Testimony on Pennsylvania's Motor Vehicle Inspection System Before the Pennsylvania House of Representatives Transportation Committee, Subcommittee on Highway Safety

Representative John S. Davies, Chairman

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Thank you Chairman Davies and the members of the House Subcommittee on Highway Safety, I appreciate the opportunity to testify before you regarding the research which has become the basis for the proposal that Pennsylvania change the frequency of its auto inspection program from a semi-annual to an annual cycle. My purpose here is not one of exhortation, but rather to inform the Committee, and its guests, of the research which has been done on motor vehicle inspection programs. I will explain the study done by the Office of Budget and Administration in January, 1981 as well as several others completed over the last dozen years.

Background

Motor vehicle inspection programs were implemented on the basis of two assumptions; explicit and implicit. The explicit assumption was that some substantial number of serious motor vehicle accidents were caused by mechanical failures and/or out of tolerance mechanical components, and that a state mandated inspection system would correct these difficulties - thereby reducing accidents. The implicit assumption was that the inspection process was worth the cost. I use the word assumption here because prior to the late 1960's there was no systematic and credible research done to demonstrate the effectiveness of vehicle inspection as a traffic safety program.

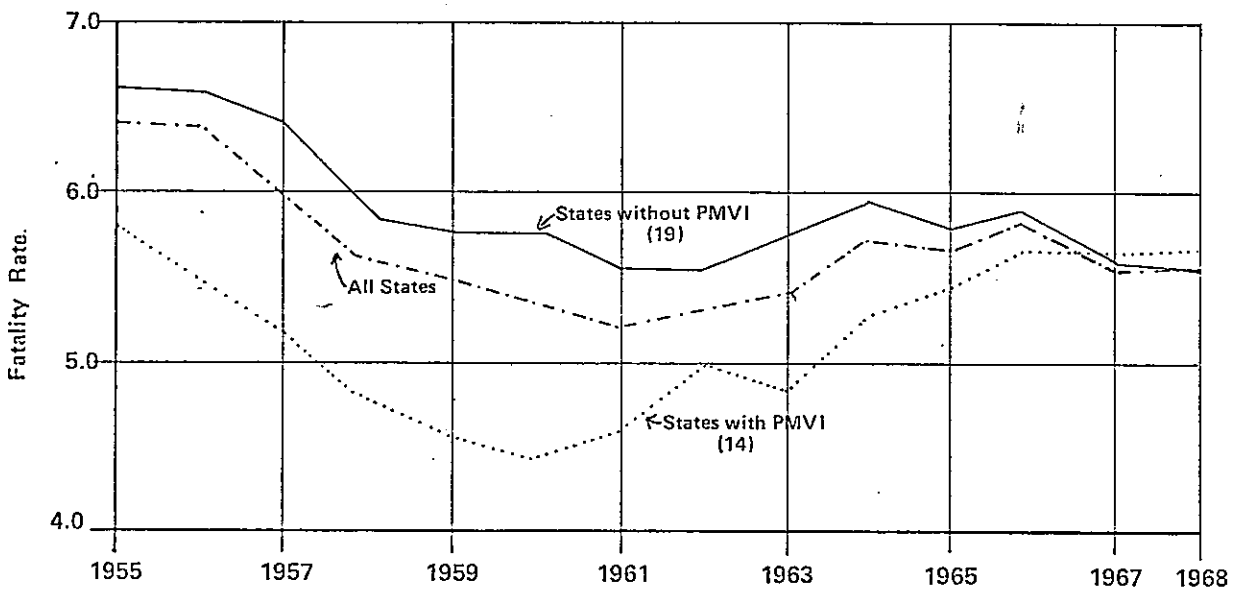
As the exhibit shows, until the latter portion of the 1960's the evidence seemed incontrovertable. The states which had periodic motor vehicle inspection (PMVI) programs showed lower fatality rates than did those without the program. In fact, states having a PMVI program had a group average fatality rate consistently below the national average, while the states without inspection systems showed rates consistently above the national average. However, the trends began to change. The distinct separation between the states with and without PMVI began to erode. The states without vehicle inspection, as far back as the late 1950's, began to converge with the national average fatality rates. By the early 1960's the fatality rates of states with vehicle inspection programs began a rather abrupt upward trend toward the national average. The states having PMVI were actually experiencing an increasing fatality rate! Then, in 1966 just before the trends would converge wiping away the fatality rate differences between the states with and without inspection, the Congress passed the Highway Safety Act requiring each state to begin periodic motor vehicle inspection. If the exhibited time series were continued up to the present, the trends for both groups of states remain essentially together; alternately passing above and below the national average. All trends show a moderate yet persistent decline.

But, with the passage of the Highway Safety Act, and with the disappearance of the differences in traffic safety between the states, a wave of reasonably sophisticated research was not long in coming; from independent sources as well as government. The National Highway Traffic Safety Administration (NHTSA) itself produced a well designed study in

MOTOR VEHICLE FATALITIES PER 100 MILLION VEHICLE MILES

1955-68

FATALITIES BY PLACE OF RESIDENCE



1968; but before doing so it concluded that the contention that PMVI is associated with reduced motor vehicle fatalities no longer could be supported by a simple analysis of aggregate fatality rates.

Clearly - factors other than, or in addition to, the presence or absence of motor vehicle inspection are involved.

Other Research

Before conducting its own analysis, the Office of Budget and Administration examined a number of previous studies on PMVI effectiveness. Other research efforts fall into three major areas: the relationship between inspection and motor vehicle condition; studies on the relationship between vehicle defects and accidents; and those seeking to define the relationship between PMVI and auto accident rates.

PMVI and Motor Vehicle Condition

Two major studies (McCutcheon and Sherman, 1969 and Ultra systems under contract to NHTSA) reviewed with regard to PMVI and vehicle condition lend support to the position that motor vehicles in PMVI jurisdictions have lower vehicle defect rates than those in jurisdictions without vehicle inspection, and that fewer vehicle defects are found in those jurisdictions with more frequent inspections.

Conclusion - These findings should not be generalized since in each study only four jurisdictions were sampled. In addition, the differences, in most cases, were small and component outages were confined, in the large majority of cases, to the least safety sensitive equipment.

Vehicle Defects and Accidents

Likely the best research done on identifying human, environmental and vehicle factors causing or contributing to vehicle accidents, was by

the Indiana University Institute for Research in Public Safety published in 1973. Human factors alone were identified as the cause in 50 to 54 percent of all accidents. Human factors alone or in dominant combination with environmental or vehicle factors were thought responsible for 85 to 97 percent of all accidents. In contrast, vehicle factors acting alone were identified as definite or probable causes in 2 to 3 percent of all accidents. Please bear in mind that these data involve all accidents - not just serious accidents.

Conclusion - This study is very well done and the results can be generalized. There is probably a small proportion of accidents which can be attributed to vehicle components. Interestingly, brakes were the only component found to have a definite accident involvement.

PMVI and Motor Vehicle Accident Rates

Highway safety researchers have developed other more powerful techniques with which to analyze the influence of PMVI on accidents. One approach adopted by several studies assesses large numbers of jurisdictions taking into account the diverse social and economic characteristics associated with vehicle accidents. Through rigorous statistical procedures, the influence of these varying characteristics can be controlled allowing the influence of PMVI to be identified. Another approach is to develop a long time series of fatality rates for states before and after adopting PMVI programs and comparing these to similar control states never having PMVI.

Conclusion - the group of studies employing the first approach were unable to account for the remaining differences among the states

fatality rates by the presence or absence of PMVI. The second approach, while not as powerful, yielded much the same result, with those states recently adopting PMVI and those which had established systems showing fatality rate trends increasing faster than the states without an inspection system. In short, all studies agree that PMVI systems are not associated with reduced fatality rates.

The Office of Budget and Administration's Evaluation of the Pennsylvania Motor Vehicle Inspection Program

The OBA study was designed to test the assumptions stated at the beginning of my testimony; does the existance of PMVI reduce the level of serious motor vehicle accidents; does the frequency of inspection influence the level of serious vehicle accidents; is PMVI worth the cost. The first two statements have been objectively analyzed and the results are a matter of public record. As to the notion of value, that is a subjective judgemental decision which we cannot measure. The value of high inspection frequency is, to a large extent, illustrated by the extent to which the traffic safety objective of auto inspection is supplanted by the desire to have state mandated auto maintenance.

Since many previous studies, including those done by the NHTSA, had demonstrated that certain demographic and socio-economic factors were strongly associated with accident rates; the OBA study used an evaluation approach to control for these influences. The analysis focused on 1971-73 annual data from the 50 states and the District of Columbia. This study period was chosen because it represented a three-year period in which the

inspection status of each state remained constant and it proceeded the national gasoline shortage of 1974 which resulted in substantial reduction in both vehicle travel and accident rates. More recent data was not available for all of the variables under study.

The first phase of the analysis employed a wide variety of demographic factors, social and economic factors, environmental conditions and highway travel data thought to influence accident levels across the states examined. Demographic and socio-economic characteristics included population, per capita income, accidental deaths, and per capita alcoholic beverage sales. Environmental conditions focused on measures such as annual days of precipitation and annual average temperatures in each state. Highway data were composed of vehicle miles travelled, vehicle registrations, highway safety standards in force, surfaced miles and highway safety expenditures per capita. Through these variables the study sought to explain or account for the differing levels of fatal accident rates and the combination of fatal and injury accident rates across the states. Like other studies before it, the OBA analysis found that per capita income, accidental death rates, percent rural vehicle miles travelled, annual precipitation and temperature were consistent and powerful explainers of the differences in rates of serious accidents across the states. We could explain between 50 and 80 percent of fatal accident rates and between 22 and 42 percent of serious accident rates by these variables alone.

The second phase of the evaluation divided the states into three groups: those with semi-annual systems; those with annual systems; and, states with no periodic inspection. This analysis mathematically controls for the affects of the above mentioned variables, thus allowing us to focus

on the influence of inspection on the remaining portion of accident rate variations.

The findings were, again, consistent with other studies in that serious accident rates among the state groups were essentially equal when differences in demographic, socio-economic, environmental and highway factors are considered. Differences in fatal and serious accident rates of annual, semi-annual and no PMVI states were not statistically significant. No significant differences could be found between annual and semi-annual states for any of the accident measures employed.

Our report conservatively estimates the cost of Pennsylvania's inspection system at $155 million annually exclusive of repair costs. The assumptions used in this calculation were:

Inspection	=	$122.4 million annually (6.8 million vehicles at $9.00 per inspection);
Time Cost	=	$27.2 million annually (1 hour at $2.00 per hour per inspection);
Travel Cost	=	$5.9 million annually (6 miles round trip at 7¢ per mile per inspection). This is based on 17 m.p.g. fleet wide and $1.25 per gallon of gasoline.

In addition, there is some evidence to suggest a reason for concern regarding the application of the system to the vehicle fleet. The OBA obtained reliable estimates from the State Police concerning the time involved in completing an inspection. Current estimates range between 30 and 45 minutes to do an inspection; and this is borne out by the prevailing cost of around $10 to $12. Given the comprehensive nature of Pennsylvania's

inspection requirements, it is estimated that 1 to 1.5 hours would be required to evaluate all components. Since this is not the case in field application, it must be assumed that inspection stations are making priority decisions on which components to inspect - if they are aware of the requirements. Further, there is no assurance that inspection decisions always include those items which are considered the most safety sensitive. Several studies have found that the large majority of rejected components are of lesser importance to safety such as lights and wipers as opposed to brakes, tires and steering.

Conclusions

The evidence from several very well designed studies from a wide variety of sources agree that PMVI systems have no detectable influence on the level of serious accidents. Furthermore, there is no empirical support for the assertion that the added impact on general vehicle condition of semi-annual inspection is at all proportional to the added cost. Indeed, the longer wear intervals for virtually all auto components may be eroding any impact on vehicle condition.