

THE HISTORY AND ACCOMPLISHMENT OF TWENTY-FIVE YEARS OF FEDERAL AID FOR HIGHWAYS

AN EXAMINATION OF POLICIES FROM STATE
AND
NATIONAL VIEWPOINTS



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Introduction

From the Annual Address of Samuel C. Hadden, 1944 President A.A.S.H.O.

SINCE THE FAR AWAY DAYS of the elegant eighties and the gay nineties, which our older members so fondly recall, every generation of Americans has begun its earthly pilgrimage under the happy illusion that the opportunities, the freedoms, the many fine things comprising the American way of life could all be taken for granted and accepted as a matter of course. It has taken a world catastrophe to remind many of us that these things are not universal or the unfailing gifts of a beneficent providence but that they were originally the fruits of the wisdom, the toil, and the struggles of our forefathers. We have been shocked to learn that they may only be preserved by the wisdom, the toil and the struggles and sacrifices of ourselves; the Americans of today.

Similarly, most of us in the highway fraternity can remember but dimly, if at all, the status of highway development before the present system of Federal Aid for highways, and the policy of close cooperation between the States and the Federal Government, was instituted in this field. Certainly none of us knew much about building automobile roads before this relationship began, for less than 2,000,000 motor vehicles had been built when the Federal Aid Road Act became law on July 11, 1916. Many of us may have taken this fruitful system and policy for granted and falsely assumed that they would continue automatically and indefinitely without further effort or attention on our part. There may even be some who see the defects in the system more clearly than its advantages and doubt its present usefulness.

Having reached the conclusion that it is necessary to sell and resell, and keep on selling, this partnership between the Federal and State governments in road construction we decided to feature this subject in some of the formal papers prepared for presentation to this convention. * * * We ask your close attention to the reading of these papers. They will be reprinted in pamphlet form and made available for distribution to newspapers, libraries, public officials, legislators, and to other interested persons and organizations.

While to some of you it may seem like the elaboration of the obvious to devote time at this late date to reaffirming our faith in the State-Federal partnership in road building, we can assure you that the dangers which threaten the continuation of this policy are quite real and not at all imaginary. This is especially true when we consider that early Federal grants for this purpose were so nominal in size as to be little more than token contributions. Because the Federal appropriations of the past have been so insufficient it now becomes more difficult, but all the more important, to increase the size of present and future programs.

* * * * *

Voluntary Federal-State Cooperation Has Produced Results of First Magnitude

For these reasons it seems appropriate and timely for us to look at the record of this relationship which has been such an intimate part of our daily lives as highway officials for many years. There has been very efficient teamwork between the State Highway Departments, the Public Roads Administration and the American Association of State Highway Officials. It is just as hard to assign proper credit to each of these agencies as it is to determine which is the most important leg of a three-legged stool. You just cannot get along without any one of them. This secular trinity, each playing its own particular part, has in a quarter of a century built on this continent 48 separate and independent State highway systems which, entirely by voluntary cooperation and without coercion, have been fitted and welded into one great network of motor highways comprising nearly a half million miles of all weather roads reaching into and joining every part of the nation. The importance of this network in this war and in the peace before and the peace to follow can hardly be overestimated.

Let us consider for a moment how this was accomplished. It should always be remembered that contrary to the belief of many, the Federal Road Act of 1916 and the many acts amending, supplementing and implementing it, give the Public Roads Administration, or the earlier Bureau of Public Roads, absolutely no positive control over any highway department. They merely authorize the Government to a limited extent to cooperate with the States in the construction of certain road projects. There is nothing mandatory about the whole matter. To establish this cooperation both parties must agree on all particulars of each project. The initiative is always, except in the case of defense access roads, with the State as to the selection of projects, their location, and their general features and details of design and construction, the Federal agencies having only the power to grant or withhold approval of the State's plans and proposals. Even these controls extend only to selected projects and in no way to other construction work done solely with State or local funds. Yet the mere availability of these Federal Aid funds quickly induced the legislatures of many States to create highway departments and to appropriate funds for highways in order that their States could properly take advantage of the opportunity so presented. It is my belief that this voluntary cooperation, with each of the 48 States free to develop its own ideas and exchange them through the Public Roads Administration, and through the committees and general meetings of the A. A. S. H. O., has had results of the first magnitude in the rapid development of the best road system on earth.

More specifically, the Federal aid system has advanced the establishment of State Highway Departments and State road improvement programs in many States. If Federal participation should be withdrawn it seems likely that State road activities would not only lag but would languish.

The availability of Federal aid funds has encouraged the continuation of State road appropriations sufficient for maintenance and minimum construction needs in many States during periods when local support for such programs was very weak.

Through the establishment of the Federal Aid System by the selection

of principal routes by the States with the approval of the Federal Government the early completion of the main routes serving both local and through traffic has been made possible.

The system has also encouraged and permitted the States to experiment with new ideas and types of construction, each with the benefit of the experience of the others.

It has fostered and established the best standards of design and construction as rapidly as collective experience reached a reasonable degree of agreement.

It has tended to discourage and cushion the violent and sudden changes of highway programs and personnel in individual States which otherwise more frequently result from changes in State administrations.

It has tended to encourage higher standards of efficiency and competency in the various highway departments.

Tribute to Commissioner MacDonald

This system of freedom of action, restrained and encouraged by the necessity to agree and cooperate with others, has been an important feature in making the American highway engineer preeminent in this field. The published standards and policies of this Association, embodying the combined judgment of this fraternity, have been accorded world-wide recognition as the most authoritative on highway matters, and have exerted a great and controlling influence on the construction of roads and bridges throughout the world.

The practices of the States and smaller units of government in carrying on their own independent road work have been greatly influenced by the standards and practices developed in the State-Federal partnership program.

We believe that our people are generally agreed that never in all history has a job even approaching in magnitude the development of our nation-wide highway system been performed with less waste and inefficiency and with a better record for honesty and devotion to the public interest.

It has been remarked that any great institution is but the lengthened shadow of a man, and so it is in this case. Even the best of laws and systems of organization fail unless administered by men of great stature. The highway record is replete with the scores of able and devoted men of great vision, integrity and indomitable determination. Many of these men, including some of the greatest, are present in this audience today. We regret that we cannot call the roll of those we all recognize as outstanding, but we must not leave this subject without paying our humble tribute to one man above all others. The American people are indeed fortunate that throughout the past quarter of a century they have had at the head of the Federal-State highway partnership a man of the stature of Mr. Thomas H. MacDonald, Commissioner of Public Roads. His unselfish devotion, his broad vision, his kindly firmness, his manifest honesty and integrity have been a tremendous influence in every chapter of the record. We doubt if the job could have been done so well without his continuing help. At this convention we are presenting to him a testimonial of the high regard in which he is held by all of us, a token of our esteem and of our enduring gratitude.

The History of Federal-Aid Highway Legislation

By SENATOR CARL HAYDEN

THE FEDERAL CONSTITUTION, among the powers expressly delegated to the Federal Government, included the power to build post offices and post roads; and an early Act of the Congress provided for the construction of the National Pike from Cumberland, Md., to the Ohio River and the territories beyond. This construction, begun in 1806, was the Federal Government's first large venture in road building—a highly beneficial one since it played an important part in settling the region beyond the Allegheny Mountains.



HON. CARL HAYDEN
Senator from Arizona

The States also manifested early intention to accomplish the improvement of highways. One—Kentucky—had prior to 1835 a State Highway Department remarkably similar in its organization and duties to the present State agencies to which in such large measure we owe the working of the modern highway miracle.

But all early highway plans of the Federal and State governments were altered as interest turned in the later 1820's to the building of railroads. This newer form of highway was deemed the better means of connection between the growing cities; it was considered ideal for the long-distance transportation needed in the westward expansion of the country. So, as decade by decade the railroad mileage lengthened, Federal and State interest in

the condition of the wagon roads declined to the point of ultimate abandonment. The roads, then regarded as mere lanes and pathways of the local rural communities, fell to the care of the lesser local governments—a sadly neglectful care under which they were allowed to go from bad to worse for half a century.

The Beginning of the Modern Road Movement

The modern good roads movement had its beginning between 1880 and 1890. Settlement had then spread back from the railroads and farmers wanted a better means of reaching the nearest town and railroad station. Local authorities began to give more attention to roads leading out from the towns but their efforts did not better the situation materially. The demand

for good roads grew much more rapidly than funds and organizations to create them.

In 1891 the New Jersey Legislature passed a law authorizing a measure of State participation in road building. The law provided only that the State would grant financial aid to the counties for road construction of approved character; but it was the first step taken by any State toward a renewal of State concern in the condition of highways. It was also the first legislative enunciation of the aid principle on which the initial action of most of the States and the successful highway cooperation of the Federal and State governments were later to be patterned.

Two years later, the Federal Congress, responding to a memorial of the League of American Wheelmen, by Act of March 3, 1893, gave expression to the renewal of Federal interest, by directing the Secretary of Agriculture "to investigate the best methods of road making," and disseminate the information acquired by his investigations. For these purposes the Congress appropriated \$10,000, and with this modest sum the Secretary endowed the work of an Office of Road Inquiry which he created. Of that small Office the Public Roads Administration as we know it today is the lineal descendant. The investigations begun in 1893 and since continued without ceasing have given unfailing guidance in the shaping of sound highway laws and policies from that year to this.

The example set by New Jersey was followed by seven other States in the remaining years of the century, with variations, the most notable of which was that introduced by Massachusetts which provided by law in 1893 for the designation of a particular group of roads, a State highway system, to the improvement of which the State's proffered aid would be limited.

Thus in three acts passed within the space of two years at the very beginning of the modern period of highway development there are to be found the seeds of intergovernmental aid and cooperation, of highway system designation, and of the great work of highway research—all factors of utmost importance in the subsequent successful development.

By 1904, State aid had become an established practice in 16 States, and in that year the first bills providing for Federal aid were considered by Congress. Authorized activity of the Federal Government was still limited to investigation and the dissemination of information, and so limited it was to remain for another eight years. But, as public opinion became more and more convinced of the desirability of national aid, the number of Congressional bills and the probability of eventual enactment increased.

The Post Road Program of 1912

I began my first term in Congress in February, 1912, in the second session of the 62nd Congress. During that session more than 60 bills providing for some form of Federal aid were introduced, and from these there matured the first of the modern Federal appropriations expressly for highway construction, the first tentative adoption of the Federal-aid device, and a provision for the appointment of a joint committee of the House and Senate "to make inquiry into the subject of Federal aid in the construction of post roads and report at the earliest practicable date." The law carrying these provisions was the Post Office Appropriations Act for the fiscal year 1913.

The appropriation provided was \$500,000. This sum was to be expended by the Secretary of Agriculture in cooperation with the Postmaster General in improving the conditions of roads selected by them over which rural delivery was or might thereafter be established, provided that the States or local subdivisions in which the improvements were made should furnish double the money allotted from the Federal fund for improvement of the roads selected. Supervision of the work was placed under the Secretary of Agriculture.

The purposes of the appropriation, as stated in the act were to ascertain "the increase in the territory which could be served by each (mail) carrier as a result of such improvement, the possible increase of the number of delivery days in each year, the amount required in excess of local expenditures for the proper maintenance of such roads, and the relative saving to the Government in the operation of the Rural Delivery Service, and to the local inhabitants in the transportation of their products by reason of such improvement. . . ."

Only 17 States elected to raise the funds necessary to match the offered Federal funds—a reflection both of the absence of available funds and of officials to advance the State interests. The entire fund, expended in the 17 States together with \$1,300,000 of local contribution, resulted in the construction of 425 miles of road; and the experiment taught many lessons that were later to be heeded in much larger undertakings.

The success of this small post-road program demonstrated that a practicable procedure for road building cooperation between the States and the Federal Government could be developed.

The Federal Aid Road Act of 1916

The joint committee appointed to study the problem made its report in January, 1915. It reported that Federal aid to "good roads" would accomplish several of the objects indicated by the framers of the Constitution—establish post roads, regulate commerce, provide for the common defense and promote the general welfare. "Above all," the report emphasized, it would "promote the general welfare." The committee thus strongly recommended Federal aid, but it did not recommend a definite plan. However, its report did stimulate Congressional debate that resulted in legislation a year and a half later.

One group in Congress favored a cooperative Federal-State relationship in the expenditure of the Federal funds. Another, of considerable strength, wished to parcel out the money to the counties to spend as they saw fit. Fortunately, the views of the former group prevailed in the bill which, as the Federal Aid Road Act, became a law on July 11, 1916.

The Federal Aid Road Act provided for the improvement of any rural road over which the United States mails then were, or might thereafter be transported, a provision so broad as to include almost any rural road. It definitely prohibited expenditure of the Federal funds on any road or street within the built-up portion of any place of more than 2,500 population. It appropriated a total of \$75,000,000 to be spent in a 5-year period, and permitted Federal participation in payment for the roads constructed up to 50 percent of the total cost or \$10,000 a mile, the remainder to be paid

from funds under the control of the States. The 5-year, \$75,000,000 total was made available in installments increased annually in proportion to the expected increasing capacity for efficient expenditure.

A very important section of the act prescribed a formula to be followed in apportioning among the several States the appropriation made available for each year—a formula employing as apportioning ratios, each with identical weight, the percentage relations of the area, population and post-road mileage of each State to the total area, population and post-road mileage of the United States. Another, and perhaps most important provision was that which made the apportioned aid available only to States in which a State Highway Department had been created, a department adequate in its authority and equipment to cooperate with the Federal agency and assume responsibility for immediate supervision of the road construction to be undertaken.

Up to a year before the law's passage there were still six States that had created no highway department of any kind, and in a number of others the existing departments had been vested with powers and staff wholly inadequate for the discharge of the responsibilities they would be called upon to assume. In all these States the necessity of compliance with the Federal Act caused the immediate creation of competent State agencies after the model of those which in other States had already proved their capacity for satisfactory performance.

To assure for the Federal Government an equal degree of technical and administrative competence the law lodged the Federal authority in the hands of the Secretary of Agriculture in whose Department there was the agency, then known as the Office of Public Roads and Rural Engineering, which had grown and matured from the small Office of Road Inquiry established in 1893, and which was, therefore, as long experienced as the oldest of the State highway departments.

Finally, this original Charter of the Federal-aid operation clearly established certain conditions vital to the success of the new intergovernmental undertaking. It preserved to the States the initiative in determining what roads were to be built and the character of their improvement. It gave the Secretary of Agriculture the authority to approve or reject the States' proposals. It placed the immediate supervision of construction work in the hands of the State highway departments; but made certain that the Federal funds appropriated would be spent for none but sound workmanship. This it did by subjecting the results of the work to the final approval of the Federal authority, by directing the withholding of the Federal share of the cost until an approved result had been obtained, requiring the States in the first instance to pay for the work done under their supervision. Finally, it imposed upon the States the duty of maintenance.

All that was needed to make this law workable as an instrument of effective action was men—competent men in the agencies representing each of the cooperating governments who would be able and willing to work together. On the part of the Federal Government this further condition was established when in 1919 young Thomas H. MacDonald was brought from Iowa, where for 15 years he had been building one of the best of the State highway departments, and placed at the head of the Federal agency—once

more renamed, the Bureau of Public Roads. And, in my judgment, the assurance of essential teamwork was rendered doubly sure when at the outset there was formed, through the American Association of State Highway Officials, the habit of free and frequent discussion of policy and practice between State and Federal authorities.

Work under the new law was hampered by the outbreak of World War I, but at the end of the war, in 1919, although little of the original appropriation had yet been expended, another appropriation of \$200,000,000 was made, expendable in the remainder of the 5-year period originally provided for with the purpose of providing work for returning veterans. The act making this appropriation also increased the limit of Federal payment per mile from the \$10,000 previously provided, to \$20,000.

With these augmented funds the provisions of the Federal Aid Road Act were put to the test of practice; and two outstanding defects of omission were quickly discovered. The law permitting the combined Federal and State funds to be expended for the improvement of almost any rural road, the pieces of road proposed for improvement in some of the States were so scattered as to defy any reasonable expectation of a connected improvement. And, some States, providing no funds of their own for maintenance, were dependent upon the uncertain action of county governments for preservation of the roads built.

The Federal Highway Act of 1921

Both of these defects were remedied when, at the end of the original 5-year period, Congress passed, and on November 9, 1921, the President approved, the Federal Highway Act—an act so sound in its fundamental provisions that it has remained for nearly a quarter of a century the basic law governing the Federal-aid highway program.

It was this act that established the Federal Aid Highway System by requiring the State highway departments, with approval of the Secretary of Agriculture, to designate a system of the principal interstate and intercounty roads limited in initial extent to 7 percent of the total mileage of rural roads then existing, and restricting to this designated system the expenditure of the then available and all future Federal-aid appropriations.

It was this act also that protected the large investment to be made by imposing upon the States the duty of providing for adequate maintenance and authorizing the Federal agency to employ directly for that purpose needed amounts of the Federal funds apportioned to any State that should fail to make adequate provision.

And it was this same basic act that authorized payment of more than 50 percent of the cost of the roads built in States in which there were then and still are large areas of public lands owned by the Federal Government, from which the State can derive no tax revenue. Improvement of sections of the Federal-aid system extending through these lands was recognized as a responsibility of the Federal Government; and the acceptance of this responsibility was given approximate effect by authorizing increase of the normal 50 percent Federal share of the construction cost by addition of a percentage equal to one-half of the ratio of public to total land area in States in which the latter ratio exceeds 5 percent.

The Federal Highway Act appropriated funds only for the fiscal year 1922, an addition of \$75,000,000 to the amounts previously appropriated; but its basic provisions were destined to govern almost without change the expenditure of \$890,000,000 later authorized for appropriation and expenditure in the next 11 years.

With the fiscal year 1923 the Congress began the practice of authorizing appropriations for succeeding periods of two or three fiscal years, a practice since generally followed which has served to notify the States in advance of the Federal Government's intentions and give their legislatures timely opportunity to make corresponding provision of matching funds. But the fund authorizing and appropriating Acts of the period from 1923 to 1930 altered the conditions governing expenditure of the funds appropriated in only one respect. They changed and changed again the limit of permissible Federal expenditure per mile of road—1923 from \$20,000 to \$16,250 per mile for that year and \$15,000 per mile thereafter, and in 1930 back to \$25,000 per mile for improvements on extensions of the original 7 percent system.

The years from 1921 to 1933 were the most productive in highway construction of all the years of our history. In these years a substantial initial improvement was effected on nearly the whole of the designated Federal-aid system. To the achievement of this result the money appropriated by the Federal Government had contributed in relatively small part; but the sound principles of highway administration established by, and in pursuance of the Federal Highway Act *had* been outstandingly conducive.

Motor-vehicle license revenues and gasoline taxes collected by the States, each year in greater sums, were expended almost exclusively on the Federal-aid and State systems. They were expended on the Federal-aid system as often without as with matching Federal funds. The modest Federal appropriations made a small part of the total of funds expended on the system; but the principles and standards developed on the Federal-aid projects were applied in the whole expenditure.

By 1932, improvement of the original 7 percent system was so far advanced in some States that the Emergency Relief and Construction Act, passed in that year, provided for the designation of additional mileage by increments of one percent whenever in any State provision had been made for the completion and maintenance of 90 percent of the previously designated mileage. The Federal Highway Act itself had provided for eventual extension of the original 7 percent system. This new Act now defined the manner and appropriate time of such extensions.

Changes in Federal Policy During the Depression

But by 1930 the bark of highway improvement had already begun to follow the ships of all our fortunes into the troubled waters of economic depression. There were then evidences that the States might encounter at least temporary difficulty in matching the Federal appropriations already authorized for the two fiscal years to follow. To tide them over the Congress, by Act of December 20, 1930, made a special appropriation of \$80,000,000 which, apportioned by the usual formula, was intended as an advance to be used in lieu of State funds to match the regular aid apportioned,

repayable in five years by deduction from future Federal-aid apportionments beginning in the fiscal year 1933. The situation growing worse instead of better, a similarly intended matching advance of \$120,000,000, apportioned in the same manner, was made by authority of the Emergency Relief and Construction Act of 1932. This was likewise intended to be repayable by deduction from future Federal-aid apportionments in 10 years, beginning with the fiscal year of 1938.

The fiscal year 1933 was at that time the last year for which a regular Federal-aid appropriation had been authorized. When these funds were apportioned on October 15, 1931, the first installment of the \$80,000,000 advance was deducted; and, matching difficulties of the States continuing, there was no authorization of regular Federal-aid appropriations for the fiscal years 1934 and 1935.

Instead, in the summer of 1933, as part of a broader attack upon the problem of unemployment, the National Industrial Recovery Act of that year appropriated \$400,000,000 for road construction to be expended immediately, without matching by the States. For the apportionment of this appropriation the Congress departed, for the first time, from the formula of the Federal Aid Road Act and the Federal Highway Act. Desiring to increase the weight of the population factor of the long standing formula in the belief that the need of employment was greatest where population was most numerous, it provided for the apportionment of the \$400,000,000 appropriation seven-eighths in accordance with the old formula and one-eighth in the ratio of population alone. The funds thus apportioned were made expendable in the usual manner by the State highway departments with the approval of the Secretary of Agriculture, through the Bureau of Public Roads, but the expenditure was not restricted as previously to the Federal-aid system. On the contrary there was specific authorization for expenditure of part of the appropriation for the construction of secondary or feeder roads to be agreed upon by the State highway departments and the Secretary of Agriculture. This act also for the first time authorized expenditure of the Federal funds in payment of all or any part of the cost of surveys and plans for the construction provided for; and made first specific mention of the use of a part of the funds provided for construction of extensions of the Federal-aid system into and through municipalities and for the elimination of hazards at railroad grade crossings. In thus extending the purposes for which the Federal funds could be expended this Act did not specifically delimit the amounts expendable for each purpose; but in its administration about 25 percent of the funds were applied to sections of the Federal-aid system within municipalities, 50 percent to rural sections of the system, and 25 percent to secondary or feeder roads.

Important Changes Made by Hayden-Cartwright Act

The first specific dedication of funds for the construction of secondary or feeder roads was made by the Hayden-Cartwright Act, approved June 18, 1934. This Act, among other provisions, authorized the appropriation of \$200,000,000 to be immediately apportioned according to the revised formula of the National Industrial Recovery Act, and directed that not less than 25 percent of the amount apportioned to any State was to be applied

to secondary or feeder roads, except as the Secretary of Agriculture, upon request and satisfactory showing of the State highway department, might fix a lesser percentage as thus applicable.

The first specific allocation for the elimination of hazards at railroad grade crossings was made by the Public Works Administrator under authority of the Emergency Relief Appropriation Act of 1935, approved April 8, 1935. The amount allocated was \$200,000,000 and this sum was apportioned, according to a new formula prescribed by the governing Act, one-half according to the population of the several States, one-fourth according to the mileage of the Federal-aid system in each, and one-fourth according to the mileage of railroads in each State.

Under the authority of this same Act the Public Works Administrator also allocated an additional sum of \$200,000,000 for road construction, to be apportioned by the formula of the National Industrial Recovery Act and expended subject to the previously described provisions of the Hayden-Cartwright Act of 1934, including its requirement of a 25 percent allocation to secondary or feeder roads.

The funds previously mentioned as authorized by the Hayden-Cartwright Act of 1934 and allocated under authority of the Relief Appropriation Act of 1935 were all available for expenditure without matching by the States, and for surveys and plans as well as for construction, but otherwise as provided by the Federal Highway Act.

In addition to its provisions thus far mentioned the Hayden-Cartwright Act of 1934 rescinded the previously required repayment of the \$80,000,000 and \$120,000,000 matching advances made in 1930 and 1932, so that these sums (except the single installment of the \$80,000,000 advance already deducted from the Federal-aid apportionment for the fiscal year 1933) and the Federal-aid funds they were used to match became in effect 100 percent Federal grants, amounting in total to \$379,246,329. Of this sum \$179,246,329 had been drawn from the matchable Federal-aid funds authorized for the period up to and including the fiscal year 1933. To that extent, therefore, these funds were converted into 100 percent grants, and with the \$200,000,000 advanced represented funds additionally made available on a 100 percent basis that should be lumped with the other 100 percent funds provided by the National Industrial Recovery Act and subsequent acts as previously related.

I have referred to certain provisions of the Hayden-Cartwright Act of 1934. The pride to which I freely confess, as one of its authors, is associated more closely with other provisions of the Act. The 100 percent grant I considered necessary under the existing circumstances as a measure of unemployment relief. I found greater gratification in the fact that the act prepared for an early return to the tested Federal-aid matching principle by authorizing the appropriation of \$125,000,000 for each of the fiscal years 1936 and 1937 to be matched as provided by the Federal Highway Act. It also abolished the restrictions that previously had prevented expenditure of regular Federal-aid funds for roads and bridges within the built-up portion of municipalities; and removed altogether the previous limitation of Federal payment per mile of road, permitting full participation in approved construction without regard to its cost,

In retrospect, it is satisfying to know that the provision permitting the use of 1½ percent of the regular Federal-aid funds it authorized for surveys, plans, and engineering investigations of projects for future construction, introduced for the first time in this act, made possible the beginning of the State-wide highway planning surveys. Continued with the support of similar provisions subsequently made, these surveys have been largely productive of information essential to the development of new policies and planning, valuable far beyond their cost.

But probably the best known section of the Act, and one which likewise I have had no cause to regret, was the one stipulating that it is "unfair and unjust to tax motor-vehicle transportation unless the proceeds are applied to the construction, improvement, or maintenance of highways . . .," and providing for the withholding of sums up to one-third of their subsequent Federal-aid apportionments from States making further inroads upon motor-vehicle revenues for non-highway purposes. This measure has had the highly beneficial effect of preventing the diversion to other uses of funds that by every test of equity and reason should be preserved for highway expenditure.

Following the return to the matching and other basic provisions of the Federal Highway Act in the authorizations for 1936 and 1937, the same provisions were continued in three succeeding Acts authorizing additional sums to be appropriated for the fiscal years 1938 to 1943, inclusive. The additional amounts authorized for these years for expenditure on the Federal-aid highway system totaled \$365,000,000. These acts also authorized additional sums to be appropriated for the construction of secondary or feeder roads in the total sum of \$115,000,000, and for elimination of hazards at railroad grade crossings in the total sum of \$190,000,000. These additional sums for secondary and feeder roads were required to be apportioned in the same manner as the regular Federal-aid road funds; those for grade-crossing improvements by the formula first defined by the Emergency Relief Appropriation Act of 1935.

In the last of the authorizing Acts referred to, cited as the Federal Highway Act of 1940, two significant new provisions appeared. A year before its passage the Bureau of Public Roads had been transferred by the President's Reorganization Plan No. 1 from the Department of Agriculture to the newly created Federal Works Agency. The old "Bureau" had now become the Public Roads Administration, and "Chief" MacDonald had acquired the new title of Commissioner of Public Roads, by which title he was authorized, in cooperation with and at the request of the State highway departments, to investigate the location and development of flight strips adjacent to public highways, for the landing and take-off of aircraft. This was the first recognition in Federal highway legislation of a possible connection between the highways and the ground facilities for aerial navigation.

The other significant departure referred to forecast thus early (the Act was approved on September 5, 1940, a year and three months before Pearl Harbor) the greater responsibility the Federal Government would assume in meeting the cost of war necessitated highway improvements. On request of the Secretaries of War and Navy or other authorized national defense agency, and by order of the Federal Works Administrator, the Federal-aid funds previously authorized were made expendable to pay the entire engi-

neering costs of surveys, plans and the supervision of construction of projects for the urgent improvement of highways strategically important to the national defense.

Highway Legislation to Meet War Needs

With war not yet upon us but soon to break, the Defense Highway Act of 1941, approved November 19, 1941, strongly supplemented the foregoing first specific preparatory measures. The sum of \$150,000,000 (later by Acts of July 2, 1942, and April 4, 1944, increased successively to \$260,000,000 and \$290,000,000) was authorized to be appropriated, and made available for expenditure without regard to formula apportionment in any State, to pay all or any part of the cost of construction and acquiring rights of way for roads, bridges or tunnels necessary, as certified by the Secretaries of War or Navy, for the improvement of access to military or naval reservations, defense industry sites or sources of strategic raw materials. To this provision the Act added a further authorization for the appropriation of two sums of \$25,000,000 to be expended for the correction of critical deficiencies of the strategic network of highways previously designated on a map approved by the Secretary of War on May 15, 1941.

One of the two \$25,000,000 funds was apportioned in accordance with the regular Federal-aid formula and was expendable to pay any part of the cost of work done up to three-fourths of the total cost, plus a percentage of the remaining fourth in the so-called "public land States" computed by the ratio of the public to total land area of those States. The second \$25,000,000 was made allocable by the Federal Works Administrator without regard to apportionment formula, to supplement other Federal funds available in payment of any part up to 100 percent of the total cost of constructing the strategic highways.

The same Act also authorized the Commissioner of Public Roads to consider claims of the States or their subdivisions for reimbursement of the cost of repair of roads damaged by the Army or Navy and present approved claims to Congress for payment out of appropriations to be made therefor.

It authorized additionally the appropriation of \$10,000,000 for studies and the construction of flight strips adjacent to public highways and the expenditure of these funds by the Commissioner of Public Roads in cooperation with the Army Air Corps, a provision that was later employed to build and acquire land for strategically necessary facilities for military and naval aircraft use.

And, very remarkably, this same Act, passed before the war, authorized the appropriation of \$10,000,000 to be apportioned and matched as provided by the Federal Highway Act, for surveys and plans for future development of the strategic network of highways and bypasses around or extensions into and through municipalities and metropolitan areas. As wisely administered by the Commissioner of Public Roads this authorization became in effect the first provision by the Federal Government and probably by any government in the United States for the advance planning of post-war highway construction or any other class of post-war public works.

The war shortly ensuing, critical shortages of manpower and materials necessitated the restriction of road work to projects of strict war essentiality.

Substantial portions of the appropriations authorized for the more recent fiscal years remained unexpendable for the intended construction purpose. Accordingly, by Act approved July 13, 1943, the Congress authorized expenditure in any State of the unobligated balances of these funds, up to the limit established by the State's share of a total of \$50,000,000, apportioned by the regular Federal-aid formula, for the survey and planning of post-war highway improvements, the amounts so used to be matched in the usual manner with State funds. It is this provision that has been effectively used in support of the greater part of the foresighted preparation that has been made for prompt beginning of a post-war highway construction program.

The same 1943 Act, by amending the definition of the term "construction" as used in the Federal Highway Act to include "the costs of rights of way, incidental to the construction of a highway," made available for eventual participation in right-of-way costs any previously authorized funds available for obligation after the date of the Act.

The history of enacted Federal highway legislation ends with the Act of July 13, 1943. Bills which I confidently expect to mature shortly in an Act as potent in its effects upon the post-war course of highway improvement in the United States as the Federal Highway Act in its guidance of past progress, have been under consideration in both Houses of Congress since March, 1943. A bill, S. 2105, has been passed by the Senate and sent to the House of Representatives, where it has been referred to the Roads Committee. That Committee has also under its consideration its own bill, H. R. 4915. Action by the House is expected to be taken in the very near future, with final passage of an agreed bill following we hope before the end of this year. Further reference to this pending legislation I prefer, and the record of its form and passage in final enactment I am compelled, to leave to a future historian.

In conclusion let me say that the best law ever designed and enacted can be made fruitless by poor administration. Fortunately for the Congress its intent and purpose in supplying Federal aid for highway construction has been carried into effect under the leadership of a man of vision, of courage, and of great ability. In all of the 25 years that I have known him, Thomas H. MacDonald has never failed to meet, to the entire satisfaction of the Congress, every responsibility that has been placed upon him. Fortunate indeed is the Nation that can produce such a man and have his superb service available to it for so long a time.

Federal Aid

From The State Viewpoint

By R. H. BALDOCK, *State Highway Engineer,
State Highway Commission of Oregon*

THE FIRST ROADS of America were the trails of the Indians and the Spanish conquistadors and missionaries. One of the first tasks of the earliest English settlers must have been the opening of ways and paths in their tiny settlements. But the earliest recorded law making definite provision for roads was passed by the General Assembly of the Colony of Virginia in 1632, some years after the founding of the first settlements.



R. H. BALDOCK
Chief Engineer, Oregon State
Highway Dept.

In brief terms that earliest highway law provided for the laying out of the simple ways required for the small settlement at Jamestown. The highway problem to be dealt with was not difficult. There were no vehicles in the colony at that time, and only one horse.

From these small beginnings our highways have spread to form a great network of 3,000,000 miles, of which 1,250,000 miles have been surfaced. Just before the war these highways teemed with the traffic of some 34,000,000 motor vehicles, serving every activity of our national life.

By far the greater part of the change that has occurred in the condition of our highways and the character of their use has been wrought since the Federal Aid Road Act was passed in 1916. But the preparation for that change began a quarter century before; and it began in the laws of two States and the Federal Government. Of the three rocks upon which the solid structure of modern highway administration has been reared, one, the principle of intergovernmental cooperation, was supplied by the Legislature of New Jersey in 1891; a second, the principle of limited system designation, was contributed by the General Court (Legislature) of the Commonwealth of Massachusetts in 1893; and the third, the foreshaping of policy and practice through research, was laid down by an inconspicuous Act of the Federal Congress in the same year. As thus, in the founding of the vast task of modern highway improvement, the Federal and State governments were cooperators, so they have remained to the great enhancement of the results achieved throughout the prosecution of the task.

The concept of cooperation and equal partnership between sovereign

governments that pervades every provision of the Federal Aid Road Act and its amendments, and the careful avoidance throughout the monumental structure of this legislation of the spirit of patronage are the features which distinguish this meritorious law. It is to the imperishable credit of the Federal agency that it has at all times administered the laws in the same spirit of cooperation and equal partnership in which they were written. And it is to Thomas H. MacDonald, first a State highway official, for the past quarter century the chief administrative official of Public Roads, and the presiding genius over the whole Federal-aid program, profound statesman of the highways, that 48 State highway departments attribute the enlightened policies that have assured the success of this great cooperative undertaking.

Federal Highway Legislation Written and Administered in a Democratic Spirit

Propagandist as the original Federal Aid Road Act undoubtedly was in partial intent, it was no new or alien doctrine that the National Government sought to spread among the States in requiring the establishment of State highway departments of adequate powers as the price of sharing in the Federal appropriation. It was the tested experience of pioneers among the States themselves that was held up as an example for others to follow. Nor did the Federal agency, even in that immediate test of its own immature experience, fall into the easy error of insistence upon conformity to a standard of perfection. It accepted the will for the deed and proceeded to work with some State departments recognizably weak, and by suggestion and example induced a gradual increase of strength and efficiency.

This much accomplished, the potential of the Federal Aid Road Act for further good had been, for the time, largely exhausted. Despite its other merits, its then great defect, the absence of a requirement of the systematic application of effort, made early amendment of the original Act a necessity. The Federal Highway Act of 1921 that replaced the earlier act had no missionary purpose. It was, rather, a deliberate charter of partnership between equal co-workers toward a fixed and common objective.

The method employed for the designation of the Federal-aid system typifies the cooperative and democratic spirit in which this law was written and has been administered. The 7 percent system was not imposed upon the States by Washington. The law read, the "State, through its State highway department, shall select or designate a system of highways not to exceed 7 percentum of the total mileage of highways 'of the State.' The Secretary of Agriculture shall have authority to approve in whole or in part the systems as designated or to require modifications or revisions thereof."

The purpose was to achieve an integrated system of interstate and inter-county highways. This was done by calling first upon the individual State highway departments each to select within its own State the competent sections of such a system. The highway departments of adjacent States were then asked to confer together concerning the connections of their respective initially designated systems. Only in the event of a failure of the State highway departments to agree on appropriate interstate connections did the Secretary of Agriculture exercise his authority "to require modifications or revisions." Only to obtain by such arbitral adjustment essential

connections between the States and to one other purpose were the particular interests of the nation urged upon the consideration of the States.

The other purpose was that of including among the roads designated such roads as would combine to form major national routes of strategic importance as determined by military authorities. The War Department was called upon for indication of such routes. It responded by means of a map, approved by General John J. Pershing, on which, in diagrammatic fashion, the principal routes of military importance were delineated. The States were asked to include, among the roads they selected, roads conforming to the routes so indicated.

The States willingly and gladly complied, and thus at the very beginning of the Federal-aid program was the assurance given that the improved system would meet, as we know now it did meet, the test of national need in a future war. Indeed, recent experience has proved that the highways most needed for service of the peaceful pursuits of our people are, in nearly every instance, identical with those required for the waging of a victorious war. This statement is made without, in any manner, detracting credit from the course followed in the selection of a system of strategic military highways.

Standards Raised Through Reasonable Procedures

In another provision of the Federal Highway Act and in the manner of its administration, there is further instance of the pervading spirit that has made for the great success of the Federal-aid operation.

The law provided: "That only such durable types of surface and kinds of materials shall be adopted for the construction and reconstruction of any highway . . . as will adequately meet the existing and probable future traffic needs and conditions thereon. The Secretary of Agriculture shall approve the types and width of construction and reconstruction and the character of improvement, repair, and maintenance of each case, consideration being given to the type and character which shall be best suited for each locality and to the probable character and extent of the future traffic. . . . That all highways . . . shall have a right of way of ample width and a wearing surface of an adequate width which shall not be less than 18 feet, unless, in the opinion of the Secretary of Agriculture, it is rendered impracticable by physical conditions, excessive costs, probable traffic requirements, or legal obstacles."

Recall first, that when this language was written into the law, few roads had been built that could be considered as complying with the standards upheld. Existing road surfaces 18 feet in width, for example, were the exception, not the rule. Recall also that State highway officials were active participants in the drafting of this law, as they have been in the formulation of all Federal-aid highway legislation since. I submit then that these advanced requirements, with which the participant State officials could be called upon to comply, were nicely balanced between an ideal objective and a practical tolerance, which were written into this law, and which fashioned it as an instrument remarkably fitted for precisely the progressive, yet practical, accomplishment that has been wrought. Nonetheless, wielded by an arbitrary and doctrinaire administration at Washington, it was an

instrument that could have wrecked the hope of a successful cooperative endeavor.

Nationally uniform standards might have been promulgated with which individual States could not in reason consistent with their particular circumstances comply. A pace of approach to the ultimate objective might have been set above the ability of some States to follow.

That no such impractical demands were made; that the Bureau of Public Roads then did choose and that the Public Roads Administration still does choose rather to agree with each State highway department upon the highest and most appropriate standards applicable in each State; that the Bureau itself gave earliest expression and support to the sensible stage construction policy that has prevailed; and that ultimate objectives were at all times approached by practicable routes; all of these things, and more, we owe to the active leadership of that clear-sighted pathfinder, Thomas H. MacDonald.

In one respect, perhaps in one only, might we now wish that the Federal agency had insisted upon a more ample provision in the projects executed. I refer to the width of rights of way, an inadequacy which presents one of the most serious of present-day difficulties. It cannot be gainsaid, however, that the admonition laid by the law upon the Secretary of Agriculture to take account of impracticabilities arising out of "excessive costs" and "legal obstacles," was in this respect strongly conducive to the acceptance, in many instances, of less than has since been proved desirable.

State highway officials have consistently endorsed, as a group, the reasonable fund-matching requirements of the Federal law, the normal 50 percent maximum payable from Federal funds, and the exception providing for larger proportionate Federal payment in the public-land States. The limitation applied in respect to the latter States, namely the addition of a percentage equal to one-half of the percentage of public lands they contain, is, if we assume equal density of the Federal-aid system in both public and non-public land areas, the exact mathematical equivalent of a 50 percent Federal contribution to cost of improvements through non-public lands and 100 percent Federal payment for roads across lands not subject to taxation by the States. This is both fair and reasonable. It must be recognized that State funds alone, unmatched by Federal contribution, have paid for much of the construction that has been carried out on the Federal-aid system in all States and in both public and non-public land areas. It must be considered also that the States alone bear the burden of maintaining all roads constructed. These facts considered, the proportionate State and Federal participation provided for by the law probably expresses with reasonable fairness the normal division of Federal and State concern in the improvement of the system.

When, as during the depression and in the recently necessitated construction to serve the special needs of war, the financing ability of the States has declined or the national interest has risen, the Federal participation has been properly and fairly increased.

Apportionment Formula Considered Just by Majority of States

In all that has previously been said, there is reflected, I believe, the considered judgment of all State highway officials. What will now be added cannot, I regret, be asserted to represent the opinion held in all States, though certainly it will accord with the view of the great majority.

In its appropriation of funds for expenditure in highway construction the Federal Government has sought to advance as rapidly, and as consistently as possible, the improvement of all parts of the Federal-aid highway system, a system interstate in character and of national as well as State and local significance. Wisely, it was decided at the outset to entrust the fair apportionment of the total sums to be appropriated to no individual or group of individuals. A methodical apportionment by reasonable objective means was preferred, and various formulas were proposed and considered.

The formula prescribed by Section 21 of the Federal Highway Act was generally agreed to express most faithfully the relative expenditure needs for adequate improvement of the Federal-aid system in the several States.

By this formula three conditions having a probable relation to the relative highway expenditure needs of the several States are taken into account in the apportionment of the total Federal appropriation, each condition governing, on a ratio basis, the apportionment of one-third of the appropriation.

One of the three conditions considered is the population of the several States. It is presumed that both the system network and the average traffic it serves will be more dense in States of large, than in States of small population, and that the relative need for road improving expenditure in the several States will depend in part on their populations. Hence one-third of the total Federal appropriation is apportioned in the ratio that each State's population bears to the total population of the United States.

The second condition considered is the mileage of rural post roads in the several States. When the formula was established the total road mileage in the various States was not known with certainty. The mileage of post roads in each State was known to the Postmaster General and could be certified by him. It was presumed that these mileages would exist in the several States in approximate relation to the total road mileage, modified in some degree by the population to be served by the mails, and since the mileage and the essential improvement of the Federal-aid system also bear an approximate relationship to these same circumstances of the States, it was inferred that expenditure need on the system would depend in part on post road mileage. Hence one-third of the total Federal appropriation is apportioned in the ratio that the mileage of rural post roads in each State bears to the total mileage of rural post roads in the United States.

Finally, the third condition considered is the area of the several States. There is wide variation in the areas of the States. Many of the larger States are sparsely populated, their mileage of rural post roads comparatively small, yet in these States, there are long distances to be spanned by the Federal-aid system between the widely separated borders in order to build a connected system of national highways. Hence it was decided to apportion one-third of the total Federal appropriation in the ratio that the area of each State bears to the total area of the United States.

From the beginning, this formula, though accepted as just by the great majority of States, has been opposed by a minority. A principal cause of the objection is not that the formula inaccurately expresses the relative expenditure needs in the several States, but that it results in a distribution of the Federal highway appropriation in different proportion from the collection of Federal revenue, to the disadvantage of the objecting States. Objection on this ground is alien to the theory and practice of our Federal form of government. It is denied by the practice in highway finance of every State, including those that object. In all States, monies collected in one proportion from various parts of the State are expended for improvement of the State highway system in the several parts in another proportion. For these reasons, the objection of the minority, although long and continuously expressed, has not found acceptance by the majority, nor has it been effective in modification of the legally prescribed formula.

The formula has been twice modified to take account of recognized altered needs for expenditure in the several States, once to adapt it to better relation with the distribution of employment need during the depression, and once to convert it to a form more suitable for the apportionment of funds provided for the elimination of hazards at railroad grade crossings.

Within the past year there has been new occasion to consider modification of the formula to better adjustment with a new distribution of expenditure needs. The factors of area and road mileage do not appear to govern, in any manner, the equitable apportionment of funds for use in urban areas. Urban population would appear to be the principal controlling factor. Needs for the improvement of secondary and feeder roads may likewise require some modification of the basic formula, but no plan has been suggested that appears to be better than the historic method of apportionment of funds for Federal-aid highways. New highway legislation is pending to provide in part particularly for improvements in urban areas and improvements of secondary and feeder roads. The desirability of appropriate revision of the Section 21 formula for the apportionment of Federal funds for, in particular, urban needs has, I believe, the concurrence of most states.

Unfortunately, however, a sharp disagreement exists as to the extent and character of the desirable modification. In this disagreement, the same States that have continuously objected to the long established Federal-aid apportionment are again arrayed on one side against the same majority on the other. And, again, the issue between the two groups appears to be drawn between the purpose, on the one hand, to apportion such Federal highway funds as may be appropriated, according to relative needs and the desire, on the other hand, to recover through the apportionment of these funds the sums of Federal revenue collected in the several States. The very nature of Federal revenue is such that there is no correspondence between the place of its collection and the place of its origin, but wholly apart from this concept, the majority opinion of the States opposes acceptance of the premise that road funds be returned in proportion to payment of Federal taxes, as inconsistent with both the relative highway improvement needs, the spirit of the American Commonwealth and the history of the development of this country.

That the Federal aid apportioned to the objecting States has not been

inconsistent with the existing need is indicated by the fact that the Federal funds they have received, together with State road-user revenues raised, at rates generally below the average for all the States, have produced in these States a degree of highway improvement comparable with the best obtained anywhere. That the aid apportioned to the other States has not anywhere exceeded the need is shown by the fact that highway conditions produced by the expenditure of combined Federal and State funds are in none of the other States superior to those of the objecting States, though in many of these other States road-user taxes have been collected at substantially higher rates.

The facts that in the entire history of the Federal-aid program only two States have failed to match every year's apportionment; that one of these failed in only one year and the other has failed because of excessive debt burdens assumed in behalf of defaulting local agencies; these facts indicate that the aid apportioned has been reasonably consistent with the matching ability of the States.

There can be no doubt that the present controversy will be settled, and settled in the American fashion by the decision of the majority after full and free debate. The policy of Federal aid will be continued in the future as it was initiated and has been developed in the past, by the will of the States. Whether the Federal contribution be large or small; and in years past it has been both; the influence of the Federal Government through its long experienced agency, the Public Roads Administration, and the vision and sagacity of "Chief" MacDonald, will continue, as a unifying, uplifting force, effective in measure beyond the monetary contribution, to advance by sound and efficient processes the progress of highway improvement in the United States.

Federal Aid

From The National Viewpoint

By THOMAS H. MacDONALD
Commissioner of Public Roads

FEDERAL HIGHWAY AID from the national viewpoint is a logical and effective compromise between exercise of the Constitutional power of the Federal Government to provide "post roads" interconnecting the States and complete abandonment of that power in recognition of the fact that the principal usage of all highways is by traffic of generally intrastate range. Its success as a policy has depended upon a clear recognition of the predominant State interest and a voluntary restraint of the Federal power within limits defined by the partial interstate concern. Its conspicuously beneficial results have been achieved through a balanced partnership of the executive ability of efficient State highway departments and the capacity of a Federal organization, trained by long experience to observe the trend of changing needs and propose accordant change of policy.



THOMAS H. MacDONALD
Commissioner of Public Roads

The Federal agency was created as the Office of Road Inquiry more than half a century ago to *investigate* and to *teach*. As the Public Roads Administration, investigation is still the larger part of its function, and though its individual pupils, now grown to man's estate, are often ahead of the teacher, it still tries to keep a page ahead of the class in conning the lessons of the combined experience.

For nearly a quarter of a century leading up to the first world war, the function of investigation and the dissemination of information was the sole concern of the Federal agency. Its activities were modest, but persistent and effective. After a period of study and self education it began the dissemination of what it had learned by the issuance of informative bulletins and the giving of lectures before local gatherings in all parts of the country.

Later, in cooperation with several railway companies it conducted traveling exhibitions in "good-roads trains," carrying the new gospel of road improvement to every county town along the lines of the railroads.

To render its teaching the more concrete and practical it lent the services of its skilled road builders and new-fledged young highway engineers on request of local officials in all States to build short sections of object-lesson roads, often with equipment borrowed from the manufacturers and materials transported free by the railroads.

In 1901 it established a road-material testing laboratory and began a study of the qualities of available road-making materials that in time encompassed practically every type of material to be found in all parts of the country and led on to the earliest studies of new and untried methods of road building with bituminous and cement binders.

Meanwhile, some of the States, following the lead of New Jersey and Massachusetts, had been experimenting with the new method of encouraging and improving the practice of county and other local road building effort through State financial aid administered by State highway departments. By 1904 such aid had become an established and continuing practice in 16 States. As I well remember, it was in that year that the State of Iowa designated the Iowa State College of Agriculture and the Mechanic Arts to act as its State Highway Commission; but my home State had been preceded in the taking of this step by the States of Massachusetts, New Jersey, Connecticut, Rhode Island, California, Maryland, New York, Vermont, Michigan, North Carolina, Delaware, Illinois, New Hampshire, Pennsylvania and Ohio.

Federal Aid Legislation Based on Sound Principles

From the successful demonstration of the effectiveness of State and local government cooperation it was a short step to the conception of a similar cooperation between the Federal and State governments and the first definite suggestion of Federal aid was made in the same historic year of 1904 to which I have previously referred. From that year onward the new idea was never absent from the deliberations of the Congress, leading in eight years to the crystallizing action of 1912, by which the trial appropriation of \$500,000 was made and a Joint Committee on Federal Aid in the Construction of Post Roads was appointed.

To that Joint Committee the utmost credit is due for its monumental report, prepared after extended hearings, summarizing and weighing all the varied and often conflicting opinions held as to the basis and principles of a sound extension of Federal aid to the States. The proposals examined took the various forms of direct aid to national roads, a reward system for State construction to established standards, a proposal for joint Federal-State construction, apportionments through the States for county construction and numerous others. Proposals of agencies to be responsible for Federal administration of the new plans included the Office of Public Roads, a new Federal Commission, the U. S. Engineer Corps, the Secretary of Agriculture, the Secretary of the Treasury who would annually distribute the Treasury surplus, a Bureau of Public Highways, a Bureau of Postal Highways in the Post Office Department, and many others.

From the maze of proposals advanced, men of good judgment culled the practicable and the workable as the success of the policy adopted in the Federal Aid Road Act of July 11, 1916, amply demonstrates.

But it is my firm belief that the principles which characterized that Act would not have obtained had it not been for the sober judgment and wise counsel of the pioneer State highway officials who then composed the American Association of State Highway Officials. The Association had been formed at Washington, D. C., on December 12, 1914. At that time hardly half of the States had effective highway departments, but it seems to me particularly significant that when the representatives of those that did have such departments gathered in the new Association to discuss the possibility of Federal action, it is recorded that: "There seemed to be remarkable unanimity among the members as to the fundamentalities which should be observed in the granting of Federal aid."

The significance is that those agreed "fundamentalities" of the pioneer State highway officials became the principles of the Federal Aid Road Act.

Cooperation between the designated Federal office in the Department of Agriculture and the State Highway Department was the essence of that Act. The State was designated as the smallest unit with which the Federal Government might feasibly deal and each State was to have an adequate highway department to exercise its functions. From the study and analysis of a host of related factors, a sound basis for the equitable apportionment of Federal funds to the States was selected in one which recognized population, area and road mileage as the factors most appropriate for the equalization of State abilities to achieve corresponding degrees of improvement. The provision of equality in the matching of Federal funds by the States within a prescribed limit of participation was designed to protect and preserve the mutuality of interest of the cooperating governments. The initiation of projects was made a definite State prerogative with review and approval by the Federal body to insure and perpetuate desirable and uniform standards. Contractual authority, likewise, resided in the State and the provision was made for permanent maintenance by the State or its subdivisions to protect the mutual investment in constructed roads. I repeat these principles at some length because they embraced most, if not quite all, of the essential requirements to a joining of the Federal and State purposes, each respecting the other's sphere of authority, which has led to such a successful and cordial relationship for so long a time since.

Route Selection and Fundamental Objectives Were Important Issues in Framing Legislation of 1921

The administrative and legal difficulties surrounding the new Federal-aid procedures effectively delayed actual construction until the spring of 1917 when the intervention of war curtailed all highway construction. There is something strikingly reminiscent in the subsequent restriction of road projects to those considered essential to the war effort. The pause given by the war was continued by the somewhat chaotic conditions which existed after the armistice. Despite the amendment of 1919 which provided additional funds, many difficulties stood in the way of rapid progress. The variety of conditions existing throughout the country made the approval of appropriate types and standards a difficult task and meanwhile public interest had become aroused over the question of selection of the roads to be improved with Federal funds.

The basic legislation had restricted the selection of roads eligible for Federal aid only by the broad test of their usage for the transportation of the U. S. mails and within this broad provision improvement projects had been widely scattered and there was difference of view as to whether the effort should be applied to the improvement of interstate or local roads, threatening not only the eventual connection of improved sections, but the very uniformity of purpose and policy that the Act in its other provisions had done so much to accomplish. When, in May, 1919, I took office as Chief of the newly named Bureau of Public Roads, it was to find myself in the midst of a conflict over route selection and fundamental objectives. One school held that Federal money should be applied only to roads of interstate importance to be selected and improved directly by Federal effort and that any other policy would result only in scattered ineffectual improvement. This point of view was founded upon the belief that highway traffic was no longer local and that highway improvement should conform to a concept of provision for interstate and transcontinental travel. This concept found expression in the Townsend Bill which also espoused the idea of a Federal highway commission, expected to be better qualified and more businesslike than the existing bureau.

The opposing school was principally concerned with the retention of the existing law. As Senator McKellar observed at the time, "Under the present law we have Federal aid to State roads. Under the proposed Townsend Bill, we have State aid to a Federal system of interstate roads." Senator McKellar's view held, simply, that the ultimate provision of great State and national highway systems would be the inevitable consequence of little beginnings. The sponsors of this view, widely supported by the highway people, believed that automotive travel was and would remain essentially local, that the matter was one of priority of improvement to meet these local needs, and that this would best be accomplished within the framework of a definitely prescribed road system, but a system chosen primarily for the service of short ranging traffic. They envisioned the more important highways extending and interconnecting, ultimately to form a vast national network, serving local and State, but eventually national traffic as well.

This was the conception, written into the Federal Highway Act approved on November 9, 1921, which erased the principal defect of the 1916 legislation, and retained the Federal administration in the Department of Agriculture. The new basic legislation strengthened the administration of both construction and maintenance. Of this latter, I am glad to say that the States' response to the requirement of State maintenance has been marked by such fidelity of adherence that, from the Federal angle, the problem of maintenance has been one of no serious concern at any time.

Needs of Future Wars Considered

In the ensuing selection of the initial 7 per cent Federal-aid system, it was fortunate indeed that we had behind us the experience of the 1918 war needs inasmuch as this experience compelled consideration of the needs of future wars. In response to a request made of the War Department for the designation of routes, the improvement of which would be consid- ed

important to wartime military activities, the Pershing map was supplied by that Department and the routes it indicated were subsequently incorporated in the Federal-aid system. It is due to this early and fortunate consideration of war needs and to no mere accident of chance that we had in 1941 a major road system in readiness for the present conflict.

The first map of the designated system mileage was published on November 1, 1923, and included a total of 163,881 miles. The annual report of the Bureau of Public Roads for the fiscal year 1924 stated that this plan for the improvement of the main highways of the nation would be possible of execution in a period of not more than 10 years, which would result in a connected system that would permit unobstructed traffic between all cities of 5,000 population or over. During the following decade, the total system mileage grew consistently, within the 7 per cent limit and the legal exceptions, to a total designated system of 207,231 miles as of June 30, 1934. At this time, by both initial construction and reconstruction, the total Federal and State effort had accomplished the improvement of 96 per cent of the system. Of the improved portion, 42 per cent of the mileage had been constructed to a high standard, 45 per cent to an intermediate type and only 13 per cent remained in the category of low type mileage.

Another decade later, as of last June 30, the total designated system had increased to 231,176 miles but 98 per cent of the mileage was improved. Of the total improved mileage, 48 per cent was of high type, 47 per cent of intermediate type and only five per cent consisted of low type improvement.

Largest credit for the substantial progress made in highway improvement in these two decades is essentially due to the fast developed and present high efficiency of the State highway departments. From small beginnings these departments have developed engineering and administrative organizations outstanding among public agencies for the business-like conduct of their operations, organizations that have never failed to meet the ever-increasing and changing demands that have been made upon them. Their adaptability to changed conditions was amply demonstrated by the many alterations of objective and administrative procedure required by the exigencies of the depression during which they proved themselves able to conduct a work relief operation of large dimensions with minimum sacrifice of the efficiency of their normal construction processes.

Highway Employment an Important Relief Measure

In the established relationship of the Federal and State highway agencies and the tested provisions of the Federal Highway Act, the Federal Government found instruments ready to hand requiring only slight adjustment of the apportionment provision and increase of the Federal participation, with which to employ immediately hundreds of thousands of men in useful work. The tasks of highway construction provided were found in their distribution through the country to be peculiarly adapted to the supply of work opportunities in approximately the proportions in which the need was distributed. The record of employment afforded, begun in 1931 and kept continuously since, shows that in the 14 years following, Federal-aid State highway construction and maintenance provided over 3.6 million

man-years of direct job employment, and estimates based upon careful investigation indicate that this was coupled with a generated off-site employment amounting to at least six million man-years in the equipment and material supply industries and in transportation.

This carefully kept record has produced very valuable data indicative not only of the general value of highway work as a relief measure, but also of the manner in which its employment potentialities vary with such factors as type of construction, methods of operation, location of work and the season in which the work is performed.

It was the recognized employment potentialities of highway construction that gave rise in the middle 1930's to the first extension of Federal aid to the construction of secondary rural roads and the improvement of trans-city connections of the Federal-aid highway system. It was the same need and circumstance that led at the same time to a substantial increase of the previous pace in elimination and protection of highway-railway grade crossings.

Need for Broadening Program Arises

But if the existence of employment need provided the occasion for the new and intensified activity in these fields, the desirability of the additional undertakings had not been unforeseen. As previously noted, the Federal-aid highway system largely unimproved when it was first designated had by 1934 been substantially improved to the extent that reasonably adequate surfaces had been laid on almost the entire extent of its rural portions. This was the objective to which primary effort had been directed. To the earlier accomplishment of that objective expenditure on the sections of the system traversing the cities had been deliberately avoided. As a result it was by this time a matter of common notice that the passage through cities was now often the least agreeable part of a highway journey. Moreover, in the effort to extend surfaced mileage the presence of defects in alignment and the generally lower standards of the earlier work had been tolerated. Bridges inherited from a much earlier period had been held in service though in many cases it was necessary to post them for limited loads and their narrow widths prohibited the safe passing of vehicles on them. Thousands of railroad grade crossings had been allowed to remain, each in some degree hazardous. All these known defects had been tolerated to advance more rapidly the first essential task of smoothing and strengthening the road surfaces to get a growing traffic through.

A few years earlier the consequent disadvantages of this course had seemed, had actually been, relatively small. The near approach to realization of the first aims, and more important the phenomenal growth of traffic and a new access of speed of movement emphasized the deficiencies, the actual dangers, that had been tolerated. Highway accidents were increasing at an alarming rate and there were conditions of the roads that were in part responsible.

It was seen that these conditions would have to be corrected. They would have to be corrected, and at the same time the periodic reconstruction of the roads already built would have to be provided for. It was

necessary to know as accurately as possible the dimensions of these combined tasks, the relative urgency and priority of the many further needs. To this end the States were invited to join in highway planning surveys, the purpose of which was to supply dependable facts where there had been at best informed opinions. The response of the States was immediate and highly productive, resulting in a few years in the establishment of a factual basis for the further planning of highway improvement unmatched in any other public works field.

It was this factual record that made possible in 1939 the conclusive negative answer given by the report "Toll Roads and Free Roads" to a resurgent demand for transcontinental toll roads, and permitted first formulation of the sound alternative proposal of a system of interregional highways as primary routes within the Federal-aid system, to be constructed by the tried processes of Federal-State cooperation.

Highway Construction Limited to Projects Essential to War Effort . . .

It was the availability of this same dependable factual record that, as war approached, permitted a prompt review of the earlier decisions embodied in the Pershing map, and the timely designation of the somewhat larger strategic network. The Defense Highway Act made provision for the correction of the more critical deficiencies of this network and also for the construction of access roads to war plants and military establishments. Quite properly, during the war, the highway organization and plant has been diverted from its normal, peacetime operations and the intervening period has witnessed the curtailment of the regular Federal-aid programs virtually to extinction. In lieu of such work, and for the duration of the war, highway construction has been limited to defense projects, screened project by project and in every stage for the measure of war essentiality. The cooperation of the States in their application to the building of defense roads against all conceivable handicaps can not be too highly commended. In the review procedures involving the certifications of essentiality by the military establishments and the War Production Board, in the tedious procedure for the processing of projects for preference rating, in the substituted design and redesign of projects for the conservation of strategic materials and in the delays attendant upon the individual project procedure, the patience of highway administration at every level has been taxed. Despite these difficulties, highway administration has been responsive to the need for conservation and a single example will serve to establish that this has been effective. Before the war, average Federal-aid highway construction required the use of one ton of iron and steel for each \$935 of expenditure. Under the wartime conservation program, the requirement for these critical items has been cut to .54 ton for the same expenditure.

In addition to providing for the immediate construction of access roads and the most urgent necessities of the strategic network, the Defense Highway Act made the first definite provision for the advance planning of postwar public works. This permitted an early start to be made upon the planning of postwar highway improvements and together with the later provision for the use of unobligated balances of Federal-aid construction

funds previously authorized, gave definite stimulus to the assembly of an imposing list of planned highway projects. As of October 1, the States had completed plans for postwar construction valued at \$398 million, an increase of about \$30 millions in the preceding month. The States also had designs under way for work to cost \$1,162 million, an increase of \$44 million during the month, and surveys were under way on additional work estimated to cost \$1,065 million. The cooperation of the States in readying their highway programs for immediate postwar launching is encouraging to the prospect of their early translation into reality.

Once again, a generation later, the pause of war has provided the opportunity for the appraisal of new highway needs in addition to the now accepted concept of the continuing need for replacement construction on all road systems. Once again, we are in a critical period of highway history—on the threshold of a new period of change which will involve an expanded scope of operations, new concepts of highway standards and related facilities and new measures of highway service that have only to be exemplified to be demanded. The automotive traffic of 20 years hence will utilize and highly benefit by the broad and ample facilities embodied in the Interregional Highway System, characterized by free and unimpeded travel between major centers of population and including the free-flowing city-penetrating and circumferential routes. This is no more than that projected primary Federal-aid system which will accommodate at least a fifth of the nation's traffic on one per cent of its road mileage. Concurrently, the major face-lifting operation which will need to be performed if we are to render our cities livable will be enhanced by the development of comprehensive metropolitan area expressway systems. And in the other direction, the smaller veins to feed these arterial ways will be protected by the selection and sustained improvement of a very important and substantial mileage of Federal-aid secondary system, perhaps that one-fifth of the nation's mileage which will contribute social value transcending its traffic service.

The needed realization of these plans will pose the highway problems of the future—problems the solution of which will necessitate a willingness to modify the old and establish a new highway tradition. If the plans proposed now seem large, they seem no larger I am sure than those which highway administrators of a quarter-century ago contemplated for the improvement of the original Federal-aid highway system. Will this Federal aid which has weathered the past meet these new conditions? It is my belief that it will.

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