

A PROPOSED PROGRAM OF HIGHWAY RESEARCH

INTRODUCTION

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Mr. Chairman, what I say will be largely introductory to the presentation of a plan for a comprehensive research program by the Director of the Highway Research Board, Mr. Crum. I hope it will not be wasteful of your time to take a few minutes to review something of the thought, purpose, and underlying conceptions back of the establishment of the Highway Research Board.

The conception of this Board primarily, it seems to me, is to assist the individual who is engaged in research. We have regarded the matter of research as being somewhat of an abstract matter in which the individual does not count. In my thinking, more and more helpfulness to the individual has come to be the very important objective of such meetings and such activities as the Highway Research Board is carrying forward, and I have attempted to outline some of the underlying conceptions of the purpose of the Board.

First: To provide a particular and exclusive opportunity for the research worker to express his ideas and ideals to the public and to his fellow workers.

Second: To develop the general conception and promote the acceptance of the dignity and importance of research in the highway and related fields.

Third: To lend encouragement and to help sustain enthusiasm in the necessarily long continued efforts of the individual. That is, I can conceive of a man carrying on work, feeling his way along an untrodden path, being occasionally discouraged as to whether he is making progress toward his objective or not. To any such individual the benefits that can come out of a meeting of this kind are the enthusiasm and stimulation that come from contact with men who may even be in the same uncertain state of mind.

Fourth: To promote friendliness and a more generous appreciation of results secured through efficient and concentrated attention to the development of new knowledge.

Fifth: To bring about through mutual confidence and unselfish desires to serve the public interest, a pooling of resources, of data and new knowledge, and the organization and correlation of efforts to make highway research more effective, efficient and conclusive.

As you know the charter for the establishment of the National Research Council came by request from President Wilson to the National Academy of Sciences. In 1918, President Wilson made a further request to continue the Council and issued at that time an Executive Order directing all governmental agencies to cooperate with the National Research Council. That gives every governmental department executive authority to cooperate. The Highway Research Board was formed under authority of the Council. The National Research Council carries authority and dignity which can well be recognized by all interested agencies in undertaking to cooperate in the work and to devote funds to the purposes outlined by the Highway Research Board. We have had, since the establishment of the Highway Research Board, the cooperation of the Council in every effective manner within its power and disposal. It is proper for me at this time to express appreciation for the attitude taken by the directing officials of the National Research Council in assisting the Highway Research Board in so many ways.

There can be very little question as to the importance of research in this highway field, although there is a very large misuse of the term "research." It comes to me over and over as I go through engineering literature on this particular subject that there is a great paucity of new information upon the various subjects connected with highway engineering and utilization; that we find little new data that some research worker has contributed. Existing data are repeated, revamped, and reworked into various other forms, but it is the same old information dished up in a new form. We cannot rest content with the amount of research information that is actually being developed. Compilations are not research. They may be the necessary preliminary preparation for the research worker. He ought to know what has gone on in the field before, but research to me means the searching out of new and important information. All research information is important because all new information is important. It may be positive or it may be negative but nevertheless it is important.

Quoting from the last report of the Secretary of Agriculture in which he discusses the question of how nearly we can measure the results of research in a material way, he says, "Scientific investiga-

tions are sometimes most fruitful when directed merely toward the discovery of fundamental principles”

The important problems in the highway field have been so insistent that there has been the tendency for the highway administrator to demand from his technical staff answers to questions which they have not had the opportunity to carry to final completion. He has had to make an answer. We have only half answers to many problems, but they are admittedly better than no answer to the administrative official carrying on a large program. As highway administrators we have necessarily accepted less scientific information than we knew we needed to more adequately insure the expenditure of large public funds. The highway administrators of the country must be brought to see that a reasonable percentage of the funds for highway purposes invested in research will in the end produce far greater results than to continue without developing new methods and new processes through research. The idea must be accepted by the highway administrators and public officials of the country who are handling funds that may be used for research, that the expenditure for this purpose is not a living expense. It is not an expenditure that is thrown to the four winds, but rather an investment that will return to the public profits a thousand times over.

There are many important problems in this highway field. The expenditures are mounting but the service demands are increasing more rapidly. You will notice I have not totaled the expenditures for highway purposes. These are not so important relatively since we have more than 26 million automobiles and other motor vehicles operating on the public highways. The amount we spend to give them a road bed over which to operate is not a very important percentage of the whole cost, although it may mount into large figures as a total. The earning capacity of improved highways has been proven. There is no question about that and, while it is true that our expenditures have been mounting, these mounting expenditures have been largely paid by the man who uses the highway. Probably expenditures will increase as long as our operation of motor vehicles continues to increase. The automobile owner will not be discouraged by the taxes he is paying and the increased funds expended if he obtains continuously better highways to use.

A few of the problems which I think are most important now are the following:

Soils and their characteristics, particularly as subgrades;
Low cost roads of adequate service character,

In talking of low cost roads, we should add the qualification that they be of adequate nature to carry the traffic.

Highway transport utilization and attendant problems;
The planning of highway systems,

There is one fact we have to face in this country. We have too many highways, particularly in the big agricultural states. There are about three million miles of public highways and to assume that we can rapidly improve any considerable percentage of this whole mileage is to disregard the facts. It is an unnecessarily large undertaking and we must reduce our mileage of highways to be improved for general use. Rather than bring back marginal lands into production, we had better turn back some of our rights of way that are fenced off and used for little other than growing weeds. The planning of highway systems becomes one of the crying needs, particularly in our big states that have so many miles of roads that they cannot hope for many years to improve the major percentage of the mileage.

The financing of highways is another subject which must receive attention; also

The effects of heavy vehicles, and relative taxation or other charges for highway purposes

The highway departments in the states are leaders in determining policies. The highway administrator is dependent largely upon the work of his technical staff to secure the information on the various problems which confront him, so that in the end the efficient research worker has an important position and the work that he does has much weight in determining policies which are put into effect. The research worker has in that way a direct access and a direct control of the shaping of policies which determine the progress which we shall make in this public work in the United States. I cannot over-emphasize the importance which I place upon the research staff within the highway organizations of this country where they are capable and where they are supported with sufficient funds actually to produce results.

Effective research, however, in my judgment, can only be secured by a national research program, rightly coordinated. On an important subject recently, out of the available 36 research projects from which to gain information, there was not the coordination sufficient

to draw definite conclusions, so coordination is as important as doing the work itself. We must obtain comparable results and when we have 36 research projects upon which to draw for information we must be able to produce information the administrator can use. If he cannot, it is our own fault if we do not get the funds necessary to carry on research.

This matter of coordinating the research program is most important since we will get the weight of all the research that is being done behind the research of the individual worker. So long as we overlook any uncontrolled variables of research projects, the administrator is not justified in giving full weight in determining his policies. The results may be open to question in some essential respect. This is why research coordination is most important.

In closing may I quote again from the report of the Secretary of Agriculture:

“The ultimate justification in utility may be remote rather than immediate. Results will come, which cannot be reckoned in advance. Results achieved as an unexpected by-product are often more important than those originally contemplated.”

To achieve the greatest success, to be able to record continuous real progress and incidentally to advance the interests of the whole highway research fraternity, we must put our house in order. There is no more necessary or effective procedure than to unite on a national research program.