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Clean Buses

<https://www.epa.gov/cleandiesel/clean-school-bus#why> (some info quoted)

“School buses travel about four billion miles each year, providing the safest transportation to and from school for more than 25 million American children every day. However, diesel exhaust from these buses has a negative impact on human health, especially for children who have a faster breathing rate than adults and whose lungs are not yet fully developed.

While new buses must meet EPA’s tougher emission standards, many older school buses continue to emit harmful diesel exhaust. EPA’s *Clean School Bus* is a national program designed to help communities reduce emissions from older diesel school buses. School districts, fleet owners and operators, bus drivers, parents and students all have a role in helping to reduce diesel emissions from school buses.”

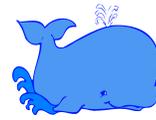
There was a rebate program, which is now closed: “In January 2011, President Obama signed the [Diesel Emissions Reduction Act of 2010 \(PDF\)](#) (7 pp, 133 K, January 2011, reauthorizing DERA through fiscal year 2016 and allowing EPA to offer rebates in addition to grants.”

Everyone can help with reducing emissions from school buses.

School Officials should be establishing idle reduction policies; working with bus companies to ensure idle reduction policies are implemented; discourage drivers from following directly behind other school buses or large vehicles, especially if they are emitting visible smoke; deploy cleanest buses on longest routes; shorten commute times for children, if possible; minimize the time children spend outside when school buses are arriving or departing; provide a space inside the school where drivers can wait on cold days; post no-idling signs on school grounds; limit idling of delivery vehicles on school grounds; and develop educational programs for students about air pollution

Owners of bus companies and other diesel vehicles should also implement idle reduction policies. The owners should educate drivers and give recognition to drivers who reduce idling times. This should discourage drivers from following directly behind other school buses or large vehicles, especially if they are emitting visible smoke. The owners should be taking steps to retrofit existing buses with pollution controls and idle reduction devices; keep buses well maintained; and replace the oldest buses with newer, cleaner buses

Drivers of buses and other diesel vehicles should follow idle reduction guidelines established by school officials and/or bus owners. They should turn off the school bus engine when standing and they should

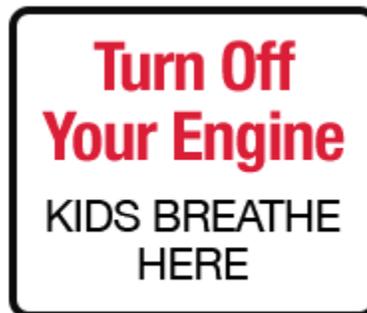


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avoid following directly behind other school buses or large vehicles, especially if they are emitting visible smoke.

Parents can talk with school officials about establishing idle reduction programs as well as with school transportation providers about establishing idle reduction programs. Parents should not idle their own personal vehicles.

Students can talk with school officials and bus drivers about reducing school bus idling as well as help school officials make and post no-idling signs



Clean School Bus's National Idle Reduction Campaign helps you take action toward a cleaner, healthier environment. The key to reducing idling is you!

Idle Reduction Matters because unnecessary school bus idling affects human health, pollutes the air, wastes fuel, and causes excess engine wear. Fortunately, it's easy to implement practices that reduce school bus idling. Diesel exhaust contains significant levels of [fine particulate matter \(PM\)](#). They are extremely tiny. These tiny and fine particles pass through the nose and throat and lodge in the lungs easily, therefore posing as a significant health concern. At most risk are children because their respiratory systems are still developing and they have a faster breathing rate, the elderly and people with existing heart or lung disease, asthma, bronchitis or other respiratory problems.

Idling school buses can pollute air in and around the bus. Exhaust from buses can also enter school buildings through air intakes, doors, and open windows. Diesel exhaust contains pollutants that contribute to ozone pollution (ground level/ bad layer which are "chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight"; climate change, and acid rain ("is a broad term that includes any form of precipitation with acidic components, such as



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sulfuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms. This can include rain, snow, fog, hail or even dust that is acidic”). School bus engines only need a few minutes to warm up. The manufacturers generally recommend three to five minutes of warm up time. Extended idling can causes engine damage as well as a waste of fuel and money.

Idling Myths:

“Myth: It's important to warm up the engine with a long idle period, especially in cold weather.

Fact: With today's school bus engines, bus and engine manufacturers routinely suggest a warm up time of less than five minutes.

Myth: It's better for an engine to run at low speed (idling) than to run at regular speed.

Fact: Running an engine at low speed causes twice the wear on internal parts as driving at regular speeds.

Myth: Idling is necessary to keep the cabin comfortable.

Fact: Many buses maintain a comfortable interior temperature for a while without idling. Bus routes should be timed so children and drivers do not need to spend a lot of extra time on the bus when it is not in route, particularly in hot or cold weather. Auxiliary heaters can be purchased and installed to keep the cabin comfortable.

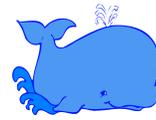
Myth: It's better to leave the engine idling because a "cold start" produces more pollution.

Fact: Continuous idling for more than three minutes emits more fine particles (soot) than a restart. Emissions after a restart contain less carbon monoxide, nitrogen oxides, and other pollutants than if the school bus idled continuously over a 10-minute period.”

Idling Reduction Technologies

“Idle reduction technologies and engine-off auxiliary heaters reduce emissions by minimizing the amount of time an engine operates. To learn more about idling reduction technologies verified by EPA, visit [Smart Way Idle Reduction Technologies](#).

Engine-off auxiliary heaters can be used to warm engines and passenger compartments in colder climates. These heaters run off diesel fuel or electric outlets and include a programmable timer to automatically start or stop the heating function. Benefits of these heaters are fuel savings, lower emissions, and longer oil life, less wear-and-tear on the engine, and relatively easy installation and maintenance. There are three types of heaters:



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- Fuel-Operated Engine Block Heaters heat the engine block for a warm start. Each block pre-heater uses only half a cup of diesel per hour compared to half a gallon or more per hour while idling. They can be used where electrical block heaters are not feasible.
- Electric Plug-in Block Heaters warm the engine block by heating the engine coolant or oil. They are powered by electricity and are available in a range of voltages and watts. A heater is mounted on the engine block and plugged in when the bus is parked at the depot, allowing for a warm start. Bus depots and garages can be designed or retrofitted to bring in the electrical service required.
- Compartment and Engine Block Heaters warm the engine block and passenger compartment simultaneously using an auxiliary heater. These heaters use only one cup of fuel per hour compared to half a gallon of fuel needed to idle for an hour. They are especially useful for nighttime-activity and buses that transport very young and/or special-needs children. In addition, the radiant heat improves safety by preventing the windows from frosting or fogging.’

Older school buses in general, produce more pollution and therefore can lead to significant health risks for students who typically ride these buses for thirty minutes to two hours a day. “Asthma, which affects 6.3 million American school children, is the most common long-term childhood disease in America, making newer, cleaner buses an urgent priority. In addition to affecting the health of students, emissions from older buses can have a negative impact on the whole community.”

“Older buses are excellent candidates for replacement with newer, cleaner vehicles which will greatly reduce children’s exposure to diesel exhaust and provide considerable safety improvements. “.

Companies should focus on replacing buses pre-1998 as they produce the most pollutants; have increased maintenance concerns, decreased fuel economy benefits, and less stringent safety equipment. Below are groupings of engine model years in order of replacement priority.

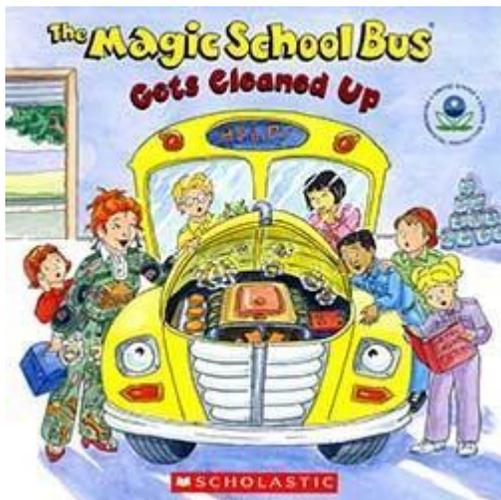
1. Pre-1998
2. 1998-2003
3. 2004-2006
4. Post 2007

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"The Magic School Bus Gets Cleaned Up"

Link to Spanish publication - ["El Autobus Mágico Necesita Una Limpieza"](#)



Publication Number: EPA-420-K-07-001

“The EPA, in collaboration with Scholastic, has created a new book in the popular "Magic School Bus" series for children. In these acclaimed educational books and videos, Ms. Frizzle takes her class on science-oriented field trips, riding their magical school bus.”

In "The Magic School Bus Gets Cleaned Up," the children and Ms. Frizzle explore the pollution emitted from their own diesel school bus and learn how to reduce emissions as they travel through the diesel engine. The children learn about [idle reduction](#) and other ways to reduce health risks from diesel exhaust. At the end of the book, the "Magic School Bus" gets its own pollution control device, a diesel [particulate matter filter](#).

There is a Real Magic School Bus and it received a Retrofit: “Based on the magical yellow school bus in the "Magic School Bus" series, Scholastic operates a [traveling science laboratory EXIT](#) housed in a yellow school bus. The bus tours the United States, offering hands-on science lessons to children at schools, fairs, and other community events.

Following the story line of "The Magic School Bus Gets Cleaned Up," this traveling bus was retrofitted with a diesel particulate filter, reducing [particulate matter](#) by up to 90%.”