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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: January 10, 1978

CORRECTED COPY

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Forwarded to:

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Director  
Oklahoma Department of Transportation  
200 N. E. 21st Street  
Oklahoma City, Oklahoma 73105  
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SAFETY RECOMMENDATION(S)

H-77-35 through 37

The National Transportation Safety Board is investigating the collision of a Midas Mini Motor Home and an automobile which occurred about 4:00 p.m. on July 14, 1977, on U.S. Route 69 north of Atoka, Oklahoma. The southbound automobile went out of control on wet pavement, crossed the centerline sideways, and collided with the northbound motor home. All six persons in the automobile were killed; the driver and right front passenger in the motor home were also killed, and the six other occupants of the motor home were injured. At the time of the accident the skies were cloudy, and visibility was estimated at less than 1 mile in moderate to heavy thunderstorms with gusty winds. Between 4:15 p.m. and 4:33 p.m., an estimated .24 to .54 inch of rain fell and the temperature was estimated to be 75° F.

The two-lane, two-way section of highway at the accident site was posted at 55 mph and had an average daily traffic volume of 5,000 vehicles; 30 to 35 percent were commercial vehicles. More than 5 miles of the road was overlaid recently with 1 inch of asphalt/concrete Oklahoma type-C mix. The "job mix formula" for the project--State-aid Project No. MC3(75)--called for 5 percent asphalt with 93 percent and 44 percent passing through the 3/8-inch and No. 8 sieves, respectively. The project was completed on June 29, 1977, and a final inspection was made on July 5, 1977. There were no deficiencies noted and the project was accepted by the State.

Comparison of the specifications of the Oklahoma type-C mix with the latest information from the Asphalt Institute and the American Association of State Highway and Transportation Officials (AASHTO) "Guidelines for Skid Resistant Pavement Design," (1976) indicates that the Oklahoma type-C mix is a dense graded mix with relatively little coarse texture. AASHTO's guide emphasizes that the coarse aggregates in a mix provide the major skid resistance at high speeds.

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At the request of the Safety Board, the Oklahoma Department of Highways conducted locked-wheel skid tests on the 5.18-mile resurfaced section of U.S. Route 69 with emphasis on the vicinity of the accident. The tests were conducted on July 18 and 28, 1977. The Oklahoma skid trailer conformed to the American Society for Testing and Material Methods' "Method of Skid Resistance Measurements," (ASTM-E-274-77) requirements, but it had not been calibrated recently at one of the Federal Highway Administration (FHWA) test centers. All tests were made for the inside wheel paths of the accident vehicles at 40 mph.

On July 18, the skid numbers at the accident site were 28 in the northbound lane and 29 in the southbound lane. On July 28, the skid numbers were 25 in the northbound lane and 24 for southbound traffic.

The FHWA recommends that road surfaces that are skid-tested at 40 mph have a minimum coefficient of friction (skid number) of 32 for a mean traffic speed of 50 mph and a minimum skid number of 35 when the mean traffic speed is 30 mph. Lower numbers indicate less resistance to skid.

Because the Oklahoma skid trailer had not been calibrated recently, the Safety Board asked the FHWA to conduct additional skid tests over the same portion of roadway; these tests were conducted on September 1, 1977. The FHWA locked-wheel skid trailer, which met the ASTM-E-274-77 requirements, indicated that at 40 mph skid numbers ranged from 15.2 to 32.9. The averages of skid numbers from five tests performed at the accident site, was 23.0 in the northbound lane and 15.4 in the southbound lane, where the automobile went out of control. Additional tests made in the center of the lanes resulted in averages of 28.2 in the northbound lane and 28.8 in the southbound lane. Five tests made in each of the lanes at 30 and 60 mph resulted in skid number averages of 25.6 and 15.9, respectively, in the northbound lane, and 22.8 and 10.1, respectively, in the southbound lane. Four tests performed on the older section of pavement just north of the overlay project revealed an average skid number of 45.4.

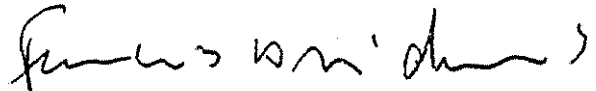
Although the effect of the pavement surface on this accident has not been established, these skid tests clearly indicate that the coefficient of friction on the resurfaced road section is well below minimum recommendations for skid resistance. The Safety Board's investigation is continuing and additional facts, analysis, and findings will be issued in a report. In the interim, the National Transportation Safety Board recommends that the Oklahoma Department of Transportation:

Post warning signs conforming to the requirements of the Manual on Uniform Traffic Control Devices on the resurfaced 5.18-mile section of U.S. Route 69 to advise motorists that the surface is slippery when wet. These signs should be maintained until the skid resistance on the overlay surface is increased. (Class I, Urgent Action) (H-77-35)

Evaluate the pavement design and construction practices used on this project in order to eliminate any possibility for this condition to reoccur. (Class II, Priority Action) (H-77-36)

Expedite the application of necessary materials to remedy the low skid resistance condition on the 5.18-mile resurfaced section of U.S. Route 69. (Class II, Priority Action) (H-77-37)

BAILEY, Acting Chairman, McADAMS, HOGUE, and KING, Members concurred in the above recommendations.



By: Kay Bailey  
Chairman



