

Highway Development under the new Federal Legislation

A paper presented by
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at the 31st annual meeting of the
American Association of State Highway Officials
Oklahoma City, Oklahoma, January 30, 1946

Just a little more than one year has passed since the Congress enacted the Federal Highway Act of 1944. About four months have gone since the funds provided became active. It is an appropriate time to report the administrative planning to prepare for effective operation under the guidance and authority of this fine concept of coordinated local-State-Federal effort to accomplish a major public purpose. This legislation is designed with a national pattern of ways and means to achieve highway improvement through joint administration between the Federal Government and the States, and with Federal recognition of the sovereignty of each State, to extend, through the State, Federal assistance also to county and municipal units of government. It provides legal authority for Federal action within the broad objectives which are defined, and very substantial Federal funds for use in bringing these predetermined objectives to realities.

While the war years have profoundly affected nearly every person's life and circumstances, in an overall sense the problems in the highway field retain with little change their prior form and dimensions. The major deficiencies previously had been well defined and recognized as such. Perhaps chief among these were the almost universal failures to cope with urban congestion and to supply an extensive mileage of improved secondary roads. The four war years have intensified the lags in both major and minor roads, and have accentuated the familiar pattern of inadequacies.

It is not necessary to review in detail the experience of the past quarter century. The foregoing examples serve to highlight the sound tenets that have emerged through the illuminating school of experience since the basic Federal legislation of 1921, and which now guide the formulation of administrative policies under this new and greatly broadened legal base. Under this legislation it is possible for the first time on a reasonably adequate scale to reach these segments of the general highway plan so vital to a comprehensive local highway service, and concurrently to modernize and redevelop the highways of the Federal-aid system to meet the growing national traffic demands.

No small or short-time program will advance us very far. The work ahead, because of our present superior knowledge of the facts, seems relatively greater than it did a quarter century ago. It is, however, only the physical task that assumes these magnified dimensions. In the intervening years the building of competent highway organizations and the development of technical knowledge, make possible now work of a character that would not, in fact could not, have been considered when modern highway improvement was first started. The spectacular advance, characteristic of our country, in the power, performance and versatility of road building equipment, has set a world record. The recognition of the outstandingly desirable and even essential qualities of the modern equipment as designed and perfected in the United States, is attested by the growing procession of engineers and public works officials from many foreign countries who are now coming to Washington

and from there spreading through the whole country to study problems of engineering and construction akin to those of their own countries. The influence which the United States is destined to exert upon the road building of the whole world in methods, organization and scope, is far beyond any previous experience.

The final, and by no means least essential element in our highway improvement industry is the contractor's organization. It is not possible to emphasize too strongly the contribution to the velocity of our highway progress as a whole that must be credited to the highway contractors and their competent, highly skilled personnel. There is a spellbound interest in watching a skilled operator of a bulldozer with brutal mechanical power finishing to line and grade the staked lines of a high fill, just balancing on the edge, but always drawing back safely just at the split second, or the engineer on a massive steam shovel juggling delicately a huge boulder precisely. Why don't more writers dramatize the skill, precision, faultless nerves and artistry of a really skilled operator of a powerful modern road machine? There is more real dynamic culture in such a picture than in a dozen still lives of so-called modern art. There are more dramatic moments in a big construction operation than on any stage.

The results in public benefits measured in terms of the reduction in unit costs for road building, coming through the combined efforts of all of these elements working in harmony, present a great record. The summary, which justifies more than a modest degree of pride in the accomplishments of the whole industry, will be offered later.

This backward glance is not to dwell upon the past experiences for themselves, but for the purpose of contrast with the greater potentials just ahead of us.

The Congress has reposed great confidence in the State highway departments and in the Public Roads organization. Equally it has set in motion a program that requires a severe break with past policies, organization and procedures, and major adjustments to administer with despatch and efficiency the new extended program. The two most important departures are, first, a program that consists of three relatively larger operations for improvement of the Federal-aid, rural secondary and main urban roads. Second, there are to be a greatly increased number of projects, and many more officials who have an interest and a legal relation to these projects. Interpolated here is the observation that if we as State and Federal officials, are intelligent enough and competent in essential understanding, no comparable break in the long traditions of highway administration will come in any foreseeable future. It will be the perfecting of the pattern of administration now entrusted to us by the Congress.

On the theory that before one offers advice he should first put his own house in order, and recognizing fully the two major characteristics that have just been defined, the Public Roads Administration has put into effect a comprehensive reorganization. This is predicated upon our responsibility to develop close relations and working agreements with the States, and through the States with the county and municipal highway organizations. These closer relations have two primary purposes: first, to develop administrative procedures that

are simple and technically sound, and second, to plan the routines for handling projects in largely increased volume to provide fiscal and technical control without unnecessary loss of time.

Our conception of how to accomplish these desired ends is indicated by the following actions which are now in effect, with the qualification that some of these policies entail continuing refinement and the acceptance of the new operating procedures on the part of our field organization.

1. To meet the greatly expanded Federal program, a major reorganization of Public Roads, in pattern, in physical distribution, in delegated authority to the officials with whom the State highway departments deal directly. Within the continental United States nine divisions have been established. The Public Roads representative becomes a Division Engineer whose duties become supervisory rather than operating. Each State within the Division becomes a district with a district engineer in charge, whose principal duties are to carry on, in cooperation with the States, the actual operations.

2. A cooperative agreement with the American Association of State Highway Officials to provide for the development of administrative and engineering regulations through joint committee action. Every memorandum or regulation that has been issued by Public Roads under the new legislation has had the scrutiny of an appropriate committee of this Association. We believe this method of procedure sets a new pattern for administering joint State-Federal undertakings.

3. To reach into the rural field there has been appointed a Board of Consultants on Secondary Roads. The Board is representative

of the most advanced county engineering organizations, and we believe the advice and counsel of this group will be effective in the determination of the policies which will be most productive in the secondary road program.

4. For the immediate future there is to be formed a Board of Municipal Engineers acting as consultants to represent the urban group.

This plan as a whole places in operation a forum before which complaints at any level can be stated and impartially considered. This method of approach to administrative problems lifts the discussion above the level of personal opinion and brings to bear the judgment and experience of an informed group representing both the State and Federal highway officials. Emphasis is placed on balancing the relations between the State and the Federal Government. Each has its own responsibilities, and it is apparent that such a plan of procedure makes possible the consideration of important matters covering the whole range of technical, administrative and fiscal questions generated by a program as extensive as that now to be placed under way.

Highway System Selection.

The selection of systems of highways for improvement is the first operational procedure on the new program. Splendid progress has been made in recommendations by the highway departments as to the routes to make up the Interstate system, and announcement can be made very soon of the major part of the system. The routes recommended for inclusion in this system total 45,556 miles, exceeding by 5,556 miles the limit of the system to be designated. Included are 2,013 miles of circumferential and distributing routes located in the vicinity of larger cities in a

majority of the States. Of the recommended mileage of main intercity routes, 31,326 miles consist of routes included in the system recommended by the National Interregional Highway Committee, constituting 92.3 percent of the total of 33,920 miles recommended by that Committee. The mileage finally adopted should consist of main intercity routes and circumferential and distributing routes in appropriate proportion.

The 2,013 miles of circumferential and distributing routes recommended are not well apportioned among the States. Some States have recommended substantial mileage of this character; others have recommended none. The conception of function, as indicated by the particular routes recommended, varies widely among the several States.

In approaching the tentative integration of the recommended routes, it has seemed desirable in the first instance to attempt to reach agreement on a system of main intercity routes only, postponing for the time being consideration of the distribution and circumferential routes, and to add later the essential mileage of such routes after a further consideration by the States on the basis of a more uniform conception of their intended function. On the basis of the partial designation of approximately 2,000 miles thus far recommended by a majority of the States, a reservation of approximately 3,000 miles for a later and more uniform designation of such routes will probably be adequate.

In the tentative integration which we will shortly present for consideration by the highway departments, we have therefore tried to select a main intercity system of approximately 37,000 miles, or 3,000 less than the limit of 40,000 miles. The system of routes tentatively selected comes within 50 miles of this objective,--about 36,950 miles.

Included in it are 30,863 miles of routes that were included in the proposed interregional highway system, and made up 91 percent of that recommended system.

On the basis of the estimates supplied by the highway departments, this system, had it then been built to the proposed interstate standards, would have served on its rural sections in 1941, a total usage of 92,600,000 vehicle-miles daily, or approximately 20 percent of the total 1941 rural highway usage. So constructed and used, the average daily traffic in the rural sections would have been 2,720 vehicles.

The tentative integration described has been completed, and a map showing the proposed tentative routes in relation to those recommended by the States and by the Interregional Highway Committee, with complete explanatory data, will be sent immediately for review to all highway departments. We believe that the proposal will be found satisfactory almost in its entirety. Such differences as may develop it will be possible to settle promptly by conferences with officials of the States concerned. The relatively small adjustments necessary is a gratifying indication of the careful consideration that has been given the recommendations by the State highway departments.

As of January 17, 1946, the status of Federal-aid secondary systems was as follows:

| <u>Status</u> | <u>Number of States</u> | <u>Mileage</u> |
|--|-------------------------|----------------|
| Awaiting review | 3 | 17,991 |
| Under review | 5 | 32,306 |
| Reviewed - awaiting further information | 3 | 6,146 |
| Approved | <u>31</u> | <u>95,319</u> |
| Total submitted | 42 | 151,762 |

In many States the approved mileage covers a small initial submission sufficient only to provide a selection of the first year's program of projects. In the 21 States that have made substantial submissions, the Federal-aid secondary systems average approximately 9.4 percent of the total rural road mileage in the State. The largest initial submissions to date are from Florida and Louisiana, with 18.2 percent and 14.0 percent, respectively, of the total rural road mileage; the smallest involves one route five miles long in Massachusetts.

In a few States the counties are offered only the minimum degree of participation required by the 1944 Act, i.e., a voice in the selection of the routes to be designated in the Federal-aid secondary system, without subsequent county participation in the formulation of the program or in the actual construction. In other States there has been established in the State Highway Department a Division of Secondary Highways with an engineer in charge who has full authority to cooperate with local highway organizations and to delegate to them as much of the responsibility for planning, engineering and construction as each county is organized and equipped to undertake. This type of cooperation is patterned after that which has been successfully established between the State highway departments and Public Roads.

A high degree of cooperation between State highway departments and counties in the Federal-aid secondary program will have far-reaching benefits.

The Board of Consultants on Federal-aid Secondary Roads, as a result of their first two-day conference with Public Roads officials, have agreed unanimously on the broad precept that the most important benefit to be derived from the Federal-aid secondary program, since a relatively limited mileage of roads can be built with the Federal-aid funds available, is the promotion of better planning, administration and engineering in all local road work, which will result if close and continuing cooperation is achieved among the three agencies concerned--the Public Roads Administration, the State highway departments and the local authorities. Steps which will aid in achieving this cooperation are:

1. (a) The establishment in each State highway department of a Division of Secondary Highways, the primary function of which would be to cooperate with the local authorities in administration, planning, engineering, construction and maintenance.
- (b) Encouraging the development of competent local highway engineering. An effective method recommended is the assignment by State highway departments of direct responsibility to counties or groups of counties for as much of the work as is feasible.
2. Counties should be encouraged to establish engineering organizations either individually or in combination of two or more counties.

We are in complete accord with these recommendations made by the Board of Consultants.

State Highway Department Organization

The administration and management of highway affairs have failed to keep pace with the scientific and technical advancements that have

been made in the field of construction and maintenance. The urgency of building as rapidly as possible an extensive system of highways has perhaps necessarily forced administration and management to a role of secondary importance. Now, with the greatly enlarged scope of operations, management becomes of paramount importance. This subject is particularly timely. With the end of the war the highway administrator faces a great test in the period of reconversion as well as in the more distant future. The Federal-Aid Highway Act of 1944 imposes an administrative responsibility very much greater than at any previous period upon the Public Roads Administration and the State highway organizations. Successful administration will depend to a greater degree than ever before upon how well the State organizations are prepared to meet the situation. In many cases the State administrative organization is poorly adapted to perform the greatly increased tasks of the immediate future. In the main these States still have the organization structure set up more than 25 years ago, except for additions through the natural process of accretion. The result is an obsolete type of organization, inadequate and ill-suited to proper and well managed operations. In such cases the only possible solution is a major reorganization which will achieve the modern, efficient and integrated structure essential to present-day administration.

Almost the whole of management may be expressed in terms of personnel. To do the job at hand, highway administration must command professional and technical competence, and it must be organized to take full advantage of the best talent available. Finding the right people for the high-level positions is important and difficult.

During the war period highway departments lost heavily of their best qualified engineering personnel. Some are returning, but many others will not return because of greater inducements elsewhere, particularly in private industry. Thus we find ourselves with a paradoxical situation, in which the public service cannot compete with private business for administrative and professional personnel, while it is recognized that the public service demands the best talent for effective administration. An examination of the facts quickly proves why this situation exists.

Statistics of salary scales recently submitted by the highway departments show the range in salaries of the chief engineering officer is from \$4,500 to \$15,000. The median salary for all States is \$6,350. Posts of comparable responsibility in private industry, or even in the Federal service, command much greater salaries. Moreover, the salaries paid have little or no relation to the responsibilities of the position or the work load, as measured by such approximate indices as mileage administered, construction and maintenance budgets, and the size of the organization.

A similar condition exists in other top administrative posts. For example, chief construction engineers' salaries range from \$3,360 to \$10,500, with a median salary of \$5,000. Likewise for the position of bridge engineer, the range in salaries is from \$3,600 to \$9,000.

In the intermediate grade engineering positions such as resident or project engineers, the situation is equally unfavorable. The range in salaries is from \$1,620 to \$4,800. For the lowest grade of engineering

personnel, the starting salary ranges from \$900 to \$2,100. While several States pay a liberal starting salary to their lowest grade of engineering personnel, the vast majority of the highway departments pay a wage less than the average Government clerk receives. Obviously salaries of this kind will not attract the better engineering talent. It is little wonder that highway organizations have found so much difficulty in attracting and holding competent personnel.

The variation in the classification and compensation of positions is astounding. No general and consistent relationship in pay between similar employments is to be found among the States. A marked compression is noted, however, because of pressure upward by increases of lower-paid positions at the bottom, and from the general disinclination of public authorities to recognize the importance and responsibility of positions at the top by proportionate increases. There is a serious need for a general overhauling of the job classification systems and compensation scales to bring them near the levels for corresponding positions in private business and industry.

During the war period there has been some general upward revision of wage scales in some States, while others have given so-called cost-of-living bonuses. In some cases flat increases were given to all but department heads and top administrative posts. But in the main the increases were insufficient to compensate for the rise in the cost of living of 26 percent since January 1941, as reported by the Bureau of Labor Statistics.

Despite the foregoing, the highway profession surprisingly has retained men of excellent calibre. However, most of the leaders in this field have reached the age of 50, and many are well past 60.

The recruitment and training of engineers to replace these men and fill existing vacancies, is urgent. In addition, the expanded program will require many more competent engineers. Too little attention has been given in the past to systematic recruitment, training and replacement.

Not only must the salary level be raised sufficiently to attract and hold competent engineering personnel, but efforts should be made to make State highway employment more attractive and secure. Surveys have indicated that greater assurance of continuity of employment, better opportunities for advancement and rewards for outstanding service, and freedom from politics are desirable and will offer additional inducements to engineering personnel. More liberal sick leave, vacations, extension of retirement systems and the security offered by the inauguration and extension of Civil Service should be explored as possibilities for adding to the attractiveness of State highway employment.

We are very hopeful this Association will agree that a serious effort must be made to strengthen the highway department organizations and to raise the standards of compensation so as to reasonably permit each Department to compete with private organizations and other public departments in securing and retaining first-class engineers in all grades, accountants, and highly qualified specialists in traffic, landscape development and other fields essential to an adequate highway department. Probably a subcommittee of the Committee on Administration should be designated to carry on this study and to report back to the Association in time for the next sessions of the State legislatures.

We may as well face the fact that many States will not be able to build adequate organizations to carry on the program now provided, unless they recognize that competent highway technicians are not available at present salary rates. A study of present salary scales and a recommended schedule can be developed without subjecting either departments or individuals to any personal embarrassment. Such a study should include recommendations for joint action with the universities and colleges for the selection and training of young engineers to build the State highway organization constantly from the bottom. Everything possible should be done to make an attractive career job as secure as employment can be made if the service rendered is competent. This question of sufficient competent personnel for each highway department is a serious one, since we see the probability that Federal funds will be forfeited by some States because of lack of organization to prepare adequate, accurate contract plans.