

Mobile Source and Transportation Control Measures

Our regional air quality plans contain two kinds of control measures developed to address mobile and transportation related emission sources:

Mobile source control measures reduce emissions from vehicle engines, such as cars, trucks and buses (on-road mobile sources) or boats, aircraft, trains and construction equipment (off-road mobile sources). The national and State governments adopt regulations limiting emissions from mobile sources. An example is the State of California's Low Emission Vehicle II regulation, which requires cleaner engines and lower emissions from cars, pick-up trucks, and other on-road vehicles. The BAAQMD also reduces mobile source emissions through incentive programs, such as the Transportation Fund for Clean Air, which funds clean fuel vehicles.

Transportation control measures (TCMs) seek to reduce emissions by reducing motor vehicle use by encouraging alternative means of transportation such as transit, walking, biking, and carpooling. TCMs are not regulations. Instead they are implemented by providing transportation alternatives (such as transit lines or bicycle facilities) and public education. TCMs are implemented by various agencies, including the Metropolitan Transportation Commission, transit districts, cities and counties. An example is the Regional Express Bus Program, under which MTC and transit operators provide low emission buses for express bus routes.

Who does what?

NATIONAL

The U.S. Environmental Protection Agency:

- Sets national ambient air quality standards
- Oversees and approves State air quality programs
- Adopts regulations for cars, trucks, buses, trains, aircraft, ships, and construction and farm equipment

STATE

The California Air Resources Board:

- Sets State air quality standards
- Oversees and assists local air pollution control districts
- Conducts air pollution research
- Adopts regulations for cars, trucks, buses, fuels, and consumer products

REGIONAL/LOCAL

The Bay Area Air Quality Management District:

- Prepares and adopts plans to achieve national and State air quality standards
- Develops stationary and mobile source control measures for regional air quality plans
- Adopts regulations and issues permits for stationary sources of air pollution
- Helps develop transportation control measures
- Implements Spare the Air program to encourage citizens and businesses to minimize polluting activity and protect themselves on high pollution days

The Metropolitan Transportation Commission:

- Plans regional transportation strategies and investments
- Distributes federal and State transportation funding
- Develops transportation control measures for regional clean air plans
- Works with cities, counties, Caltrans, transit districts and others to implement transportation projects

Mobile Source Programs

The term "mobile source," as used in the CCAA and by the Air District, refers collectively to vehicular sources and other non-stationary sources. Mobile sources are defined in the CCAA as self-propelled devices that may travel upon a highway, including automobiles, trucks, construction equipment, farm equipment, and off-road vehicles. "Non-vehicular" mobile sources, or "non-road" sources as they are defined in the federal Clean Air Act (CAA), include ships, boats, aircraft, locomotives, and lawn and garden equipment. Mobile sources are by far the largest sources of ozone precursors.

STATE AND NATIONAL MOBILE SOURCE PROGRAMS

State and national programs play a critical role in reducing air pollutant emissions from mobile sources. Mobile source emissions are regulated by establishing equipment emission standards and by regulating the fuel used in the equipment. The federal CAA contains a special provision allowing California to set motor vehicle emission standards that are specific to the State. The California standards cover motor vehicles (including cars, motorcycles, and trucks), heavy industrial and construction equipment, off-highway vehicles such as dirt bikes and all-terrain vehicles, and lawn, garden and other utility engines. In California, these mobile sources are regulated primarily by the Air Resources Board.

Mobile source emissions are also controlled through fuel regulations. ARB is authorized to adopt standards, rules and regulations to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in order to accomplish the attainment of the state ambient air quality standards at the earliest practicable date. ARB adopts fuel specifications for motor vehicle fuels – gasoline, diesel and alternative fuels. The most current reformulated gasoline regulations went into effect on December 31, 2003, requiring Phase 3 reformulated gasoline standards and prohibiting the use of the fuel additive MTBE. Phase 3 Reformulated Gasoline (CaRFG3) regulations require refiners to produce gasoline that meets eight specifications to reduce air pollution from the gasoline used in motor vehicles. Recent amendments to the diesel fuel standards require that sulfur content of diesel fuel be reduced from the current 500 ppm to 15 ppm, beginning in June 2006.

Motor vehicle emissions are controlled through in-use performance standards to ensure that the systems continue to operate properly. The State of California has had an inspection and maintenance (I&M) program since 1984 to test vehicles for compliance with the standards. The California Bureau of Automotive Repair (BAR) implements the I&M program. In 2002, AB 2637 (Cardoza) was signed into law and directed BAR to implement an Enhanced Area Smog Check Program in the urbanized regions of the San Francisco Bay Area. The program went into full effect in October 2003, and requires the use of a dynamometer to test the vehicle's emissions while in operation. In addition, the pass/fail cut points for emissions are more stringent for enhanced smog check areas and certain vehicles that tend to have higher emissions are directed to Test-Only stations.

Overall, ARB's motor vehicle control program provides substantial emission reductions. A comprehensive list of ARB programs to reduce emissions from motor vehicles follows:

■ **Diesel Mobile Programs**

- *The Carl Moyer Program* – Provides grants through participating air pollution control districts to cover the incremental cost of cleaner on-road, off-road, marine, and locomotive engines. Allocations to this program began in FY 1998/99.
- *Off-Road Mobile Sources Emission Reduction Program* - Exhaust emission standards have been adopted by ARB and/or U.S. EPA for off-road engines included in the following categories: Small Spark-Ignition Off-Road Engines and Equipment Less Than 25 Horsepower (including Lawn and Garden Equipment, and Small Industrial Equipment); Off-Road Recreational Vehicles (including Motorcycles and All-Terrain Vehicles); Off-Road Compression Ignition (Diesel) Engines and Equipment; Off-Road Large Spark Ignition (Gasoline and LPG) Engines and Equipment 25 Horsepower and

Greater (including Industrial Equipment, Forklifts, and Portable Generators); Airport Ground Support Equipment; Locomotives; Commercial Marine Vessels; and Recreational Marine (including Personal Water Craft, Ski boats, Inboards, and Outboards)

- *On-Road Heavy-Duty Diesel New Engine Program* - Reduces emissions from new on-road heavy-duty diesel engines through the development of emission control regulations and test procedures for these engines. 2004 - 2005 and subsequent model year heavy-duty diesel engine standards received final approval in 1999 and 2001.
 - *Public Transit Bus Program*- Reduces criteria pollutant emissions and toxic air contaminants from urban buses. In June 2004, the ARB adopted modifications to the fleet rule for transit agencies to allow the purchase of diesel hybrid electric buses by diesel-path transit agencies and allow for a delay in the implementation deadlines for the zero-emission bus demonstration project.
 - *Heavy-Duty Diesel In-Use Strategies Program* – Reduces emissions from all existing on- and off-road diesel engines, with a special emphasis on reducing particulate emissions, through the following three implementation programs: Retrofit Assessment and Implementation (solid waste collection vehicles and on-road heavy-duty public fleet vehicles); and Heavy-duty Testing and Field Support. Implementation of this program is based on adoption of a series of rules and control measures that began in February 2000.
 - *Heavy-Duty Diesel Idling Control Measure* – On July 22, 2004, the ARB adopted a heavy-duty diesel idling control measure that limits unnecessary idling.
- **Fuels Program** – Adoption of standards, rules and regulations to achieve the maximum degree of emission reduction possible from vehicular and other mobile sources in the following four categories: reformulated gasoline; diesel fuel; alternative gasoline fuels; and alternative diesel. ARB adopted a clean fuel regulation that became effective in January 2001. ARB conducts ongoing verification of alternative diesel fuel emission benefits.
 - **Aftermarket, Performance, and Add-On Parts Regulations** - Regulates the installation of parts or modifications that are proven by their manufacturers and ARB not to increase vehicle emissions. This is an ongoing ARB program and includes certification of alternative fuel certified retrofit systems and verification of heavy-duty diesel retrofit device emission reduction systems. Regulations became effective in September 2000, on certification procedures for all aftermarket part and conversion systems for off-road vehicles, engines and equipment.
 - **Motor Vehicle and Engine Certification Program** – Certifies new motor vehicles and engines for emission compliance before they are legal for sale, use, or registration in California. This is an ongoing ARB program in which certification is granted annually to individual engine families and is good for one model year.
 - **Heavy Duty Vehicle Inspection Program** – Inspection of trucks and busses for excessive smoke. In June 1998, ARB resumed the Heavy Duty Vehicle Inspection Program. In July 1998 ARB began the Periodic Smoke Inspection Program, where diesel and bus fleet operators are required to annually self-inspect their vehicles and repair those with excessive smoke emissions.
 - **Low Emission Vehicle Program** – Establishes improved emission reduction standards for automobiles. LEV II regulations are the most recent and are effective from 2004 through 2010. The new standards extend passenger car emission standards to heavier sport utility vehicles and pickup trucks (with gross vehicle weight up to 8,500 pounds) which formerly had been regulated under less-stringent emission standards.
 - **Recreational Marine Engines** – Reduces emissions of ROG and oxides of nitrogen (NOx) emissions for certain marine vessels with proposed regulations for other spark-ignition engines

used in boats for propulsion. In 2001, all new outboards sold in California were required to meet the U.S. EPA 2006 emission levels. In 2002, ARB adopted regulations governing emissions from all for all 2003 model year and later inboard engines.

- **On-Board Diagnostic (OBD) Program** - OBD II systems monitor components in 1996 and newer vehicles less than 14,000 lbs to ensure that a vehicle remains as clean as possible over its entire life, and assists Smog Check repair technicians in diagnosing and fixing problems with the computerized engine controls. ARB is currently developing OBD requirements for heavy-duty vehicles over 14,000 lbs.
- **On-Road Motorcycle Regulation** - ARB adopted new emission standards for on-road motorcycles in December 1998. These new standards apply to motorcycles with engines over 280cc manufactured for the 2004 model year and later.
- **School Bus Program** - Provides criteria for the purchase of new school buses and retrofits of existing school buses to reduce particulate matter emissions and reduce school children's exposure to harmful diesel exhaust emissions. Proposition 40, approved by voters in 2002, provided allocation for this program for two years with distributions beginning in FY 2002/03.
- **School Bus Idling Limit** – To reduce emissions and exposure to diesel exhaust particulate matter this regulation requires school bus engines be manually turned off upon arriving at a school and restarted no more than 30 seconds before departing. This measure became effective in July 2003.
- **Zero Emission Vehicle Program** – Certifying and creating incentives to promote zero emission vehicles. Amendments to the Zero Emission Vehicle Regulation, adopted in April 2002, adjusted the rate and schedule of ZEV and partial ZEV sales mandates and adjustments to various credit and allowance mechanisms.
- **Climate Change Program** – AB 1493 (Pavley) requires ARB to adopt a regulation that would reduce emission of greenhouse gases from motor vehicles in California. The draft regulation was proposed in June 2004. The proposed regulation would be phased in between 2009 and 2014 and achieve CO₂ emission reductions of approximately 30%. In September 2004, the ARB Board will consider adoption of the final proposed regulation for reducing greenhouse gas emissions from motor vehicles.

The federal CAA prohibits all states, including California, from establishing emission standards for aircraft engines, new locomotive engines and new engines less than 175 horsepower used in construction or farm equipment. Only EPA has authority to regulate these sources. EPA has promulgated regulations or otherwise established programs to control emissions from these important source categories. Gas turbines, used in almost all commercial aircraft, became subject to United Nations International Civil Aviation Organization (ICAO) NO_x, hydrocarbons, CO and smoke standards in 1997.

In 1998, EPA adopted more stringent emission standards ("Tier 2" and "Tier 3") for NO_x, hydrocarbons, and PM from new non-road diesel engines. This program includes the first set of standards for non-road diesel engines less than 50 hp, including marine engines in this size range. It also phases in more stringent "Tier 2" emission standards from 2001 to 2006 for all engine sizes and adds yet more stringent "Tier 3" standards for engines between 50 and 750 hp from 2006 to 2008.

In May 2004, as part of its Clean Diesel Programs, EPA finalized the Clean Air Non-road Diesel Rule, a comprehensive rule to reduce emissions from non-road diesel engines by integrating engine and fuel controls to optimize emission reductions. These fuel improvements will reduce PM from engines in the existing fleet of non-road equipment and makes it possible for engine manufacturers to use advanced emission control technologies.

AIR DISTRICT MOBILE SOURCE PROGRAMS

The Air District does not have the authority to regulate mobile sources, but reduces mobile source emissions by providing grants or incentives to encourage the use of cleaner vehicles and fuels. The Transportation Fund for Clean Air (TFCA) is an Air District grant program that funds both mobile source and transportation control measures implemented by local public agencies. To fund these measures the State Legislature allows the Air District to impose a \$4 surcharge on motor vehicle registration fees paid for vehicles registered in the District. Mobile source measures funded through the TFCA program include purchase or lease of clean fuel vehicles, primarily through the Vehicle Incentive Program (VIP), as well as engine retrofits and repowers. Another TFCA-funded program, the Vehicle Buy Back Program, accelerates the voluntary retirement of older, high emitting vehicles from the region's roadways by providing financial incentives to scrap them.

The Carl Moyer Program provides incentives that cover the incremental cost of cleaner heavy-duty engines with a primary focus of reducing NO_x emissions. Among the eligible projects are cleaner on-road, off-road, marine, locomotive and stationary agricultural pump engines, as well as forklifts, airport ground support equipment, and auxiliary power units. The Air District also has grant programs for low emission school buses and heavy-duty diesel PM₁₀ filter retrofits.

The Air District also reduces mobile source emissions through the Spare the Air (STA) program. The STA program is an intermittent, voluntary control program in which the Air District encourages Bay Area residents, businesses and public agencies to reduce or postpone polluting activity on days when weather conditions are conducive to forming high ozone levels. STA advisories include recommendations to avoid discretionary driving, to use transit, carpooling, walking or cycling instead of driving alone, to link trips to avoid cold starts, and postpone refueling of vehicles.

In addition to State and federal regulations and District incentive and STA programs, the Ozone Strategy includes control measures that reduce emissions from on-road and off-road mobile sources. These control measures encourage the retirement of older, more-polluting equipment and the introduction of new, less-polluting equipment, or encourage operational changes (e.g. reduced idling) to reduce emissions. The measures would be implemented mainly through incentive programs and through development and promotion of model ordinances for cities and counties.

State Transportation Control Measures

Motor vehicles are the largest source of ozone precursors in the Bay Area, and reducing these emissions is essential to regional efforts to attain the State ozone standard and reduce transport. Motor vehicle emissions have dropped substantially over the years thanks to State and national regulations on vehicles and fuels, and motor vehicle emissions are expected to continue to decrease in the future as the vehicle fleet becomes cleaner. TCMs play a critical role in complementing State and national regulatory efforts by reducing motor vehicle use.¹ TCMs also help achieve other goals, including improved mobility and reduced congestion.

CCAA TCM REQUIREMENTS

The California Clean Air Act (CCAA) emphasizes transportation control measures. CCAA legislative intent states that in developing attainment plans, air districts shall "focus particular attention on reducing the emissions from transportation and areawide emission sources." (Sec. 40910.) The CCAA specifically requires air districts to "adopt, implement and enforce transportation control measures." TCMs are defined as "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions." (Sec. 40717.) TCMs must be sufficient to substantially reduce the rate of increase in vehicle trips and vehicle miles traveled. (Sec. 40918.) As noted previously in the discussion of CCAA legal requirements, Health and Safety Code

¹ TCMs are distinguished from mobile source measures in that mobile source measures reduce vehicle *emission rates*, while TCMs reduce vehicle *use* by reducing vehicle trips and/or vehicle miles traveled.

Section 40233 lays out a process for developing a TCM emission reduction target and TCM plan when developing the 1991 Clean Air Plan. The Air District and MTC in 1991 complied with the required process. Under the CCAA, setting a TCM emission reduction target in subsequent planning cycles is discretionary. While a TCM emission reduction target has not been set in subsequent plans, the TCMs have undergone extensive revision and expansion, as described below.

STATE TCM DEVELOPMENT IN THE BAY AREA

The Bay Area has extensive experience with developing and implementing TCMs. The first regional plan prepared pursuant to the CCAA, the 1991 Clean Air Plan, included 23 TCMs to meet State planning requirements (State TCMs). Plan updates in 1994 and 1997 included thorough revisions to the State TCMs. The regional strategy for the State ozone standard now contains 19 State TCMs that cover the full spectrum of transportation strategies, including:

- Bus transit
- Rail transit
- Ferry service
- Carpooling and vanpooling
- Bicycle and pedestrian enhancements
- Land use programs
- Pricing measures
- Traffic management
- Employer programs and youth programs
- Public education and episodic measures

The Air District, MTC and other regional and local partners have worked together over the years to develop one of the most comprehensive TCM plans to address the California ozone standard. This effort has continued during the preparation of the 2005 Ozone Strategy.

The control measure review and development process included a thorough review of potential TCM enhancements. MTC and Air District staff considered a wide range of new or enhanced TCM programs, including:

- New initiatives deriving from the Smart Growth Strategy/Regional Livability Footprint Project and MTC's Transportation 2030 process;
- Input from the Ozone Working Group and community meetings;
- Input from cities, counties and other public agencies;
- Input from environmental, business and community groups;
- Suggestions from staff and Advisory Council members;
- Review of TCM programs in other regions.

All of the State TCMs have been revised to reflect this input. The resulting State TCMs take into consideration current fiscal and political conditions but at the same time set an ambitious course for the future, particularly as additional revenues become available and land use changes occur over the long term.