

PLANNING FOR FUTURE HIGHWAYS

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In the Hayden-Cartwright Act, enacted in the summer of 1934, there appeared for the first time in Federal highway legislation a recognition of the need for definite planning of the future course of highway improvement extending beyond the main roads.

"With the approval of the Secretary of Agriculture," the Act reads, "not to exceed $1\frac{1}{2}$ per centum of the amount apportioned for any year to any State under Sections 1 and 4 of this Act may be used for surveys, plans and engineering investigations for future construction in such State, either on the Federal-aid highway system and extensions thereof or on secondary or feeder roads."

Back of this general and legal phraseology there was the definite intent to encourage and make possible the conduct of broad studies and investigations in all States, such as were believed to be needed to establish a sound basis for a future highway development plan and policy.

The funds authorized by the Hayden-Cartwright Act were \$200,000,000 as a direct grant and \$250,000,000 as Federal aid. As the aid funds must be matched by an approximately equal amount of State funds, the total expenditure, provided for by the Act to which the $1\frac{1}{2}$ percent permission applies was \$700,000,000. To this sum, within the past year, there has been added \$400,000,000, the amount allotted for road construction and grade crossing elimination from the eight billion dollar work relief appropriation; and

the rules and regulations governing expenditure of this sum also permit the use of not more than $1\frac{1}{2}$ percent for surveys and investigations.

Thus, within the past two years there has been made available for the purpose of such studies a total of not less than \$16,000,000. A relatively small amount has been used in a few States for minor project investigations. A part has been lost to the planning purpose by obligation to construction work; but there remains much the larger part that is still available; and, in response to the urging of the Bureau of Public Roads, a large part of this remainder will now be used for comprehensive planning studies.

The particular proposal of the Bureau that has brought such welcome response was made last September. To date it has been adopted by 33 State highway departments that have definitely indicated their intention to cooperate; and eight of these State departments are already at work in the field, while the rest have progressed through various stages of the necessary preliminary arrangements.

We call these studies State-wide highway planning surveys. The name is fairly descriptive. They are in fact State-wide, since they embrace, not the main State highway system only, as in most previous studies, but the entire mileage of rural highways. There is, perhaps, some ambiguity in the use of the word "Planning,"

since we shall not at present attempt to lay down a plan, but rather to develop the accurate information which is the indispensable prerequisite of sound planning. In that respect, we hope that our effort may be distinguished from much that is done these days in the name of "Planning." We do recognize the need of facts.

There is one thing that these proposed studies are not; they are not just so many more traffic counts. Unfortunately, it is not possible to say as briefly what they are. However, a fairly compact statement would be something like this: They consist of a number of related studies that seek to determine the present state of the whole rural highway system; to rate the service rendered by the numerous parts; to prepare the way for a selection of that part of the whole system which, by reason of its relative importance and absolute utility, so far as we may now see, merits inclusion in future improvement plans; to assemble the facts necessary for an estimate of the ultimate cost of owning and maintaining the economically necessary improved system; all to the end that a definite, economically and socially defensible, integrated highway improvement program may be established and the future of highway transportation may be protected from the hazards inherent in shortsighted and shifting public policy.

Now, if you will have it so, I am prepared to confess that that definition is more compact than intelligible; but a fuller description that I shall give you after a while will, I hope,

somewhat repair that defect. For the present it may be well to answer another question that may have formed itself in your minds. So, suppose we leave the question of what these planning surveys are to pass to the question why they are needed at this particular time. Since we have got along without them this long, why should we need them now?

I can answer that question best if you will let me recall some of the things we have been doing, and some we have not been doing in road building these last three or four decades.

There are some of you, I am sure, who remember as I do that some twenty-five or thirty years ago there was what we were pleased to call a Good Roads Movement, and we were quite excited about it. Every one was for or against "good roads," and those that were "for" were quite commonly banded together in what were called Good Roads Clubs or Road Boosters' Clubs - it amounted to the same thing. I know because I helped to organize a number of both of them. And the rallying cry of those clubs was, "we want good roads."

Why did they want them? Well, they talked a good deal about getting the farmer out of the mud in those days too; but I believe you would find that there were two rather more intriguing reasons. One was that we thought it would be very nice to have a few good roads so that there would be somewhere to go with the horse and buggy, or the bicycle or - the new automobile; somewhere outside

of town. The other was that the next county had some; and we couldn't let the next county get ahead of us. It was almost as simple as that, as I recall it; and what it led to in road building was the construction of a lot of little pieces of road. They never went very far. They never seemed to have much reason for going where they did go. But, we kept on building them all through the 1900's and - nearly everywhere - well into the teens. It was road building for pleasure! For the pleasure of joy riding! For the pleasure of just having good roads!

I say we kept at it nearly every where well into the teens; but there were a few places about the end of the 1900's where men began to think a little. A few years before the office of Public Roads had taken a road census and it showed that there were in the whole country then some two and a half million miles of roads. These men took a good look at those astronomical figures and they said to themselves: "Look here, we can go on building these little pieces of road until we're all gray headed and then some and still we won't get anywhere." It was then that there was born the opposition to roads that "begin nowhere and end nowhere" as they put it; which was a negative virtue that soon blossomed into the positive idea of the Limited System, and the Limited System was not only the first, but just about the best idea in highway planning that this country had had or has had.

First one State, then another, then two or three more - that was the way they fell into line. They called these limited systems

State Road Systems. Generally they connected the county seats or the big towns and we promised ourselves that we would resist the temptation to scatter our few road building dollars over a lot of other roads until we had those State Roads all built and finished.

In those days we were building permanent roads and we looked forward to the time when they would be finished and we could stop spending money altogether.

But, as I have said, it was pretty well along in the teens before there was much of that sort of thing. Federal aid began in 1916, and the idea of the limited system wasn't strong enough then to get itself into the first Federal law; but it did get into the Federal Highway Act in 1921. In fact, it was the principal requirement of the amended Act, and we began at once to designate the Federal aid highway system. A main system of interstate and inter-county highways, limited in extent to 7 percent of the total mileage of highways of record in the country at the time of passage of the Act. That was what the Act said it was to be; and that was what we tried to make it. And when we had in that way selected the roads that we thought were really important and had joined them into connected systems, you can imagine what we found out about the roads we had built with Federal aid during the previous five years! Yes, we found that about three-fourths of all those roads we had built before we had a plan were so unimportant and so scattered that they couldn't by the longest possible stretch be made to fit into the new system.

The nearly fifteen years that have passed since the passage of the Federal Highway Act have been years of intensive effort applied to the Federal aid system and the several State systems of main roads that quickly were designated. The whole country agreed to build its most important roads first and it has stuck to the job. The lesser roads were left in the hands of local authorities to be treated by them as a purely local problem in whatever way they might find possible. The result, so far as the main roads are concerned, is eminently satisfactory. We have a network of main highways that has been improved to a point of high utility. What remains to be done to make them fully adequate for the needs of their modern traffic we can do. But, without doing anything more, we have a main highway system upon which it is possible to travel from any part of the United States to any other part, however distant, continuously upon improved roads with the possible exception of a mile or so at the beginning and end of the journey. That is the result of firm adherence to the principle of restriction of improvement effort to the limited main road system; and that was a piece of early highway planning upon which the country has every reason to congratulate itself.

There was another decision that was quite generally taken in those early days of road improvement that we also have had reason to count as fortunate. Early, we decided to reserve the motor vehicle license taxes for the support of the main roads. At first they didn't amount to much, and, such as they were, we decided in most States to

hold them as a fund for maintenance. Later, when they began to grow, we found that there was a considerable balance for construction, a balance that grew and grew. The story of that growth and of the later still more rapid growth of the companion gasoline taxes is an oft-told tale that it is not necessary to tell again. What I want to say here is that so long as we held the yield of the user taxes as a fund to be devoted wholly or in large part to the improvement of the main roads, we had an assured support for that important work, to which in great measure we owe the success of the results achieved.

And there is one other remark to be made. By good fortune, native wit, or Providential guidance - I do not think it was deliberate - we avoided the temptation to kill the goose. We increased the taxes, but not faster than the service we gave in return and we kept our customers satisfied - so much so that we have seen and known that very rare phenomenon - a cheerful taxpayer.

Now these things that I have been mentioning are things that we have done in these recent decades; done, and well done. There are some other things that we have not done, and some things that we have done that it would have been better that we had not done, especially in the last few years. And I want next to touch briefly upon a few of these things.

One of the things we have not done - as States or Nation - has been to make satisfactory provision for the improvement of the

local roads. There are supposed to be some 2,600,000 miles of them. Nobody knows much about them. We have left them in the hands of local authorities in whose care they have been somehow and to some extent improved. While we have been building an ordered main highway system we know that the mileage of surfaced local roads has grown. How much? Where? How well? We cannot say. About all we know is that like Topsy it has "just grewed."

This step-child treatment of the local roads has been deliberate. It has been unavoidable. Fifteen years ago the paramount necessity was to build a system of main roads. The whole time since then we have been busy "doing first things first." And all the time, we have been telling those who would have liked to have seen something more happening on the local roads, "we'll get around to you bye and bye." Well, "bye and bye" has come. The local road is going to have its day. That is the meaning of the bills that bob up in one legislature after another, all aimed at doing one thing or another on behalf of the local road. That is the meaning of the bills that in State after State become Acts. These acts do two things mainly. They shift a little more of the motor vehicle tax return to the local roads, and incidentally away from the main roads. They provide for turning over to the State highway department more or all of the local road mileage. One thing that they seldom do - I note it in passing - is to increase the total funds available for the accomplishment of the larger task they impose.

And, recently, there has been another sign that the day of the local road has come. It has been adopted by the Federal government. Three large appropriations have been made for the improvement of "secondary or feeder roads." That others will follow is, I believe, better than a good guess.

And here I am coming very close to telling you why we are becoming so much interested in State-wide highway planning surveys. We - and when I say "we" I mean the State and Federal highway officials - we are going to have the responsibility for an efficient administration of a secondary and feeder road improvement program. There are said to be, as I have already mentioned some 2,600,000 miles that might lay claim to a part in that program. We know that a lot of those miles don't belong, but we don't know which, and we very much want to know.

But before I pursue this thought further, let me return again for a moment to that catalogue of things done and not done and others that should not have been done, to speak of another of the "not dones" and of one of the "should not's."

We have not done a thing that we must soon do or suffer serious pains and penalties for not doing; and when I say "we" here I mean all of us - the whole public. This thing is to appreciate that we cannot dance unless we are willing to pay the fiddler; to be more specific, that we cannot in two breaths ask for more and better roads and reduce the road appropriation. And while we are appreciating that it will be well if we will go a

little further and appreciate also the fact that it isn't the cost of building roads that counts, or the cost of maintaining them, but the cost of owning them - the cost of possessing the roads we build forever after. That's what counts. If we can once grasp that, we shall soon see that it is nearly time that we had a real understanding of how many and what additional improved roads we want to go on paying for forever. As time goes on and road building goes on with it, that understanding becomes more and more imperative. As long as we stuck to the main highways we could be sure that we would want to keep up the roads we built, but when we start taking on what are popularly (but most inappropriately) called the farm-to-market roads, we had better know where we want to stop, or we shall find out one day, perhaps, that we have built more roads than we want to keep built.

We have not at this time the means to such an understanding; and here again I approach the reason why we want to make these State-wide highway planning surveys.

But before I get into that, I recall that I promised to say something about some things that we have done in recent years that perhaps we should not have done; so I shall just mention two of them.

One was the diversion of motor-vehicle and gasoline taxes to other than road purposes. If the Federal government should decide to reduce its offsetting contributions, the loss of that diverted money may show in the roads, and it will not be easy to get it back.

Another rather short-sighted thing - however expedient it may have seemed - has been the abandonment or partial abandonment of property taxation as a road building measure. It will be difficult to get that back too, and we don't really know whether the motorist to whom we look to pay the check is going to be able to pay for all we are going to order. And, after all, property is benefitted to a very considerable extent by road improvement, and especially by the improvement of the land-serving roads that are about to receive increased attention at the moment we choose to reduce land taxes.

I shall not say we would not have done these things if we had had the benefit of the facts that our State-wide highway planning surveys will produce; but I should like to think we would not have done them.

And so, having come again to the verge of the main subject, I shall stand my ground this time and tell you what it is we are going to do in the State-wide highway planning surveys.

First of all, we are going to make an inventory of the entire rural road system. We shall drive automobiles over every mile of it, measuring by odometer the length of it, and obtaining all information necessary to produce the first complete transportation maps of the country. We shall be able to put on these maps all of our rural roads. We shall know for the first time how many miles we really have. We shall not be surprised to find as, a few years ago we did find in North

Carolina, that much of the mileage we think we have, simply does not exist. We shall determine what roads have been improved and what is the present state of their improvement. On the main roads we shall locate the places where the existing improvement is below the standard required for modern high-speed traffic - where sight distances are too short, where curvature is too sharp, where grades are too steep. We shall record the exact condition of every railroad grade crossing and determine the amount of the traffic over it on the road and the rails.

To this detailed knowledge of the roads we shall add complete determination of the location of all railroads, all navigable waterways, all bridges over major streams, which we shall classify as free or toll, all ferries, all rural railroad stations and wharves, and all aviation landing fields. All of this information will be mapped, producing, as I have said, the first complete transportation maps of the country.

And there will be one other exceedingly valuable result of these inventories. We shall locate and put on the maps every home, every store, every mill and factory, every church, and school, every producing mine, and oil well, in short every definite origin and destination of highway traffic in rural territory. Thus, we shall know exactly how many homes are served by every section of road and just what other interests are directly served by the roads; and that - as a basis for highway planning we regard as exceedingly important information. In from two to three

months the field work of the inventory will be done, and the tabulating, classification, and mapping of the data will be well under way.

Meanwhile the traffic studies will be in progress, and these will be of several kinds. There will be the usual scheduled counts at important intersections of the main roads - key stations, as we call them - for the purpose of measuring the main-road flow and establishing factors of seasonal change.

More important, to my mind, there will be what we call "blanket counts" at thousands of points on the main roads and the local roads as well. Imagine the flow of traffic over the land as a mass of varying thickness lying upon a level plane. Where the traffic is heavy there will be a ridge; where it is light, there will be a valley. The whole irregularly shaped mass we will call the traffic solid, and its volume will represent the total usage of all our rural highways expressed in vehicle-miles. We shall locate our blanket-count stations in such manner as to develop the rise and fall of the surface of the traffic solid, in much the same way that we would select elevation points in a topographic survey and with the same object - to develop the shape of the surface - the surface of the traffic solid.

Remember that the first object of highway planning is "Selection," and you will see what we are driving at. In any highway program that we may conceive we shall not attempt to serve with improved roads every vehicle mile of traffic. To do that would mean that we would have to improve every mile of road including many that are used by very few vehicles indeed, or, as we have found, no vehicles at all. Obviously we shall not improve every mile of road; but, if not, how many shall we improve, and which particular miles shall they be?

Now think again of our traffic solid. Its total volume represents the total vehicle-mileage of traffic on the entire road system. Of that total volume, some percentage lies above the elevation that represents 1,000 vehicles a day. A larger percentage lies above 500 vehicles a day. A still larger percentage lies above 100 vehicles a day. Perhaps 95 percent of the whole volume lies above 50 vehicles a day - in other words, 95 percent of the movement of traffic over the entire road system is carried on roads of traffic density 50 vehicles a day and more. Now, if that is the case, suppose we flood the surface of our traffic solid with water to a depth of 50 vehicles a day. Rising above the lake will be all parts of the surface representing more than 50 vehicles a day and the volume of the solid above the lake level will be 95 percent of the total volume. If then we will select the roads represented by our exposed surface and

incorporate them in our improvement program, we may be reasonably sure that we shall serve with improved roads 95 percent of our total highway movement. The roads represented by the surface below the lake level we may omit from our program and be assured that we are omitting not only the least important roads but also roads that, taken all together, serve no more than 5 percent of the total traffic. And when we come to count the mileage of the selected and the omitted roads we shall probably find that the selected mileage - the mileage that serves 95 percent of the total traffic - represents not 95 percent of the total mileage but far less than that, probably less than 50 percent, perhaps less than 40 percent.

It is such a determination and such a method that we have in view in our blanket counts. The information they supply will permit a selection of roads on the basis of relative traffic service. We join that information to the facts produced by the inventory that permit a determination of relative property service, and we have the two principal guides to rational system selection. With other modifying factors - the agricultural characteristics of the land, the general economic prospects of each section, and other considerations - they will afford a convincing answer to the question: What additional roads shall we improve?

To this the determinations of the weight of vehicles operating over the roads, made at "loadometer" and "pit-scale"

stations, will add a knowledge of the type of improvement required on every selected mile; and tell us how many miles must be designed for heavy truck movement and how many will serve mainly the lighter vehicles - information that bears directly upon the question of the relative contribution that should be made in taxes by the heavy and light vehicles for the support of the improvement program.

To these and other determinations of the physical dimensions of the improvement program, rationally arrived at, we will adjoin the findings of studies financial in character. Studies designed to show what taxes are now levied for road purposes; the yield of such taxes; and who pays them; how much rural residents pay and how much urban residents pay. Studies to show how the taxes raised are expended; how much for construction; how much for maintenance; how much on main roads; how much on lesser rural roads; how much on city streets. Studies to show how the benefits of road service received by various elements of the population - city people, country people; motor vehicle owners, non-motor vehicle owners, etc. - relate to the payments by each element. These are for the purpose of establishing the facts - of which there is a lamentable ignorance - as to just how much we are now paying for roads and who is paying it, for the purpose, among others, of adjustment of inequalities.

And finally there will be another class of financial studies, the object of which will be to establish the elements of the equation of annual road cost - the factors of capital cost, and road life, and maintenance cost - which, applied to any

projected program of improvement will determine, not how much it will cost to build the projected roads or how much to maintain them but rather - that which above is significant - how much it will cost annually to own them in perpetuity. It is that cost that the public - that wants the roads, that needs the roads - must be prepared to pay. It is in terms of that cost only that a limit may reasonably be put upon the road improvement program; and it is the fixing of that limit and the evaluation of road service obtainable within it that is the final object of our State-wide highway planning surveys.