A Proposed Recommended Practice

Guidelines for Determining Where the 55-MPH Speed Limit Could Be Raised

Prepared by a Special Technical Council Task Force

In 1985, the Institute adopted the following policy on the U.S. national maximum speed limit:

> *It is the policy of the Institute of Transportation Engineers to support exceptions to the national maximum speed limit of 55 miles per hour when traffic engineering and safety studies clearly indicate that the benefits, including safety, will be higher than identifiable adverse impacts.*

Shortly after approval of this policy, a special Technical Council task force on the 55-MPH speed limit was formed. The objective of the task force was to develop guidelines for use by governmental jurisdictions in selecting segments of highway where the 55-MPH national speed limit could be raised should the decision be made to revise the national speed limit. The task force developed the following guidelines for determining where the 55-MPH speed limit could be raised. The report is being processed as a proposed recommended practice of the Institute.

Comments are being sought to assist the consideration for adoption of the report as an ITE recommended practice. Comments should be submitted by March 15, 1987. Comments, questions, and any requests for a public hearing should be directed to: Institute of Transportation Engineers, 525 School Street, S.W., Suite 410, Washington, D.C. 20024; Phone: (202) 554-8050.

Any comments and suggested revisions received will be considered by the Technical Council task force prior to forwarding of the report to the ITE Standards Approval Board for a final decision on adoption as a recommended practice of the Institute.

Task force committee members are: James L. Pline, P.E. (Chairman), *Institute of Transportation Engineers; Paul Fowler, P.E., Auto Club of Southern California; Damian Kulash, Transportation Research Board; Brian O'Neill, Insurance Institute for Highway Safety; Harold R. Hofener, P.E., Oklahoma Department of Transportation; Peter G. Koltnow, American Trucking Associations; Lt. Col. Larry Thompson, Arizona Department of Public Safety; Albert L. Godfrey, Governors Highway Safety Rep.; and Gerson J. Alexander, Human Factors Consultant. Resource Agencies: Tom Klimek, U.S. Department of Transportation, Federal Highway Administration; and Sue Partyka, U.S. Department Of Transportation, National Highway Traffic Safety Administration.*

The U.S. Congress has received proposals for revision of the 55-mile-per hour national speed limit law, but the U.S. Department of Transportation has indicated that it is premature to make such changes. Secretary of Transportation Elizabeth H. Dole has been critical of any legislation that does not fully address the problems brought about by increasing the national speed limit. Her statement that "DOT cannot support any legislation until there are *valid criteria* for selecting road segments where the limit could be revised without adversely affecting safety" provided the initiative for this task force. Secretary Dole also requested that appropriate countermeasures be developed to avert increased loss of life resulting from higher travel speeds.

The task force was established as an advisory panel of the Institute of Transportation Engineers. It was not the intention of the task force to address whether the 55-MPH national speed limit should be changed. Any such revision is solely the prerogative of Congress; no changes can be made until it enacts permissive legislation. If, however, Congress passes legislation permitting speeds to be posted by the states in excess of the current national speed limit, there will be need for some valid and generally accepted criteria for selecting appropriate highway segments on which a higher speed limit could be permitted. Such criteria should meet the safety concerns of Secretary Dole.

Additionally, it is critical to the success of any speed limit adjustments that such revisions do not contribute to either a significant change in highway accidents or an increase in accident severity. Accordingly, the task force was given the requirement that any criteria developed be conservative so that obvious gains in safety over the past 20 years would not be nullified.

This report is provided as a guide for persons or agencies considering a revi-

sion to the 55-MPH national maximum speed limit. The recommended criteria have been developed from the diverse knowledge and experience of the task force members, who represent the transportation community, highway interests, and safety groups. The task force hopes that the criteria will be applied cautiously, with close monitoring of any speed limit revisions, to ensure that highway safety is not significantly compromised.

General Considerations

Any proposal to permit higher speed limits should recognize that higher limits would be inappropriate for many highways. Speed limits higher than 55 MPH are not appropriate for those interstate highway segments that have a lower design speed. The design speed of a highway segment is the maximum safe travel speed under ideal conditions; therefore, the speed limit must be lower in order to discourage motorists from exceeding the design speed. In addition, many interstate segments, including some classified as rural, handle such high traffic densities that speed limits above 55 MPH would be especially hazardous.

It should also be recognized that any increase in the 55-MPH speed limit on selected highway segments might lead to increased travel speeds. Furthermore, raising the 55-MPH limit on some highway segments will also make it more difficult to enforce the 55-MPH limit where it is retained. Higher speed limits, therefore, will necessitate increased enforcement efforts not only on the segments with higher limits, but also on those where the existing 55-MPH limit is retained.

Any repeal of the 55-MPH speed limit should be permitted on a selective basis with provisions to revert to the 55-MPH limit if the higher speed limit on selected segments could not be justified. It should also include a legislative requirement that the U.S. Department of Transportation study and report on traffic characteristics, vehicle operations, and accident statistics on the revised segments. Any consideration for overall higher limits should be delayed until a report on the consequences of the selective adjustments is available to the appropriate policy makers.

The task force has developed suggested criteria recognizing these considerations, the safety concerns, and the political climate for revision of the 55-MPH national maximum speed limit. It is the task force's general opinion that any changes should be done incrementally on selected highway segments so that the existing law's safety benefits are not reduced significantly.

Background Data

The 55-MPH national maximum speed limit, enacted by the Congress on January 2, 1974, abruptly changed how highway speeds were regulated in the United States. Enacted as a national fuel conservation measure, the 55-MPH limit effectively imposed a federal regulation replacing the previous state-controlled speed limits. As the fuel shortage subsided, the 55-MPH limit was retained by the Congress because of its effects on traffic safety. This impact was indeed striking: during 1974, the first year of the 55-MPH limit, highway fatalities fell 9,100 from their 1973 level. This was the largest single-year drop in highway fatalities since World War II.

However, not all of the sharp decline in highway fatalities that occurred in 1974 can be attributed to the speed limit. Numerous other factors were involved. First, the number of fatalities varies from year to year because of the random nature of accidents.

Second, since 1946 the fatality rate has been falling continuously, with an average decline of about 3% per year. This continued improvement in highway safety reflects the result of numerous improvements in vehicle design, highway design, medical capability, availability of emergency medical services, driver behavior, and other factors.

Third, the amount of highway travel fell slightly (about 1.5%) in 1974, and some corresponding decline in highway fatalities would be expected. Fourth, the type of travel that occurred during the Arab oil embargo may have involved fewer high-risk trips. Data to document such shifts are lacking, but it is nonetheless possible that travel was inherently safer in 1974 because of such causes.

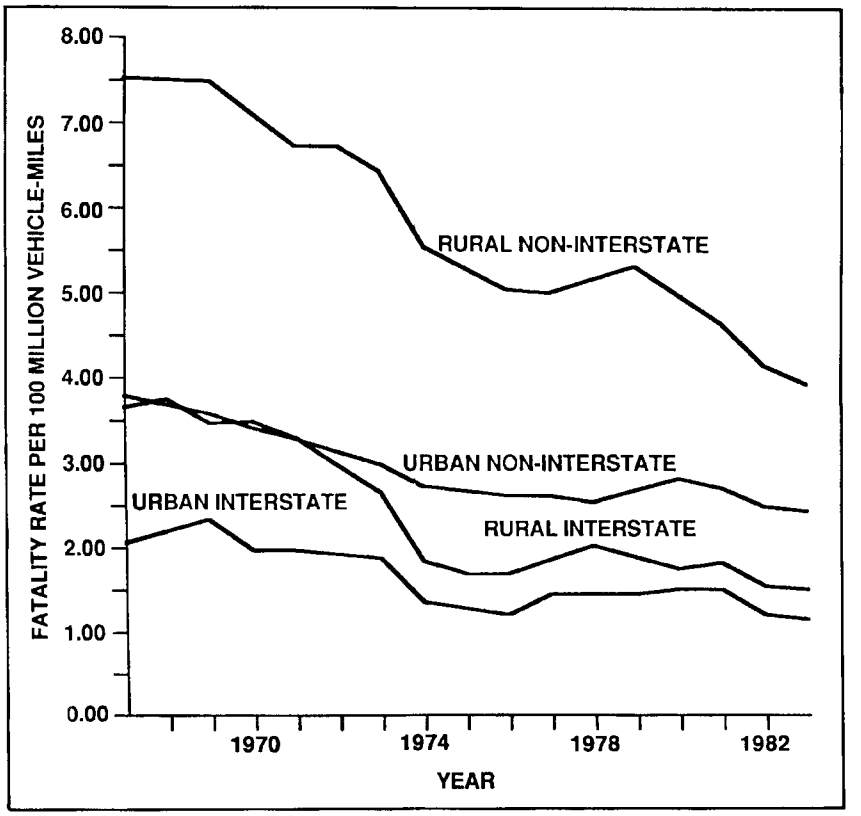

Figure 1. U.S. fatality rates.

There are two chief reasons why the 55-MPH speed limit might have led to improved highway safety: It reduced the average driving speed, and it reduced the variation in driving speed. Driving at lower average speeds is inherently less risky because a driver has more time to perceive a problem and react, a driver's ability to negotiate roadway geometrics is improved, the required vehicle braking distance is less and the crash severity of an impact is less. Less variation in speeds also makes driving safer because there is less need to weave through traffic, change lanes, or make passing maneuvers when vehicles are traveling about the same speed.

A great number of careful analyses have been done to isolate the effect of the 55-MPH limit on highway safety using various statistical approaches, different road systems, and data from different sources. The National Research Council Committee reviewed those analyses in terms of their reliability and applicability. Based on its review, the National Research Council Committee concluded that a saving of between 3,000 and 5,000 lives in 1974 could be attributed to the 55-MPH limit, and that this was a reasonable and fair interpretation of all the available data. Recorded experiences in more than 10 other nations show effects of similar proportions.

Since 1974, three things have altered the effectiveness of the speed limit:

1. The law is less widely observed, and speeds have increased.
2. There is more travel than in 1974.
3. Continued improvements in roads, vehicles, medical services, and driver behavior have made driving safer in general, reducing the risk of high driving speeds.

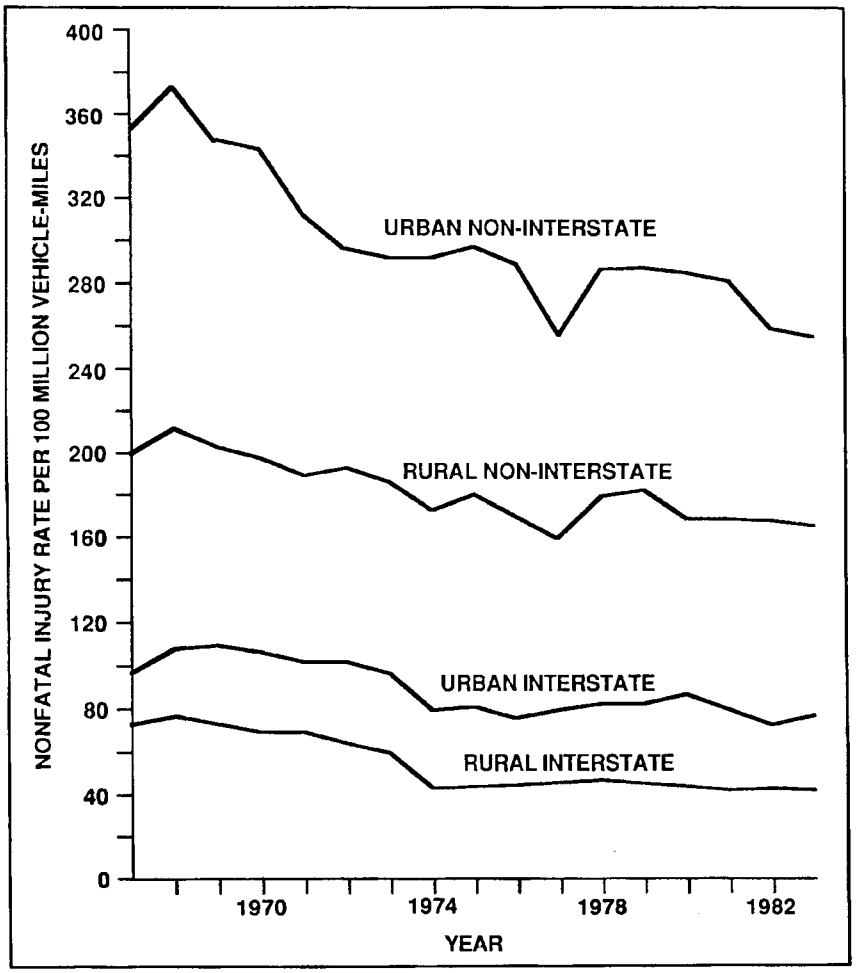

Figure 2. U.S. injury rates.

The National Research Council study, *55: A Decade of Experience,* can be reviewed for a more extensive examination of the 55-MPH national maximum speed limit over the past 10 years.

Recommended Guidelines

The Task Force recommends that the following guidelines be used judiciously in identifying segments of the highway system where the 55-MPH speed limit could be revised if Congress authorizes any changes:

1. Freeway Segments Only, With Full Control of Access and Complying with Freeway Design Standards.

Divided highways with full access control were selected for inclusion in the criteria because of the lower accident rates (Figures 1 and 2). In addition, the freeway and toll-road system generally reflects the highest category of design for all roadway systems, such as full access control, curvature, and consistent cross-section.

The design speed of the selected segment should equal or exceed the proposed speed limit in compliance with Chapter VIII, "Freeways," in *A Policy on Geometric Design Standards of Highways and Streets,* published by the American Association of State Highway and Transportation Officials, 1984 edition. Each freeway segment should be reviewed and inventoried for determination of design standard compliance. These data should be determined and certified as meeting adequate design standards under the required engineering and traffic study (see guideline number 4).

2. Level of Service C or Higher With a Traffic Density Less Than 30 Passenger Car Equivalents per Mile per Lane in the Peak Hour.

This criterion should comply with the *Highway Capacity Manual,* TRB Special Report 209, 1985 Edition, Chapter 3, "Basic Freeway Segments." As noted therein, the measure of effectiveness of level of service is highway density. Accordingly, a density less than 30 pc/mile/lane does indicate a Level of Service C or better. A general description of Level of Service C would be as follows:

Level C provides for stable operations,

but flows approach the range in which small increases in flow will cause substantial deterioration in service. Average travel speeds are still over 54 MPH. Freedom to maneuver within the traffic stream is noticeably restricted at LOS C, and lane changes require additional care and vigilance by the driver. Average spacings are in the range of 175 ft., or 9 car-lengths, with a maximum density of 30 pc/mi/ln. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. Queues may be expected to form behind any significant blockage. The driver now experiences a noticeable increase in tension due to the additional vigilance required for safe operation.

Note that the criterion pertains to the peak hour conditions and that, accordingly, a higher level of service will prevail except for a few hours per day. It is expected that this criterion would limit potential segments to selected rural sections with lower vehicle volumes having stable, relatively free-flowing conditions.

3. A Minimum Segment Length of 10 Miles.

The minimum segment length of 55 MPH or higher speed limit should not be less than 10 miles.

It is not appropriate to have short segments of different speed limits, because longer segments will provide the greatest benefit to longer trips and tend to recognize the homogeneous sections.

Some concern was expressed to limit the criterion to only rural sections. However, there are several potential ways to define both urban and rural areas, none of which provide a method that adequately addresses this issue. The combination of criteria will eliminate those urban sections with frequent interchanges, higher volumes, and operational limitations. If an urban segment can be justified as appropriate for a higer speed limit based on the outlined criteria, including guideline number 4, then it is appropriate that it should be included with a contiguous rural section.

4. Engineering and Traffic Study.

It is important that each potential segment be thoroughly analyzed, with relevant roadway conditions, traffic characteristics, operational features, and safety considerations adequately documented. In most cases, such data exist and should be readily available for support or rejection of a proposed change in the speed limit. Engineering analysis of existing data and information relative to speed zoning is in keeping with traditional engineering principles, standard practices, and recommended policies. Additionally, the engineering and traffic study provides the basic data needed to complete the monitoring requirement in guideline number 5. The study should consider the following items:

a. Analysis of compliance with freeway design standards for appropriate design speed.
b. Accident analysis and comparison with statewide average rates.
c. Capacity and level-of-service calculations.
d. Roadway features, such as length proposed, interchange locations, terrain considerations.
e. Speed characteristics, traffic volumes, vehicle types, and freeway flow considerations.
f. Special features or considerations relating to roadway segment.
g. Current status and quantity of existing enforcement.
h. Need to exclude specific vehicles from higher speed zoning.
i. Concurrence of responsible engineering and enforcement authorities.

The study should either justify increasing the speed limit to not more than the highway design speed or provide the basis for recommending no change in the 55-MPH speed limit.

5. Monitoring Study and Analysis.

Traffic characteristics, vehicle operations, and accident experience must be monitored continuously to ensure that there is no unacceptable deterioration of operational or safety conditions. The monitoring data should be compared with the original engineering and traffic study to measure the changes that have occurred. Also, the study should discuss the significance of any changes and initiate activities to limit potential adverse impacts. These monitoring results should be provided to appropriate agencies for analysis and consideration in re-

Rural Interstate Highways and Other Rural Freeways—Mileages and Conditions

Total Rural Interstate Open to Traffic—31,627 miles*
(Dec. 31, 1984)

With less than 12 ft. lanes (none less than 11 ft.)	28 mi.
With no left shoulder (all with right shoulder)	1,479 mi.
With impaired sight distance (horizontal)	66 mi.
With bad pavement condition (PSR 2.5)	4,295 mi.
Designed for 55 MPH or less**	406 mi.
Designed for 55 MPH to 65 MPH**	2,055 mi.
Designed for greater than 65 MPH**	23,298 mi.

*SOURCE: Table B, Interstate Cost Estimate.
**Excludes Alaska's 1,049 miles of rural interstate

Other Rural Freeways With Full Access Control—4900 miles (approximate)

Data on *1583* miles of rural freeway with full control of access indicate the following:

With less than 12 ft. lanes	4 mi.
With no left shoulder (all have right shoulders)	281 mi.
Horizontal & vertical alignment that restrict speeds	47 mi.
With bad pavement condition (PSR 2.0)	59 mi.
Design speed of 55 MPH or less	11 mi.
Design speed of 56 MPH to 65 MPH	127 mi.
Design speed of greater than 65 MPH	1,054 mi.

SOURCES: HPMD files, HHP-12, and HPP-23
Highway Statistics 1984
The Status of the Nation's Highways: Conditions and Performance, June 1985
Interstate Management Branch HNG-13, Table B Interstate Cost Estimate

porting on experience with increased speed limits.

Conclusion

Setting or changing a policy regarding speed limits involves inherent trade-offs between lives saved and travel time; fundamental questions about public behavior and public acceptance; the ability of federal and state governments to contain the current trend toward faster driving; and differing philosophies about state and federal roles. Statistical and engineering analyses cannot answer those questions—ultimately the U.S. Congress must make a political decision on where and how to set speed limits. Recognizing that proposals have been made to increase the national speed limit in selected circumstances, these guidelines focus special attention on the criteria that might be used to identify appropriate highway segments so as to have the least detrimental impact on highway safety and the most beneficial impact on drivers and enforcement agencies.

These guidelines are recommended for the consideration of the Institute of Transportation Engineers. If accepted, it is suggested that they be endorsed by appropriate individuals, agencies, and organizations as the appropriate document for selecting those segments of highway where the 55-MPH national maximum speed limit may be increased.

Although these guidelines represent the consensus of the task force members, they do not necessarily reflect individual views on specific items. Also, they do not necessarily represent the policies or positions of any of the organizations whose staff or members participated in the task force. All members of the task force, especially those from outside the Institute, appreciated the opportunity to work together on this project of substantial national importance. ▮