

HHA-104

Evaluating Vehicle Emissions Inspection and Maintenance Programs

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SUMMARY:

Motor vehicles are a major source of air pollution on urban, regional and national scales. Programs to control their emissions have focused on setting emissions standards for new vehicles, resulting in engineering and design improvements in emissions-control systems.

Inspection and maintenance (I/M) programs have been instituted in many jurisdictions to ensure that those controls operate properly throughout the life of a vehicle. These programs are implemented in areas violating federal air quality standards (nonattainment areas) and in other areas seeking to improve air quality. The inspection typically involves regularly scheduled exhaust tests measuring carbon monoxide (CO), hydrocarbons (HC), and sometimes nitrogen oxides (NOx) emissions. I/M tests also include a visual inspection of the components controlling evaporative and exhaust emissions and may include a functional gas-cap test and a pressure test of the evaporative emissions-control system. The U.S. Environmental Protection Agency (EPA) has oversight and developmental responsibility for I/M programs, which are implemented by state agencies.

Evidence suggests that I/M programs have been less effective than anticipated. This concern prompted Congress to request this study in its fiscal 1998 appropriations to EPA. In response to this request, the National Research Council (NRC) convened the Committee on Vehicle Emission Inspection and Maintenance Programs to conduct this study. Phase 1 of the study, presented in this report, examines the criteria and methodology for evaluating I/M programs and assesses their effectiveness in reducing vehicle emissions. Phase 2 will evaluate several types of I/M programs in more depth. The study charge also calls for the committee to make recommendations for improving I/M programs. The committee recommends some improvements in this report and will address others in Phase 2.

In carrying out its charge for this report, the committee reviewed passenger-car and light-truck emissions (the emissions typically targeted by I/M programs) within the context of overall emissions from mobile sources and other anthropogenic sources. Emissions-control technologies and testing techniques were considered, together with how changes in these factors might affect I/M programs. The committee also reviewed methods to estimate emissions reductions, and it examined previous evaluations of these reductions and other criteria important for evaluating such programs.