

**Objects of the State-wide Highway Planning Surveys**

By

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Responding to the suggestion of the United States Bureau of Public Roads, highway departments of 40 States since November 1935, have undertaken the systematic studies of highway problems that are described as State-wide highway planning surveys. The surveys are being conducted in each State under the joint direction of the State highway department and the Bureau in accordance with a uniform scheme, designed to produce in all States comparable information as a basis upon which to establish sound plans and policies for future development of the highways and the system of highway transportation they are intended to serve.

In the building of roads we have about reached the end of a pioneer period. Heretofore the major part of our work has been the building of new roads for a fast growing new traffic of constantly enlarging demand. In the beginning there were no improved roads, or virtually none. The first necessity was "to get the traffic through." We have done that by the initial improvement of a main highway system of some 330,000 miles and the construction of an additional mileage of local roads estimated at not less than 700,000. Over these roads, although they are by no means fully

adequate, it is now possible to travel from end to end of the country without serious hindrance or inconvenience.

Thus we have come to a point at which we can say that the elemental needs of the traffic have been served. And as we reach this point we can also see that the traffic itself is beginning to take on a more stable form. The enormous increase of the past is not to be expected in the future. Unquestionably there will be further increase in the registration of motor vehicles, but we may confidently anticipate that such increase will occur at a diminishing rate. And, without too greatly underestimating the inventive genius of the motor industry, we can venture the hope that in the streamlined vehicle of today we see an approach to the ultimate form of the motor vehicle, at least in those features of its design to which there must be a response in the character of the road structure.

With the obvious first needs of the traffic satisfied and the nearer approach to a mature and stable demand, it now becomes both necessary and profitable to take careful stock of the highway plans we have thus far created, and determine, with a degree of accuracy that has heretofore been neither possible nor necessary, the extent and character of the required and economically supportable further development. Mainly, it is this that the Federal Bureau and the cooperating State highway departments are undertaking to do in the highway planning surveys. In the course of the investigations necessary to accomplish this first purpose they are also assembling

a mass of factual information concerning the character and dimensions of the highway movement which it is hoped will prove useful in the solution of problems associated with the reasonable regulation of highway transportation and its proper coordination with other forms of transportation.

Up to this time we have dealt separately with the improvement of two groups of our roads. To do so has been both expedient and necessary. In one group - comprising the Federal-aid and State highways - we have gathered together a definite mileage of the principal intercity connections, forming an arterial network that covers the entire country. In the other group, customarily referred to as the local roads, we have left the much larger remainder of the entire road system. The total mileage of this group has never been accurately known; and, unlike the relatively homogeneous arterial network, its constituent parts vary in traffic importance from sections that are virtually the equal of any included in the arterial system to a large mileage on which the traffic could be enumerated on the fingers of one hand.

By the choice of the traffic itself the roads of the arterial system were early seen to be those of maximum importance. Their construction involved the most difficult problems and the largest expenditures. For these reasons they were set apart from the other roads and placed under the control of the road building agencies of the States and the Federal Government. As a chain is

no stronger than its weakest link, it was recognized that the work done upon these arterial highways would be most effective if it were directed to the gradual upbuilding of the system as a whole rather than to an improvement, section-by-section to what might be conceived to be the ultimately necessary standard for each. It is this general policy that has been followed and that has now resulted in the virtually complete closure of the wholly unimproved gaps in the system. As a further consequence of the same policy it follows that the general standard of the existing improvement is by no means at the level to which it must ultimately be raised and the deficiency is emphasized by recent unanticipated changes in the design and especially the speed of motor vehicles. On this account standards of curvature and sight distance are especially deficient. But there are other recognizable defects, such as narrow surfaces and rights of way, narrow and inadequate bridges, and grade crossings of railways, that remain simply because in the initial improvement they have been accepted as tolerable until such time as the general state of the whole system would permit the use of the money necessary for their correction.

While State and Federal road building agencies have been working to bring the arterial system to its present state three thousand county governments and a larger number of lesser agencies have been working upon the far larger mileage of other roads, and

according to such information as can be obtained, have probably improved to some degree nearly a third of the total mileage of these roads.

In some cases the degree of improvement effected is as great as any within the arterial system. In some cases such an improvement is probably merited since it is known that there remain, without the arterial system, sections of road of importance equal to most within the system. In other cases a high degree of improvement has probably been given to relatively unimportant roads; and in still other instances, improvement has possibly been withheld where it is needed.

It may be assumed that the roads that have been improved are generally the more useful; but of this there is no real assurance. A large but unmeasured mileage remains wholly unimproved, and whether or not and to what extent additional improvement is needed or justified no man today can say because of the inadequacy of local government records and the almost total lack of dependable information concerning the relative usage of any roads outside of the arterial system.

But, if there is uncertainty as to the need, there is no doubt of the existence of a strong public demand for the improvement of additional local roads.

In summary, it may be said that the work that has been separately done up to this time upon the two groups of roads - the arterial system on the one hand, and the local roads on the other - has resulted in the satisfaction of the most urgent needs of the traffic. On the arterial system there remains to be accomplished a further improvement that is in large part imperatively required to promote safety and relieve congestion. On the local roads there is a probable but uncertain need of further improvement justifiable on ordinary economic grounds and a strong demand for additional work expressed in terms of human desire, social welfare, and broad national economy.

For the first time, in the planning surveys now in progress, these further needs of the two groups of roads are being considered together. It is highly important at this stage of the development, when we may be approaching the limits of feasible undertaking, that this be done for two reasons: First, that we may be warned of the permanent cost of the whole investment we are making; and second, that in the end the results of all work on both groups of roads shall fit

together to produce a proper balance in the highway system as a whole.

In the two groups of roads, as they have been improved to date, we have already created a large capital investment. Without the addition of another mile the maintenance and desirable further improvement of the roads already improved, will entail a large annual expenditure; and every additional mile improved will add to this continuous annual cost.

Our people have not thought of the cost of the roads in this way. Their thoughts have thus far been centered upon the building of new roads. They have been willing to pay for that purpose in considerable amount, particularly when, by the issuance of bonds, they have been spared to some degree the immediate pain of the payment. Unless they are properly advised they may take on in this way a greater burden than they will be willing indefinitely to support.

That this is not a remote possibility, but rather a much too imminent danger is the lesson we can read if we will in the experience of recent years. Not in one State, but in several, we have witnessed the necessary shouldering by the State governments of the bonded highway indebtedness of counties and other local agencies. Not in one, but in several States, we have seen a complete transfer of responsibility for local roads to the State government, less with the object of improving the efficiency

of administration than with the motive of escaping taxes. And in not one, but in practically all of these States, we have seen a situation created that might have proved disastrous, had it not been for the timely enlargement of Federal contribution.

It is with such experience in mind that we seek in the highway planning surveys first, to determine the present state of the whole highway system; next, to locate and evaluate the need of further improvement wherever it may be found, whether on the main arterial system or the lesser local roads; and finally, to estimate and make known as nearly as possible the continuing costs of the whole improvement found to be desirable, in order that effective measures may be taken to meet such costs by taxes distributed in equitable relation to the benefits conferred.

As necessary to accomplish these primary purposes, the surveys consist of three principal parts: First, an inventory of all roads, to determine the existing condition; second, a group of traffic studies to determine the relative service performed by each part of the whole system and the relative need of further improvement; and third, a group of financial studies, the most important objective of which is the estimation of the financial resources of the State and all its parts that will probably be available for the sustaining of a maximum highway investment.



The objects, as thus briefly stated, are the principal objects of each of the three phases of the surveys. In each we seek, in addition, by various means, to amass information bearing broadly and in detail upon various other aspects of the whole problem of highways and their effective use.

In the inventory, which is made by driving over every mile of the rural highways, we are not only measuring and determining the condition of the highways themselves, but we are also recording the location of every farmhouse and home, every church and school, every hotel, store, public institution, mill, mine, and every place of whatever kind in rural territory that is the origin or the destination of highway traffic. We are determining and recording the roads that are used for the carriage of the mails, for the transportation of children to school, and as the routes of common carrier busses and trucks. We are also determining, for mapping purposes, the location of all railroads, the prescribed routes of all regular air lines, the courses and extents of all navigable and all actually navigated streams, and as to each respectively the location of their stations, ports, and wharves.

All these determined facts of the inventory will be classified in numerous significant statistical tables, and will also be charted on large-scale maps, the first with such wealth of economic detail ever to be attempted. As an aid in future

highway planning these maps will be invaluable, and not for highway planning only, but every other public planning purpose as well.

As an important detail of the inventory, we are determining the exact physical condition existing at every railroad-highway grade crossing in rural territory, the angles and grades of highway approach, and the visible distance along the railway from points on the highway. To these physical grade crossing facts the traffic surveys will add the density of highway traffic at each crossing, and later, through the cooperation of the association of American Railroads and the individual railway companies, a record will be obtained of the number, character and time of train passages over each crossing, and of the number of collisions, injuries and fatalities that have occurred, and the amount of damage claims paid, at each during the last five-year period.

To the results of the inventory, showing the location and present condition of all existing rural roads, and the amount and character of human settlement upon them, there will be joined the outcome of the traffic counts, which will present a composite picture of the flow of traffic over the whole highway system, and will show the relative present traffic use of each and every section. This will be the simplest of the many results of the series of related studies that comprise the traffic phase of the surveys.

Others will indicate the weight of vehicles found on all parts of the highway system, with bearing upon problems of road design and the taxation and regulation of vehicles and traffic. Distinguished from these studies of what may be described as the flow of weight over the highway system, there will be other precise measurements of the weight and related dimensions of vehicles, obtained generally at pit scales for the purpose of establishing, beyond doubt and controversy, the characteristics of various kinds and sizes of vehicles employed for all kinds of purposes. These determinations will have a direct bearing upon questions of the taxation and regulation.

By one type of origin-and-destination study, conducted at various points, an effort is being made to settle questions of the prevailing range of movement over various classes of highways - the primary or main highways, the secondary or feeder highways, and the tertiary or land access roads. Through these same general origin-and-destination studies we shall also have one means of approach to an answer to questions of the relative interest in various classes of highways of city residents and country dwellers, and the varying degrees to which the traffic using each class of our highways is composed of a city-to-city movement, of a movement from country to city and vice versa, and of a movement between country points. All of these determinations, having bearing mainly upon questions of taxation, will be reinforced and, we hope, verified

by information obtained in the so-called road-use studies of the financial phase of the surveys - studies which approach the same problem by another method.

By other and more specific origin-and-destination studies, at favorable locations where the traffic is presented with alternate free and toll facilities, we shall seek, by noting the conditions of choice of the shorter and more expensive toll route over the longer or more tedious free route, to measure the value that highway users of various classes place upon savings of time, distance, and vexatious delay.

And by still other, and still more specific origin-and-destination studies we shall seek to indicate proper answers to recognized problems of highway routing, as local as questions of city by-passing and as broad as questions of the eventual substitution of direct, inter-regional routes for the present meandering routes that are the consequence of intercity and intertown growth.

By studies of the commodities carried by trucks and of the origins and destinations and trip-distances of trucks and buses, and private passenger cars, there will be an effort to throw light upon questions of the competition existing between the highway carriers, both public and private, and the railroads and other public transportation facilities.

Also included in the traffic phase of the surveys, there will be measurements of the speed of traffic and of particular classes of vehicles, especially trucks, under various highway

conditions, the purpose of which will be to single out causes of highway congestion in order that they may be corrected by future design of the road system and of vehicles. And finally, to the extent possible in the present state of public records, there will be a careful and intimate analysis of highway accidents in relation to the time, place, and other circumstances of their occurrence, as a basis for the devising of accident-prevention measures in general and the revision of dangerous highway conditions in particular.

To the results of the inventory and the traffic phases the group of financial studies, constituting the third major phase of the surveys, contributes what may well be termed the clinching facts. If the inventory shows what the present highway condition is, and the traffic studies tell what the desirable eventual condition should be, the financial studies will indicate, we hope, the extent to which the desirable condition can be realized by revealing the limits of the resources of the State and all its parts that will probably be available for the purpose. This vital objective cannot be achieved from any but an all-inclusive view of every available highway tax resource, National, State, and local, including those of the municipalities for streets. It cannot be achieved with a knowledge of the burden of highway and street taxes only, but requires also a general knowledge of the whole tax burden supported by all people for all public purposes. For the people,

through their taxes pay for many functions of government; and they will not pay excessively for one function at the expense of another; but, it may be added, when they pay for streets and roads they have a right to expect to get not good State roads only, or city streets, or local roads, but all these together, in proper balance and relation, without regard to arbitrary classifications, and limited only by sound economic considerations.

Unfortunately it is not possible to obtain this comprehensive view of all taxes paid from any single source. Hence it is necessary that the data of the financial studies be assembled from many sources. Unfortunately it is not possible, because of lax accounting and reporting to obtain a thoroughly correct view; but it is possible to approximate such a view; and the effort to array the essential facts and the difficulties encountered in so doing, should have wholesome effect by revealing the weaknesses and deficiencies of the public business administration.

And what is true of the search for revenue is also true of the analysis of the purposes of outgo. Both must be viewed comprehensively, because the highway transportation system in its ultimate state must be a unit, and the more nearly we approach the ultimate state the more imperative does it become that we treat it as a unit of closely coordinated parts.

The profound facts with which it is to be hoped our people may be made familiar by these highway planning surveys are that the cost of a highway system is a perpetual one; that the limit

of new highway building is reached not when we have built as many miles as we might be willing to pay to build, but when we have built as many as we are willing to pay indefinitely to keep. Through the discovery of the limit of this latter willingness or ability, which is the prime object of the financial studies, it is hoped to set a reasonable limit upon the gross size of the improved highway system; and within this limit to choose upon the basis of their revealed relative importance and usefulness, as shown by the inventory and traffic studies, those coordinated sections of roads and streets which, without regard to their present arbitrary classification, should comprise the ultimate improved highway system. This is the final and most important objective of the highway planning surveys.