

Curbing diesel emission could reduce big city mortality

30 September 2019, by Blaine Friedlander



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U.S. cities could see a decline in mortality rates and an improved economy through midcentury if federal and local governments maintain stringent air pollution policies and diminish concentrations of diesel freight truck exhaust, according to Cornell University research.

"The U.S. must reduce emission in the transportation sector. By improving air quality through better policies and technology in the freight [transportation sector](#), we can breathe better and save lives," said senior author Oliver Gao, professor of civil and environmental engineering.

Freight transportation is a pillar of the U.S. [national economy](#), but while long-haul trucks account for less than 6% of the vehicle miles traveled over U.S. highways, they account for about 40% of the emissions of air polluting particulate matter and about 55% of nitrogen oxides—the precursor to ozone in the atmosphere, the study said.

"People use their family cars some 10 to 12 years, and log about 120,000 miles over the car's lifetime," said Gao. "A diesel truck can stay on a

fleet about 25 to 30 years and easily log a million miles."

To reduce emissions by midcentury, the researchers said, truck manufacturers need to add advanced pollution-reduction technology to new trucks and retire older, highly polluting vehicles.

Freight trucks primarily use [diesel engines](#), which are efficient and durable but emit fine-particulate exhaust, which poses a cancer risk 7.5 times larger than all other air toxins. Diesel exhaust is classified as a Group 1 (highest level) carcinogenic, according to the World Health Organization's International Agency for Research on Cancer.

Gao and his colleagues modeled the public [health](#) impacts of restraining particulate matter, based on emission change for future air quality. They estimated improved health outcome (preventing 3,600 premature deaths nationally each year) and \$38 billion annually in [economic benefits](#) for reducing those deaths.

In order to achieve emission reduction goals and the benefits in public health, stringent emission standards and fuel policies should be continuously and effectively implemented, the study said.

In addition, the societal benefits of reduced freight emissions are expected to largely exceed the implementation costs of such standards and policies. For instance, the total compliance in particulate restraint costs from 2011 to 2050 would be about \$1.8 billion annually, which is about 5% of their calculated yearly health savings, \$38 billion.

The researchers point out that employing a carbon tax on freight serves to increase oil prices and shifts at least 15% of freight to energy-efficient rail, reducing overall emissions and obtaining 9% more health benefits nationally.

While current federal regulations have emissions

limits on new vehicles, the regulations do not affect vehicles already in use, Gao said. Aging trucks, however, can easily degrade from normal to high-emitting conditions. Eliminating super-emitting vehicles completely could further reduce long-haul freight emissions by nearly 70% and provide 20% more health benefits, the researchers said.

"Getting rid of the [particulate matter](#) is an important part of reducing air pollution from diesel truck emissions," said Gao.

More information: Shuai Pan et al, The air quality and health impacts of projected long-haul truck and rail freight transportation in the United States in 2050, *Environment International* (2019). [DOI: 10.1016/j.envint.2019.104922](https://doi.org/10.1016/j.envint.2019.104922)

Provided by Cornell University

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