

CHAPTER 7

IMPLEMENTATION

Introduction

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INTRODUCTION

Achieving clean air objectives requires the effective and timely implementation of the measures defined in Chapter 4. In general, these measures rely on the application and advancement of technologies and management practices. These strategies also require actions by numerous agencies. This chapter presents the adoption and implementation schedule of the control measures proposed in the Plan and delineates each agency's area of responsibility. Implementation support activities are also discussed.

RESPONSIBLE AGENCIES

Implementation of the Plan's strategies requires a cooperative partnership of governmental agencies at the federal, state, regional and local level. As described in Table 7-1, these agencies form the four cornerstones from which implementation programs will evolve.

At the federal level, the U.S. EPA and other agencies are charged with reducing emissions from federally controlled sources such as commercial aircraft, trains, marine vessels, and other sources. As discussed in Chapter 4, the 2007 AQMP incorporates several measures carried over from the 1997 AQMP and 1999 Amendment to the 1997 Ozone SIP.

At the state level, CARB is responsible for reducing emissions from motor vehicle and consumer products. The Plan's on-road and off-road mobile source control program is principally based on CARB's proposed control measures. Also, California's inspection and maintenance program for on-road vehicles is administered by the Bureau of Automotive Repair (BAR), a part of the California Department of Consumer Affairs.

At the regional level, the District is responsible for the overall development and implementation of the AQMP. The District is specifically authorized to reduce the emissions from stationary point, and some area sources such as coatings and industrial solvents. Emission reductions are also sought through funding programs designed to provide monies for the purchase of new low-emission equipment and vehicles and the retrofit of existing off-road sources to low-emission alternatives. In addition, the district regulates indirect sources under Health and Safety Code 40716 by implementing a mandatory ride sharing program or equivalent mobile source emission reduction alternative program for large employers. As a means of achieving further emission reductions, the District may seek additional authority to regulate sources that have not been under the District's jurisdiction in the past such as marine vessels, consumer products, and other on-road and off-road sources. The District implements its responsibilities with participation from the regulated community through an extensive rule development and implementation program.

This approach maximizes the input of those parties affected by the proposed rule through consultation meetings, public workshops, and ongoing working groups.

At the regional level, the Southern California Association of Governments (SCAG) assists sub-regional and local governments in playing a formative role in the air quality elements of transportation planning. In addition, local governments serve an important role in developing and implementing the Plan's transportation control measures. SCAG is responsible for providing the socioeconomic forecast (e.g., population and growth forecasts) upon which the Plan is based. SCAG also provides assessments for conformity of regionally significant transportation projects with the overall Plan and is responsible for the adoption of the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP) which include growth assumptions and transportation improvement projects that could have significant air quality impacts, and transportation control measures as required by the CAA.

TABLE 7-1
Agencies Responsible for Implementation
of the 2007 AQMP Revision for the South Coast Air Basin

Agency	Principal responsibilities
EPA	<ul style="list-style-type: none">• Forty-nine state mobile vehicle emission standards;• Airplanes, trains, and ships;• New off-road construction & farm equipment below 175 hp;
ARB	<ul style="list-style-type: none">• On-road/Off-road vehicles• Motor vehicle fuels; and,• Consumer products
SCAQMD	<ul style="list-style-type: none">• Stationary (e.g., industrial/commercial) and area sources;• Indirect sources• Some mobile sources (e.g., visible emissions and use regulations from trains and ships)
SCAG	<ul style="list-style-type: none">• AQMP conformity assessment• Regional Transportation Improvement Program• Transportation Control Measures
Local Government/ CTCs	<ul style="list-style-type: none">• Transportation and local government actions (i.e., land use approvals & ports); and,• Transportation facilities

CONTROL MEASURES

The Plan proposes measures that can be implemented using currently available technologies and management practices as well as a long-term strategy necessary to meet attainment of the ozone standard. Control measures are to be implemented by all levels of government including federal agencies, the state ARB, the District and local governments and SCAG.

Control Measure Ranking

The California Clean Air Act requires air pollution control districts to assess the effectiveness of control measures in reducing ambient ozone concentrations as part of their plan submittals. The CCAA requires districts to determine that their AQMPs are cost-effective strategies that attain air quality standards by the earliest practicable date [H&SC 40913(b)]. In addition, plans must include an assessment of the cost-effectiveness of available and proposed control measures and a list of the measures ranked from the least cost-effective to the most cost-effective [H&SC 40922(a)]. Tables 6-6 and 6-7 in Chapter 6 show the ranking of the control measures by cost-effectiveness. In developing their control strategy implementation schedule, districts must consider the other effectiveness criteria including technological feasibility, total emissions reduction potential, rate of reduction, public acceptability, and enforceability [H&SC 40922(b)]. The criteria used for this Plan are listed in Table 7-2.

Table 7-3 lists the control measures, the responsible agency, and the proposed adoption and implementation dates. New items proposed for the first time in this Plan have been placed in the appropriate position on the existing schedule based on a review of the AQMP control measure prioritization factors described above.

CARB

CARB is responsible for adopting on- and off-road mobile source emission standards, fuel requirements, and consumer product regulations. Table 7-3 identifies the suggested control measures and their proposed adoption and implementation dates that CARB will be responsible for implementing in the 2007 AQMP.

TABLE 7-2
Criteria for Evaluating 2007 AQMP Control Measures

Criteria	Description
Cost-Effectiveness	The cost of a control measure to reduce air pollution by one ton [cost covers obtaining, installing, and operating the control measure].
Efficiency	The positive effects of a control measure compared to its negative effects.
Emission Reduction Potential	The total amount of pollution that a control measure can actually reduce.
Enforceability	The ability to force polluters to comply with a control measure.
Equity	The fairness of the distribution of all the positive and negative effects among various socioeconomic groups
Legal Authority	Ability of the District or other adopting agency to implement the measure or the likelihood that local governments and agencies will cooperate to approve a control measures
Public Acceptability	The support the public gives to a control measure.
Rate of Emission Reduction	The time it will take for a control measure to reduce a certain amount of air pollution.
Technological Feasibility	The likelihood that the technology for a control measure will be available as anticipated.

TABLE 7-3

2007 AQMP Control Measures, Implementing Agency,
Adoption Date and Implementation Period

Control Measure	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
<u>Facility Modernization</u>				
MCS-01	Facility Modernization [NO _x , VOC, PM]	SCAQMD	2008-2010	Beginning 2012
<u>Energy Efficiency/Conservation</u>				
MCS-02	Urban Heat Island [All Pollutants]	SCAQMD	On-going	On-going
MCS-03	Energy Efficiency and Conservation [All Pollutants]	SCAQMD	2008-2010	Beginning 2010
<u>Good Management Practices</u>				
FUG-01	Improved Leak Detection and Repair [VOC]	SCAQMD	2008-2009	2009-2010
FUG-02	Emission Reductions from Gasoline Transfer and Dispensing Facilities [VOC]	SCAQMD	2009	2010-2012
FUG-04	Emission Reductions from Pipeline and Storage Tank Degassing [VOC]	SCAQMD	2007	2008-2009
BCM-01	PM Control Devices (Baghouses, Wet Scrubbers, Electrostatic Precipitators, Other Devices) [PM]	SCAQMD	2008-2009	2010-2012
MCS-04	Emissions Reductions from Green Waste Composting [VOC, PM]	SCAQMD	Phase 1: 2009-08 2008-09	2012
MCS-06	Improved Start-up, Shut-down and Turnaround Procedures [All Pollutants]	SCAQMD	Phase 2: 2010 2010	2012
<u>Market Incentives/Compliance Flexibility</u>				
CTS-02	Clean Coating Certification Program [VOC]	SCAQMD	2008-2009 2009- <u>2010</u>	2010
CMB-02	Further SO _x Reductions for RECLAIM(BARCT) [SO _x]	SCAQMD	2008	2011-2014
FLX-01	Economic Incentive Programs [All Pollutants]	SCAQMD	On-going	On-going
FLX-02	Petroleum Refinery Pilot Program [VOC and PM _{2.5}]	SCAQMD	2008	2010

TABLE 7-3 (continued)2007 AQMP Control Measures, Implementing Agency,
Adoption Date and Implementation Period

Control Measure	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
<u>Area Source Programs</u>				
FUG-03	Emission Reductions from Cutback Asphalts [VOC]	SCAQMD	2008	2010
CTS-01	Emission Reductions from Lubricants [VOC]	SCAQMD	2008	2010
CTS-03	Consumer Products Certification and Emissions Reductions from Use of Consumer Products at Institutional and Commercial Facilities [VOC]	SCAQMD	2007-2010	2010-2020
CTS-04	Emission Reductions from the Reduction of VOC Content of Consumer Products not Regulated by the State Board [VOC]	SCAQMD	2008-2010	2010-2020
CMB-01	NOx Reduction from Non-RECLAIM Ovens, Dryers and Furnaces [NOx]	SCAQMD	2008	Beginning 2010
CMB-03	Further NOx Reductions from Space Heaters [NOx]	SCAQMD	2009	Beginning 2012
CMB-04	Natural Gas Fuel Specifications [All Pollutants]	SCAQMD	2008	2009
BCM-02	PM Emission Hot Spots – Localized Control Program [PM2.5]	SCAQMD	On-going	On-going
BCM-03	Emission Reductions from Wood Burning Fireplaces and Wood Stoves [PM2.5]	SCAQMD	2007-2008	2008-2014
BCM-04	Additional PM Emission Reductions from Rule 444 – Open Burning [PM2.5]	SCAQMD	2007	2008-2010
BCM-05	PM Emission Reductions from Under-fired Charbroilers [PM 2.5]	SCAQMD	2010	2012 2014
MCS-05	Emission Reductions from Livestock Waste [VOC]	SCAQMD	2009	2011
MCS-07	Application of All Feasible Measures [All Pollutants]	SCAQMD	2007-2010 On-going	2010-2020
MCS-08	Clean Air Act Emission Charges of \$5,000 Per Ton Fees for Major Stationary Sources with Potential to Emit Over 10 Tons Per Year [VOC, NOx]	SCAQMD	2009-2010	2011

TABLE 7-3 (continued)
 2007 AQMP Control Measures, Implementing Agency,
 Adoption Date and Implementation Period

Control Measure	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
<u>Emission Growth Management</u>				
EGM-01	Emission Reductions from New or Redevelopment Projects [NOx, VOC, PM2.5]	SCAQMD	2009	Beginning 2010
EGM-02	Emission Budget and Mitigation for General Conformity Projects [All Pollutants]	SCAQMD	Beginning 2007	Beginning 2007
EGM-03	Emissions Mitigation at Federally Permitted Projects [All Pollutants]	SCAQMD	Beginning 2007	Beginning 2007
<u>District's Mobile Source Program</u>				
MOB-01	Mitigation Fee Program for Federal Sources [All Pollutants]	SCAQMD	2007-2010	2010-2020
MOB-02	Expanded Exchange Program [All Pollutants]	SCAQMD	2007- 2010 Beginning 2007	2010-2020
MOB-03	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities [All Pollutants]	SCAQMD	2007-2010	2010-2020
MOB-04	Emission Reductions from the Carl Moyer Program [NOx, PM2.5]	SCAQMD	On-going	On-going
MOB-05	AB923 Light-Duty Vehicle High-Emitter Identification Program [NOx, VOC]	SCAQMD	N/A On-going	2008 2007-2020
MOB-06	AB923 Medium-Duty Vehicle High-Emitter Identification Program [NOx, VOC]	SCAQMD	N/A 2008	2008 2010-2020
MOB-07	Concurrent Reductions from Global Warming Strategies [All Pollutants]	SCAQMD	On-going	On-going
<u>Mobile Source and Consumer Product Control Measures Developed By CARB*</u>				
ARB-ONRD-01	Smog Check Enhancements [VOC, NOx, PM]	BAR	2007-2008	By 2010
ARB-ONRD-02	Expanded Vehicle Retirement [VOC, NOx, PM]	CARB/BAR	2010 2008-2014	2010 2008- 2014
ARB-ONRD-03	Modifications to Reformulated Gasoline Program [VOC]	CARB	2007	2008 Beginning 2010
ARB-ONRD-04	Cleaner In-Use Heavy-Duty Trucks [VOC, NOx, PM]	CARB	2007 -2008	2010-2015

TABLE 7-3 (continued)2007 AQMP Control Measures, Implementing Agency,
Adoption Date and Implementation Period

Control Measure	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
ARB-ONRD-05	Port Truck Modernization [NOx, PM]	CARB/ SCAQMD	2007- 2008	2008-2020
ARB-OFRD-01	Marine Vessels – Fuel, Auxiliary & Main Engines [VOC, NOx]	U.S. EPA/ CARB/ SCAQMD	2007-2009	2007- 2010 Beginning <u>2010</u>
ARB-OFRD-02	Accelerate Introduction of Cleaner Line-Haul Locomotives [VOC, NOx, PM]	CARB/ U.S. EPA	2007-2008	By -Beginning <u>2012</u>
ARB-OFRD-03	Clean Up Existing Harbor Craft [VOC, NOx, PM]	CARB	2007	2008 <u>2009</u> -2018
ARB-OFRD-04	Cleaner In-Use Off-Road Equipment [VOC, NOx, PM]	CARB	2007	Phase in starting 2008
ARB-OFRD-05	New Emission Standards for Recreational Boats [VOC, NOx]	CARB	2009-2010	2012- 2013 <u>2023</u>
ARB-OFRD-06	Expanded Off-Road Recreational Vehicle Emission Standards [VOC]	CARB	By 2010	2012- 2015 <u>2023</u>
ARB-CONS-01	Consumer Products [VOC]	CARB	2007-2012	2010-2014
<u>Recommended Mobile Source and Clean Fuel Control Measures*</u>				
SCONRD-01	Accelerated Penetration of Advanced Technology Partial Zero and Zero Emission Vehicles [VOC, NOx, CO]	CARB	2007-2008	2010- 2020 <u>2023</u>
SCONRD-02	Deployment of On-Board Diagnostics (Phase III) in Light- and Medium Duty Vehicles [VOC, NOx, CO, PM]	CARB/BAR	2008	2012- 2020 <u>2023</u>
SCONRD-03	Further Emission Reductions From On Road Heavy-Duty Vehicles [NOx, PM]	CARB/ SCAQMD	2007 -2008	2010-2014
SCONRD-04	Further Emission Reductions from Heavy-Duty Trucks Providing Freight Drayage Services [NOx, PM]	CARB/ Marine Ports/ SCAQMD	2007- <u>2008</u>	2007 <u>2008</u> -- 2020 <u>2023</u>
SCOFFRD-01	Construction/Industrial Equipment Fleet Modernization [VOC, NOx]	CARB	2007	2009- <u>2023</u>

TABLE 7-3 (continued)2007 AQMP Control Measures, Implementing Agency,
Adoption Date and Implementation Period

Control Measure	Control Measure Name	Implementing Agency	Adoption Date	Implementation Period
SCOFFRD-02	Further Emission Reductions from Cargo Handling Equipment [NOx, PM]	CARB/ Marine Ports	2007- 2010 2008	2023 2010-2014
SCOFFRD-03	Further Emission Reductions from Locomotives [NOx, PM]	U.S.EPA	2007- 2010 2008	2023 2012-2014
SCOFFRD-04	Emission Reductions from Airport Ground Support Equipment [NOx, VOC, PM]	CARB	2007- 2010 2008	2023 2010-2014
SCOFFRD-05	Emission Reductions from Transport Refrigeration Units [NOx]	CARB	2009	2010- <u>2023</u>
SCOFFRD-06	Accelerated Turnover and Catalyst Based Standards for Pleasure Crafts [VOC, NOx, PM]	CARB	2007- <u>2008</u>	2010- <u>2023</u>
SCFUEL-01	Further Emission Reduction from Gasoline Fuels [NOx, SOx]	CARB	2007- 2010	<u>2010-2012</u>
SCFUEL-02	Greater Use of Diesel Fuel Alternatives [NOx, SOx, PM]	CARB/ SCAQMD	2008	2015
<u>Transportation Control Measures</u>				
TCM-A	HOV Improvements	SCAG, CTCs, Local Gov't	2007	2007-2023
TCM-B	Transit & Systems Management	SCAG, CTCs, Local Gov't	2007	2007-2023
TCM-C	Information Based Measures	SCAG, CTCs, Local Gov't	2007	2007-2023
<u>SCAG-01</u>	<u>Truck-Only Lanes</u>	<u>SCAG, CTCs,</u> <u>Local Gov't</u>	<u>2008-2010</u>	<u>2008-2023</u>
<u>SCAG-02</u>	<u>High-Speed Transport System</u>	<u>SCAG, CTCs,</u> <u>Local Gov't</u>	<u>2008-2010</u>	<u>2008-2023</u>

TABLE 7-3 (continued)

2007 AQMP Control Measures, Implementing Agency,
Adoption Date and Implementation Period

Long-Term Mobile Source and Consumer Product Control Measures

SCLTM-01A	Further Emission Reductions from On-Road Mobile Sources [NOx]	CARB	2009-2012	2015-2023
SCLTM-01B	Further Emission Reductions from On-Road Heavy-Duty Vehicles [NOx]	CARB/BAR	2009-2012	2015-2023
SCLTM-02	Further Emission Reductions from Off-Road Mobile Sources [NOx]	CARB/ U.S. EPA	2009-2012	2015-2023
SCLTM-03	Further Reductions from Consumer Products [VOC]	CARB	2009-2012	2015-2023

* The recommended mobile source and clean fuel control measures listed in this table represent a menu of potential control strategies which could be implemented by CARB to achieve the additional 41 tons per day of NOx reductions needed for PM2.5 attainment by 2015. Refer to Chapter 4. Annual rulemaking schedule to be developed by CARB within adoption date window but at earliest practicable date to achieve the necessary reductions.

District

The District is responsible for implementing the stationary and mobile source control measures proposed by the District. As shown in Table 7-3, stationary source control measures will be implemented primarily through District rules and regulations as specified in federal and state law.

As indicated in Chapter 4, several key approaches are proposed for implementing the stationary source emission reduction measures. Specifically, the Plan proposes to use source-specific control approaches and market incentives to implement most of the stationary source measures. Chapter 4 and Appendix IV-A provide more detail relative to these implementation approaches.

Southern California Associations of Governments

The region's long-range transportation blueprint, its previously triennial and now quadriennial Regional Transportation Plan (RTP), and the shorter-term programming needed to fund the improvements, the Regional Transportation Improvement Program (RTIP), together form the foundation for improving transportation system performance while at the same time assuring the timely attainment of air quality goals within the South Coast Air Basin. The RTIP is the vehicle used to implement the goals of the long-range RTP and provides for timely implementation of Transportation Control Measures (TCMs) for the South Coast Air

Basin. The RTIP is a short-term document covering six years, and it must be updated at least every two years. As the biennial element of the RTIP is revised, the list of fiscally constrained projects (i.e., projects for which funding has been identified), will be updated.

Local Governments and Transportation Agencies

Local governments (cities and counties) are also responsible for helping to provide supportive actions through participation in voluntary programs. Local governments and transportation agencies are also responsible for implementing several measures in the Plan including, but not limited to, the transportation improvements called for in the Plan. SCAG helps local governments coordinate their efforts and ensure that the region's transportation projects, programs and plans conform to the SIP. In addition, actions by the Ports of Los Angeles and Long Beach are needed to help address goods movement related air pollution.

Congestion Management Program Linkage to the AQMP

The Congestion Management Program is a comprehensive strategy to relieve traffic congestion and maintain levels of service on roadways within the Southern California region. The County Transportation Commissions (CTCs) are the designated Congestion Management Agencies (CMA) within the SCAG region and are directly responsible for the preparation of Congestion Management Plans (CMP) for their respective counties. SCAG reviews and incorporates CMPs into the RTP through the regular update cycle.

The CMPs interlink with the AQMP in several areas, particularly through TCMs. Most TCM projects identified in the RTIP are designed to help relieve congestion at the local level. Thus, implementation of the AQMP helps local governments tackle congestion, which, in turn, reduces emissions from idling vehicles or the number of vehicles traveling on congested roadways, and also helps maintain the level of service standards. At the same time, the CMP process provides local governments a mechanism to contribute to the regional effort toward attaining the NAAQS. In addition, the process gives local governments an opportunity to work cooperatively with their CTCs and subregional agencies to craft integrated trip reduction strategies to meet the CMP trip reduction requirements.

The CMP process and the AQMP are further linked through the local capital improvement program. This required element of the CMP must be consistent with the RTIP, which in turn must be consistent with the RTP. The relationship between the air quality management plans and the regional transportation planning process is iterative. Thus, for example, the 2004 RTP must conform to the 2003 AQMP, and, in turn, forms the basis for the 2006 RTIP, and both these, together, provide the context for the current AQMP.

Southern California Economic Partnership (The Partnership)

The Partnership is a non-profit organization assigned the mission of accelerating the deployment of advanced transportation technologies (ATTs) throughout Southern California. It was established in 1994 based on the SCAG Regional Mobility Element and the AQMP as an implementation organization for advanced transportation technology strategies. The technology focus is on technologies that improve traffic flow, transit usage, carpooling, telecommuting, alternative fuel vehicles and infrastructure and commuter information services.

The Partnership, through its public/private participatory structure, is capable of providing networking and guidance to those parties interested in the deployment of advanced transportation technologies throughout Southern California. “Stakeholder Workshops” are held to discuss implementation barriers and assist in the development of deployment and marketing strategies. In addition to its administrative support of programs such as Clean Cities, Commute and ITS Southern California, it has in effect become a clearinghouse of ATT information and progress.

To aid Southern California cities and counties in ATT deployment, The Partnership has developed various documents and web site materials and links that provide goals and objectives, implementation worksheets, model policies, model resolutions, building codes, product/service technology updates, infrastructure suggestions and requirements, training and safety requirements, case studies, funding opportunities and an activity recognition program. The Partnership produces these documents and conducts workshops and presentations to encourage participants to use ATTs. It also develops and distributes ATT newsletters and promotional materials to heighten awareness and garner unified understanding and support for the technologies from both the public and private sectors. Most of this information is also presented on The Partnership’s web site (www.the-partnership.org) which is continuously updated with deployment achievements throughout the region.

Workshops and Outreach

To generate additional interest and understanding of technology deployment, The Partnership occasionally hosts technology workshops at the District and other convenient locations for local elected officials, city planners and managers, with considerable private sector involvement and support. In addition to these workshops, The Partnership also: 1) makes presentations to cities, schools and organizations; 2) distributes monthly technology “News Flashes” to all stakeholders via email or published on The Partnership’s web site; and 3) attends the meetings of related organizations and project developers.

Information Distribution and Industry Networking Support

Since the Partnership works closely with the stakeholders in supporting transportation technologies, it has become a de facto clearinghouse of ATT information. In this capacity, it is suited to direct and introduce interested participants to other stakeholders with similar goals and into the formation of productive and mutually beneficial public/private partnerships.

TECHNOLOGY ADVANCEMENT

The District's Technology Advancement Office (TAO) sponsors public-private research and development partnerships in order to identify and promote low- and zero-emissions technologies for both stationary and mobile sources. The TAO has several programs through which advanced mobile and stationary source control strategies are funded, demonstrated, and commercialized. One such program is the Carl Moyer Program which is a state-wide funding program that provides monies to purchase low-emission on- and off-road vehicles and equipment and marine engines to reduce NOx and PM. A second program overseen by TAO is the RECLAIM Executive Order Fee Program which channels monies collected from funds established under Executive Order and Rule 2020 – RECLAIM Reserve to fund projects with approved protocols established under Regulation XVI – Mobile Source Offset Programs. The TAO also administers projects funded through the Mobile Source Air Pollution Reduction Review Committee (MSRC). The MSRC, which was established in 1990 with the adoption of Assembly Bill 2766, funds projects to reduce air pollution from motor vehicles as needed for implementing the California Clean Air Act of 1988. The fourth mechanism where advanced mobile and stationary source control strategies are funded, demonstrated, and commercialized is under the Clean Fuels Program, which was established in state law in 1988 under the California Health and Safety Code, 40448.5. The Clean Fuels Program leverages cost-share from other government agencies (e.g., CARB, CEC, U.S. EPA, and DOE) as well as the technology providers themselves.

Table 7-4 lists some key currently underway or potential projects being considered by the TAO to facilitate development and commercialization of low-polluting technologies. Some of the stationary source projects do not have specific linkages to the control measures but serve as future technologies that may be available to meet current regulations with future compliance dates or AQMP control measures.

SCAQMD Clean Fuels Program – Technology Advancement Plan

SCAQMD Clean Fuels Program – Technology Advancement Plan is a formal plan required by state law to be adopted by the District's Governing Board. The most recent update of the Technology Advancement Plan for 2006 focused on potential projects for research, development, demonstration, deployment and

commercialization of alternative and clean fuels technologies and advanced technologies that may reduce emissions and help meet the clean air goals of the District. The key areas of the 2006 Technology Advancement Plan are summarized below.

TABLE 7-4
Current or Potential TAO Projects

Project Description	Pollutant(s)	Goal(s)	Associated Control Measure
<u>Alternative Fuels – On-Road Applications</u>			
Remote Sensing of High Emitting Light/Medium-Duty Vehicles	VOC, NO _x , PM10	A, B, C	MOB-06 MOB-07
Development & Demonstration of Advanced Natural Gas Engine Meeting 2010 On-Road Heavy-Duty Exhaust Emission Standards	VOC, NO _x , PM10	A, B, C	SCONRD-03 SCONRD-04
Aftertreatment Technologies for PM Emissions Control of natural gased-Fueled Heavy-Duty Engines	PM10	A, B	SCONRD-03 SCONRD-04
Demonstrate Fischer-Tropsch Synthetic Fuel in Heavy- & Medium-Duty Vehicles	NO _x , PM10	A, B, C	SCFUEL-02
Demonstration of Fischer Tropsch Synthetic Fuel in Heavy & Medium-Duty Vehicles; and Advanced Diesel Fuels, Engines, NO _x Absorber Catalyst & Diesel Particulate Filter Project	VOC	A, B, C	SCFUEL-02 SCONRD-03 SCONRD-04
Perform Evaporative Emission Testing on Gasoline Heavy-Duty Hybrid-Electric Bus	VOC, NO _x , PM10	A, B, C	SCONRD-03 SCONRD-04
Development of Heavy-Duty Diesel Engines Meeting 2010 On-Road Heavy-Duty Exhaust Emissions Standards	NO _x , PM10	A, B, C	SCONRD-03 SCONRD-04
<u>Alternative Fuels – Infrastructure</u>			
Cost-Share Small-Scale Natural Gas Liquefaction Plant	VOC, NO _x , PM10	B	SCONRD-03 SCONRD-04
Cost-share Installation of CNG Fueling Facility	VOC, NO _x , PM10	B	SCONRD-03 SCONRD-04
Incentive Buydown Program for CNG Home Refueling Appliances	VOC, NO _x , PM10	B	SCONRD-01
<u>Fuel Cell and Hydrogen Technologies</u>			
Develop, Demonstrate & Evaluate Truck Fuel Cell Auxiliary Power Unit	VOC, NO _x , PM10	A, D	SCONRD-03 SCONRD-04
Develop & Demonstrate Advanced Storage Tanks for Storing CNG/LNG and Compressed and Liquid Hydrogen	VOC, NO _x , PM10	A, D	SCONRD-03 SCONRD-04
Demonstrate & Develop Hydrogen Refueling Stations	VOC, NO _x , PM10	A, D	SCONRD-03 SCONRD-04

TABLE 7-4 (continued)
Current or Potential TAO Projects

Project Description	Pollutant(s)	Goal(s)	Associated Control Measure
Develop & Demonstrate Hydrogen Internal Combustion Engine Vehicles	VOC, NO _x , PM10	A	SCONRD-01 SCONRD-03 SCONRD-04
<u>Electric and Hybrid Electric Technologies</u>			
Develop & Demonstrate Hydrogen-Internal Combustion Engine for Hybrid-Electric Buses	VOC, NO _x , PM10	A, D	SCONRD-03 SCONRD-04
Evaluate Hybrid Electric Vehicles	VOC, NO _x , PM10	A, B, C	SCONRD-01
Optimize & Demonstrate Plug-In Hybrid Electric Vehicles	VOC, NO _x , PM10	A, B, C	SCONRD-01
Develop & Demonstrate Hydraulic-Hybrid System for Heavy-Duty Vehicles	VOC, NO _x , PM10	A, B, C	SCONRD-03 SCONRD-04
<u>Alternative Fuels – Off-Road Applications</u>			
Demonstrate Retrofit Technologies on Switcher and Head End Power Locomotives	NO _x , PM10	A, B, C	SCOFFRD-03
Demonstration of Particulate Trap Technologies	VOC, NO _x , PM10	A, B, C, D	SCONRD-031 SCONRD-04 SCOFFRD-02
<u>Emissions Analysis</u>			
Conduct In-Use Emissions Testing of On-Road Heavy-Duty Trucks	VOC, NO _x , PM10	C, D	SCONRD-03 SCONRD-04
<u>Stationary Sources - Clean Energy Technologies</u>			
Low and Zero Emission Stationary Technologies	VOC, NO _x PM10	A, B, C	Long-Term Measure
<u>Stationary Sources – VOC Reduction Technologies</u>			
Zero- & Low-VOC Resin Technology for Advance Control Measure Development	VOC	A, B, C	CTS-01 ARB-CONS-01

- A. Supports technical feasibility
- B. Supports commercialization
- C. Demonstration of current or potential CARB standards or guidelines
- D. Enhances databases (e.g., emission factors, inventories, health data, etc.)

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Program (Carl Moyer Program) provides incentive funding to reduce emissions from heavy-duty diesel-powered vehicles and equipment as well as gross polluting passenger cars and small trucks. The main objective of the program is to support projects that would provide emission reductions that are not already required by statute, rule, order, or regulation. The program was first funded in 1998 by the Governor, formally established by the Legislature in 1999, and is administered by the CARB and local and regional air pollution control districts. The District will be administering incentive funds through the Carl Moyer Program for the replacement of diesel-fueled on- and off-road vehicles including refuse haulers, heavy-duty trucks, transit and school buses, construction equipment, marine and port applications and other vehicles and equipment. New engines, re-powers and retrofits are allowed within the program.

A variety of vehicle classes and types are funded under the Carl Moyer Program to help purchase new vehicles or new engines/repowers and for installation of retrofit units on older engines. New vehicles and engines must achieve at least a 30 percent reduction, and repowered vehicles and retrofits must achieve at least a 15% reduction of NOx emissions compared to current emission standards. New engines must be CARB-certified, when applicable, and retrofits must be CARB-verified. Projects reducing PM and/or VOC are also eligible for funding provided they are cost-effective. Alternative fuel engines, such as those using compressed natural gas, liquefied natural gas, propane and electricity will be given preference for funding. Cleaner diesel engines may also be considered in the off-road category. In addition, the District is conducting a car and small truck remote sensing and repair or scrap project under the program.

As part of the Draft 2007 AQMP, the District will continue to aggressively seek out Carl Moyer dollars and fund projects that produce surplus, verifiable, and enforceable emission reductions. Surplus emission reductions achieved through the Carl Moyer Program are important to the success of the PM_{2.5} and ozone attainment strategies.

Alternative Fuels - Incentives Program

Exhaust emissions from high-emitting diesel-fueled school buses are harmful to children and are a key source of public exposure to toxic diesel particulate matter and smog forming pollutants. There are thousands of older school buses on the road that have remained in service primarily because school districts lack funds to replace them. Since 1999, with the help of state funding, the District has approved almost \$59 million to clean up and replace diesel-powered school buses in the Southland. Projects approved include the purchase of 286 compressed natural gas-powered school buses (with an additional 133 for the District's Governing Board to consider in October 2006), 86 lower-emitting new diesel buses and the retrofitting of 2,101

diesel buses with particulate emission traps (an additional 452 diesel school buses will be considered by the District's Governing Board in October 2006). Recent state budget cuts have resulted in a reduction of about \$2 billion from school budgets, potentially affecting the transition to less-polluting school buses.

The District recently proposed that \$14M of its AB923 funds be recognized in the "Lower-Emission School Bus Replacement & Retrofit Program Fund" and used to facilitate the acquisition of new compressed natural gas buses by school districts and the concomitant reduction or elimination of diesel-fueled school buses. Distribution of the funds for school buses will take into consideration several elements, including, but not limited to, the environmental justice provisions of the Health & Safety Code as amended by AB-1390 (Firebaugh), population distribution among various counties, and the mix of older versus newer buses.

Alternative Fuels - On-Road

Major emission reductions are required in this area, particularly from heavy-duty vehicles. Continued efforts focused on the development of lower-NO_x and PM emitting heavy-duty natural gas and diesel engines, as well as development and demonstration of alternative fuel school buses and other heavy-duty vehicles. The District has initiated projects for the development of heavy-duty natural gas engines that will meet the 2010 on-road heavy-duty exhaust emissions standard of 0.2 g/bhp-hr NO_x. Two of the major natural gas engine manufacturers have announced their intentions to certify heavy-duty natural gas engines meeting 2010 emission standards as early as 2007. Additionally, plans to demonstrate zero-emission technology for idling heavy-duty trucks and trailers were included.

The District is interested in ethanol (E85) and biodiesel and has initiated projects to evaluate the emissions benefits of these renewable fuels. There are many flexible fuel vehicles (FFVs) that can run on either E85 or gasoline. E85 should exhibit decreased HC emissions due to the fuel's lower volatility, but the District is investigating the potential for permeation issues in older vehicles when E85 is mixed with conventional gasoline. The District is also concerned that no FFVs has been certified to SULEV emissions levels.

The District has also initiated a program to evaluate the emissions from biodiesel in heavy-duty trucks. High levels of biodiesel blends (e.g., B99) have shown greatly reduced PM but with higher NO_x emissions. The District is evaluating biodiesel in tandem with two different SCR systems to mitigate any NO_x increases.

Alternative Fuels - Infrastructure

Since 2001, the District funded the development of natural gas refueling sites, and studies on compressors, meters, and home dispensing and liquefaction equipment. Plans to conduct additional studies to enhance the liquefied natural gas manufacturing, distribution, and detection technologies are contained in the 2006

update. Another area of focus will be to develop best practices that can lead to standardization and modularization, as well as upgrade existing older natural gas refueling stations. The continued support and development of home refueling for alternative fuels is also an area of interest.

The District is also focused on the development and deployment of renewable biofuels, including ethanol and biodiesel. The specifications of the fuels themselves and their emissions under different load cycles and applications will be carefully evaluated to ensure that any increases in pollutant emissions are mitigated.

Fuel Cell and Hydrogen Technologies

The District is currently demonstrating fuel cell vehicles in its daily fleet activities and plans to expand the demonstration of fuel cell vehicles in other conventional and non-conventional fleets. The plan also proposed to co-sponsor studies to develop more realistic demonstration specifications for fuel cell transit buses, specifically to evaluate realistic operational availability, training, on site service, and warranty issues.

In the area of hydrogen fueling infrastructure, the plan included development and demonstration of distributed hydrogen production and refueling stations for fleet and commercial uses, as well as home refueling appliances. Furthermore, the plan included additional work on cosponsoring studies for certifying hydrogen components and subsystems, as well as the personnel involved in the installation, operation, and maintenance of hydrogen systems. To facilitate the development of the hydrogen refueling infrastructure, the District funded the development and demonstration of thirty hydrogen-powered internal combustion engines. The thirty vehicle demonstration also serves as a transition path to dedicated hydrogen and fuel cell vehicle technologies.

Aftertreatment

The heavy-duty in-use fleet is responsible for a large portion of the mobile source emissions in the Basin. The District continues to evaluate after treatment technologies to be used on a wide variety of model year trucks, including diesel particulate filters, oxidation catalysts, and selective catalytic reduction systems.

Electric and Hybrid Electric Technologies

Electric and Hybrid Electric Technologies, including demonstration of light-duty and heavy-duty electric and hybrid-electric vehicles, as well as refinement of charging technologies and advanced energy storage systems are proposed in the 2006 TAO Plan. The District will continue the development and demonstration programs, with focus on a variety of fleets, including transit buses and heavy-duty trucks. There will also be continued focus on advanced energy storage devices such as ultra-capacitors, lithium-technology, and high-speed flywheel battery

applications. The District also plans to upgrade hybrid-electric development and demonstration projects with current, better-performing components resulting in enhanced reliability and lower emissions, as well as plug-in recharging capability.

The District is also evaluating the use and application of electric technologies for container movement. Examples of such technologies include electrification of gantry cranes, linear induction motors, and magnetic levitation systems for container movement within and from the ports.

Alternative Diesel Fuels - Off-Road Applications

The District plans to evaluate various off-road technologies. Some of these include demonstration of low- and zero-emission locomotives, low-emission alternative fuel off-road engines using technology developed for on-road engines, including retrofit equipment. Another area of focus will be the use of gas-to-liquid fuels, emulsified fuels, bio-diesel, and low-sulfur diesel fuels in construction equipment and other off-road uses. These alternative diesel fuels offer the potential for large PM and NOx reductions especially when used in tandem with after treatment devices. Demonstration of particulate control technologies is a high priority area. The plan also includes projects pertaining to low-emission marine engines, including hybrid-electric technology.

Stationary Sources

The District funded numerous projects for the use of microturbines for stationary power generation as well as stationary fuel cell units. The District plans to further investigate low and zero-emission technologies such as low NOx burners, renewable fuels (e.g., digester and landfill), hydrogen blends, hybrids and fuel cell/micron turbine power plants. The District will also continue to focus on demonstration of low-cost emission monitoring systems. The 2006 plan also included projects focusing on technology assessments of future VOC limits in various District rules, as well as additional development and demonstration of near-zero or zero-VOC technologies for solvents, coatings, and adhesives.

IMPLEMENTATION SUPPORT ACTIVITIES

Implementation of the 2007 AQMP will require support activities sponsored by the District and SCAG. These efforts are described in the following subsections.

District Assistance and Outreach Programs

Since the adoption of the 1991 AQMP the District has provided assistance to the agencies charged with implementing the Plan. A key accomplishment was the District's CEQA Air Quality Handbook to assist local governments in assessing and mitigating air quality impacts from projects within their jurisdiction. The District

has designed and implemented a City Executive Outreach Campaign to raise awareness among city managers and administrators of District programs affecting them and the types of District resources available to them. Areas being covered during this process include:

- Fleet rule compliance and funding opportunities, including technical assistance available
- Complaint Process/Constituents Issues
- Building Department Services
- No-cost, no-fault, compliance assistance for small businesses
- Training programs for city and county building and safety staff, and
- Incorporation of a model air quality element into General Plans.

Local Governments Assistance Program

In May 2005, the District developed a guidance document for assisting local governments in addressing air quality issues in their general plans and local planning. The guidance document provides a list of suggested goals, objectives, policies, and strategies that local governments can implement to prevent or reduce potential air pollution impacts and protect public health. A number of cities have already adopted Air Quality Elements in their General Plans or have in place different air quality programs or policies, while the majority of cities do not have such programs. In order to facilitate an even stronger collaboration between the District and local governments, the District would develop two types of local government pilot programs to seek emission reductions within city or county operations:

Partnership Program

Under this program, the District will seek to partner with local governments to implement targeted programs to reduce emissions. An example of this program will be a targeted lawn and garden equipment exchange program jointly funded and implemented by the District and the local governments. Other feasible strategies include modernization of corporate fleet on-road and off-road vehicles, low-emitting shuttles for city transportation, energy efficiency and conservation programs, and public outreach and education programs. The District could set aside funding for city contractors who could meet the minimum air quality criteria. The District will work with local governments to develop a model for green contracting requirements which could be used by local governments at other public and private entities.

SCAG Assistance

SCAG has provided significant assistance and outreach to County Transportation Commissions (CTC) and local governments in understanding, assessing and

implementing programs to address TCMs and associated air quality issues. SCAG provides funding to its thirteen subregions to help develop policies and strategies and prepare monitoring programs which address TCMs, air quality and mobility requirements--identifying locally sensitive implementation options and continuing to develop monitoring programs to report progress.

In cooperation with the District, SCAG helped create and launch the now independent Southern California Economic Partnership (The Partnership), as discussed previously in this chapter. SCAG continues to participate in an active role to implement new strategies to improve air quality and mobility.

MONITORING

The 2007 AQMP sets the course for attaining the federal and state air quality standards in the Basin. As the Plan is implemented, it is essential to periodically assess the effectiveness of the air pollution control programs in reducing emissions, and to determine whether or not the Basin is still proceeding along the course set forth in the AQMP. Monitoring the AQMP's effectiveness will also be an integral part of preparing the annual rule work plan. Once every three years, the District is required to assess the overall effectiveness of its air quality program as discussed in Chapter 6. Significant enhancements have been incorporated into the modeling approach for the 2007 AQMP as discussed in Chapter 5. SCAG with the assistance of County Transportation Commissions (CTC), and CARB will also be responsible for monitoring their portion of the Plan.