



Clean School Bus USA

EPA's New Initiative to Reduce Pollution from School Buses

Mobile Sources Technical Review Subcommittee

December 3, 2003

Clean School Bus USA: Tomorrow's Buses for Today's Children



- Launched in April 2003
- Partnership of public and private sector leaders
- The charge: provide cleanest possible transportation for this generation of school children by:
 - Reducing school bus idling & reinforcing smart driving practices
 - Retrofitting buses with modern pollution control technology
 - Replacing the oldest buses with new, cleaner buses
- The goal: modernize 100% of the fleet by 2010
- The benefits: healthier kids and communities
 - 1,000s of fewer cases of respiratory symptoms each year
 - Reduced asthma symptoms, medication, and missed school days

Why Focus on School Buses?



- 24 million children ride school buses
- Almost 400,000 diesel school buses in U.S
- School buses are very safe but we can do better:
 - many very old
 - rudimentary or no emission controls
- Diesel exhaust presents a significant public health risk
- PM concentrations higher on bus than outside
- 2004 & 2007 HD standards only apply to new engines
- Today's kindergartners will be in college before the school bus fleet turns over
- Effective retrofit technologies now widely available₃

The Three R's



- **Reduce Idling and Reinforce Smart Driving Practices**
 - Smart, easy, and immediate way to reduce pollution
 - Saves fuel and money
 - Available to all fleets
- **Retrofit**
 - Recommended for 1991 and later buses
 - Achieves big reductions in particulate matter emissions (up to 90%)
- **Replace**
 - Recommended for 1990 and earlier buses
 - Buses meeting EPA's 2007 emission standards will emit 90% less particulate matter
 - Important safety improvements too

Reduce Idling and Reinforce Smart Driving Practices



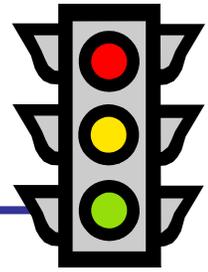
Idling

- Establish anti-idling policies
- Don't start bus until ready to depart
- Use battery to power flashing lights
- Consider block heaters for cold climates
- Provide comfortable waiting areas for bus drivers

Smart Driving Practices

- Avoid caravanning - keep a distance from other diesel vehicles especially if there is visible smoke
- Implement good fleet maintenance procedures
- Shorten commute times for kids
- Use the cleanest buses on longest routes
- Minimize time children spend outside school when buses are arriving and departing

Some School Bus Retrofit Options



Clean Fuel/Clean Technology	% Reduction in Particulate Matter	Approximate Cost
Ultra-Low Sulfur Diesel (ULSD)	5-10% and enables PM filter technology	5-20 cents more per gallon than diesel
Particulate Matter Filter (must be used with ULSD)	60-90%	\$5,000-\$8,000
Oxidation Catalyst	20-30%	\$700-\$2,000
Biodiesel (B20 - 20% blend)	10% (increases nitrogen oxides 1-2%)	15-20 cents more per gallon than diesel
Emulsified Diesel	50% (also reduces nitrogen oxides 10%)	20-40 cents more per gallon than diesel

Replacement Options



- Both diesel and compressed natural gas (CNG) offer very low emissions
 - School bus engines are subject to tough new emission standards taking effect in 2007
 - New buses can take advantage of 2007 technology now
 - Same standards will apply to both diesel and CNG
- Diesel
 - Need PM filter and ULSD for lowest emissions
 - ULSD available everywhere starting in 2006
- CNG
 - Fueling infrastructure expensive but CNG may be practical where infrastructure already exists or funding available
 - A new CNG school bus costs about \$35,000 more than an equivalent diesel bus

Making it Happen



- CSBUSA goals are extremely ambitious
 - Get almost 15,000 school districts to adopt anti-idling & smart driving practices
 - Retrofit 260,000 buses or about 37,000 per year
 - Replace 130,000 buses - districts with oldest buses tend to be those least able to afford new ones
- Will require:
 - Resources
 - Technical support and info sharing
 - Behavior change
- Stakeholder partnerships essential!

Resources for Clean School Bus Projects



- Federal funds
 - EPA - \$5 million in FY03, maybe again in FY04
 - Energy Bill - conference report included \$300 million FY05-07
 - CMAQ and other clean air grant programs
- State & local support
 - Appropriations in NY, TX, WA
 - Tax incentives in GA, OR
 - Other state & local incentives, especially for biodiesel
- Enforcement settlements - federal and state
- Corporate sponsorship
 - Many examples: 3M, Citigroup; Caterpillar



Other Challenges

- Technical Support & Info Sharing
 - Concept: “do-it-yourself” - need to share the know-how
 - Point of contact and resource centers in each state
 - Comprehensive info clearing house - web & print
 - Also: mentors and vendor support
 - Continued research and info on best practices
- Behavior Change
 - Education and training, especially by peers
 - Monitoring and incentives
 - Labor issues
 - Continued research and info on best practices

2003 Clean School Bus Demonstration Grants



- Congress allocated \$5 million for school bus grants
- Overwhelming response to competition over summer
 - 120 applications, almost \$60 million in requests, \$36 million match
 - Applications from 36 states + Puerto Rico
 - Applicants included school districts, state/local agencies, nonprofits, and national organizations
- Grants awarded in October to 17 projects in 14 states
- \$5 million match by recipients
- Goal: demonstrate a variety of approaches to reducing pollution from school buses

Demonstration Projects



Applicant	EPA Region	State	Type of Technology
City of Medford	1	MA	Filters
Maine Department of Environmental Protection	1	ME	Catalysts
Corning-Painted Post Area School District	2	NY	Filters
North Allegheny School District	3	PA	Catalysts
General McLane School District	3	PA	Catalysts
Western North Carolina Regional Air Quality Agency	4	NC	Catalysts
Columbus Municipal School District	4	MS	Catalysts
Illinois Environmental Protection Agency	5	IL	Catalysts
Regional Air Pollution Control Agency	5	OH	Catalysts
Cleveland Municipal School District	5	OH	Filters
Texas State Energy Conservation Office	6	TX	Filters
Regional Air Quality Council	8	CO	Catalysts / Biodiesel
Salt Lake Clean Cities Coalition	8	UT	CNG
Paradise Valley Unified School District #69	9	AZ	Filters
Clovis Unified School District	9	CA	Catalysts / PuriNOx / Filters
Puget Sound Clean Air Agency	10	WA	Catalysts / Filters
National School Transportation Association	Nat'l	--	Catalysts / Filters

Demonstration Project Implementation



- Some projects already underway
- Teams of grantee, CSBUSA, EPA regions will support implementation
- Purpose:
 - Tech and other support for grantee
 - Enhance project demonstration value
- Grant reporting requirements
 - Final report must address lessons learned
 - Primary audience is peers

Clean School Bus USA: For Every School Bus Fleet



- Idling programs don't cost money, they save money
- The best choice for retrofit and replacement depends on the individual fleet
 - Fuel availability
 - Resource availability
 - Fleet activity characteristics
- Some options are not expensive
- Partnerships can help with both resources and information
- Through education and action we can provide tomorrow's buses to today's children

For more information...



- www.epa.gov/cleanschoolbus
- www.epa.gov/otaq/retrofit