

In conclusion, it should be remembered that surface-treatment performance is dependent, first of all, upon adequate base support and drainage. Performance is also dependent upon weather conditions during construction and immediately afterward. Surface treatments should be constructed early enough in the summer to permit curing under traffic during warm weather. The warm weather is necessary for proper curing of the bituminous material, and the traffic under such conditions gives additional compaction resulting in a denser, better sealed, longer-life surface.

APPLICATION OF PHOTOGRAPHY TO HIGHWAY RESEARCH

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The value of photographic records and the importance of photographs as a medium of description have made the use of pictures indispensable in the proper presentation of technical papers, reports, and bulletins.

The growth of the Joint Highway Research Project and the multiplicity of studies have made the centralization and standardization of the photographic work most desirable. As a

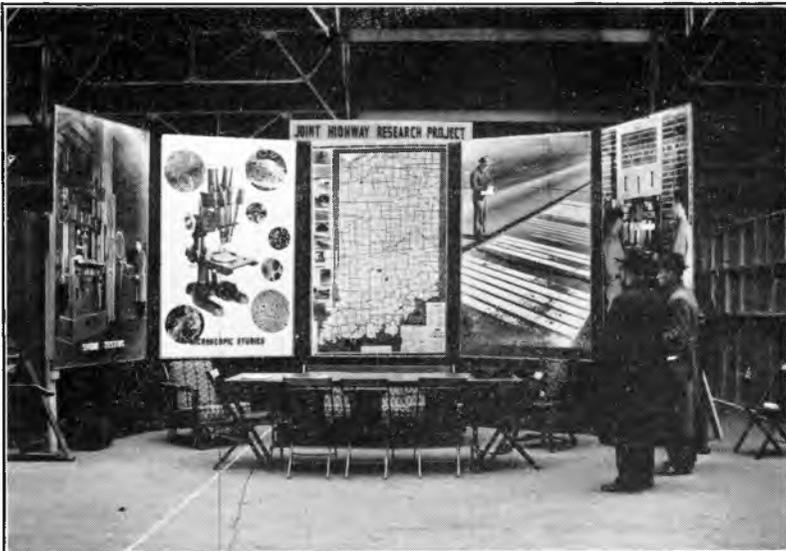


Fig. 1. Photographic exhibit of Joint Highway Research Project at the Road Show.

result of this need, the photographic department was formed in August, 1939. Before this time each individual made his own photographic records. Because of the increasing demand for photographic work, a new darkroom was built, in which the work for the Project is done. A file, containing over 3,500 photographs, is maintained for the convenience of the members of the Project. Over 200 pictures have been taken in color, and two movies, in color, have been made.

The normal photographic load consists of the making of lantern slides, the photographing of charts, maps, drawings, specimens, and equipment, and the developing, printing, and filing of the prints and negatives. Standardization of the photographic process and darkroom technique has been developed in order that the pictures taken will be true representations of the existing conditions.

The use of the photographic process proved to be invaluable in the study of the microscopic characteristics of various types of bituminous materials. Photographs were taken of the various bituminous materials studied, and there is on file a complete record of this most worthwhile study.

The apparatus for making photomicrographs has not only been applied to the study of asphalts, but also to soil, chert, and concrete.

Another important use of the photographic process is in the study of aerial photography as applied to topography with the aspects of drainage, relocation, and various types of traffic problems.

In addition, an apparatus is being constructed by the staff that will record, photographically, the changes in speed of a moving vehicle, as it traverses danger zones of our highways. This project will prove of great importance in the study of traffic accidents on curves and hills.

Other current projects making use of photographic methods are those pertaining to stress analysis by using photoelastic materials and equipment, and a study of traffic-paint weathering and durability.

In the near future a study of reflection-type traffic signs will be made by using a photographic means of analysis. Night photography will be used to compare the luminosity of various types of highway markings. The study will be placed on a comparative basis, making no attempt to duplicate the eye sensitivity.

One of the widest applications of photography to research is the use of the photographic processes as a visual means of expression conveying to the viewer, in the case of scientific research, in a simple and clear manner the results of a scientific accomplishment.

This can be in the form of a short, well-edited movie, or perhaps a series of lantern slides showing step by step just how the thing is done. If it is to be written in report form,

more value would result from a report containing a series of well-planned pictures.

In the field of visual education the camera is to the photographer as the paint brush is to the artist. It is his means of painting the picture that he has observed. It is not only to give praise to the artist but to bring to the observer a record of a scene that he was not able to perceive.

THE STATE POLICE AND HIGHWAY SAFETY

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Three major factors enter into highway safety: the car, the road, and the driver. In the main, you men are dealing with problems of the road. As for myself and my state troopers, we are dealing principally with the driver. The motor car itself is largely up to the manufacturers, who fortunately are improving the safety features of their products every year. This latter phase does not concern us except in the matter of motor vehicle inspections where equipment is believed defective.

The two former items, however, are of mutual concern. I am happy to report that the Indiana State Police have co-operated with the State Highway Commission in detecting the hazardous spots in our state system. Our officers have been encouraged to report the point at which the nature of the roadbed, or the traffic control devices, or the lack of them, seemed to be contributing to highway accidents. These suggestions have been periodically transmitted to the traffic division of the State Highway Commission, and the traffic and maintenance engineers have investigated and, wherever advisable, have rectified these conditions.

Our men do not pretend to be traffic engineers. They do not know whether their recommendations are sound in the light of the most modern thought. But they are constantly patrolling these roads and they know where trouble piles up. Hence, we have effected this relationship between the engineer and the policeman.

At least eighty percent of the activities of the Indiana State Police are in the field of traffic control and the servicing of accidents. More than a million three hundred thousand drivers ply the roads of Indiana holding Indiana driver's licenses, and hundreds of thousands of others travel the eight federal highways that run east and west across the state and the three major federal highways that run north and south. Indiana is literally the crossroads of the nation,