area wide sources." The integration of public outreach programs with transportation, land use management, and indirect source review programs is essential to their acceptance and success.

9.2 DESCRIPTION OF EXISTING PROGRAMS

Annually the District's Public Education and Public Information (PEPI) Team develops the Public Outreach Strategy that identifies the primary outreach objectives, key audiences, outreach tactics and evaluation protocol on which to focus resources throughout the fiscal year. The outreach goals center on increasing air quality awareness amongst the general public, as well as targeting individual segments of the population such as outreach to children and the Latino community. The Public Outreach Strategy also includes plans to assist the District with implementation of rules and regulations.

A Public Outreach Action Plan is developed for each of the goals included in the Public Outreach Strategy. This plan list out the specific programs to be implemented and evaluated throughout the year. A critical component to the Outreach Strategy is the tracking and evaluation process. This allows the District to identify the number of people reached with each outreach program and to measure public awareness, attitudes and actions.

The following programs listed below provide background information, current issues and ideas for public participation pertaining to many air quality topics.

Community Outreach & Events

Since August 1995, the District has been providing presentations to numerous civic groups, community organizations and local schools from third grade to college level. District staff present an overview of air quality in San Luis Obispo County and identify specific practices citizens cam embrace to assist the District in achieving air quality goals. The District's "Clean Air...Everyone's Business" video, supplementary brochures and educational materials accompany the presentations.

Several APCD staff participate on the District's "Speaker's Bureau," which provides speakers on an ad hoc basis for many different types of functions and events. Speaker requests range from panelists for scientific forums to lunchtime speakers for civic groups. The District also places a high value on responding to educational requests and provides speakers for presentations to grade schools and classroom lectures to college students.

To make our message more accessible to younger children, District staff created a character called "Professor Ozone." This "scientist" informs and entertains children by guiding them through a recipe for "Smog Soup", and then explains what changes in the recipe would create a cleaner, more pleasant version of the soup. Professor Ozone has appeared before numerous elementary school classes and community youth organizations throughout the county, and continues to receive requests for appearances.

By partnering with local organizations and governmental agencies, the District participates in a variety of educational and environmental forums throughout the county to promote programs relating to clean air. We have been a long time sponsor of the annual Earth Day celebrations held each April, Clean Air Month observed each May, and Rideshare Week in October. We also sponsor and are an active participant in Pollution Prevention Week, held in September, which recognizes businesses and organizations for proactive efforts to reduce air pollution at the source before it is generated.

The District is actively involved in the planning and sponsoring of these events. Activities are varied and have included speaker's forums, electric bicycle test-drive, bike tune-up and safety clinics, clean-fueled vehicle demonstrations, free bus/shuttle transportation, and air quality information displays. The District's public information booth, replete with informational posters, brochures and an interactive air quality game, invites and encourages the public to learn more about air quality issues and how they can help protect the air we share.

"Bikefest" is an annual event that is co-sponsored by the District and the County Rideshare Office. This event promotes bicycling as a viable commute mode as well as healthy, environmentally friendly recreation. All ages are encouraged to participate. Incentives such as T-shirts, bike water bottles, and bike helmets for riders under 18 years of age have been distributed free of charge to participants at previous events.

The District designed and funded an interactive Clean Air Exhibit for the San Luis Obispo Children's Museum. This booth was created to help parents and their children understand how their transportation choices impact air quality, and what they can do to help protect the air. It is estimated that more than 50,000 children and adults visit the Children's Museum each year.

The 2000 Census Report concluded that the Latino population is the fastest growing ethnic group in California; in San Luis Obispo County, Latino's now comprise over sixteen percent of the population. To respond to the growing population, in 2000 the District launched it's first ever Latino Outreach Project, a six month outreach program that focused on two cities in the south county. A "foto novella" styled brochure was developed in both English and Spanish to introduce the District and explain the recently adopted Backyard Burn Rule. In addition to the brochure, posters and flyers were also designed and disseminated at Health Fairs, service organizations and common marketplaces in the communities. A telephone line was installed to receive calls from Spanish speaking individuals and in-field translation services were secured to assist the District in our efforts. Television and radio public service announcements were also aired to expand awareness within the Latino community countywide.

Publications

Since 1980, the *Quarterly Report* summarized the District's air monitoring data, special projects, and the activities of the planning, engineering, enforcement, and technical services divisions. In 1993, the District modified the format of the *Quarterly Report* into a four to six page newsletter called *Clear Vision*. Each edition includes features on current air quality issues and upcoming events, a message from the Director, information on alternative transportation, and a summary of air quality measurements at our monitoring stations. Currently, *Clear Vision* is distributed to approximately 260 organizations and individuals, including the media, industries, environmental groups, local government agencies, cities and the general public.

Each year, an *Annual Air Quality Report* is produced describing the results of air monitoring in the county during the previous calendar year. This informative document provides graphics and text descriptions of the air quality at each monitoring station, including where and when exceedances of health standards have occurred, and an analysis of significant pollutant trends over the past 10 years. The *Annual Report* is distributed to the media, local jurisdictions, public agencies, California Air Resources Board (ARB), Environmental Protection Agency (EPA), local industry and the general public.

A resource guide for employers participating in the Transportation Choices Program has been developed and distributed to all employers with 50 or more employees. This user-friendly handbook describes the various transportation alternatives available and provides useful information on benefits, incentives, potential candidates, minimum requirements and associated support services for each option described. Transportation Choices Information Centers are also provided to large employers as a convenient way for commuters to get vanpool schedules, bus schedules and other transportation information while at work.

The District continues to update and produce a series of informational brochures on APCD operations and local air quality issues to assist the District's efforts to implement rules and clean air programs. These brochures have a common graphic theme, and include such topics as: SLO *County APCD: Who Are We, and What Do We Do*; *Asbestos Compliance*; *Permits*; *Notices Of Violation, and The Outdoor Burn Rule*. We have also produced three citizen action brochures entitled *10 Tips On How You Can Clear the Air*, and *Woodburning Tips, and Alternatives to Burning*. As part of the District's Latino Outreach Pilot Project, a Spanish brochure *El Aire Limpio nos Beneficia a Todos* was developed to introduce the Spanish-speaking community to the District and expand awareness on the Backyard Burn Rule. Compliance assistance booklets published by the ARB are also distributed to the public on such topics as agricultural burning, vapor recovery at gasoline stations, coating of metal and plastic parts, and others.

All of the air quality brochures, newsletters and the annual report are available free to the public and can be picked up at the District office or on our website. Also available at the SLO County Local Resource Display is a short synopsis of air quality in the county describing general trends, meteorology and major emission sources.

World Wide Web

In 1996, the District initiated efforts to obtain a presence on the Internet with the introduction of a District website. Recently revamped and expanded, this user-friendly site provides information on APCD operations, upcoming meetings and events, Board meeting summaries and agendas, downloadable forms and applications to aid businesses, a staff contact list, grant information, links to related websites, and a variety of other useful information on different air quality topics and issues. Located at www.slocleanair.org, the website is updated frequently and continues to grow as an integral means for the District to disseminate air quality information to businesses, media and the public at large.

Media Relations

Press releases are issued by the District on an "as needed" basis to inform and educate the public on local air quality issues, special programs or projects, upcoming meetings and other newsworthy information. Local print and broadcast news media often follow up the press releases with more in-depth stories or with special feature articles on particular issues. A weekly ozone report with information about current levels of ozone monitored at four different county locations has been published in The Tribune newspaper since 1989.

Identity and Image

The District's logo is incorporated into all District publications, letterhead, and outreach materials to ensure a consistent, professional image and style. The logo design is readily identifiable and provides an immediate association with the APCD and air quality to the viewer. The District is also planning other graphic aids such as bumper stickers and posters to promote different aspects of the Clean Air Plan and our agency mission.

9.3 NEW PROGRAMS PROPOSED FOR ADOPTION

Only a fully aware and informed public can make intelligent choices about critical issues that affect their lives. Therefore, it is important that new publications and outreach programs be developed to inform the public about critical air quality issues. These programs should be designed to motivate people to integrate positive attitudes and behaviors regarding air quality into their daily lives. Only with the public's assistance can we reach the goals in the Clean Air Plan, providing cleaner, healthier air for everyone.

Community Outreach

Through the PEPI Team, the District updates the annual Public Outreach Strategies to promote different air quality programs each year that will increase public awareness regarding the importance of, and their role in, preserving clean air as a resource for San Luis Obispo County. Depending on the District's top priorities for any given year, programs might include topics such as transportation alternatives, clean car awareness, pollution prevention, global warming and other issues of current concern. Promotional efforts will include radio, television and print advertisements, public forums, website postings, email list-serve, literature publication and distribution, and other outreach tools.

Partnering with community-based organizations and local governments (e.g., American Lung Association, Community Health Commission, SLO Regional Rideshare, etc.) allows the District to apply our limited resources collectively and expand an outreach program to reach a larger audience. By joining efforts with Cal Poly and Cuesta College, the District can work effectively with faculty and students to develop and implement outreach materials to be used on a number of air quality programs throughout the County.

After successful completion of the Latino Outreach Pilot Project in 2001, the District needs to build on this effort and incorporate Latino outreach as a standard element of our Public Outreach Action Plan.

With the rapidly increasing use of the web by the general public, community organizations, governmental agencies and industries, the District will be updating our website presence to maximize the use of our site. Adding new sections such as the Kid Zone will complement the District's efforts to better reach target audiences.

In addition to these outreach programs the District can gain further public support in the county by taking part in annual community events such as the California Mid-State Fair in Paso Robles, Mission Plaza events in San Luis Obispo, and business fairs held throughout the county.

Educational Programs

The future rests in our children. Attitudes and behaviors that are begun today will become habits they will carry with them throughout their lives. Outreach to schools should be seen as a high priority when planning for the future of our county. Personal contact with representatives of the County Superintendent of Schools Office, as well as school districts and individual schools is essential to the success of such

programs. Through the County Office of Education's Curriculum Committee the District can work to secure an air quality curriculum in schools countywide. In addition, an updated educational display is needed at the local Children's Museum.

A wide variety of air quality educational resources are available to curriculum specialists, principals, and teachers. These include our speaker's bureau; the "Clean Air...Everyone's Business" program for grades 7-12; "Think Earth", a K-6 curriculum on land, air, water, and energy; and "Transportation Tips", a program that encourages walking, biking, and carpooling with special emphasis on bike safety, available for grades K-3, 4-8, and 9-12. In addition, the District has developed four separate air quality curriculum that are designed for grades K – 6. These teacher resources, as well as other kid-focused materials, will be available on the District's new website.

The District will also sponsor special environmental contests and promotions and will work with teachers to provide ideas, materials, and support for classroom or school-wide projects. One potential project entails soliciting children's artwork for a calendar promoting alternative transportation choices, similar to those developed in other districts.

Earth Day and Clean Air Month activities will continue to be an exciting opportunity to reach large sections of the public due to the established tradition and excellent media coverage it has generated. Speakers, demonstrations, clean air promotions, and environmental forums during annual celebration will continue to be important elements of the education program.

New Publications

Several new publications will be designed and a distribution system developed to reach the appropriate target audience. All new publications will be printed on recycled paper whenever possible to provide a positive model of conservation in action.

New publications will include the following:

- Clean Car Awareness: information on new vehicle emission standards as well as driving and vehicle maintenance tips.

- Smart Growth Brochure: introduction to land use practices, transportation infrastructure and the overall impact on air quality

- "Who We Are" Brochure: update the general APCD brochure in both English and Spanish

- Global Warming Brochure: causes and solutions for global warming and stratospheric ozone depletion

Media Relations

A major avenue for community outreach and program promotion is through television, radio, and print media. The District can continue to expand its audience by providing additional public service announcements, publicizing events on community calendars, issuing press releases and participating in talk show interviews about general and specific air quality issues.

9.4 IMPLEMENTATION AND FUNDING

The public information and education program is an integral element of this Plan and will help contribute to its success. To meet the needs of implementing the public education program, the District employs a public information officer. The PEPI team assists this individual in developing, implementing, and presenting the various components that have been described above.

In order to reach students as efficiently as possible, the District will provide teachers with information, materials, and resources at the Science Cooperative for Outstanding Public Education teacher training workshops. We are fortunate in this area to have a pool of resources to draw from at Cal Poly State University. Senior project students, teaching credential candidates, interns, and volunteers will be sought to assist in all phases of our information and education programs.

Funding is programmed into our annual budget on an ongoing basis to support our public information and education programs. Additional funding will be sought from nonprofit groups, local, state, and federal government grants, as well as private funding sources.

As the public information and education program is implemented, accurate records need to be kept on all phases of design, promotion, and presentation to facilitate critique of the program as a whole. Opportunities for public feedback and suggestions have been designed into each program element to ensure that our program is responsive to the needs and interests of the community. From that standpoint, development of our public information and education program should be an ongoing creative and dynamic process that adjusts to the needs of the public and to the changing nature of air quality issues as we work to achieve the goals of the Clean Air Plan.