Motor Vehicles and the 1990 Clean Air Act

Background

The Clean Air Act of 1970 set a national goal of clean and healthy air for all. It established for the first time specific responsibilities for government and private industry to reduce emissions from vehicles, factories, and other pollution sources. In many ways, the far-reaching law has been a great success. Today's cars, for example, typically emit 70% to 90% less pollution over their lifetimes than their 1970 counterparts.

Despite considerable progress, the overall goal of clean and healthy air continues to elude much of the country. Unhealthy air pollution levels still plague virtually every major city in the United States. This is largely because development and urban sprawl have created new pollution sources and have contributed to a doubling of vehicle travel since 1970. Furthermore, scientists and now the public have become concerned about previously unrecognized environmental threats such as acid rain and air toxics.

With these issues in mind, Congress and the Administration in 1990 amended and updated the Clean Air Act for the first time since 1977. The 1990 Clean Air Act includes provisions to further control urban smog, carbon monoxide, and diesel particulates and to address air toxics and acid rain. Motor vehicles contribute to all these problems. This fact sheet focuses on the mobile source provisions of the 1990 law, which together will reduce most vehicle-related pollutants by more than 40%.

The 1990 Clean Air Act – What's New?

The new Clean Air Act strengthens components of the earlier law. The tailpipe standards now in effect for cars, buses, and trucks will be tightened, for instance, and Inspection and Maintenance (I/M) programs have been expanded to include more areas and allow for more stringent tests.

The 1990 law also presents several entirely new concepts with regard to reducing motor vehicle-related air pollution. For the first time, fuel is considered along with vehicle technology as a potential source of emission reductions. And more attention is focused on reducing the growth in vehicle travel. The new provisions include:

- **Emphasis on Fuels**

  The amendments mandate that improved gasoline formulations be sold in some polluted cities to reduce emissions of carbon monoxide or smog-forming hydrocarbons. Other programs set low vehicle emission standards to stimulate the introduction of even cleaner cars and fuels.

- **Nonroad Engines**

  Under the previous Clean Air Act, EPA's mobile source pollution control authority applied only to highway vehicles. The 1990 law requires EPA to control locomotive emissions and to study, and regulate, if warranted, any category of nonroad engines that contributes to urban air pollution. This includes boats, farm equipment, bulldozers, lawn and garden devices, and construction machinery.

- **Clean Transportation Alternatives**

  The law requires the smoggiest cities to employ ridesharing and other transportation alternatives to reduce the amount of vehicle traffic. In areas where smog levels exceed certain criteria, employers of 100 or more will be asked to find ways to increase the average number of passengers in each vehicle for commutes to work and during work-related driving trips.

The 1990 Amendments: The View from the Driver's Seat

Typical drivers will probably not be aware of many vehicle and fuel changes manufacturers make in response to the new Clean Air Act, although these changes could add $200 to the cost of a car and a few cents per gallon to the cost of gasoline. But there are other programs that drivers will notice, especially in areas with air pollution problems.

Starting in 1994, new cars will be equipped with "onboard diagnostic systems." These systems will feature dashboard warning lights that alert drivers to malfunctioning emission control equipment. Controlled by a "brain" in the vehicle's computer, the onboard diagnostic system must also be capable of storing "trouble codes" that help mechanics pinpoint the malfunction.

Another change involves tampering and misfueling. Such activities have always been discouraged, but were previously illegal only for commercial operations. "Backyard mechanics" now are also subject to stiff penalties for deliberate tampering.

For drivers in polluted cities, more changes will be apparent. Some cities will have to start I/M programs to check vehicle emissions on a regular basis. Areas that already require I/M testing may have to institute more stringent programs. At the pump, drivers will begin to see special nozzles that recover gasoline vapors before they can escape into the air.

A Summary of Some Specific Clean Air Act Programs

- **Tighter Tailpipe Standards**

  The current tailpipe standards for cars are 0.41 gram per mile (gpm) total hydrocarbons, 3.4 gpm carbon monoxide, and 1.0 gpm nitrogen oxides. Lower standards of 0.25 gpm nonmethane hydrocarbons and 0.4 gpm nitrogen oxides will be phased in between 1994 and 1996 (the 3.4 gpm standard for carbon monoxide does not change). EPA is required to study whether even tighter standards are needed, technologically feasible, and economical. If EPA determines by 1999 that lower standards are warranted, the standards will be cut in half beginning with 2004 model year vehicles.

- **Carbon Monoxide Control**

  Mobile sources are the primary cause of carbon monoxide pollution in 39 U.S. cities. The 1990 Clean Air Act sets up two new programs to address this problem. For the first time, carbon monoxide emissions will be regulated at cold temperatures. Carbon monoxide emissions can be very high in cold weather because both fuel combustion and pollution control equipment operate less efficiently in the cold. In the past, tailpipe standards applied only at 75 °F., so manufacturers optimized emission control equipment for that temperature. The new Clean Air Act will require cars to meet a carbon monoxide standard at 20 °F. The standard of 10 gpm will be phased in beginning with 1994 models. If, by 1997, carbon monoxide levels are still too high in six or more cities, the cold temperature emission standard will drop to 3.4 gpm for 2002 models. The second new provision involves increasing the oxygen content of gasoline sold during the winter in the 39 cities. The oxygen helps reduce carbon monoxide emisions by enhancing fuel combustion. The wintertime fuel requirements began in 1992.

- **Ozone Control**

  Ground-level ozone, a primary component of smog, exceeds healthy levels in urban areas acrsoss the United States. It is our most serious and persistent air quality problem. A major thrust of the 1990 Clean Air Act involves reducing urban ozone levels. As a complement to stricter tailpipe standards, the new law introduces several programs to minimize "evaporative emissions," as gasoline vapors from fuel evaporation are a major source of the hydrocarbon compounds that form smog. Devices that trap gasoline vapors from the engine and fuel system will be improved. In addition, systems to capture gasoline vapors during refueling will be required at service stations in smoggy cities. Most importantly, gasoline volatility will be capped, reducing the propensity for fuel to evaporate in the first place.

- **Air Toxics Control**

  Most provisions requiring cleaner cars and fuels will dramatically lower vehicle toxic emissions. In addition, EPA must study and, if warranted, regulate emissions of benzene, formaldehyde, and other toxic air pollutants.

- **Reformulated Gasoline**

  By 1995, all gasoline sold in the nine worst ozone areas must contain a minimum oxygen content and a maximum benzene content. Reformulated gasoline must also reduce by at least 15% emissions of toxic and smog-forming compounds, without increasing emissions of nitrogen oxides. By 2000, gasoline sold in these cities must be able to reduce emissions of toxic and smog-forming compounds by at least 20% to 25%. Other cities can elect to use this cleaner gasoline, and many are expected to do so.

- **Urban Buses**

  Beginning in 1993, urban buses must meet a diesel particulate standard of 0.1 gram per brake-horsepower-hour. The standard, which applies only to urban transit buses, drops to half that level in 1994. If monitoring data indicate that buses are not meeting the standard, EPA must implement a "low-polluting fuels" program for new buses in large cities. Possible fuels include methanol (an alcohol fuel) and compressed natural gas.

- **Clean Fleets**

  Beginning in 1998, 30% of new vehicles purchased by centrally-fueled fleets in certain cities will be required to use clean fuels and meet tailpipe standards that are lower than those in place for general passenger cars (0.075 gpm hydrocarbons, 3.4 gpm carbon monoxide, and 0.2 gram per mile nitrogen oxides). The purchase requirement will grow to 70% by the year 2000. The program, which is intended to stimulate development of new, low-polluting fuel/vehicle combinations, will affect 22 metropolitan areas in 19 states across the country where pollution levels are high.

- **California Pilot Program**

  Like the fleets program, the California Pilot program is designed to encourage production of clean fuels and vehicles. Beginning in 1996, manufacturers must produce at least 150,000 "clean" cars (capable of meeting a 0.125 gpm hydrocarbon, 3.4 gpm carbon monoxide, and 0.4 gpm nitrogen oxide standard) for sale in California. The number increases to 300,000 by the year 1999. In 2001, the standards drop to the fleets program levels.

Timetable for Selected Mobile Source Provisions of the 1990 Clean Air Act

199? Limits on maximum gasoline vapor pressure become law nationwide.

Regulations setting minimum oxygen content for gasoline take effect in 39 areas where carbon monoxide levels exceed national pollution standards.

1993 Production of vehicles requiring leaded gasoline becomes illegal.

New standards for sulfur content of diesel fuel take effect, reducing the maximum sulfur level by 80%.

199? Phase-in of tighter tailpipe standards for light-duty vehicles begins.

Enhanced Inspection and Maintenance programs begin in some polluted cities.

Phase-in of cold temperature carbon monoxide standards for light-duty vehicles begins.

Trucks and buses must meet stringent diesel particulate emission standards, equivalent to 5% of the uncontrolled level.

New cars must be equipped with on-board diagnostic systems.

1995 Reformulated gasoline provisions take effect in the nation's nine smoggiest cities.

New warranty provisions on emission control systems take effect.

1996 Phase-in of California Clean Fuels pilot program begins.

Lead banned from use in motor vehicle fuel.

All new vehicles (1996 model year cars and light trucks) must meet new tailpipe and cold-temperature carbon monoxide standards.

1998 Clean-fuel fleet programs begin in ozone and carbon monoxide non-attainment areas in 19 states.

2001 Second phase of the Fleets and California Pilot clean fuels programs begin.

For Further Information:

The EPA National Vehicle and Fuel Emissions Laboratory is the national center for research and policy related to auto pollution. To request fact sheets on other mobile source issues, write to us at 2565 Plymouth Road, Ann Arbor MI 48105, or call 313/668-4333.

Cities Affected by Key Mobile Source Provisions of the Clean Air Act

METROPOLITAN AREA	POLLUTANT CATEGORY*		CONTROL PROGRAM					
	Carbon Monoxide	Ozone	Commute Options**	Reformulated Gasoline†	Oxygenated Fuels	Clean Fleets	Refueling Controls	Inspection & Maintenance††
Albuquerque, NM	Moderate				•			•
Anchorage, AK	Moderate				•			•
Atlanta, GA		Serious				•	•	•
Atlantic City, NJ		Moderate					•	•
Bakersfield, CA (San Joaquin Valley)		Serious				•	•	•
Baltimore, MD	Moderate	Severe	•	•	•	•	•	•
Baton Rouge, LA		Serious				•	•	•
Beaumont-Port Arthur, TX		Serious				•	•	•
Boston-Lawrence-Worcester, MA-NH	Moderate	Serious			•	•	•	•
Charleston, WV		Moderate					•	•
Charlotte-Gastonia, NC-SC		Moderate					•	•
Chicago-Gary-Lake County, IL-IN-WI		Severe	•	•		•	•	•
Chico, CA	Moderate				•			•
Cincinnati-Hamilton, OH-KY-IN		Moderate					•	•
Cleveland-Akron-Lorain, OH	Moderate	Moderate			•		•	•
Colorado Springs, CO	Moderate				•			•
Dallas-Fort Worth, TX		Moderate					•	•
Dayton-Springfield, OH		Moderate					•	•
Denver-Boulder, CO	Moderate				•	•		•
Detroit-Ann Arbor, MI		Moderate					•	•
Duluth, MN-WI	Moderate				•			
El Paso, TX	Moderate	Serious			•	•	•	•
Fairbanks, AK	Moderate				•			•
Fort Collins-Loveland, CO	Moderate				•			•
Fresno, CA (San Joaquin Valley)	Moderate	Serious			•	•	•	•
Grand Rapids, MI		Moderate					•	•
Greensboro-Winston Salem-High Point, NC	Moderate	Moderate			•		•	•
Hartford, CT (Greater Connecticut)	Moderate	Serious	•	•	•	•	•	•
Houston-Galveston-Brazoria, TX		Severe	•	•		•	•	•
Huntington-Ashland, WV-KY-OH		Serious					•	•
Josephine Co., OR (Grants Pass)	Moderate				•			
Kewaunee Co., WI		Moderate					•	
Klamath Co., OR (Klamath Falls)	Moderate				•			
Knox & Lincoln Co., ME		Moderate					•	
Las Vegas, NV	Moderate				•			•
Lewiston-Auburn, ME		Moderate					•	•
Los Angeles South Coast Air Basin, CA	Serious	Extreme	•	•	•	•	•	•
Louisville, KY-IN		Moderate					•	•

* 1990 Clean Air Act classification The metropolitan area generally includes suburbs and nearby towns

** The Employee Commute Options (ECO) program is designed to discourage single-occupancy commuting to work

† Other ozone nonattainment areas are expected to opt in to this program

†† This is a partial list of cities required to implement Inspecion and Maintenance programs "o" indicates an enhanced program will be required

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	Carbon Monoxide	Ozone	Commute Options**	Reformulated Gasoline†	Oxygenated Fuels	Clean Fleets	Refueling Controls	Inspection & Maintenance††
Manitowoc Co., WI		Moderate					•	
Medford, OR	Moderate				•			•
Memphis, TN-AR-MS	Moderate	Moderate			•		•	•
Miami-Fort Lauderdale, FL		Moderate					•	•
Milwaukee, WI		Severe	•	•		•	•	•
Minneapolis-St. Paul, MN-WI	Moderate				•			•
Missoula, MT	Moderate				•			
Modesto, CA	Moderate	Moderate			•		•	•
Muskegon, MI		Severe					•	•
Nashville, TN		Moderate					•	•
New York, N. NJ-Long Island, NY-NJ	Moderate	Severe	•	•	•	•	•	•
Parkersburg-Marietta, WV-OH		Serious					•	•
Philadelphia, PA	Moderate	Severe	•	•	•	•	•	•
Phoenix, AZ	Moderate				•			•
Pittsburgh-Beaver Valley, PA		Moderate					•	•
Portland, ME		Moderate					•	•
Portland-Vancouver, OR-WA	Moderate				•			•
Portsmith-Dover-Rochester, NH-ME		Serious					•	•
Providence-Pawtucket-Fall River, RI-MA		Serious				•	•	•
Provo-Orem, UT	Moderate				•			•
Raleigh-Durham, NC	Moderate	Moderate			•		•	•
Reading, PA		Moderate					•	•
Reno, NV	Moderate				•			•
Richmond-Petersburg, VA		Moderate					•	•
Sacramento, CA	Moderate	Serious			•	•	•	•
Salt Lake City-Ogden, UT		Moderate					•	•
San Diego, CA	Moderate	Severe	•	•	•	•	•	•
San Francisco-Oakland-San Jose, CA	Moderate	Moderate			•		•	•
Santa Barbara-Santa Maria-Lompoc, CA		Moderate					•	•
Seattle-Tacoma, WA	Moderate				•			•
Sheboygan, WI		Moderate					•	•
Southeast Desert, CA		Severe	•	•		•	•	•
Spokane, WA	Moderate				•			•
Springfield, MA		Serious				•	•	•
St. Louis, MO-IL		Moderate					•	•
Stockton, CA	Moderate	Marginal			•		•	•
Syracuse, NY	Moderate				•			•
Toledo, OH		Moderate					•	•
Ventura County, CA		Severe	•	•		•	•	•
Washington, DC-MD-VA	Moderate	Serious			•	•	•	•