

Mr. Fairbank did not present this paper at Dallas.

STATUS OF THE STATE-WIDE HIGHWAY PLANNING SURVEYS

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It is now about three years since a highway planning survey was begun in the first State. For various shorter periods 45 other States have been at work; and the average period of operation for all now stands at two years and four months.

In three years, even in two and one-third years, a great deal of work should have been done; and a great deal of work has been done. For about one year of the average two and one-third, this work was mainly a field gathering of inventory, traffic, financial, and other facts concerning the highways and their use. No such comprehensive accumulation of all the essential facts pertaining to any department of public administration had ever before been attempted; and in its ~~the~~ operations of fact collection the highway departments worked with high efficiency. Sticking closely to predetermined schedules they amassed a literally tremendous record of factual data, for every item of which there is a definitely intended use.

We may refer to these fact-collecting operations in the past tense because the initial accumulation is substantially complete in all but a few States, which are generally those that started late; and in all but these few States the great bulk of the facts desired have been for various periods in the possession of the State highway departments.

Now, the accumulation of facts is the first and easiest step in the scientific method; and the highway planning surveys attempt to apply the scientific method to highway administration. Unlike its opposite, which has been called the method of "hunch and guess", the scientific method is laborious. But, long experience in many fields assures us that if we will apply it faithfully and sincerely to our problems it will lead in the end straight to a correct solution, which the easier, but far less certain meandering of "hunch and guess" may never find.

We have seen remarkable results of the scientific method when it has been applied in the realm of pure science - in physics and chemistry; when it has been employed in the field of bacteriology and medicine; and when it has been addressed to the physical and economic problems of great modern industry - the electrical industry, the automotive industry. And, seeing these results of other applications, we are led to believe that similar results will surely follow its application to problems within the purview of government, such as the problems of highway administration.

Of such an application of the scientific method the first step was taken when, in the majority of States, the field operations of the highway planning surveys had laid up in the offices of the State highway departments a bulky record of their fact gathering. But after this first step of the scientific method there are two others. The second is the classification of the facts gathered and their comparison in various relationships; the third is the study of the classified and related facts and the drawing of conclusions.

Most of the State highway planning surveys are now taking the second of these steps - the analytical step; and, to those who are pursuing the analysis, it is perhaps unnecessary to say that it is at this analytical stage that the greatest tedium of the scientific method is experienced. It is this stage of seemingly endless and overlapping classification, of many-sided factual comparison, of long-sustained, intense, and apparently resultless effort, that must severely tries the patience of the scientific worker.

The scientist in his laboratory, pottering about, trying this and that, engaged, that is to say, in the same process of classification and comparison that now occupies the planning surveys; such a scientist was once the object of the mild derision of the unscientific. It was a Member of Parliament, an unscientific member to be sure, who gave expression to the impatient skepticism of his class when, addressing Michael Faraday, he remarked: "But, my dear fellow, what's the use of it?" He had been privileged to witness an apparently fruitless experiment with an obviously useless little toy that Faraday called an electromagnet; and he drew from that great exponent of the scientific method the biting, but prophetic rejoinder: "Perhaps, someday, you can tax it!"

Since Faraday's day the least scientific among us has learned to pull the forelock in the presence of the laboratory scientist, but we may still put on somewhat superior airs with those who would introduce the scientific method into humanistic and economic fields - into the very province of government and public administration.

Highway officials have employed the scientific method in dealing with their physical problems to the great advantage of the public they serve. To the patient research of highway department investigators must be given a large measure of credit for the remarkable improvement of portland cement concrete. It was highway experimenters who discovered the facts that led to the development of the modern pneumatic tire for motor vehicles. Highway officials have been willing patiently to pursue the scientific method in dealing with their physical problems, even when the pursuit was long. They have held faith in an eventual successful outcome of the most tedious and unpromising experiments; and they are finding their reward in the greater certainties of highway design made possible by the subgrade investigations.

If there are in this audience any highway officials who, at this somewhat unfruitful stage of the highway planning surveys, may be inclined to doubt the eventual utility of these economic studies, I would ask of them only the measure of faith that made possible the present successes of the subgrade experiments, and I promise results not less satisfying than those which are now crowning the long and patient work in that physical field.

When I characterize as somewhat unfruitful the present stage of the planning surveys, I have in mind the vast potential usefulness of the facts that have been gathered. I do not disparage the valuable and practical results that are now beginning to emerge in increasing number.

Among the first of these results are the large scale base maps of the counties and the general highway and transportation maps made from them. In States where less than three years ago no maps were to be had on which could be found all of the public roads, the completion in that period of such maps for every county is a result of the surveys that is of no small value. In the 46 States in which the surveys are in progress there are 3,005 counties. On October 31, 1938 base maps of 1,321 of these counties had been completed by the State survey organizations. For more than 1,400 of these counties the completed maps had been reviewed and approved by the Bureau, and for nearly 900 additional counties incomplete maps were on the drafting boards in various stages of progress. To have made such progress in

the production of base maps of almost 2,700 of the 3,005 counties in these 46 States - in the production of maps of such substantial accuracy and such fulness of useful detail as these are - is no mean accomplishment even for three years of work.

Numerous other public agencies are finding these maps useful and their requests for copies multiply. Commercial and private map users that have discovered their existence also want copies. Compliance with these requests at a reasonable price, sufficient to compensate the reproductive outlay of the highway departments, is one way of returning to the public the benefit of the expenditure for preparation of the maps. It is a service that the State highway departments are in a position to render, which will be highly appreciated and broadly useful. Thus far many of the departments have failed to make practicable provision for this service. Underestimating the potential demand, such departments have expected to reproduce the maps by the Van Dyke and similar processes, and have established scales of prices calculated to discourage such collateral uses. Other processes are available, specifically the offset printing process, by which it is possible to reproduce moderately numerous copies at very attractive prices. Unless and until private initiative supplies the means of making these map results of the surveys available to other users at reasonable prices, the Bureau hopes that the several State highway departments will arrange to afford the service at prices considerably lower than those that have been announced by some of the departments.

One of the important uses that will be found for the maps will be their use in the surveys now being instituted by the United States Department of Agriculture, the object of which is to classify all of the rural lands of the country in respect to their fitness for agricultural and other purposes. Practicable methods for such surveys have now been developed by the Federal Department, and preliminary steps, which it is hoped will lead quickly to detailed surveys in all States are now being taken by the agricultural extension services. It is expected that committees formed of representatives of various interested groups will be appointed in each State to assist in the work, and the State highway departments will certainly be asked to participate in the work of the committees. Use of the planning survey maps for this purpose is so clearly of advantage to highway administration as to justify contribution of all needed copies by the highway departments and payment of the costs from Federal and State highway funds.

In one State - Michigan - the planning survey facts have recently been found useful, and have been splendidly used as the basis of a campaign of public education preparatory to the vote on a constitutional amendment prohibiting the use of road user revenues for other than road purposes. The same ballots that gave a large majority for the amendment supported by the survey facts defeated 2 other proposed constitutional amendments.

In a number of States the survey data, although far from completely tabulated, have been found sufficient to reinforce and give unquestionable authority to various proposals that will be made to State legislatures shortly to convene. In Vermont, for example, a report of the highway commission to the legislature, based upon survey facts, will clearly demonstrate the predominant need of modernizing improvements of the State highways. One effect, it is hoped, will be the reversal of a trend toward increased allotment of motor revenues to town roads, ^{a trend} that has marked the legislation of recent years. In this case, I believe I may add, members of the highway commission were agreeably surprised by the strength of the presentation it was possible to develop from the decidedly incomplete summaries of the survey facts at present available.

All State highway departments have recently been made aware of the use that is being made of the planning survey facts in the report which the Chief of the Bureau is required to make to Congress on or before February 1, 1939 on the feasibility of construction of a system of six transcontinental superhighways and its operation as a toll system. The Bureau is deeply appreciative of the prompt response by all State departments to its request for inventory and traffic facts in great detail not only on the existing highways that approximate the location of the six toll road routes chosen for investigation, but also on a greater mileage of other important routes to which reference will be made in the report. Without the information supplied by the surveys it would have been virtually impossible to have complied satisfactorily with the demand of the Congress in the limited time allowed. Without that information it is doubtful whether in the time allowed there could even have been a decision on the routes to be investigated - a decision which, thanks to the data available, it has been possible to obtain with the almost complete concurrence of the Bureau and all State highway departments in the space of a few weeks.

The facts supplied by the States for the purpose of this report are so pertinent and convincing that we believe there can be no question of a concurrence by the State departments in the Bureau's final estimate of the feasibility of toll operation of the system as complete as the agreement on the location of the roads themselves.

If at times the requests of the Bureau for special reports of survey facts have seemed over numerous and insistent I believe it will be the general judgment that the inconvenience of compliance is more than compensated by the importance and soundness of the conclusions the response has made possible.

As the more advanced States approached the conclusion of the field work of the survey, the Bureau proposed numerous forms of tabulation in which it would be desirable to arrange the facts gathered for comparison and study. Though formidable in number we are confident that substantially all of the groupings suggested will be required for the studies eventually desirable. If, in a few instances, tabulations suggested prove to be superfluous, we shall hope that our State cooperators will agree that a certain excess is desirable, and a degree of irrelevance unavoidable in arranging the data of a research of such magnitude and complexity.

Later, in April of this year, we submitted for the consideration of all State departments an outline, in great detail, of a form of report that would serve to define clearly the existing state of the whole highway system, and indicate the policies and financial provisions required for the future. We attempted by means of the outline to suggest as definitely as possible the various uses that would be made of the survey data and the manner in which they would be combined to accomplish the broad purposes intended.