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 available
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

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

* Does not include National School Transportation Project
## Demonstration Projects

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