

**ARB Adopts Ground-Breaking Emission Control Program for Urban Buses** -- On February 24, 2000, California's Air Resources Board (ARB), by unanimous vote, adopted a comprehensive program imposing stringent emission control requirements for both new and existing urban buses sold for use in California. In adopting the final rule the Board rejected requests to grant air quality districts specific authority to require transit agencies to purchase only alternative fueled buses. It also accelerated the deadlines for completing retrofits for transit authorities pursuing the diesel path and gave transit authorities added flexibility to meet the interim 0.5 g/bhp-hr NO<sub>x</sub> standard (see discussion below).

The rule is designed to further reduce emissions of both ozone precursors and toxic air contaminants, including diesel PM, from the California urban transit bus sector. To provide transit agencies with flexibility in determining their optimal fleet mix, the rule allows transit agencies to choose between two compliance paths, either the diesel path or the alternative-fuel path (see Table 1 below). For transit agencies choosing the alternative-fuel path, a minimum 85 percent of new bus purchases would have to be low-emission, alternative-fuel buses, beginning with the adoption of the regulation through model year 2015. The fleet rule contains six components: 1) a NO<sub>x</sub> fleet average requirement; 2) PM retrofit requirements; 3) low-emission bus purchase requirements; 4) a zero-emission bus (ZEB) demonstration project; 5) ZEB purchase requirements; and 6) requirements for transit agencies to use low-sulfur diesel fuel. The NO<sub>x</sub> fleet average requirements, PM retrofit requirements, and low-sulfur diesel fuel requirements are the same for transit agencies on either the diesel or alternative-fuel path. The provisions are described in more detail below.

***4.8 g/bhp-hr NO<sub>x</sub> Fleet Average Standard*** -- Transit agencies on both the diesel and alternative-fuel paths must meet and maintain a minimum fleet average standard of 4.8 g/bhp-hr NO<sub>x</sub> by October 2002. The ARB staff expects that the fleet average requirement can be achieved by most transit agencies simply by retiring their pre-1988 buses and replacing them with new buses.

***Low-Emission Buses*** -- Beginning in October 2002 transit authorities may not take delivery of any buses certified to standards above those shown in Table 1 for the model year in question. In response to a proposal from the Engine Manufacturers Association (EMA), the Board granted individual transit companies pursuing the diesel path the ability to propose compliance options in lieu of buying buses meeting a 0.5 g/bhp-hr standard during 2004-2006. The transit authority must demonstrate to ARB that its proposed alternative compliance strategy will provide greater NO<sub>x</sub> emission reductions than if it purchased buses meeting the 0.5 NO<sub>x</sub> standard. As a condition of ARB's acceptance of its proposal, engine manufacturers committed to comply with the 0.01 g/bhp-hr PM standard beginning in October 2002 and to conduct a demonstration program designed to show that a 0.5 g/bhp-hr NO<sub>x</sub> standard and a 0.01 g/bhp-hr PM standard are achievable.

**Table 1**

<b>Urban Transit Bus Fleet Rule Requirements and Emission Standards</b>				
<b>Model Year</b>	<b>“Diesel” Path</b>		<b>“Alternative-Fuel” Path</b>	
	<b>NOx (g/bhp-hr)</b>	<b>PM (g/bhp-hr)</b>	<b>NOx (g/bhp-hr)</b>	<b>PM (g/bhp-hr)</b>
2000	4.0	0.05	2.5 optional <sup>(1)</sup>	0.05
10/2002	2.5 NOx+NMHC	0.01	1.8 NOx+NMHC optional <sup>(1)</sup>	0.03
10/2002	4.8 NOx fleet average		4.8 NOx fleet average	
2003-09	PM Retrofit requirements		PM Retrofit Requirements	
7/2003	3 bus demo of ZEBs for large fleets (>200)			
2004	0.5	0.01		
2007	0.2	0.01	0.2	0.01
2008	15% of new purchases are ZEBs for large fleets (>200)			
2010			15% of new purchases are ZEBs for large fleets (>200)	

Notes: Shaded area shows existing requirements and existing optional emission standards

- (1) Although transit agencies on the alternative-fuel path are not required to purchase engines certified to these optional standards, the staff expects that they will do so in order to qualify for incentive funding. At present, the only alternative-fuel engines available are certified to optional, lower-emission NOx standards.

***PM Retrofit Requirements --*** The PM retrofit requirements apply to existing diesel-powered buses regardless of the path the transit authority chooses. However, the Board accelerated the deadline for retrofits for transit authorities following the diesel path. Below are the schedules for the required PM retrofits.

***Alternative-Fuels Path***

**TIER 1 – 1990 and Earlier Buses**

100 percent of these buses must be retrofitted by January 1, 2003.

**TIER 2 – 1991 through 1995 Buses**

20 percent of these buses must be retrofitted by January 1, 2003.

75 percent of these buses must be retrofitted by January 1, 2004.

100 percent of these buses must be retrofitted by January 1, 2005.

**TIER 3 – 1996 through 2003 Buses**

20 percent of these buses must be retrofitted by January 1, 2007.

75 percent of these buses must be retrofitted by January 1, 2008.

100 percent of these buses must be retrofitted by January 1, 2009.

## ***Diesel Path***

### **TIER 1 – 1990 and Earlier Buses**

100 percent of these buses must be retrofitted by January 1, 2003.

### **TIER 2 – 1991 through 1995 Buses**

50 percent of these buses must be retrofitted by January 1, 2003.

100 percent of these buses must be retrofitted by January 1, 2004.

### **TIER 3 – 1996 through 2003 Buses**

20 percent of these buses must be retrofitted by January 1, 2005.

75 percent of these buses must be retrofitted by January 1, 2006.

100 percent of these buses must be retrofitted by January 1, 2007.

### ***Zero-Emission Bus Demonstration for Transit Agencies Choosing the Diesel Path --***

Transit agencies on the diesel path with more than 200 urban buses in their active fleets must place at least three ZEBs in service by July 1, 2003.

***Zero-Emission Bus Purchase --*** Transit agencies with more than 200 urban buses in their active fleets would be required to purchase (or lease) ZEBs. For transit agencies on the diesel path, a minimum 15 percent of new urban bus purchases/leases must be ZEBs beginning in model year 2008. For transit agencies on the alternative-fuel path, a minimum 15 percent of new urban bus purchases/leases must be ZEBs beginning in model year 2010. These requirements will sunset in the model year 2015.

***Requirements for Low-Sulfur Diesel Fuel --*** Low-sulfur diesel fuel is necessary for most exhaust control technologies to function more efficiently and reliably. Therefore, the urban transit bus fleet rule requires any transit agency (on both the diesel and alternative-fuel paths) using diesel fuel to purchase and use low-sulfur diesel fuel with a cap of 15 parts per million sulfur. The requirement is effective beginning July 1, 2002, in order to comply with the proposed PM retrofit requirements.

For a copy of the staff report and regulatory language visit the ARB web site at <http://www.arb.ca.gov/msprog/bus/bus.htm>.