

**Title:**

**Community Assessment of Freeway Exposure and Health: Approach and Methods**

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**Abstract:**

A significant portion of urban air pollution derives from motor vehicle exhaust on highways and busy streets. Recent studies have shown that the near-highway environment contains elevated concentrations of ultrafine particles (UFP; diameter <0.1 micrometer), which is a concern, because UFP is generally more toxic than larger particles. CAFEH is a 5-year, observational, cross-sectional, community-based participatory research study of traffic exposure to pollutants and cardiovascular health outcomes in neighborhoods adjacent to major highways in the Boston, Massachusetts, area. We are conducting environmental monitoring of particle number concentration and other air pollutants in Somerville (just north of Boston) near Interstate-93 (>1.5 x 10<sup>5</sup> vehicles/day) using a mobile monitoring platform. The air monitoring data is being used to develop a model of UFP levels that varies temporally and geographically based on traffic volume, meteorology and other factors. Residents aged 40 and older living <100 m, 100-400 m and >1000 m have been selected for participation. Participants complete a survey of demographics, time-activity and other factors that modify exposure, cardiovascular diagnoses, diet, stress, occupational exposure, tobacco smoke exposure and other potential confounders. A subset of these participants take a supplemental survey and have blood pressure and ankle brachial index measured and donate blood samples that will be analyzed for C-reactive protein (CRP), lipid profile and fibrinogen. We are also launching two companion studies that will install in-home air filtration (HEPA) to assess whether UFP levels can be reduced and, if they can, whether we can detect indications of health benefits. CAFEH is a community-based participatory research study that explicitly seeks to educate the public and inform policy makers and influence public health practice. To that end, we have a large and diverse advisory board that includes municipal, state and federal agency representatives.