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The National Highway Planning Survey and Secondary Roads

**By H. S. Fairbank, Chief, Division of Information
Public Roads Administration, Federal Works Agency**

In the United States there are, in round numbers, 327,000 miles of primary rural highways, 2,600,000 miles of secondary and lesser roads, and 215,000 miles of city streets. Physically, these highways and byways lie upon the land as a single unbroken network. There are no breaks where city streets end and rural highways begin; nor are there visible spaces between the trunk highways and their branches to tell us that at such points we pass from one "system" to another. It is only in administration that we separate this physically composite system into a variety of "systems."

Administratively there are "systems" galore. There is a United States system, and a Federal-aid system, and a public lands system, and a national forest system, and a national park system. There are 48 State systems, more than 3,000 county systems, and township systems and city street systems in numbers large but uncertain. Administratively each of these systems is regarded and dealt with as a separate entity. At many points one of

them overlaps upon another; but physically there is neither overlap nor separation, but a single, continuous, intermeshing network, covering the entire land.

Over this interconnected network move 30,000,000 motor vehicles in a tremendous and complex activity of travel that aggregates 250 billion vehicle-miles annually. On some parts of the network the travel concentrates heavily. On many other parts it is very lightly distributed. But whether heavy or light the service of the various parts is determined not by the administrative systems in which they happen to be grouped, but only by the physical facts of their location and condition. This is true with respect to the character as well as the amount of the travel on the various parts of the system. A road becomes in fact a trunk highway not by virtue of its inclusion in a State or Federal-aid highway system, but because in location it occupies a favorable relation to the sources and normal lines of movement of large volumes of traffic; and because in condition and capacity it is capable of accommodating such large volumes. A

farm-to-market road, on the other hand, owes its character as such, not to its more or less arbitrary classification as a county or township road, but to the fact that it conveniently joins an agricultural producing area with a natural and desirable market. This condition may be satisfied by a State highway as well as by a county or township road. Indeed we are finding that, judged by the character and amount of their usage, State highways are often the most important of farm-to-market roads.

Ideally, there should exist between the capacity and other characteristics of each section of the highway system and the volume and character of its traffic an adjustment as complete as that which exists between the arteries and veins and capillaries of the human body and the normal flow of blood in the circulatory system. That there exists in the road system at present no such closeness of balance between the duties and capacities of the various parts is plainly evident; and it is toward the achievement of some such adjustment in

a practicable degree that all road building efforts should be directed by whatever agencies they may be exerted.

It must be recognized that one of the reasons for the existing lack of balance lies in the division of the whole system into various administrative "systems" and the largely uncoordinated development of such "systems" by numerous and mutually independent agencies. What is perhaps a more important reason is the fact that there has been available to most of these agencies no information that would enable them to measure correctly the degree of the maladjustment existing. It is this necessary information that the highway planning surveys have attempted to supply in 46 States.

By these surveys we are enabled for the first time to comprehend the street and highway system as a whole. The large-scale county maps resulting from them are in most cases the first to show with substantial accuracy the location, classification and condition of all rural roads. Traffic counts have

been made previously on the primary highways of most States and on local roads in a few counties, but never until these surveys were undertaken, has there been an attempt to measure and chart the flow of traffic over all rural roads. Nor has there ever before been such an effort as the surveys have made to ascertain the revenues available and expenditures made for all classes of roads and streets, or so completely and fairly to assess the relative benefits conferred by the expenditures.

In the light of the very complete information thus made available the achievement of a balanced development of the whole street and highway system becomes a possibility, dependent mainly upon the understanding and will of the people to demand it, and the ability of administrative agencies to adjust their operations to the plain indications of facts at their disposal. Since the result to be gained is so obviously in the general interest, the degree of its actual achievement may really be taken as a

test of the efficiency of the democratic process. The first essential is the formulation and acceptance of an agreed master plan in which the ascertained improvement needs of all sections of the system would be incorporated and coordinated. The next step would call for an equitable obtainment of revenues and an allocation of such revenues in the proportions required for realization of the agreed plan. To neither of these thoroughly rational procedures is it probable that complete popular assent can be obtained. This being recognized whatever practicable measures may be suggested to approximate the ideal should receive the support of all who are truly interested in an efficient and economical development of the highway and highway transportation system of the country.

In its report on Toll Roads and Free Roads, which the President last year transmitted to Congress, the Public Roads Administration attempted to define the broad outlines of such a master plan as would be needed to coordinate the road and street improvement of the Nation; and tried further to

indicate in general terms the extent of the appropriate Federal contribution toward its realization. The report discussed at length the outstanding improvement needs of all sections of the highway system - the city streets, the primary highways, and the secondary roads. To give effect to some of the suggestions made legislation will be required, but within the limits of its present authority the Administration is attempting, in the light of information supplied by the planning surveys, to put into effect the principles it has propounded, and in no direction, I believe, is this effort made with greater probability of useful result than in the planning of a Federal-aid secondary or feeder road program.

Those of you who are familiar with the acts appropriating Federal funds for the improvement of secondary roads will recall that they are couched in very brief and general terms. They describe the roads to which their appropriations are to be applied simply as "secondary or feeder roads,

including farm-to-market roads, rural-free-delivery mail roads, and public-school bus routes."

This brief description has been amplified by administrative rules and regulations, in harmony with the apparent purpose of Congress, in several ways. First the rules provide that the funds may be expended only for the improvement of roads outside of municipalities ^{1/} and not included in the Federal-aid system. By this provision it is made clear that the term "secondary" is to be construed in relation to the routes of the long designated Federal-aid system as "primary." State highways, not included in the Federal-aid system are not excluded from consideration as Federal-aid secondary roads unless by reason of their character they fail to qualify as essentially "feeder" roads.

Next, the rules add to the three categories of feeder roads mentioned in the act one other class specifically described as "mine-to-market roads," and a general class defined as "other rural

^{1/} With the exception of streets in the District of Columbia.

roads of community value which connect with important highways or which extend reasonably adequate highway service from such highways, or which lead to rail or water shipping points or local settlements."

Subject to these general definitions, the regulations require each State highway department, as soon as possible, to "undertake the selection and designation of an initial system or group of secondary or feeder roads . . . based upon their relative importance as determined from factual data secured from State-wide studies for the planning of a complete highway system . . ." And finally, the rules stipulate that the initial system or group of roads to be designated is not to exceed 10 percent of the highway mileage of the State and that this initial system may be modified or increased, from time to time, as justified by the progress of its improvement.

Pending the availability of planning survey data essential for designation of the system, the rules have permitted construction projects to be

approved where it can reasonably be anticipated that the roads involved will be selected for inclusion in the system when it is designated; and thus far all States have been operating under this provision. But with the maps, traffic data and other essential records of the planning surveys now nearing completion in many States, the Administration is urging early compliance with the requirement of system designation and a number of States have begun and made substantial progress in the process of selection.

No invariable rules have been prescribed to govern this process. The undertaking is viewed as a problem requiring solution in each State in a manner consistent with its particular conditions and circumstances. But certain general procedures are being employed in all States and as methods tried in one State are found to be useful they are recommended by the Administration and adopted for use in others; and in this way there is gradually emerging a generally usable procedure.

The first essential is a determination of the basic total highway mileage. When this figure has been obtained from the planning survey inventories, it is divided by 10 to determine the limiting mileage of the system, and the State then undertakes to designate roads to comprise a system of aggregate length equal to or less than the limiting mileage determined. In view of the experimental nature of the undertaking and the probability of a gradual perfection of method with accumulating experience, the Administration is advising the initial designation of a system of less extent than the 10 percent limit will permit.

When the mileage to be designated has been decided upon, the next step calls for a tentative apportionment of that mileage among the various counties of the State. This is done by multiplying the total mileage to be designated by apportionment factors resulting from the averaging of various appropriate factors believed to be representative of the relative secondary and feeder

road requirements of the several counties. There is no invariable requirement regarding the factors to be employed, except that they shall be reasonably representative of elements suggestive of the need of secondary or feeder road service.

As the roads to be designated are generally intended primarily to serve the needs of agricultural communities, one of the factors recommended and commonly used is the percentage in each county of the total area of farms in the State. Since numbers of farms are also expressive of the relative need for farm road service the percentage in each county of the total number in the State may also reasonably be employed as a factor. It is reasonable to suppose also that the need for farm-to-market roads must have some rather definite relation to the amount or value of farm production, and a factor equal to the percentage in each county of the total value of farm products sold or traded in the State is also recognized as a reasonable choice. And similarly there are good reasons suggesting the use of

factors based upon rural population, rural-free-delivery-route or school-bus-route mileage and vehicle-mileage of traffic on local roads. Nor are these all the factors that can be employed with reason. In States where mining is an important rural industry in some or all of the counties, a factor based upon the value or amount of mine production would be a very reasonable selection. And one State, in which the service of tourists and recreation seekers affords a means of livelihood for a substantial part of the rural population, is considering, at the suggestion of the Administration, the use of a factor based upon the value or some other measure of the importance of recreation as an industry.

The general procedure calls for a choice of several factors, each reasonably representative of the relative need for secondary road service from one point of view, and the averaging of county percentages based upon the several factors chosen to form composite percentages of mileage allocation.

These percentages are then applied to the total mileage to be designated to obtain as the result a tentative allocation of mileage to each county.

The mileage to be designated in each county having been thus tentatively decided, the next problem is the selection of the particular roads which are to constitute the designated mileage. The selection is made first in the unqualified order of traffic importance; i. e., in each county there is a selection of a group of the most heavily traveled eligible roads of an aggregate mileage approximating as closely as possible the mileage to be designated in the county. To be eligible the roads must be essentially rural in character and must connect at one or both ends with the Federal-aid highway system but not be included in it; and as they should run to logical terminal points it is possible that their aggregate mileage in each county may not exactly equal the mileage tentatively allotted for designation. If so, a reasonable readjustment of the tentative mileage

allocation is effected; and the roads selected in the order of traffic importance are located on maps of the respective counties.

To the roads thus selected and located divers tests are then applied to determine the degree of their conformity to the various purposes expressed or implied in the law and the rules and regulations. First, the planning survey records are consulted to determine whether the selected roads qualify as rural-free-delivery or school-bus routes; next they are studied to determine their suitability as means of access to farms or other rural industries and communities; and, finally, the character of their traffic is studied to determine whether it is representative of an essentially feeder service or whether it consists in larger part of a through or trunk line movement. On the basis of such tests as these each tentatively selected road is either finally selected or rejected, and if rejected is replaced by another acceptable road next in order of traffic importance, so that there results in

the end in each county a selection of roads, high in traffic importance, conforming generally to the purposes of the act and the rules and regulations, and approximating in aggregate mileage the allocated portion of the total mileage to be designated in the State.

Where the necessary facts are available the roads thus selected are subjected to one more test before they are finally accepted. They are studied in relation to the character of the lands served by them, and if they are found to serve mainly sub-marginal agricultural lands or territories seen to be otherwise unproductive or unworthy of development they are rejected and replaced by other more acceptable mileage.

The methods described illustrate one application of the results of the highway planning surveys to a problem associated with the development of secondary roads. Necessarily the particular processes and standards employed are determined by the character of the legislation to which they are

designed to give effect. The selection of the Federal-aid 10 percent system certainly does not constitute a completely adequate program for the development of secondary roads, but it is representative of the type of problems that may be encountered in establishing such a program. As, in this representative problem, it has been found possible to employ with good effect the information supplied by the planning surveys, so unquestionably they can be similarly employed in the more complete studies necessary for the rational establishment of any larger program.