Move to 'Green' school buses could boost kids' class attendance

April 11 2023, by Dennis Thompson

Jouncing along to school in a fume-spewing, rattletrap yellow bus is

practically a rite of passage for most American students.

But outdated buses actually wind up costing kids many days of education, thanks to the clouds of diesel exhaust left in their wake, a new study argues.

School districts that upgrade to a "greener" bus fleet have higher attendance rates than those with older, dirtier-running buses, researchers report.

Replacing all school buses built prior to 2000 could add more than 1.3 million additional student days of attendance each year in the United States, the study estimated.

About 25 million children ride the bus to school every day, the researchers said.

Older buses cough out higher levels of diesel exhaust, which can trigger asthma attacks in kids, said lead researcher Meredith Pedde, a research fellow in epidemiology with the University of Michigan.

"Air pollution can even affect those without asthma," Pedde added. "It has been linked to upper respiratory infections, pneumonia and other types of respiratory illness, so it might be impacting a larger student body than just asthmatic students."

To see whether cleaner buses cut down on student absences, Pedde and her colleagues examined data from the U.S. Environmental Protection Agency's School Bus Rebate Program.

The EPA program doled out more than $7 million annually to replace or retrofit old polluting buses between 2012 and 2017, the years covered by this study.

Funds from the program are awarded randomly, which gave researchers a chance to compare student attendance among the winning districts against that of districts stuck with an older fleet.

The research team looked at attendance rates at 383 districts that received funding and more than 2,400 districts that applied but didn't win.

Districts randomly selected for EPA bus upgrade funding had more than 350,000 estimated additional student days of attendance each year, researchers found.

"Specifically, the winners saw an additional six students in attendance each day in an average size district of 10,000 kids," Pedde said.

"And we saw even stronger results when we looked at districts that replaced the oldest buses," she continued. "The districts that replaced school buses that were older than 1990 saw improvements of 45 additional students attending school each day in an average-sized district."

Extrapolating those results nationwide, researchers estimated that replacing all pre-2000 model buses could add more than 1.3 million attendance days in the United States.

The findings were published April 10 in the journal *Nature Sustainability*.

"I think everybody recognizes that those fumes make people sick," said Dr. Lisa Patel, a member of the American Academy of Pediatrics' Council on Environmental Health and Climate Change. "This study drew a really clear line between exposure to that pollution and the impact on children."

Newer school buses, particularly electric models, also save on fuel and maintenance costs, Patel noted.

"And the missed school days actually matter in a lot of districts, in terms of the funding that they get," she added. "Ensuring there is a kid in that seat every day matters to a district's bottom line."

However, new buses can cost $100,000 to $300,000, making school districts loath to replace them. The average school bus remains on the road for 16 years before it's decommissioned, researchers noted.

Cheaper upgrades to buses are available and can help.

For example, adding a diesel particulate matter filter to a bus exhaust can lower emissions by 60% to 90%, researchers said in background notes. Diesel catalytic converters and closed crankshaft ventilation can reduce particle pollution inside buses by 50% to 60%.

Retrofits like these cost about $10,000 per bus, researchers noted.

The good news is that the Bipartisan Infrastructure Investment and Jobs Act passed in 2021 contained $5 billion in funding for newer, cleaner school buses, according to the EPA.

In October, the Biden administration handed out nearly $1 billion of that funding to 389 school districts nationwide. The grants will help the districts buy more than 2,400 clean school buses.

"There is a lot of money out there right now," Pedde said. "Districts can apply to get financial help in replacing these buses. Especially for the oldest buses, the pre-1990 buses, they're just a lot more polluting and dirty than newer buses."

More information: The U.S. Environmental Protection Agency has more about the Clean School Bus Program.

Meredith Pedde et al, Randomized design evidence of the attendance benefits of the EPA School Bus Rebate Program, *Nature Sustainability* (2023). DOI: 10.1038/s41893-023-01088-7