

The Progress of the National Highway Program

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The Federal-Aid Highway Act of 1944 will be two years in effect on October 2, a few days hence. While two years can hardly be considered old age, the pressures for more and better highways are so intense it already seems timely to ask some searching questions--the kind of questions that require cold facts to satisfy--facts that are essentially honest and disinterested. The basic question is - Has the Federal Highway Act, with the concomitant State legislation, in a short lap demonstrated a capacity to produce results, and provided a pattern of administration that, in these two essential elements, can be impartially judged adequate?

Dr. LeComte du Nouy, in his recent book "Human Destiny," says "human observations are always related to the system of reference chosen." He gives credit to the late Professor Charles Eugene Guye, a brilliant Swiss physicist, for the exposition of the principle that "it is the scale of observation which creates the phenomenon." Lest this become a bit too rarefied, perhaps it can be simplified by an example. When a man looks at a mouse he is impressed by its utter inconsequence. True, a mouse can cause some feminine squeals and tight wrapping of skirts, but the "scale of observation" is too magnified to lift the mouse above a minor nuisance. But have you ever considered what the mouse's "scale of observation" of the man must be? We are aware from his behavior that he wants no part of any man in his life. The difference in physical magnitude between the man and the mouse may exaggerate the "scale of observation" in a relative sense, but it

may impress an important point. It requires more than the "scale of observation" of which the mouse is capable just to understand, and at least a reasonable degree of experienced intelligence to evaluate the unlimited potentials of this new legislation, which are already promised by the actual accomplishments in less than 24 months. The promise lies in the facts of the current program. Notwithstanding the shortage of critical materials, of disorganization of engineering and contracting forces, and other limiting conditions, the highway officials responsible for the administration of the new legislation have made a truly magnificent record. Under the legislation we can broaden the scope of credit for accomplishment to include county and city officials in addition to the State highway departments. For the first time we have experienced truly national teamwork in the attack on our highway problems. The credit for setting in motion the over-all program to develop a national pattern of highway development to serve the three major classes of highway traffic must go to this splendid concept of legislation. At the center of this activity are the State highway departments, and here are some of the results of cooperative teamwork in the face of all obstacles.

The Current Status of the Selection of the Federal-aid Systems

During the breathing space afforded by the war some of the highway departments had taken advantage of their opportunity to make comprehensive revision of the Federal-aid system. Such activity has been carried on during the past year and is expected to continue during the coming year to gain a more orderly segregation of routes as between the Federal-aid system and the Federal-aid secondary system. Such re-examination and adjustments are encouraged by the Public Roads Administration. During the

past year six States and the Territory of Hawaii have made comprehensive revisions in their Federal-aid systems. In the remaining States and Territories there have been 168 revisions of previously approved routes and the addition of 21 new routes. These changes have resulted in the expansion of the Federal-aid system by 1,012 miles during this one-year period.

Progress being made in the improvement of the Federal-aid system in the postwar period is indicated by the fact that improvements have been programed on about 15,000 miles, or approximately 7 percent of the Federal-aid system. The improvement of this mileage involves the use of about \$437,000,000 of Federal funds, or about 67 percent of the postwar funds authorized for the Federal-aid system by the Federal-Aid Highway Act of 1944. This relation implies that utilization of the entire amount authorized will provide for improvement of about 23,000 miles, or 10 percent of all the mileage included in the Federal-aid primary system. It would seem that a faster rate is necessary if a program of economic replacement is to be followed.

Measured in terms of postwar accomplishments in construction, as well as in terms of work which is programed, steady progress is being made. Plans are approved for 10,210 miles involving \$278,000,000 of the Federal funds, or 43 percent of such funds available under provisions of the Federal-Aid Highway Act of 1944. Ninety percent of this work is under contract or completed.

The Federal-aid secondary system

Beginning in the spring of 1945 and continuing throughout the calendar year 1946, most of the States proceeded to select their initial

Federal-aid secondary systems under the provisions of the Federal-Aid Highway Act of 1944. By January 1, 1947, the systems for all States and Territories combined included a total of approximately 325,000 miles or approximately 41 percent more than the mileage included in the Federal-aid system. By January 1, 1947, most of the States had Federal-aid secondary systems, which included principal secondary or feeder roads of descending importance down to that level needed to provide adequate latitude for programing. Since the first of the year another 32,000 miles have been added by the States needing additional mileage to round out their systems to reach this objective. There are still a few States requiring some relatively small mileage increases to reach this objective, but for the country as a whole it is anticipated that the rate of system expansion will now settle down to a steady and moderate long-range rate of growth required to maintain at all times adequate latitude for programing for a period of, say, 6 to 8 years in the future.

In the selection of the secondary systems, emphasis has been given to the fact that they should be composed of the principal secondary and feeder roads to conform with provisions of the Federal legislation. In effect this means that the Federal-aid secondary network is extending outward from market areas to provide the maximum amount of farm-to-market service per mile included. As the Federal-aid primary and Federal-aid secondary systems expand from the 590,000 miles now included in these two systems to reach, perhaps in a period of 10 years, as much as 750,000 miles, they will embrace one-quarter of the total rural-road mileage. That one-quarter will provide almost 90 percent of the entire service, and routes on the systems will pass or come within 0.2-mile of almost one-half of all rural dwellings. People living on the other three-quarters of the

rural roads more remote from market areas will usually travel over the routes of the Federal-aid or Federal-aid secondary systems in traveling from farm to market and return.

Improvements on the Federal-aid secondary system have now been programed on about 32,000 miles, or approximately 9 percent of the total mileage included in the Federal-aid secondary system. The improvement of this mileage involves the use of about \$274,000,000 of Federal funds, or about 63 percent of the postwar funds authorized for the Federal-aid secondary system by the Federal-Aid Highway Act of 1944. It would appear that the entire amount authorized will provide for improvement of about 51,000 miles, or about 14 percent of all of the mileage presently included in the Federal-aid secondary system.

Measuring postwar accomplishments in terms of construction progress, the picture is considerably brighter than a year ago but work still lags a little behind the Federal-aid program. Plans are now approved for 18,300 miles of secondary roads, involving \$159,000,000 of Federal funds or 37 percent of such funds available under provisions of the Federal-Aid Highway Act of 1944. This is three times the amount of a year ago. Plans have been approved during the 9 months since our Los Angeles meeting involving funds approximately equal to the value of work for which all plans had been approved prior to the Los Angeles meeting. Eighty-four percent of all work for which plans are approved is under contract or completed.

The urban Federal-aid system

It is desirable that major effort in system selection activities be applied to the selection of the Federal-aid system in urban areas.

It is generally recognized that the improvement of our main intercity routes has progressed in an orderly fashion largely because of the prior selection of the Federal-aid and main State highway systems. Establishment of the systems has set a goal, and periodic studies of the needs of these systems have been the means of avoiding haphazard and random development. The benefits of system selection in the case of the Federal-aid secondary system provide a recent example of the desirability of proceeding in this manner. The time is ripe now for selecting the Federal-aid system in urban areas to provide the same basic framework for orderly accomplishment of our newest long-range task of assisting the municipalities in arterial street development. Preliminary instructions have been sent out to our Division Engineers to proceed with this important step.

Improvements on the Federal-aid system in urban areas have now been programed on 618 miles, involving the use of \$178,000,000 of Federal funds, or about 50 percent of the authorized postwar Federal-aid urban funds. Plans have been approved for projects involving \$79,000,000 of Federal funds, or 22 percent of the authorized postwar Federal-aid urban funds. This is almost four times the amount of a year ago. Seventy-five percent of all work for which plans have been approved is under contract or completed.

The Interstate System of Highways

The designation was announced, on August 2, of the complete intercity network of the National System of Interstate Highways. This network, comprising 37,681 miles of the 40,000-mile eventual extent of the entire system, includes 2,882 miles in cities, forming the principal

extensions into and through the connected cities. The remainder of 2,319 miles has been reserved to permit addition in the larger cities of distribution and circumferential routes, essential as terminal connections of the system. Designation of this further mileage in cities, now under way, requires the close cooperation of city, State, and Federal authorities.

The additional designation of interstate highway routes in the cities will proceed simultaneously with the further selection of routes for addition to the Federal-aid system in urban areas. The latter selection will embrace the former, and in addition will include the routes of substantial importance as arteries within the urban areas. The result will be a large expansion of the existing Federal-aid mileage in the urban areas, and of course a corresponding increase in the scope of application of the Federal urban-area funds.

It is in its requirement of the planning of three systems, rather than in the appropriations it authorizes for a short term of years, that the great fundamental merit of the 1944 Act is to be found. By the fact that the new system selection it requires will accomplish a complete functional classification of all roads and streets, differentiating clearly between the two general classes of arterial and land-service facilities in both urban and rural areas, the 1944 Act is distinguished from the parent Act of 1921, which provided for only a partial classification, and expedient first measure of planning.

Contract Awards and Construction Put in Place
January 1, 1946, to August 31, 1947

Contracts awarded on Federal-aid projects during the 20-month period from January 1, 1946, to August 31, 1947, amounted to \$932,000,000 in total cost. During the same period, the total cost of construction put in place on these and other projects under way at the beginning of the period amounted to \$671,000,000. Thus, during the 20-month period, total contract awards on Federal-aid projects exceeded the total cost of construction work done by about \$261,000,000. Data covering the excess of contract awards over work done since January 1, 1946, and ratios of work done to contracts awarded, are as follows for the intervals indicated:

<u>Interval</u>	<u>Contracts awarded</u>	<u>Work done</u>	<u>Excess of contract awards over work done</u>	<u>Ratio, work done to contract awards (percent)</u>
Jan. - June, 1946....	\$243,823,000	\$80,121,000	\$163,642,000	33
July - Dec. 1946.....	274,889,000	250,032,000	24,857,000	91
Jan. - June, 1947....	290,246,000	195,777,000	94,469,000	67
July and Aug., 1947..	123,447,000	145,010,000	-21,563,000	117
Total.....	932,405,000	671,000,000	261,405,000	72

The awarding of contracts at a more rapid rate than construction was being completed resulted in a program of Federal-aid projects under construction on August 31, 1947, amounting to \$817,000,000 total construction cost, of which projects let to contract between January 1, 1946, and August 31, 1947, amounted to over \$766,000,000. The following breakdown of projects under contract not completed as of August 31, 1947, indicates the total cost of projects placed in contract-awarded status prior to January 1, 1946, during each 6-month interval from that date to June 30, 1947, and during the 2-month interval from June 30, 1947, to August 31, 1947:

<u>Interval</u>	<u>Total construc- tion cost</u>	<u>Percent of total</u>
Prior to January 1, 1946.....	\$ 50,558,415	6.2
January - June, 1946.....	125,565,088	15.4
July - December, 1946.....	254,492,204	31.2
January - June, 1947.....	263,048,409	32.2
July and August, 1947.....	123,061,365	15.0
Total.....	<u>816,725,481</u>	<u>100.0</u>

The total cost of projects under construction on June 30, 1947 was about \$771,300,000, as compared to the \$816,700,000 total indicated above for August 31, and the June 30 total for projects let to contract after January 1, 1946, was \$717,774,926.

The Federal-Aid Highway Act of 1944 and prior legislation provided for the financing of several classes of work in addition to construction, such as highway planning, preliminary engineering, purchase of rights-of-way, and, under the Defense Highway Act, of advance engineering surveys and maintenance of access roads to sources of raw materials. The total program of Federal-aid work under way or let to contract as of August 31, 1947, included construction and other classes of work as follows:

<u>Class of work</u>	<u>Total cost</u>	<u>Percent of total</u>
Construction.....	\$816,700,000	92.5
Highway planning.....	9,100,000	1.0
Preliminary engineering.....	27,100,000	3.1
Purchase of rights-of-way.....	16,100,000	1.8
Advance engineering surveys.....	13,400,000	1.5
Maintenance (access roads).....	1,100,000	0.1
Total.....	<u>\$883,500,000</u>	<u>100.0</u>

Work remaining to be done as of August 31, 1947, on all projects under way or let to contract as of that date amounted to approximately \$441,000,000, or about 50 percent of the \$883,000,000 total program indicated above. Assuming equal rates of completion for the various

classes of work included in the total program, the total construction work remaining to be done as of August 31, 1947, on projects previously let to contract amounted to approximately \$408,000,000 (92.5 percent of \$441,000,000.)

The total work remaining on June 30, 1947, amounted to about \$463,000,000, compared to the \$441,000,000 total indicated above for August 31.

In addition to the Federal-aid program, highway contracts awarded on independent State work and on local work during the period from January 1 through August 31, 1947, totaled \$176,800,000 and \$126,600,000 respectively. (Data covering contract awards on independent State work are assembled by Public Roads, and on local highway work by the Federal Works Agency from F. W. Dodge reports, Engineering News-Record, etc.). These State and local awards total \$303,400,000 or about \$110,000,000 less than contract awards on Federal-aid work alone during the same period. Total contract awards on Federal-aid, independent State, and local highway construction projects during the 8-month period January through August, 1947, amounted to approximately \$717,000,000.

The total cost of contracts awarded since January 1, 1946, for Federal-aid, State, and local highway work amounts to \$1,645,000,000, as follows, for the award periods indicated:

	Total cost of contract awards			
	Federal-aid 1/	State 1/	Local 2/	Total
Jan. - June, 1946...	\$243,800,000	\$100,200,000	\$73,100,000	\$417,100,000
July - Dec., 1946...	274,900,000	128,800,000	107,300,000	511,000,000
Jan. - June, 1947...	290,300,000	123,700,000	81,500,000	495,500,000
July and Aug. 1947..	123,400,000	53,100,000	44,700,000 3/	221,200,000
Total.....	932,400,000	405,800,000	307,000,000	1,645,200,000

1/ Source - Public Roads Administration.

2/ Source - Federal Works Agency, as assembled from F.W. Dodge reports, Engineering News-Record, etc.

3/ Local contract awards for August were estimated, since reported data were not available.

Based upon the relation between Federal-aid contract awards prior to August 31, 1947, and construction work remaining to be done as of August 31, 1947, the total Federal-aid, State, and local highway construction work under contract and remaining to be done as of August 31, 1947, would amount to \$720,000,000, as follows:

<u>Kind of projects</u>	<u>Contract awards, January 1946 through August 1947</u>	<u>Estimated total cost of construction work under contract and remaining to be done, as of August 31, 1947</u>
Federal-aid.....	\$932,400,000	\$408,000,000
State.....	405,800,000	178,000,000
Local.....	307,000,000	134,000,000
Total.....	1,645,000,000	720,000,000

The estimate of \$720,000,000 of highway construction work under contract and remaining to be done as of August 31, 1947 is not precise but it does afford an indication of the approximate total volume of highway construction under contract and not completed.

Personnel Administration

Organizational difficulties and low salary scales continue to beset highway departments. Expected improvement has not materialized, and shortages of engineering and technical personnel are jeopardizing current highway programs. A study just completed by the Highway Research Board Committee on Organization and Administration, upon which the Association's Special Committee on Classification and Compensation of Highway Department Employees expects to base its recommendations to this Association, indicates that there were approximately 9,800 unfilled engineering positions in the 48 State highway departments as of July 1, 1947.

The study recommends minimum salary levels which would require salary increases in about three-fourths of the States. Failure to deal adequately with the salary question underlies the difficulties now facing the departments, and they must redouble their efforts to secure salary scales which will enable them to attract and hold competent employees.

Salary increases alone are no panacea, however. Previously I have called attention to the need for improved personnel policies, greater security, better recruiting, and modernized organizational structures. These advances are also advocated by the Highway Research Board Committee report, which I commend to the attention of all highway administrators for its rational approach to the problem.

Finally, since improvised personnel policy and inadequate organization are together limiting the capacity of State highway departments to develop and operate in accord with the many-times-increased responsibilities of recent years, I urge highway administrators themselves to take a greater interest in personnel policy and related matters. The problems of organization should be attacked with the same vigor and scientific approach as has been applied to technical problems.

The Importance of Strengthening and Broadening the Scope of the Planning Surveys

The results already obtained from the Nation-wide highway planning survey should convince even the most skeptical that local as well as national transportation policies must be determined upon the collection, analysis, and use of factual data. The war demonstrated the interrelation and interdependence of the various forms of transport and, in the foreseeable future, it is certain that this country will continue to require

the movement of persons and commodities by highway, rail, water, and air. The time has arrived when we must broaden the scope of our outlook and studies to the end that the best possible service can be rendered by all forms of transportation, in the public interest.

Highway transportation is the common denominator in the over-all transportation field, in that the performance of this service correlates, assists, and implements all other types of movement. It would seem necessary, therefore, that a better understanding and spirit of cooperation among the selected representatives of highway, rail, water, and air transport be encouraged and developed. It is recommended that you invite the active participation of the other transportation industries in the formulation of plans for future development, to the end that the public as a whole may be best served and that this nation shall have an efficient transportation system adequate for its commerce and the national defense.

In the urban areas, particularly, the daily reciprocal movement from home to work and work to home is the most prominent feature of highway traffic. It is for the more efficient conveyance of these great tidal movements that the various degrees of arterial street improvement are proposed and required. The necessity for improved arteries will increase as the inevitable outward trend of urban home location continues.

In a large and unfortunately increasing measure, the great tidal movements are inefficiently accomplished in private motor cars. In large but undesirably decreasing part, they are served by mass transit facilities. Our previous experience in the building of rural highways has accustomed us to the thought of highway passenger traffic as a movement almost universally accomplished in privately owned motor vehicles.

As we approach the problem of arterial improvement in the cities, we cannot fail to recognize the vastly larger element of mass transit in the urban passenger movement. We shall have to learn to think of mass transit as highway traffic, and as a form of highway traffic especially in need of improvement. Whatever we can do to promote the patronage of mass transit and reverse the past trend toward the preferential use of private automobiles will be a contribution of great benefit in the solution of urban traffic problems. Unless this reversal can be accomplished, indeed, the traffic problems of the larger cities may become well nigh insoluble. We will make this highly desirable contribution only if, in the planning of our urban arterial improvements, we incorporate the special provisions that are needed for the service of express mass transit in its several appropriate forms.

In summary, that the "scale of observation" be adequate is essential to the successful administration of the new and greatly expanded responsibilities of the highway officials at all levels of government. True, there will be obstacles stemming from sources whose "scale of observation" is limited to, or restricted by, self interest. Highway officials are not building roads for the sake of building roads. This national highway program is one major force in a determined attack upon grave social and economic problems, national in implication and effect. For example, those who hold that the road program reaches too far into the rural areas may well lift their eyes from the roads themselves to the vision of food supplies--food not only for our own people but in a large measure for the hungry peoples of the world--the most critical problem of the world today. Road transport is one of the indispensable means to make possible this objective. The service list

could be indefinitely extended. It is necessary now to inform the public fully as to all elements of the long-range program. The States of New York and California have set high standards in the reports they have prepared. Before the next legislatures meet the other 46 States must be equally well informed, and we have the responsibility to the Congress to provide them with equally adequate information for the Nation as a whole. This is the important task ahead.