

NATIONAL TRANSPORTATION SAFETY BOARD  
 WASHINGTON, D.C.

ISSUED: November 19, 1981

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 Forwarded to:

Honorable Drew Lewis  
 Secretary  
 U.S. Department of Transportation  
 Washington, D.C. 20590

SAFETY RECOMMENDATION(S)

H-81-88 through -92

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 In 1976, the Congress authorized the expenditure of Federal-aid Primary, Secondary, and Urban Highway funds for resurfacing, restoration, and rehabilitation (RRR) projects by the States. The Safety Board has been concerned about the Federal Highway Administration's (FHWA) implementation of the RRR program since 1977, when FHWA issued the first of three rulemaking proposals for the program. The Board provided extensive comments on each of the proposals and, on September 22, 1981, adopted a report evaluating FHWA activities to implement a national program for preserving and improving the non-Interstate Federal-aid Highway System through the use of Federal-aid funds for RRR work. 1/

The Safety Board believes that the way in which the RRR funds are used will have a major impact on the short- and long-term safety and durability of the Federal-aid Highway System. The proportion of Federal-aid construction and reconstruction projects is declining, while the proportion of RRR-type projects is increasing. The level of designed-in safety provided through RRR projects, particularly on the thousands of miles of currently substandard Primary, Secondary, and Urban roads, will strongly affect the numbers of deaths and injuries on these roads. The design standards used on these projects and the criteria used to manage this Federal-aid program are thus a matter of extreme importance to safety.

These concerns are heightened by the fact that the sheer amount of vehicle travel increases steadily each year, and that the proportions of heavy trucks and small cars, light vans, and motorcycles have increased dramatically in the past 10 years and will soon come to dominate the vehicle mix. The upper and lower ranges of vehicle sizes and weights are growing further apart. Few of our roads were designed for this range of vehicles. Any consideration of the impact of road design on safety must also include consideration of the current and future vehicle sizes and safety design. All this means that the job of reducing or even holding steady the numbers of Americans killed or injured during highway travel is going to become more difficult and will be heavily influenced by the level of safety provided by the road itself. The scope and nature of the RRR program will have a large, possibly decisive, effect on the level of accidents in the decades to come.

1/ For more information, read Safety Effectiveness Evaluation—"Federal Highway Administration Non-Interstate Resurfacing, Restoration, and Rehabilitation Program" (NTSB-SEE-81-4).

The Secretary of Transportation, and, by delegation, the Federal Highway Administration, have an overall responsibility to ensure the safety of both individual highway projects in which Federal-aid funds are involved and of the Federal-aid Highway System as a whole. This responsibility is expressed by Congress in several ways in 23 U.S.C. Section 109(a) states that the "Secretary shall not approve plans and specifications for proposed projects on any Federal-aid system if they fail to provide for a facility (1) that will adequately meet the existing and probable future traffic needs and conditions in a manner conducive to safety, durability, and economy of maintenance. . . ." Section 105(f) provides that, "In approving programs for projects on the Federal-aid systems . . ., the Secretary shall give priority to those projects which incorporate improved standards and features with safety benefits." Section 101(a) states the Congressional intention that "it shall be the national policy that increased emphasis be placed on the construction and reconstruction of the [non-Interstate] Federal-aid systems . . ., in order to bring all of the Federal-aid systems up to standards and to increase the safety of these systems to the maximum extent."

The Safety Board believes that the FHWA's attempts to implement the Federal-aid RRR program have so far been inconsistent with these responsibilities. The FHWA has never articulated an overall policy on the appropriate roles of new construction, reconstruction, safety improvements, and pavement preservation. Without such a policy, the Congress and the American public cannot be reasonably assured that the short- and long-term improvements needed to be made on the Federal-aid Highway System will be performed, and performed in a reasonably timely and economical fashion. Without such a policy, the FHWA cannot fulfill its statutory obligation to assure the Federal-aid Highway Program provides facilities that are "conducive to safety, durability, and economy of maintenance" and to "bring all of the Federal-aid systems up to standards and to increase the safety . . . to the maximum extent."

To manage the expenditure of Federal funds for RRR projects, the FHWA has produced a series of rulemaking proposals unsupported by facts and mutually inconsistent in their basic assumptions. The basic concept embodied in the current proposal—that each State develop its own RRR standards and criteria—was explicitly rejected in two earlier rulemaking notices for reasons of safety and the need for national consistency. The various proposals' basic assumption that greater systemwide safety can be achieved through use of lower standards has not been supported. The Board has analyzed in detail the "technical report" published by the FHWA in support of this assumption ("RRR Alternative Evaluations for Non-Interstate Rural Arterial and Collector Highway Systems," March 1980). We have reviewed its data and methodology several times with FHWA officials. We have concluded that the report's methodology is fundamentally unsound, its text is contradictory and misleading, and its major conclusion is unsupported.

The current rulemaking proposal is unacceptable for a number of reasons. It will result in inconsistency from State to State and from project to project, thus precluding, among other things, the ability to make sound evaluations of the cost and safety benefits of the RRR program. It permits the use of the AASHTO design guide for RRR, rejected earlier for safety reasons and whose full impact on deaths and injuries has not yet been analyzed. The current proposal provides no criteria for determining whether the type and quality of work that may be proposed by a State are even cost-effective. For example, there are no requirements that a State demonstrate that it has reviewed the accident history, maintenance history, current and anticipated traffic volume (including percentage of small cars and heavy trucks/buses), and other relevant facts to decide on the optimum treatment. There are no criteria to prevent a State from resurfacing an existing skid-prone road with new skid-prone pavement. No criteria have been proposed for deciding when a State's proposal merely to resurface a road is inappropriate, when in fact more

substantial improvements or even reconstruction is in order. No plan has been proposed for monitoring the effects of Federally-funded, State highway programs on overall system condition and safety.

The current proposal makes no provision for systematically collecting much-needed data on the relative construction costs, safety impact, maintenance costs, and anticipated durability of various levels of design and various combinations of improvements. In 1978, the FHWA acknowledged (Docket 78-10) that "the existing research does not provide reliable information on the full impact of variances in individual design criteria," but assured the public that "many remaining questions will be answered and problems resolved by future research, development, and evaluations." The only study underway in the FHWA, after 5 years of rulemaking, that might answer some of these questions is now acknowledged by the FHWA to be unable to answer them. Yet the current proposal makes no provision for collecting the data that could be generated through the RRR program. It is, of course, dismaying that after 50 years of roadbuilding experience and many billions of Federal road construction dollars later, so little is in fact known about the durability and safety characteristics of various design elements.

Beyond this, the Safety Board can find no evidence that the FHWA even has accurate knowledge about the current practices being used to carry out the RRR program. So far as the Board can determine, the FHWA has spent 5 years proposing a series of various RRR approaches, without even ascertaining, on the national level, what exceptions from current design standards for RRR projects are being requested by each of the States; what exceptions are being granted by each of the FHWA Division Administrators; on what bases the exceptions are sought and granted (or denied); and what impact these exceptions may be having on safety, cost, and durability. The Safety Board recommended to the FHWA, in comments on two RRR rulemaking proposals (Dockets 78-10 and 80-3), that exceptions to current design standards should continue to be granted only through a "thoroughly documented review and approval process." The Board continues to believe that such information is essential for a rational development of the RRR program.

The Safety Board believes that the FHWA should not avoid its responsibility to adopt a systematic, business-like approach to ensure the consideration of safety and long-term road durability needs in the Federal-aid Highway Program and the RRR program as part of it. If it is not possible to bring all RRR projects up to new construction standards, it is essential that each section of road proposed for RRR work be evaluated against specific uniform criteria to determine the safety impacts. These criteria should include:

1. Criteria for the types of information that should be used in analyzing the condition and operational characteristics of segments of roadways to be considered for improvement. The information should include such factors as structural condition, geometric design, presence of high hazard locations, accident experience, traffic volume, and vehicle mix.
2. Criteria for analyzing the foregoing factors and setting priorities for improvements. Such criteria should include a measurement of safety level (for instance, a comparison of the road's accident experience to the average accident experience on roads of similar geometric and operational characteristics in the State) for use in determining what safety improvements will be necessary, if any, in an RRR project. The criteria should also require an analysis of all factors to determine how much improvement--from mere resurfacing to full reconstruction--is appropriate for safety- and cost-effectiveness.

3. Criteria should be developed to ensure that those basic design elements with significant benefits (e.g., lane width, shoulder width, horizontal/vertical curvature, superelevation) are included in all RRR projects, unless the State can demonstrate that they would not be cost-effective on a particular project.
4. Criteria should be established for the systematic collection of data about the relative construction costs, safety impacts (including rates of death/injury/property damage), safety costs (i.e., medical, disability, productivity, property losses, etc.), maintenance costs, and durability of various levels of design and various combinations of improvement types.
5. An integral part of the RRR program must be the development and publication of a plan for monitoring the States' programs for conformance to the criteria established for work using Federal-aid RRR funds.

In addition to setting forth these kinds of minimum criteria for Federal participation in RRR work, the FHWA should develop and publish an explicit plan for monitoring the effects of State highway projects, including RRR, on system condition and on safety. The 1981 "Report of the Secretary of Transportation to Congress on the Status of the Nation's Highways: Conditions and Performance" stated that it will be necessary to monitor the RRR program to determine its effects on pavement conditions. However, none of the FHWA RRR proposals has described a plan for doing this. Although the FHWA's Highway Performance Monitoring System (HPMS) may be able to provide generalized information on overall effects of the RRR program, much more detailed knowledge is needed on the effects of specific State RRR practices, particularly if each State is permitted to determine its own practices. As for safety effects, the HPMS does not gather any data about the accident experience of the road segments monitored, and no other plan for collecting this crucial information has been developed by the FHWA.

Finally, the FHWA must unambiguously define the following terms: reconstruction, resurfacing, restoration, rehabilitation, maintenance, improvement, and betterment. There is now nearly total confusion, even among the best-informed highway officials, as to the distinctions among these terms. Because there are said to be important differences in the design requirements for these activities, and because the legal and funding responsibilities for maintenance still rest with the States, these terms must be clearly defined.

As a result of this evaluation, the National Transportation Safety Board recommends that the Secretary of Transportation:

Direct the Federal Highway Administration to review and document, within 1 year, the current practices used in each State in conducting RRR projects. At a minimum, this review should include: documentation of the exceptions requested by each State to 23 CFR Part 625 design standards; the exceptions granted by each FHWA Division Administrator; the bases on which these exceptions are being granted; the procedures used to analyze the impact on cost and safety of the projects; and any results of those analyses. (Class II, Priority Action) (H-81-88)

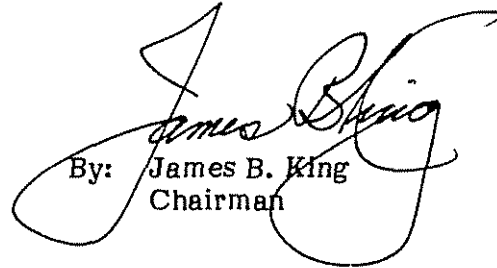
Direct the Federal Highway Administration to develop a comprehensive, objective analysis that will carefully and fully describe the design criteria for individual RRR projects and the criteria by which the FHWA will approve State selection of RRR projects. (Class II, Priority Action) (H-81-89)

Direct the Federal Highway Administration to prepare an analysis that will show, within the overall Federal-aid Highway Program, the optimum combination of construction/reconstruction and RRR projects for assuring the preservation and enhancement of the Federal-aid Highway System. (Class II, Priority Action) (H-81-90)

Direct the Federal Highway Administration to develop and publish for comment, prior to issuance of a final RRR rule, a plan for monitoring and evaluating the impact of the RRR program on the Federal-aid Highway System condition and safety. (Class II, Priority Action) (H-81-91)

Direct the Federal Highway Administration to administer the RRR program under existing procedures and standards for new construction projects, with exceptions permitted only if their basis and predicted impact are documented for review and future evaluation. (Class II, Priority Action) (H-81-92)

KING, Chairman, DRIVER, Vice Chairman, GOLDMAN and BURSLEY, Members, concurred in these recommendations. McADAMS, Member, did not participate.

  
By: James B. King  
Chairman

