# CHAPTER 6
# CLEAN AIR ACT REQUIREMENTS

**Introduction**

**Federal Clean Air Act Requirements**

**California Clean Air Act Requirements**

## INTRODUCTION

The purpose of the 2003 Revision to the AQMP for the South Coast Air Basin is to set forth a comprehensive program that will lead the Basin and those portions of the Salton Sea Air Basin under the District's jurisdiction into compliance with all federal and state air quality planning requirements. Specifically, the 2003 AQMP revision is designed to satisfy the California CAA triennial update requirements and fulfill the District's commitment to update transportation emission budgets based on the latest approved motor vehicle emissions model and planning assumptions. The Plan will be submitted to U.S. EPA as SIP revisions once approved by the District's Governing Board and CARB.

## FEDERAL CLEAN AIR ACT REQUIREMENTS

In November 1990, Congress enacted a series of amendments to the CAA intended to intensify air pollution control efforts across the nation. One of the primary goals of the 1990 CAA Amendments was an overhaul of the planning provisions for those areas not currently meeting NAAQS. The CAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and an attainment demonstration, and incorporates more stringent sanctions for failure to attain or to meet interim milestones. There are several sets of general planning requirements, both for nonattainment areas [Section 172(c)] and for implementation plans in general [Section 110(a)(2)]. These requirements are listed and briefly described in Chapter 1 (Tables 1-4 and 1-5). The general provisions apply to all applicable pollutants unless superseded by pollutant-specific requirements.

The following sections discuss the federal CAA requirements for PM10, ozone, CO, and $NO_2$.

### PM10 Planning Requirements

Results of ambient air quality monitoring data indicate that the Basin exceeds federal and state standards for PM10. These microscopically fine particles can originate from several industrial processes, including direct emissions and atmospheric chemical reactions which convert gases into particles (referred to as "secondary" particulates), and from a variety of fugitive dust sources, both natural and man-made. In the western portions of the Basin, secondary particulates account for about 45 percent of the annual average PM10, while soil and reentrained dust (referred to as "fugitive dust") accounts for about 30 percent. In the eastern portion of the Basin, the contributions from secondary particulates and fugitive dust are approximately 40 percent each. Mobile sources also contribute directly to ambient PM10 levels through tailpipe emissions and, indirectly, through resuspension of road dust.

Under the 1990 CAA Amendments, the South Coast Air Basin was originally classified as a "moderate" PM10 nonattainment area. In response to SIP submittal requirements of the CAA for "moderate" areas, the District submitted applicable portions of the 1991 AQMP to the U.S. EPA prior to the November 15, 1991 statutory deadline. In accordance with the CAA requirements for moderate PM10 nonattainment areas, the moderate area PM10 SIP submittal proposed the implementation of "reasonably available control measures" (RACM) for fugitive dust sources, and relied upon the AQMP for reductions in precursor gaseous emissions as part of the ozone attainment plan. In February 1993, EPA reclassified the Basin from a "moderate" to a "serious" nonattainment area for PM10. The moderate area SIP further showed that the complexity of the problem was of sufficient magnitude that the PM10 standards could not be attained by 2001 -- the deadline for serious nonattainment areas. The CAA provides a maximum five-year extension to the attainment date for those areas that cannot meet the 2001 date after all best available control measures (BACM) have been implemented by 1997; thus making 2006 the latest attainment year possible. The District had previously shown in the 1997 AQMP and 2002 update that it will need until 2006 to meet the federal PM10 standards.

## Current PM10 Requirements

For areas such as the Basin that are classified as serious nonattainment for PM10, Section 189(b)(3) defines major PM10 sources that would be subject to CAA major source requirements. Sections 189(b)(1)(B) and 189(e) of the CAA require the implementation of "best available control technology" (BACT) for point sources of PM10 and precursor emissions (i.e., precursors of secondary particulates) and BACM for area sources of fugitive dust. It should be noted that federal BACT is equivalent to California best available retrofit technology (BARCT). U.S. EPA guidance[1] also states that, in instances where mobile sources contribute significantly to the area's exceedance of federal PM10 standards, transportation control measures (TCMs) are also to be included as part of the PM10 SIP submittal. The CAA requires an attainment demonstration for PM10 as well as the establishment of emission reduction milestones (CAA Section 189(b)(1), 189(c)(1)). Lastly, contingency measures for PM10, in the event of failure to meet emission reduction milestones or achieve attainment, are also required as part of the SIP submittal (CAA Section 172(c)(9)).

[1] U.S. EPA, State Implementation Plans for Serious PM-10 Nonattainment Areas, and Attainment Date Waivers for PM10 Nonattainment Areas Generally; Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, Federal Register, pp. 41998-42017, August 16, 1994.

### *Major PM10 Source Requirements*

Section 189(b)(3) of the CAA defines a major source of PM10 as any stationary source that emits or has a potential to emit at least 70 tons per year of PM10. These major sources then would be subject to major source requirements contained in the CAA. District Rule 1302(p) defines major PM10 sources in accordance with the CAA, making them subject to the major source requirements under New Source Review.

### *BACT for Point Sources*

As mentioned in the 1994 and 1997 AQMPs, BACT for point sources of PM10 and PM10 precursors is presently addressed through the District's NSR and RECLAIM programs (District Rules 1303 and 2005).

### *BACM for Fugitive Dust Sources*

For fugitive dust sources, the selection of BACM to be implemented must be based on a combination of technical feasibility, cost-effectiveness, and energy/environmental considerations. The District developed a list of candidate BACM as part of the 1994 PM10 BACM SIP submittal. These measures were refined and updated for the 1997 AQMP:

| | | |
|---|---|---|
| CM #97BCM-01: | Paved Roads | |
| | 1a | Minimal Track-Out |
| | 1b | Routine Street Cleaning |
| | 1c | Post Event Street Cleaning |
| | 1d/1e | Curbs and Gutters / Chemical Stabilization of Unpaved Road Shoulders |
| CM #97BCM-02: | Construction/Demolition Activities<br>Wider Application of Dust Control Plans | |
| CM #97BCM-03: | Unpaved Roads<br>Paving/Chemical Treatment/Speed Reductions | |
| CM #97BCM-04: | Agricultural Activities<br>Soil Conservation Plans | |
| CM #97BCM-05: | Miscellaneous Sources<br>Controls on Weed Abatement | |
| CM #97BCM-06: | Further Emission Reductions from Fugitive Dust Sources to Meet Best Available Control Measures Requirements (RACM to BACM Upgrade) | |

The District committed to adopt all identified candidate BACM via rulemaking action by December 31, 1996 and implement these BACM by February 8, 1997. Based on the revised emissions inventory and other available information, each of the candidate BACM were evaluated for cost-effectiveness and control efficiency. The District

completed the BACM technological and cost feasibility analysis prior to July 1996. BCM-01(a/b/c), BCM03, BCM-04, and BCM-06 met both the technological and cost feasibility criteria and were adopted in February 1997 through amendments to Rule 403 - Fugitive Dust and new Rule 1186 – PM10 Emissions from Paved and Unpaved Roads and Livestock Operations. The District identified the candidate BACM not meeting either the technological or cost feasibility criteria. Those measures were CTY-12 (formerly BCM-01d/e), CTY-13 (formerly BCM-02), and CTY-14 (formerly BCM-05). Contingency Measures 97CTY-12 and 97CTY-13 were adopted in February 1997 as contingency actions in Rules 403 and 1186. CTY-14 remains a contingency measure in the 2003 AQMP.

The 2003 AQMP includes two new BACM: BCM-07 - Further Emission Reductions from Fugitive Dust Sources and BCM-08 - Further Emission Reductions from Aggregate and Cement Manufacturing Operations. BCM-07 proposes to review existing District BACM regulations to consider enhancements that would further reduce PM10 emissions from fugitive dust sources. Additionally, the BACM review will consider regulations for specific geographic areas based on soil type, wind conditions, and source extent. As this control measure may address fugitive dust sources in localized areas, it is also intended as a means to ensure compliance in those areas that are subject to high levels of PM10. BCM-08 proposes to establish prescriptive measures to control fugitive dust from area sources within aggregate facilities and cement plants as well as evaluate whether additional controls are necessary for the control of PM10 for sources at aggregate and cement manufacturing plant operations subject to District Rule 404 - Particulate Matter - Concentration, Rule 405 – Solid Particulate Matter - Weight, and Rule 1112.1 - Emissions of Particulate Matter From Cement Kilns.

### *Transportation Control Measures*

Transportation control measures meeting the CAA requirements have been submitted in previous SIPs, including the 1994 and 1997 California Ozone SIP. Updated transportation control measures necessary for attainment of the federal PM10 and ozone standards are described in Appendix IV-C.

### *PM10 Attainment Demonstration*

Section 189(b)(1)(a) of the CAA requires a PM10 attainment demonstration. The results of the attainment demonstration are summarized in Chapter 5. The air quality modeling used for the PM10 attainment demonstration is described in Appendix V.

### *Establishing PM10 Milestone Targets*

Section 189(c) of the CAA requires the establishment of PM10 milestone targets. The 2003 AQMP establishes targets for 2003 and the attainment year of 2006. The PM10 milestone targets are shown in Table 6-1.

**TABLE 6-1**

PM10 Attainment Year Targets
(Annual Average - Tons per Day)

| Pollutant | 2003 | 2006 |
|---|---|---|
| PM10 | 292 | 292 |
| NOx | 1,048 | 935 |
| SOx | 58 | 57 |
| VOC | 804 | 673 |

***Contingency Measures for PM10***

The federal CAA requires PM10 contingency measures to be implemented in the event of failure to meet milestone emission reduction targets and/or failure to attain the standard by the attainment date in 2006 (CAA Section 172(c)(9)). The PM10 contingency measures are those BACM measures that have failed either the technical feasibility or cost-effectiveness criteria or both. As discussed above, Rules 403 and 1186 contain contingency actions (based on Contingency Measures 97CTY-12 and 97CTY-13) to be implemented to meet CAA requirements. CTY-14 is the only remaining contingency measure for PM10 carried over from the 1997 AQMP. In addition to the fugitive dust contingency measures, other contingency measures for ozone serve as contingency for PM10 to reduce VOCs and NOx which are precursors to particulate organics and nitrates. Further, 2003 AQMP Contingency Measure CTY-01-Accelerated Implementation of Control Measures, includes measures that reduce PM10 and PM10 precursors. The full descriptions of each of the contingency measures are contained in Appendix IV-A, Section 2.

## Ozone Planning Requirements

This section describes how the 2003 AQMP meets the major ozone planning requirements of the federal CAA for the South Coast Air Basin. The requirements specifically addressed here are:

1. the post-1996 VOC rate-of-progress requirements,
2. the ozone attainment demonstration,
3. the contingency measure requirements, and
4. the average vehicle occupancy requirement.

## Post-1996 VOC Rate-of-Progress

The reasonable further progress requirements in the CAA are intended to ensure that each ozone nonattainment area provide for sufficient precursor emission reductions to attain the ozone national ambient air quality standard. More specifically, Section 182(c)(2) requires that each serious and above ozone nonattainment area achieve actual VOC emission reductions of at least three percent per year averaged over each consecutive three-year period beginning six years after enactment of the Act until the area's attainment date (i.e., November 15, 2010 for the South Coast Air Basin). This is called the "post-1996 rate-of-progress" requirement of the CAA.

According to Section 182(c)(2)(C), actual NOx emission reductions which occur after 1990 can be used to meet post-1996 VOC emission reduction requirements provided the NOx reductions satisfy the following criteria. First, the control strategy used to demonstrate attainment must consist of both VOC and NOx control measures. More specifically, the mix of VOC and NOx emission reductions used to satisfy the post-1996 rate-of-progress requirements of the CAA must be consistent with the controlled VOC and NOx emission levels used in the modeling demonstration. And lastly, the combined annual VOC and NOx reductions must average three percent per year. As discussed below, since the baseline VOC emissions are below the overall target levels for the milestone years 2005 and 2008 there is no need for NOx substitution in those years; NOx substitution is only necessary in 2010.

The 2003 AQMP post-1996 rate-of-progress demonstration for the Basin is presented in Tables 6-2 and 6-3a and 6-3b and Figures 6-1a and 6-1b. These tables and figures depict the VOC and NOx emission target levels and the projected baseline for 2005, 2008, and 2010, respectively. Controlled emission levels are not shown since the VOC and NOx emission reductions from existing District and CARB rules, included in the projected baseline, are sufficient to meet the CAA rate-of-progress.

For the milestone years 2005 and 2008, the baseline VOC emission levels are below the target levels. In 2010, however, the VOC reductions in the baseline are insufficient and NOx substitution is necessary and allowed according to Section 182(c)(2)(C) of the CAA. The proposed reduction rates for milestone years are shown in Table 6-2. These rates are determined by applying all the creditable VOC reductions at each milestone and providing sufficient NOx reductions to satisfy VOC reduction requirements of Section 182(c)(2).

## TABLE 6-2

Percent of VOC and $NO_x$ Emission Reductions from the 1990 Baseline to Meet the Post-1996 Rate-of-Progress Requirements

| Year | VOC | NOx | CAA* |
|---|---|---|---|
| 2005 | 42.0 | 0.0 | 42.0 |
| 2008 | 51.0 | 0.0 | 51.0 |
| 2010 | 55.0 | 2.0 | 57.0 or attainment |

* The percent VOC and NOx reductions must equal the CAA percent reduction requirements listed here.

## TABLE 6-3A

Summary of Rate of Progress Calculations - VOC

| ROW | CALCULATION STEP [a] | 2005 | 2008 | 2010 |
|---|---|---|---|---|
| 1 | 1990 ROP Base Year [b] | 1869.8 | 1869.8 | 1869.8 |
| 2 | FMVCP/RVP [c] Reductions | 373.6 | 386.1 | 390.5 |
| 3 | Adjusted 1990 Base Year [d] | 1496.2 | 1483.7 | 1479.3 |
| 4 | Required Reduction (%) [e] | 42.0 | 51.0 | 55.0 |
| 5 | Emission Reductions [f] | 628.4 | 756.7 | 813.6 |
| 6 | RACT Corrections | 0.0 | 0.0 | 0.0 |
| 7 | I/M Corrections | 0.0 | 0.0 | 0.0 |
| 8 | Target Level [g] | 867.8 | 727.0 | 665.7 |
| 9 | Projected Baseline [h] | 752.1 | 687.3 | 659.4 |

[a] Units are in tons per day unless otherwise noted; [b] Contains only anthropogenic emissions;
[c] FMVCP/RVP = Federal Motor Vehicle Control Program/Reid Vapor Pressure; [d] (Row 1) – (Row 2)
[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NOx reductions) thereafter from the adjusted 1990 baseline year; [f] [(Row 3) x (Row 4)]/100; [g] (Row 3) – (Row 5) – (Row 6) – (Row 7); [h] Projected baseline emissions shown in Appendix III taking into account existing rules and projected growth. It includes emission reduction credits.

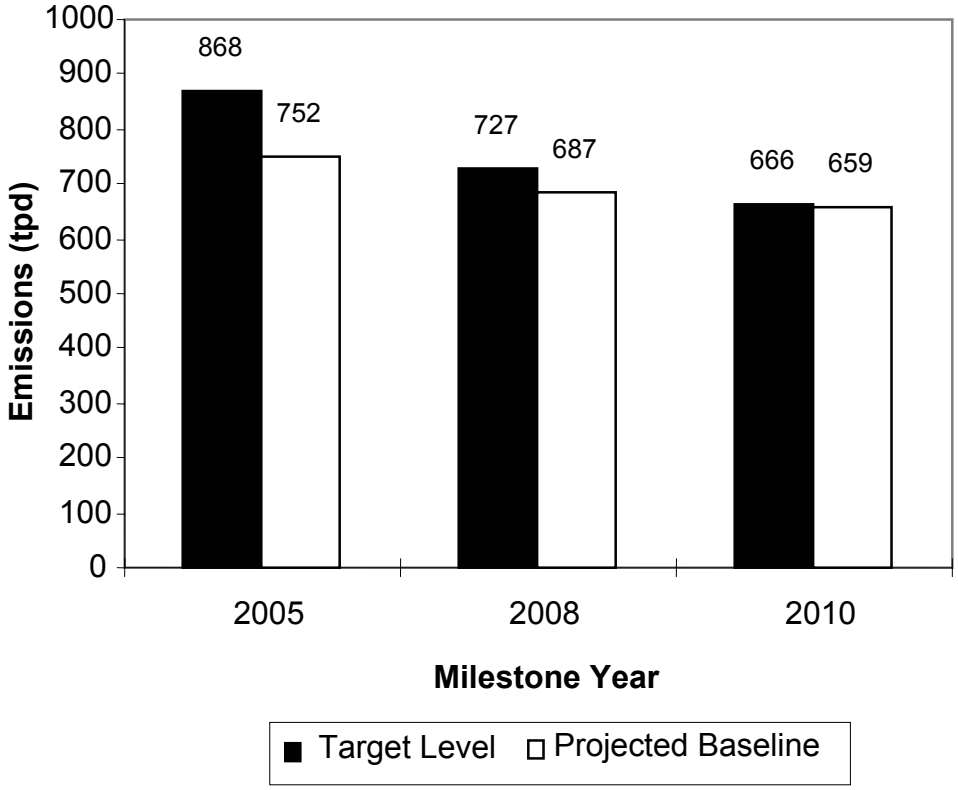



**FIGURE 6-1a**
Post-1996 Rate of Progress - VOC

**TABLE 6-3b**
Summary of Rate of Progress Calculations - NOx

| ROW | CALCULATION STEP [a] | 2005 | 2008 | 2010 |
|---|---|---|---|---|
| 1 | 1990 ROP Base Year [b] | 1546.4 | 1546.4 | 1546.4 |
| 2 | FMVCP/RVP [c] Reductions | 0.0 | 0.0 | 0.0 |
| 3 | Adjusted 1990 Base Year [d] | 1546.4 | 1546.4 | 1546.4 |
| 4 | Required Reduction (%) [e] | 0.0 | 0.0 | 2.0 |
| 5 | Emission Reductions [f] | 0.0 | 0.0 | 30.9 |
| 6 | RACT Corrections | 0.0 | 0.0 | 0.0 |
| 7 | I/M Corrections | 0.0 | 0.0 | 0.0 |
| 8 | Target Level [g] | 1546.4 | 1546.4 | 1515.5 |
| 9 | Projected Baseline [h] | 951.6 | 854.2 | 763.8 |

[a] Units are in tons per day unless otherwise noted; [b] Contains only anthropogenic emissions;
[c] FMVCP/RVP = Federal Motor Vehicle Control Program/Reid Vapor Pressure; [d] (Row 1) – (Row 2)
[e] 24% VOC reduction by 1999 and 3% per year (total VOC and NOx reductions) thereafter from the adjusted 1990 baseline year; [f] [(Row 3) x (Row 4)]/100; [g] (Row 3) – (Row 5) – (Row 6) – (Row 7); [h] Projected baseline emissions shown in Appendix III taking into account existing rules and projected growth. It includes emission reduction credits.

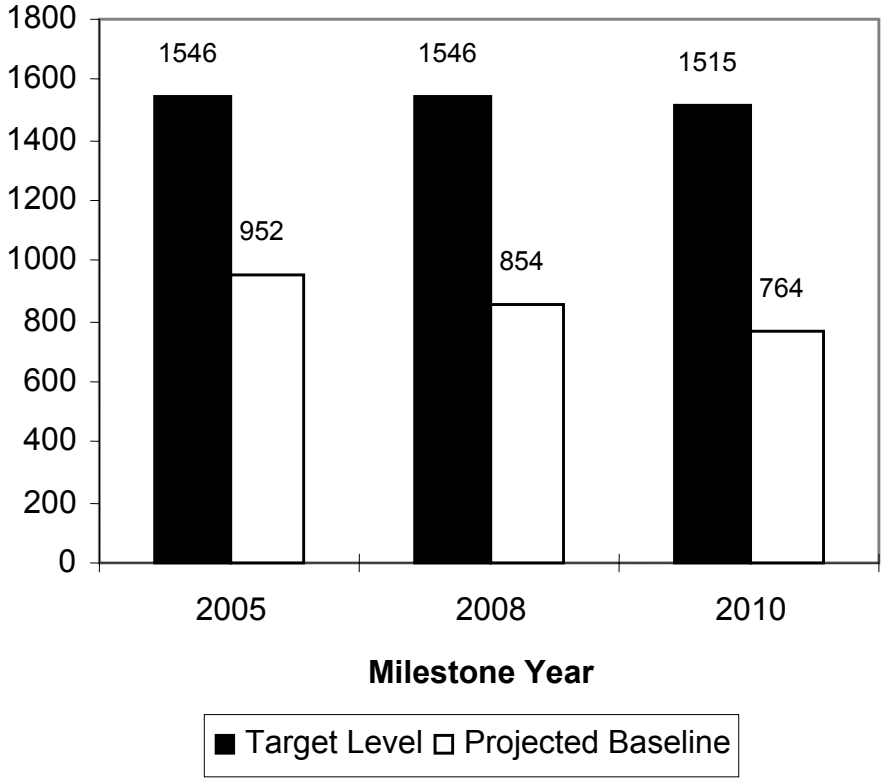



**FIGURE 6-1b**
Post-1996 Rate of Progress – NOx

## Ozone Attainment Demonstration

Under the federal CAA, air quality modeling is an integral part of the planning process to achieve clean air. Specifically, Section 182(b)(1)(A) requires that moderate and above ozone nonattainment areas must reduce VOC and $NO_x$ emissions sufficiently to attain the national ambient air quality standard for ozone. It is not sufficient for extreme ozone nonattainment areas to meet the post-1996 rate-of-progress requirements of the CAA; extreme ozone nonattainment areas, such as the Basin, must also demonstrate attainment by November 15, 2010. This may result in emission reductions in addition to those required by the reasonable further progress components of the CAA [i.e., Sections 182(b)(1) and 182(c)(2)]. A summary of the ozone attainment demonstration is provided in Table 5-2 of Chapter 5. The ozone attainment demonstration is fully described in Appendix V.

### Contingency Measures

Section 172(c)(9) of the 1990 CAA requires that the plan shall provide for implementation of specific measures in the event an area fails to make reasonable further progress or to attain the applicable standards by the specified dates. Such measures shall be included in the Plan revision as contingency measures to take effect without further action by the State or the Administrator. In addition to the contingency provisions required under Section 172(c)(9), Section 182(c)(9) requires the plan revision to provide for the implementation of specific measures to be undertaken if the area fails to meet any applicable milestone for ozone. Such measures must be included in the plan revision as contingency measures to take effect without further action by the State or the U.S. EPA Administrator upon a failure by the State to meet the applicable milestone. The contingency measures included as part of the 2003 AQMP are contained in Appendix IV-A, Section 2.

### Average Vehicle Occupancy Requirements (AVO)

Section 182 (d)(1)(A) of the CAA requires the District to include transportation control strategies and TCMs in the Plan that offset any growth in emissions from growth in vehicle trips and vehicle miles traveled and attain reduction of mobile source emissions. Such control measures must be developed in accordance with the guidelines listed in Section 108(f) of the CAA. The programs listed in Section 108(f) of the CAA include, but are not limited to, public transit improvement projects, traffic flow improvement projects, the construction of high occupancy vehicle (HOV) facilities and other mobile source emission reduction programs. The TCMs included in the 2003 AQMP (see Appendix IV-C) have been developed to meet the requirements of Section 182(d)(1)(A) and 108(f) of the CAA and include the capital-based and non-capital-based facilities, projects and programs contained in the Regional Mobility Element and programmed through the RTIP process. As an additional measure of reducing mobile source emissions, Section 182(d)(1)(B) of the CAA allows the implementation of employer-based trip reduction programs that are aimed at improving the average vehicle occupancy (AVO) rates. As an alternative to trip reduction programs, Section 182(d)(1)(B) also allows the substitution of these programs with alternative programs that achieve equivalent emission reductions. Rule 2202 - On-Road Motor Vehicle Mitigation Options, adopted in December 1995, was developed to comply with CAA Section 182(d)(1)(B); emission reductions from Rule 2202 are reflected in the baseline inventory.

## Carbon Monoxide Attainment Demonstration

The South Coast Air Basin has historically had a persistent CO problem. However, there has been considerable improvement in CO air quality in the Basin from 1976 to

2002. In 2001, the Basin met both the federal and state 8-hour CO standards for the first time at all monitoring stations. During a particularly stagnant morning in January 2002, however, the 8-hour federal standard was exceeded at one location. This was the only location and day exceeding the federal standard in 2002. Since the provision specified in the federal CAA defining attainment of the federal 8-hour average CO standard allows no more than one day and one location to exceed the standard in a two-year period, the Basin is currently in compliance with the federal 8-hour standard.

Based on the above, the 2003 revision to the CO Plan provides a dual purpose: it replaces the 1997 attainment demonstration that lapsed at the end of 2000, and it provides the basis for a CO maintenance plan in the future. Although the trend of reducing CO emissions is expected to continue, the 2003 AQMP does not include a request for EPA to consider re-designation of the Basin's CO attainment status at this time. A comprehensive discussion of the CO attainment demonstration is included in Chapter 5 and Appendix V.

Section 187(a)(3) of the 1990 CAA requires that adopted and enforceable contingency measures be included in the CO attainment demonstration plan submittal (see Appendix IV-A, Section 2). One contingency measure is included for CO attainment planning, to be implemented if the area fails to maintain the federal standard.

A list of the contingency measures developed for these CAA requirements is provided in Chapter 9.

## Nitrogen Dioxide Maintenance Plan

Under the CAA, an area can be redesignated as meeting attainment if, among other requirements, the U.S. EPA determines that the NAAQS have been attained. Section 175A of the CAA states that any district that submits a request under Section 107(d) for redesignation of a nonattainment area to attainment must submit a revision of the applicable SIP that provides for maintenance for at least 10 years after the redesignation. U.S. EPA guidance states that a determination of compliance with the NAAQS must be based on three complete, consecutive calendar years of quality-assured air quality monitoring data.

The federal annual $NO_2$ standard was met for the first time in 1992 and the standard has been met every year since. The South Coast Air Basin was redesignated as an attainment area in 1998. As such, based on the ambient nitrogen dioxide measurements and the demonstration shown in Chapter 5 that the Basin will maintain the federal nitrogen dioxide air quality standard with the projected baseline future-year emissions, this Plan serves as the Nitrogen Dioxide Maintenance Plan for the South Coast Air Basin.

## Transportation Conformity Budgets

The 2003 AQMP sets forth the strategy for achieving the federal one-hour ozone, PM10, and CO standards, and maintaining the federal $NO_2$ standard. For on-road mobile sources, Section 176(c) of the CAA requires that transportation plans and programs do not cause or contribute to any new violation of a standard, increase the frequency or severity of any existing violation, or delay the timely attainment of the air quality standards. In other words, on-road mobile sources must "conform" to the attainment demonstration contained in the SIP.

U.S. EPA's transportation conformity rule, found in 40 CFR parts 51 and 93, details the requirements for establishing motor vehicle emissions budgets in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP attainment demonstration. The on-road motor vehicle emissions budgets act as a "ceiling" for future on-road mobile source emissions. Exceedances of the budget indicate an inconsistency with the SIP, and could jeopardize the flow of federal funds for transportation improvements in the region. As required by the CAA, a comparison of regional on-road mobile source emissions to these budgets will occur during the periodic updates of regional transportation plans and programs.

The on-road motor vehicle emissions estimates for the 2003 AQMP were analyzed using the CARB's EMFAC2002 on-road mobile source emission factor model in conjunction with the most recent motor vehicle activity data from SCAG. Emissions forecasts were generated for the summer, winter, and annual average planning inventory using EMFAC2002 for each milestone and attainment or maintenance year. The ozone emissions budgets for VOC and NOx are derived from the summer planning inventory and the reductions from defined new measures in the 2003 SIP. The PM10 emissions budgets for PM10 and the PM10 precursors VOC and NOx, and are derived from the annual average planning inventory. The CO and $NO_2$ emissions budgets for CO and NOx, respectively, are both derived from the winter planning inventory. These budgets reflect existing control programs and new commitments for technology and transportation control measures.

The SIP emissions inventory includes both defined commitments to develop specific measures and less defined long-term strategies allowed under Section 182(e)(5) of the Clean Air Act, also known as the "black box." The emissions budgets factor in only on-road mobile source reductions from adopted measures and the defined commitments.

This SIP includes an overall emissions reduction commitment for the long-term State-local strategy under Section 182(e)(5) for all sources, including an extensive public process to identify specific measures. The plan does not allocate emission reductions by source sector. In 2006-2007, the carrying capacity will be reassessed and the black box further defined. At that time, the SIP will be revised to identify specific measures that

may affect on-road mobile, off-road mobile, stationary, and area-wide sources to fulfill the long-term obligation. The combination of emission reductions will depend on which new technologies prove feasible. Until these long-term measures are identified, the transportation emissions budget can only reflect the anticipated benefits of defined measures in this plan. In the next SIP revision, we will adjust the budgets to reflect the latest control strategy, including commitments for additional reductions from on-road motor vehicles.

This approach is consistent with U.S. EPA's transportation conformity rule, which provides that if emissions budgets rely on new control measures, these measures should be specified in the SIP and the emissions reductions from each control measure should be quantified and supported by agency commitments for adoption and implementation schedules. Moreover, the rule provides that conformity analyses by transportation agencies may not take credit for measures which have not been implemented unless the measures are "projects, programs, or activities" in the SIP supported by written implementation commitments by the responsible agencies (62 FR 43780, 40 CFR 93, subpart A).

The emissions budgets for ozone and PM10 are provided here for up to the respective attainment year. However, since transportation analyses are needed beyond the attainment dates, the carrying capacities for PM10 and ozone attainment demonstration also serve as the budgets for future years (e.g., 2010, 2020 and 2030 for PM10 and 2020 and 2030 for ozone). Ozone precursor emissions from motor vehicles are projected to continue declining through these extended periods. However, there is projected long-term growth in direct PM10 emissions due to increased vehicle travel on paved and unpaved roads.

To address this increase in primary PM10 emissions from travel while continuing to provide for attainment after 2006, this plan establishes a mechanism for conformity demonstration purposes based on the implementation of the new control measure, "Transportation Conformity Budget Backstop Control Measure" in which commitments are made to achieve additional primary PM10 reductions from transportation-related PM10 source categories in 2020 and 2030 to offset the increased emissions. Specifically, the measure is proposed to be adopted in 2019 and 2029 in order to achieve 9 and 16 tons per day of PM10 reductions in 2020 and 2030, respectively. This measure will be revised in future SIP revisions to reflect updated PM10 emission inventories and attainment demonstrations.

**TABLE 6-4**

Motor Vehicle Emissions Budgets: PM10 *
(Annual Average - Tons Per Day)

| | | 2003 | 2006 |
|---|---|---|---|
| **VOC** | Baseline EMFAC2002 | 315.8 | 263.8 |
| | SCAG TCM Benefits | 0.0 | -8.5 |
| | Adjusted Baseline EMFAC2002 | 315.8 | 255.3 |
| | South Coast AQMD Rule 2202 | -3.5 | -2.6 |
| | I/M Improvements | -1.9 | -2.6 |
| | Adjusted Inventory | 310.4 | 250.1 |
| | New Defined State Measures | 0.0 | 0.0 |
| | New Local Measures | 0.0 | 0.0 |
| | **Mobile Source Emission Budgets**** | **311** | **251** |

| | | 2003 | 2006 |
|---|---|---|---|
| **NOx** | Baseline EMFAC2002 | 641.8 | 562.9 |
| | SCAG TCM Benefits | 0.0 | -7.0 |
| | Adjusted Baseline EMFAC2002 | 641.8 | 555.9 |
| | South Coast AQMD Rule 2202 | -4.1 | -2.9 |
| | I/M Improvements | -2.8 | -4.1 |
| | Adjusted Inventory | 634.9 | 548.9 |
| | New Defined State Measures | 0.0 | 0.0 |
| | New Local Measures | 0.0 | 0.0 |
| | **Mobile Source Emission Budgets**** | **635** | **549** |

| | | 2003 | 2006 |
|---|---|---|---|
| **PM10** | Baseline EMFAC2002 | 18.9 | 19.9 |
| | SCAG TCM Benefits | 0.0 | -0.6 |
| | Adjusted Baseline EMFAC2002 | 18.9 | 19.3 |
| | South Coast AQMD Rule 2202 | -0.1 | -0.1 |
| | I/M Improvements | 0.0 | 0.0 |
| | Reentrained road dust (paved) | 136.8 | 134.9 |
| | Reentrained road dust (unpaved) | 9.7 | 8.7 |
| | Road Construction dust | 2.2 | 2.2 |
| | Adjusted Inventory | 167.6 | 165.0 |
| | New Defined State Measures | 0.0 | 0.0 |
| | New Local Measures | 0.0 | 0.0 |
| | **Mobile Source Emission Budgets**** | **168** | **166** |

* 2006 budget is applicable to all future years beyond 2006.
** Rounded up to the nearest ton.

**TABLE 6-5**

Motor Vehicle Emissions Budgets: Ozone
(Summer Planning - Tons Per Day)

| | | 2005 | 2008 | 2010 |
|---|---|---|---|---|
| **VOC** | Baseline EMFAC2002 | 267.5 | 233.6 | 208.6 |
| | SCAG TCM Benefits | 0.0 | -13.7 | -15.7 |
| | Adjusted Baseline EMFAC2002 | 267.5 | 219.9 | 192.8 |
| | South Coast AQMD Rule 2202 | -2.7 | -2.1 | -1.7 |
| | I/M Improvements | -2.7 | -2.2 | -1.9 |
| | Adjusted Inventory | 262.1 | 215.6 | 189.2 |
| | New Defined State Measures | 0.0 | 0.0 | -34.2 |
| | New Local Measures | 0.0 | 0.0 | 0.0 |
| | **Mobile Source Emissions Budgets**** | **263** | **216** | **156** |

| | | 2005 | 2008 | 2010 |
|---|---|---|---|---|
| **NOx** | Baseline EMFAC2002 | 552.9 | 474.9 | 413.9 |
| | SCAG TCM Benefits | 0.0 | -5.5 | -7.8 |
| | Adjusted Baseline EMFAC2002 | 552.9 | 469.4 | 406.0 |
| | South Coast AQMD Rule 2202 | -2.9 | -2.3 | -1.8 |
| | I/M Improvements | -4.2 | -3.7 | -3.4 |
| | Adjusted Inventory | 545.8 | 463.4 | 400.9 |
| | New Defined State Measures | 0.0 | 0.0 | -37.4 |
| | New Local Measures | 0.0 | 0.0 | 0.0 |
| | **Mobile Source Emissions Budgets**** | **546** | **464** | **364** |

** Rounded up to the nearest ton.

**TABLE 6-6**

Motor Vehicle Emissions Budgets: Carbon Monoxide
(Winter Planning - Tons Per Day)

| | | **2002** |
|---|---|---|
| **CO** | Baseline EMFAC2002 | 3402.4 |
| | SCAG TCM Benefits | 0.0 |
| | Adjusted Baseline EMFAC2002 | 3402.4 |
| | South Coast AQMD Rule 2202 | -41.9 |
| | I/M Improvements | 0.0 |
| | Adjusted Inventory | 3360.5 |
| | New Defined State Measures | 0.0 |
| | New Local Measures | 0.0 |
| | **Mobile Source Emission Budgets**** | **3361** |

** Rounded up to the nearest ton.

**TABLE 6-7**

Motor Vehicle Emissions Budgets: Nitrogen Dioxide *
(Winter Planning - Tons Per Day)

| | | **2003** |
|---|---|---|
| **NOx** | Baseline EMFAC2002 | 692.3 |
| | SCAG TCM Benefits | 0.0 |
| | Adjusted Baseline EMFAC2002 | 692.3 |
| | South Coast AQMD Rule 2202 | -4.4 |
| | I/M Improvements | -2.8 |
| | Adjusted Inventory | 685.0 |
| | New Defined State Measures | 0.0 |
| | New Local Measures | 0.0 |
| | **Mobile Source Emission Budgets**** | **686** |

* 2003 budget applicable to future years, including the last year of maintenance plan (i.e., 2010).
** Rounded up to the nearest ton.

## CALIFORNIA CLEAN AIR ACT REQUIREMENTS

The California Clean Air Act established a number of legal mandates to facilitate achieving health-based state air quality standards at the earliest practicable date. The following CCAA requirements are addressed in the remainder of this chapter:

(1) Demonstrate the overall effectiveness of the air quality program;

(2) Reduce nonattainment pollutants at a rate of five percent per year, or include all feasible measures and an expeditious adoption schedule;

(3) Ensure no net increase in emissions from new or modified stationary sources;

(4) Reduce population exposure to severe nonattainment pollutants according to a prescribed schedule;

(5) Include any other feasible controls that can be implemented, or for which implementation can begin, within 10 years of adoption of the most recent air quality plan; and

(6) Rank control measures by cost-effectiveness.

### Plan Effectiveness

The CCAA requires, beginning on December 31, 1994 and every three years thereafter, that the District demonstrate the overall effectiveness of its air quality program [H&SC 40924(b)]. Trends in the following air quality indicators are used to demonstrate the recent (i.e., for the three preceding years) effectiveness of the District's program:

(1) VOC, $NO_x$, and carbon monoxide (CO) emissions;

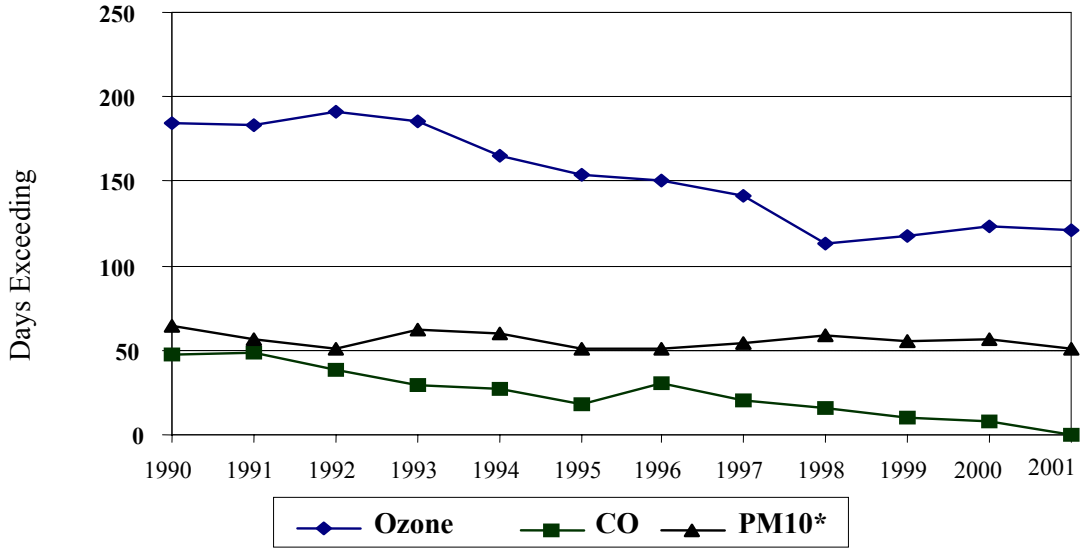
(2) ozone and CO exceedance days; and

(3) ozone and CO population exposure.

Trends in the Basin-wide annual average rate of reduction of VOC, $NO_x$, and CO emissions since 1997 are shown in Chapter 3. Since 1997, emissions of VOC, NOx, and CO have decreased on an annual basis by five percent, three percent, and six percent, respectively.

The number of days exceeding state standards in 1990 through 2001 for ozone, CO, and PM10 air quality is illustrated in Figure 6-2. Even over this relatively short time period, it is evident that air quality has improved in the Basin. Trends in $NO_2$ air quality are not shown in Figure 6-3; however, improvement in air quality relative to that pollutant is also evident and the region has been redesignated to attainment for the state $NO_2$ air

quality standard in 1996. The reader is referred to Appendix II for a more comprehensive discussion of local air quality trends.




*PM10 is normally measured every sixth day so actual number of days could be six times higher for the entire period

**FIGURE 6-2**

Days Exceeding State Standards

Trends in population exposure are shown in Table 6-8. Population exposure is a particularly good indicator of air quality trends since it takes into account spatial and temporal changes in air quality. For example, per-capita population exposure reflects the length of time the Basin population is exposed to unhealthful air quality. Table 6-8 shows the per-capita exposure to ozone and CO for the historical period 1986-88 and for the years 1993, 1995, 1997, and 2000. The per-capita levels shown in the table represent average exposure above the state 1-hour standard levels for each pollutant.

The table clearly shows that the per-capita exposure to ozone and CO has decreased dramatically since the 1986-88 period. The Basin is below the state 1-hour CO standard; therefore, the per-capita exposure to CO is zero.

**TABLE 6-8**

Trends in Annual Average Per-Capita Exposure to Ozone and CO
Based on 1-Hour Averages

| Period or Year | Annual Average Per-Capita Exposure Ozone (pphm-hrs) | CO (ppm-hrs) |
|---|---|---|
| 1986-88 | 198.5 | 8.4 |
| 1993 | 71.8 | 0.1 |
| 1995 | 46.6 | 0.0 |
| 1997 | 8.0 | 0.0 |
| 2000 | 4.6 | 0.0 |

In summary, the trends of all the indicators show improved air quality in the South Coast Air Basin; the population is being exposed to unhealthful air quality less and less each year. These air quality improvements are the direct result of AQMP implementation.

## Emission Reductions

"Planning" inventories are developed to characterize emissions during periods when air quality standards are exceeded and to serve as the basis for emissions reduction accounting (see Chapter 3). The planning inventories are higher than the comparable annual average emission inventories; this difference is primarily due to seasonal temperature changes and the corresponding effects on pollutant emissions rates (e.g., higher solvent and gasoline evaporative emissions on hot summer days; more fuel combustion on cold days).

The planning inventory 1990 baseline emissions and estimated emission reductions for the reporting years 1997, 2000, and 2003 is presented in Table 6-9. These estimates are based on the controlled emissions and the adoption and implementation schedules contained in Chapter 7. As seen in the table, the proposed control strategy falls short of the CCAA emission reduction goals (i.e., five percent per year for all nonattainment pollutants) even with the implementation of maximum feasible controls and an expeditious adoption schedule. Nonetheless, the strategy represents "all feasible control measures" and an "expeditious adoption schedule" as permitted under H&S Code 40914.

**TABLE 6-9**

Summary of 2003 AQMP Emissions Based on Planning Inventory Emissions (tons/day)*

| Year | Summer Ozone Inventory VOC | | Summer Ozone Inventory $NO_x$ | | Winter CO Inventory CO | |
|---|---|---|---|---|---|---|
| 1990 Baseline | 1,870 | | 1,546 | | 10,329 | |
| Emission Reductions | | | | | | |
| 1997 | 648 | (35%) | 381 | (25%) | 3,869 | (37%) |
| CCAA Requirement | | (35%) | | (35%) | | (35%) |
| 2000 | 823 | (44%) | 393 | (25%) | 4,729 | (46%) |
| CCAA Requirement | | (50%) | | (50%) | | (50%) |
| 2003 | 1,024 | (55%) | 517 | (33%) | 5,802 | (56%) |
| CCAA Requirement | | (65%) | | (65%) | | (65%) |

*Emission reductions are estimated as the 1990 equivalent. Percent reductions from 1990 baseline are shown in parenthesis.

## Population Exposure

The CCAA also requires a reduction in overall population exposure to criteria pollutants. Specifically, exposure to severe nonattainment pollutants above standards must be reduced by at least:

(1) 25 percent by December 31, 1994;

(2) 40 percent by December 31, 1997; and

(3) 50 percent by December 31, 2000.

Reductions are to be calculated based on per-capita exposure and the severity of exceedances. This provision is applicable to ozone, CO and $NO_2$ in the Basin [H&S Code 40920(c)]. The definition of exposure is the number of persons exposed to a specific pollutant concentration level above the state standard times the number of hours exposed. The per-capita exposure is the population exposure (units of pphm-persons-hours) divided by the total population.

The Regional Human Exposure (REHEX) model is used to estimate per-capita exposure reduction. It considers population mobility; time spent indoors, outdoors and in transit; exposure by age classification; and activity pattern by season and weekday/weekend.

**Ozone**

An analysis using the REHEX model indicates that the CCA Amendments exposure reduction targets have been achieved for ozone with a margin of safety. Figure 6-3 summarizes the results and compares exposure reductions to the targets.

The REHEX model also allows more detailed exposure reduction estimates disaggregated by age group and county. These results are summarized in Figures 6-4 and 6-5, respectively. As shown, the greatest exposure reduction for an individual age class is for children, who have longer exposure to outdoor concentrations; the geographic location with the most improvement for all age groups is that comprised of the two inland counties.

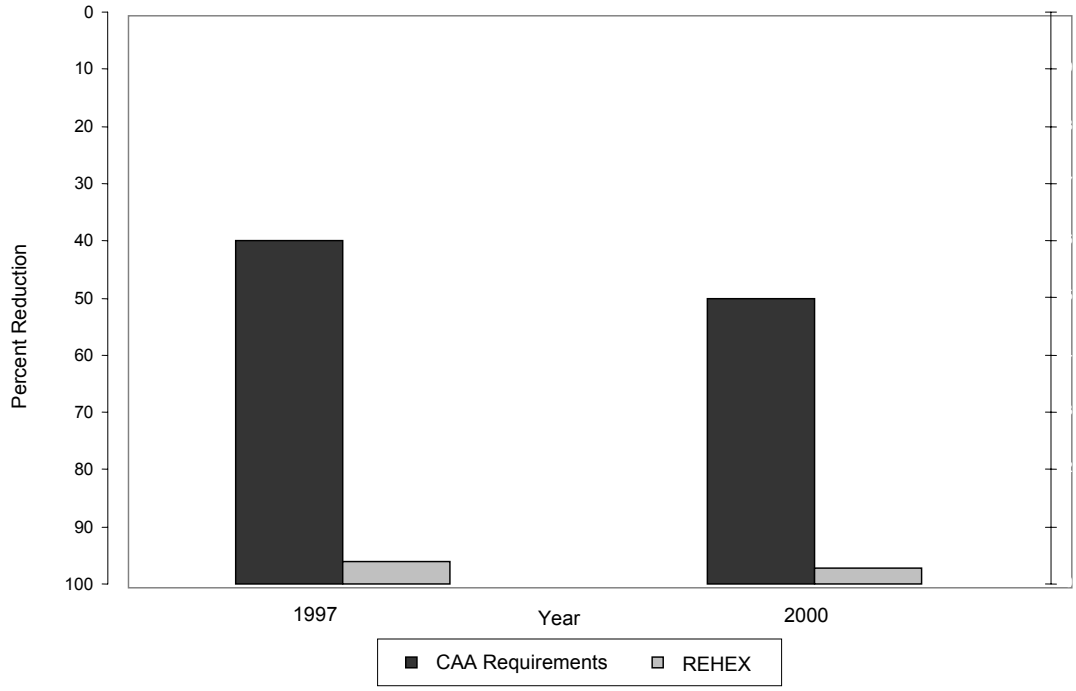



**FIGURE 6-3**
Percent Reductions in Annual Average Per-Capita Exposure to Ozone

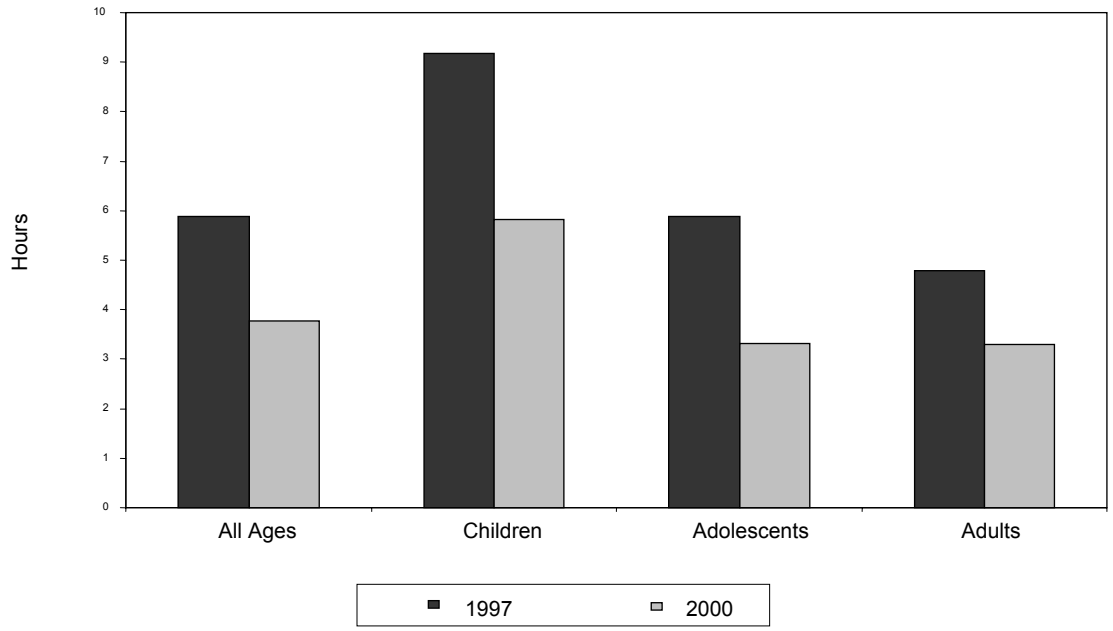



**FIGURE 6-4**
Per-Capita Ozone Exposure Above the State Standard by Age Group

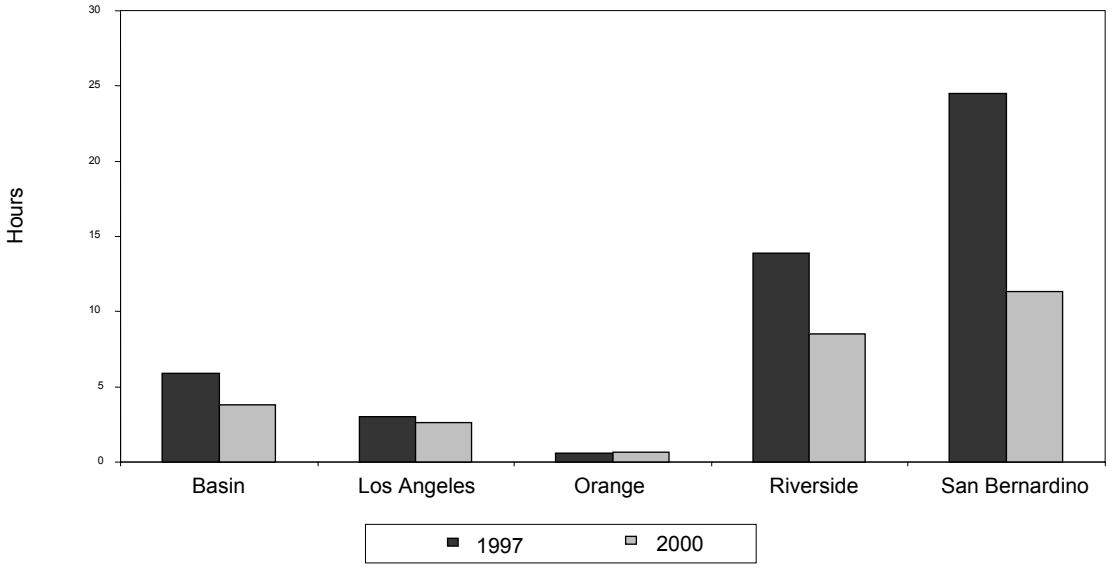



**FIGURE 6-5**
Per-Capita Ozone Exposure Above the State Standard by County

### Carbon Monoxide

As discussed in Chapter 5 and in Appendix V, the 1-hour and 8-hour CO standards have been met. Therefore, the Basin population will not be exposed to unhealthful CO levels and thus per capita exposure is reduced 100 percent from the 1986-88 base levels.

## Cost Effectiveness Ranking

The CCAA requires the District Governing Board to determine that the AQMP is a cost-effective strategy that will achieve attainment of the state standards by the earliest practicable date [H&SC 40913(b)]. In addition, the Plan must include an assessment of the cost-effectiveness of available and proposed measures and a list of the measures ranked from the least cost-effective to the most cost-effective [H&SC 40922].

Table 6-10 and Table 6-11 provide a listing of the control measures that have available cost information for stationary and mobile source measures, respectively. The cost-effectiveness for stationary source measures ranges from $2,000 to as high as $20,100 per ton of pollutant reduced. Two methods are used to calculate the cost-effectiveness of the mobile source measures. The CARB transmitted the cost-effectiveness values for the mobile source measures based on incremental cost analyses, published reports and other internal methods. However, the District uses the Discount Cash Flow method in its calculations, as it has since the 1987 AQMP. The Discount Cash Flow method is more versatile in analyzing complex financial cash flows and is the most widely used cost methodology by major businesses. The proposed implementation schedule for these measures is provided in Chapter 7 and is based on this information and other relevant factors.

**TABLE 6-10**

Cost-Effectiveness Ranking of District's Stationary Source Control Measures [a]

| Measure Number | Description | Dollars/Ton | Ranking by Cost Effectiveness |
|---|---|---|---|
| BCM-08 | Further Emission Reductions from Aggregate and Cement Manufacturing Operations | $700 | 1 |
| WST-01 | Emission Reductions from Livestock Waste (PR1127) | $2,000 - $7,000 | 2 |
| CMB-09 | Emission Reductions from Petroleum Fluid Catalytic Cracking Units (PR1105.1) | $3,500 - $11,500 | 3 |
| MSC-05 | Truck Stop Electrification | $5,000 | 4 |
| CMB-10 | Additional Reductions for NOx RECALIM | $7,000 | 5 |
| WST-02 | Emission Reductions from Compositing (R1133, 1133.1, 1133.2) [b] | $10,000 [c] | 6 |
| CTS-10 | Miscellaneous Industrial Coatings and Solvents | < $13,500 | 7 |
| FUG-05 | Emission Reductions from Fugitive Sources | < $13,500 | 7 |
| PRC-07 | Industrial Process Operations | < $13,500 | 7 |
| PRC-03 | Emission Reductions from Restaurant Operations | $14,500 | 8 |
| CTS-07 | Further Emission Reductions from Architectural Coatings (R1113) | < $20,000 | 9 |

[a] The cost-effectiveness values of these measures are based on the Discount Cash Flow methodology and four percent real interest rate.
[b] Control Measure WST-02 was adopted January 10, 2003 as Rule 1133 - Composting and Related Operations – General Administrative Requirements, Rule 1133.1 Chipping and Grinding Activities, and Rule 1133.2 - Emission Reduction From Co-Composting Operations.
[c] Cost-effectiveness based on VOC and $NH_3$ reductions combined.

## TABLE 6-11

Cost-Effectiveness Ranking of State Control Measures*

| Measure Number | Current Title | Old Measure Number | CE Ratio $/ton HC+NOx | Ranking by CE |
|---|---|---|---|---|
| SMALL OFF-RD-2 | Set Lower Emission Standards for New Non-Handheld Lawn and Garden Equipment – Like Lawnmowers [Spark-Ignition Engines Under 25 hp]. | | 1,100 | 1 |
| SMALL OFF-RD-1 | Set Lower Emission Standards for New Handheld Lawn and Garden Equipment – Like Weed Trimmers, Leaf Blowers, and Chain Saws [Spark-Ignition Engines Under 25 hp]. | | 1,600 | 2 |
| OFF-RD LSI-1 | Set Lower Emission Standards for New Off-Road Gas Engines [Spark-Ignition Engines 25 hp and Greater]. | | 2,100 | 3 |
| ON-RD HVY-DUTY-3 | Pursue Approaches to Clean Up the Existing and New Truck/Bus Fleet. | | 2,200 | 4 |
| MARINE-1 | Pursue Approaches to Clean Up the Existing Harbor Craft Fleet – Cleaner Engines and Fuels. | MARINE-2 | 2,600 | 5 |
| ON-RD HVY-DUTY-1 | Augment Truck and Bus Highway Inspections with Community-Based Inspections. | | 3,000 | 6 |
| OFF-RD LSI-2 | Clean Up Existing Off-Road Gas Equipment Through Retrofit Controls [Spark-Ignition Engines 25 hp and Greater] | | 3,000 | 6 |
| LT/MED-DUTY-2 | Improve Smog Check to Reduce Emissions from Existing Passenger and Cargo Vehicles. | | 3,200 | 7 |
| ON-RD HVY-DUTY-2 | Capture and Control Vapors from Gasoline Cargo Tankers. | | 4,000 | 8 |
| FVR-1 | Increase Recovery of Fuel Vapors from Aboveground Storage Tanks. | | 4,000 | 8 |
| FVR-3 | Reduce Fuel Permeation Through Gasoline Dispenser Hoses. | | 4,000 | 8 |
| CONS-1 | Set New Consumer Products Limits for 2006. | | 4,480 | 9 |
| CONS-2 | Set New Consumer Products Limits for 2008-2010. | | 4,480 | 9 |
| OFF-RD LSI-3 | Require Zero Emission Forklifts Where Feasible – Lift Capacity <8,000lbs]. | | 7,500 | 10 |
| FVR-2 | Recover Fuel Vapors from Gasoline Dispensing at Marinas. | | 8,000 | 11 |
| OFF-RD CI-1 | Pursue Approaches to Clean Up the Existing Off-Road Equipment Fleet [Compression Ignition Engines]. | OFF-RD CI-2 | 21,000 | 12 |
| LT/MED-DUTY-1 | Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program. | | 22,000 | 13 |

* Cost-effectiveness provided by CARB.