

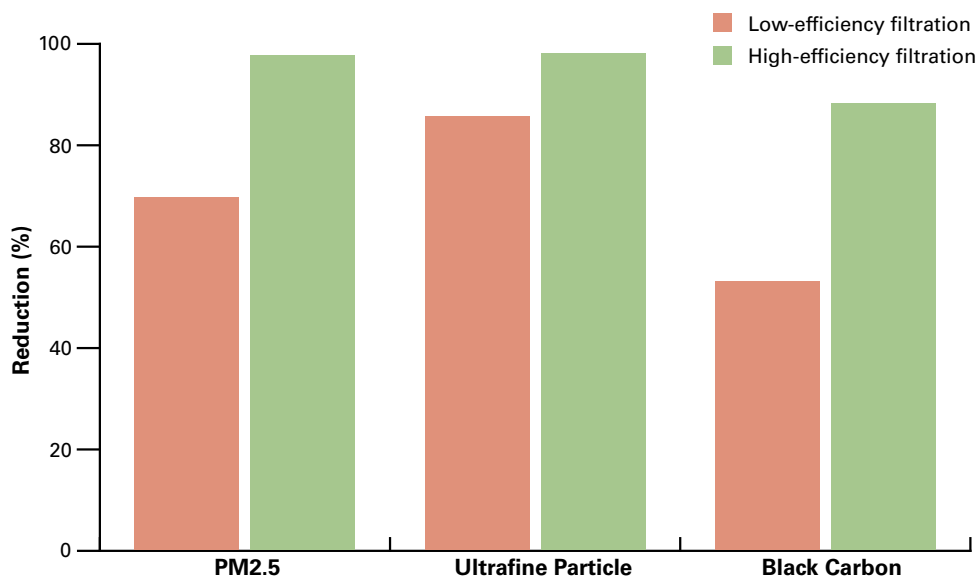


CARB is actively investigating mitigation measures to reduce exposure to traffic pollution and protect people's health. This research note summarizes results from several recently completed research projects.

## Reducing Near Roadway Exposure to Air Pollution

*Urban design and air filtration help lower health risks*

*Certain street and building designs can reduce exposure to traffic pollution by up to 67%. High-efficiency filtration can reduce traffic pollution entering indoor and in-vehicle spaces by over 90%.*



The chart shows greater reduction of fine particulate matter (PM2.5), ultrafine particles and black carbon for air filtration in homes that is highly efficient at removing particles from the air (high-efficiency) compared to filtration that is much less efficient at removing particles (low-efficiency).

### What you should know about exposure to traffic pollution

The burning of gasoline, diesel fuel and oil in motor vehicle engines can produce a large amount of air pollution. Exposure to high levels of traffic pollution is linked to increased risk for a number of adverse health effects such as heart and lung diseases and premature death. Many policies and programs have been implemented to reduce traffic pollution; since 2000, traffic pollution has declined by more than 70% in California. However, there are still times and places at which high concentrations of traffic pollution occur, such as inside vehicles when driving on roadways with high traffic volumes, and in buildings close to busy traffic. People who spend substantial amounts of time in these places may have increased health risks. Children, the elderly and individuals with existing heart or lung diseases are especially vulnerable. To achieve greenhouse gas emissions reductions in accordance with Senate Bill (SB) 375, infill and compact development has been planned and implemented in many regions. This type of development has many benefits, but may also result in people spending more time near busy roads where they are more likely to inhale traffic pollution. Measures to reduce exposures are critical for promoting sustainable communities and protecting public health.

## NEW RESEARCH FINDINGS

### Effective Measures to Reduce Exposures to Traffic Pollution Near Busy Roadways

- Street designs that have more open space and varied building heights can decrease near-street traffic pollution by up to 67%.
- Moving bus stops farther from intersections can reduce exposures to traffic pollution by up to about 50% if moving from 65 feet to 130 feet from an intersection.
- Sound walls and dense vegetation together can reduce traffic pollution downwind of freeways, but the magnitude of reduction varies greatly, largely depending on wind speed and direction.
- In buildings, high-efficiency filtration (i.e., filtration that can remove much smaller particles than standard filters) in ventilation systems can remove over 90% of the particles from incoming outdoor air, with relatively low energy consumption.
- In vehicles, high-efficiency cabin air filters for passenger vehicles and school buses can reduce particle concentrations by 55% to 90% inside vehicle cabins, about twice the reduction achieved by the filters typically found in cars and buses.

## IMPORTANCE OF FUTURE RESEARCH

### Health, Reducing Driving, Policy Impact

- The California Air Resources Board (CARB) is supporting ongoing research on the health impacts of exposure to traffic pollution and the benefits of high-efficiency filtration for reducing indoor particle levels and associated asthma symptoms in children with moderate to severe asthma.
- CARB is supporting ongoing research of strategies that reduce the need for driving and thus reduce the generation of traffic pollution. This includes studies of active transport, such as walking and biking; public transportation; the siting of affordable housing near transit, and measures for tracking progress toward achieving Senate Bill (SB) 375 – the Sustainable Communities and Climate Protection Act – goals.
- CARB staff are investigating commuters' exposures to traffic pollution for different transportation modes and analyzing the impacts that SB 375 and other policies to reduce vehicle emissions are likely to have on exposures to traffic pollution.

## ONGOING EFFORTS TO REDUCE EXPOSURE TO TRAFFIC POLLUTION

- Ongoing efforts to reduce emissions from cars and trucks and to move all vehicles towards "zero emission" alternatives will continue to drive down traffic pollution.
- A CARB technical advisory, which summarizes strategies to reduce air pollution exposure near busy roads, provides planners and other stakeholders with information on science-based strategies that can be implemented to reduce exposures. The technical advisory is referenced and summarized in the Office of Planning and Research's forthcoming General Plan Guidelines, and is available at [www.arb.ca.gov/ch/landuse.htm](http://www.arb.ca.gov/ch/landuse.htm).
- California is updating its building codes to require more protection against air pollutants entering indoor environments, based on research findings on high-efficiency filtration.

## FOR MORE INFORMATION

[www.arb.ca.gov/research](http://www.arb.ca.gov/research)  
[research@arb.ca.gov](mailto:research@arb.ca.gov)  
(916) 445-0753

### Research project information can be found at:

Identifying urban designs and traffic management strategies for southern California that reduce air pollution exposure (Contract 12-308) <http://bit.ly/2pY46Lf>

Effectiveness of sound wall-vegetation combination barriers as near-roadway pollutant mitigation strategies (Contract 13-306) <http://bit.ly/2opr8O7>

Reducing in-home exposure to air pollution (Contract 11-311) <http://bit.ly/2pZbRDG>

Reducing air pollution exposure in passenger vehicles and school buses (Contract 11-310) <http://bit.ly/2pZzfRp>