From the standpoint of air pollution, the only marked disadvantage noted in these tests was that the turbine engine, when it was fueled with kerosene, produced an odor similar to that from diesel engines; however, the odor was not severe.

It is important to note that these tests do not represent a full evacuation of the turbine engine's potential for contributing to communiy air pollution. As previously noted, only one vehicle was tested and the testing was focused on well known motor vehicle pollutants. No attempt was made to determine whether turbine engines produce significant amounts of lesser known or hitherto unknown classes of pollutants. Because there is often a substantial degree of variation in emissions from individual cars of the same general type, the fact that only one turbine car was tested must be kept in mind. The results are believed to be representative of this type of engine, but data to confirm this are not available.

Insofar as can be determined from available information, the outlook for the use of turbine engines—at least in trucks and buses—is essentially the same as it was in 1962 when, in a report to the Congress, the Surgeon General of the Public Health Service said: "There is no doubt that the turbine will find application for a number of purposes where its advantages are clear-cut. This includes fire engines and other emergency vehicles. For pulling one or several heavy trailers over turnpikes and interstate highways, turbines are unquestionably superior power plants."

The prospects for using gas turbine engines in passenger cars have generally been considered less promising, pricipally because of their relatively high fuel consumption and their lag in providing acceleration from a standing start. In recent weeks, however, the Chrysler Corporation has taken a more hopeful view, at least in its statements to stockhoders and the public.

On April 19, Chrysler announced development of a second-generation turbine engine which will serve as the basis for its future work in this area. The new model was said to overcome, to an unspecified degree, the disadvantages of the earlier prototype. Air pollution data for the new model have not been released. Chrysler is the only major automobile manufacturer known to be involved, to any appreciable degree, in efforts to develop turbine powered passenger cars. Both Ford and General Motors are known to be actively engaged in the development of turbine powered trucks.

The need to control emissions from diesel engines is still another important aspect of the problem of motor vehicle pollution. Although less than 0.5 percent of our vehicles are diesel powered, from the standpoint of someone driving behind a diesel bus or truck, the need to control diesel emissions may well seem the most important. I suspect that no other aspect of the problem makes so many people so indignant or so uncomfortable on so many occasions. The smoke and odors that come from diesel engines are, by any standard, an obnoxious nuisance; moreover, diesel engines contribute to community air pollution in other less obvious ways, as well.

In a diesel engine, tailpipe exhaust emissions comprise almost 100 percent of the total emission. Hydrocarbon emission amounts to about 2 percent of the supplied fuel. Both hydrocarbon and carbon monoxide emission from diesels are well within the present Federal standards set for new gasoline powered vehicles. However, because the extremely high diesel exhaust flow rate offsets lower concentration values, the pounds per hour rate of hydrocarbon emission from a diesel is close to that from an equivalent gasoline engine. Evaporative losses are nil because diesels have a closed system of fuel injection and diesel fuel is less volatile than gasoline. Crankcase emission losses are zero for two-cycle engines because blow-by past the piston becomes mixed with the inlet air for the next stroke. On the four-cycle engine, crankcase emissions are not over 0.05 percent of the fuel or over 2½ percent of tailpipe emissions. Nitrogen oxides emissions are substantial and are comparable to those from gasoline engines.

Catalytic afterburners and fuel additives for the control of diesel smoke and odor have undergone limited tests. Results indicate a worthwhile reduction in these emissions but, before such devices and additives can be considered on a broad scale, more comprehensive studies are required.

The Amendments to the Clean Air Act provided authority under which the Secretary of Health, Education, and Welfare can establish national standards for the control of diesel emissions. A number of technical problems relating