

## STATE-FEDERAL RELATIONS IN HIGHWAY DEVELOPMENT

By Thos. H. MacDonald  
Commissioner of Public Roads

Presented at the 34th Annual Meeting  
of the American Association of State Highway Officials  
Salt Lake City, Utah, September 21, 1948

While in theme repetitions of previous observations before this Conference, a review of State-Federal relations in our common objective of efficient highway development appears timely, since the lag is greater in perfecting administrative organization and practices than in development of engineering techniques. In the long run the results realized will depend in greater degree upon the quality of highway administration than upon the accumulated engineering knowledge. The latter is the servant, not the master, of highway destiny. Progress in engineering techniques goes on at an accelerated pace. This contrasts sharply with advance in administrative policies and the development of efficient administrative tools.

The engineer, before turning his transit forward, takes precise observations upon his previously fixed points. For the course to follow ahead, he is greatly aided if major triangulation monuments have been previously established. The postwar years particularly have been marked by uncertainties without triangulation points ahead. In place of reliable landmarks to guide the highway official in solving day-to-day problems of administration, there have been continuing blank spaces of major extent. Decisions have to be made resting upon the best information available at the moment, with the full knowledge that conditions as they unfold may substantially affect the validity of policies thus set in motion to accomplish hoped-for objectives.

Highway development for the nation is no overnight job. It is a continuing undertaking with mammoth dimensions, and its importance is rapidly accelerating. The only guidance the highway official has under present-day conditions to determine current administrative policies are the back sights that are fixed by yesterday's experience, and the collection and analysis of factual data to determine the future course that appears to offer greatest promise.

The most useful administrative test for building a sound policy structure is the factual focus. The bringing into focus of all major facts is the only method of obtaining a reasonably true perspective of large problems--an effective tool too infrequently used. Since improved highways must be classed as public services, not as end products, the factual focus should be used to measure their relativities. That is, their true priority and value are relative to the essentiality of each of the whole category of individual and public services which are dependent upon them and impossible without them.

Upon this basis we can examine some of the current policies and problems.

#### 1. Relative Extent of Federal-aid Highway Program

Criticism has been expressed that the three-year annual \$500,000,000 Federal-aid authorization of 1944 represented an extraordinary participation by the Federal Government in the Nation's total highway and street program, and that since the level of private industrial activity and employment is very high, the size of the Federal-aid program should be

materially reduced in the interest of economy and as an anti-inflation measure. Testimony to this effect was in fact introduced during the hearings in Congress preceding the passage of the 1948 Act which authorizes \$450,000,000 per year for the fiscal years 1950 and 1951.

The facts tell quite a different story. It is now universally recognized that adequate highway systems are required by, and are essential to, the economy and security of the Nation. The postwar Federal contribution is not a major or even a high percentage of the annual cost of providing and maintaining the highways and streets now in service. During the years 1946 and 1947 it represented only 14 percent of the total highway construction and maintenance bill. For these years the Federal contribution in actual expenditure did not reach the level of \$500,000,000, but if the full rate of expenditure had been realized, the Federal contribution would have been less than 20 percent of the total highway bill. There is no way to measure with any precision the relative Federal, State and local responsibilities in the cost of providing our highways and streets. There can be a reasonable recognition of the equities involved. In this cooperative undertaking, which possesses such extensive national utility, and which is best suited to our plan of government, it is inconceivable that a Federal contribution ranging between 15 and 20 percent of the over-all cost can be fairly judged an adequate contribution by the Federal Government, much less an excessive participation.

Viewed as a single isolated figure preceded by a dollar sign and followed by a string of ciphers, \$500,000,000 is a large sum. Viewed

in its proper context in relation to the total of Federal expenditures, and the dollars involved in the highway transportation industry as a major element in the whole national economy, the Federal contribution to the highway program of the Nation does not bulk so large. During the fiscal year 1948 Federal expenditures approximated \$36.66 billion. Of this total, slightly more than 3 percent was expended on construction, and less than one percent on the Federal-aid highway program. Again, if the rate of expenditure of Federal aid had been at the full amount authorized, it would have represented less than 1-1/2 percent of the total Federal expenditure. Does this now appear to be such an excessive contribution by the Federal Government?

In terms of the individual citizen, a \$500,000,000 Federal participation represents \$3.42 per capita, or less than one penny per day. This is equivalent to about one stick of chewing gum.

There is still another factor to be considered in viewing the size of the Federal-aid highway contribution. The postwar dollar is considerably smaller than the prewar dollar. Expressed in terms of highway construction purchased, the present annual postwar Federal-aid contribution amounts to very little more than the smaller Federal-aid authorizations of the prewar years, and is relatively less than work relief expenditures for certain years.

Incidentally, propaganda unchallenged seriously misleads public thinking. The criticism that Federal aid as a policy leads to extravagant spending is false. The rate of expenditure relative to the funds available is more rapid for projects financed wholly by State or Federal

funds than for projects financed jointly. This slower rate of exhaustion of funds reflects more adequate consideration of priority of need, and more thorough preparation of plans required as a prerequisite for joint administrative agreement. These requirements many times are the only protection of a sound, long-range program against the distortions of political pressures or promises.

## 2. The Highway System--An Operating Plant

Next in order perhaps under present conditions is a back-sight on the question,--Are highway improvements a luxury purchase? The provision, maintenance and operation of highway facilities represent basically an essential phase of one of the principal industries of the Nation--the industry of highway transportation--an industry which we obviously cannot eliminate and one which the public gives no indication of curtailing. Quite the contrary! In the postwar period the unexpected expansion of the highway transportation industry is continuing. It is reflected in no uncertain terms by the continued demand for new cars, by the amazing increase in motor truck use, and by the increase in the use of all motor vehicles.

With all its size and importance, expenditures for highway transportation are a modest portion of all expenditures of the Nation. The Department of Commerce reports that in 1947 the total of personal consumption expenditures was 165 billions of dollars, of which slightly more than 12 billions, or about 7.5 percent, went for motor vehicle transportation. In 1947 total highway and street expenditures approximated \$2.5 billion, only 1.5 percent of \$165 billion. If street and highway expenditures could be eliminated entirely, it would have no preventive effect as an anti-inflation measure.

The industry is as completely dependent upon highways and streets, upon which all motor vehicles must operate, as it is upon the motor vehicles themselves. The only difference from a completely private transportation industry is that in this case the roadbed, or the plant, is provided by Government--Federal, State and local. Just as with any other plant, this plant must be initially constructed, enlarged from time to time, maintained, and periodically renewed. Road sections wear out and must be replaced. Obsolescence is an acute factor. There may be some categories of public construction, generally lumped under the label "public works," which can be regarded as postponable in times of prosperity, and which can be undertaken or expanded materially in times of depression in accord with the "pump priming" theory. The provision of adequate highways and streets cannot be so classified. Maintenance to a degree can be substituted temporarily for construction and reconstruction. This is exactly what we did during the war period, and to no small extent what we are now doing in the postwar period. During the war we built up a large backlog of deferred construction and reconstruction which we have hardly begun to reduce. In every State the volume of required construction necessary to bring our highways and streets to a condition of adequacy represents a program which it will require years to complete. To attempt to defer this needed program of capital improvements by maintenance is simply a penny-wise, pound-foolish policy. The maintenance dollar is worth no more than the construction dollar. Beyond a certain point it becomes necessary to spend several maintenance dollars for every construction dollar to keep an outworn section of highway or street in

service. With obsolete highways we soon reach the point where the expenditure of any number of maintenance dollars will not keep them open to traffic. The maintenance forces of the Nation have done an heroic job during the war and the immediate postwar period, but it is high time that we recognize the need to accelerate our program of capital replacements in the interest of true economy. We cannot achieve true economy by depreciating the capital now invested in our highways.

### 3. Price Trends and Progress

Highway construction costs continue at a high level and the price trend still points upward. However, the increase in highway costs is not out of line with the increase in costs for all types of construction, which in turn is not out of line with the general increase in the cost of all commodities. Since the total street and highway construction currently represents less than one-tenth of the total of construction activity, it is apparent that the highway and street program is too small a part of the total construction program, to say nothing of the total national economy, to affect the price structure materially.

If we are to continue in business we must pay the "going rate." If there is contractors' capacity to produce we need to increase our operations, in many States to a figure double or treble the present rate of construction. In doing so, however, we are not justified in paying exorbitant prices. We must continue our policy of eliminating unnecessary high-cost items, and of "careful shopping" for the essential items.

A study of price relationships in individual States indicates that we would pay about the same unit prices for highway work whether we

halved the present highway program or doubled it. In 1947 the highway program in various States ranged from less than 5 percent to more than 15 percent of the total construction activity, and yet there was no consistent relationship with respect to the extent of the advance in highway prices.

This is not to say that in any State the highway program can be doubled overnight without any effect on highway prices. It is probable that the manner in which the program is accelerated and maintained has a much more significant effect upon prices than the size of the program within the limits which we are here discussing. Unless the State adopts a policy of smoothly accelerating its construction program to the required rate, and thereafter maintains that rate, the highway contracting industry will not be encouraged to meet the program, nor can highway contractors afford the risk of close bidding when contract lettings are offered on an erratic feast and famine schedule.

We all recognize that the highway construction program has been seriously handicapped since the end of the war by critical shortages of materials, equipment, contractors' organizations, and labor. Many of the shortages are still with us. The staffing of adequate engineering organizations continues to be difficult. High prices heretofore have caused the postponement of many needed improvements in the hope of a price decline. Necessary preliminary arrangements relating to planning and financing are holding up some of the very important urban projects.

During the three years since the end of the war—the same three years for which the postwar funds were apportioned—we have placed

postwar projects under contract to the extent of about \$865,000,000 in Federal funds, or about 60 percent of the apportionments for the three years combined. In terms of construction put in place, the progress in advancing the postwar program amounts to about 40 percent of the funds apportioned for the first three postwar fiscal years.

Notwithstanding the many difficulties, the postwar program is gaining momentum. During the fiscal year 1946,--the first postwar fiscal year,--Federal funds for postwar projects placed under contract amounted to only about 20 percent of a \$500,000,000 apportionment. For the fiscal year 1947 the corresponding figure was 58 percent, and for the fiscal year 1948 it was 79 percent. During July and August of this year the projects on which contracts were awarded totaled over \$100,000,000 in Federal funds, and included a sizeable volume of urban work.

On a mileage basis the progress is impressive. Nearly 27,000 miles have been completed, and an additional 18,000 miles are under construction or under contract. When projects in program or plans-approved stage are included, the improvements financed from postwar funds total almost 64,000 miles, or more than 10 percent of the present mileage of the primary and secondary systems combined.

While we have achieved in the postwar period much in which we can take pride, we have not yet achieved a rate of highway construction which is consistent with the needs. Considering the Federal-aid program as an index, the volume of construction put in place during the last fiscal year represents 71 percent of one postwar year's Federal-aid apportionment

of \$500,000,000. In relation to needs there is every evidence that a Federal-aid authorization of \$450,000,000 to \$500,000,000 a year is conservative. Thus far, however, measured in terms of the final test of construction put in place, we have achieved a \$346,000,000 rate of production during the last fiscal year.

Several of the States have succeeded in advancing their Federal-aid highway construction program to the point where it approximates the postwar rate of Federal fund authorizations. Other States are approaching that objective. There are a number of States, however, whose postwar programs have been considerably delayed for various reasons, and it is in these States that particular attention needs to be given to expediting the programs in every way possible. The need for additional highway improvements is too great everywhere to justify satisfaction with respect to the over-all rate at which vitally needed facilities are being provided. Only by increasing our present efforts and continuing the program without interruption can we expect to overcome the many deficiencies that now exist in our highway transport plant.

Continuity of operations must be maintained. In a stable program, where the work contracted for and the work done during a year are about equal, it is necessary to have an average of about 60 percent of an annual apportionment contracted for and remaining to be done in order to accomplish during the year a volume of work equal to an annual apportionment. In an expanding program such as we have had since the end of the war, and have now, the ratio is 70 percent or more, and when there is a significant volume of large urban projects which require several years to complete, the ratio may be even higher.

These statements should not be misinterpreted. There are two reliable governors of the rate of contracting that should be attempted. First, the capacity of the highway organization to administer and to provide adequate engineering control, and second, the capacity of the contracting industry to mature high class production on time. These two governors effectively operating can be relied upon to determine the rate of contracting which should not be exceeded.

#### 4. New Patterns of Highway Administration Crystallized by 1944 Act

During the three decades 1916 to 1948 we have achieved a degree of highway development that far exceeds that of any other nation. The Federal-Aid Highway Act of 1944 constitutes a basic revision of Federal-aid highway legislation,--a revision not of the time-tested administrative principles of that law, but rather a revision adjusted to the three-fold task before us. It is not a mold to force conformance to any preconceived or arbitrary notion, but rather a recognition of the well defined future needs. It recognizes the basic requirements of our main routes by continued substantial provision for the primary Federal-aid system. It recognizes the need for the improvement of secondary or farm-to-market roads, but it wisely provides for an orderly development by requiring the designation of a system of principal secondary and feeder roads. It recognizes the increasingly acute problem of urban congestion with the provision of substantial authorizations for expenditure in urban areas. Finally, it provides for the designation of the National System

of Interstate Highways. In the light of our present knowledge the integrated pattern recognizes the most important required service and provides a national policy of road improvement not subject to informed attack.

## 5. Population Distribution Pattern

Certain basic factors profoundly influence the direction of sound administrative policies. The long continued change in the population balance from the rural to the urban areas, the growth of metropolitan concentrations, the shifts in urban population internally, and the fantastic expansion of daily travel mileage have rendered obsolete the conventional street plan for major traffic flows, and made necessary arterial systems for the mass movements. There has been a steady and rapid increase in the urban population, and a relative decrease in the rural population since 1800. From 1900 to 1940 the urban population increased from 40 to 56.5 percent of the total. In the same period, however, the population of the central core of the metropolitan areas increased at a much slower rate than their satellite communities. There has been a large increase in the size of metropolitan areas. The process is well illustrated by the nation's capital. The city has spilled over its original boundaries well into Maryland and Virginia. The approximate radius of the metropolitan area is at present about ten miles. There is every indication that it will shortly increase to 20 miles, and a sound plan for the future must extend well beyond this distance. Small, self-contained communities complete with shopping centers and small industries

are springing up everywhere in this metropolitan area. The growth of these smaller business communities is largely the result of the initiative of a great many individuals without serious conformity to any metropolitan plan. Because of the large number of independent governmental units involved, practically every large metropolitan center is today without a coordinated plan for the area as a whole. The most effective way--probably the only way--to realize a desirable area plan, is to select and construct promptly the skeleton framework of a long-term development pattern;--that is, the arterial road and street network which must serve the satellite communities and the central city. Until this framework, comparable to the steel framework of a modern building, becomes an actuality, the growth of the suburban communities, business districts and industries will continue to be largely an uncoordinated, heterogeneous growth. When the framework is an actuality, the growth of these communities will almost automatically be adjusted to the arterial system and be regulated thereby.

## 6. New Concepts of Decentralization

The growth of industrialism supplied the reason for population concentration. Industry has been piled on industry in metropolitan areas, and the constantly increasing numbers of workers required have multiplied the problems of preserving decent living standards. One major result is the priority problem of traffic congestion. There has been much conversation about decentralization, but very little has been done to change the trend of plant expansion in close proximity to existing units.

Now a new concept--that of security--is for the first time being given serious attention. Recently the National Resources Security Board has stated that the only present known defense against the new and terrible weapons of warfare is space;--not that space in itself protects, but that by segregation at reasonable distances of plant units,--particularly those of a critical nature,--there is the opportunity to protect the major part of an industry. Heretofore decentralization of industry has been loosely thought of in terms of relatively long distances. With the newer concept of five to ten-mile separations of plant units, and the separation of critical from non-critical plants or institutions, there appears to be a possibility of the acceptance of a new pattern for the future as new plants are built or old ones expanded. Over a period of time a measure of security would emerge that certainly does not now exist. The relation of such a concept of industrial development in the future to the larger scale planning of the arterial highway system within metropolitan areas is apparent. The policy of a security plan for future plant location and development is utterly dependent upon the provision of free flowing arterial and inter-communicating highways. Such highways must cut across the boundary lines of many jurisdictions. They become a common denominator for the whole area. By the force of these conditions the highway officials, State and Federal, are projected into the role of coordinators.

#### 7. Pressures to Distort a Balanced Highway Program

This year motor vehicles in use will doubtless pass 40,000,000 units. The service demanded of the highways, and every quantitative

element involved in highway transport stand at an all-time high. Highway construction costs are double those of the prewar period, and the highway funds are being depleted by maintenance costs at nearly twice the prewar rate. There are individuals and associations purporting to speak for the industries most dependent upon the extent, capacity and condition of the highway systems for their markets, that are placing serious obstructions--perhaps the main obstacles--in the path of the highway officials who are endeavoring to plan a legislative program calculated to meet at least in part the current realities of service demand, cost and income. Along with the demand of purely selfish interests for the legalizing of heavier loads, and the lowering of road user taxes, are the pressures to disperse road user income to the less important roads and away from the control of the highway departments. The only possible way of meeting the critical situation thus induced is an informed public opinion secured through the medium of the current needs studies now under way in many States. The importance of these cannot be over-emphasized. The membership of the study committees is composed of, or includes, representatives of the legislature, thus meeting the essential requirement that the legislative branch shall have complete information and shall help to formulate recommendations.

Our faith in the tenets of democracy lies largely in the proven fact that we can rely upon the majority action when the legislative branch understands the problems. We have recent confirmation in the legislation adopted by the State of California after a thorough study

and a factual report of the reasonable needs. That State has rendered a great service in pioneering a sound procedure to secure public support and legislative approval of a well balanced highway development program.

### 3. State-Federal Administrative Operations

The truly significant effect of the Federal-aid plan of operation is qualitative. The results spring less from the Federal funds than from the administrative principles incorporated in the Federal-aid legislation with the passage of the first Acts in 1916 and 1921, and which are perpetuated in the Act of 1944. In essence, these administrative principles establish a partnership of each of the State governments, represented by its State highway department, and the Federal Government, represented by the Public Roads Administration;--a partnership to which each partner brings his contribution and in which each assumes his share of responsibility; a partnership in which there are allotted to each partner specified functions; a partnership dedicated to a single, nation-wide program. Moreover, each of the separate State partners has a common Federal partner, which has been of the utmost importance in securing cooperation of adjoining States in the solution of inter-State problems.

The motive that first brought the State highway departments together to form this highly important American Association of State Highway Officials was the seeking of Federal highway legislation. The Federal-aid plan has demonstrated the principle that the States and the Federal Government can, by joint action, successfully attack problems which have both State and Federal aspects. There are no highways, except

in Federal areas, that are constructed and maintained wholly by the Federal Government, like the "National Highways" of other countries. Although other factors are involved, the plan of joint highway administration adopted in this country is very largely responsible for the advance in engineering techniques, operations and production, that has made the United States the Mecca of the highway engineers and officials of the world.

When the Federal highway law of 1916 was enacted, a most important prerequisite to the sharing in the Federal funds by the individual States was the establishment of an adequate State highway department. Less than half of the States had such departments. Today, with every State included, these departments are an honor to, and a major constructive force for, the Nation.

The 1944 Act extended Federal aid to the secondary and urban road systems. Of the more than 3,000 counties, our estimates at that time showed less than one-third provided with adequate highway engineering administration. In the urban areas for the first time under the supervision of the State highway departments, wide-spread engineering studies were made of the modern requirement of efficient arterial systems. The progress is good within the time. When we succeed in these areas in establishing the same engineering service and control that now exist for the Federal-aid highway system, we are well on the way toward the realization of a balanced highway program for the Nation.

We have attacked together the many new frontiers involved in the enlarged program. The more extensive operations have required changes in the organization of the Public Roads Administration as well as the State highway departments. There have been surprisingly few frictions developed by these major changes, a fact for which we are profoundly grateful to the State highway departments. We realize that these Departments confront certain difficulties, and it will be the constant effort of the Public Roads Administration, in its administrative policies, to provide the flexibility that will make the task of the highway easier, and free them from unnecessary administrative detail to the fullest extent consistent with our legal responsibilities. Our objective is that of the State highway departments. It is to the interest of the Public Roads Administration that we have and help to develop the strongest possible highway department in every State.