The East Bay Children's Respiratory Health Study Traffic-Related Air Pollution Near Busy Roads

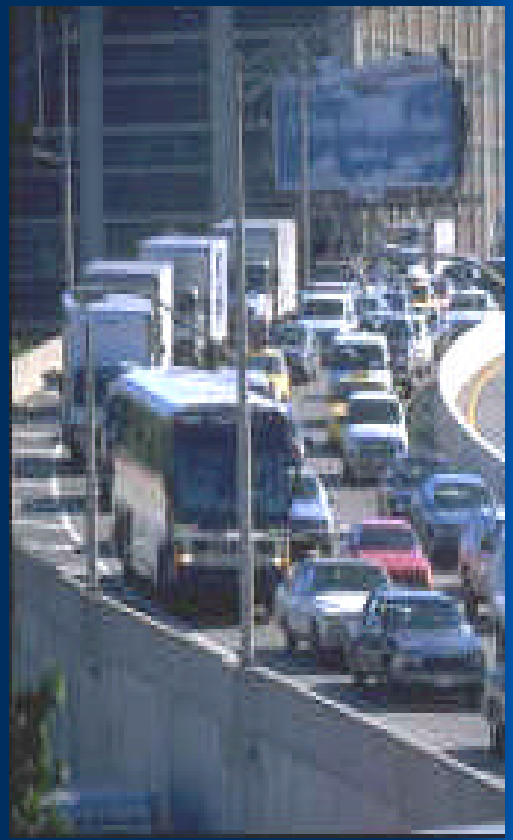
December 9, 2004

Air Resources Board

California Environmental Protection Agency

Background

- **Association between traffic and respiratory disease**
  - mostly European Studies
- **Ambient monitors**
  - typically do not measure direct impact of traffic
- **Surrogate measures of traffic pollution**
  - residential proximity, traffic volume
- **Question of extrapolation to U.S.**
  - traffic mix, emission controls, population may differ
- **Need to evaluate health impacts of proximity to traffic**

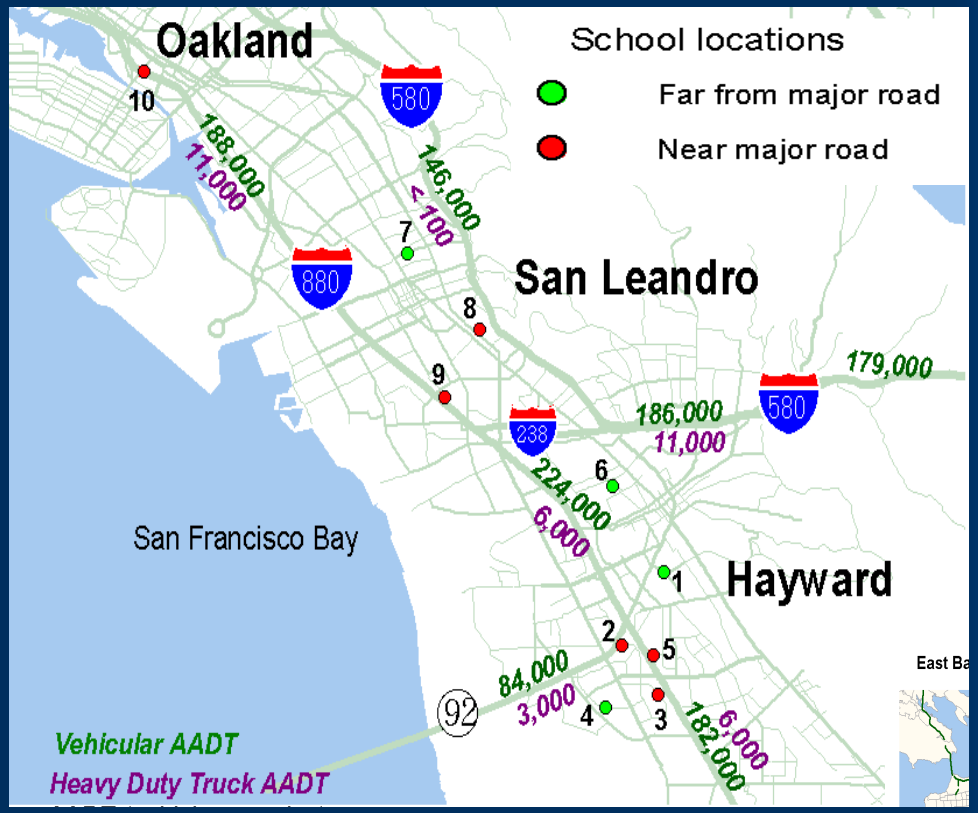


Methods

- **Cross-sectional study in Alameda County**
  - 1,109 students between 3rd - 5th grades
- **School selection criteria - (10 schools)**
  - distance from major roads and highways
  - similar demographics across schools
- **Surveyed child and parent**
  - history, home environment, and demographics
- **Air pollutants measured at the schools**
  - PM10, PM2.5, NO_X, NO_2, NO, and black carbon
- **Moderate regional air pollution levels**

Population

- **Race/Ethnicity**
  - White 13 %
  - Black 11 %
  - Hispanic 44 %
  - Asian 14 %
  - Other 19 %



- **SES indicators**
  - Household at/below Federal poverty level of 31%
  - Parent's education: high school or less equaled 49%

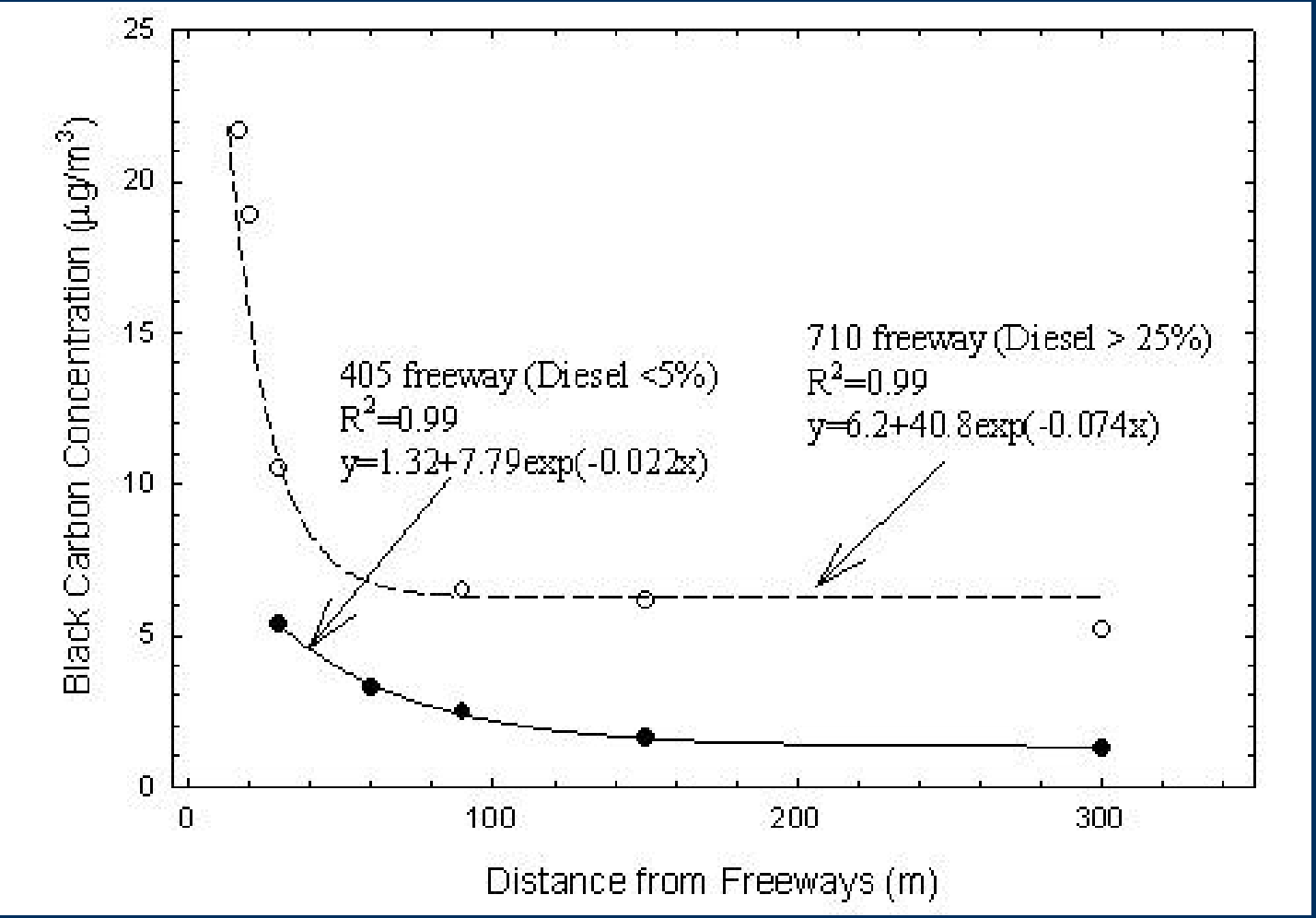
Results

- Schools downwind and near major roadways had higher concentrations of black carbon, NO_X, and NO
- Found a 5 to 8% increase in asthma and bronchitis symptoms with exposure to these traffic-related pollutants
- Suggest that fresh traffic emissions may play a role in these relationships
- ARB supporting a new study to improve exposure estimates for the East Bay Children's Study

Brett C. Singer, et al. "Passive measurement of nitrogen oxides to assess traffic-related pollutant exposure for the East Bay Children's Respiratory Health Study," Atmospheric Environment 38 (2004) 393–403

Kim, *et al. "Traffic-related Air Pollution near Busy Roads, The East Bay Children's respiratory Health Study,"* American Journal of Respiratory and Critical Care Medicine, Vol. 170, 2004.

Black Carbon Decreases with Distance from Highway



Zhu, et al.," Study of ultrafine particles near a major highway with heavy-duty diesel traffic, Atmospheric Environment," 36, (2002) 4323-4335

Implications

- **Findings are consistent with previous investigations in Europe**
- **Helped support passage of a School Siting Bill by Senator Escutia (SB 352)**
  - 500 foot setbacks from freeways improve children's health
- **Supports need for additional measures that reduce emissions and exposures to traffic air pollution in order to improve children's health**

The East Bay Children's Respiratory Health Study Traffic-Related Air Pollution Near Busy Roads

Air Resources Board

California Environmental Protection Agency