SCHOOL BUS EMISSIONS & UPGRADES

LOWER EMISSIONS. CLEAN AIR. **Factsheet** **May 2023**

School buses are safe transportation, but they emit pollution that is dangerous to breathe. Studies have found that diesel pollution can concentrate inside school buses, leading to even higher exposures for children who ride buses. It is well-documented that children are more vulnerable than healthy adults to the effects of diesel emissions, which can aggravate long-term conditions such as asthma and cause respiratory disease. The US EPA has worked aggressively at the national level to reduce pollution from new diesel-powered school buses by requiring them to meet more stringent emissions standards. As a result, new buses are up to 95 percent cleaner than yesterday's models. However, because of the high level of durability and relatively long life of heavy-duty diesel engines, it will take years for new cleaner buses to replace those in the existing fleet. This means that without additional effort, today's kindergartners will be in college before the benefits of today's standards are fully realized.

Depending on the age of the school bus, pollution, in the form of gases and fine particulates, is emitted from the engine crankcase and tailpipe. Although children spend only a short time on the school bus, they are repeatedly exposed to higher levels of contaminants every school day. A study in Connecticut found contaminants inside the cabins of buses 5-15 times higher than levels outside.

> *Levels of fine particles were often higher under certain circumstances: when buses were idling with windows opened, when buses ran through their routes with windows closed, when buses moved through intense traffic, and especially when buses were queued to load or unload students while idling.*[1]

What is in Diesel Exhaust from School Buses?

Each year, diesel emissions are linked to thousands of premature deaths, hundreds of thousands of asthma attacks, millions of lost work/school days, and numerous other health and environmental impacts. Contaminants include:

- **Fine Particulate Matter** (PM), or $PM_{2.5}$ can travel deep into lungs and may even reach the bloodstream causing damage to the lungs and heart.
- **Nitrogen Oxides** (NOx) react with volatile organic compounds to form ground-level ozone ("smog"). Smog damages lung tissue and aggravates respiratory disease.
- **Toxic Air Pollutants** – diesel exhaust contains at least 40 toxic air pollutants that are known or suspected of causing cancer or other serious health effects if inhaled. Diesel exhaust includes benzene and 1,3-butadiene, both classified as known human carcinogens. In fact, the World Health Organization has classified diesel exhaust as a **known human carcinogen**.

[1] *Wargo, John, Ph.D., Children's Exposure to Diesel Exhaust on School Buses. 2002. Environment and Human Health, Inc., p. 10.*

For More Info:

Contact the Vermont Air Quality & Climate Division at (802) 828-1288 or visit our websites:

- http://dec.vermont.gov/air-quality/mobile-sources/diesel-emissions/vt-diesel-grant
- http://dec.vermont.gov/air-quality/vw

Asthma Prevalence in Vermont School Children

Children are more susceptible to air pollution than healthy adults because their respiratory systems are still developing and they have faster breathing rates.

Asthma is now the most prevalent chronic disease among U.S. children.[2] In 2019, the Vermont Department of Health indicated 8% of children in Vermont have asthma. This equates to approximately 9,000 children or one in twelve children having asthma.[3]

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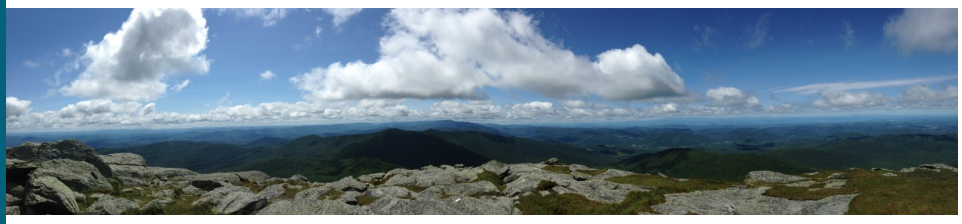
Older, more polluting school buses can lead to increased health risks for students who typically ride these buses for one-half to two hours a day.

Financial Incentives for School Bus Electrification Projects

The **Vermont Diesel Emissions Reduction Financial Assistance Program** provides reimbursement funding for up to 45% the cost to replace diesel-powered school buses with zero tailpipe emissions electric options. With funding from the Environmental Protection Agency's (EPA's) Diesel Emission Reduction Act (DERA) grant, Vermont Department of Environmental Conservation (DEC) provides technical and financial assistance to Vermont school districts and supervisory unions statewide to replace eligible school buses with new, all-electric vehicles. This is an annual program, with application periods typically opening in the fall. Additional details can be found at https://dec.vermont.gov/air-quality/mobile-sources/diesel-emissions/vt-diesel-grant.

The **Volkswagen Environmental Mitigation Trust** was established in accordance with settlement agreements after Volkswagen was discovered to have equipped light-duty 2.0 and 3.0 liter diesel engine vehicles with illegal emissions control defeat devices. The State of Vermont has dedicated the majority of its allocation of the trust funds to support heavy-duty vehicle electrification projects, including an electric bus pilot project for school and transit buses. The results of this pilot project will serve to evaluate the feasibility of electric buses and their charging equipment under real-world conditions in Vermont. The Vermont DEC plans to use additional funding to provide grant opportunities to future applicants for projects that achieve significant reductions in diesel emissions from diesel powered engines, vehicles and equipment operating in Vermont. These opportunities will be posted online when available at https://dec.vermont.gov/air-quality/vw.

The **US EPA Clean School Bus Program** is providing $5 billion funding to replace existing school buses with low- and zero-emission models over the course of 5 years (FY2022-2026). Visit https://www.epa.gov/cleanschoolbus for funding opportunities available through this program.



[2] Centers for Disease Control and Prevention. Asthma Prevention Program. http://www.cdc.gov/asthma/nacp.htm

[3] Vermont Department of Health, Asthma Data Pages. February 2022. https://www.healthvermont.gov/sites/default/files/documents/pdf/HS_Asthma_Data_Pages_2022.pdf