

## THE STORY OF THE CHARTS

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The four charts attached tell a concise story of the rise of the present-day highway problem. They picture the rapidly increasing numbers of vehicles requiring accommodation, the lack to this day of a consistent and commensurate financial provision for the construction of highways, the degree of the highway deficiency that has resulted, the nature of the relation that has existed between highway transportation and the general economy of the country, and the probable continuance of highway inadequacy in the absence of a substantial increase in the rate of capital investment in the highway plant.

### MOTOR-VEHICLE REGISTRATIONS - 1920-1954

The chart so captioned shows how the numbers of motor vehicles have increased over the years, and the relative numbers of autos, trucks and buses in each year. The numbers of trucks and buses alone now exceed the total of all vehicles in 1920, and the substantial increases in these larger and heavier vehicles now annually recorded are significant beyond their numerical values in the increase of traffic demand upon the highways.

Our roads are built to serve the movement of the vehicles here enumerated. Count something less than 10,000 miles a year for each vehicle, an average annual amount that tends slightly to increase from year to year, and you add up to the stupendous totals of vehicular movement our streets and highways are now required to accommodate. The total has risen from 302 to 540 billion vehicle-miles between 1940 and 1954.

Now see the chart captioned:

### FEDERAL AID HIGHWAY CONSTRUCTION PUT IN PLACE

Here we see year by year the total cost of Federal-aid highway construction. While this is only part of the total of all highway construction it reflects accurately what has been occurring in the entire road building program.

The heights of the shaded bars represent the actual costs in dollars of changing purchasing power. The heights of the adjacent black bars represent the dollars that would have been required to do the same amount of work at the average prices prevailing during the period 1925-1929. Thus the black bars afford a true comparison of the actual physical volumes of construction involved in the Federal-State cooperative program from year to year.

From 1928 through 1941 bid prices were lower than the average for the base period. So the adjusted values (black bars) are higher than the actual dollar values (shaded bars). Price increases since 1942 have reversed the relative heights of the bars. Since that year the adjusted values (black bars) have been the smaller. The black bars thus reflect the post war shrinkage in purchasing power of the dollar.

Notice that 1953's actual expenditure of more than a billion dollars, which more than doubled the 1936 expenditure of less than 450 million dollars, produced a construction volume which in adjusted value exceeded the 1936 volume by only about 20 percent. Between these two years the registration of vehicles increased by just about 100 percent.

The vehicles, increasing at a rate so far beyond the rate of highway construction and reconstruction made possible by highway dollars provided, have made demands upon the highway plant to which the condition of the plant has become increasingly inadequate. An increasing deficiency has accumulated, varying in degree from State to State, but of substantial proportions in all States.

On the vitally important routes of the nation's backbone highway system the varying degrees of these deficiencies are shown in the chart captioned:

SUFFICIENCY ANALYSIS OF RURAL PORTIONS OF  
THE NATIONAL SYSTEM OF INTERSTATE HIGHWAYS

The rural highways included in this system of interstate routes - the segment of our entire highway system of greatest significance for service of the nation's transportation needs both in peace and war - are shown to be variously deficient from State to State. In national summary, only 24 percent of the rural mileage of the system is rated as completely sufficient in its present condition for the service of the traffic it carries. Seventy-six percent of the mileage is found in need of reconstruction and improvement to correct existing inadequacies, and on 16 percent of the total mileage the need of reconstruction is critical.

All of these indices of the problem that faces us are brought together in the chart captioned:

SIGNIFICANT TRENDS IN HIGHWAY DEVELOPMENT

Here, in the section labeled HISTORICAL, are shown by the black bars the annual totals of highway expenditure on all of the nation's roads and streets, from 1930 to 1954, the actual dollar expenditures of each year adjusted to the common base of 1953 road construction prices.

The depreciated value of the highway plant in each year, resulting from these and earlier expenditures (not shown on the chart) is represented historically from 1920 to 1954 by the dashed line.

A solid line, appropriately labeled, traces the growth of total vehicle-mileage (the total of travel on all road and streets) through the same historical period.

And there is added another line (solid with dots) which represents the changing, and generally increasing, value of the country's Gross National Product, a measure of the nation's total economy.

The construction values are represented to a dollar scale appearing at the right of the chart. The curves of VEHICLE-MILES, GROSS NATIONAL PRODUCT, and DEPRECIATED INVESTMENT, represent index values of these different quantities referred to the value of each in the year 1940 represented as 100.

Note that the curve of increasing vehicle-mileage, starting low in 1920, soon catches up with the curve of gross national product and continues in close parallel with it through the decade of the thirties. The increasing use of motor vehicles, starting in earlier obvious immaturity, had by then reached a stage of mature growth closely geared to the growth of the general economy.

The curve of depreciated highway investment, rising from early low values in the years when the highway system was still largely unimproved, also approaches the other two curves and runs with them through the thirties. This decade, it should be remarked, was the period when our highways were recognizably most adequate to their task. The concentrated and accelerated road building effort of the two preceding decades had by 1933 produced a system of, largely, two-lane highways. However inadequate this system would be rated by the measure of today's needs and standards, it bore a close relation to the needs of its day, and through the later years of the decade it remained in that fortunate relation as a result of a sustained large volume of reconstruction and new construction. This high level of construction activity in large measure raised to the then necessary standard of adequacy not only the pioneer improvements of the earlier decades but also most of the previously unimproved mileage of more important highways.

With the onset of World War II the hitherto parallel trends of the three curves abruptly diverge. The curve of gross national product mounts upward with the War generated heightened productive activity; the curve of vehicle-miles drops precipitately under the compulsion of gasoline rationing. The curve of depreciated investment soon follows downward the lessening input of construction effort that had already set in as early as 1938. In this latter decline there began an arrearage of highway adequacy which, first seriously felt immediately after the War, has continued and increased to this day.

In the close juxtaposition of the three index curves which existed during most of the decade of the thirties we see a condition that probably must subsist in any period of appropriate balance between road usage and the facility provided and between both and the state of the general economy.

In an economy such as ours, so large a part of which is bound up with the manufacture, servicing and use of motor vehicles, relative changes in the general economy result in considerable part from corresponding relative changes in the numbers and uses of vehicles, and vice versa. And if, in some not yet foreseeable future period, a constant level of the depreciated or serviceable value of the highway plant can be accepted as the reasonable requirement of a then unchanging maximum level of highway usage, it is fairly apparent that the upward climb of highway usage or vehicle-mileage should most appropriately be matched by a parallel augmentation of the depreciated value of the highway plant.

Not since the end of the second World War has this condition existed. On the contrary, as the chart shows, the rapid increase of vehicle-mileage has far exceeded the slight increase in the depreciated value of the highway system it has been possible to effect with the revenues provided.

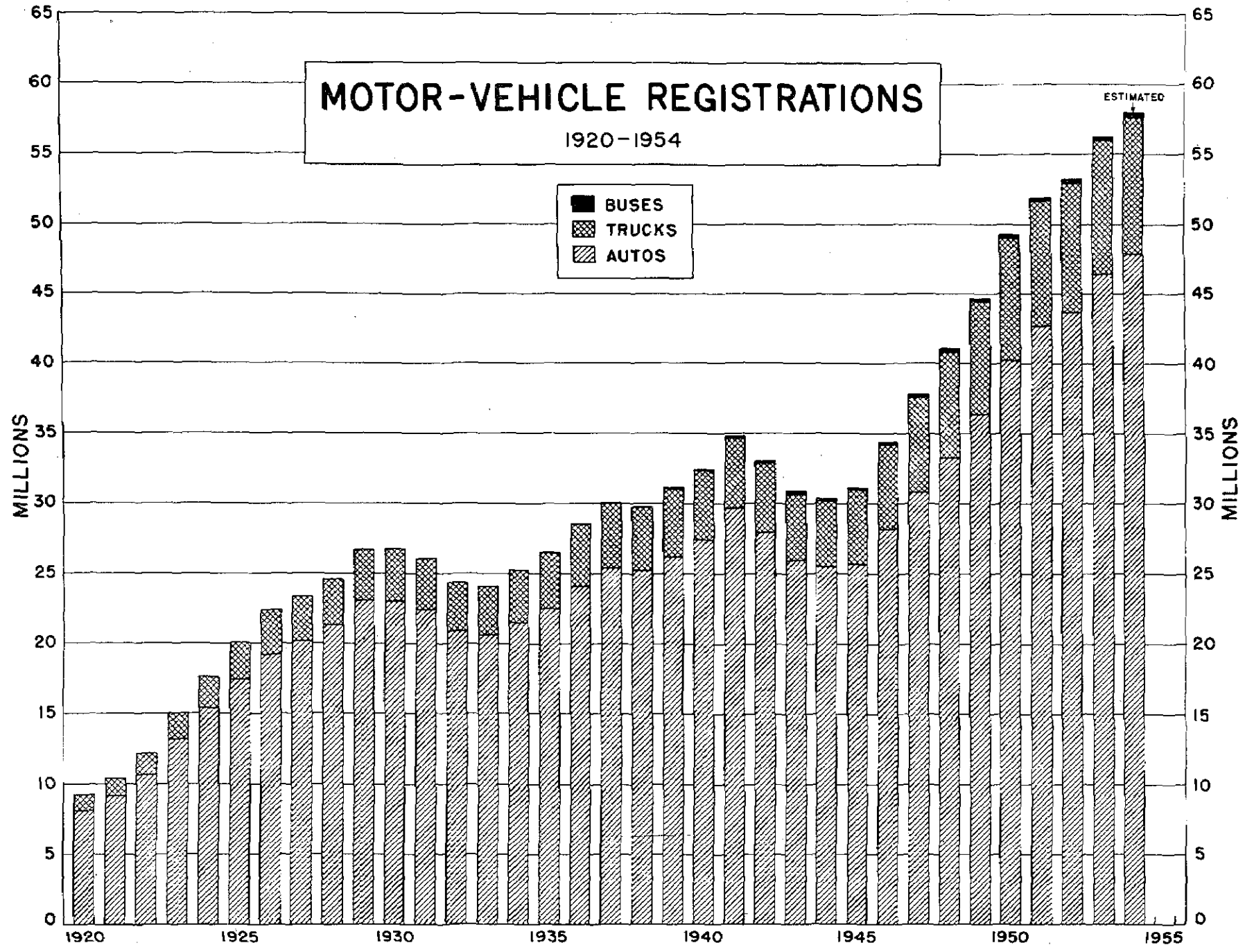
The essential objective of a sound highway program in the years ahead is the achievement of a rate of new highway investment which will, as early as possible, return the future trend of depreciated investment to the close parallelism with vehicle-mileage growth that existed in the period of the thirties.

How far short of this desirable goal a continued investment of revenues raised at current rates is likely to fall is indicated in the FORECAST section at the right of the chart. Here the past trend of the curve of vehicle-miles is projected to indicate a possible future growth to 1974. The bars representing the annual investment in road construction through the same period are scaled to indicate the capital outlay to be expected, in terms of 1953 prices, if the collection of highway revenues continues at the current rates of taxation and appropriation. And the index curve of depreciated investment takes the course consequent from the annual investment shown.

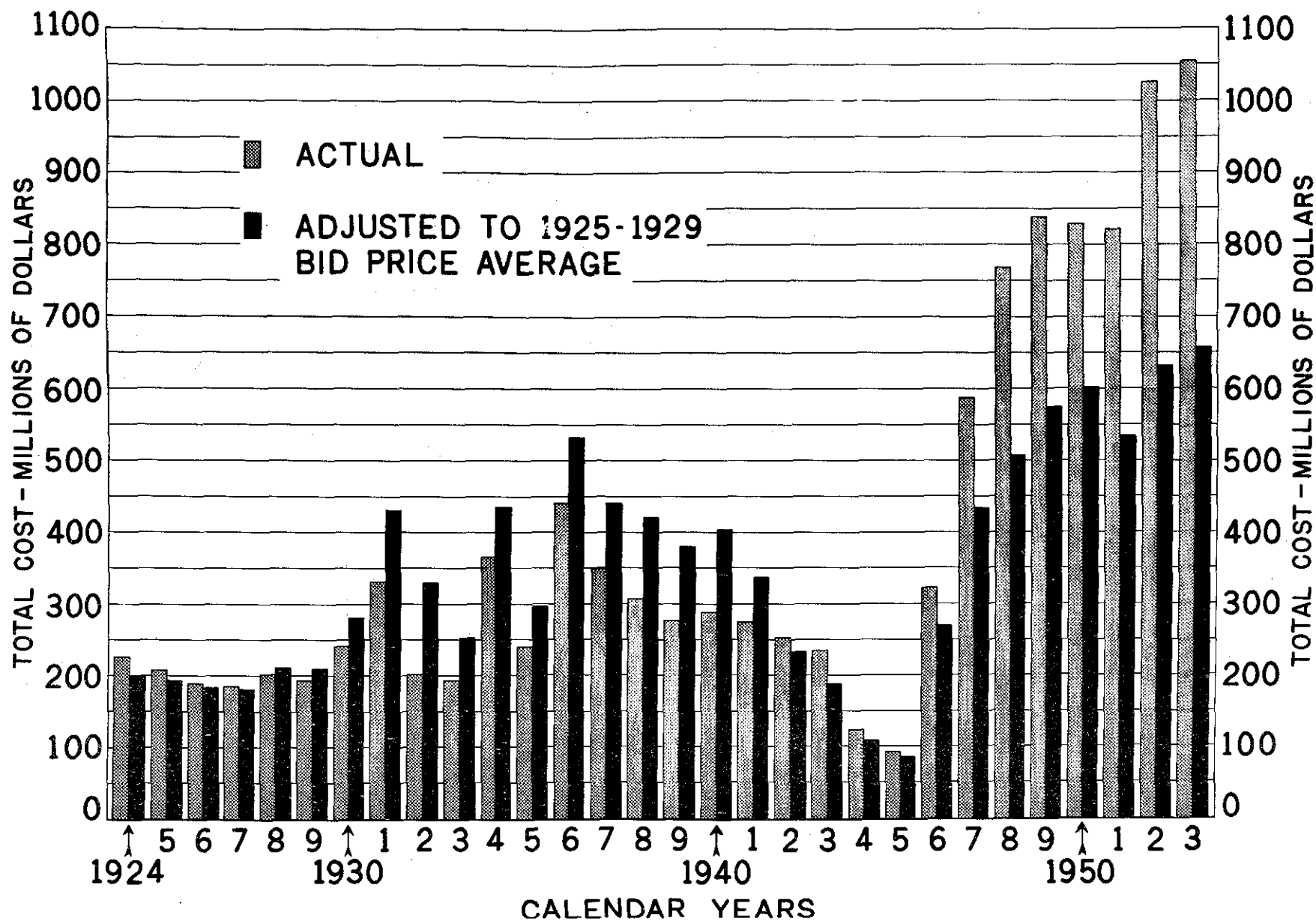
It is indicated that the continued investment of revenue yield at the present rates can at best prevent a further lagging of the provision of highway facilities behind the need engendered by increasing traffic demand. To take up this lag and return our highway plant to a condition of adequacy to the traffic demand such as existed during the ten-year period between 1930 and 1940 will call for the investment of capital sums substantially in excess of the normally to be expected future revenues.

# MOTOR-VEHICLE REGISTRATIONS

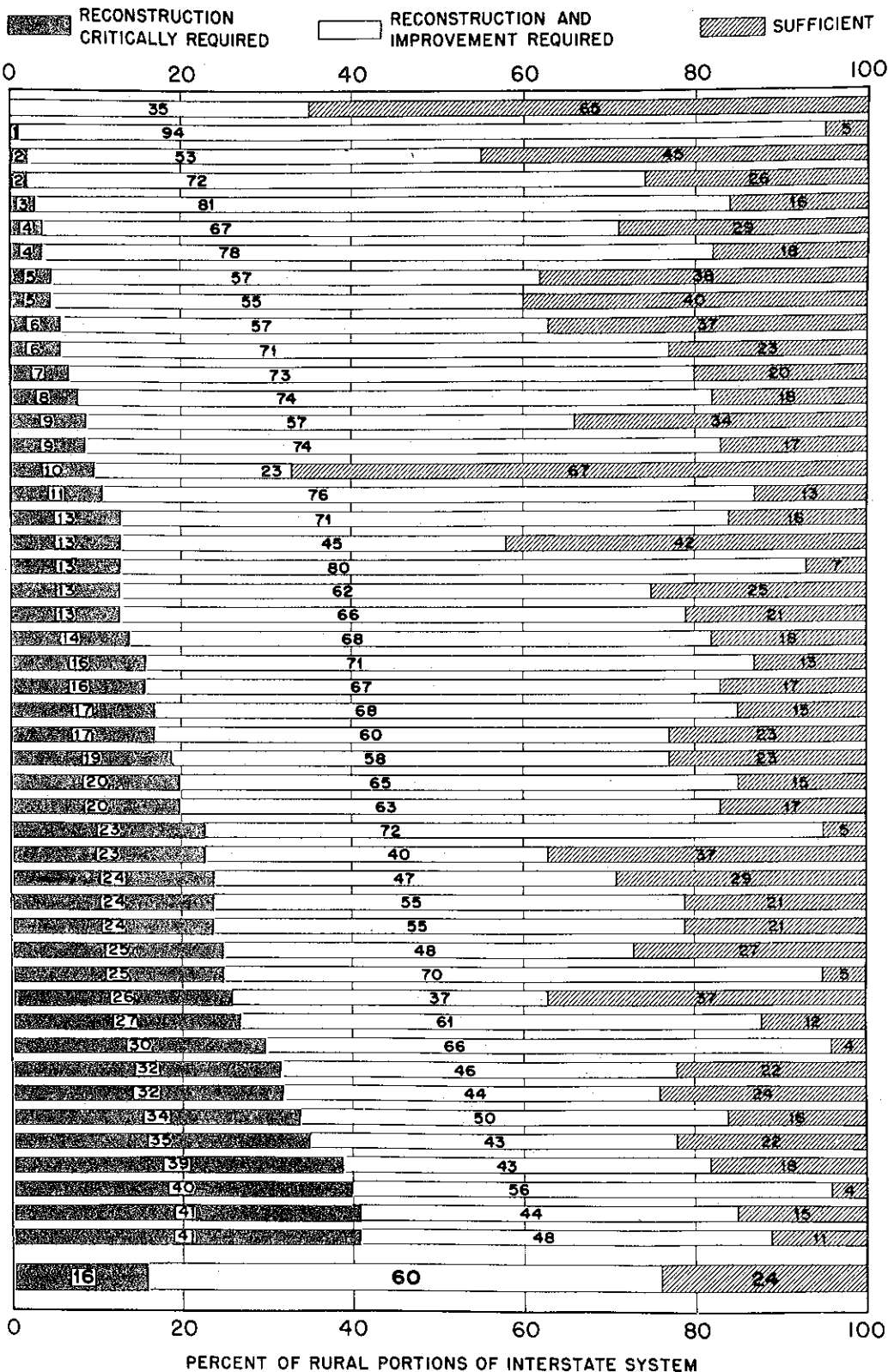
1920-1954



# FEDERAL-AID HIGHWAY CONSTRUCTION PUT IN PLACE



PERCENT OF RURAL PORTIONS OF INTERSTATE SYSTEM



ARRANGED BY STATES IN ASCENDING ORDER OF PERCENT OF CRITICAL RECONSTRUCTION NEEDS

SUFFICIENCY ANALYSIS OF RURAL PORTIONS OF THE NATIONAL SYSTEM OF INTERSTATE HIGHWAYS

PERCENT OF RURAL PORTIONS OF INTERSTATE SYSTEM

# SIGNIFICANT TRENDS IN HIGHWAY DEVELOPMENT

INDEX - 1940 = 100

CONSTRUCTION - CURRENT TAX STRUCTURE;  
CAPITAL OUTLAY AT 1953 PRICES

