

The *Southern California Particle Center and Supersite* (SCPCS) seeks to explore health and exposure issues related to mobile source pollution. With funding from the U.S. EPA and California Air Resources Board, investigators at the SCPCS work to better understand why airborne particulate matter emitted from cars and trucks causes adverse health outcomes. As part of our research, we have taken measurements on and near major freeways in Los Angeles in an effort to characterize the particles found there. These and other scientific studies have sparked media attention and community interest, generating many questions regarding where to buy property and whether health is affected by living in a particular location. It is impossible for us to answer individual questions about potential risks in specific locations. We can, however, offer some general guidance on what is currently known about exposure to pollution and the related health effects of living near busy roads and freeways.

Numerous studies have linked traffic-related air pollution with respiratory problems such as asthma and chronic bronchitis. Studies have found decreased lung function, increased hospital visits for people with respiratory diseases, increased absenteeism from work and school, and increased morbidity (illnesses) and mortality (deaths) associated with exposure to particulate matter. All of these effects were observed at levels common in many U.S. cities. (Pope)

New studies show that long-term exposure to particulate matter has also been linked to increased illness and death rates from cardiovascular (heart-related) disease, and that sudden increases in air pollution may even cause more heart-related illnesses and deaths than is seen from lung disease. (Pope; Johnson) Some particles in air pollution, given their tiny size, are able to pass through the cellular tissue in the lungs and enter the circulation system. Their presence in the lungs may also induce a series of events that ultimately affect the heart. (Utell)

Of growing concern to the general public is whether living near a freeway is detrimental to health. The closer people are to the source of traffic emissions, the higher their exposure is to many of the constituents of exhaust. Compelling evidence suggests that people living, working and going to school near roads with heavy traffic may have an increased risk of adverse health effects associated with exposure to mobile source pollution. These “traffic density” studies have observed development and increased aggravation of asthma (Montnémy), decreased lung function in children (Brunekreef), and low birth weight and premature births for mothers living near major roadways (Ritz).

Taking this research into consideration, it is easy to see why new homebuyers are concerned with how close property is to a busy road or freeway. Unfortunately scientists cannot say exactly how close is “too close” at this point. European studies have shown increased respiratory health problems in children who live or go to school within 100 meters (~330 feet) of a busy roadway, with the greatest risks appearing in the first 50 meters (~165 feet). Studies conducted by SCPCS investigators here in LA show that carbon monoxide and ultrafine particles – the smallest portion of particulate matter emissions and potentially the most toxic – are extremely high on or near the freeway, dropping to about half that concentration 50-90 meters (~165-295 feet) from the freeway. After about 300 meters (~990 feet) the concentration of particulate matter reaches the “ambient” level – the normal level in the air without the influence of any nearby sources. In 2003 the California state legislature enacted a law that new schools must be built at least 500 feet from very busy roadways.

Besides the actual distance from a roadway, there are a number of additional factors that influence exposure to mobile source pollution when at home:

- Weather - temperature, humidity, wind direction and speed all affect the concentration of pollution;
- Placement of the house - is it upwind or downwind of the major roadway? That is, does the wind blow pollutants from the cars and trucks toward the property?
- Construction/design of the house – older houses may have greater air exchange between indoors and outdoors with more outside air getting inside and therefore potentially increasing exposure to pollutants;
- Type of filtration system installed in the home - few homes have HEPA (High Efficiency Particulate Air) filters, but they have been shown to remove significant amounts of the particulate matter from the air.

There are also a number of personal factors to consider when determining what your personal exposure may be, such as:

- Will I be at home during peak traffic times?
- Will I spend much time outdoors during these times?
- Will I open my windows or will I use central heating and cooling?
- How much time do I spend on the freeway? [On-road studies are currently being conducted which may show that if you have a considerable commute, the exposure you receive during your time on the freeway may well overshadow your level of exposure at home.]

Other resources for questions on particle measurements and possible health effects:

South Coast Air Quality Management District

<http://www.aqmd.gov/>

General phone number – (800) CUT-SMOG (800-288-7664)

California Air Resources Board

<http://www.arb.ca.gov/>

Community Health / Environmental Justice Section – (866) 397-5462

Air Pollution and Respiratory Health, National Center for Environmental Health, CDC

<http://www.cdc.gov/nceh/airpollution/default.htm>

U.S. EPA – Air

<http://www.epa.gov/ebtpages/air.html>

For more detailed information about the topics presented above, please reference the following citations.

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