

Log H-335

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

Honorable Ray A. Barnhart
Administrator,
Federal Highway Administration
Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

H-82-34

On March 4, 1982, the Federal Highway Administration (FHWA) announced the withdrawal of its notice of proposed rulemaking (NPRM) on "Skid Resistant Pavement Surface Design." This rulemaking, initiated in November 1977, solicited comments on the broad issue of skid resistant pavement surfaces and wet pavement accident reduction. In April 1980, the scope of the rulemaking was narrowed to a few areas which could have significant effects on reducing accidents on wet pavement. In part, the rulemaking would have required aggregates to be from acceptable prequalified sources, analysis of wet pavement accident data, and "periodic review of State highway agency practices relating to skid resistant pavement surfaces" to insure that the skid resistant pavement surfaces were maintained.

In its withdrawal notice, the FHWA stated that the "proposed rule is not warranted." The FHWA based its withdrawal primarily on the responses of 15 States, stating that 9 States were opposed to the proposed rule and that "these States indicated that the rule was not necessary and was inappropriate since the States already had adequate programs to insure that skid resistance is maintained."

On the other hand, the National Transportation Safety Board has conducted 13 in-depth accident investigations, a statistical study of accident and weather data in all States, and a review of skid resistance programs in 10 States. The results of the investigations, study, and reviews support the need for the rulemaking. Based on the Safety Board's experience and the 5,400 to 7,000 fatalities that occur annually on wet pavement, continued (and even more intensive) positive action is still needed. The FHWA has developed good guidance material for a State in its Technical Advisory on Skid Accident Reduction Program (T 5040.17 December 23, 1980). However, even the best of guidelines may be of limited value without periodic monitoring to assure implementation, such as was proposed in the FHWA rulemaking that was withdrawn.

Five of the 15 States which replied to the proposed rulemaking were among the 6 States which our study ^{1/} statistically demonstrated to have the worst problem with accidents on wet highways. These five States, in our belief, could be expected to be concerned that rulemaking to establish standards or guidelines might increase tort

^{1/} Special Study--"Fatal Highway Accidents on Wet Pavement -- The Magnitude, Location, and Characteristics," February 22, 1980 (NTSB-HSS-80-1).

liability suits from accidents attributed to skidding on wet pavement, as indicated in one of these States' responses, and their responses should have been weighed accordingly. One of the five States called the rulemaking "unnecessary," another was concerned with duplication of other rulemaking, and two others were concerned about costs if prequalified aggregate was required. Conversely, many of the States which Safety Board studies indicate have effective programs, such as Pennsylvania, Florida, and Virginia, did not comment. The establishment of reasonable minimum standards is not likely to be resisted by those States that already have good programs.

Not all the nine opposing States' comments were negative or completely against the rulemaking. The Safety Board's review of the docket found that only a minority of these States referred to the rulemaking as "unnecessary," "severely restrictive," "needless duplication," "too far reaching," "questionable," or the like. Most of the 15 States provided good arguments for technical changes in the NPRM, such as the need for revision of the experimental pavement section. Many States questioned the FHWA, as the Safety Board has, about the failure to include a definition in the rulemaking as to what is "adequate" for a skid resistant surface or for qualifying an aggregate for acceptance. One State encouraged the FHWA to include a requirement for texturing of surfaces in the rulemaking--a suggestion also made by the Safety Board. One State was only concerned with being allowed to use its MuMeter to measure friction, as is done by several States.

A Safety Board evaluation of selected State skid resistance programs ^{2/} found several cases in which State and local officials demonstrated that either they did not have the expertise or did not use the information available to them to determine what type of skid resistant surfaces should be used. For example:

- o In 1977 after the FHWA reviewed Mississippi's program, the State agreed to begin using accident data to define where skid testing was needed. Mississippi still has not implemented this program, although it reportedly is to be implemented in the near future.
- o Many States have never tested local streets, even those with a known high incidence of accidents on wet pavement. In some cases this is due to lack of authority to do so and in other cases it is due to lack of equipment. Only a few local jurisdictions have the equipment to do this testing and, therefore, States are looked upon for assistance.
- o Missouri apparently did not recognize that a wet pavement problem existed on its highways when skid numbers were 25 to 30, ^{3/} even though 60 percent of all the accidents in the State were reported to be on wet pavement. ^{4/} Some States examine a location when 20 or 30 percent of the accidents are on wet pavement.
- o On a heavily traveled U.S route in Oklahoma, the unacceptable aggregate used on a State-funded project would have been prohibited

^{2/} Safety Effectiveness Evaluation--"Selected State Highway Skid Resistance Programs," September 29, 1980 (NTSB-SEE-80-6).

^{3/} A skid number is the coefficient of friction times 100 (100x) of a standard tire sliding on wet pavement when tested at 40 mph with a two-wheel skid trailer or equivalent device following the procedures outlined in ASTM E274-79.

^{4/} Highway Accident Report--"Gateway Transportation Co., Inc., Tractor-Semitrailer Penetration of Median Barrier and Collision with Automobile, I-70, St. Louis, Missouri, September 25, 1977" (NTSB-HAR-79-3).

from use on a federally funded project due to its known susceptibility to polish, 5/ and consequently to become slick.

- o Prior to a Safety Board accident investigation, 6/ Utah used a pavement design with void ratios which were below the Asphalt Institute's recommended values for preventing asphalt from bleeding to the surface, resulting in a slippery condition when the surface is wet.
- o Federal review of programs could eliminate unproductive duplication of similar work. As an example, Nebraska was devoting most of its skid resistance equipment and crew to conducting an independent seasonal variation program (corrections to account for weather changes) even though a national program involving several other States and researchers was simultaneously examining the same problem.
- o Incomplete accident investigations can lead to biased data that lead to false or incomplete conclusions. Most States do not test sites immediately after even a serious accident and do not investigate accidents with sufficient thoroughness to isolate vehicle, human, or roadway factor involvement. Nine of the 12 wet pavement accidents investigated by the Safety Board occurred on surfaces which, when thoroughly tested soon after the accidents, had skid numbers below 30, which many experts would consider to indicate a need for correction. (One site with high skid numbers (39 to 50) had severe rutting which allows water to accumulate in wheel paths.) Due to a lack of this type of data, State administrators may refer to desirable friction numbers as "minimum magic numbers" and may be wary of guidelines on minimum desirable friction numbers because of potential tort liability. 7/ Both State and Federal administrators seem to be cautious of minimum sets of numbers even if ranges are varied based on accident experience, geometrics, volume of traffic, etc.

The Safety Board continues to be concerned that inferior local aggregate may be used on road surfaces where more skid resistant aggregate is needed. In its June 1980 response to this docket, the National Limestone Institute (NLI) stated, "NLI hopes that FHWA will urge each agency having jurisdiction over road construction to carefully evaluate all aggregates available to it for use and to assess the ability or inability of each to serve adequately in a specific course application with full regard given to the potential traffic demands to be made on that surface." Perhaps contradictory to this philosophy, two limestone quarry operators and four contractors and/or associations in West Virginia responded to the docket opposing the rulemaking and encouraging more use of local aggregate to reduce costs. Two of these responses avoided discussion of the need for skid resistant surfaces.

5/ Highway Accident Report--"Midas Mini Motor Home/Automobile Collision, U.S. Route 69, Near McAlester, Oklahoma, July 14, 1977" (NTSB-HAR-78-2).

6/ Highway Accident Report--"Osterkamp Trucking, Inc., Truck/Full Trailer and Dodge Van Collision, U.S. 91 near Scipio, Utah, August 26, 1977" (NTSB-HAR-79-1).

7/ Letter from Robert N. Hunter, Chief Engineer, Missouri Highway and Transportation Commission, to FHWA Docket Number 77-16, Notice 2, dated May 30, 1980; letter from Francis W. Holder, P.E., Research and Materials Engineer, Commonwealth of Massachusetts, Department of Public Works to FHWA Docket Number 77-16, Notice 2, dated June 6, 1980.

Based on these findings, the Safety Board cannot agree with the FHWA's current contention that all "State and local officials have the expertise and information to best determine what type of skid resistant surfaces should be used." In fact, FHWA's own report in 1978 on its overall safety review of all 50 States stated:

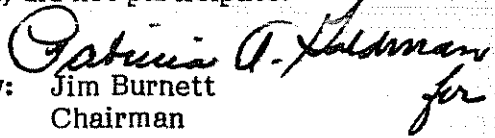
Even with good design and construction controls, "bleeding" asphalt pavement and pavements with questionable surface characteristics were observed on new projects. Division offices should review the established performance records for pavement design related to skid qualities and determine that all mixes under consideration have been evaluated. . . . On older sections of highways the FHWA review team observed many miles of roadway that appeared to have questionable pavement skid resistance qualities. Wet weather accident data was not always available for the review team to evaluate. Where resurfacing and overlay projects were involved, the role that pavement skid resistance had played in establishing priorities was not clear. Many States did not use skid inventory data as part of the criteria for prioritizing repaving needs. In fact, States appeared to be making minimal use of both skid inventory data and wet weather accident data. The FHWA Division Offices must stress the importance of a systematic process for maintaining good skid resistance on all Federal highways through evaluation of skid characteristics and accident data." 8/

It appears that the FHWA in its recent decision to withdraw the rulemaking may not have taken into consideration the lack of important elements in some States' programs that was observed by the FHWA task force review in 1978 and the Safety Board's review in 1979. The FHWA should provide the leadership that is needed, and that presumably will not be provided as a result of the withdrawal of the rulemaking, by conducting a comprehensive review of all State wet pavement accident reduction programs. State programs at least should be compared to the guidelines presented in the FHWA's Technical Advisory on Skid Accident Reduction Program (T 5040.17). Through a study the FHWA could contribute expertise, transfer knowledge from State to State, eliminate redundancy of similar research, and provide more positive feedback to States in a cooperative environment. A detailed and specific technical review conducted in a format similar to that used in 1978 when all safety aspects of the 50 States' programs were examined on a broad basis would be appropriate.

Therefore, the National Transportation Safety Board recommends that the Federal Highway Administration:

Conduct and publish a comprehensive review of each State's skid accident reduction program to identify problem areas, to develop corrective recommendations where necessary, and to disseminate more widely innovative local practices of proven value and general applicability. (Class II, Priority Action) (H-82-34)

BURNETT, Chairman, McADAMS and BURSLEY, Members, concurred in this recommendation. GOLDMAN, Vice Chairman, did not participate.

By:  for
Jim Burnett
Chairman

8/ "Highway Safety Review - Report of the Safety Review Task Force to the Federal Highway Administration," December 1978, FHWA.