

Oxygen Sensor Replacement Study

The State of Alaska has two serious carbon monoxide (CO) nonattainment areas, Anchorage and Fairbanks. Under the Clean Air Act, the communities must meet the national ambient air quality standard for CO as expeditiously as possible. Both the Municipality of Anchorage (MOA) and the Fairbanks North Star Borough (FNSB) recently submitted CO attainment plans to EPA and have met the health standards for two years. Because of this, the communities are now able to complete new CO maintenance plans, a key element of which is the development and implementation of additional contingency measures and controls to show continued attainment with the health standard for the next ten years. A primary issue in developing the CO maintenance plans is the selection of reasonable control strategies to address needed CO reductions or for use as contingency measures.

Motor vehicle emission control components were only required to meet a 50,000-mile durability. The oxygen sensor is an important component in controlling CO emissions from motor vehicles. **Replacement of oxygen sensors in high mileage vehicles that originally met the 50,000-mile durability standard has been identified as a potential area for controlling CO emissions in Fairbanks.** There is no test data available at cold temperatures to determine the emission benefit of replacing oxygen sensors in Fairbanks motor vehicles. Quantifying the impact of oxygen sensor replacement on emissions is critical to determining whether this would make an appropriate strategy for controlling high CO concentrations in the community.

In the past, the Alaska Department of Environmental Conservation, in cooperation with the Fairbanks North Star Borough and the Municipality of Anchorage, conducted cold temperature emission testing on Alaskan vehicles. The purpose of these studies was primarily to characterize CO emissions during cold start and to evaluate the effectiveness of plugging-in vehicles. As a result, a testing facility was established in the FNSB transit building. The testing facility contains a dynamometer and analytical bench that allows the loaded-mode testing of motor vehicles at local, ambient temperatures.