

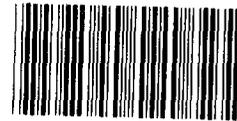
GAO

Briefing Report to the Chairman,
Subcommittee on Water Resources,
Transportation, and Infrastructure,
Committee on Environment and Public
Works, U.S. Senate

March 1988

HIGHWAY SAFETY

Monitoring Practices to Show Compliance With Speed Limits Should Be Reexamined



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**Resources, Community, and
Economic Development Division**

B-229461

March 31, 1988

The Honorable Daniel Patrick Moynihan
Chairman, Subcommittee on Water Resources,
Transportation, and Infrastructure
Committee on Environment
and Public Works
United States Senate

Dear Mr. Chairman:

In your letter of March 10, 1987, you asked us to study how the states are monitoring motorist compliance with the 55 mph national maximum speed limit. You were concerned by recent reports suggesting that states' monitoring practices do not clearly indicate whether they are complying with the law and that criteria and sanctions contained in the law were not being enforced.

Currently, states are considered in compliance if at least 50 percent of motorists on public highways posted at 55 mph are recorded as traveling at or below 55 mph after adjusting the data for speedometer and sampling errors. If more than 50 percent of a state's motorists on 55-mph-posted highways exceed the limit, the state may be forced to forfeit up to 10 percent of its primary, secondary, and urban highway funds.

We reviewed the speed monitoring programs of six states that had different experiences in meeting the compliance requirement and different equipment for data collection: Arizona, Idaho, Maine, Maryland, New York, and Vermont. On October 9, 1987, we briefed your staff on (1) state monitoring plans and practices, (2) Department of Transportation's Federal Highway Administration (FHWA) oversight of state monitoring programs, and (3) state efforts to enforce motorist compliance with the 55 mph speed limit. We also presented our observations on the relation of the monitoring program to improved highway safety. This briefing report details the results of our work and includes a recommendation to the Secretary of Transportation.

Overall we found the following:

- The six states that we reviewed had monitoring programs that were generally in compliance with applicable regulations, and the monitoring stations were, for the most part, located in accordance with FHWA guidelines. However, we did find several monitoring sites that we

believe were inappropriately located. Corrective action is being considered at these locations.

- FHWA's initial active involvement in the development and implementation of state monitoring plans has decreased. In some states FHWA's role is limited to reviewing state annual reports and recommending certification for compliance or the imposition of sanctions.
- The states differ in the amount of effort spent in enforcing the 55 mph speed limit, but we found little relationship between speed limit enforcement activities and the level of motorist compliance.

More importantly, however, we found that the speed monitoring aspect of the program does not correspond well with the primary objective of the 55 mph national speed limit, which is to improve highway safety. The monitoring program was instituted to ensure that states are complying with the 55 mph speed limit and are working toward achieving the goal of safer highways.

Under current FHWA guidelines, states with compliance problems can, with FHWA approval, resample their road systems to attempt to replace monitoring sites where motorists generally disobey the 55 mph speed limit with sites where vehicle speeds are likely to be slower because of road or traffic conditions. Similarly, states can elect to increase speed limits on rural interstate highways to 65 mph and thereby remove these roads from the sample of roads to be monitored. In our opinion, actions such as these, although helping to ensure that states are in compliance with the 55 mph law, do nothing to change motorist driving behavior or improve highway safety.

Conversely, safety-enhancing actions taken by states, such as stepped-up police enforcement, might have little or no effect on each state's ability to achieve compliance with the 55 mph speed limit because enforcement resources are insufficient to affect statewide average driving speeds. According to the National Academy of Sciences, there is only 1 patrol officer for every 190 miles of 55-mph-posted highway.¹ Other state policies designed to reduce highway deaths and injuries, such as posting less well-designed roads at speeds under 55 mph, might actually hurt a state's compliance record because such roads are not monitored under the 55 mph national maximum speed limit program.

¹55: A Decade of Experience, Transportation Research Board Special Report No. 204, National Research Council (Washington D.C.: 1984).

In addition, the criterion used for judging compliance does not take into consideration differences in road quality and design. For example, it is probably safer to drive 65 mph on a well-designed, limited access, rural interstate highway than to drive 55 mph on a two-lane rural connector. However, compliance measurement practices do not distinguish among roads of different quality. Also, the compliance criterion does not assign greater weight to gross violations as opposed to relatively minor ones (i.e., a state where more than half the motorists drive 20 mph over the limit is subject to the same sanctions as a state where more than half the motorists drive only 1 mph over the speed limit).

Officials at departments of transportation in the states we surveyed generally agreed that the overall speed monitoring program inadequately reflects the state's speed enforcement efforts and road quality differences among the states. They do not believe that the speed monitoring program provides an adequate basis for sanctioning states for noncompliance. Most officials critical of using only speed data to decide compliance and assess sanctions believe that other factors should be reflected in a comprehensive speed monitoring program. These factors include, but are not limited to, (1) speed-related fatalities, (2) speed limit enforcement levels, and (3) road types.

Researchers at several state departments of transportation, as well as analysts at the National Academy of Sciences, have suggested alternate ways to measure compliance and assess penalties, such as putting greater weight on very high speed violations and violations on less well-designed roads. Although we did not undertake a comprehensive review of the individual proposals, our review indicates that these alternate approaches contain elements that could improve the current speed monitoring program.

Therefore, we recommend that the Secretary of Transportation undertake a study of the feasibility of instituting a weighting scheme and report the results of this analysis to the Congress along with any recommendations for legislative changes necessary to improve the compliance monitoring system.

Agency Comments

In its March 2, 1988, comments on a draft of this report (see app. I), the Department of Transportation (DOT) expressed basic agreement with our observation that the current compliance monitoring system is flawed because it fails to distinguish between serious and minor violations on different types of roads. However, DOT believes that any weighting

scheme devised to improve the program will merely cause the states to adopt new strategies to avoid the threat of sanctions. DOT recommended in early 1988 congressional testimony that the Congress consider abandoning the compliance monitoring system. DOT said that, instead, the Congress should return to the pre-1978 procedure whereby the governor of each state certifies that the state has not posted any roads above the limit allowed by the Congress and that enforcement efforts are in place.

Such an alternative is certainly within the Congress' prerogative. However, if the Congress chooses to continue to require the states to monitor and report speeds on 55-mph-posted roads and to provide sanctions for noncompliance with a performance standard, we continue to believe that the current system should be redesigned so that it better corresponds to the congressional goal of improved highway safety.

Scope and Methodology

We obtained information for this briefing report by reviewing state plans of six states: Arizona, Idaho, Maine, Maryland, New York, and Vermont. We believe that these states are illustrative of the broad range of driving conditions in the nation and of the problems that states have experienced under the compliance monitoring program. Five of these states have failed to remain in compliance. Four went out of compliance and made adjustments to regain compliance. One state, New York, went out of compliance for the first time in 1987, and the other, Idaho, has never had problems staying in compliance. These states also differed as to the type of monitoring equipment used to record vehicle speeds. Finally, these states were among those of interest to individual members of the Committee.

We discussed the monitoring plans of these states, as well as the entire speed monitoring program, with FHWA division officials and representatives of both the state departments of transportation and the state police. We also visited a sample of speed monitoring locations in the states to determine whether they were selected and placed in accordance with federal regulations.

This briefing report is divided into five sections. Section 1 provides background information on the intent of the national speed limit and the evolution of the speed monitoring program, as well as the objectives, scope, and methodology of this review. Section 2 discusses FHWA oversight of state speed monitoring practices. Section 3 discusses how speed monitoring data relate to safety and enforcement and how states

achieve compliance. Section 4 reports on suggested ways to improve the program, and Section 5 contains our conclusions and recommendation.

We are sending copies of this report to the Senate Committee on Environment and Public Works, the House Committee on Public Works and Transportation, and the Secretary of Transportation. Copies will also be made available to other interested parties upon request.

This work was performed under the direction of Kenneth M. Mead. Other major contributors to this briefing report are listed in appendix II.

Sincerely yours,

A handwritten signature in cursive script that reads "J. Dexter Peach". The signature is written in dark ink and is positioned above the typed name and title.

J. Dexter Peach
Assistant Comptroller General

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Abbreviations

DOT	Department of Transportation
FHWA	Federal Highway Administration
GAO	General Accounting Office

Introduction

Background

The 55 mph national maximum speed limit, which was originally enacted by the Congress in the Emergency Highway Energy Conservation Act of 1974 as a temporary fuel conservation measure, was made permanent in 1975 partly because of its apparent safety benefits. In 1974, the first year of the 55 mph speed limit, there were 9,100 fewer highway deaths than in 1973, a decrease of 17 percent. Although a number of factors contributed to the improved safety record, many highway safety analysts attributed much of the decline in fatalities to the reduced speed limit.

Between 1975 and 1978, the Congress required governors to certify that their states were making an effort to enforce the law and to report on state speed trends for highways posted at 55 mph. The federal government had little power to influence state enforcement efforts. In the Highway Safety Act of 1978, the Congress established a penalty provision whereby the states could lose up to 10 percent of their consolidated primary, rural secondary, and urban system highway funds if a specified percentage of traffic (currently 50 percent) on roads posted with 55 mph speed limits exceeded the speed limit. However, the states were allowed to adjust the collected speed data downward to reflect speedometer error, sampling error, or any other factor that might result in a state's being erroneously sanctioned.

The procedures for collecting speed data were defined by the Federal Highway Administration (FHWA) in its Speed Monitoring Program Procedural Manual. This manual established the statistical methodology for selecting the sample of roads to be monitored and set forth guidelines for identifying the specific monitoring sites. Each state is required to report the results of its speed monitoring efforts and submit to FHWA an annual sampling plan demonstrating that its monitoring procedures are in accord with the guidelines. Once the plan has been reviewed, it is either approved or rejected by FHWA division officials in each state.

To select the highways to be monitored, a state divides all roads posted at 55 mph into 5-mile segments for each of the functional road categories.¹ A random sample is drawn from these segments and weighted by the vehicle-miles traveled on each functional category with a minimum of two locations for each functional category monitored. Originally, speeds were to be recorded only on straight, level highways in daylight hours and under clear weather conditions, but in 1980 the guidelines

¹The functional categories of highway that have 55-mph-posted roads are urban and rural interstates, other freeways and expressways, principal and minor arterials, and major collectors.

were changed to allow states to monitor speeds under a more representative set of travel conditions. Most states switched to 24-hour monitoring and began to record speeds even during periods when traffic was congested and during inclement weather.

Although these monitoring changes and error adjustments initially reduced recorded average speeds and the proportion of vehicles exceeding 55 mph, over time recorded speeds crept back up. Consequently, an increasing number of states were faced with the prospect of losing federal-aid highway funds. In 1987, the Congress permitted the states to raise the speed limits on rural interstate highways to 65 mph. These interstates are usually the safest and best-designed roads; they are also the roads where speeds are highest. Since 65 mph roads do not have to be monitored for speed compliance and can be eliminated from the sample, it will make it easier for states to remain in compliance. To date, 39 states have raised the speed limit on these interstates, but more than 500,000 miles of roads remain posted at 55 mph. These roads continue to be subject to the speed limit law.

Objectives, Scope, and Methodology

The Chairman, Subcommittee on Water Resources, Transportation, and Infrastructure, Senate Committee on Environment and Public Works, asked us to examine how state and federal agencies are fulfilling their responsibilities under the law. To accomplish our objective, we interviewed federal and state highway officials and state law enforcement officials in six states: Arizona, Idaho, Maine, Maryland, New York, and Vermont. Although no attempt was made to develop a statistically representative sample, we believe that these six states are illustrative of the broad range of driving conditions in the nation and of the problems that some states have experienced with meeting the compliance standard. Five of the 6 states in our survey have been out of compliance in 1 or more years. Since the compliance program was instituted in 1978, 12 states nationally have faced sanctions for being out of compliance. Of the states we surveyed, only Idaho has never had a problem with the compliance standard. Both densely traveled roads in eastern states and lightly traveled highways in western states were included in our survey.

These states also differed in the type of sensors employed to detect vehicles and record traffic speeds. Maine and Idaho use pneumatic tubes stretched across the road, while the others have adopted loop counters embedded in the highway. In addition, these states were included

because they were of interest to individual Committee members. Therefore, although a more scientifically drawn sample is necessary for statistical analysis, we believe that the experiences in these states provide a reasonable approximation to state monitoring and federal oversight activities on the national level.

We examined each state's speed monitoring plan and inspected a sample of speed monitoring sites. We interviewed state transportation officials responsible for carrying out the monitoring program, FHWA regional and division officials with oversight responsibilities, and FHWA personnel at the U.S. Department of Transportation (DOT) headquarters in Washington, D.C. We visited more than 60 monitoring sites in the 6 states to judge whether they were representative of road types and conditions in the state and whether they conformed to the guidelines in the Speed Monitoring Program Procedural Manual. We also examined data on state speed enforcement efforts and highway safety performance and compared these measures with the speed monitoring and compliance data.

We reviewed a number of previous studies of the 55 mph speed limit, including ones prepared by California, Maryland, and the National Academy of Sciences. When possible, we examined the speed monitoring plans and reports of the past 5 years for the six states in our survey.

Our review was conducted between June 1, 1987, and September 30, 1987, in accordance with generally accepted government auditing standards.

FHWA Oversight of State Speed Monitoring Practices

The information gathered in six states indicates that state monitoring programs generally meet federal requirements. However, we found several problem areas, including (1) a lack of FHWA oversight of state speed monitoring programs, (2) inappropriate location of monitoring sites, and (3) biases caused by state police speed control tactics.

FHWA Oversight

The Speed Monitoring Program Procedural Manual guides the states in establishing a valid statistical method for measuring a sample of vehicle speeds on highways posted at 55 mph. The manual specifies the minimum data collection requirements of a state speed monitoring plan, including the

- number of miles of highway posted at 55 mph,
- distribution of travel on these roads,
- number of sampling site locations,
- distribution of sampling site locations by functional road type (i.e., interstate, freeways, principal and minor arterials, and major collectors), and
- speed monitoring schedules.

It was not the purpose of the manual to specify how FHWA division offices, located in each state, are to execute their oversight responsibilities. According to FHWA headquarters officials, considerable latitude is given to the divisions to ensure state compliance with the 55 mph speed limit program. Directives issued in 1984 and 1985 from FHWA headquarters emphasized the divisions' responsibilities for reviewing state speed monitoring activities, including ensuring that (1) state sampling plans are unbiased, (2) monitoring is conducted in accordance with the plan, and (3) the states operate speed monitoring equipment according to manufacturers' specifications.

FHWA division oversight varied widely in the states that we visited. Most divisions participated in the development of the initial state monitoring plan as well as in the initial site selection. Only in Maine and Vermont did FHWA officials tell us that they continue periodically to inspect sites and observe speed monitoring sessions. For example, in Vermont the FHWA division office receives an annual schedule from the state that lists the dates of all speed monitoring sessions. Using this schedule, the FHWA division actively monitors data collection as well as ensures that the state is following the approved plan. Conversely, in Arizona FHWA does not systematically inspect sites because monitoring schedules are not provided to the FHWA division office. Arizona state highway officials told

us that speed monitoring is conducted only when technicians can be freed from other duties.

State Monitoring Sites

To ensure that motorists are obeying the 55 mph speed limit, states are required to monitor speeds on a sample of highways posted at 55 mph. The placement of the monitoring equipment should be at a site that is representative of conditions on the 5-mile segment. The monitor should not be near or on a sharp curve, on a steep grade (greater than 4 percent), within 1000 feet of an intersection or commercial entrances, or where other unusual features exist that might influence vehicle speeds.

Table 2.1 shows the total mileage in these six states that could be posted at 55 mph, the actual mileage posted at 55 mph, the number of monitoring sites, and the number of sites we visited.

Table 2.1: Highway Mileage on 55-mph-Posted Roads and Monitoring Sites in Six States, 1987

State	Total mileage^a	Actual miles posted 55 mph	Total number of monitoring sites	Monitoring sites visited by GAO
Arizona	11,126	5,028	38	12
Idaho	8,709	4,305	33	18
Maine	5,990	1,301	30	8
Maryland	5,918	901	28	9
New York	21,543	14,510	51	8
Vermont	3,525	371	24	8
Total	56,811	26,416	204	63

^aExcluding local streets and minor collectors

Note: These data are for the period before the Congress permitted states to raise speed limits to 65 mph on rural interstates.

Source: Federal Highway Administration.

Most of the 63 sites that we visited were located in accordance with the guidelines specified in the manual. However, we did find several sites which, in our opinion, were inappropriately located. These included sites located near legal u-turns, traffic lights, areas where traffic merges, and speed advisory signs. For example, one of the nine sites we visited in Maryland was located between two traffic lights where it would be difficult for a vehicle to travel 55 mph if either light were red. Maryland transportation officials told us that they thought this condition was the result of recent development in the area and they would reevaluate the site.

In New York, one of the eight sites we visited was on a road that was not posted at 55 mph throughout the 5-mile segment. It was in a residential neighborhood where posted speeds ranged from 30 mph down to 15 mph in a school zone. There was a 55 mph sign at the speed monitoring site, but it was hidden behind a tree. FHWA division officials said that they were unaware of this situation.

As a result of our review, the New York State Department of Transportation, in conjunction with FHWA, began a statewide inspection of all noninterstate speed monitoring sites. FHWA agreed that the site described above was inappropriate. In addition to this site, the New York State Department of Transportation found another site on a road posted at 45 mph throughout the 5-mile segment to be monitored. State officials told us that both sites are being considered for deletion from the 1988 plan.

State Police Involvement

In each of the states we reviewed, state police received copies of quarterly and annual speed statistics that summarize speed data by road type. In Maryland, the state police also receive site-specific speed data. The state police told us that they occasionally use this information to focus their enforcement activities in areas where high speeds are reported. Although this practice could bias the data collection effort, no state police agency with whom we spoke said it purposefully tries to influence speed data by patrolling the area near the monitoring sites at times when speed data collection is taking place.

This has not always been the case. In both Vermont and Maine, FHWA found that state police had stationed patrol cars at monitoring sites while monitoring was taking place. In both cases the FHWA division took exception to this practice, and speed data collected during these sessions were disregarded. Both FHWA and state transportation officials told us that, except for providing copies of quarterly and annual speed statistics, state departments of transportation do not work with state police in developing their monitoring plans.

Speed Monitoring Data Do Not Always Reflect State Highway Safety and Enforcement Efforts

We found that state compliance with the national maximum speed limit is not necessarily the best indicator of the safety of a state's highways, nor does the level of compliance necessarily reflect speed enforcement efforts by state police. For example, states with relatively good compliance records do not have the best safety records in terms of highway fatalities, nor do states that aggressively ticket speeders necessarily motivate motorists to comply with the 55 mph speed limit.

Monitoring Data Are Not Indicative of Highway Safety

The 55 mph speed limit was made permanent in part because of its apparent safety benefits. A number of studies have examined the benefits of the 55 mph speed limit and concluded that it has saved lives.¹ Although the 55 mph speed limit may enhance highway safety, we did not find any evidence that the current procedures for judging and encouraging state compliance with it correlated to highway safety. In the states visited, we found no relationship between the current measure of compliance (percentage of traffic exceeding 55 mph) and the highway fatality rate on rural interstates. (See table 3.1.)

Table 3.1: Comparison of Fatal Accident Rates on Rural Interstates and Measured Speeds, FY 1985

State	Fatal accident rate ^a	Rank	Percent over 55 mph on rural interstates ^b	Rank
Arizona	2.09	1	84.1	3
Idaho	1.94	2	69.3	6
Maine	0.53	6	85.1	2
Maryland	0.84	5	83.3	4
New York	0.92	3	89.7	1
Vermont	0.87	4	76.3	5

^aMeasured in fatal accidents per 100,000,000 vehicle-miles of travel

^bUnadjusted data

Note: Because rural interstates are the only system posted almost entirely at 55 mph, they allow comparisons of fatal accident rates on 55-mph-posted roads in different states.

Table 3.1 shows that Idaho, with the lowest percentage of motorists exceeding 55 mph on rural interstates (69.3 percent), had the second highest fatal accident rate (1.94) of the six states that we reviewed. On the other hand, Maine, which had the second highest percentage of motorists exceeding 55 mph on rural interstates (85.1 percent), had the lowest fatal accident rate (0.53). Although this analysis is limited to

¹55: A Decade of Experience, Transportation Research Board Special Report No. 204, National Research Council (Washington D.C.: 1984).

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rural interstate highways in six states, the 1984 National Academy of Sciences study of the speed limit, which included different types of roads with 55 mph speed limits in all states, showed similar results.

In addition, some states elect to post their undivided two-lane highways at speeds less than 55 mph. Maryland is one such state. Maryland transportation officials told us that posting their roads at the safer lower limits works to the state's disadvantage. They told us that in Maryland a larger proportion of the roads posted at 55 mph are of interstate quality, while in other states many of the 55 mph posted roads are of lower design quality, and travel speeds are naturally slower. As a result, other states record slower speeds systemwide and thereby remain in compliance. Maryland transportation officials state that if they had raised the speed limit on undivided, two-lane roads from 50 mph to 55 mph and included them in the monitoring, Maryland, in all probability, would have been in compliance in 1984 and 1985, because including roads where speeds typically are slower would lower the average.

Furthermore, the current compliance criterion does not take into account differences in road design. All roads in the monitoring system are weighted equally in determining whether a state complies with the national maximum speed limit. However, modern interstate highways, characterized by multiple divided lanes and limited access, have the lowest death and injury rates of any part of the highway system. Rural interstate highways comprise only 6 percent of the nation's 55 mph posted highways, but carry 19 percent of traffic on these roads. Rural interstate highways account for only 9 percent of the fatalities on roads with 55 mph speed limits, despite the fact that speeds are highest on these roads.² Recognizing these differences, the National Academy of Sciences recommended that a point system be attached to the compliance criterion to reflect the different safety risks on different road systems. (See section 4 for additional discussion of the National Academy of Sciences study.)

Monitoring Data Are
Not Indicative of
Enforcement Activity

State efforts to enforce the 55 mph speed limit by ticketing more violators also do not always result in achieving compliance. For example, Maryland aggressively ticketed violators of the 55 mph limit, yet the state was unable to stay in compliance. The decision to impose sanctions does not explicitly take into account a state's enforcement efforts.

²55: A Decade of Experience, pp. 175-176.

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Table 3.2 shows the number of speeding tickets issued in the six states per mile of road with 55 mph speed limits.

Table 3.2: Number of Speeding Citations Per Mile of 55-mph-Posted Roads, 1984-86

State	1984	1985	1986
Arizona	29.2	33.5	36.8
Idaho	8.3	13.4	12.6
Maine	16.8	19.3	20.3
Maryland	170.1	181.9	161.0
New York	17.9	17.9	18.6
Vermont	72.4	96.3	96.7
National average	14.0	14.8	15.1

Source: Federal Highway Administration.

As table 3.2 shows, Maryland had an aggressive speed limit enforcement program. In 1984 the state police issued about 170 speeding citations per mile of road posted at 55 mph, or about 150,000 tickets. In 1985 this number increased to about 182 citations per mile of road posted at 55 mph, or about 164,000 tickets. The Maryland state police have used a variety of enforcement techniques such as unmarked vehicles, aerial speed enforcement, and rolling roadblocks. Despite these efforts, in 1984 Maryland's adjusted figure for the percentage of motorists exceeding the 55 mph speed limit was 55.9 percent. Consequently, in 1985 the Department of Transportation reserved from obligation 10 percent of Maryland's fiscal year 1986 federal highway funds, \$5.66 million, pending a return to compliance. In 1985 Maryland was again cited for noncompliance.

Maine encountered a similar situation. The state police doubled the number of speeding citations and warnings between 1982 and 1986. In addition, Maine instituted a number of initiatives, such as public awareness programs and aircraft enforcement, to encourage motorists to stop speeding. Despite these efforts, Maine was found not to be in compliance in 1986.

A 1987 study on the national maximum speed limit prepared by the California Department of Transportation and the California Highway Patrol stated that the present system for judging compliance is unrealistic. This study noted that despite the best efforts at enforcement and the fact that the California Highway Patrol issues more than 1,000,000 citations a year for exceeding the 55 mph speed limit, speeds continue to creep up.

How States Achieve Compliance

The six states that we visited employed various methods to achieve compliance, some of which did not have a positive impact on either speed or safety. For example, officials in Maine said they had several sites that continually recorded high-speed traffic. Therefore, with FHWA approval, they took a new random sample of road segments and the resulting group of roads to be monitored did not include these high-speed sites. Nothing in the Speed Monitoring Program Procedural Manual prohibits resampling, although approval by FHWA is required. In 1985, when Maryland found that it was unable to comply with the national maximum speed limit through aggressive enforcement, it drew a new sample of roads to be monitored and secured FHWA's approval for its revised speed sampling plan. The revision resulted in the relocation of 10 sites to reflect the effects of congestion and hills within the road network. As a result of these changes, Maryland returned to compliance in 1986.

In addition to resampling and relocating sites, other options are currently available to states either to stay in, or to return to, compliance. States can now raise the speed limit on rural interstates, the type of roads that traditionally have higher speeds, to 65 mph. Because these roads are no longer posted at the national speed limit, they are no longer part of the monitoring program. Thirty-nine states now have 65 mph speed limits on their rural interstates; four of the six states we visited (Arizona, Idaho, Maine, and Vermont) have raised the limit to 65 mph on these roads. Although no officials in the states we visited said the move to 65 mph was done solely to stay in, or to return to, compliance, officials of the states that have raised the limit said that the move will help them with their compliance profile.

Another option, which may actually have a negative effect on safety, is to raise the speed limit on roads now posted, for safety reasons, below 55 mph to 55 mph. The design or geographic characteristics of these roads usually encourage slower speeds. Including these roads in the monitoring plan would lower the statewide average speed, but probably at a cost of more accidents and injuries because more motorists could legally drive at the higher speeds.

The 1987 California study made such an observation. It noted that one state reportedly had raised the speed limit on its secondary roads to 55 mph so that the relatively slower speeds on these roads would offset the higher freeway speeds. The study went on to say that it is not likely that such action will enhance highway safety.

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Although enforcement and compliance were generally found not to correspond, one state in our survey, Vermont, was able to return to compliance by increasing the number and severity of speeding citations and heightening public awareness through a campaign highlighted by media spots with the governor. According to state officials, these actions seemed to have encouraged motorists to comply with the national maximum speed limit.

Alternative Methods of Monitoring Speeds and Assessing Compliance With the 55 mph National Maximum Speed Limit

The lack of correspondence between the basis for assessing sanctions (failing to keep at least 50 percent of vehicles below 55 mph on 55-mph-posted roads) and the safety performance of those roads, as measured by the fatal accident rate, has troubled others who have studied the speed monitoring program. Several state and federal highway officials told us that they did not believe that the current compliance criterion reflects highway safety. Most said it was an inappropriate basis for assessing sanctions for noncompliance. They believe that other factors, such as the type of road, the level of enforcement, and the state's overall highway safety record, should be taken into consideration before assessing sanctions. Some who have examined the program have recommended changes that would take these factors into account.

We did not make an independent assessment of the potential impacts of any of the proposed changes to the compliance measurement system. However, the problems that they are designed to address are ones that were brought to our attention by the federal and state transportation officials whom we interviewed for this study, and they appear to warrant further consideration by federal officials responsible for overseeing the program.

National Academy of Sciences

In 1984 the National Academy of Sciences issued an assessment of the nation's experience after a decade under the 55 mph speed limit. The Academy's report pointed out that the variance in vehicle speeds—that is, the difference between the speeds of the slowest and fastest cars on the road—is an important factor in highway travel safety. The less variation in traffic speeds, the safer the highway. Therefore, the Academy concluded that the existing standard could be improved if it encouraged a narrower variation in traffic speeds. The Academy recommended a point system that weighted the number of drivers traveling at high speeds more heavily than those who were driving just above the speed limit. For example, a state might be judged to be out of compliance if it scored 300 points using the point system in table 4.1.

Table 4.1: Weighting Scheme for Assessing Compliance and Sanctions in National Academy of Sciences Study

Percentage of motorists traveling	Point multiplier
55 to 59 mph	1 point
60 to 64 mph	5 points
65 mph or more	10 points

Source: 55: A Decade of Experience, Transportation Research Board Special Report No. 204, National Research Council (Washington D.C.: 1984).

Section 4
Alternative Methods of Monitoring Speeds
and Assessing Compliance With the 55 mph
National Maximum Speed Limit

Under such a system, the percentage of motorists exceeding the speed limit would continue to be the basis for determining compliance, but the emphasis would be placed on the faster driving that increases the variance and most impairs highway safety. Under this approach a state in which all the traffic drove 57 mph would score 100 points (100 percent exceeding the limit multiplied by 1 point) and be in compliance, although it would be out of compliance under the existing system. On the other hand, a state where two-thirds of the traffic obeyed the limit, but one-third traveled 65 mph, would be out of compliance with the point system (67 percent x 1 point = 67; 33 percent x 10 points = 330; 67 + 330 = 397 points), although in compliance under the current system, because more than half the traffic traveled at or below 55 mph. The revised system, therefore, calls for sanctions where speeding threatens safety and no sanctions when the violations are not serious. The existing system does not make such a distinction.

In addition to treating violations in closer relation to their safety risks, the Academy noted that a point system could be extended to reflect safety priorities on different types of highways as well. The Academy also noted that fatality rates on two-lane roads are two to four times higher than on interstates, and speeding on these highways should be emphasized in enforcement. By weighting the high speed drivers on these roads, the Academy reasoned, the states would be encouraged to devote their enforcement resources where the safety risk is greatest.

California

A 1987 study by the California Highway Patrol and the California Department of Transportation of the 55 mph national maximum speed limit made a variety of recommendations, including a call for a compliance measurement process to better reflect safety priorities.

Table 4.2 illustrates a different weighting scheme proposed by the authors of the California study that takes into account both the seriousness of the violations and the types of roads on which they are occurring.

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Table 4.2: Weighting Scheme for Assessing Compliance and Sanctions Proposed by the California Highway Patrol and the California Department of Transportation

Percentage of motorists traveling	On freeways weight by	On other roads weight by
56 to 60 mph	1 point	2 points
61 to 65 mph	5 points	20 points
66 mph or more	10 points	40 points

Source: Maximum Speed Limit Compliance Formulas, California Highway Patrol and California Department of Transportation (Sacramento: 1987).

If penalties were assessed at 1500 points, then speeding on roads other than freeways would be more likely to trigger sanctions. For example, if on freeways 70 percent of motorists traveled between 61 mph and 65 mph, 20 percent exceeded 66 mph, and 10 percent traveled between 56 mph and 60 mph, the state would not be sanctioned (70 percent x 5 points = 350 points; 20 percent x 10 points = 200 points; 10 percent x 1 point = 10 points; 350 + 200 + 10 = 560 points). If the same percentages prevailed on other roads, the state would be out of compliance (70 percent x 20 points = 1400 points; 20 percent x 40 points = 800 points; 10 percent x 2 points = 20 points; 1400 + 800 + 20 = 2220 points).

Maryland

The Maryland Department of Transportation also developed an alternative method of measuring compliance with the 55 mph speed limit. Maryland's approach differed from that described by the National Academy of Sciences and the California Department of Transportation in two ways. First, Maryland officials believe that state enforcement efforts should be included in the decision on whether to impose sanctions. Some states, because of terrain or the type of roads posted 55 mph, will always find it more difficult to stay in compliance. Thus, Maryland officials believe that efforts to enforce the limit, as demonstrated by the rate of citations, should be taken into account. Second, Maryland would add a fourth speeding category covering vehicles traveling more than 70 mph. Table 4.3 shows Maryland's proposed weighting scheme.

Table 4.3: Weighting Scheme for Assessing Compliance and Sanctions Proposed by Maryland Department of Transportation

Percentage of motorists traveling	Point multiplier
55 to 59 mph	1 point
60 to 64 mph	5 points
65 to 69 mph	10 points
70 mph or more	20 points

Source: Maryland Department of Transportation.

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Maryland officials also suggest that separate weights be assigned to violations in three categories of highways—interstates and freeways, other major highways, and rural collector roads. The weights would be based on the fatal/injury rate on these roads in the individual states. Violations on roads in states that had particularly poor records would be weighted more heavily than violations on roads in states with good safety records. Maryland transportation officials contend that such an adjustment would incorporate other factors affecting the safety record of highways in the state.

Conclusions and Recommendation

On the basis of our review of speed monitoring practices in the six states in our survey, we believe that there is room for improvements in the program. Although our sample of states was not scientifically drawn and includes 5 of the 12 states that have experienced compliance problems, we believe that these 6 are illustrative of the broad range of driving conditions in the nation and of the problems experienced by some states in complying with the 55 mph speed limit.

Conclusions

The 55 mph speed limit monitoring programs in the six states we surveyed were generally in compliance with federal regulations set forth in FHWA's Speed Monitoring Program Procedural Manual. We found some discrepancies, however, including several monitoring sites that were inappropriately located and learned of some state police tactics that had biased some recorded speed data. We also found that although all six FHWA division offices in our sample reviewed and passed on state monitoring plans, only two took an active role in ensuring that the states were properly collecting and reporting speed data on 55-mph-posted roads. These problems, by and large, are being or have been addressed. Therefore, we are making no recommendations with regard to FHWA's monitoring program.

Our review leads us to believe that there is a lack of correspondence between the compliance measurement program and the congressional goal in making permanent the 55 mph national maximum speed limit—to foster highway safety. States that have difficulty meeting the compliance standard either could solve or have solved their problem by, among other techniques, resampling or increasing speed limits on rural interstates. These actions might lead to compliance as measured by the current system, but they do not necessarily improve highway safety.

In addition, monitoring data are not always indicative of state efforts to enforce the 55 mph speed limit. For example, two of the six states we visited—Maryland and Maine—went out of compliance while maintaining aggressive enforcement programs. The current compliance standard does not differentiate between serious and minor violations of the speed limit, nor does it take into account differences in the quality of road on which the violations occur. A state is out of compliance if more than 50 percent of the motorists exceed the 55 mph speed limit, regardless of where they are speeding or how fast they are going. For these reasons, we believe that the current compliance standard is inadequate for deciding which states should be sanctioned for failing to promote highway safety through speed limit enforcement. We agree with the consensus

conclusion of those state highway officials we interviewed that the criterion for determining sanctions should better reflect highway safety performance.

Recommendation

We recommend that the Secretary of Transportation direct the Administrator of the Federal Highway Administration to undertake a study of the feasibility of instituting a weighting scheme that places greater weight on high speed violations and violations on roads of lower design quality in assessing whether to sanction a state for noncompliance with the 55 mph national maximum speed limit. The Secretary should report the results of this analysis to the Congress along with any recommendations for legislative changes necessary to improve the compliance monitoring system.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOT, on March 2, 1988, expressed its basic agreement with our observation that the current compliance monitoring system is flawed because it fails to distinguish between serious and minor violations and among violations on different types of roads. However, DOT believes that any weighting scheme devised to improve the program will merely cause the states to adopt new stratagems to avoid the threat of sanctions. In February 1988 testimony before the Subcommittee on Water Resources, Transportation, and Infrastructure, Senate Committee on Environment and Public Works, DOT recommended that the Congress consider abandoning the compliance monitoring system. DOT said, instead, that the Congress should return to the pre-1978 process whereby the governor of each state certifies that no road in the state is posted above the limit established by the Congress and that enforcement efforts are in place. Thus, DOT recommended repealing the compliance criterion, the sanctions for noncompliance, and the federally mandated monitoring and reporting requirements.

Such an alternative is certainly within the Congress' prerogative. However, if the Congress wishes to continue to require the states to report speed data and to assess sanctions for failing to achieve a standard of motorist compliance with the speed limit, then we believe the current system should be redesigned to better take into account those speed violations that represent the greater threat to driving safety. This would, in our opinion, significantly improve the linkage between the program and

Section 5
Conclusions and Recommendation

the established congressional goal of improving highway safety. We recognize that no system is perfect, but we believe that, as long as a compliance monitoring system is desired, it should be as accurate a reflection of the law's goals as is feasible.

Agency Comments From the U.S. Department of Transportation



U.S. Department of
Transportation

Assistant Secretary
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400 Seventh St., S.W.
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MAR 2 1988

Mr. J. Dexter Peach
Assistant Comptroller General
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

Enclosed are two copies of the Department of Transportation's comments concerning the U.S. General Accounting Office draft report entitled, "Highway Safety: Monitoring Practices to Show Compliance with Speed Limits Should be Re-examined," dated January 25, 1988.

Thank you for the opportunity to review this report. If you have any questions concerning our reply, please call Bill Wood on 366-5145.

Sincerely,

Jon H. Seymour

Enclosures

DEPARTMENT OF TRANSPORTATION

Reply to GAO Report of January 25, 1988 on Highway Safety:
Monitoring Practices to Show Compliance With Speed
Limits Should be Reexamined

Summary of GAO Findings and Recommendations

The GAO found and/or concluded that (1) the six States (Arizona, Idaho, Maine, Maryland, New York, and Vermont), whose speed limit monitoring programs were surveyed by the GAO during the review, had monitoring programs that were generally in compliance with applicable regulations and the monitoring stations were, for the most part, located in accordance with the FHWA guidelines, (2) although several discrepancies were found with regard to FHWA's monitoring program, corrective actions are being or have been taken, and consequently, no recommendations are being made with respect to FHWA's monitoring program, (3) the FHWA's initial active involvement in the development and implementation of State monitoring plans has decreased, (4) the States differ in the amount of effort spent in enforcing the 55 mph speed limit, but the GAO found little relationship between speed limit enforcement activities and the level of motorist compliance, and (5) the speed monitoring aspect of the program does not correspond well with the primary objective of the 55 mph national speed limit, which is to improve highway safety.

The GAO recommended that the Secretary of Transportation direct the FHWA Administrator to examine the feasibility of introducing a weighting scheme that places greater emphasis on high-speed driving, violations on roads with poorer safety records, and the intensity of a State's enforcement efforts. The GAO further recommended that the Secretary report to the Congress the results of this examination, including any recommended legislative changes considered necessary to improve the compliance monitoring system.

Summary of Department of Transportation Position

In the Department's February 25 testimony before the Senate Committee on Public Works and Transportation, we illustrated how the recent amendments to the speed limit worsened the flaws in the speed limit compliance criteria established by section 154 (National Maximum Speed Limit) of Title 23, United States Code. These criteria were already badly flawed. We stated that we agree with the GAO that the present compliance criteria fail to recognize the threats to highway safety posed by different types of speed violators, such as those whose speeds are far in excess of the limit or who speed on two-lane highways where the risks are greater than on freeways. In concluding our appraisal of the compliance criteria, we stated that by looking only at roads posted at 55 mph, the criteria completely ignore the very real risks of speeding on other more dangerous roads, which are usually posted at lower speeds. In response to the GAO draft report, we can affirm each of these statements.

Appendix I
Agency Comments From the U.S. Department
of Transportation

We differ with the GAO in that we do not believe that the flaws of the compliance criteria will be eliminated merely by changing the criteria. We believe it is likely that the principal effect of a new weighting scheme would be to cause the States to adopt new stratagems to avoid the threat of penalties. Any new approach, such as those recommended by the GAO, which kept a minimum level for compliance would result in new States being at risk of losing highway funds, despite enforcement efforts that might exceed those of many States which are not threatened with sanctions. We believe that any such outcome would be contrary to the interests of safety.

We have therefore recommended, both in testimony before the House Public Works Committee in March 1987 and in last month's testimony in the Senate, that the Congress should seriously consider abandoning the entire compliance and sanctioning process, returning to the pre-1978 process. This would simply require governors to certify that no road has a posted speed limit above the maximum levels imposed by the Congress and that their enforcement efforts are in place. The States would once again be able to determine the level of speed monitoring and speed enforcement necessary without fear of financial sanctions. We have confidence in the States' abilities to enforce their laws without detailed Federal oversight.

While we would prefer giving all authority for setting speed limits back to the States, the Congress has acted to maintain a national maximum speed limit. In view of this action, we recommend reforming the law to keep the requirement for the States to certify that they have posted the correct speeds, but to repeal the compliance criteria, the sanctions for noncompliance, and the federally mandated monitoring and reporting requirements. We expect that the States would continue to monitor speeds for their own highway safety programs, and we would encourage them to do so.

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