

2. RECOMMENDATIONS

1. ***Prohibit Bus Idling:*** Drivers should be required to turn off bus engines immediately upon reaching their destinations. Buses should not be turned on until fully loaded. This is especially important when buses are queued while loading and unloading at schools and transfer stations. Exceptions should include conditions that would compromise passenger safety—e.g., extreme weather conditions, idling in traffic. In cases where engine operation is necessary to activate safety equipment such as flashing lights, buses should be retrofitted to permit battery operation. Idling restrictions should be defined by state statute and include clear and substantial enforcement power, instead of the present Department of Environmental Protection regulation 22a-174-18 (a)(5).
2. ***Retrofit Diesel Buses to Lower Emissions:*** Diesel school buses should be refitted with particle traps and catalytic converters designed to reduce emissions. Retrofit of the existing fleet should be completed by 2003.
3. ***Require School Buses to Use Ultra Low Sulfur Fuels:*** Ultra low sulfur diesel fuel (<15 ppm) should be required for all school buses. Acid aerosols, ozone precursors, and fine particulate emissions would be substantially reduced in the vicinity of children.
4. ***Replace Bus Fleet With Low Emission Vehicles:*** Existing diesel fleets should eventually be replaced with new low emission vehicles.
5. ***Allocate the Cleanest Buses to the Longest Routes:*** Bus companies and towns should allocate buses with the lowest emissions to the longest routes. Meeting this recommendation requires emissions testing to distinguish between clean and dirty buses.
6. ***Set Priorities:*** Priority for replacement with low emission vehicles, retrofit technologies, and filtration equipment should be assigned to communities with the highest ambient pollution levels, and to bus routes with the highest traffic intensity within communities.
7. ***Limit Ride Duration:*** School districts should reduce students' exposure to air pollution by limiting time spent on buses. This is already regulated by some town policies. Limiting ride duration would reduce exposure to pollution generated by diesel buses, and by other traffic.

8. ***Require Routine Maintenance:*** Buses should be monitored and maintained to ensure that emissions remain at their lowest possible level. Special care should be taken to ensure that exhaust systems are fully intact and secure, and that engine compartments are completely sealed from interior passenger space.
9. ***Test Tailpipe Emissions:*** Tailpipe emissions should be routinely tested on all school buses. This should be required by federal regulation, and implemented by the State.
10. ***Establish Passenger Cabin Air Quality Standards:*** The federal government should establish standards for air quality within vehicles that provide assurance of health protection for children.
11. ***Require Filtration Equipment:*** The federal government should require the installation of air filtration equipment on school buses. Equipment should be capable of removing vehicle exhaust from air entering the passenger cabin. This is especially important when buses travel in areas with high traffic intensity, or high outdoor background concentrations of pollutants.
12. ***Adjust Federal Air Quality Standards to Account for Indoor and Vehicle Exposures:*** EPA should adjust outdoor air quality standards to better account for probable indoor and within-vehicle exposures to air pollution. The Clean Air Act demands that standards be set to provide “an adequate margin of safety,” however governments’ neglect of particulate levels within homes, schools, and vehicles make it impossible to conclude that standards protect health.
13. ***Expand PM_{2.5} Monitoring Network:*** The State of Connecticut should expand its monitoring network to more fully capture the local variability of air pollutants.

6. Recommendations By Level of Government

RECOMMENDATIONS FOR THE FEDERAL GOVERNMENT

- 1. Retrofit Diesel Buses To Lower Emissions:** The federal government should require the retrofit of existing school buses with particle traps and catalytic converters designed to reduce emissions. Retrofit of the existing fleet should be completed by 2003.
- 2. Require Buses to Use Ultra Low Sulfur Fuels:** The federal government should require the use of ultra low sulfur diesel fuel (<15 ppm) on school buses. The effect would be to substantially reduce acid aerosols, ozone precursors, and fine particulate emissions in the immediate vicinity of children.
- 3. Replace Bus Fleet With Low Emission Vehicles:** The federal government should require and provide financial support for eventual replacement of existing diesel fleets with low emission vehicles, especially in areas of the country beyond compliance with current federal pollution standards.
- 4. Test Tailpipe Emissions:** The federal government should require periodic tailpipe emissions testing of all school buses, unless they have been retrofitted with particulate traps and converters, and use ultra low sulfur fuels.
- 5. Set Passenger Cabin Air Quality Standards:** The federal government should establish health protective standards for air quality within vehicles. Standards should provide an ample margin of safety for children.
- 6. Require School Bus Air Filtration Equipment:** The federal government should require the design and installation of air filtration equipment capable of removing vehicle exhaust from air entering bus passenger cabins. This is especially important when buses travel in areas with high traffic intensity, or high outdoor background concentrations of pollutants such as urban environments.
- 7. Federal Standards Should Assume Indoor and Vehicular Exposures:** EPA should adjust outdoor air quality standards to account for probable indoor and within-vehicle exposures to air pollution. The Clean Air Act demands that standards be set to provide "an adequate margin of safety," yet governments' neglect of particulate levels within homes, schools, and vehicles makes it impossible to conclude that current standards protect health.
- 8. Expand Air Quality Monitoring Network:** The federal government should require states to develop air quality monitoring programs that capture variability in regulated air pollutants. The existing stationary monitoring network should be supplemented with both additional stationary sources, and with personal monitoring data collection to better understand variability in exposure, especially among susceptible populations.

RECOMMENDATIONS FOR STATE GOVERNMENTS

- 1. Prohibit School Bus Idling:** Idling should be restricted by State law. Bus drivers should be required to turn off bus engines immediately upon reaching their destinations. Buses should not be turned on until fully loaded. This is especially important when buses are queued while loading and unloading at schools and transfer stations. Exceptions should include conditions that would compromise passenger safety—e.g., extreme weather conditions, idling in traffic. In cases where engine operation is necessary to activate safety equipment such as flashing lights, buses should be retrofitted to permit battery operation. Idling restrictions should be defined by state statute and include enforcement power, rather than by the present DEP regulation 22a-174-18 (a)(5).
- 2. Retrofit Diesel Buses To Lower Emissions:** The State should plan and implement a school bus retrofit program to ensure that buses are refitted with particle traps and catalytic converters designed to reduce emissions. Retrofit of the existing fleet should be completed by 2003.
- 3. Require School Buses to Use Ultra Low Sulfur Fuels:** The state should facilitate and monitor the suggested federal requirement that school buses use low sulfur diesel fuel (<15 ppm).
- 4. Replace Bus Fleet With Low Emission Vehicles:** The state should work with federal agencies (EPA, DOE, DOT) to plan for the replacement of the existing diesel fleet with new low-emission and alternative-fueled vehicles.
- 5. Set Priorities to Reduce Emissions and Exposure:** The State should plan for, guide, and set priorities to retrofit buses and convert to ultra low sulfur fuels. Priority should be assigned to communities with the poorest outdoor air quality. Within communities, priority should be assigned to the routes that have highest traffic intensity.
- 6. Require Routine Maintenance:** The State should require that routine maintenance be conducted to ensure that emissions remain at their lowest possible level. Special care should be taken to be certain that exhaust systems are fully intact and secure, and that engine compartments are completely sealed from interior passenger space.
- 7. Test Tailpipe Emissions:** The State should be responsible for periodic tailpipe emissions testing of all school buses.
- 8. Expand PM_{2.5} Monitoring Network:** The State should substantially expand its monitoring network to more fully capture local variability of air pollutants.

RECOMMENDATIONS FOR LOCAL GOVERNMENTS

- 1. *Prohibit Bus Idling:*** Local governments and school districts should immediately adopt policies that require drivers to turn off bus engines upon reaching their destinations. Buses should not be turned on until fully loaded. This is especially important when buses are queued while loading and unloading at schools and transfer stations. Exceptions should include conditions that would compromise passenger safety—e.g., extreme weather conditions, idling in traffic. In cases where engine operation is necessary to activate safety equipment such as flashing lights, buses should be retrofitted to permit battery operation. School districts should inform drivers about the effects of idling on both indoor and outdoor air quality. This idling restriction will improve air quality within buses, and in the vicinity of schools.
- 2. *Adjust Contract Provisions to Lease Retrofitted Vehicles and Require Clean Fuels:*** School districts should adjust their contracts with bus service companies and fuel providers to require the use of ultra low sulfur fuels, particle traps and catalytic converters, without waiting for federal or state requirements to take effect.
- 3. *Set Priorities:*** School districts and local governments should allocate buses with the lowest emissions to the longest routes.
- 4. *Limit Ride Duration:*** School districts should reduce students' exposure to air pollution by limiting time spent on buses. This is already regulated by some town policies. Limiting ride duration would reduce exposure to pollution generated by diesel buses, and by other traffic.
- 5. *Require Routine Maintenance:*** Local governments should ensure that buses are monitored and maintained so that emissions remain at their lowest possible level. Special care should be taken to be certain that exhaust systems are fully intact and secure, and that engine compartments are completely sealed from interior passenger space. Maintenance requirements to ensure health protective air quality should become a routine contract provision between bus companies and local governments.
- 6. *Reconsider Location of Bus Parking Lots:*** Local governments should consider whether the location of bus parking facilities contribute to routine air pollution in the vicinity of schools, playgrounds, and residential areas. Some relief may be provided by setting limits on bus idling within parking lots.