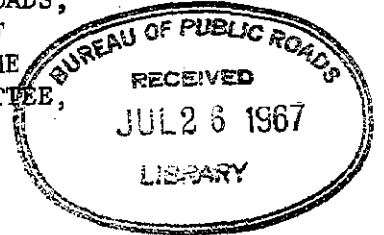


STATEMENT BY F. C. TURNER, DIRECTOR OF PUBLIC ROADS,  
FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF  
TRANSPORTATION, BEFORE THE SUBCOMMITTEE ON THE  
FEDERAL-AID HIGHWAY PROGRAM, PUBLIC WORKS COMMITTEE,  
U.S. HOUSE OF REPRESENTATIVES



Mr. Chairman and members of the Subcommittee: I believe that your hearings are making a significant contribution to the future safety of highway travel. The Bureau of Public Roads wants to contribute to that safer future on the highway, too, and I am pleased to participate here today.

You have directed your attention appropriately to the problem of roadside hazards on the Interstate System. This is a serious problem, major in its importance because it concerns our principal highway network for interstate and defense travel; highways being designed and constructed for the highest quality of service to its users. We are aware of and are giving appropriate recognition to the fact that structures alongside the roadway must be given different treatment in future design of our Interstate System.

In a way, this is a unique situation because other types of hazards are substantially less on the Interstate System than on older roads. With most types of accidents eliminated or at least markedly reduced by the Interstate System design features, I suppose we should not be too surprised to find that single-vehicle, run-off-the-road accidents are the major type of accident possibility remaining on our Interstate highway facilities.

Obviously, something must be done, and we have no doubt that something much better can be done. We already have taken the necessary actions in that direction.

During the course of these hearings you have observed, with considerable repetition, examples of roadside features -- signs, light poles, bridge piers, guardrail and the like -- which present serious hazards to vehicles which leave the roadway out of control.

It is obvious that these items were not deliberately placed in such a way as to create hazards.

The large directional sign is designed specifically to convey information to the high-speed passing motorist in a manner which will reduce to a minimum his distraction from his driving chores and give him information needed to safely maneuver his vehicle. Standards for this type of signing have been developed only within the last 7 to 8 years. Prior to that time we did not use such large signs requiring the heavier mounting poles and foundations which have been discussed throughout this hearing.

The justification for lights is also premised on providing a safer environment for the driver. However, the pole which supports the light is necessarily, in many cases, an additional safety hazard and we may properly raise the question about whether the added safety from a lighted roadway exceeds the hazard introduced by the pole mounting.

The bridge piers and abutments support structures permitting the separation of cross traffic for the purpose of eliminating the hazards of at-grade intersections, but while they eliminate one set of hazards, their very presence at the same time introduces other hazards not previously existing.

Guardrail is one of the best safety devices we have to lessen the chance of serious damage to a vehicle out of control and running off the paved roadway and shoulder, but in its use, we often introduce another hazard.

So, while many of our newer design features have been introduced to reduce hazards, their very presence also produces a set of new hazards of a different type. It is our purpose to reduce both sets of these hazards to the lowest possible level. I believe the measures we are now taking will do this.

There is no simple answer to offer for the question you have asked as to why these roadside obstacles have been erected as seen by you in numerous

pictures. The Administrator has mentioned some of the causes. The principal cause is clearly that our previous judgment in designs dated 7 to 8 years ago did not anticipate the degree and frequency with which drivers would run off these new roads. It took some time to observe that a dismaying pattern of run-off-the-road accidents was occurring and an equally long time to develop appropriate corrective measures and to get these into the stream of planning and construction. While some defects are still being included in construction, I believe that the focus of attention on these items by this subcommittee and the Bureau has served to force the desired change. But change comes slowly, even with the impetus of such things as these hearings.

However, I would say that while the necessary actions have already been taken, communication, implementation of, and compliance with these actions must still be pursued diligently.

The most tangible of these actions has been a joint endeavor of the Bureau of Public Roads and the American Association of State Highway Officials described in a report of the Special AASHO Traffic Safety Committee -- "Highway Design and Operational Practices Related to Highway Safety", February 1967, and being referred to generally as the "Yellow Book."

This undertaking was formally begun about a year and a half ago when the Bureau of Public Roads proposed to AASHO that a special study of the traffic and safety characteristics of the Interstate System and other highways be made. The purpose of the study was to develop guidelines for treating the problem of "run-off-the-road" accidents in which fatal or serious injury resulted when roadside obstructions were hit. We were taking action based on the study and continued observation of the accident trends which I referred to a few moments ago.

The proposal contemplated a review of traffic safety conditions at locations where accident and operational problems existed.

AASHO agreed to the undertaking and the assignment was given to the AASHO Special Traffic Safety Committee.

This Committee had been created in 1964. As a top level group, it was composed of the President of AASHO and the Chairmen of several of its major standing Committees. The membership included the Chief Engineers of the California, Colorado, Connecticut, and Kansas Highway Departments and the Commissioner of Public Works and Highways of New Hampshire. The Committee was assisted by four State traffic engineers and several representatives of the Bureau of Public Roads.

During the period June 14 to August 18, 1966, the Committee visited 10 States, 7 major metropolitan areas and numerous other cities and towns, observing actual highway traffic operations in a critical vein, and discussing with State and local police, traffic engineers, and local officials possible ways of increasing safety on the highway.

Its findings, conclusions and recommendations are covered in detail in the report which has already been supplied to this Committee. It clearly brings out that much can be accomplished by removing hazards that currently exist on and along our roads and streets, and by improving design and operational practices so that similar or other hazards will not be built into highways of the future. Considerable space is devoted by the report to how this can be accomplished.

On May 8, I wrote personally to each State highway department expressing the Bureau of Public Roads full concurrence in the report's recommendations and conclusions. We consider it to be one of the most important documents ever developed by the joint efforts of AASHO and Public Roads. We have pledged and demonstrated our active interest in seeing that every State applies the report's findings beginning immediately and continuing on a large scale for as long as is necessary to provide the highest possible level of safety on the Federal-aid highway systems. A copy of my letter is submitted for the record.

This study and report confirmed a policy established last year by the Bureau of Public Roads, and covered in our Instructional Memorandum 21-6-66, August 1, 1966. The policy required that all aspects of location, design, traffic control, drainage features and roadside appurtenances are to be examined during development of the plans, specifications and estimates beginning with the location survey, and to the maximum extent possible in the construction and post-construction stages, to insure that hazards arising from vehicles leaving the roadway out of control will receive primary consideration.

The memorandum specifically calls for the elimination of all unnecessary sign supports, light standards, drainage structure obstructions and other appurtenances from proposed plans. Where the need for such features does not permit complete elimination, they are to be located, if possible, in unexposed positions. Where this is not feasible, adequate protection for the out-of-control vehicle is to be provided in the form of impact absorbing guardrail, special grading of the surrounding area, or other

means which will reduce the severity of accidents. In addition to the various memoranda on the subject, I have made a number of speeches to the regional associations of State highway officials and held numerous personal conferences stressing the urgency of action toward the removal of all potentially lethal roadside appurtenances.

To assist the States in expediting the correction of existing hazards as recommended in the previously described AASHO report, we have streamlined our project procedures. This is covered in the letter sent to each State highway department, and in more detail in a following set of instructions to our field offices. A copy of those instructions, Instructional Memorandum 21-11-67 and the supplemental Instructional Memorandum 21-11-67(1) are included for the record.

I believe it is important at this point to mention that in following up on the letter and the Instructional Memorandums, our Regional Highway Administrators have been carrying out careful analyses of pending State plans and instructing our Division Engineers to work with the States toward bringing these plans into conformance with the AASHO "Yellow Book."

In fact, our stand on the implementation of the AASHO "Yellow Book" has been so firm that there have been some protests from the highway construction industry that we are stopping the program. What minor delays are necessary will be negligible, and certainly for the best possible reason. For the most part, adjustments in design can be made which will either eliminate completely any unnecessary obstacles, or relocate those which cannot be eliminated, or protect the motorist with well designed impact absorbing devices from those roadside elements which cannot be either eliminated or feasibly relocated.

For the sake of clarity and emphasis, I might spell out here what I indicated earlier: that the AASHO recommendations will be applied to the Interstate System throughout, and will have particular application to the older sections. We have asked the States to calculate the cost of the additional work required to bring previously constructed sections of the Interstate System into conformity with the AASHO safety recommendations, in connection with the new estimate of cost of completing the System, due to be presented to Congress next January, so that this work will be included in our report to you at that time along with the request for its financing.

Another Federal-State effort which has important applications in the field of highway safety is the work of the so-called "design review teams" which the Bureau of Public Roads has been promoting. I am including for the record copies of memorandums we have issued on this subject. In recent years a number of States have established functioning committees or teams to review completed projects and make recommendations as to their safety and other design features. These teams function under various names, such as Operational Surveillance Teams, Freeway Operation Review Committees, Design Review Teams and others, but all have the same purpose -- to insure the utilization of proven superior design practices and the elimination or correction of those which have proven unsatisfactory.

The Bureau of Public Roads has urged the establishment of these teams in all States along with effective review and reporting procedures to accomplish their purpose. To date 36 States have reported the establishment of such

review teams, with others in prospect in 4 additional States. The typical team consists of several members, including representatives from such disciplines as design, construction, maintenance, traffic operations, police and Bureau of Public Roads.

The findings and recommendations of existing teams have been consistent with those outlined in the AASHO "Yellow Book." Our planned design manual, already described by the Administrator, will add considerably to this consistency.

We have under way an intensive amount of research and investigation into various highway safety matters, including the development in as short a time as possible of new structural systems to replace or eliminate fixed objects along the roadway. The program also includes the development of several new devices for vehicle impact cushioning and deflection to prevent or reduce the severity of run-off-the-road accidents. Guardrail now available and in general use is not entirely satisfactory because the guardrail itself is often a formidable obstacle and actually creates a roadside obstruction while providing protection from some other hazard.

Devices such as a "bumper" in front of fixed roadside hazards are flowing from the research effort, which is in addition to our continuing longer-range research and development activities in the areas of traffic operations and communications, all of which also have strong highway safety connotations. The types of research and investigation I have mentioned are indicative of what is under way but it is important to remember that a great deal of study and lead time is necessary before any new design developments can be actually incorporated into a highway construction project.



The Bureau also has recently engaged in a number of activities designed to provide and to assist in the development of basic information on the scope of the traffic accident problem. In July 1966 we completed arrangements for obtaining copies of police investigation reports on fatal accidents which occur on completed sections of the Interstate System.

Our initial reasons for this undertaking were exploration and staff development. We are not satisfied that adequate analytical procedures are being applied to the mass of accident information presently available, nor in fact, that fully adequate analytical procedures have even been developed. This, then, has been a special study to develop staff competence in accident data analysis and to explore and devise analytical procedures that will effectively equip us to assist the State highway departments in establishing data analysis activities which we think must be undertaken.

I believe the Subcommittee is aware of our activities under Bureau programs, additional to those I have discussed, having a high degree of impact on highway safety. For the record, however, I would like to summarize three of these: The Interstate System Program, the Spot Improvement Program initiated at the request of President Johnson, and our new TOPICS Program.

The National System of Interstate and Defense Highways, as you well know, is being constructed to the highest design standards ever developed for roads in this country or any other country. The danger of head-on collisions is substantially reduced by separation of roadways for opposing lanes of traffic. The elimination of all at-grade intersections has completely removed the serious accident potential at crossroads. Private driveway connections are also prohibited, thus further reducing or eliminating this possibility of a collision between vehicles.

Presently, almost 25,000 miles of the System are open to traffic,

providing us sufficient experience with traffic operations under these standards to know that the fatality rate on the Interstate System runs less than a third of that on the older, conventional highways.

It must be borne in mind, however, that substantial portions of this System were constructed some years ago and that this construction was based on engineering designs developed even several years earlier. Consequently, some sections of the System were designed without the benefit of important knowledge gained in the intervening years, particularly in the causes of various types of highway accidents. The Bureau has provided recent authority that these older sections of the System can be modified in the light of current knowledge of improved safety procedures. The outlook, therefore, is that the safety record of the Interstate System will be still further improved with the incorporation of additional safety features on the older segments.

On the older highways, the so-called Spot Improvement Program is potentially one of the most important of all developments in the field of highway safety. It has directed the attention of the Bureau and the State highway departments to the possibilities of reducing accidents through particular attention to the removal of specific highway hazards. In terms of money invested, the benefits are expected to be increased by more careful selection of future safety projects on the basis of both actual accident experience and advanced identification of potential hazards. This will become standard procedure as the States are able to develop their capabilities in this area. The most significant and far-reaching aspect of this program is that the procedures required to carry it forward will result in the comprehensive and continuing surveillance system which is so sorely needed as a basis for further safety improvements. A breakdown in the smooth operation of a highway manifests

itself in accidents. Thus, a system or procedure which identifies and locates accidents is at the same time a pulse-taker of highway operational efficiency.

As a corollary to the Spot Improvement Program, I mention the TOPICS Program, which has the purpose of making existing streets and highways in urban areas more useful by increasing their traffic-carrying ability, reducing congestion, and improving their safety. To achieve these objectives, the program involves the application of modern traffic engineering and operational techniques to a selected network of the major traffic-carrying streets in the urban area. While many improvements of this type are primarily generated by the need to move traffic efficiently, they add up in fact to a kind of spot improvement safety program for the urban areas, and in that context can be considered part of the Bureau's and the States' overall highway safety effort.

The present annual toll of traffic deaths and injuries on our highways presents a grim picture. But before we become overawed by grimness in assessing the situation which exists, we should interpret and place in proper perspective the statistical information available to us. To be realistic about it, there are factors involved in the problem which cannot be cured by any amount of highway improvement.

This is not to say that we shouldn't try to improve on the other factors. But, in trying, we must recognize that there is probably an irreducible minimum of traffic accidents and deaths and we should proceed with all means at our disposal to reach that minimum. Included in that minimum most certainly are an unknown number of deaths from natural causes, perhaps some that are suicide or even murder. It is useless to talk seriously about reducing fatalities until we are also willing as a society to take serious steps to eliminate the

socially accepted mixture of alcohol and driving because a majority of the annual victims result from this cause rather than any deficiency in highway design or construction.

It is quite obvious that the accident problem must be attacked on many fronts and your Subcommittee has correctly selected as one of these fronts the design of the roadway and the location of its roadside appurtenances.

While the manner of handling these appurtenances is an important area for consideration, it must be kept in proper perspective. It should be recognized that accidents and fatalities involving features such as those which have been so amply and frequently presented to the Subcommittee are far less in number than those which have been prevented by appropriate standard design which has not been discussed. Likewise the total number of accidents of the kind covered extensively in the hearings contributes only a small fraction of all highway fatalities. Any fatality is too many, and we must work diligently to avoid all of them. In so doing, however, we must always keep at the forefront of our emphasis these items which produce the largest measure of benefit for the effort and dollars which are available to us.

Actually, the total of all fatal accidents of the general type being discussed in these hearings constituted a very small percentage of the total fatalities last year -- a figure about equal to those occurring between railroad and highway vehicles -- or the number of fatalities from bicycles, motorcycles and similar non-auto vehicle types. The question is immediately posed then as to which one of these accident groups to focus special attention on, if a choice must be made among them. The obvious answer is to treat all three at the same time, but the practical and

real limits of money and other limitations has in the past prevented such a desirable choice.

Your Chairman quite properly wants to be assured mistakes of the past are not carried over in our new roads, particularly the Interstate System. A related question is whether the design of highways is being done in such a manner as to make use of the fruits of research and experience.

The answer to both of these questions is an unqualified yes and I offer my previous remarks in support of this.

I emphasize that highway safety has been a principal objective of the Bureau of Public Roads since the first Federal-aid road legislation of 1916. It is in fact a specifically stated requirement governing our approval of Federal-aid projects and is contained in the basic Act of 1921 and continued in every amendment to the Act since that date.

Substantial research in design and operation has been conducted, or sponsored, and implemented by the Bureau of Public Roads and the State highway departments.

While highway safety has been of primary concern over the years, the practical limitation of available funds at both State and Federal levels has historically restricted the extent to which all of the objectives of highway engineers and administrators could be achieved, over and above the mere movement of people and goods.

Even where the additional achievements were possible, it has generally happened in the past that advanced design features intended to enhance safety or aesthetics or both, have been frequently assailed as "frills" by some public officials as well as by private individuals and groups who demanded more miles of road improvement as the principal product of the highway departments.

This, then, is a partial report on Bureau activities in the field of your inquiry. Briefly summarized, the Bureau's principal activities in this area are concerned with these main, closely-related efforts:

A modified and expanded program for identifying and correcting high accident locations, or potentially high-accident locations.

A concerted effort to provide a uniformly safe environment along our roadsides to substantially reduce hazards to vehicles leaving the road out of control.

A continuing program of research and experimentation in highway and traffic engineering in its broadest sense.

All things considered, the Bureau and the State highway departments have done a conscientious, constructive job over the years in enhancing highway safety, as evidenced by a substantial decline in the fatality rate while the exposure to accidents has increased sharply due to increased travel. We are always willing and eager to learn how to do a better job, and we welcome any additional knowledge and sound suggestions which these hearings or any other source might develop.

The establishment of the Federal Highway Administration in the new Department of Transportation is hoped to be of great help over the long haul in bringing even more expertise to bear on the total problem by assigning specific areas of responsibility to its component agencies. In this reorganization process the Driver Register Service, which has functioned in the Bureau of Public Roads since 1961, has been transferred to the National Highway Safety Bureau. We are proud of its accomplishments under our own direct jurisdiction,

and expect that it will be a tool of increasing value in the attack on the highway accident problem.

The Subcommittee's own studies, as well as the testimony during these hearings, will clearly indicate that more money than is presently available or in sight will be required in the effort to make a marked reduction in the role of the roadway and roadside in the highway accident, injury and death toll rate. While this may not be the proper place to make the point, I believe that it should be strongly made because it is a key consideration in the problem you are attacking and we might as well recognize the fact. The highway engineer is frequently accused of short-sightedness but, as one of them, I honestly think that the problem over the years has been due more to funding deficiencies than to defective vision, lack of knowledge of the problem, or a lack of concern. We have had to make choices on how to spend the funds at our disposal and while safety has always been the paramount consideration, we have had to forego some safety items which appeared of least hazard in order to put primary funding emphasis on those believed to represent the larger safety benefits.

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