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FEDERAL AID AS A ROAD BUILDING POLICY
WHAT IS IT AND WHAT HAS IT ACCOMPLISHED?

Section I

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With the passage of the Federal-aid Road Act and its approval by the President on July 11, 1916, the United States entered upon a policy of highway construction under the joint supervision and at the joint expense of the Federal and State governments which has come to be known as the Federal road policy.

The immediate and, in some respects, the most important result of the new policy was that it led to the creation of highway departments in all States. The establishment of such State agencies was required by the act as a condition precedent to the extension of Federal cooperation; and there was the additional requirement that the highway departments established should have immediate control and supervision of the construction of the roads in which the United States put its money.

There were still at that time seventeen States in which there was no State agency for highway construction and no interest on the part of the State government in the improvement of the roads. The counties in these States still had sole jurisdiction over all highways, and such works of improvement as were carried out at all were administered by numerous county

officials with little regard for the coordination of the projects and plans of the individual counties even within the boundaries of a single State. At State borders all semblance of concerted effort ceased.

In a number of other States there was some sort of State agency, but the powers and duties with which these early highway departments were endowed were generally those of advice and engineering assistance only. The control of the work of road construction and maintenance was still vested in county officials who were at liberty to seek and accept the proffered advice or not, as they might elect; and although the reward of State financial assistance was held out as an inducement it was not always sufficient to overcome the skepticism of the local officials, jealous of their century-old prerogatives and decidedly engineer-shy. Nor was the State's advice particularly effective even when it was accepted; the initiative still rested with the counties, both as to the roads to be improved and, by their right of refusal, as to the character of the improvement, and this effectively prevented the development of a consistent improvement program.

A few of the more advanced States had competent State engineering agencies adequately equipped and manned, and fully

empowered to develop the improvement of the more important roads of the State in accordance with an orderly and consistent plan.

Central Control Completes Main Highways

This was the status of highway administration in 1916 when the Federal-aid policy was adopted. It was only twelve years ago, as time is measured by the calendar; but, in all that pertains to roads and the use of the roads it was of another era. The States of New York and Pennsylvania now have as many motor vehicles as there were then in the entire country; where now the average motorist is accustomed to drives of hundreds of miles over continuously improved highways, such a journey outside of very limited areas would then have been attended by the most discouraging difficulties. The difference is the result of twelve years of centralized control and engineering administration of the main State roads; and the Federal-aid act was not only the cause of this reform in many of the States, but is probably the only force that prevents a return to the old methods of local administration in several.

In 1916 there were 287,000 miles of surfaced roads in the entire country. Now the surfaced roads are estimated at 585,000 miles and the annual construction exceeds 40,000 miles. Of this annual program the portion in which the Federal

Government participates directly averages less than 9,000 miles; so, we do not wish to attribute the acceleration of the road improvement movement to the Federal-aid policy. The credit for that belongs to the motor vehicle, and there would probably have been as great an increase in the mileage of improved roads if there had been no Federal aid as there has been with it. What we do assert - and that without hesitation - is that, as a result of the Government's participation and the inevitable concomitants of that participation a high degree of order and harmony has been brought into what would otherwise have been at best a discordant, and at worst a planless, expenditure of effort.

The requirements of the Federal law and administration have been the strongest forces at work to effect a concentration of the State highway expenditures on the really important roads. With few exceptions the idea of such concentration had not taken root in any State in 1916. Although the original Federal act did not require it, one of the first administrative acts of the Bureau of Public Roads was the request that each State highway department designate and file with the Bureau at Washington a limited system upon which it would confine its Federally-aided constructive effort. Later, when the original act was amended in 1921, the expenditure of the Federal

appropriations was limited strictly to the Federal-aid system established by the act - a system restricted to not more than 7 per cent of the total mileage of road in all States. By that time the wisdom of such restriction, first recognized and applied in a few of the more advanced States, then expounded and preached by the Federal bureau, had received practically universal acknowledgment. Becoming finally an absolute requirement of the Federal law, this concentrative policy, is responsible to a greater extent, perhaps, than any other cause for the present continuity of main road improvement. Without it there would have been such a scattering of effort that we would now be not much nearer the ideal of consistent, continuous, and well balanced road improvement than we were in 1916.

The Federal Agency a Highway Common Denominator

The participation of the Bureau of Public Roads with the State agencies in all States makes it the common denominator of the State fractions which make up the sum of national road building effort. It has served to disseminate a knowledge and practice of successful methods and to bring about the abolition of inefficient and uneconomic practices. It has been responsible for a standardization of construction and administrative policies at a level which tends to approach the highest. The co-partnership existing between the Federal

bureau and each of the State highway departments has been the binding force which has kept the highway officials of the country to a community of effort. It has given to their official organization, the American Association of State Highway Officials, the dignity and force of a highway congress with the will and the ability to frame and put into effect the measures of interstate cooperation required by the increasingly interstate character of highway traffic, a result of the utmost importance for the common good.

The close association of the Federal organization with those of the States and the wise and ample support which the Congress has given to the research activities of the former, has enabled it to perform the functions of the testing laboratory for the highway business of the country at large. Experimenting with new processes, testing materials, measuring destructive forces and seeking new and better ways of combating them, performing these services itself and encouraging others by its example and cooperation to do likewise, the Federal bureau has contributed heavily to the development of the modern science of road building, the applications of which are seen in the superior service and durability of the roads of today. PUBLIC ROADS, the journal of highway research in which it publishes monthly the results of its tests and investigations, is the guide, philosopher

and friend of the designing and construction engineer - and not in the United States only, but throughout the world. It gives them regularly views of the latest advances in their profession and keeps them constantly abreast of the developments which are taking place in their basic science; and so enables them to improve the efficiency and economy of their work.

To these important results of the Federal-aid policy may be added - not by any means as the least - the liberation of the constructive forces from local political influence and obstruction. To the extent of the work in which the Government has directly cooperated this liberation has been practically complete; and the example thus upheld has had its effect upon the general complexion of the entire highway industry. What has been done in road building in the United States in the last dozen years is an engineering feat of the first magnitude, performed with a degree of efficiency, businesslike management, and freedom from political manipulation, seldom, if ever, equalled in public work. And the fact that it can be thus characterized without reservation is due in no small measure to the Federal Government's participation.

Finally - and this we are not disposed to over-emphasize - the Federal aid has contributed to the building of 70,000 miles of the most important roads of the country at a cost to the

Government of \$600,000,000 - less by half a billion dollars than the amount which the same Government has collected in excise taxes on motor vehicles since 1917. Practically all of this improved mileage is within the Federal-aid system, a network of only 186,000 miles which nevertheless reaches directly practically every city and town in the country having a population of 5,000 or more. As the States alone, without Federal assistance, have improved at least an equal mileage of the system it will be seen that the progress already made has brought us well within sight of the initial improvement of the entire system.

What Is The Federal-Aid Plan?

What is the Federal-aid road plan that has brought these things about, and how is it administered? In its original form, as it was established in 1916, it was a plan for the encouragement of road improvement under State direction. Upon the condition that each State would create a State highway department adequate in the opinion of the Secretary of Agriculture to supervise the road work to be done, the Federal Government proposed to apportion to them an appropriation of \$75,000,000 to become available in sums of increasing amount in each of the five years between 1917 and 1921. The amount appropriated for the first year was \$5,000,000, a small beginning

consistent with the ability of the States to expend it wisely. For the second year the amount appropriated was \$10,000,000, for the third it was \$15,000,000, for the fourth \$20,000,000, and for the fifth it reached the maximum of \$25,000,000, making a total of \$75,000,000 for the five years.

The apportionment of these sums to the several States was not entrusted to human judgment. It was inflexibly fixed according to a mathematical formula, the factors of which were designed to recognize the variable needs of the States. This formula, which is still followed, requires first the deduction of a small administrative percentage - now $2\frac{1}{2}$ per cent - from the appropriation and the division of the remainder into three equal parts, one of which is then apportioned among the 48 States and the Territory of Hawaii in proportion to their respective land areas, the second in proportion to their population as shown by the latest available Federal census, and the third in proportion to the mileage of post roads and star routes in each as certified by the Postmaster General. The sum of the three parts falling to each State makes up the total apportionment which the State receives, except that the share of those States which would thus receive less than one-half of one per cent of the whole, appropriation is increased to that amount and the apportionments

of the other States are adjusted accordingly. Five commonwealths benefit by this provision. They are the small States of Delaware, New Hampshire, Rhode Island and Vermont, and the Territory of Hawaii.

The sums thus set apart to their credit were available to the States under the provisions of the original act for the improvement of rural post roads, defined as "any public road over which the United States mails now are or may hereafter be transported," exclusive of streets in towns having a population of 2,500 or more with certain exceptions based upon the distance between abutting houses. It will be seen that this was a wide-open definition. Practically any rural road in the United States would answer the description, and it was so intended. There was no thought at that time in Congress of restricting the Federal assistance to the main roads. The purpose of the legislation and the end that it immediately accomplished was that of encouraging road improvement under adequate State engineering supervision. Later, as has already been remarked, the idea of restriction was introduced administratively by the request of the Bureau of Public Roads that the State proposals be confined to a definite limited system, and finally in 1921 this idea was incorporated in the law.

Initiation of Projects Rests with the States

From the beginning the initiation of projects upon which the Federal assistance is to be sought has rested with the States. The State highway department decides where, and when, it will undertake cooperative projects and submits to the appropriate district engineer of the bureau, of which there are twelve, definite proposals in the form of project statements or descriptions detailing the location of the sections of roads which it would like to improve, the character and amount of the traffic, the general type of improvement contemplated, and other pertinent information. The difference between the early and the later practice in this regard is simply that whereas formerly the State department was free to propose practically any road for improvement, it may now propose only sections of road which are included in the designated, limited system.

Upon receipt of the State's proposal, the Federal district engineer, if he has not already done so, makes an inspection of the road concerned and reports to the headquarters office his judgment as to the importance of the improvement and the adequacy of the type proposed by the State. If he believes the project to be desirable from the Federal viewpoint, and the headquarters office and Secretary of

Agriculture agree with him, the State highway department is notified that the project is acceptable, and the State then prepares to submit definite plans and specifications for the proposed work.

These are subject to the review of the bureau engineers and the approval of the chief of bureau, and when, finally, the State and Federal agencies are agreed, a definite legal agreement is drawn up by which the two parties agree to cooperate and share the cost, the Federal share being limited to not more than 50 per cent of the cost of the labor and materials involved.

Red Tape Delays Avoided

To avoid unnecessary delay, the State is not required to postpone the letting of contracts and the commencement of the construction work until the agreement has been signed. It may proceed at any time after the plans and specifications have been approved by the bureau's district engineer, with the understanding that if, for any reason, the Secretary of Agriculture should fail to ratify the project, the State will either modify it, or withdraw it and carry it out without Federal cooperation.

Besides being limited to one-half the cost, the extent of the Federal participation is also qualified by a limitation

of the amount that can be expended per mile. This limit, first set at \$10,000 per mile exclusive of the cost of bridges more than twenty feet in length, was changed after the world war to \$20,000 in recognition of the general increase in prices, and later was reduced to \$15,000 per mile, the current limit.

It will be clear, therefore, that if the total cost of an improvement at present exceeds \$30,000 per mile exclusive of the cost of bridges more than twenty feet in length, the Federal share can not be as great as 50 per cent of the cost; and this together with the circumstance that the amount of Federal cooperation requested by the State is in some cases less than 50 per cent accounts for the fact that the average payment by the Government on the roads built to date amounts to only about 43 per cent of their cost. The State pays the balance, and the Federal law requires that the funds from which such payment is made must be subject to the complete control of the State.

The actual construction in nearly all cases is done by contract let to the lowest responsible bidder, and the immediate supervision of the work rests with the State highway department subject, however, to regular inspection by the Federal engineers, and to the approval of the bureau. The

contractor is paid in full by the State, which is then reimbursed by the Federal Government to the extent of the Federal share, and no money is paid from the Treasury at Washington until the work upon which it is due has been completed to Federal satisfaction.

Maintenance Assured

After completion, the Federal-aid roads are maintained by the States which pledge their good faith to keep them in repair. They are inspected at least twice a year by engineers of the bureau, and if there is evidence of the need of repairs, that need is called to the attention of the State highway department; and the department is expected within ninety days of the receipt of the notice to put the road in a proper condition of maintenance. If it fails to do so the Secretary of Agriculture is authorized and directed by the law to perform the necessary work and deduct its cost from whatever balance of the appropriation there may be available to the credit of the State, and to refuse to approve new projects in the State until the amount paid has been refunded, such refund to be apportioned among all the States in the same manner as the original appropriations, so that the offending State would lose all but its pro-rata share. It is indicative of the generally high character of the

maintenance work of the States that it has not yet been necessary in any case to enforce this section of the law to its full extent.

With the exception of the provision requiring the designation of the Federal-aid highway system, which was carried by the Federal Highway Act of November 9, 1921, none of the several amendments of the original act has made a fundamental change in the policy and methods it laid down. But this one amendment put into effect a totally different idea of the purpose of the Federal aid.

Immediate Improvement Of Main System The Present Purpose

The 1916 law was designed to encourage road improvement in backward States and to develop competent and adequate engineering control in all. The 1921 act had for its purpose the improvement of a main interstate and intercounty system of highways covering the United States in the shortest possible time. To accomplish this it required the State highway departments, in cooperation with the Bureau of Public Roads, to designate such a system, setting as a limit upon its extent a mileage equal to 7 per cent of the total mileage of roads then existing in the States; and it provided that, thereafter, the Federal appropriations could be expended only for the

improvement of parts of the designated system.

There was no intention that the roads comprising this system should be improved only with Federal participation. On the contrary it was expected that the States would apply their independent efforts also toward its improvement, and the fact that substantially as much of the system has been improved by the States without Federal aid as with it, shows that the law has not been so interpreted. Nor was it the intention permanently to limit the Federal participation to 7 per cent of the country's road mileage. It was believed that a well chosen system of main arteries consisting of that percentage of the total road mileage, if it were consistently and adequately improved, would serve the more important needs of interstate and inter-county transportation; and the requirement laid down by Congress was designed to accomplish this end at the earliest possible date and before attempting to develop a larger mileage. But when provision has been made by any State for the completion and maintenance of the entire original 7 per cent system the act permits the State highway department, with the approval of the Secretary of Agriculture, to add additional mileage upon which subsequent Federal appropriations may be expended. In the three small States of Delaware, Maryland and Rhode Island this has already been done, which means that in these States

the original 7 per cent mileage has been fully improved and the improved system is now being extended.

The Special Obligation To The Public Land States

One other important change in the provisions of the original act, made by the subsequent amendments, has been of special benefit to the sparsely settled Western States. Large portions of some of these States are still owned by the Federal Government as national parks and forests, as Indian reservations and national monuments, and simply as unappropriated public land. None of these lands is subject to taxation by the States. The extreme case is that of Nevada where the Government still owns three-fourths of the land in the State. In Utah the Federal ownership extends to more than half the State's area, and in other States there are lesser percentages of public land.

When these States, with their large areas of non-taxable land, were required to match the Federal appropriations on a 50-50 basis it was soon found that they would not be able to support the burden. The basis was inequitable; and in order to correct it the law was amended so as to permit the Federal Government to pay more than 50 per cent of the cost of the roads built. The increased percentage was adjusted to the

amount of publicly owned land in each of the States by providing that the general Federal limit of 50 per cent could be increased by a percentage equal to one-half of the ratio of public land to the total land area of the State. Thus, Nevada, with public lands amounting to about 75 per cent of its total area, may be assisted to the extent of fifty plus one half of seventy-five, or 88 per cent; and the percentages for the other States were determined in a similar manner. Only the States in which the unappropriated public land amounts to more than 5 per cent of the total land area benefit by this new provision. These, with the percentages of Federal participation now permissible, are as follows: Arizona, 72.3 per cent; California, 60.1 per cent; Colorado, 56.1 per cent; Idaho, 59.8 per cent; Montana, 56.5 per cent; Nevada, 87.7 per cent; New Mexico, 63.4 per cent; Oklahoma, 55.5 per cent; Oregon, 62.3 per cent; South Dakota, 55.6 per cent; Utah, 78.9 per cent; Washington, 54.4 per cent; and Wyoming, 64.2 per cent.

It will be observed that this more liberal provision does not increase the amount of Federal funds spent in these States, but only the portion of the cost of the roads built that may be paid by the Government.

Such, briefly, are the main features and principal results of the policy under which the Federal Government after nearly a hundred years of inactivity has resumed its interest in the improvement of the means of highway communication between the States.