

Testimony of *Libby*  
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on

Earthquake Damage in Los Angeles  
on February 9, 1971

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House Public Works Committee

at the

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Mr. Chairman and Members of the Committee:

On February 9, 1971, two of our Federal Highway Administration field employees were present in the Los Angeles area. As soon as the severity of the February 9th earthquake was known, the California Division of Highways notified our Division Office that they would request assistance in the repair of the highway damage under section 125 of title 23, United States Code. At the same time, additional Federal Highway Administration personnel were dispatched to the area from our Division Office in Sacramento.

Under our streamlined emergency relief procedures this informal notification is all that is required to make the expenditures for the emergency repair of Federal-aid highways by a State, county or city eligible for reimbursement

under the authority of title 23, United States Code, providing, of course, that the Governor eventually issues an emergency proclamation and the disaster is of such magnitude that we can concur in that proclamation under the requirements of the law. In this case, there was never any question in regard to our concurrence because of the severity of the quake. Major reconstruction projects are programmed and constructed under regular Federal-aid procedures.

Since the earthquake, Governor Reagan has issued an emergency proclamation and has furnished a copy to us. In addition, our field engineers have, in cooperation with State, county and city officials, made a thorough inspection of damage and have reported their findings to us. This material reached Washington on Friday of last week. I, of course, immediately concurred in the declaration and I am presenting a copy of that declaration and my concurrence for the record.

I wish to clear up any misunderstanding that may exist about expenditures that have been made for earthquake damaged highways which are on the Federal-aid system. Our Policy and Procedure Memorandum 23-1 (Paragraphs 6a(3) and (4)) permits the reimbursement of costs incurred from the day of the disaster for temporary operations, emergency repairs and

preliminary engineering for permanent repairs when subsequently programmed. Expenditures made for the repair of damaged highways on the Federal-aid system are and have been eligible since the actual occurrence of the earthquake. The Federal Highway Administration's procedures are such that there is an implied commitment to get necessary emergency work done. This implied commitment exists the minute the disaster occurs so that there is no delay as far as our emergency relief procedures are concerned.

I cannot refrain from conveying my admiration for the efficient manner and the speed with which the California Division of Highways opened the roads closed by the collapse of the overhead structures. Reports to my office indicate that all of the heavily damaged interstate highways were reopened on February 12th with the exception of a short-four-lane detour on I-5. This to my mind is an excellent example of emergency action.

As I understand the situation at least 28 structures were damaged. Ten of these are a complete loss, nine are damaged and repairable and nine are damaged but useable. Our latest estimates show that the cost of repairing the highway damage caused by the earthquake is \$25 million. Of the total, approximately \$20 million is eligible under the provisions of title 23, United States Code, and the

other \$5 million is considered eligible under Public Law 91-606, the Disaster Relief Act of 1970.

On February 10th I signed a purchase order to permit two earthquake research investigators from the University of California Earthquake Engineering Research Center to participate with a Federal Highway Administration team in the inspection of highway structures damaged by the February 9th earthquake. Hopefully, our investigation of the damage will assist us in the development of more adequate designs for highway structures, particularly bridges, to replace those destroyed by the earthquake. This program of research is not something that the Federal Highway Administration concocted after the February 9th earthquake. In 1965 the Federal Highway Administration (then the Bureau of Public Roads) published a comprehensive document, "Task and Study Statements of the National Program for Research and Development in Highway Transportation". The intent of this document was to encourage needed research by the States using Federal-aid research and development funds. Included in this compendium was a section concerned with "Protection Against Seismic Effects". This section succinctly describes the needed research effort in this field. I will submit a copy of this task statement to the Committee for your information.

The objective of the seismic studies effort delineated in the task statement was to improve the design procedures for bridges, embankments, and other highway structures, to afford maximum protection against earthquakes at minimum costs, and to extend these developed design practices to all areas where potential earthquake intensities justify their use.

Since no State was able to initiate that program, the Federal Highway Administration decided to conduct a multi-year research program financed under our limited administrative budget. It was proposed in the 1971 Federal Highway Administration budget submission to Congress that as a part of our research funding requested to improve protection against natural hazards (\$360,000), the research plan to improve design techniques for earthquake protection of highway structures would be initiated. The fiscal year 1972 budget submitted by the President to the Congress contains funds to expand research in this area to nearly double the 1971 effort, which would, of course, increase that portion of the research funds available for earthquake research. It was envisioned that our initial analytical investigations for fiscal year 1971 will be followed by a well planned program of laboratory model experimentation, model-to-prototype

correlation, response analyses, design parameter identification and quantification, and economic factor analyses. The urgency of this program is now apparent. We are anxious to proceed with this research program and I am happy to inform the Committee that preliminary contacts of last December have now resulted in initiating negotiations with the University of California Earthquake Engineering Research Center (Berkeley), financed in part by National Science Foundation grants, for a program of long-term research. Of course, you are aware that it is impractical to build all of our highway structures to withstand the maximum forces that may occur in an earthquake. In reconstructing these highways, however, there may be changes in design details to reflect some of the experience gained from this catastrophe. I wish to point out that California's present design criteria is by far the most realistic and sophisticated method used by any of the highway departments for providing earthquake resistance.

This disaster will undoubtedly produce a considerable amount of new information which hopefully we can utilize to improve our design methods. We have and will continue to cooperate with the California Division of Highways and the City and County of Los Angeles in their efforts to restore the highway system as soon as possible. Also, the

Federal Highway Administration intends to continue to study improved design of highway structures in order to provide as adequate a protection against earthquake forces as prudently possible.

I will be happy to answer any questions the Committee may have.

Thank you.