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Vehicle Emissions Inspection Programs Should Target Worst Polluters

WASHINGTON -- By expending too many resources to inspect "cleaner" low-emitting vehicles, coupled with a lack of effective ways to deal with the dirtiest ones, states are missing opportunities to reduce air pollution, says a new report from the National Research Council of the National Academies. Older and malfunctioning vehicles that usually make up about 10 percent of the nation's fleet, but typically emit about 50 percent of most harmful air pollutants from motor vehicles, should be the primary target of state emissions inspection and maintenance programs if they are to achieve any real progress in reducing vehicle emissions.

The report, requested by Congress, also endorses findings from independent and state-sponsored evaluations showing that flawed computer models used by the Environmental Protection Agency (EPA) and state agencies overestimate the reduction in vehicle emissions that is attributable to inspection and maintenance programs. Actual emissions are typically reduced by less than half of what was projected.

"Inspection and maintenance programs should focus on repairing the worst polluting vehicles and verifying repairs, but in ways that are both cost-effective for states and not overly burdensome for owners," said Ralph J. Cicerone, chair of the committee that wrote the report and chancellor at the University of California, Irvine. "We also need better methods of evaluating the impact of these programs. But having said that, it's important to emphasize that these programs are absolutely necessary to reduce harmful auto emissions and achieve better air quality."

Inspection and maintenance programs have been set up in jurisdictions that violate federal air-quality standards, and typically involve regularly scheduled exhaust tests measuring emissions of carbon monoxide, hydrocarbons, and in some cases nitrogen oxides. The programs are implemented by the states, and overseen by EPA, and have the potential to reduce emissions in several ways. Motorists may be persuaded to do a better job of maintaining their vehicles, repairs might be made before inspection or as the result of failing a test, and some vehicles may be scrapped because the owner did not think the repair was worth the cost given the vehicle's age or condition.

Amendments made to the Clean Air Act in 1990 require a number of states with particularly high levels of pollution to conduct more comprehensive, or "enhanced," inspections and to submit an evaluation of the effectiveness of their emissions inspection programs to EPA every two years, although most states have not complied. A barrier to federal compliance has been EPA's mandate to use only one evaluation method, but the agency has begun to provide better guidance to states. Its guidelines, however, should be based on more sound measurements and statistical methods -- and be peer reviewed, the committee said. Comprehensive, long-term evaluations of testing programs should be conducted in a few locations to research some fundamental issues related to the efficacy of these programs, such as the extent of pre-inspection repairs, the durability of emissions-related repairs, the effectiveness of inspection programs in reducing non-tailpipe emissions, and the fate of failing vehicles.

Focusing on high emitters may raise fairness concerns because these vehicles are more likely to be owned by people with limited economic means, the committee said. As it stands now, 10 percent of vehicles required to undergo emissions testing never show up for inspection, while 10 percent to 27 percent of vehicles failing inspection never end up passing the test. Since many of the owners of these cars probably cannot afford to fix them, policies should be explored to provide financial relief or other incentives so they will obtain long-lasting repairs or replace faulty vehicles.

On the other hand, there also is growing evidence that reducing the frequency of testing vehicles with a low probability of failure, including an exemption for testing recent year models, could be very cost-effective, the committee said.

The models used by EPA and the states to project emissions reductions need improvement, the committee said. Currently, states are allowed to use overly optimistic assumptions in the models, leaving them little incentive to test vehicles as they are being driven to verify whether the emissions reductions projected by the models are actually occurring or not. Evaluation of the emissions benefits from inspection and maintenance programs should be based on data collected from on-road vehicles. For example, remote-sensing devices could be used to estimate emissions of moving vehicles.

The credits that EPA grants to states for emission-reduction benefits attributable to inspection and maintenance programs should be closely tied to actual reductions that are based on observational and empirical data, not projections from models, the committee emphasized. The credits are accumulated by states to demonstrate compliance with air-quality standards.

New technology may change how vehicle-emissions tests are conducted in the future. For example, the current version of on-board diagnostic systems in cars built since 1996 alert motorists to potential problems in both the exhaust and emissions-control components by illuminating a light on the dashboard, and the vehicle's computer can be used by mechanics to trace the source of a malfunction. However, these systems do not actually measure emissions, instead relying on the computer to indicate whether any emissions-related malfunctions exist.

Nonetheless, EPA has issued a rule requiring states to use on-board diagnostic systems for testing individual cars and trucks. Whether this technology can become effective and reliable as a testing device and whether it would result in large costs to inspect and repair low-emitting vehicles, perhaps at the expense of finding and fixing high-emitting vehicles, requires an independent examination, the committee said.

The report notes that future air-quality improvement programs are likely to place greater emphasis on controlling emissions of nitrogen oxides and particulate matter because of growing environmental and health problems attributable to these pollutants. This means inspection programs may need to target the heavy-duty diesel vehicles that are a major source of these pollutants but largely exempt from current inspections.

The report was sponsored by the U.S. Environmental Protection Agency. The National Research Council is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. It is a private, nonprofit institution that provides science and technology advice under a congressional charter. A committee roster follows.

Read the full text of [Evaluating Vehicle Emissions Inspection and Maintenance Programs](#) for free on the Web, as well as more than 1,800 other publications from the National Academies. Printed copies are available for purchase from the [National Academy Press Web site](#) or by calling (202) 334-3313 or 1-800-624-6242. Reporters may obtain a pre-publication copy from the Office of News and Public Information (contacts listed above).

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