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CLEAN **AIR** RESEARCH PROGRAM

RESEARCH EXAMINES AIR POLLUTION EXPOSURES AND HEALTH IMPACTS NEAR ROADS

Issue:

With over 35 million people in the United States living within 300 feet of a major road, there is growing concern about the health impacts from the air pollutants associated with the cars, trucks and other vehicles on them.

Studies have shown that people who live, work, or attend school near major roads have an increased incidence and severity of particular health problems that may be related to air pollution from roadway traffic. Health effects include reduced lung function and impaired development in children, asthma, cardiovascular disease, low birth weight, and pre-term newborns, and premature death.

Research is needed to better understand what type of pollutants are common near roadways, how people are exposed to them, the extent of exposure, and the type and severity of health effects.

Scientific Objective:

The Clean Air Research Program in the U.S. Environmental Protection Agency's Office of Research and Development (ORD) has launched the first in a series of near-roadway studies as part of an integrated and multi-disciplinary approach conducting air pollution science. The research objectives are to:

- Identify and define mobile source emissions through direct measurements of vehicles and monitoring near roads with varied traffic levels and vehicle classifications
- Assess factors affecting the variability of near-road air pollutants, such as traffic activity and roadway-design features
- Improve modeling tools for near-road air quality and human exposure assessments
- Assess the health effects from near-roadway exposures

Following the completion of a pilot study in Raleigh, NC, the first full-scale study to measure, define, and profile roadway air pollutants began in December 2008 along a portion of I-15 in Las Vegas. During the year-long study, EPA scientists and engineers will work with the Federal Highway Administration to gather information to better understand the relationship between traffic emissions and roadway-related air pollution concentrations at various distances from the roadway.

Future work will include a similar measurement study in Detroit along with a cooperative effort to link potential health effects to these pollutants.

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CLEAN AIR RESEARCH PROGRAM

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Key scientific questions include:

- How do traffic and roadway emissions affect exposures and adverse health effects for populations living, working, or going to school near roads?
- What decision tools are available, or can be produced, to identify the relationship from traffic emissions to population exposures and to adverse health effects for use in regulatory decision-making and transportation planning?
- Do public facilities located near major roadways present an exposure and health risk to their occupants?

Application and Impact:

ORD's near roadway research will provide important scientific data and tools needed by federal, state and local governments and organizations to make decisions about road projects and to address health concerns related to roadways. The research will be used in the development of federal regulatory and voluntary programs to reduce air pollution near roadways. State highway and environmental agencies can use the science to assess the local health impacts of transportation decisions.

The information also can assist communities in evaluating traffic emissions impacts related to construction or other road-related activities. For example, this research will inform local school districts facing decisions on whether to locate new schools near large roadways, and ways to mitigate impacts from local roads on existing schools.

With data collected from the roadway studies, numerous scientific papers and products will be prepared that will improve knowledge about the impacts of traffic emissions on air quality near roads and the possible links to adverse health effects.

A few examples include:

- EPA/ORD is updating its AERMOD model to provide features that enable modelers to predict near-roadway emissions under different scenarios.
- ORD is developing guidance for organizations implementing or interpreting data from near-roadway monitoring stations to provide the ability to predict air quality under certain traffic scenarios
- ORD is developing guidance to transportation and urban planners on potential mitigation benefits of roadway design options.

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