

HIGHWAYS AND THE NATION'S ECONOMY

JOINT COMMITTEE ON THE ECONOMIC REPORT

(Created pursuant to Sec. 5 (a) of
Public Law 304, 79th Congress)



MARCH 9 (legislative day, MARCH 8). 1950.—Ordered to be printed

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1950

31

13

Senate Resolution No. 232

[Submitted by Mr. O'MAHONEY]

SENATE OF THE UNITED STATES,
March 9 (legislative day, March 8), 1950.

Resolved, That the committee print entitled "Highways and the Nation's Economy", prepared for the use of the Joint Committee on the Economic Report, be printed with illustrations as a Senate document.

Attest:

LESLIE L. BIFFLE,
Secretary.
By EMERY L. FRAZIER,
Chief Clerk.

JOINT COMMITTEE ON THE ECONOMIC REPORT

(Created pursuant to sec. 5 (a) of Public Law 304, 79th Cong.)

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LETTER OF TRANSMITTAL

JANUARY 25, 1950.

To Members of the Congress:

Transmitted herewith is a report on the current highway needs of the Nation and the relationship of these needs to our economy as a whole. This report was assembled by the staff of the Joint Economic Committee in cooperation with the Bureau of Public Roads.

The work was undertaken with a view to measuring the impact on the general economy of the Federal contribution to the construction of the Nation's highway systems. In order to have original evidence from the States, I addressed inquiries last July to the governors and highway authorities of all the States to determine the extent of existing highway deficiencies in the Nation. Information was sought on the need for road repairs and new construction and also on work currently under contract and for which authorization had been made. The responses were turned over to the Bureau of Public Roads in order that the information contained in them could be coordinated with data which the Bureau itself had collected. The Bureau was also asked to assemble available information on the significance of these highway deficiencies to the economy of the Nation. These materials are presented in part II of this report.

The study has been productive of much interesting information. For example, there are 3,327,000 miles of highways, roads, and streets in the United States. More than 5,000,000 people spent all or part of their working hours in 1948 driving 7,000,000 trucks almost 74,000,000,000 miles over the entire American road system. Approximately 2,500,000 people were employed during the same year manufacturing principal instruments of highway transportation; namely, motor vehicles, tires, automobile parts, gasoline and oil—and in selling these commodities to the people and servicing the vehicles. There are 50,000 motels and restaurants dependent to a large extent on highway transportation. In other words, the Federal and State investment in good roads makes business.

Current deficiencies on the highways, roads, and streets of the Nation, as indicated in the reports from the States, total \$41,000,000,000. The largest single need, \$23,000,000,000, is for modernizing our State highway systems and their urban extensions. The rest of the \$41,000,000,000 reflects the needs of our city and village streets and local rural roads.

The widespread interest in the estimates and materials when they were released in preliminary form has prompted me, in transmitting these data to other members of the Joint Economic Committee, to make this information available at the same time to all Members of the Congress and for public distribution. The committee print, of course, presents only data which have been assembled for the use

of the committee and does not necessarily represent the views of the committee or of its members or staff individually.

The cooperation and interest shown by the governors and State highway officials has been most gratifying and has enabled the presentation in this report of the first national estimates to cover all phases of our highway system, Federal aid, State, county, and local roads and city and village streets.

The work of the Bureau of Public Roads in compiling the results of the survey and preparing other materials for the committee is most deeply appreciated.

Sincerely,

JOSEPH C. O'MAHONEY,
Chairman, Joint Committee on the Economic Report

HIGHWAYS AND THE NATION'S ECONOMY

INTRODUCTION

The Joint Committee on the Economic Report has as its basic concern the maintenance of maximum production, employment, and purchasing power in the Nation. Directly related to all of these objectives is the development and maintenance of an adequate system of highways. Highway transportation expenditures annually amount to at least \$30,000,000,000, or one-eighth of our total national product. A substantial portion of our labor force is employed in the construction of highways and in highway transportation, or in servicing highway transport. Almost all milk, most fresh fruits and vegetables and much of our livestock move over the Nation's roads. The use of trucks in agriculture has increased 60 percent since 1941 and it is estimated that over 50,000 motels and restaurants depend upon the existence of an adequate highway system.

As part of its continuing study of the national economy, the Joint Economic Committee has attempted to appraise the size and nature of the task faced by the Nation in providing and maintaining the kind of highway system required by current and anticipated high levels of economic activity. Information has been obtained directly from the governors and highway departments of each State on the status of highway construction and existing highway deficiencies within the States. These State officials were asked to supply data not only on their own State highway systems but to estimate, wherever possible, the backlog of road repair and construction for county and local roads and city and village streets. In the relatively few instances where it was not possible for the States to furnish information for other jurisdictions within their borders, estimates for those jurisdictions have been made with the help of technicians from the United States Bureau of Public Roads.¹ Hence it is possible for the first time to present an analysis of the highway deficiencies for the entire 3,327,000 miles of highways, roads, and streets in the Nation. Other studies have been made of portions of the total mileage such as the Bureau of Public Roads statement on the 37,800 miles of key highways for national defense, and many States have reports available on their own systems. Nowhere, however, was there information which could be put together to cover the needs of the entire country.

In addition to the national totals, an analysis of the needs by individual States as reported by the correspondents to the joint committee has been included in the study and appears as an appendix to this report.

¹ The consultant services of A. C. Clark, H. A. Radzikowski, and S. E. Ridge, civil engineers, and of the statistical work of Mrs. J. K. Baker, all of the U. S. Bureau of Public Roads, are deeply appreciated

In order to provide a better understanding of the significance of these highway deficiencies to our national economy, the Bureau of Public Roads has been asked to assemble existing data on the economic aspects of highway transportation under modern conditions, on present and future motor vehicle use, on cost factors involved in motor-vehicle transportation, on recent trends in highway construction and Federal aid, and on recent highway construction as related to changing motor-vehicle requirements. These data are given in part II of the report. Part I, in addition to providing estimates of total highway needs, translates these needs in terms of the employment and market their fulfillment would create.

PART I

NATIONAL HIGHWAY NEEDS

On July 1, 1949, the chairman of the Joint Economic Committee wrote each State governor and State highway department asking them to provide the committee with information on the need for immediate and future highway construction in their State, and the size of their present and contemplated highway construction program. All States have replied to this letter and in most cases have also been able to assist the committee with data on the need for improving the local rural roads and the city and village streets as well as the need for improvements on their State highways and their urban extensions.

The needs in each State are summarized in table 1. As will be noted, some of the States were not able to provide an accurate appraisal of the needs on the local roads and city streets. Where these needs were not reported, estimates have been prepared based on the mileage, population, and general road conditions in the State. Since it was necessary to estimate for only a relatively few States it is believed that the validity of the total figures is not significantly affected.

TABLE 1.—*Reported cost of correcting existing highway deficiencies*

State	State highways, rural and urban	County and local roads	City and village streets	Total reported
Alabama.....	\$234,000,000	\$490,000,000	\$120,000,000	\$844,000,000
Arizona.....	150,096,000	70,000,000	37,000,000	257,096,000
Arkansas.....	239,468,000	66,000,000	24,000,000	329,468,000
California.....	1,415,000,000	389,287,000	760,713,000	2,565,000,000
Colorado.....	284,051,000	88,230,000	30,100,000	402,381,000
Connecticut.....	628,000,000	-----	-----	628,000,000
Delaware.....	99,000,000	20,000,000	4,500,000	123,500,000
Florida.....	95,704,000	10,000,000	10,000,000	115,704,000
Georgia.....	539,341,185	638,325,000	50,000,000	1,227,666,185
Idaho.....	229,750,000	-----	-----	229,750,000
Illinois.....	1,128,895,000	564,864,000	825,158,000	2,518,917,000
Indiana.....	317,619,737	92,975,300	76,174,800	486,669,837
Iowa.....	482,282,155	463,134,514	-----	945,416,669
Kansas.....	520,120,000	343,540,000	93,632,000	957,292,000
Kentucky.....	408,058,283	167,616,063	-----	575,674,346
Louisiana.....	500,000,000	-----	-----	500,000,000
Maine.....	134,529,000	10,000,000	19,497,000	164,026,000
Maryland.....	700,000,000	-----	-----	700,000,000
Massachusetts.....	1,000,000,000	26,000,000	26,000,000	1,052,000,000
Michigan.....	879,507,582	319,654,300	235,748,805	1,434,910,687
Minnesota.....	490,000,000	261,700,000	86,200,000	838,900,000
Mississippi.....	147,735,000	267,961,000	73,096,000	488,792,000
Missouri.....	256,000,000	-----	-----	256,000,000
Montana.....	498,705,000	300,000,000	40,000,000	838,705,000
Nebraska.....	257,190,000	120,020,000	85,621,000	462,831,000
Nevada.....	98,264,000	-----	-----	98,264,000
New Hampshire.....	192,535,000	16,356,000	8,925,000	218,216,000
New Jersey.....	518,700,000	126,100,000	109,000,000	753,800,000
New Mexico.....	157,427,728	-----	5,000,000	162,427,728
New York.....	1,763,739,000	-----	-----	1,763,739,000
North Carolina.....	132,000,000	200,000,000	-----	332,000,000
North Dakota.....	200,000,000	50,000,000	-----	250,000,000
Ohio.....	2,480,000,000	802,000,000	1,127,000,000	4,509,000,000
Oklahoma.....	202,000,000	121,000,000	41,000,000	364,000,000
Oregon.....	270,000,000	105,000,000	65,000,000	440,000,000
Pennsylvania.....	960,576,000	-----	-----	960,576,000

See footnotes at end of table, p. 4.

TABLE 1.—*Reported cost of correcting existing highway deficiencies—Continued*

State	State highways, rural and urban	County and local roads	City and village streets	Total reported
Rhode Island.....	\$180,000,000	\$25,800,000	\$73,200,000	\$279,000,000
South Carolina.....	323,000,000			323,000,000
South Dakota.....	293,000,000	107,616,000	13,032,000	413,648,000
Tennessee.....	600,000,000	400,000,000	220,000,000	1,220,000,000
Texas.....	1,294,000,000	1,068,630,000		2,362,630,000
Utah.....	213,128,000	48,000,000	14,300,000	275,428,000
Vermont.....	100,438,350	38,870,575	10,520,600	149,829,525
Virginia.....	217,600,000	1102,400,000	80,000,000	400,000,000
Washington.....	300,000,000	62,523,000	38,925,000	401,448,000
West Virginia.....	486,609,500	1300,000,000		786,609,500
Wisconsin.....	300,000,000	45,000,000		345,000,000
Wyoming.....	137,360,800	27,500,000	10,000,000	174,860,800
District of Columbia.....			200,000,000	200,000,000
Total.....	23,044,630,320	\$8,456,102,752	\$4,613,343,205	\$36,114,076,277

¹ State jurisdiction.

² Incomplete, major State highway needs only.

³ The total estimated cost of correcting the deficiencies on county and local roads, including the States not reported above, is \$10,400,000,000; for city and village streets it is \$7,700,000,000. The estimated total is \$41,144,630,000.

NOTE.—Compiled from returns submitted in reply to the chairman's inquiry to governors and State highway authorities, 1949.

The total cost of correcting the present deficiencies on the highways, roads, and streets of the Nation is estimated at \$41,144,630,000. Of this amount, \$7,700,000,000 is estimated as the amount needed for city and village streets, and \$10,400,000,000 for the correction of deficiencies on the local rural roads.¹ The remaining \$23,044,630,320 is the amount needed for the State highway systems and their urban extensions.²

In addition to appraising present deficiencies, many of the States have estimated the annual expenditure that would be necessary to correct all deficiencies on Federal-aid, State, city, and county and local roads within a predetermined future period, and at the same time rebuild those highways that will become deficient during that period. These estimates were generally made on the basis of a 10-year period, although some States used a longer period. Since these estimates were not all made on the same basis, it was thought that it would be more accurate to present them as a percentage addition to present needs, rather than as dollar values. Those States that reported both their needs for 10 years and their present needs, indicated that an additional 35 percent over and above the present needs would be required to correct highway deficiencies in the 10-year period.³ Based on the current rate of maintenance expenditure (\$1,170,000,000 in 1948), over \$1,000,000,000 more per year will be required for the maintenance and operation of the Nation's roads and streets.

¹ Deficiencies reported by the States for local rural roads account for \$8,456,103,000 of the \$10,400,000,000 and for \$4,613,343,205 of the \$7,700,000,000 estimated needs for city and village streets. The difference in both instances represents the amount which had to be estimated where States were unable to report on anything other than their own systems' needs.

² The \$23,044,630,320 is the total amount reported by the 48 States.

³ Some States in estimating their 10-year requirements, adjusted their construction costs for an expected decrease in the construction price index. For the purpose of this report, these adjustments have been eliminated entirely from the cost of the present deficiencies. This correction for price changes was also eliminated from estimates of deficiencies expected to occur during the 10-year period where possible. In a few cases this could not be done and the estimate of 10-year needs is slightly below the 1948 price level. It is believed, however, that these estimates can, for most purposes, be considered as current (1948 price level). Any future rise or fall in the construction cost index will, of course, raise or lower the estimate accordingly.

At the time of submission of the State reports to the committee, it was stated that highway construction work valued at \$1,259,987,000 was under way on the State highway systems. It was also reported that additional work estimated to cost \$2,823,864,000 is being authorized or being planned.

ESTIMATED EMPLOYMENT

It is estimated that the construction of the total highway, road, and street improvements reported above will provide a total of 19,491,455,-000 hours of employment in their construction and in the production of the materials, supplies, and equipment used directly on the work. Table 2 shows the hours of employment that the construction of these needed highways in each State might be expected to provide.

TABLE 2.—*Estimated man-hours of construction employment provided by present reported needs, by States*

	<i>On- and off-site</i>		<i>On- and off-site</i>
Alabama	512,722,000	New Hampshire	105,990,000
Arizona	114,979,000	New Jersey	326,727,000
Arkansas	173,030,000	New Mexico	77,754,000
California	1,053,445,000	New York	807,059,000
Colorado	178,713,000	North Carolina	182,145,000
Connecticut	289,508,000	North Dakota	114,350,000
Delaware	57,237,000	Ohio	2,070,443,000
Florida	62,520,000	Oklahoma	187,176,000
Georgia	724,974,000	Oregon	192,570,000
Idaho	106,172,000	Pennsylvania	461,365,000
Illinois	1,150,163,000	Rhode Island	123,329,000
Indiana	229,893,000	South Carolina	196,959,000
Iowa	464,549,000	South Dakota	197,972,000
Kansas	491,349,000	Tennessee	612,062,000
Kentucky	300,939,000	Texas	1,207,634,000
Louisiana	274,035,000	Utah	126,463,000
Maine	93,752,000	Vermont	79,691,000
Maryland	345,800,000	Virginia	207,060,000
Massachusetts	480,301,000	Washington	170,932,000
Michigan	663,460,000	West Virginia	386,600,000
Minnesota	402,129,000	Wisconsin	157,386,000
Mississippi	274,555,000	Wyoming	79,005,000
Missouri	131,697,000	District of Columbia	94,604,000
Montana	399,115,000		
Nebraska	231,865,000	Total	17,409,652,000
Nevada	37,474,000		

¹ The total on- and off-site employment, including the estimated amount for those county and local road and city street needs not reported, is estimated to be 19,491,445,000 man-hours. With the addition of the labor created in the consumer goods industry, the total employment due to the construction of needed highways has been estimated at as high as 42,683,439,000 man-hours. All man-hour estimates have been derived from Bureau of Public Roads data on the relation between man-hours and dollar expenditures in conjunction with information on actual needs furnished by the State highway departments to the chairman of the Joint Economic Committee. The figures have been verified for reasonableness with the individual States.

In analyzing the employment involved in the future highway program it is necessary to include also the large numbers of men now at work maintaining each mile of the Nation's 3,327,000-mile highway, road, and street system. Table 3 shows the estimated maintenance employment by States. This figure does not include the men employed on contract maintenance work, nor does it include the men employed in producing the materials, supplies, and equipment used for maintenance purposes. Since highway maintenance work requires even in this mechanized age much more hand labor than highway construction work, the secondary labor employed in produc-

ing the needed maintenance equipment, materials, and supplies will not be as large in comparison to the on-site labor as in the construction field. Its importance cannot, however, be overlooked. It is not unreasonable to assume that the off-site labor will amount to at least 50 percent of the on-site labor.

TABLE 3.—*Estimated annual maintenance employment, by States, 1949*

	Annual maintenance employment		Annual maintenance employment
Alabama.....	6, 100	New Hampshire.....	2, 300
Arizona.....	1, 250	New Jersey.....	7, 300
Arkansas.....	4, 000	New Mexico.....	1, 000
California.....	11, 800	New York.....	28, 000
Colorado.....	4, 600	North Carolina.....	8, 100
Connecticut.....	5, 000	North Dakota.....	1, 400
Delaware.....	600	Ohio.....	18, 100
Florida.....	6, 100	Oklahoma.....	5, 750
Georgia.....	5, 500	Oregon.....	4, 600
Idaho.....	2, 175	Pennsylvania.....	22, 500
Illinois.....	10, 600	Rhode Island.....	1, 500
Indiana.....	6, 400	South Carolina.....	4, 000
Iowa.....	8, 100	South Dakota.....	2, 225
Kansas.....	6, 000	Tennessee.....	5, 900
Kentucky.....	5, 500	Texas.....	13, 300
Louisiana.....	7, 500	Utah.....	1, 430
Maine.....	2, 900	Vermont.....	1, 325
Maryland.....	3, 450	Virginia.....	7, 400
Massachusetts.....	7, 500	Washington.....	5, 900
Michigan.....	13, 000	West Virginia.....	5, 600
Minnesota.....	9, 600	Wisconsin.....	13, 150
Mississippi.....	6, 650	Wyoming.....	1, 400
Missouri.....	6, 000	District of Columbia.....	450
Montana.....	2, 600		
Nebraska.....	5, 200	Total.....	311, 415
Nevada.....	660		

While it is possible to estimate within fairly close limits the direct employment generated by a given dollar volume of highway construction, it is more difficult to determine the effect of expenditures for highway labor or materials in generating employment in the economy as a whole. The resultant effect will vary with changing economic conditions and improvements in technology. Estimates have been made which show as far as it is possible to do so the direct, indirect, and induced employment which can within a reasonable time be attributed to the expenditure of \$100,000 for highway construction. Items such as taxes, interest, dividends, insurance premiums, etc., which are not necessarily transferred immediately into cash purchases have not been considered in developing these estimates which show that every \$100,000 expended for highway construction should provide approximately 103,704 hours of employment. Based on this calculation, it is estimated that the construction of the Nation's backlog of needed and beneficial highway improvements would create in the Nation's economy at least 23,191,994,000 hours of employment in the production and marketing of the consumer goods purchased by labor. This is, of course, in addition to the direct and indirect employment which amounts to 19,491,445,000 hours. The total employment that can be expected from this expenditure for this improvement to our Nation's transportation system is estimated to be 42,683,439,000 man-hours (30,488,000 man-years at 1,400 hours

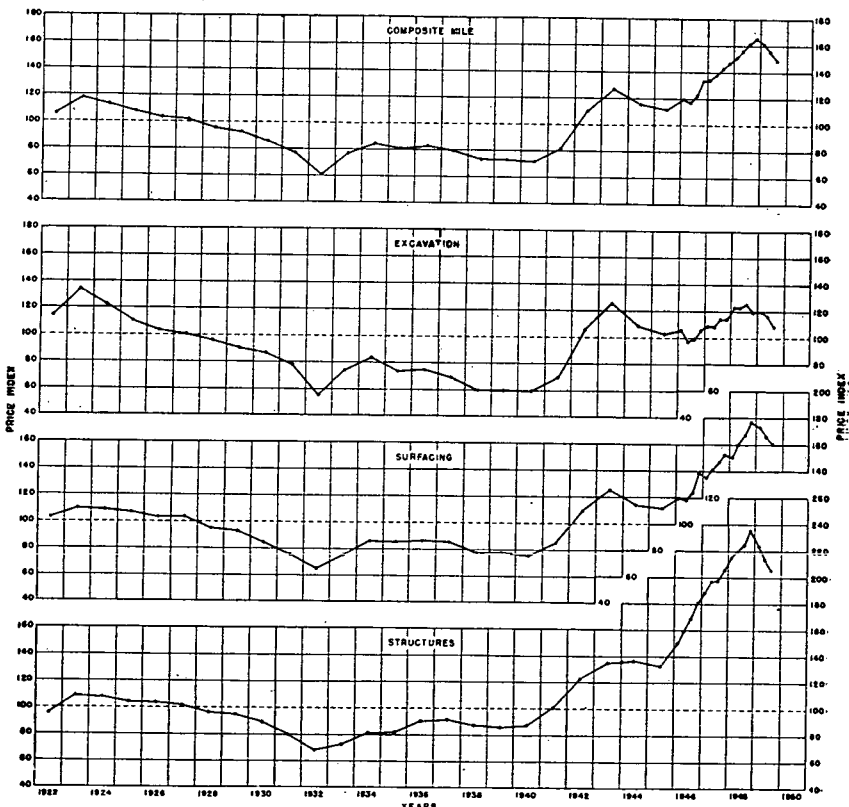
per year). In addition, it is estimated that all or part of the annual income of over 900,000 people can be attributed to the annual expenditure for maintenance of our Nation's highways. This includes the employment provided in the consumer goods field.

CONSTRUCTION COST TRENDS

At the same time that the committee queried State governors and highway commissioners on their highway needs, questions were also asked of these officials in regard to construction cost trends.

As indicated in the State by State tabulations, almost all of the States report that the bids received on contracts offered in 1949 have been lower than those received during 1948. The extent of this decrease has varied from only a leveling off in some States to a drop of about 10 percent in others. This shift is also reflected in the composite mile index of highway construction cost, prepared by the Bureau of Public Roads (chart 1). This index has declined 10 percent from the high of late 1948. The surfacing index has declined 9.2 percent and the structural index 12.7 percent. This decline has come about without a corresponding decrease in the cost of the materials, equipment and labor. It is attributed to increased supplies

CHART 1
Price trends in highway construction
[Averages for 1925 to 1929 taken as base]



Source: Bureau of Public Roads, U. S. Department of Commerce

of equipment and materials, the availability of firm quotations and delivery dates for both materials and equipment, increased competition and increased productivity and availability of labor. During the first 6 months of 1949, the low bid averaged 7.8 percent below the engineers' estimate as compared to 1.8 percent in 1948.

Most all of the States also report that competition for highway work is increasing. This is due in part to the increasing availability of materials, supplies, equipment, and labor. The Bureau of Public Roads, from an analysis of the bids received on Federal-aid projects located throughout the country, reports that an average of 5.9 bids were received per contract during the first 6 months of 1949. This compares with 4.2 per contract in 1948 and 3.8 per contract in 1947. It is not unusual at the present time, for 20 or more proposals to be submitted on one project.

A study of the contractors bidding on Federal-aid work shows that in 1948, 562 new contractors (individuals or firms who had not previously bid on Federal-aid work during the postwar period) received awards. During the first 6 months of 1949, 179 new contractors submitted the lowest bid. In addition to these successful new bidders, 500 bid unsuccessfully in 1948 and 347 in 1949.

These data, together with the data shown in the analysis of the replies from the States, show that at the present time the cost of highway construction is decreasing and the competition for highway work is increasing. It is estimated that there are approximately 4,600 highway contractors located throughout the country. These contractors have a potential prequalification rating of approximately \$6,000,000,000.

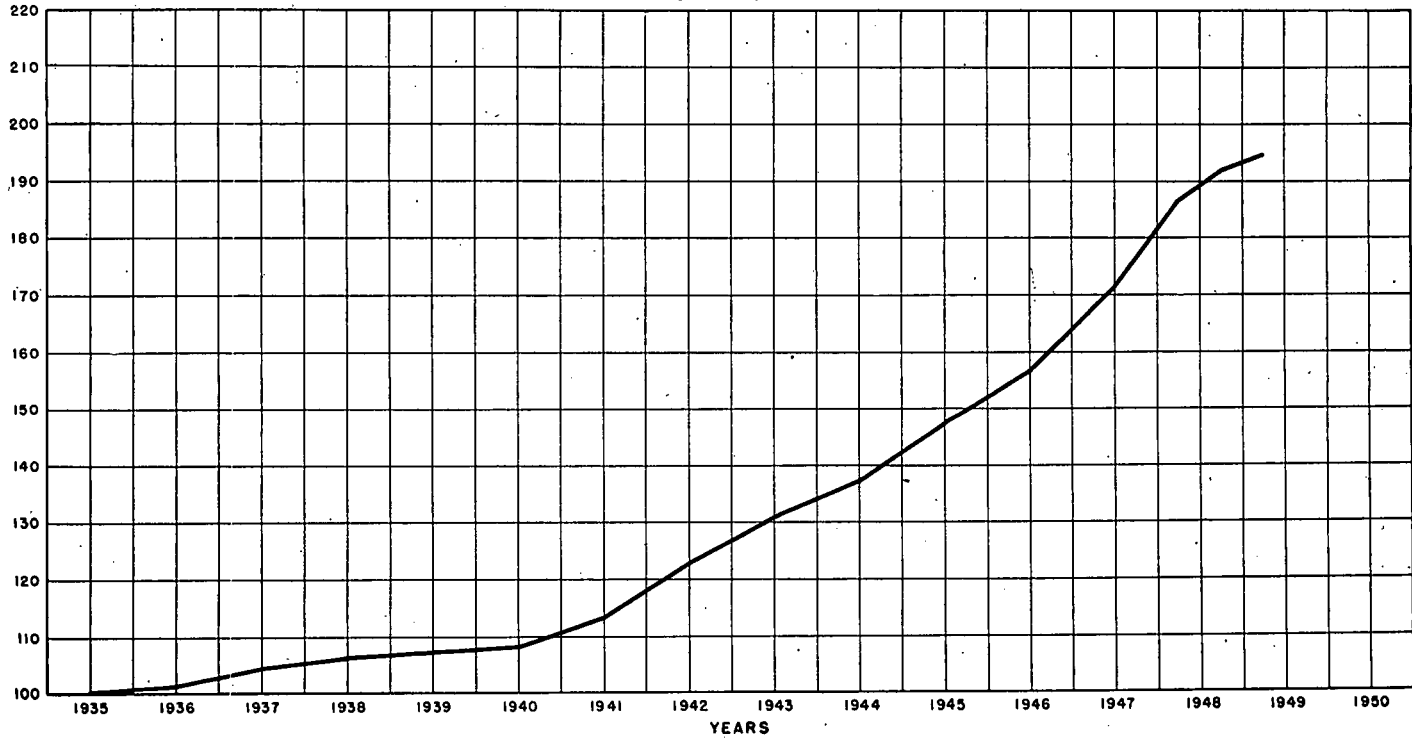
MAINTENANCE COST TRENDS

Compared to the construction cost index, the maintenance and operating cost index of our Nation's highway system has not risen as fast or as high. This is due, no doubt, to the very nature of the work. Maintenance is generally performed by governmental (State, city and local) employees operating Government-owned equipment and using materials and supplies purchased by the governmental authorities. Wages are, in general, lower and do not fluctuate as much as in private employment. However, the work is more steady and the average employee works more hours per year. Equipment charges are made on the basis of actual costs; materials and supplies are charged at the purchase cost, not as under the competitive bidding system at an anticipated cost. Chart 2 shows the trend in the cost of maintaining and operating the country's State highways since 1935.

CHART 2

Index of cost trends in highway maintenance and operation

[1935 base]



Source: Bureau of Public Roads, U. S. Department of Commerce.

PART II

HIGHWAY TRANSPORTATION IN A HIGH LEVEL ECONOMY ¹

The highway transportation industry is a kind of cooperative enterprise in which the people through their governmental agencies provide the roadbed while private corporations and individuals furnish the rolling stock and all the incidental equipment and fuel which makes highway traffic possible. The people of the Nation receive the benefits of economical transportation in lowered transportation costs of the goods and services they produce and consume, or they pay the added cost of deficient highways in higher transportation and consumer costs.

The benefits related to or depending on a good road system cover a wide range of economic activity. Almost 900,000 ² persons are employed in manufacturing motor vehicles, tires and parts and 100,000 ² more are engaged in producing the 30,460,641,000 gallons of gasoline (1948 consumption) and the other petroleum products used in cars and trucks. Over 1,500,000 persons are employed in selling and servicing the vehicles traveling over the highways. The transportation of the Nation's population within and between our great cities accounts for more than 200,000 ² workers, and it is estimated that 5,100,000 ² persons spent all or part of their working hours driving the Nation's 7,000,000 trucks almost 74,000,000,000 miles in 1948. To construct and maintain our system of highways, roads and streets, even at the present low construction level, requires the employment of over 600,000 persons a year on the job site.

TABLE 4.—*Estimated automotive industry consumption of products of other industries, 1948* ¹

<i>Items</i>	<i>Estimated consumption</i>
Steel.....net tons..	10, 220, 982
Iron, malleable.....tons..	422, 563
Gray iron.....do.....	1, 400, 545
Rubber, crude.....long tons..	699, 741
Plate glass.....square feet..	173, 937, 900
Leather, upholstery.....do.....	40, 006, 086
Aluminum.....tons.....	31, 027
Copper.....do.....	162, 524
Tin.....do.....	14, 775
Lead.....do.....	336, 868
Zinc.....do.....	112, 289
Nickel.....do.....	14, 775
Cotton.....bales.....	1, 084, 697
Lumber, hardwood.....board feet..	258, 561, 329
Lumber, softwood.....do.....	153, 659, 304
Glycerine.....pounds.....	26, 890, 378
Cloth, upholstery.....yards.....	66, 664, 498
Manganese ore.....long tons..	57, 622

¹ Data from a survey by the Automobile Manufacturers Association, adjusted for 1948 automobile production. Steel estimates based on actual 1948 use.

² Materials assembled for the Joint Economic Committee by the Bureau of Public Roads, U. S. Department of Commerce.

³ Data from p. 42, Automobile Facts and Figures, twenty-ninth edition, 1949. Published by Automobile Manufacturers Association.

Estimates of indirect employment show that, for every 10 men employed on the highway construction site, over 12 men are employed in the production of the materials, supplies and equipment used in the work. In addition, the man-hours of employment that are being used at the present time in constructing and reconstructing service stations, garages, and other buildings that are being built or rebuilt solely for the servicing of the vehicles using the highways should be considered.

Also, many other people derive all or part of their income from the highway transportation industry. It is estimated that 80 percent of the rubber, 75 percent of the plate glass, and half of the malleable iron produced is consumed by the automobile and truck manufacturing industry. Table 4 shows the estimated consumption of the products of other industries by the automotive industry. Table 5 shows the support that the motor-transport industry gives to the railroad industry. This business, amounting to almost 4,000,000 carloads of freight annually and valued at \$815,000,000, assists the economy of the railroad industry.

TABLE 5.—*Rail-freight shipments of highway transportation industry commodities, 1948*¹

	Carload
Motor vehicles, parts, tires	814, 000
Gasoline.....	498, 000
Crude petroleum.....	174, 000
Lubricating oil.....	83, 000
Iron and steel.....	209, 000
Iron ore.....	269, 000
Coal and coke.....	98, 000
Lumber.....	15, 000
Road and fuel oil.....	63, 000
Crude rubber.....	33, 000
Cement for roads, bridges.....	438, 000
Asphalt for roads.....	125, 000
Gravel, sand, stone, brick.....	850, 000
Miscellaneous, such as nonferrous metals, paints, upholstery.....	248, 000
Total automotive freight.....	3, 917, 000
Rail revenues from automotive freight.....	\$815, 000, 000

¹ As estimated by the Automobile Manufacturers Association in *Automobile Facts and Figures*, twenty-ninth edition, p. 70.

An additional commercial group that is dependent on good highways is the roadside motels and similar enterprises. It is estimated that there are at present over 50,000 motels, restaurants, etc., located along the public highways of our Nation. The construction and operation of these and similar establishments provides a large segment of our population with all or part of their income.

Table 6 shows the importance of vacation business to each of the States. Much of this business will wither if our Nation's road system is not kept in such a condition that the motorist can use it with safety and enjoyment.

This tourist business, while imposing in itself and vital to our economy, is only a part of the total highway use. Table 7 shows the dependence that some of the other portions of our economy place in motor transport. It shows the percent of various commodities transported to or from specific marketing centers by motortruck. It will be noted that, for 25 of the 39 commodities, more than 50 percent

of the quantities are transported to market over the highways. Actually, almost all commodities are transported partially by motortruck. The table clearly discloses how a saving of even a few cents in transportation cost, brought about by an improvement in roads and highways, affects each person in the country. The cost of living is very definitely affected by the cost of highway transportation.

TABLE 6.—*Estimated vacation-travel income of States in 1948*¹

	Value		Value
Alabama.....	\$50,000,000	Nevada.....	\$60,000,000
Arizona.....	100,000,000	New Hampshire.....	108,000,000
Arkansas.....	125,000,000	New Jersey.....	375,000,000
California.....	700,000,000	New Mexico.....	80,000,000
Colorado.....	125,000,000	New York.....	1,000,000,000
Connecticut.....	51,000,000	North Carolina.....	200,000,000
Delaware.....	50,000,000	North Dakota.....	30,000,000
Florida.....	700,000,000	Ohio.....	500,000,000
Georgia.....	105,000,000	Oklahoma.....	60,000,000
Idaho.....	50,000,000	Oregon.....	92,000,000
Illinois.....	350,000,000	Pennsylvania.....	600,000,000
Indiana.....	325,000,000	Rhode Island.....	19,000,000
Iowa.....	185,000,000	South Carolina.....	50,000,000
Kansas.....	250,000,000	South Dakota.....	60,000,000
Kentucky.....	71,000,000	Tennessee.....	150,000,000
Louisiana.....	100,000,000	Texas.....	350,000,000
Maine.....	115,000,000	Utah.....	100,000,000
Maryland.....	50,000,000	Vermont.....	53,000,000
Massachusetts.....	192,000,000	Virginia.....	150,000,000
Michigan.....	500,000,000	Washington.....	150,000,000
Minnesota.....	200,000,000	West Virginia.....	100,000,000
Mississippi.....	200,000,000	Wisconsin.....	300,000,000
Missouri.....	200,000,000	Wyoming.....	50,000,000
Montana.....	61,000,000		
Nebraska.....	60,000,000	Total.....	9,552,000,000

¹ As reported in Automobile Facts and Figures, published by Automobile Manufacturers Association, twenty-ninth edition, p. 2. Based on studies by State agencies, tourist bureaus, AAA motor clubs, Federal Reserve banks, and other sources.

TABLE 7.—*Percent of farm products and other commodities hauled by truck, 1948*¹

	Percent hauled by truck		Percent hauled by truck
Livestock (66 markets):		Fruit and vegetables (12 markets):	
Cattle.....	69	Apples.....	58
Hogs.....	74	Beans.....	78
Calves.....	73	Cabbage.....	64
Sheep and Lambs.....	42	Cantaloup.....	32
Total livestock.....	69	Cauliflower.....	63
Dairy products:		Celery.....	51
Milk (75 metropolitan areas).....	100	Cucumbers.....	79
Butter (10 markets).....	44	Grapefruit.....	28
Fresh eggs (11 markets).....	65	Green corn.....	86
Cheese (10 markets).....	20	Greens.....	90
Live poultry (10 markets).....	98	Lettuce.....	40
Dressed poultry (11 markets).....	56	Onions (dry).....	36
Miscellaneous:		Oranges.....	25
Sand and gravel.....	66	Peas.....	40
Crushed stone.....	48	Peaches.....	65
Portland cement.....	16	Potatoes.....	38
Fuel briquettes.....	18	Squash.....	93
Packaged fuel.....	93	Strawberries.....	83
Blast furnace slag.....	46	Sweetpotatoes.....	75
Pulpwood.....	90	Tomatoes.....	51
Household goods.....	90	Watermelons.....	46

¹ As reported in Automobile Facts and Figures, published by Automobile Manufacturers Association, twenty-ninth edition, p. 34. Based on data from U. S. Department of Agriculture, U. S. Bureau of Mines and American Trucking Association.

Another and most important part of the influence of highway transportation industry employment is the effect that an increase or decrease in it has on the general employment situation. Studies of the movement of money through the normal channels of trade show that an increase or decrease in on- and off-site employment in any industry will induce a similar increase or decrease in the production and marketing of consumer goods.

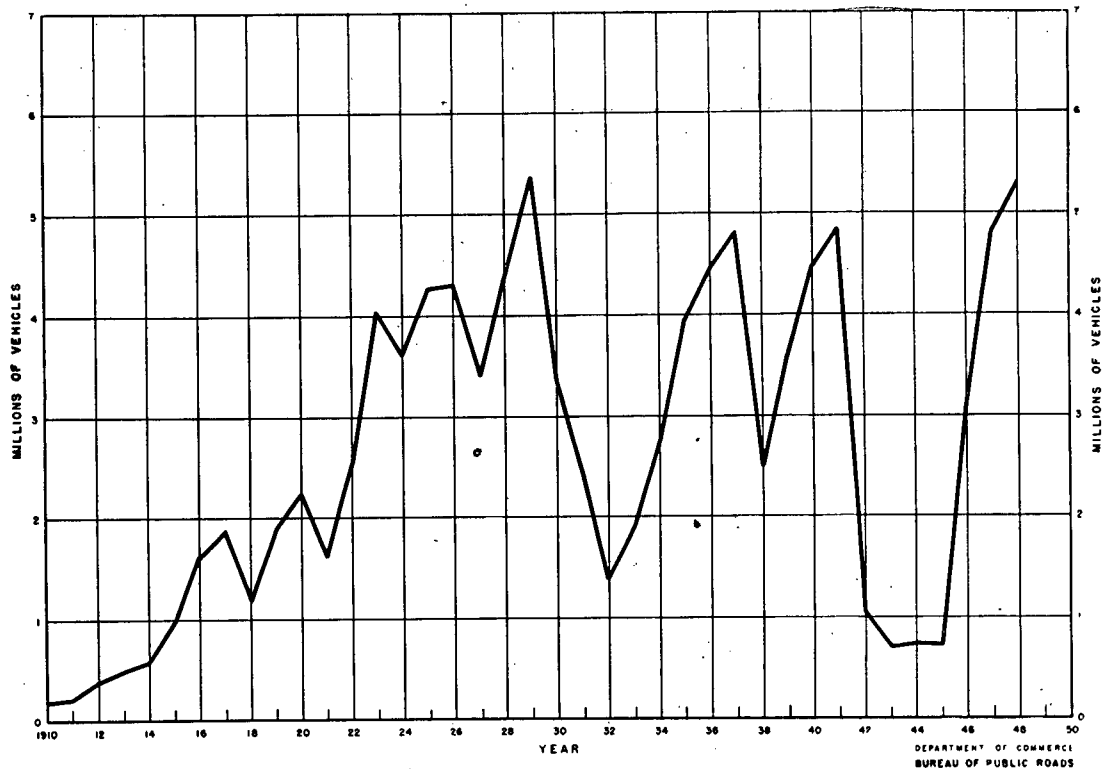
EXPANDING MOTOR-VEHICLE PRODUCTION AND HIGHWAY USE

An important measure of the progress being made in the modernization and expansion of our supply of motor-vehicle equipment is the rate of production of new cars and trucks. During the twenties, in the period of full production following the First World War (chart 3), the total car, truck, and bus production rose from slightly over 2,000,000 units per year to over 5,000,000 units per year in 1929. The average annual production during the 10-year period was 3,570,947 units. Production, of course, fell off during the period after 1930, but had begun to regain full strength again just prior to World War II. During the war it was necessary to curtail production of civilian goods, and automobile production fell off considerably. As soon as hostilities ceased, however, the automobile industry rapidly retooled, and during 1946 produced over 3,000,000 units. In 1947, 4,797,922 units were produced and in 1948, 5,285,425. It is estimated by the Automobile Manufacturers Association that approximately 6,200,000 units were produced in 1949. This is a new annual production record.

Of equal interest in evaluating the progress being made by private enterprise in fulfilling its part in the transportation-industry team is a brief summary of vehicles registered in the Nation. During the twenties, registrations of cars, trucks, and busses (chart 4) rose from about 9,000,000 units in 1920 to over 26,000,000 units. During the early thirties, and again during the war, many vehicles were out of service and registration dropped slightly. After the war, these were again registered, production was resumed, and the 1948 registration rose to over 41,000,000 vehicles. It is particularly important in evaluating these figures to realize that in 1925 only about 2,500,000, 13 percent of the total vehicles registered, were trucks and busses, and that this percentage has increased progressively since that time until in 1948 over 7,000,000 trucks and busses, 18 percent of the total vehicles registered, are traveling the Nation's highways, roads and streets.

Advances in the design and construction of the vehicle itself have had considerable effect on the increased registration and on the much more rapid increase in the mileage traveled by these vehicles each year. The Automobile Manufacturers Association estimates that those cars built previous to 1925 and scrapped during that year were only slightly over 6 years old and had traveled less than 26,000 miles, about 4,000 miles per year. Data on the cars scrapped during 1947 show that these vehicles were over 12 years old and had traveled an average of 90,000 miles, over 7,000 miles per year.

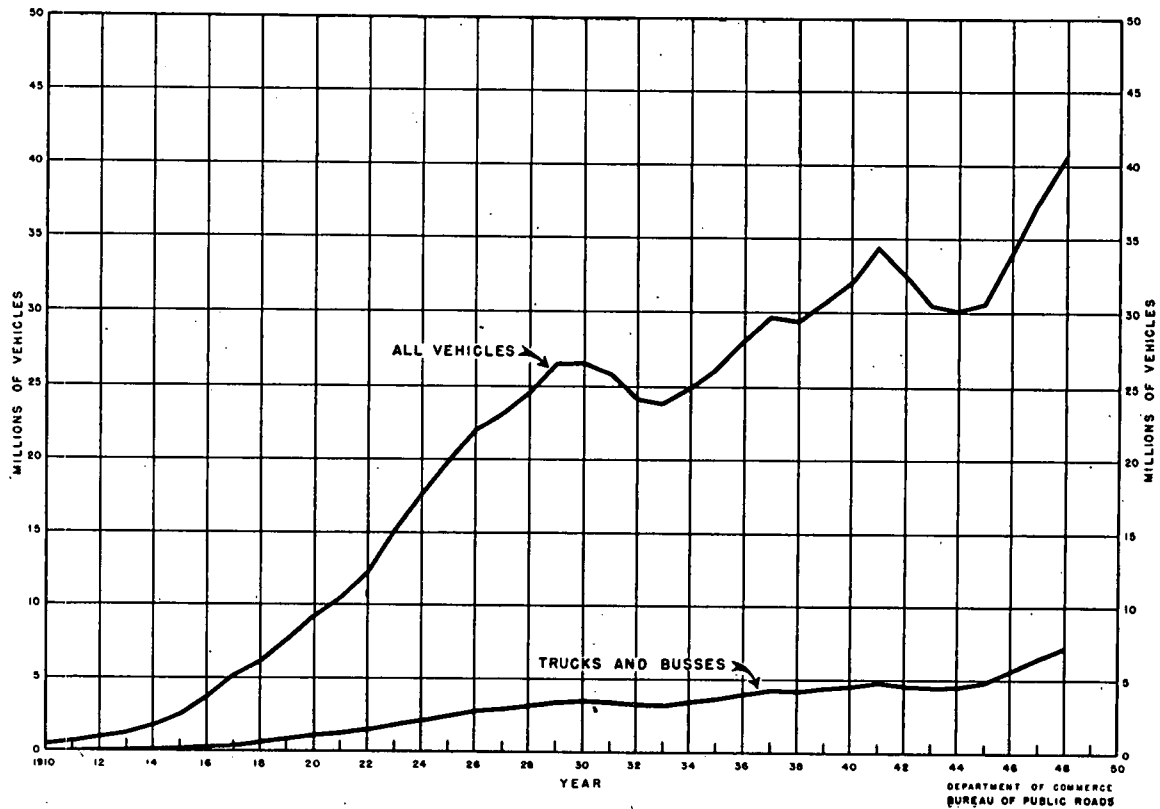
CHART 3
U. S. motor-vehicle production, 1910-48



Source: Automobile facts and figures, published by Automobile Manufacturers Association, 29th edition, p. 5.

CHART 4

U. S. motor-vehicle registration, 1910-48



Records of the miles traveled by motor vehicles on our Nation's highways (chart 5) show that in 1936 all vehicles traveled a total of 252 billion miles. Of this, trucks and busses accounted for over 43 billion miles, 17 percent of the total. In 1948, the total vehicle travel amounted to over 397 billion miles, an increase of over 57 percent since 1936. Truck and bus travel amounted to over 78 billion miles or almost 20 percent of the total vehicle travel. Current trends indicate that highway travel during 1949 will be at least 5 percent higher than in 1948. This trend, if it continues, will increase the total vehicle miles traveled to approximately 417 billion miles per year.

A report prepared by the American Trucking Association from data filed with the Interstate Commerce Commission by class 1 motor carriers of property shows that the truck loadings for 1948 were 205 percent above the loadings in 1938. Figures for the first 6 months of 1949 indicate that loadings will increase about 3 percent in 1949 as compared to 1948.

The Public Roads estimate of carried load in ton-miles on main rural roads has risen from 28,000,000,000 ton-miles in 1936 to 83,000,000,000 in 1948, an increase of 197 percent. The ton-miles carried by truck combinations on these roads, the type vehicle more commonly used by the large carrier, has risen from 14,000,000,000 in 1936 to 58,000,000,000 in 1948, an increase of 321 percent.

This information on the trucks, busses and cars produced, the vehicles in operation and the total annual miles of vehicle movement, indicates that private enterprise in the transportation team can produce and our citizens desire to operate, either for profit or for pleasure, ever-increasing numbers of motor vehicles. At the present rate of production, all motor vehicles now using the highways can be modernized by replacement at least once every 8 years.

ECONOMIC EFFECT OF THE COST OF MOTOR VEHICLE OPERATION

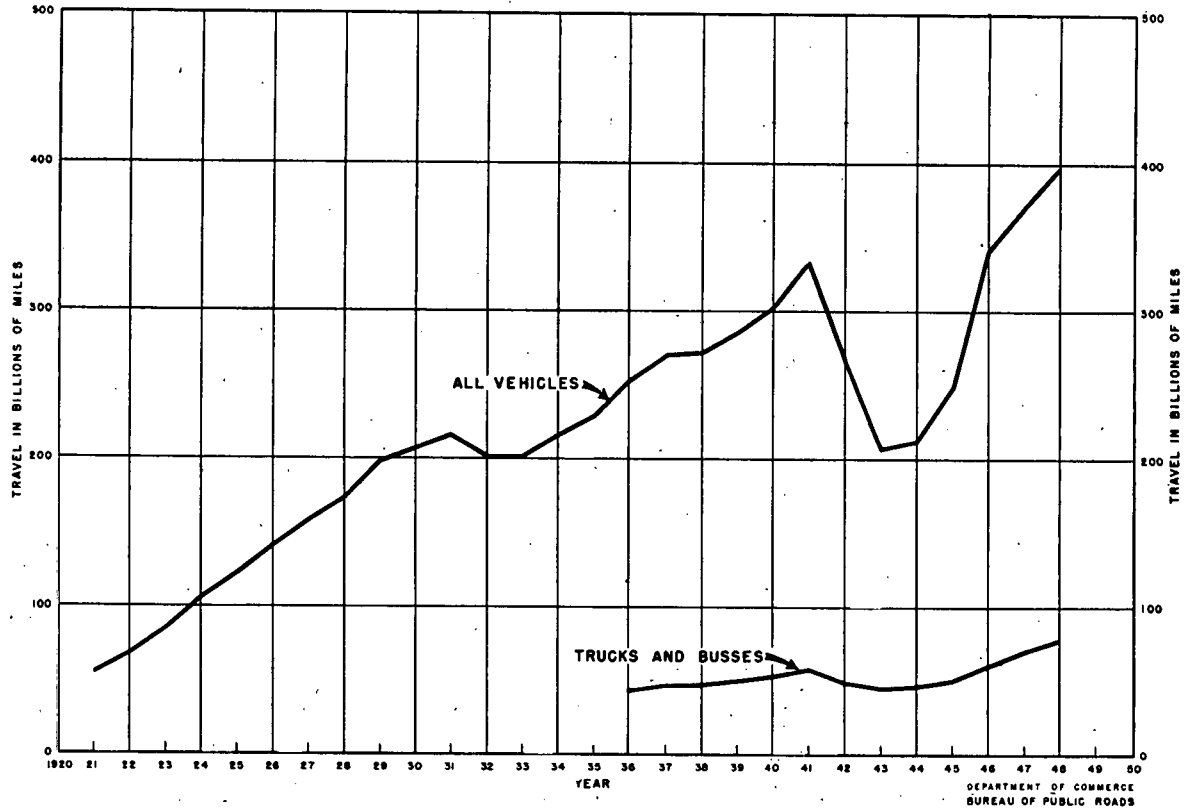
The large annual mass of motor vehicle movement makes it desirable to give some consideration to the public loss or gain from the operation of vehicles over highways in various conditions. Small savings to individual highway users through road improvements can have a large effect on our economy. An average saving of 1 cent a mile due to savings in time and the cost of motor vehicle operation on the 400,000,000,000 vehicle miles of highway travel in 1948, would amount to \$4,000,000,000 per year. A saving of $\frac{1}{4}$ of a cent a vehicle mile would amount to \$1,000,000,000.

Many studies have been made in the past few years of the cost of vehicle operation and the effect that the type of highway and type of road surface has on this operating cost. Basically, the cost of owning and operating a motor vehicle is made up of depreciation, repairs, storage, fuel, supplies, and the driver's wages.

Time is the primary factor in determining many of these costs. The truck or bus driver is paid in most cases by the hour, and if not, the

CHART 5

Miles of vehicle travel in United States, 1920-48



trip time has an important effect on any other basis of payment. The private passenger car driver, while not on an actual wage, certainly obtains some benefits from reduced trip time, if not in actual dollars, then in additional time to enjoy his home or recreational activities. Poor alignment and grade, congestion, poor road surfaces, an excessive number of intersections and lack of parking and terminal facilities are the major contributors toward loss of time on our highways. Studies conducted on the Arroyo Seco Parkway in Los Angeles, a well modernized travelway, show that motorists were able to maintain an average speed of slightly over 40 miles per hour, while on the older Figueroa Street in the same city, traffic could move at a rate of only about 17 miles per hour. Anyone familiar with east coast traffic problems can attest to the saving in time and patience occasioned by the use of urban traffic facilities such as the Pulaski highway through Newark, N. J., the West Side and East Side highways on Manhattan, the Westchester County Parkways, the Merritt Parkway in Connecticut and many others too numerous to mention here.

Time, is not, of course, the only element of saving that accrues to the highway user through the improvement of the road and street system. A 1938 report² stated that the average cost of operating a car that traveled 8,000 miles per year was 6.22 cents per mile on earth surfaces, 5.62 cents per mile on gravel, and 4.63 cents per mile on pavement. A 1939 report³ was presented showing that gasoline mileage was 2 miles per gallon less and that oil mileage was 50 percent less on gravel-surfaced roads than on paved highways. Tire wear on gravel-surfaced roads was twice the wear on paved surfaces. A 1928 study⁴ showed that vehicle operating costs, exclusive of depreciation, were 4.78 cents per mile on earth surfaces, 3.89 cents per mile on gravel, and 3.03 cents per mile on paved surfaces. There is little doubt that the inclusion of depreciation in these figures would have raised the cost considerably, probably to a greater extent on the earth or gravel surfaces than on the paved surfaces. A recent study by the Pacific Northwest forest and range experimental station shows that the tire cost alone, of a 50- to 60-thousand-pound gross weight truck is 15.73 cents per mile on earth surface roads, 11.86 cents per mile on gravel-surfaced roads and 4.74 cents per mile on bituminous or concrete-paved surfaces.

On the modern Arroyo Seco Parkway in Los Angeles, gasoline consumption was also cut appreciably. A test car made better than 20 miles to the gallon on the parkway as against 11 to 13 miles per gallon on Los Angeles city streets.

A report⁵ shows that in traveling over the German Autobahnen from Bruchsol to Nauheim,⁶ rather than over the old roads, 9 miles of travel could be saved and that in a Mercedes touring car, fuel consumption could be reduced from 5.95 gallons to 3.1 gallons at a speed of 40 miles an hour. This represents an increase in the mileage obtained of 12.7 miles per gallon.⁷ If speed were essential, rather than economy, the trip could be made in 1 hour and 14 minutes

² A report presented by Prof. R. A. Moyer, of Iowa State College, before the Highway Research Board of the National Academy of Science. Data was obtained by analyzing the actual operating costs of 293 cars used by rural mail carriers in Iowa and Indiana.

³ By Prof. R. A. Moyer, Iowa State College, Proceedings of the Highway Research Board, 1939.

⁴ By T. R. Agg and H. S. Carter, Iowa State College, engineering experiment station, Bulletin 91, 1928.

⁵ By Prof. R. C. H. Clements, M. C., M. Inst. of C. E. of England.

⁶ 92 miles as compared to 101 miles via the old road between these 2 points.

⁷ 17 miles per gallon on the old road and 29.7 miles per gallon on the Autobahnen.

compared to 2 hours and 16 minutes on the old road. The speed in this case was 74 miles per hour and the gasoline mileage 16.75, only slightly less than at 40 miles per hour on the old road.

The saving accruing to commercial operators on such highways was also demonstrated by a test run made on the German Autobahnen with a 12.3-ton (gross) truck and 3.18-ton trailer. At an average speed of 25.8 miles per hour on the old road only 5.9 miles per gallon of gasoline was obtained; at an average speed of 23.9 miles per hour on the new road, 8.48 miles per gallon was obtained. Such evidence is conclusive proof that good highways can reduce the cost of vehicle operation.

One of the most important economic benefits accruing from the improvement of highways is the reduction in the loss of life and property damage from motor-vehicle accidents. Recent reports indicate that the improvement of many of our higher traffic routes could reduce the fatality rate on those highways by at least 75 percent. The following table (table 8) shows the fatality rate on three modern limited access highways compared to the fatality rates on other highways in the same areas.

TABLE 8.¹—Fatalities per 100 million vehicle miles

Description	Length (miles)	Period	Average daily traffic	Fatality rate
Expressways:				
Merritt Parkway, passenger cars.....	37.5	July 1938-January 1945	8,900	3.5
Hartford Expressway, 14 percent trucks.....	4.2	October 1942-October 1946.	6,150	2.7
Arroyo Seco Parkway, Calif.....	5.8	1941-44.....	27,200	3.5
Other routes:				
Connecticut State highway, average.....	2,880	1940-44.....	2,360	8.0
U. S. No. 1, New York-New Haven, urban and suburban 4-lane undivided.....	46.0	July 1938-January 1945	10,800	11.2
California State highway average (rural).....		1941-44.....		14.0
Figueros St., Los Angeles.....	5.35	1941-44.....	25,100	14.0

¹ Source: Program and Project Planning in Highway Research Board, Bulletin No. 6, 1949, by Roy E. Jorgensen, Chief Engineer, Connecticut State Highway Department.

Another study⁸ showed that the accident rate on two-lane and four-lane pavements were almost the same, slightly less than four per million vehicle miles of travel. The rate on three-lane pavements was one-third higher, about five per million vehicle miles, and the rate on controlled access highways was 40 percent lower, slightly over two per million vehicle miles.

The preceding data indicate that the operating cost of the average passenger car was, in the prewar period, reduced approximately 1 cent per mile by traveling on a gravel road as compared to a dirt road and approximately 1 cent per mile by traveling on a bituminous or concrete paved highway as compared to a gravel road. This does not, of course, take into account the savings due to the greater possible speed, the more pleasant trip, the lower accident rate and savings to the adjacent property owners by the elimination of dust.

Recent advances in the cost of new cars and the cost of car repairs and fuel have substantially increased these operating costs. This makes it reasonable to assume that present operating costs would be approximately 2 cents per mile higher on earth than on gravel surfaces,

⁸ Sponsored jointly by the Bureau of Public Roads and the National Safety Council and based on data covering 9,000 accidents on 4,000 miles of major rural highways in 10 States.

and 2 cents higher on gravel than on paved surfaces. It can be seen from these data that a change in surface type from earth to gravel on a road carrying 50 vehicles per day, will reduce the present cost of operating those vehicles using the road by at least \$365 per mile per year. As stated previously, this does not include such savings as reduced trip time, reduced driver fatigue, and so forth. The saving accruing to the truck owner would be much greater since the differential between the cost of operating on the various surface types would be greater. Also the driver's time becomes a charge against the operation, and the time saved, therefore, becomes a tangible saving.

Stating the problem another way, it can be said that if each user on one particular 10-mile section of road passes over that section twice each day, the total present-day extra cost due to the uneconomical travel over an earth surface as compared to a gravel surface amounts to \$146 per year. Each of these car owners, therefore, pays \$146 each year for the privilege of driving over 10 miles of earth surface rather than over 10 miles of gravel. One hundred of these highway users could, therefore, afford to pay for a road, the 10-year cost of which, including reconstruction and the added maintenance cost, if any, would total not more than \$146,000 or \$14,600 per mile. In most sections of the country, a good gravel surface can be constructed and maintained for this additional amount of money.

NATION'S HIGHWAY SYSTEMS

There are in this country at the present time 3,327,000 miles of highways, roads, and streets (table 9). Approximately 585,000 miles of these are maintained by the 48 State highway departments. In Virginia, West Virginia, Delaware, and North Carolina, the State authority maintains all, or nearly all, of the rural roads in the State. In the remaining 44 States, the State highway authorities maintain 14 percent of the total rural road mileage.

Most of the remaining rural roads, over 2,000,000 miles of roads and trails, are maintained by the local rural authorities. In some States this responsibility is centered in the counties or parishes. There may be as many as 250 or as few as 20 county highway authorities in one State. In other States all the local rural roads are maintained by the townships or towns. This is generally a much smaller unit than the county or parish. In the remaining States, the responsibility for these local rural roads is divided between the county and the town or township. This means that three separate organizations are responsible for the rural roads in one particular area; State, county, town or township. This necessitates that their operations overlap to some extent.

The urban streets are to a large extent maintained and operated by the city and village authorities. In a number of States, however, the State authorities do assume the responsibility for the maintenance of the State highway routes passing through cities and villages. This may amount to a sizable mileage of streets. In Pennsylvania, for instance, the State is responsible for the maintenance of 2,854 miles of borough and city streets. The extent of this responsibility varies in accordance with the laws in the several States, but in general covers only the reconstruction and maintenance of the surface. The responsibility for such items as drainage maintenance, street cleaning, and so forth, usually remains with the village or city authorities.

TABLE 9.—Existing rural and urban mileage in the United States at the end of 1947,¹ classified by system and type of surface

[In thousands of miles]

System	Total	Nonsurfaced mileage			Surfaced mileage			
		Total	Primitive and unimproved	Graded and drained	Total	Low type ²	Intermediate type ³	High type ⁴
Rural mileage:								
Under State control:								
State primary systems.....	337	15	5	10	322	49	140	133
State secondary systems.....	92	16	9	7	76	35	29	12
County roads under State control ⁵	120	51	26	25	69	51	16	2
State parks, forests, reservations, etc. ⁶	5	3	1	2	2	1	1	-----
Total.....	554	85	41	44	469	136	186	147
Under local control:								
County roads.....	1,659	915	540	375	744	591	111	42
Town and township roads.....	686	369	163	206	317	280	30	7
Other local roads.....	39	39	39	-----	-----	-----	-----	-----
Total.....	2,384	1,323	742	581	1,061	871	141	49
Under Federal control: National parks, forests, reservations, etc. ⁶								
	72	58	34	24	14	11	2	1
Total rural mileage.....	3,010	1,466	817	649	1,544	1,018	329	197
Urban mileage:								
Under State control: Urban extensions of State highway systems.....								
	31	1	-----	1	30	2	8	20
Under local control: City streets and alleys.....								
	286	79	(⁷)	79	207	75	46	86
Total urban mileage.....	317	80	-----	80	237	77	54	106
Total rural and urban mileage in the United States.....	3,327	1,546	817	729	1,781	1,095	383	303

¹ Compiled for latest available years from reports of State authorities and planning survey data, by Bureau of Public Roads.

² Consists of stabilized soil and gravel or stone surfaces.

³ Consists of bituminous treated and mixed bituminous surfaces.

⁴ Consists of bituminous penetration, bituminous concrete, sheet asphalt, portland cement concrete, brick, block, and dual-type surfaces.

⁵ County roads are under State control in Delaware, North Carolina, Virginia (all but 3 counties), and West Virginia.

⁶ State and national park, forest, reservation, and other roads that are not a part of the State or local systems.

⁷ Graded and drained classification includes primitive and unimproved mileage.

URBAN AUTHORITIES

Of particular importance, in the urban highway and street problem, is the need for effective machinery to coordinate the activities of the State, city, county, and other local highway authorities within metropolitan areas. Such machinery should accelerate the development of integrated highway systems within these areas. The Washington, D. C., urban area exemplifies the problem. This area includes, in addition to the District of Columbia, the counties of Montgomery and Prince Georges in the State of Maryland, and the cities of Alexandria and Falls Church and the county of Arlington in Virginia. In Maryland, the State, the two counties and a number of the small suburban centers have some authority over highways and streets. In Virginia, the two cities and the one county, as well as the State, have

some degree of control over the solution of transportation problems. It was suggested, in a discussion of this problem at a recent meeting of the American Society of Civil Engineers, that joint action by all interested parties through a metropolitan area authority was necessary to solve the interrelated street and access problems into the District of Columbia. At the present time a committee has been set up to study the transportation problem in this area. Virginia, Maryland, the District, and the Bureau of Public Roads, together with other interested parties, are participating and should be able to initiate a pattern for economic development of the area through more efficient traffic movement.

This Washington area is only one example. As designated for Federal-aid purposes, the Chicago urban area contains 29 additional adjacent urban areas. The Los Angeles area contains 30 additional areas of over 5,000 population and five incorporated places under 5,000 population. Many other areas often covering parts of two States, such as the Philadelphia-Camden and the New York-northern New Jersey areas, could be cited.

FEDERAL INTEREST IN HIGHWAYS

The obligation to raise the highway system of the Nation to a standard required by a high-level economy rests not only on the States and localities but is shared by the Federal Government.

The interest of the Federal Government in the development of an integrated transportation system in this country is not of recent origin. One and one-half centuries ago, recognition was given to the national interest in the development of roads. It was recognized then that our great country could not develop without first having a convenient means of transportation.

Shortly before 1800 the then Northwest, the territory adjacent to the Ohio River, was opened for settlement. In 1806 Congress appropriated money for the development of the trail, known later as the National Pike, from Cumberland, Md., to Wheeling, W. Va. It was later projected westward through what became the State capitals of Ohio and Indiana, through Illinois to St. Louis on the Mississippi. The road is today United States Highway 40, an important east-west route. This expenditure by our forefathers was made to further the economic development of a vast territory. The importance of highways has increased, not decreased, over the intervening 150 years.

Again, in 1912, Congress appropriated \$500,000 for the improvement of post roads in rural areas. The 1916 act followed and provided a well-balanced administration. The 1921 act retained the earlier principles, but added the requirement for joint Federal and State designation of a system of main rural roads on which all future Federal appropriations would be spent. The interest of the Federal Government is also recognized in our national forests and parks through Federal appropriations for highways in these areas.

Since 1921, every route on the system, now about 232,000 miles of highways, has been improved. The present act continued Federal assistance on this system but, in addition, recognized the Federal economic interest in a secondary system to feed these main rural highways and in the urban extensions of these main rural highways. In addition, the designation of a national system of interstate highways was directed. This system, containing 37,800 miles of the primary and urban systems, serves 21 percent of the rural traffic; connects all cities of over 250,000 population, all but six cities of over 100,000 population, over half of the cities of 50,000 to 100,000 population, and 2,538 other cities, towns, and urban places. It is estimated (1940 census) that 50 percent of our rural population and 60 percent of our rural and urban population reside in areas traversed by this system.

Under the major modifications of the basic 1921 act made by the 1944 act, there are now four systems of Federal-aid highways, as follows:

[In miles]

1. The interstate system (part of the primary system)	37, 800	
2. The Federal-aid primary system, Act of 1921.....		232, 785
3. The Federal-aid secondary system, Act of 1944.....		384, 430
4. The Federal-aid urban system, act of 1944 (part of primary system).....	14, 000	
Total.....		617, 215

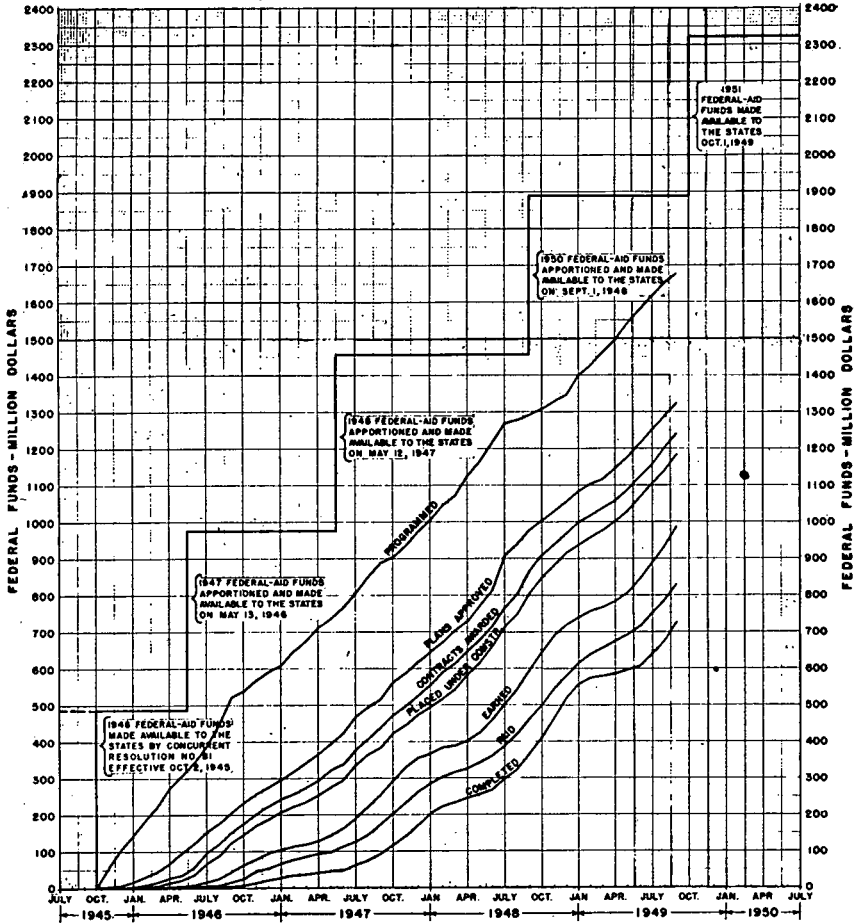
POSTWAR FEDERAL AID

Since 1944, the beginning of the postwar period, \$2,400,000,000 has been authorized for Federal-aid highway construction. With these funds and the matching fund provided by the State and local authorities, over 44,100 miles of highway improvements have been completed at a total cost of \$1,330,000,000 (August 25, 1949). An additional 35,000 miles of improvements estimated to cost \$1,966,000,000 have been programed. Two hundred and thirty-six million dollars of the fiscal 1950 Federal funds have not been programed; \$450,000,000 of fiscal 1951 funds have been authorized, but are not as yet apportioned. Chart 6 shows the details of this program to date. The type of work constructed during the fiscal year ending June 1949, under the program, is shown on table 10. Table 11 shows the Federal funds still to be placed under contract by the various States. Column 1 is the amount that is programed, but not placed under contract. Column 2 shows the unprogramed balance of the apportioned funds; column 3, the approximate apportionment for fiscal year 1951; and column 4, the total amount still available to each State up to the end of fiscal year 1951.

CHART 6

POSTWAR FEDERAL-AID HIGHWAY FUNDS

SUMMARY, FEDERAL-AID PRIMARY, SECONDARY AND URBAN FUNDS



Source: Bureau of Public Roads, U. S. Department of Commerce.

TABLE 10.—Type of Federal-aid road improvements financed from all major funds¹ completed during the fiscal year 1949

SUMMARY

Type	Total cost	Federal funds	Miles
C Graded and drained earth.....	\$57,446,184	\$29,219,804	1,887.2
D Soil.....	2,855,800	1,474,520	198.5
E Gravel or stone.....	92,761,612	48,002,437	7,219.0
F Bituminous surface treated.....	86,845,925	43,375,130	4,782.5
G Mixed bituminous.....	87,021,404	47,025,902	3,634.1
H Bituminous penetration.....	19,034,048	9,640,957	453.7
I Bituminous concrete, sheet or rock asphalt.....	52,888,556	27,263,939	900.2
J Portland cement concrete.....	156,562,530	80,021,494	1,362.4
KLM Combination.....	6,401,178	3,102,507	68.1
X Bridges.....	149,998,352	82,722,564	81.9
Y Miscellaneous.....	8,874,499	5,581,059
Total.....	720,690,088	377,430,313	20,587.6

TABLE 10.—Type of Federal-aid road improvements financed from all major funds¹ completed during the fiscal year 1949—Continued

BRIDGES

Type	Total cost	Federal funds	Number of bridges
Stream crossings.....	\$97,937,910	\$49,484,347	2,676
Railroad separations.....	20,254,580	15,307,009	118
Highway separations.....	14,041,676	7,285,426	102
Combinations.....	17,764,186	10,045,782	42
Total.....	149,998,352	82,722,564	2,938

RAILWAY-HIGHWAY IMPROVEMENTS

Crossings	Total cost	Federal funds	Number of crossings
Eliminated by separation.....	\$31,796,132	\$23,793,152	125
Eliminated by relocation.....	3,908,487	3,087,646	24
Protected.....	2,852,895	2,559,099	466
Separation structures reconstructed.....	7,718,590	5,755,056	34
Total.....	46,276,104	35,194,953	649

¹ Bureau of Public Roads, U. S. Department of Commerce.TABLE 11.—Summary of postwar Federal-aid funds available for additional contracts¹

State	Programed but not yet under contract	Unprogramed balance	Approximate 1951 appropriation ²	Total
Alabama.....	\$6,015,436	\$12,198,589	\$8,788,000	\$27,002,025
Arizona.....	3,887,650	902,548	5,113,000	9,903,198
Arkansas.....	9,822,575	1,889,522	6,705,000	18,417,097
California.....	10,397,159	4,645,767	19,856,000	34,898,926
Colorado.....	4,373,355	3,731,332	6,811,000	14,915,687
Connecticut.....	5,482,291	1,643,214	4,242,000	11,367,505
Delaware.....	1,653,938	2,632,662	1,806,000	6,092,600
Florida.....	11,250,793	4,043,268	6,271,000	21,565,061
Georgia.....	12,305,429	1,607,743	10,288,500	24,201,172
Idaho.....	7,263,231	2,820,855	4,389,000	14,473,186
Illinois.....	41,801,342	5,519,084	20,439,000	67,759,426
Indiana.....	13,122,849	9,446,199	10,645,000	33,214,048
Iowa.....	9,008,058	1,849,967	9,842,000	20,700,025
Kansas.....	6,812,105	3,616,620	9,422,000	19,850,725
Kentucky.....	9,549,791	1,789,176	7,977,000	19,315,967
Louisiana.....	13,289,114	3,042,990	6,694,000	23,026,104
Maine.....	4,671,276	2,273,401	3,454,000	10,398,677
Maryland.....	3,789,597	1,312,318	4,272,000	9,373,915
Massachusetts.....	9,132,901	15,031,068	9,196,000	33,359,969
Michigan.....	11,389,942	2,954,334	14,770,000	29,114,276
Minnesota.....	8,089,939	1,589,198	10,988,000	20,667,137
Mississippi.....	1,782,907	8,316,143	7,223,000	17,322,050
Missouri.....	18,632,700	6,232,324	12,760,000	37,625,024
Montana.....	5,819,318	8,196,244	7,093,000	21,108,562
Nevada.....	9,183,150	4,824,794	7,426,000	21,433,944
Nebraska.....	2,064,813	3,395,759	4,334,000	9,794,572
Nevada.....	3,034,839	1,428,680	2,046,000	6,509,519
New Hampshire.....	3,372,833	1,883,853	8,387,000	13,643,686
New Jersey.....	7,954,822	1,836,859	5,696,000	15,486,681
New Mexico.....	36,297,715	33,486,467	30,096,000	99,880,182
New York.....	7,165,677	8,473,507	10,194,000	25,833,184
North Carolina.....	6,099,874	2,412,308	5,265,000	13,777,182
North Dakota.....	29,164,396	8,302,198	17,722,000	55,188,594
Ohio.....	14,512,489	3,652,284	8,987,000	27,151,773
Oklahoma.....	3,931,416	2,769,124	6,315,000	13,015,540
Oregon.....	22,488,078	7,337,663	22,173,000	51,998,741
Pennsylvania.....	3,535,051	2,555,456	2,622,000	8,712,507
Rhode Island.....	1,939,618	5,828,686	5,546,000	13,314,304
South Carolina.....	6,072,089	1,210,460	5,521,000	12,803,549
South Dakota.....	8,027,997	2,773,538	8,969,000	19,770,535
Tennessee.....				

See footnotes at end of table, p. 26.

TABLE 11.—*Summary of postwar Federal-aid funds available for additional contracts*¹—Continued

State	Programed but not yet under contract	Unprogramed balance	Approximate 1951 apportionment ²	Total
Texas.....	4,858,395	7,178,338	25,584,000	37,620,733
Utah.....	4,598,687	1,556,245	4,159,000	10,313,932
Vermont.....	1,516,010	1,158,165	1,812,000	4,486,175
Virginia.....	6,923,643	11,660,654	7,842,000	26,426,297
Washington.....	7,433,067	1,692,892	6,573,000	15,698,959
West Virginia.....	7,469,449	795,977	4,788,000	13,053,426
Wisconsin.....	10,995,772	7,551,493	10,397,000	28,944,265
Wyoming.....	2,665,328	414,619	4,266,000	7,345,947
Hawaii.....	3,823,247	1,837,191	1,974,000	7,634,438
District of Columbia.....	2,449,022	190,270	2,643,000	5,282,292
Puerto Rico.....	5,082,391	3,023,974	2,744,000	10,850,365
Total.....	451,803,564	236,515,120	433,125,000	1,121,443,684

¹ Bureau of Public Roads, U. S. Department of Commerce, as available from the Washington Headquarters Record as of August 1, 1949.

² Available to the States on Oct. 1, 1949.

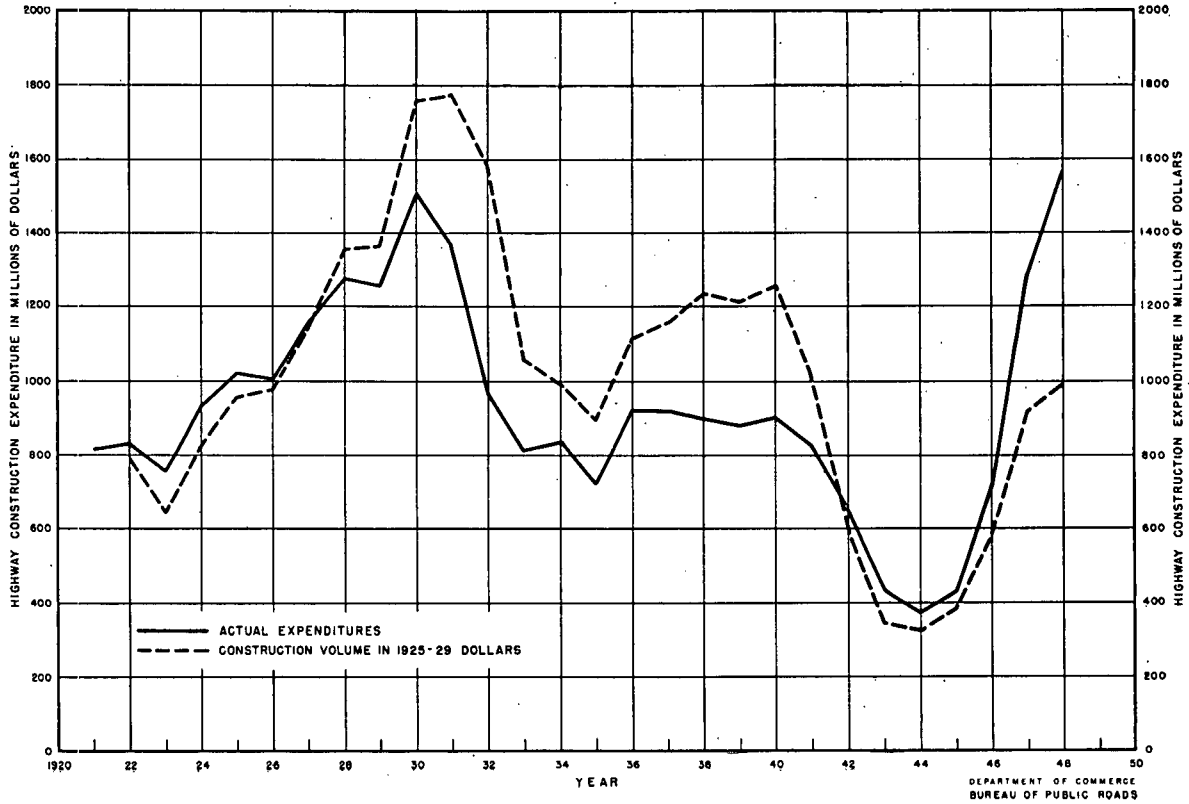
HIGHWAY CONSTRUCTION VOLUME

The dollar volume of all highway construction with and without Federal aid, including State, city, county, and local (chart 7), averaged \$1,239,000,000 per year during the period 1926 through 1930, and reached a peak of \$1,505,000,000 annually in 1930. During the thirties the annual highway construction expenditure decreased and averaged only \$903,200,000 during the late thirties. During the war years, highway construction was further curtailed and fell below \$400,000,000 in 1944. With the cessation of hostilities in 1945, the volume of highway construction again rose and totaled \$1,284,000,000 in 1947 and \$1,569,000,000 in 1948.

It would appear that the 1948 highway construction volume compares favorably with the 1930 construction rate of \$1,505,000,000 per year. This, however, is not the case. In the same period the construction cost index has risen from 85.7 in 1930 to 158.2 in 1948, an increase of 85 percent. Today, therefore, an expenditure of \$1.85 is required to purchase the same amount of highway construction as could be purchased in 1930 for \$1.00. In other words, in terms of the 1930 highway construction dollar, the 1948 dollar is worth only 54 cents. The dotted line on chart 7 shows the dollar value of construction that was purchased each year in terms of the 1930 dollar. As indicated by this chart, only a little more than half as much construction was accomplished in 1948 as in 1930. It would require an expenditure of 2,791,000,000 1948 dollars to perform the same amount of highway construction as was accomplished in 1930 and 1931.

CHART 7

Annual highway construction expenditures, 1919-48



63383-50-5

HIGHWAY CONSTRUCTION VOLUME PER TON-MILE OF TRAFFIC

Other factors have influenced the cost of highways. Today's higher average motor-vehicle speeds require that vertical and horizontal alinements be much improved over the standards in existence in 1930. Today's motor vehicles, particularly the trucks, are larger and have much heavier axle loadings. Today's highways must be built to withstand this heavier traffic. The closed winterized car requires an all-weather road. The frequency of all traffic is greater, particularly the heavily loaded trucks. This also requires that the roadbed be stronger, and, consequently, more costly. If it is assumed that the expenditure should vary in accordance with the frequency and weight of traffic, it is found that, as shown on chart 8, the annual construction expenditure in 1936 amounted to 1.8 mills per gross ton-mile of vehicle travel. The 1948 construction expenditure (1,569,000,000 1948 dollars) was equivalent to only 822,000,000 1936 dollars or 0.86 1936 mill per gross ton-mile of vehicle travel. To perform construction at the 1936 rate per gross ton-mile in 1948 would have required \$3,226,000,000.

HIGHWAY CONSTRUCTION EXPENDITURE RELATIVE TO EXPENDITURE FOR NEW MOTOR VEHICLES

Previously, it was shown that private enterprise which has been providing the rolling stock for the highway transportation team has been expanding the production and operation of motor vehicles. Chart 9 shows a comparison between the expenditure for new motor vehicles and the expenditure for construction and reconstruction of highways. In the period 1929-36, 62 cents was expended for highway construction for every dollar expended for new motor vehicles (wholesale value without taxes). For the past 3 years—1946, 1947, and 1948—less than 27 cents has been expended for highway construction for every dollar expended on new motor vehicles.

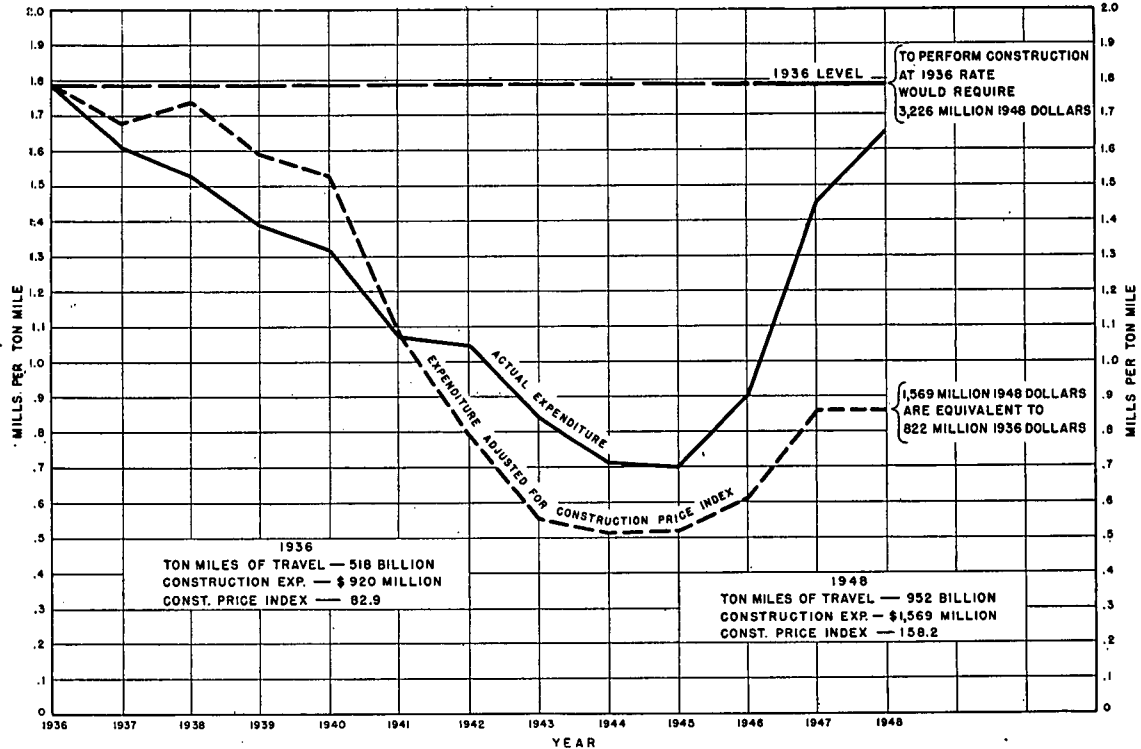
HIGHWAY CONSTRUCTION EXPENDITURE IN RELATION TO GROSS NATIONAL PRODUCT

It is also of interest to note the relationship that exists between the Nation's gross national product and the Nation's highway construction expenditure. Chart 10 shows that during the period 1929-36, 1.38 percent of the gross national product was used to construct highway and street systems. This percentage declined steadily until in 1944 less than 0.2 percent of the gross national product was being expended for highways. From then on, the percentage rose, until in 1948, 0.6 percent of the gross national product was being expended for highways. The 1948 rate was less than half of the 1929-36 rate.

The expanding production rate of modernly designed motor vehicles, the introduction of these vehicles on the highways, and the more extensive use and wear of the roads, together with the lowered rate of highway construction in place, has resulted in a present accumulation of highway deficiencies estimated at \$41,506,111,000. The deficiencies will be described by States in the following appendix.

CHART 8

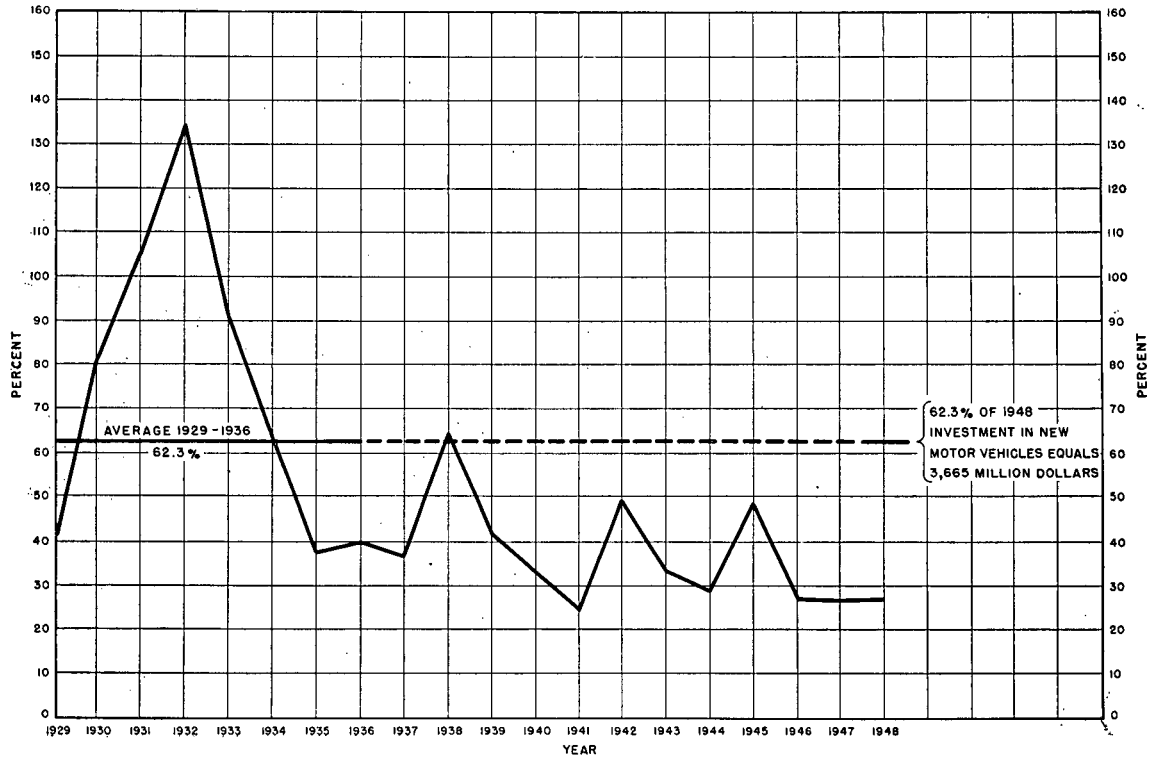
Estimated construction expenditure per gross ton-mile of vehicle travel



Source: Bureau of Public Roads, U. S. Department of Commerce.

CHART 9

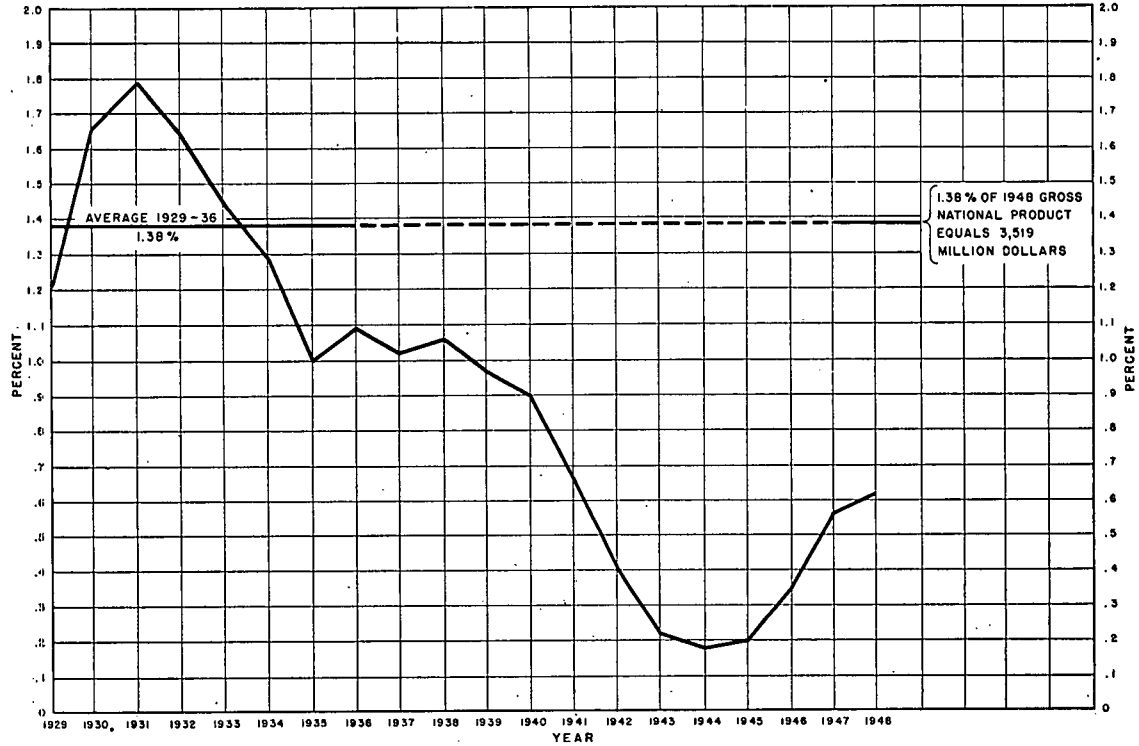
Ratio investment in new highways to investment in new motor vehicles



Source: Bureau of Public Roads, U. S. Department of Commerce.

CHART 10

Ratio, highway construction to gross national product



Source: Bureau of Public Roads, U. S. Department of Commerce.

APPENDIXES

APPENDIX A

Analysis of the present and future highway construction program in each State, prepared from data received in reply to the committee's inquiry to the individual States and from other available sources.

Alabama

The State of Alabama has under contract, construction work valued at \$8,500,000. Additional work, estimated to cost \$64,545,000, is authorized and is being planned. Some of this work is located on the State highway system and the remainder consists of State-county projects on the county roads. Not all of the county road work and none of the work on city and village streets are included in the above figures.

It is also estimated that the cost of constructing and reconstructing the Alabama highways, roads, and streets that are now deficient, will amount to \$844,000,000. Of this total, \$234,000,000 is required on the State highway system, rural and urban; \$490,000,000 on the county and local roads; and \$120,000,000 on the city and village streets.

The construction of these needed and beneficial highways, roads, and streets should provide 512,722,000 hours of employment on and off the job site. The injection of these 512,722,000 hours of labor into the economy should provide nearly an equal amount of employment in the production and marketing of consumer goods.

In addition to these construction expenditures, Alabama is spending annually about \$5,000,000 for the maintenance of the State highway system, about \$16,000,000 for the maintenance of county roads, and an additional amount for the maintenance of city and village streets. This expenditure provides direct employment for an average of 865 persons throughout the year on the State highways, and an estimated 4,500 persons on the county roads. It is therefore probable that nearly 6,100 persons are engaged in maintaining the highways, roads, and streets of Alabama. A certain amount of the work is also accomplished by the use of convict labor.

Recent lettings of highway construction projects have demonstrated that more bids are being received per project than before the beginning of 1949. Construction costs are somewhat lower and road-building equipment and materials more easily available.

Arizona

The State of Arizona has under contract work valued at \$10,105,175 and has authorized and is planning additional construction, estimated to cost \$56,373,399. These figures do not include any work on the local county roads or city streets.

It is also estimated that the future requirements for constructing the State highways to adequate standards amount to \$150,096,000.

The needed construction on the county roads is valued at \$70,000,000 and on the city and village streets at \$37,000,000. The total value of the needed highway, road, and street construction in Arizona is, therefore, approximately \$257,096,000.

The construction of these needed highway improvements should provide 114,979,000 hours of employment on and off the job site. The injection of these man-hours of employment into the economy should add at least 145,493,000 additional hours of employment in the production and marketing of the consumer goods purchased by labor.

In addition to these construction expenditures, the State of Arizona is spending annually about \$1,645,000 on the maintenance of the State highway system. Other recent data indicate that the Arizona counties expend approximately \$1,626,000 on the maintenance of the county roads, and about \$772,000 is spent annually on the maintenance of the city and village streets. These expenditures provide employment for an average of 511 persons throughout the year on the State highway system and an estimated 500 persons on the county roads. It is therefore probable that about 1,250 men are employed in maintaining the highways, roads, and streets of Arizona.

Construction costs in Arizona have decreased 5 to 8 percent on the average job. It is felt that this is due to an increase in the productivity of labor and a reduction in the cost of materials. It is estimated that the price of lumber has decreased 20 percent, of steel 12 percent, and of asphalt 10 percent.

Arkansas

The State of Arkansas has under contract highway work valued at \$13,000,000 and has authorized work estimated to cost \$12,000,000 on the State highway system. Additional work is probably being done on the county roads and city streets.

It is also estimated that the improvement of the Arkansas highways, roads, and streets that are now deficient would cost \$329,468,000. Over a 10-year period, the cost of improving the deficient highways, roads, and streets of Arkansas would amount to \$397,357,000. Of this total, \$287,257,000 is required on the State highway system, rural and urban; \$75,000,000 on the local rural roads; and \$35,000,000 on the local urban streets.

The construction of the highways presently deficient would provide 173,030,000 hours of employment on and off the job site. This employment should provide a slightly larger amount of employment in the production and marketing of the consumer goods purchased by labor.

In addition to these construction expenditures, the State of Arkansas spends about \$6,000,000 annually on the maintenance of State highways; the counties, slightly over \$6,000,000; and the cities, an estimated \$1,700,000. These expenditures provide direct employment for an average of 1,529 persons all year-round on the State highways. Including the employment on the county roads and city streets, it is estimated that about 4,000 men are engaged in maintenance of the highways, roads, and streets of Arkansas.

Recent construction bids have been below estimates, and it is apparent that there is considerable increased interest and competition among bidders on highway construction in the State of Arkansas.

California

The State of California has under contract highway construction work valued at \$83,936,700, and is planning work estimated to cost \$150,000,000. Additional work is under way and being planned by the counties, cities, and villages.

The present cost of constructing the critical deficiencies on the State highway system is estimated to be \$1,415,000,000. A previous study indicated that the cost of constructing the deficient county roads, city streets, and city expressways not included in the State highway system, amounts to \$953,110,000. This estimate was made previous to June 1947, and since that time construction costs have increased. It is estimated that the present cost of these needed highway and street improvements is approximately \$1,150,000,000. The total cost of the present deficiencies is, therefore, some \$2,565,000,000. As noted above, this cost includes only the critical deficiencies on the State highway system, of which the interstate system of highways is a part. A recent estimate by the California Division of Highways of the cost of improving the interstate system alone to prescribed standards was at least \$680,000,000 more than the cost of constructing only the critical deficiencies on that system. Since only correction of the critical deficiencies on the interstate system was included above, the addition of this \$680,000,000 will raise the total amount required to construct these needed and beneficial highway improvements to approximately 3¼ billion dollars.

The construction of the critical deficiencies, valued at \$2,565,000,000, should, according to studies conducted by the California Department of Highways, provide 380,902,000 man-hours of on-site employment. The production and transportation to the job site of the materials and supplies used on the work should require another 672,543,000 hours of labor off the job site. The injection of these 1,053,445,000 man-hours of labor into the economy should result in the addition of 1,440,889,000 hours of employment in the production of the consumer goods purchased by labor.

In addition to this construction expenditure, California spends about \$19,000,000 per year for the maintenance of the State highway system. The counties expend about \$20,000,000 on the maintenance of county roads and the cities and villages \$15,000,000 on their streets. The State employs an average of 2,807 men on the maintenance of the State system. It is probable that there are another 5,000 men engaged in the maintenance of county roads, and about 4,000 on the city streets. It is therefore estimated that a total of 11,800 men are employed in maintaining the highways, roads, and streets of California.

The California construction cost index rose to a peak of 216.8, 116.8 percent above the 1940 level, in the first half of 1948. It has now dropped to 195.7, 95.7 percent above the 1940 level, a reduction of 9.7 percent from the 1948 peak. There has, at the same time, been a marked increase in competition among the contracting organizations. The average number of bidders per highway project has increased from 5.1 in 1948 to 6.7 during the first half of 1949. This increased interest in highway contracts is even more evident in the bidding on structural contracts. On this type of work, the average number of bids per project has increased from 5.5 last year to 8.1 this year.

It is reported that the decrease in cost can be attributed to the following factors: An increase in labor productivity from 75 percent of the 1940 productivity in 1948 to 90 percent; an increase in the availability of materials and labor; and the reduction in the price of many materials, together with the availability of firm quotations.

Colorado

The State of Colorado now has under contract 339 miles of highway construction work valued at \$16,336,971. In addition, they have authorized and planned 1,042 miles of future work which is estimated to cost \$41,130,643. All of this construction is on the State highway system, and undoubtedly a considerable amount of work is also under way and being planned on local roads and city and village streets which do not come under the State highway department.

The State estimates that 13,688 miles of their highways, roads, and streets are deficient at the present time. The total cost of correcting these deficiencies will be \$402,381,000. The State highway system alone requires 7,204 miles of improvement, costing \$284,051,000; the counties need 5,882 miles of road work, valued at \$88,230,000; and 602 miles of improvements valued at \$30,100,000 would be required to remodel, reconstruct, or relocate currently inadequate city streets. It is further estimated that during the next 10 years it will be necessary to improve an additional 5,602 miles at a cost of \$154,188,000 to take care of the deficiencies expected to accumulate in that period. Of this total, \$95,023,000 will be needed on the State systems, \$44,115,000 on the county roads, and \$15,050,000 on city streets.

Construction of all present needs on the roads and streets of Colorado should provide 178,713,000 hours of employment on and off the job site, and the injection of this amount of labor into the economy should induce at least another 226,424,000 hours of work in the production and marketing of consumer goods.

The annual maintenance expenditure in Colorado amounts to about \$5,000,000 on the State highway systems and \$11,200,000 in the counties. The cities and villages expend additional funds on the maintenance of their streets. The total maintenance expenditure in the State, therefore, should come to about \$18,000,000. Maintenance work employs approximately 1,000 persons throughout the year on State highways, and an estimated 3,000 people on the county roads. When those persons employed by the cities are included, it is likely that about 4,600 people are employed in maintaining the highways, roads, and streets of Colorado.

Lower bid prices on highway work are being secured, keener competition is apparent, and the average number of bidders per project has increased. Contractors in this area report that the labor output per man has improved. It is estimated that Colorado contractors have the capacity to construct \$40,000,000 worth of highway work each year.

Connecticut

The State of Connecticut now has under contract work that will require an expenditure of \$14,000,000, and has authorized and is planning work estimated to cost \$146,000,000. Some additional construction is being carried on by the towns and cities.

The construction of the needed highways, roads, and streets in Connecticut, including those now under contract and authorized, is expected to require approximately \$628,000,000 of State funds.

The construction of these beneficial highway improvements should provide 289,508,000 man-hours of employment on and off the job site and should provide some 357,000,000 additional hours of employment in the production and marketing of the consumer goods purchased by labor.

In addition to the construction outlined above, the State of Connecticut expends approximately \$14,000,000 annually for the maintenance and improvement of the State highway systems, and the towns and cities expend about \$11,000,000 on the roads and streets under their supervision. It is estimated that the total maintenance employment in Connecticut is over 5,000 persons.

In Connecticut, competition is increasing among the bidders for the smaller highway contracts, and the bids received are 5 to 7 percent lower than last year. On the larger contracts, the number of bidders has not increased, but prices have dropped approximately 10 percent. These reductions are attributed to greater productivity on the part of the "on job" labor.

Delaware

The State of Delaware now has under contract highway construction work valued at \$33,070,000 and has additional work authorized and planned, which the highway department estimates will cost \$14,240,000. These amounts include the cost of work in the cities of Wilmington and Dover, and on the Delaware Memorial Bridge. The smaller municipalities are also doing some construction.

An estimate of the future construction needs of Delaware comes to \$119,000,000 for the State highway system and the two major cities. An additional \$4,500,000 would probably be necessary to construct the village streets to acceptable standards.

The expenditure of these \$123,500,000 would provide 57,237,000 hours of employment on the job site and in the manufacture and transportation of the materials used in the work. This increase in employment should induce slightly more than that amount of work in the consumer goods industry.

Delaware maintenance requirements currently run about \$2,000,000 per year for the State highway system. The total maintenance expenditure, including the cities and villages, probably amounts to \$2,200,000. The State employs an average of 500 persons each year on highway maintenance, while it is estimated that another 100 work for city and village maintenance departments, a total of 600 persons.

Delaware reports that "competition on highway work has been very keen during this construction season," and that "recent bidding indicates a marked decrease in unit and contract costs."

Florida

The State of Florida now has under contract highway construction work valued at \$6,886,000, and has authorized or is planning work valued at \$121,000,000. The cities and counties are probably expending additional amounts on the construction of roads and streets.

It is estimated that the construction of all Florida highways, roads, and streets that are now deficient will require the expenditure of \$115,704,000. Additional deficiencies, occurring in the next 10

years, will raise the cost of constructing the 10-year requirements to \$518,857,000.

The construction of this \$115,704,000 worth of highways that are now deficient should provide 62,520,000 hours of employment on and off the job site. The injection of this labor into the economy should result in the addition of an equal amount of employment in the production and marketing of the consumer goods purchased by labor.

The State of Florida also expends approximately \$9,000,000 per year on the maintenance of the State highway system. The counties expend over \$6,000,000 on the local roads. The total maintenance expenditure in Florida, including the amount spent by cities and villages, is therefore estimated to amount to over \$21,000,000 per year. The State of Florida employs an average of 2,170 persons throughout the year in maintaining the State highways, and it is estimated that the counties employ about 2,000 men on the local roads. The total maintenance employment in Florida, including the personnel employed in maintaining the city streets, is estimated to be in excess of 6,100 persons.

The cost of highway construction in Florida reached a peak in 1947 and has now receded approximately 10 percent below that peak. There is more interest and competition than at any time since the war, and this interest and competition is steadily increasing.

Georgia

Work under contract or actually being constructed in Georgia at the present time amounts to \$36,942,700: \$27,512,000 on the State highway systems; \$7,630,700 on county and local rural roads; and \$1,800,000 on city and village streets and alleys. The total amount of highway work authorized and planned is \$52,482,900; of this, \$36,143,300 will be spent on the State systems, \$10,939,600 on county and local rural roads, and \$5,400,000 on city and village streets.

Georgia estimates that on the State highway system it will cost \$539,341,185 to correct present deficiencies. The \$638,325,000 needed by counties and the city and village requirements, which amount to \$50,000,000, make the total needs for the State almost \$1,228,000,000. An additional \$360,426,525 would be needed to correct the deficiencies which would accumulate during a 10-year period.

If all of Georgia's presently needed improvements were constructed, the expenditure of this \$1,228,000,000 should inject into the economy 724,974,000 man-hours of labor on and off the job site. This should result in at least 682,963,000 more hours of work in the consumer goods industry.

Maintenance in Georgia costs the State about \$5,000,000 annually, while the counties expend close to \$7,700,000 and the cities and villages \$3,300,000, to make a total of \$16,000,000. The State employs over 2,000 persons on maintenance work, the counties about 2,500, and the cities another 1,000. Therefore, there are approximately 5,500 persons employed in the maintenance of the highways, roads, and streets of Georgia.

The Georgia report contains the following comments.

The experience in contract lettings since the first of this year indicates a decided tendency toward reduced costs as shown in bids on nearly \$7,000,000 in three separate lettings, in each of which the bids were under the engineers' estimates more than 10 percent throughout. Competition has been very keen, with apparent very close figuring being done by the bidders.

Idaho

The State of Idaho now has under contract highway work valued at \$5,799,167, and the proposed and authorized program is estimated to cost \$17,579,770. These estimates do not include the work under construction or proposed on the local county roads and city streets.

The cost of constructing the State highways to adequate present-day standards is estimated to be \$229,750,000. Additional construction would, no doubt, be necessary on the local rural roads and urban streets.

The construction of these needed improvements on the State highway system should provide 106,172,000 hours of work on and off the job site and should induce at least 136,000,000 hours of work in the production of the consumer goods purchased by labor.

The maintenance of the Idaho State highways, not included above, requires an annual expenditure of about \$2,000,000; the county roads, about \$3,000,000; and the city streets, \$1,400,000. The expenditure of these funds provides employment for approximately 675 men on the State highway system, 1,000 men on the county roads, and 500 on the city streets. Total maintenance employment in Idaho, therefore, amounts to approximately 2,175 persons.

It is felt that, in Idaho, there are definite indications of increased contractor interest in highway work, and that there is a gradual tendency toward lower prices, particularly in asphalt and crushed aggregate surfacing work. The labor supply is increasing, with less turn-over and increasing productivity.

Illinois

The State of Illinois expects to construct in this biennium (July 1, 1949, through June 30, 1951) work valued at \$50,000,000 on the State highway system. Additional work will be accomplished on the county roads and city and village streets.

A report prepared for the Illinois Highway and Traffic Problems Commission shows that \$2,518,917,000 is required to improve those highways, roads, and streets that are now deficient. The improvement of the presently deficient State highways, rural and urban, will require the expenditure of \$1,128,895,000; the county roads, \$564,864,000; and the city streets, \$825,158,000. This report also indicates that additional deficiencies occurring during the next 10 years will raise the 10-year cost of improving inadequate highways to \$3,788,117,239.

Included in these 10-year needs are 6,231 miles of State highways, 70,323 miles of county roads, and 11,205 miles of city and village streets. Of this 87,759-mile total, 64,900 miles are deficient now. Many of these unsatisfactory conditions have been in existence for several years. The following table indicates the type of work needed in the 10-year improvement program.

<i>Total improvement needs</i>		
Type of improvement:	[1947 prices]	<i>Estimated cost of improvements</i>
New pavement.....		\$1, 416, 773, 006
Resurfacing.....		247, 066, 348
Resurfacing and widening.....		186, 892, 651
Structures.....		952, 094, 965
Right-of-way.....		105, 255, 751
Other.....		173, 800, 373
Superhighways.....		644, 914, 000
Stopgap and emergency needs.....		61, 320, 145
Total.....		<u>3, 788, 117, 239</u>

The type of work needed on the State highway system, rural and urban, during the next 10 years is shown on the following table. This table contains a small amount of duplicate mileage due to contemplated stage construction.

Improvement needs on State highways

[1947 prices]

Type of improvement	Miles	Estimated cost of improvements
Resurfacing.....	1,080	\$30,418,000
Resurfacing and widening.....	2,069	82,372,000
Reconstruct:		
Same line and grade.....	441	58,551,000
Same line, new grade.....	1,396	148,944,000
New line, new grade:		
Old surface left for local traffic.....	842	122,669,000
Old surface abandoned.....	266	35,272,000
Old surface transferred.....	22	5,171,000
Construction of 2 additional lanes.....	649	67,503,000
Right-of-way.....		82,981,000
Structures.....		213,186,000
Other.....		653,000
Superhighways.....	226	644,914,000
Stopgap and emergency needs.....		18,899,350
Total.....		1,511,533,350

The following table shows the 10-year needs on the Illinois State-aid system. This system contains the more important and more heavily traveled county roads.

Improvement needs on State-aid roads

[1947 prices]

Type of improvement:	Estimated cost of improvements
New pavement.....	\$77,410,904
Resurfacing.....	51,607,270
Resurfacing and widening.....	25,803,635
Structures.....	64,389,371
Right-of-way.....	14,470,106
Stopgap and emergency needs.....	9,023,953
Total.....	242,705,239

The type of improvements needed within 10 years on the local county roads is shown in the following table. This program does not include the improvement of all of these 76,000 miles, but it does include the provision of an all-weather outlet from each point of traffic origin, homes, farms, mines, industries, facilities and points of public interest.

Improvement needs on local roads

[1947 prices]

Type of improvement:	Estimated cost of improvements
New surface.....	\$192,159,831
Resurfacing.....	48,543,219
Resurfacing and widening.....	47,536,697
Structures.....	183,298,265
Right-of-way.....	3,727,907
Stopgap and emergency needs.....	15,042,471
Total.....	490,308,390

The following table shows the type of improvements required within the next 10 years on those municipal streets of the State that are not included as part of the State highway system. It will be noted that the needs in the city of Chicago constitute 73 percent of the total urban needs.

Improvement needs on municipal streets

[1947 prices]

Type of improvement	Municipal needs except Chicago	Chicago's needs	Total municipal needs
Resurfacing.....	\$43,451,836	\$6,883,500	\$50,335,336
Widening.....	30,442,058	-----	30,442,058
Reconstruction.....	45,662,538	126,547,346	172,209,884
New construction.....	52,946,615	-----	52,946,615
Structures.....	40,842,819	390,133,365	430,976,184
Right-of-way.....	2,838,138	1,238,600	4,076,738
Traffic control facilities.....	2,555,037	3,375,220	5,930,257
Off-street parking.....	1,541,147	165,850,000	167,391,147
Total major thoroughfares.....	220,280,188	694,028,031	914,308,219
Total local street needs.....	196,569,144	414,338,526	610,907,670
Total 10-year needs.....	416,849,332	1,108,366,557	1,525,215,889
Stopgap emergency needs.....	-----	-----	18,354,371
Total.....	-----	-----	1,543,570,260

The construction of the immediately needed highway improvements in Illinois, valued at \$2,518,917,000, should provide 1,150,163,000 hours of on- and off-site employment and should add at least an equal amount of work in the production and marketing of the consumer goods purchased by labor.

The employment created by the construction expenditure discussed above is only a part of the total highway employment. Maintenance of Illinois highways requires additional manpower. The State alone expends about \$12,000,000 annually on maintenance, and employs on the average 3,584 workers. The counties and other local highway authorities expend over \$15,000,000 and probably employ 4,000 persons. The total maintenance employment in Illinois, including the personnel employed by the cities and villages, is estimated to amount to approximately 10,600 men.

Since January 1949, the price trend on State highway contracts in Illinois has been slightly downward, possibly as much as 12 percent. The supply of road material and equipment is adequate to meet the demand. Competition in bidding is erratic. Some jobs attract a large number of bidders, while on others only one or two bids are received. Labor seemingly is still adequate to fill the needs in highway work and will probably be adequate to meet an expanded construction program.

Indiana

The State of Indiana now has somewhat in excess of \$35,000,000 worth of highway construction under contract and is planning work, the total value of which comes to another \$30,000,000. This \$65,000,000 is all State highway department funds, and it is probable that further expenditures are being made and anticipated by county highway departments and by the cities and villages.

The State Highway Commission of Indiana has submitted a report which indicates that it will require the expenditure of \$486,669,837

to eliminate present deficiencies on the roads and streets of the State. Of this amount, \$317,519,737, including \$36,828,540 for the interstate routes, is needed on the State highway system, rural and urban, and the remaining \$169,150,100 will be required to make improvements on the roads in 88 counties and the streets in 198 cities.

The needed work may be broken down into the types of improvement listed in the following tables: (Note that right-of-way costs are included in estimates for the State system only.)

Type of work	Miles	Estimated cost
State highway system needs:		
New construction.....	1, 100	¹ \$101, 815, 620
Widening.....	146	4, 757, 152
Widening and resurfacing.....	719	31, 571, 573
Resurfacing.....	2, 671	44, 627, 890
Shoulder widening.....	1, 236	39, 107, 495
Right-of-way (2,242 miles).....		18, 950, 040
New structures.....		67, 354, 255
Structure widening.....		9, 335, 712
Total.....	5, 872	317, 519, 737
Needs of 88 counties:		
Improvement of dirt roads.....	5, 821	12, 513, 300
New construction.....	1, 074	8, 119, 700
Roadside drainage.....	22, 346	6, 779, 400
Resurfacing.....	19, 667	34, 004, 000
Shoulder widening.....	13, 333	7, 316, 500
Railroad grade crossing protection (454).....		611, 000
New structures.....		20, 447, 000
Repair existing structures.....		3, 184, 400
Total.....	62, 241	92, 975, 300
Needs of 198 cities:		
New construction.....	1, 322	41, 626, 400
Shoulder widening and roadside drainage.....	978	1, 863, 000
Surfacing.....	1, 002	6, 751, 300
Resurfacing.....	1, 894	13, 765, 200
Railroad grade crossing protection (325).....		712, 100
New structures.....		11, 031, 600
Repair existing structures.....		425, 200
Total.....	5, 196	76, 174, 800

¹ Includes railroad crossing protection.

The Indiana State Highway Commission also estimates that if all deficiencies were eliminated in the 10-year period, 1950 through 1959, it would cost an additional \$228,308,336 to take care of the needs which would accumulate during that period of time on roads and streets presently adequate. The total cost of the 10-year construction program to eliminate both present and anticipated deficiencies, therefore, would be \$714,978,173; the State system needs would come to \$531,877,173, and improvements in the counties and cities would require the expenditure of the remaining \$183,101,000.

Construction or reconstruction of the \$486,669,837 worth of highways presently deficient should provide 229,893,000 hours of employment on and off the job site and should induce into the economy at least another 270,739,000 hours of work in the production and marketing of consumer goods.

Indiana State highway system maintenance requires the expenditure of approximately \$8,500,000 each year; Indiana counties spend over \$11,500,000; and Indiana cities invest almost \$4,000,000 annually in the upkeep of their streets. This \$24,000,000 expenditure gives steady employment to about 6,400 people, in addition to the work

that would be created by a construction program such as was outlined above. About 2,400 people are employed by the State, close to 3,000 by the counties, and the remainder by the cities.

Indiana reports a considerable increase in the number of bidders competing for highway contracts and finds that the average price decline in bids on bridge contracts was about 10 percent below those received in the latter part of 1948. They believe that more labor is now available and that "the output per man has definitely improved."

Iowa

The State of Iowa has under contract \$19,773,000 worth of highway construction. Of this, \$12,142,000 is being expended on the primary or State road system and the remainder on the farm-to-market or Federal-aid secondary road system. This figure does not include the highway construction work being done by the county boards of supervisors from the secondary road construction fund. It is estimated that this work amounts to \$13,731,796 per year and that about \$10,000,000 worth of work was under construction by contract or force account on July 1, 1949. Additional construction is, in all probability, being carried on in the cities and villages.

Recent legislation by the Iowa General Assembly was designed to provide \$24,100,000, including \$6,300,000 Federal aid, per year for State primary roads; \$11,500,000, including \$3,500,000 Federal-aid funds for Federal-aid secondary roads; and \$11,600,000 of State and local funds for local county roads. This should provide \$47,200,000 per year for highway construction in Iowa.

The highway investigation committee, created in 1947 by the Iowa General Assembly, reported that needed construction work on the State primary road system, including urban extensions, would cost \$482,282,155 and that the construction of the needed improvements to the county roads would cost \$463,134,514. The total rural needs in Iowa, therefore, are valued at \$945,416,669. The cost of improving those city streets not included as extensions of the primary State road system was not estimated, but the committee stated that even though approximately 75 percent of these streets were surfaced (1944 data), many were surfaced years ago and are no longer adequate to serve the present heavy concentration of traffic.

On the State highway system, rural and urban, widening and resurfacing work will require the greatest expenditure, \$193,823,961. New surfacing will cost \$118,704,710; excavation, \$60,631,261; and bridges, \$74,726,500.

In the counties, 7,616 miles of the more heavily traveled roads should be bituminous surfaced at a cost of \$86,383,045. About 11,389 miles of existing roads should be regraded. This regrading and the necessary surfacing and drainage facilities will cost \$91,747,383. On the purely local roads, 34,849 miles should be graded, surfaced, and provided with suitable drainage structures. This work is expected to cost \$285,004,086.

The construction of this work, valued at \$945,416,669, should provide 464,549,000 hours of work on and off the job site and should inject into the economy at least 525,945,000 additional hours of work in the production and marketing of the consumer goods purchased by labor.

In addition to the construction employment discussed above, the maintenance of the highway system in Iowa provides additional employment. It is anticipated that the maintenance of the primary State roads will require the expenditure of over \$6,000,000 per year. The counties now expend about \$21,000,000 per year for the maintenance of the secondary roads. Additional expenditures are made by the cities and villages. About 1,900 persons are employed in maintaining the Iowa State highways and at least 5,000 on the secondary and local county roads. Total maintenance employment in Iowa, including the employment in the cities and villages, therefore amounts to approximately 8,100 persons.

Kansas

Kansas has under contract at the present time highway construction which will cost \$18,614,000. They have authorized and planned \$46,791,000 worth of work. These amounts cover both main highways and farm-to-market roads.

A detailed survey of Kansas highway needs produced the following total costs of presently needed improvements: All State highways, \$520,120,000; county roads, \$343,540,000; city and village streets exclusive of State highways, \$93,632,000. The total for the entire State highway, road, and street requirements is, therefore, \$957,292,000. On the State highway system this expenditure would correct 7,726 miles of deficiencies and provide 1,421 needed structures; the counties would be able to bring 71,285 deficient miles up to standard and construct or repair 7,819 bridges; and 2,951 miles of city and village streets, including 121 structures needed on those streets, could be reconstructed. This is a total of 81,962 miles of roads and 9,361 structures. If these needed and beneficial improvements were to be made during the next 10 years, an additional expenditure of \$135,020,000 would be required to pay for replacement of roads and structures which would become deficient during that period.

Construction of all improvements needed on the Kansas roads would provide 491,349,000 hours of employment on and off the job site and should lead to at least another 526,000,000 additional hours in the production and marketing of consumer goods.

Maintenance work on the highways, roads, and streets of Kansas requires an annual expenditure of about \$23,000,000. The State highway department spends over \$9,000,000 and employs an average of 1,696 people; the counties and townships spend almost \$11,500,000 and employ about 3,500; and the cities spend more than \$2,500,000 each year, probably employing 800 people. The total number of persons engaged in highway maintenance, therefore, is about 6,000.

The Kansas report contains the following comments:

We have found that there is definitely an increase in interest and competition among bidders since the first of this calendar year. At the same time there has been a downward trend in construction costs, accompanied by greatly improved availability of road building equipment and materials.

Kentucky

The Commonwealth of Kentucky now has under contract highway construction work valued at \$31,736,559. This work involves the construction of 241 miles of Federal-aid projects, 1,156 miles of other State highway work, and 966 miles of other rural highway and rural

secondary work. The Kentucky Department of Highways has on file plans for highway work estimated to require the expenditure of \$59,400,000. This work involves the improvement of 1,980 miles of highways.

The Kentucky Department of Highways, with the aid of the Citizens Committee for Long Range Planning, estimates that 46,778 miles of the highways and roads of Kentucky will not accommodate safely the present and expected future traffic. To reconstruct these deficient highways at present prices will require the expenditure of \$575,674,346.

The extent and cost of these needed and beneficial highway improvements are shown in the following tabulation:

	Mileage	Total cost including right-of-way
Interstate system:		
Rural.....	578.80	\$98,529,282
Urban.....	69.55	79,913,001
Federal-aid primary (not interstate):		
Rural.....	2,240.77	122,058,500
Urban.....	34.32	6,651,000
Federal-aid secondary, rural.....	3,181.27	97,805,500
State projects not Federal aid:		
Rural.....	151.11	2,890,000
Urban.....	2.57	211,000
Integrated system county roads including all school bus and rural mail routes not on State or Federal-aid systems.....	22,314.70	69,555,757
Other county roads (land service).....	18,205.30	98,060,306
Total.....	46,778.39	575,674,346

Some additional construction will be necessary in the cities and villages.

The construction of this \$575,674,346 worth of highway work should provide 300,939,000 hours of on- and off-site employment and should, through its effect on the general economy, add at least 323,000,000 additional hours of work in the production and marketing of the goods purchased by labor.

In addition to these construction expenditures, Kentucky requires about \$14,000,000 each year for the maintenance of rural roads. Additional funds are being spent in the maintenance of city and village streets. This expenditure of over \$17,000,000 provides employment for about 3,246 persons on the State highway system and an estimated 1,200 persons on the county roads. The total maintenance employment, including those employed by the cities and villages, is, therefore, estimated to be about 5,500.

Recent experience in Kentucky indicates that there is increased interest in highway work among construction contractors and some decrease in unit costs.

Louisiana

The State of Louisiana has under contract \$30,000,000 worth of highway construction work and has authorized or is planning work valued at \$67,000,000. Additional work is probably being carried on in the parishes, cities, and villages.

It is further estimated that the reconstruction of the 9,000 miles of Louisiana State highways that are now deficient will require the expenditure of \$500,000,000. Included in these deficiencies are 597 miles of highway on the interstate system, estimated to cost

\$221,009,900, and 8,403 miles of other State highways, the improvement of which is expected to cost \$278,990,100. Over 220 miles of this construction is located on urban extensions of the State highway system (including interstate highways) and is estimated to cost \$192,831,505. Additional work and expenditures will probably be necessary in Louisiana to improve the parish roads and local city and village streets.

The construction of this needed highway work, valued at \$500,000,-000, should provide 274,035,000 hours of on- and off-site employment. This employment should, in its effect on the whole economy, provide at least an equal amount of additional hours of employment in the production and marketing of the consumer goods purchased by labor. This estimate does not include the necessary work in the parishes and cities.

In addition to the construction expenditures discussed above, the State of Louisiana expends about \$14,000,000 per year in maintaining the State highway system. This provides employment for an average of 4,000 men throughout the year. It is estimated that the parishes spend about \$6,500,000 and employ approximately 2,000 people. Inclusion of the employment in the cities and villages should bring the estimated total highway maintenance employment in Louisiana up to approximately 7,500 persons.

Competition for highway construction work in Louisiana is now keen, and better prices are being obtained. Material and equipment are more plentiful than at any other time since the war.

Maine

The State of Maine had, on September 10, 1949, \$10,733,800 worth of highway construction work under contract. Additional work valued at \$4,561,503 will be placed under contract before June 30, 1950. This does not include the State-aid road work that is carried on in conjunction with the town highway authorities. This amounts to approximately \$2,000,000 each year.

In the recent report, *Maine Highway Needs*, the cost of rebuilding the highway, road, and street system to present-day standards was estimated to be \$164,026,000. It was found that the rebuilding of the State highway system alone would require over \$134,000,000. One thousand one hundred fifty-one miles of State highway and 2,268 miles of State-aid highway are in need of construction at an estimated cost of \$92,691,600; 104 miles of State highway and 42 miles of State-aid highway should be widened at a cost of \$5,051,400; 350 miles of State highway and 391 miles of State-aid highway require resurfacing at a cost of \$10,786,000; 213 State highway bridges and 853 State-aid bridges should be rebuilt at a cost of \$26,000,000. In all, 4,306 miles of State-administered highways should be improved and 1,066 bridges should be rebuilt at a total cost of \$134,529,000. Of the 10,490 miles of townways and city streets, 8,745 miles, approximately 83 percent of the total, fail to conform to tolerable standards. Seven thousand one hundred and forty-seven miles should be constructed and 1,598 should be widened and resurfaced. One thousand four hundred and eighty-two structures, 91 percent of the structures on the system, should be rebuilt. This work is estimated to cost \$29,497,000.

The construction of these deficient highways in Maine should provide about 93,752,000 man-hours of on- and off-site employment

and should add at least 95,972,000 additional hours of work in the production and marketing of consumer goods.

In addition to the above highway-construction employment, the maintenance of Maine State highways requires an expenditure of \$5,500,000 and provides work for an average of about 1,400 men throughout the year. The towns and cities expend over \$5,000,000 in maintaining the local roads and streets and probably employ another 1,500 men. The total maintenance employment in Maine, therefore, amounts to about 2,900 men.

Recent contract lettings have indicated more competition on the part of contractors. Up until recently, there has been no reduction in contract prices. Bids have frequently exceeded the State highway commission's estimates. However, bids just recently received indicate that more competition may be expected and that prices are somewhat reduced. Calls are now being received from all classes of labor and from truck owners who desire to work on highways.

Maryland

The State of Maryland had under contract on June 30 of this year in excess of \$32,000,000 worth of highway-construction work. The State road commission is planning to let contracts for work valued at an additional \$27,000,000 during the balance of 1949 and will probably place about \$40,000,000 worth of work under contract in each of the three following years. In addition, Maryland expects to contract for and complete construction of the Chesapeake Bay Bridge within these 3 years, at a total cost of \$37,500,000. Definite plans, therefore, have been made for the expenditure of \$184,500,000 of State highway funds on the State highway system between June 30, 1949, and January 1, 1953. Additional work is undoubtedly under contract and being planned by the counties, cities, and villages.

An estimate of State highway needs in Maryland places the total cost of improvements required at about \$700,000,000. The expenditure of this amount of money should provide 345,800,000 hours of on- and off-site employment and should induce at least another 391,657,000 hours of labor into the national economy. Additional labor hours would, of course, come from the construction and repair work needed on county roads and city and village streets.

Maintenance work, too, provides employment. The \$6,000,000 now spent annually by the State will have to be increased as new construction projects are brought under maintenance, and the 1,450 persons now employed will rise to a higher figure in proportion to the dollar increase. Maryland counties spend over \$3,000,000 on maintaining their roads and probably employ nearly 1,000 persons. When the cities and villages are included, it is likely that the total expenditure for maintenance at present runs close to \$12,000,000 and that 3,450 people are now engaged in the work.

Maryland finds that there is a tendency toward lower construction costs and that greater interest and increased competition is evidenced by the bids they have received recently.

Massachusetts

The Commonwealth of Massachusetts had under construction and reconstruction, as of June 30, 1949, State highway work valued at \$15,239,304, and had under contract or advertised work valued at \$2,580,043. They anticipate that by the middle of next year they will have under contract for State highways and their urban extensions,

work the total cost of which will be \$114,000,000. In addition to this State money, a considerable amount will be expended by towns and cities for roads and streets not included in the State system.

There is a great need for highway improvement in Massachusetts, almost entirely concentrated in the main highways and their urban extensions. The main highways are old and inadequate for present volumes and speeds. The needs of Massachusetts cities for adequate highway transportation "have hardly been touched." It is estimated that it would require the expenditure of \$1,000,000,000 to take care of all the present deficiencies on the State highways and that another \$200,000,000 would be needed to remedy deficiencies which will accumulate on these roads within the next 10 years. A local rural road report recently completed indicates that there are approximately 650 miles of inadequate rural roads which will cost about \$26,000,000 to rebuild. Presently inadequate urban streets which are not a part of the State highway system have deficiencies on at least 325 miles. Since it is estimated that the cost of urban streets would be twice that of rural roads "due to wider roadways, land takings, etc.," another \$26,000,000 would be needed for their reconstruction.

Expenditure of the \$1,052,000,000 needed for reconstruction of the highways, roads, and streets of Massachusetts at the present time, would provide 480,301,000 hours of employment on and off the job site and would induce at least another 585,238,000 hours of work in the production and marketing of the goods purchased by labor.

Maintenance work provides further employment. The State spends over \$11,000,000 annually, and gives work to 2,481 persons. The towns and cities probably employ an estimated 5,000 persons in maintaining their roads and streets. The total maintenance employment in Massachusetts is, therefore, approximately 7,500 persons.

Massachusetts finds increased interest and competition among bidders for highway work this year, as compared to previous years, and feels they are getting very adequate competition on projects of all sizes. Prices are no longer rising and seem to be pretty well stabilized. Equipment and materials are readily available.

Michigan

The Michigan State Highway Department, as of July 1, 1949, had approximately \$56,000,000 worth of highway work under contract. Another \$43,000,000 has been either authorized and programed or planned for future construction. Michigan's other 563 road- and street-building agencies, 83 county road commissions, and 480 municipal street departments are likewise carrying out improvements to the limit of their finances and planning others comparable in total to the requirements of the State trunk-line program.

The total needs for highway construction and reconstruction in this State have been fully summarized in an engineering analysis recently published. In this report is a table which shows that it will cost \$1,434,910,687 to adequately meet all of Michigan's present highway, road, and street deficiencies. State trunk lines, rural and urban, will require \$879,507,582 of this total; the counties need \$319,654,300 for their primary, local, and urban roads; and the city and village streets will require work valued at \$235,748,805. If this needed work were to be spread over a 10-year period, an estimated additional \$229,610,000 would be required to take care of deficiencies which would accumulate during that time. These additional dollar

needs have been adjusted to take account of predicted changes in the construction price level.

The dollar requirements summarized above would bring up to a tolerable standard 49,065 miles, or 46 percent of the entire mileage (106,435) of roads in Michigan. Resurfacing and other low-cost work is needed on 25,000 miles of local county roads, and 85 miles of expressways should be constructed on State trunk lines in the cities. Of 8,414 bridges and grade separations, 2,236 (27 percent) need repairs, rebuilding, or replacement. This does not include the grade separations required on expressways. The more heavily traveled general-service roads are relatively further behind traffic needs than roads chiefly serving local traffic. Costs would range from an estimated \$5,000 a mile on local roads and \$13,000 on primary county roads to an average of \$84,500 a mile on rural State trunk lines. On urban mileage the costs would probably range from \$34,000 a mile in the smaller villages to \$565,000 a mile on State trunk lines in the cities.

Of the total amount needed for improvements in Michigan, 78 percent is for the improvement of roads and streets (including special expressway structures), 10 percent is for bridges and grade separations, 9 percent for purchase of rights-of-way, and most of the remaining 3 percent for off-street parking facilities, highway lighting, and special traffic signals.

Classification of the types of improvements presently needed is shown in the following tables:

Nature of improvement	Miles	Estimated cost
Rural State trunk lines:		
Expressways (including structures).....	318	\$54,825,000
4-lane divided pavements.....	896	92,846,500
2-lane pavements.....	1,975	133,990,500
Widening—resurfacing.....	307	7,106,500
Blacktop on gravel.....	2,130	87,628,850
Structures (bridges and separations).....	(471)	46,530,000
Right-of-way.....	(¹)	52,580,625
Total.....	5,626	475,507,975
Urban State trunk lines:		
Expressways (including structures).....	85	216,914,848
4-lane divided.....	39	5,740,500
Other pavements.....	556	60,182,252
Blacktop on gravel.....	34	1,333,552
Structures.....	(96)	16,524,000
Right-of-way.....	(¹)	73,494,000
Miscellaneous ²		29,810,455
Total.....	714	403,999,607

¹ Included in mileage of other types of improvement.

² Includes the cost of highway-lighting, traffic control, and off-street parking facilities. The cost of the latter is estimated to be less than the cost of widening many streets to permit both parking and adequate traffic flow.

Nature of improvement	Major streets	Local streets	Total estimated cost
City streets:			
Structures.....	\$22,510,919	\$1,075,048	\$23,585,967
Street construction.....	44,692,351	91,301,873	135,994,224
Widening only.....	11,886,763	5,902,605	17,789,368
Widening and resurfacing.....	18,632,419		18,632,419
Resurfacing only.....	6,683,223	18,747,589	25,430,812
Right-of-way.....	7,298,532		7,298,532
Miscellaneous.....	7,017,483		7,017,483
Total.....	118,721,690	117,027,115	235,748,805

Nature of improvement	Miles	Estimated cost
Primary county roads:		
Concrete pavement.....	255	\$10,572,300
Heavy blacktop.....	8,718	110,942,800
Light blacktop.....	614	5,123,000
Gravel.....	3,396	21,620,800
Structures.....	(733)	23,597,200
Right-of-way.....	(1)	755,800
Total.....	12,983	172,616,900
Local county roads:		
Concrete.....	1	62,500
Heavy blacktop.....	107	1,039,600
Light blacktop.....	2,916	21,151,040
Gravel.....	19,675	77,739,150
Rural streets.....	2,512	12,563,010
Structures.....	(697)	12,713,000
Right-of-way.....	(1)	69,500
Total.....	25,211	125,338,400

¹ Included in mileage of other types of improvement.

Urban county roads.—County roads in urban places require 162 miles of street paving, 16 bridges, and 28 grade separations. The correction of these existing deficiencies will cost \$21,699,000. The grade separations, all in Wayne County, account for 72 percent of the total cost.

Expenditure of the \$1,434,910,687 mentioned above as the total amount needed to bring Michigan roads up to tolerable standards would provide about 663,460,000 hours of on- and off-site employment and should induce at least another 807,439,000 hours of work in the consumer-goods industry.

In addition to the employment which could be provided by an adequate construction program, a number of persons are engaged constantly in maintaining the present road systems in the State. The State itself expends over \$12,000,000 each year on the maintenance of roads and employs an average of 3,805 people; the counties spend nearly \$22,000,000, employing about 6,000 persons; and the cities, about \$11,000,000, employing another 3,000 people. Total maintenance expenditures in the State comes to approximately \$45,000,000 annually, and the total maintenance employment is about 13,000 persons.

Michigan feels that they are “‘over the hump’ as far as prices are concerned.” They have had a great many bids and favorable prices on recent lettings.

Minnesota

On July 1, 1949, trunk highway work under contract in the State of Minnesota totaled \$14,839,000, and another \$2,994,000 worth of highway work off the trunk system had been let by the State highway department. Authorized construction on State highways was valued at \$22,740,000. Additional work was under way and being planned on the county and local rural roads and the city and village streets.

A tabulation of construction needs of all Minnesota road-building agencies places the value of all improvements required to bring the highways, roads, and streets of the State up to acceptable standards at \$838,800,000. The State highways have \$490,900,000 worth of deficiencies; county and local agencies need \$261,700,000 to do the necessary work on their roads, and the cities and villages should

expend \$86,200,000 in improving their streets. Another \$93,300,000 worth of deficiencies would be accumulated if these improvements were made during a 10-year period.

The construction of presently needed improvements would require about 402,129,000 hours of employment on and off the job site, and should result in an increase in employment of at least 472,001,000 hours of work in the production and marketing of consumer goods.

Maintenance work in Minnesota requires an annual expenditure of about \$11,000,000 by the State, almost \$15,000,000 by the counties, more than \$4,000,000 by the townships, and almost \$9,000,000 by the municipalities. This \$39,000,000 expenditure provides work for approximately 9,600 persons. The State regularly employs 2,109 persons, the local agencies about 5,000, and the cities and villages another 2,500.

There has been a substantial reduction in the unit prices bid on many items of work during the first 6 months of 1949 as compared to the last 6 of 1948. Lower prices were noticed particularly in the bids on excavation, concrete paving, gravel bases, and bituminous surfacing. This seems to be a direct result of increased competition among bidders, and, in the case of bituminous work, of the substantial reduction in the delivered price of bituminous materials.

Mississippi

The State of Mississippi had under contract on June 30, 1949, 393 miles of highway work valued at \$17,173,729 on the primary and urban highway system. On the secondary or farm-to-market program 165 miles was being constructed at a cost of \$3,292,946. Additional work is probably being carried on and planned by the other road-building agencies in the State.

The total present needs on the Mississippi highways, roads, and streets amount to \$488,792,000. It is estimated in a study prepared at the request of the legislative highway planning committee that the present needed work on the rural State highway system will cost \$125,431,000; on the urban extension of that system, \$22,304,000; on the proposed State-aid system, \$160,490,000; on the local county roads, \$107,471,000; on the city arterial streets, \$42,546,000; and on the local city and village streets, \$30,550,000.

The following table shows the type, the mileage needed, and the cost of the work contemplated on the rural State highways. Over one-third of this expenditure will be made for grading and drainage work, and a little less than one-third each for bridges and surfaces.

Type of work	Miles	Cost
Resurfacing.....	160	\$2,600,000
Resurfacing and widening.....	347	11,253,000
Widening.....	21	1,122,000
Reconstruction on existing location.....	1,000	30,268,000
Construction on new location.....	748	40,577,000
Bridges and grade separations (783).....		39,611,000
Total.....	2,276	125,431,000

The type of urban State highway work is as shown below. Reconstruction of existing roads on existing location is the major requirement on these routes.

Type of work	Miles	Cost
Resurfacing	13	\$597, 000
Resurfacing and widening	41	3, 555, 000
Widening	64	3, 837, 000
Reconstruction on existing location	55	6, 084, 000
Construction on new location	26	4, 129, 000
Signs, signals, and markings		208, 000
Bridges and grade separations (41)		3, 894, 000
Total	199	22, 304, 000

The highway needs in Mississippi are greatest on those county roads suggested for inclusion in the State-aid system. This system is made up of the higher traffic and more important county roads. The work involved in modernizing them is itemized below. Reconstruction on existing location is, as in the case of the urban State highways, the major item needed on these roads.

Type of work	Miles	Cost
Resurfacing	1, 866	\$15, 167, 000
Widening	10	24, 000
Resurfacing and widening	1, 157	9, 753, 000
Reconstruction on existing location	7, 944	94, 509, 000
Construction on new location	355	4, 542, 000
Bridges (4,130)		36, 495, 000
Total	11, 332	160, 490, 000

On the 41,000 miles of lightly traveled local county roads, 15,950 miles of improvement is needed to meet minimum standards. Over 12,000 miles of this work consists of reconstruction on existing locations. Even with this program, over 16,000 miles of local roads will still be of the earth surface type. The following table indicates the type of work required:

Type of work	Miles	Estimated cost
Resurfacing	1, 948	\$6, 220, 000
Widening	160	279, 000
Resurfacing and widening	874	3, 737, 000
Reconstruction on existing location	12, 631	67, 654, 000
Construction on new location	157	795, 000
Grade widening	180	452, 000
Bridges (5,098)		28, 334, 000
Total	15, 950	107, 471, 000

In the cities of Mississippi, 1,991 miles of streets are deficient. Of these, 699 miles are arterial streets, and the remainder local streets. The following table itemizes the work needed:

Type of work	Miles	Cost
Resurfacing	71	\$2, 438, 000
Widening	66	2, 024, 000
Resurfacing and widening	174	8, 026, 000
Reconstruction on existing location	1, 598	53, 295, 000
Construction on new location	82	3, 801, 000
Traffic operation and control		62, 000
Bridges and grade separation (139)		3, 452, 000
Total	1, 991	73, 096, 000

The engineering analysis of Mississippi's highway transportation system, "Today and Tomorrow," finds that if these needed improvements were to be made over a 10-year period, it would be necessary to rebuild many additional miles of road and to replace a number of structures now in satisfactory condition. Even allowing for an expected reduction in costs due to lower prices, they believe that the total cost of correcting present deficiencies and providing for those which would occur in a 10-year period, together with necessary maintenance and administration costs, would run over \$730,000,000.

To make the improvements needed at present, valued at \$488,792,000, would probably require 274,555,000 hours of labor on and off the job site. It should also induce into the economy another 275,048,000 hours of employment in the consumer-goods industry.

In addition to this construction employment, there are a considerable number of persons required constantly to maintain Mississippi's roads and streets. The State should spend more than \$4,000,000 each year, the counties almost \$14,000,000, and the cities and villages over \$2,000,000, a total of \$20,000,000. This number of dollars spent in maintenance would give work to about 6,650 people: about 1,450 on the State highways, close to 4,500 in the counties, and around 700 on the city and village streets.

Like other States, Mississippi finds an increased amount of interest and competition among bidders on highway contracts in recent months. They have also experienced a decrease in construction costs and find there is now less delay in securing materials formerly classed as critical.

Missouri

The Missouri State Highway Department placed construction work valued at \$25,327,830 under way during 1948. Of this amount \$16,928,211 was spent on 359 miles of highway on the major system, and the remaining \$8,399,619 was used for improvements to 1,012 miles of the supplementary system. It is estimated that this annual construction rate will probably be continued in the future. Undoubtedly the counties and cities are contracting and planning considerable additional work on the roads and streets supervised by them.

Future construction needs in Missouri amount to \$256,000,000 on their major system of State highways alone. An expenditure of this size would provide 131,697,000 hours of on- and off-site employment and should induce into the national economy at least another 145,692,000 hours in the marketing and production of the consumer goods these workers would purchase.

In the future, maintenance expenditures will probably run about \$11,000,000 per year on the State highway system, and almost \$8,000,000 in the counties. The total Missouri maintenance expenditure of approximately \$22,000,000, including the city expenditures, provides steady employment for about 6,000 persons. The State employs about 2,500 persons, the counties over 2,500, and the cities possibly another 1,000.

Missouri reports there has been increased interest and competition among bidders on highway work since the first of this year and believes there is a definite downward trend in costs, although the change seems to be small so far.

Montana

The State of Montana had under contract as of July 1, 1949, highway construction valued at \$12,751,500. Of this work \$7,875,400 worth is still to be completed. Their programed and planned work is estimated to cost \$38,224,500. This program is based on State revenues, Federal-aid and forest highway allocations expected to be available between the present time and September 1952. The counties and cities, as well as the State, are also spending money on construction needed to improve their road and street systems.

An estimate places the total highway, road, and street needs of Montana at \$838,705,000. State highway needs amount to \$498,705,000; the ultimate improvement of such county and rural highways, not on the Federal-aid or State systems, as warrant improvement, to a graded and graveled status is estimated to cost about \$300,000,000; and improvement or renovations to modern standards of the major part of the mileage of city and village streets and alleys not on the Federal-aid or State systems will run approximately \$40,000,000.

The expenditure of this \$838,705,000 should produce 399,115,000 hours of on- and off-site employment and should provide almost 90,000,000 more than that amount in hours of work in the consumer-goods field.

In addition to the employment which could be created by the construction program outlined above, maintenance work, costing close to \$12,000,000 annually, provides jobs for approximately 2,600 persons in Montana. The State expends close to \$6,000,000, employing about 1,000 people; the counties spend over \$5,000,000, and employ another 1,300 people; and the cities and villages pay about \$1,000,000 for the upkeep of their streets, employing possibly 300 persons.

Montana has noticed a slight decrease in construction costs in the past 6 months and believes they will level off at a figure substantially under the peak costs of 1948.

Nebraska

The Nebraska State Highway Department has construction work contracted and in progress valued at about \$11,000,000, and they expect to maintain an annual improvement program of about \$15,000,000 from now on. The counties, cities, and villages will spend an additional amount to meet the needs on roads and streets not on the State highway system.

Nebraska's total needs on all its highways, roads, and streets are valued at \$462,831,000. The State highway department estimates that the value of needed improvements on the State system is \$257,190,000. An engineering appraisal of Nebraska highway needs, prepared at the request of the Governor, estimates that the counties need \$120,020,000 to bring their roads to acceptable standards, and that it will take \$85,621,000 worth of improvements to correct deficiencies on the city and village streets not on the State system. This survey indicates that there are 6,419 miles of deficient roads and 1,148 inadequate structures on State highways, 63,877 miles of road and 2,357 structures which need improvement on the county system, and 1,921 miles of city and village streets together with 39 structures which will not meet present traffic requirements.

On the Nebraska rural State highway system, 1,698 miles of new construction, valued at \$51,356,000, 3,017 miles of reconstruction on existing locations, estimated to cost \$113,406,000, 7 miles of widening estimated to cost \$693,000, and 1,386 miles of surfacing, valued at \$23,577,000 are needed. On the same system, 199 new structures should be built and 907 should be reconstructed. The cost of these structures is estimated to be \$34,629,000. The rural interstate system, which makes up only one-half of 1 percent of the total rural State mileage, but carries 10 percent of the total traffic, accounts for nearly 10 percent of the above costs.

On the urban extensions of the Nebraska State highway system, 42 structures valued at \$11,077,000, \$3,398,000 worth of new construction, and \$21,177,000 worth of reconstruction, resurfacing, and widening of existing streets is needed. The average width of the streets on this system would be increased from 30 to 38 feet. Work in the city of Omaha accounts for more than 53 percent of the total urban State highway needs.

Almost 70 percent of all Nebraska county and township roads now need some form of improvement; 64 percent of the county primary roads and 71 percent of the land access roads are deficient. The program outlined would gravel all 11,654 miles of earth road now on the primary system, producing a county primary network of 21,947 miles of graveled or paved roads built on good roadbeds with proper drainage structures. More than 16,000 miles of gravel surface would be added to the more heavily traveled land access roads, while 45,000 miles would be allowed to remain as earth roads but would be graded and drained more effectively than at present.

Of the city and village streets not on the State highway system, 1,921 miles, or 41 percent, were found deficient in width and surfacing, or for other reasons. More than half of the total dollar needs are in Omaha, and when Lincoln is considered also, these two cities will require 61 percent of the total money. Of the total urban needs, 693 miles of high-type construction or reconstruction are called for, 169 miles of low-type bituminous, and 1,022 miles of gravel or stone. In addition, 37 miles of widening are needed.

It is estimated in the study, Nebraska Highway Needs, that the replacement cost during a 10-year period of construction would come to about \$68,980,000 for all highways, roads, and streets. The State system would need \$27,000,000, the counties \$30,420,000, and the cities and villages the remaining \$11,560,000.

An expenditure of \$462,831,000, the total amount estimated necessary to take care of Nebraska's present highway needs, should provide 231,865,000 hours of on- and off-site employment and would probably add at least another 254,000,000 hours of work in the consumer-goods industry.

In addition to the employment which could be provided by this construction program, maintenance work requires the services of a number of persons. Total expenditure in Nebraska should amount to about \$17,000,000 annually; of this total, the State spends over \$6,000,000 on the maintenance of their highway system, the counties about \$9,000,000 on the primary and land access roads, and the cities and villages approximately \$2,000,000 on the streets which are their responsibility. About 5,200 persons in the State are needed in these

various road-maintenance departments. The State employs 1,500, the counties another 3,000, and the cities around 700.

In 1948 the average number of bidders per project was 3.3, and to date this year that average has increased to 5.1. Bids received this year show a slight downward price trend from the 1948 peak.

Nevada

The State of Nevada has under construction at the present time highway work valued at \$4,463,389. They are building 69.5 miles of new construction on the secondary system at an estimated cost of \$732,240, and have under way 111.3 miles of construction on new alinement, or reconstruction, on the primary system at a probable cost of \$3,731,149. The counties should also have some road and street work in progress.

To modernize the Federal-aid system in Nevada would cost, including the structures needed, a total of \$86,264,000. Of this amount, \$54,290,000 would be used to improve 1,626 miles on the rural Federal-aid system; \$5,324,000 would be needed for 35 miles of improvements on the urban Federal-aid system; \$23,660,000 would go into needed work on 1,375 miles of the secondary Federal-aid system; and the remaining \$2,990,000 would pay for the construction and reconstruction of structures.

A break-down according to type of work needed is given below:

	Miles	Amount
Widening.....	817	\$16,754,000
Improvements on new alinement.....	1,196	36,577,000
Resurfacing and reconstruction on new alinements.....	1,023	28,536,000
Right-of-way.....		1,407,000
Bridges (143).....		2,990,000
Total.....	3,036	86,264,000

The State estimates that if this program were to be spread over a 10-year period it would cost another \$6,662,000 for stopgap improvements, \$1,665,000 for replacements of new work, and \$17,514,000 for replacements of presently nondeficient sections which would fail during that time. The total amount of money needed to bring Nevada Federal-aid systems to acceptable standards within 10 years is, therefore, \$112,105,000.

Construction of the present total needs, valued at \$86,264,000, could be expected to provide 37,474,000 hours of employment on and off the job site and another 48,542,000 hours in the production and marketing of the consumer goods used by this labor. These estimates include only the work necessary on the presently constituted Federal-aid system. It is also essential to improve those deficient local roads that provide such an important link in our transportation system.

Maintenance, as well as construction, provides employment for highway workers. Nevada finds that maintenance costs the State an average of \$1,500,000 per year. Nevada counties expend over \$750,000 on the maintenance of roads under their jurisdiction, and Nevada cities and villages expend another \$450,000 annually on the upkeep of their streets. This \$2,700,000 expenditures gives work to

about 660 persons, the State employing 310, the counties and towns the remainder.

The State of Nevada finds an increased interest in the letting of road contracts and keener competition among bidders, resulting in a decrease in the costs of some items of work.

New Hampshire

The State of New Hampshire now has under contract 38 miles of highway construction, the total cost of which is \$11,667,000. This amount includes the 14.7-mile toll road, costing \$7,500,000. They also have 17 miles of main highways, estimated to cost \$1,883,000, now authorized for construction and are planning another 38 miles, valued at \$4,605,000. Undoubtedly, other projects are under way and being planned by the cities, towns, and villages.

The New Hampshire Highway Department has prepared a report indicating that present deficiencies throughout the State amount to \$103,604,000. This figure may be broken down as follows:

	<i>Total cost in 1948 prices</i>
Interstate system, urban and rural.....	\$21, 884, 000
Other State highways, urban and rural.....	56, 439, 000
Total State highway system.....	78, 323, 000
Town roads.....	16, 356, 000
City and village streets.....	8, 925, 000
Total.....	103, 604, 000

This same figure can also be broken down into the various types of work needed as follows:

Type of work	Miles	Cost
State highway system, urban and rural:		
Construction of roads and bridges.....	661	\$58, 866, 000
Widening and resurfacing.....	592	13, 384, 000
Repair of bridges (134).....	5, 059, 000
Betterments.....	523	1, 014, 000
Total.....	1, 776	78, 323, 000
Town roads:		
Construction of roads and bridges.....	3, 616	9, 071, 000
Repair of bridges (355).....	7, 285, 000
Total.....	3, 616	16, 356, 000
City streets:		
Construction and reconstruction of 65 miles of primary and 72 miles of secondary streets.....	137	7, 442, 000
Street lighting.....	149, 000
Bridges (13).....	1, 334, 000
Total.....	137	8, 925, 000

A total of 5,529 miles of road, therefore, should be constructed, reconstructed, or otherwise improved, and work is needed on 502 bridges.

The estimate further indicates that if a program to meet all essential needs were planned for a 10-year period, it would be necessary to spend another \$21,440,000 for deficiencies which would accumulate during that time. Stopgap improvements would amount to \$3,330,000, replacements of new work \$740,000, and replacement of presently nondeficient sections \$17,370,000.

All the needs outlined above are classified by the State as "essential." They also indicate that to eliminate "all" deficiencies on the State system would require the expenditure of another \$5,045,000 on 21 miles of the interstate system, and \$109,567,000 more on 903 miles of other State highways. A large part of this work would be new construction where only betterments were estimated for the essential needs.

It is quite possible that there are still further deficiencies on the town roads and city and village streets which do not fall in the "essential" classification, but even without taking these into consideration, the total amount needed in New Hampshire reaches \$218,216,000, according to the highway department report. Expenditure of this amount should create 105,990,000 hours of on- and off-site employment and should provide another 124,000,000 hours of work in the production and marketing of consumer goods.

In addition to this employment which would result from a highway construction program, maintenance of the roads and streets of New Hampshire employs a number of persons. The State itself spends about \$3,900,000 each year, the towns approximately \$2,057,000, and the cities \$1,173,000, a total of \$7,130,000. This expenditure provides work for about 2,300 people. Of these, nearly 1,400 work for the State, and the remainder for the towns and cities.

New Jersey

New Jersey has a present highway construction program of \$50,367,000 per year. Of this amount \$30,730,000 is being spent on the State highway system, \$3,000,000 on Federal-aid secondary roads, and \$16,637,000 on municipal roads and streets.

To correct all deficiencies now found on New Jersey roads and streets would cost an estimated \$753,800,000. This amount is divided between the State system of highways, with needs totaling \$518,700,000, the county and local organizations, which have highway needs amounting to \$126,100,000, and the towns and cities, whose estimated deficiencies amount to \$109,000,000.

In addition to the presently needed \$753,800,000, if an improvement program were planned to cover 10 years it would be necessary to add \$752,600,000 more to correct deficiencies which would occur during that period.

Expenditure of the amount needed to correct all present deficiencies should provide 326,727,000 hours of employment on and off the job site and, by its effect on the economy, should induce an additional 438,636,000 hours of labor in the production and marketing of the consumer goods purchased by labor.

Maintenance of New Jersey's roads and streets provides further employment. The State spends close to \$8,000,000 annually on maintaining the highways under their jurisdiction, and the counties and townships spend about \$12,750,000. Including those people employed by the cities and villages, approximately 7,300 are engaged in maintenance work in New Jersey, the State giving work to about 1,300 and the remainder working for the counties, townships, cities, and villages.

New Mexico

Records in the State of New Mexico indicate that they presently have under contract \$3,549,027 worth of highway construction work. An additional \$20,000,000 has been authorized. These expenditures

will all be on the State highway system. It is likely that local departments in the counties, cities, and villages are also planning some construction work on the roads and streets under their jurisdiction.

The State highway department has prepared an estimate of present deficiencies on their roads and places the total amount needed to correct those deficiencies at \$157,427,728. Eight hundred and fifty-nine miles of road and 23 grade separations require correction on the interstate system, at an estimated cost of \$56,081,900. On the Federal-aid primary system, exclusive of the interstate system, \$56,410,703 should be spent to remedy deficiencies on 1,824 miles. On the remaining roads which make up the State highway system, improvements are needed on 4,193 miles, at a probable cost of \$44,935,125.

The tabulations which follow show the types of improvement which the State believes are necessary and the probable cost of each.

Type of construction	Miles	Cost
Estimated cost of needed construction on interstate system:		
Relocation:		
2-lane.....	21.3	\$735,100
4-lane.....	64.5	8,840,000
Reconstruction:		
2-lane.....	697.4	35,035,600
4-lane.....	46.9	5,758,000
Widening and resurfacing, 2-lane.....	28.4	884,200
Grade separations (23 each).....		4,829,000
Total.....	858.5	56,081,900
Estimated cost of needed construction on Federal-aid primary system (not including interstate system):		
Relocation.....	388.1	17,471,626
Reconstruction.....	575.5	21,524,862
Widening.....	35.5	514,217
Widening and resurfacing.....	614.7	13,809,089
Resurfacing.....	210.0	3,090,909
Total.....	1,823.8	56,410,703
Estimated cost of needed construction on State highway system (exclusive of Federal-aid primary system):		
Grade:		
10-foot gravel surface.....	1,619.5	4,843,342
18-foot gravel surface.....	1,215.0	7,454,899
Widening, 18-foot gravel surface.....	71.1	370,580
18-foot gravel surface.....	106.2	350,475
Reconstruction and oil surface.....	797.4	24,665,263
Widening and oil surface.....	200.4	4,845,993
Oil surface.....	182.9	2,404,573
Total.....	4,192.5	44,935,125

It is also estimated that approximately \$5,000,000 could be expended in the State of New Mexico to take care of deficiencies on city streets within incorporated municipalities. This brings the presently estimated total need figure to \$162,427,728, and it is probable that this amount would be increased substantially if the cost of correcting deficiencies on local roads was also included.

The expenditure of this \$162,427,728 should provide 77,754,000 hours of employment on and off the job site, and, through its effect on the economy, result in an additional 92,439,000 hours of labor in the consumer-goods field.

Maintenance work costs New Mexico about \$4,275,000 each year and employs about 1,000 men. The State expends over \$3,000,000 and has an average of 591 people on its highway maintenance pay

roll. The county and local roads are maintained by around 200 people at a cost of \$675,000, and the municipal streets require an average annual expenditure of \$600,000 and the services of 200 persons.

New York

The State of New York now has under contract highway construction work valued at \$140,144,000. Plans are available for \$50,000,000 worth of construction which will be contracted before April 1, 1950, and planning is now under way for a tentative 1950 program totaling \$140,000,000. This work is all under the jurisdiction of the New York State Department of Public Works. It is believed that the counties, towns, cities, and villages are also spending, and planning to spend, a considerable amount of money on the construction of roads and streets which are their responsibility.

New York estimated in 1945 that their total needs on the State highway system to 1960 were \$2,000,000,000. Since then, contracts valued at \$236,261,000 have been awarded. The remainder, \$1,763,739,000, is still to be contracted. No estimates are available at present on the requirements of local road, city and village streets which are not a part of the State system, but, considering the many large cities and the urban counties and towns in New York State, these needs must be quite large. Even the expenditure of \$1,763,739,000 should produce 807,059,000 hours of on- and-off-site labor and inject at least another 981,130,000 hours of work into the economy in the consumer-goods field.

Maintenance work employs additional labor, about 28,000 persons annually in New York State. Maintenance of the State system costs about \$22,000,000 each year and employs an average of 6,000 persons. The counties and towns expend over \$38,000,000 and employ nearly 12,000 people. The cities and villages must employ almost that many more on the maintenance of their streets.

The New York State Department of Public Works has noticed a change in highway contract bidding recently. The number of bidders has increased about threefold, and the prices submitted for projects reflect a price cut of approximately 9 percent.

North Carolina

The State Highway and Public Works Commission of North Carolina has highway construction presently under contract amounting to \$17,894,680. It is expected that the commission will award contracts during the balance of this calendar year in the amount of approximately \$6,000,000. Funds authorized for expenditure for the balance of this fiscal year amount to \$42,698,692. In addition to these funds, a recent bond issue of \$200,000,000 was authorized for the construction and stabilization of county roads. Fifty million dollars of this amount is immediately available, and plans are being made to place this work under contract as soon as possible. The cities and villages probably have still further construction planned on their streets.

To modernize and bring the State highway system up to acceptable standards, will require the expenditure of about \$132,000,000. It is expected that the \$200,000,000 bond issue mentioned above will provide for all essential improvements on the county road system, but no estimate has been made of the needs in the cities and villages of North Carolina.

Expenditure of \$332,000,000 on highway construction should provide 182,145,000 hours of employment on and off the job site and would probably add almost an equal number of hours of labor in the consumer-goods industry.

North Carolina State maintenance expenditures amount to about \$23,000,000 annually, and an average of 6,614 people are employed by the State on the primary and county roads. The cities and villages probably employ another 1,500 persons, making the total maintenance force in the State about 8,100 men.

North Dakota

North Dakota placed under contract between January 1, 1949, and July 15, 1949, highway construction work costing \$7,305,884. They have additional work programed which will correct deficiencies on 1,629 miles of road and is estimated to cost \$12,593,500, and work in the planning stage valued at \$15,750,000. Since the above figures apply to only the State primary and secondary systems and the county secondary system, it is believed that some additional work is under way and being planned by the counties on those roads not included in the secondary system and by the cities and villages.

To meet the present construction needs on the State system would require an annual expenditure of \$20,000,000. Another \$5,000,000 each year would be required to improve the county secondary roads to tolerable standards. Therefore, an adequate construction program for these systems would require the expenditure of \$250,000,000 in a 10-year period. The need for improvement in the cities and villages of North Dakota has not been determined.

An expenditure of this size should provide 114,350,000 hours of employment on and off the job site and, by its effect on the economy, add at least 135,880,000 more hours of labor in the consumer-goods field.

The present annual State expenditure for maintenance runs about \$4,000,000. This is considered inadequate for present-day needs and costs. The counties spend another \$2,200,000 on maintenance in North Dakota each year, while the cities average about \$600,000. The total expenditure for maintenance, therefore, is close to \$6,800,000 annually. This expenditure should provide work for about 1,400 people, an average of 573 on the State system, around 630 in the counties and 200 in the cities and villages.

North Dakota reports that bid prices have come down each month during 1949, apparently in proportion to the competition received. On grading, competition is very keen and the prices have dropped considerably; on surfacing, competition is fair and the price decrease has been appreciable; on structural projects, competition was poor and prices have dropped only slightly.

Ohio

On August 1, 1949, Ohio had under way State highway construction contracts valued at \$72,700,000, of which \$39,300,000 still remained to be paid. It is anticipated that the Ohio Department of Highways will place approximately \$45,000,000 of construction under contract during 1949. They have programed and made available for programing another \$53,535,000 worth of work, all of which is included in the Federal-aid program. An estimate of the work in progress and planned by the counties, townships, cities, and villages is not

available, but it is probable that a considerable amount of money is being expended by these agencies.

The State's current estimate of the funds needed to bring the State highway system to adequate standards amounts to \$2,480,000,000. Of this amount \$1,035,000,000 is needed for improvements on the rural interstate system, \$645,000,000 on the urban interstate highways, and the balance of \$800,000,000 on the remaining rural and urban State roads. It is believed that when a survey of total highway needs, now being made, is completed, the requirements of the townships, counties, cities, and villages will come to about \$2,029,000,000. The total needs in Ohio will, therefore, probably be about \$4,509,000,000.

A program which would make all needed improvements in Ohio should provide approximately 2,070,443,000 hours of on- and off-site employment and would probably add to the Nation's economy an even greater number of hours of employment in the consumer goods industry.

Maintenance work in Ohio requires the expenditure of an estimated \$72,700,000 annually. The State system requires maintenance costing \$27,700,000 and the counties, townships, cities and villages expend about \$45,000,000. Work is provided for an average of 5,119 people on the State highway system, for over 5,500 on the county roads, for 2,500 on the other local roads and 5,000 on the city and village streets. This means, therefore, that highway maintenance work in Ohio employs close to 18,100 persons constantly in addition to the labor that could be provided by construction, as estimated above.

Ohio finds increased interest and competition among bidders on highway contracts this year. Both the availability and productivity of labor has improved, and construction materials are more readily available. These factors have both contributed to a definite downward trend in bid prices during 1949.

Oklahoma

The State Department of Highways of Oklahoma has been opening bids during 1949 on approximately \$3,000,000 worth of highway construction per month. If this rate is continued for the balance of the year they will have placed under contract about \$36,000,000 worth of construction. In all probability the counties, cities, and villages are also planning the expenditure of some funds on the roads and streets under their jurisdiction.

It is estimated that deficiencies amounting to \$364,000,000 are to be found at the present time on Oklahoma's roads and streets. Construction of these needed improvements would require 187,176,000 hours of labor on and off the job site, and should increase employment by at least 196,677,000 additional hours of work in the production and marketing of consumer goods.

Maintenance work in Oklahoma provides additional labor for about 5,750 persons and requires an annual expenditure of almost \$23,000,000. Maintenance of the State highway system costs about \$11,000,000 and takes an average of 2,147 people; the counties expend over \$10,000,000 and probably employ 3,000 men; the cities and villages spend almost \$2,000,000 and probably employ another 600 people.

There has been a progressive increase in contractors bidding on highway work, and in the last few months low bids have been approximately 5 percent below the engineer's estimates.

Oregon

The value of highway construction work now under contract in the State of Oregon is \$25,000,000. This work is all on the State highway system, as is the \$20,000,000 which the State reports has been authorized and the planned work valued at \$20,000,000. The counties, cities, and villages are also carrying on and planning construction work on the roads and streets under their jurisdiction.

Present deficiencies on all of Oregon's roads and streets would cost about \$440,000,000 to correct. Needs on the interstate system amount to \$85,000,000 and on other State highways to \$185,000,000, or a total of \$270,000,000 for all roads on the State highway system. The counties have needs valued at \$105,000,000 and the deficiencies on city streets account for the remaining \$65,000,000. The Oregon State Highway Department estimates that if a 10-year program were planned to correct all present deficiencies, it would be necessary to include another \$120,000,000 to cover the deficiencies which would develop during this time.

According to an engineering analysis, Highway Transportation in Oregon, made for the Legislative Interim Committee for the Study of Highways, Roads and Street Needs, Revenue and Taxation, 7,210 miles of these present deficiencies on Oregon's highways, roads, and streets are classified as being intolerable.

On the rural primary State highways, 967 miles are in this category. All of this mileage has insufficient surface and roadway width; 98 percent has substandard surface conditions; 66 percent is poorly alined; 95 percent has poor drainage; 93 percent has poor base; and there is excessive grade on 14 percent. Resurfacing or reconstruction should be done on 565 miles, or 58 percent of this same mileage.

On the State secondary highway system, a total of 281 miles out of those deficient are considered intolerable. All of these 281 miles are deficient in roadbed width, surface width, surface type, and surface condition; excessive grades are noted on 20 percent of the mileage and excessive curvature on 46 percent.

Urban extensions of the State highway system have 24 miles of intolerable conditions. Seventy-five percent of this mileage needs a median strip; 75 percent is too narrow from curb to curb; 75 percent lacks adequate traffic control facilities; 71 percent needs additional traffic lanes; 79 percent is deficient in surface condition; 54 percent is deficient in base construction; 50 percent requires relocation; and 29 percent is deficient in surface type.

Of the 4,300 miles of main county roads, 2,186 miles are listed as intolerable, structurally or functionally, and 3,175 miles of the local county roads also show intolerable conditions. The types of deficiencies on these 5,361 miles are as follows:

	Mileage	Percent
Main county roads:		
Resurfacing needed.....	1,315	60
Higher surface type needed.....	1,237	57
Poor base.....	955	44
Substandard width.....	821	38
New construction needed.....	541	25
Poor alinement.....	404	21
Local county roads:		
Roadway width inadequate.....	2,132	67
Surface width inadequate.....	1,868	59
Surface type needs changing.....	1,816	57
Poor surface condition.....	2,178	69

Two hundred and sixty-seven miles of arterial city streets and 310 miles of local city streets now deficient are in the intolerable classification, the conditions needing correction being as follows:

City streets	Miles	Percent
Traffic lanes too narrow.....	287	50
Additional width needed for parking lanes.....	85	15
More traffic lanes needed.....	122	21
Higher type surface needed.....	301	52
Better traffic controls needed.....	134	23

On the State primary system a total of 115 structures (stream crossings and grade separations) require either rebuilding or replacement on new locations. Of the existing bridges, 17 are of insufficient load capacity and 41 are too narrow. Of the existing timber structures 24 are over 20 years old, and 20 are over 25 years old.

Of 39 State secondary system structures in need of rebuilding or replacement, 38 are too narrow, and 33 are deficient in load capacity. Included in this group are 17 timber bridges over 20 years of age and 37 older than 15 years.

On the main county roads, 199 structures require immediate new construction or reconstruction. Of this total, 170 are too narrow and 134 unsafe for present traffic. Among the 128 wooden structures needing replacement on these roads, 17 are over 25 years old, 25 over 20 years old, and 48 over 15 years old.

Immediate needs on local county roads include new construction or reconstruction of 294 structures, of which 243 are below safe load capacity and 271 are too narrow for current traffic. Of 235 timber structures to be replaced, 33 are more than 25 years of age, 20 are more than 20 years old, and 125 are more than 15 years old.

On city arterials the urgent needs include 59 new or rebuilt structures, of which 43 are currently too narrow and 21 are of insufficient load capacity. Of the 19 timber structures needing immediate reconstruction, 1 is more than 25 years old, 7 over 20 years, and 8 over 15 years old.

Immediately needed local street structures total 57, of which 29 are deficient in load capacity and 31 deficient in width. Of the 31 timber structures, 5 are more than 25 years old, 12 over 20 years of age, and 17 more than 15 years old.

If the \$440,000,000 needed to correct present deficiencies in Oregon was to be expended, it should provide about 192,570,000 hours of employment on and off the job site and should induce at least another 250,409,600 hours of work in the consumer-goods field.

Oregon highway maintenance work also provides employment for about 4,600 persons. A total annual maintenance expenditure of \$15,700,000 in the State is divided between the State itself, close to \$7,000,000, the counties, almost \$7,000,000, and the cities and villages, about \$1,700,000. The State employs an average of 2,100 persons, the counties about 2,000, and the cities the remaining 500.

Recent bidding on State highway construction projects in Oregon definitely indicates greater interest and increased competition. More bids are being received and prices are lower. The State estimates that prices are from 10 to 15 percent lower than they were at the end

of 1948. Factors causing these lower prices are reported by them to be—

1. Greater availability and greater efficiency of labor.
2. Greater availability of equipment.
3. Some reduction in costs of materials.
4. Belief that costs will not go higher.
5. Anticipation of lower material costs.
6. Willingness to accept less profit.

Wages are no lower than they were in 1948. Lumber and asphalt prices are lower, but there has not yet been a reduction in other material prices.

Pennsylvania

The Commonwealth of Pennsylvania had under contract on January 1, 1949, highway construction work valued at \$73,280,000 and expects to place an additional \$80,400,000 worth of work, exclusive of right-of-way costs, under contract this year. Another \$12,175,000 worth of work will be contracted in 1949 by the State highway and bridge authority. Total highway contracts let this year will, therefore, probably have a value of well over \$92,000,000. The State program for 1950 is expected to amount to about the same figure. The townships, counties, cities, and boroughs are responsible for 59 percent of the total road and street mileage in Pennsylvania, and are undoubtedly planning additional construction work on the highways under their jurisdiction.

The State estimates that to provide for immediate needs \$960,-576,000 should be spent on State highway construction, and that to provide for these immediate needs and to correct the deficiencies which would accumulate during a 10-year period \$1,625,412,000 would be required. If a 10-year program were to be followed, therefore, in order to make needed improvements, the annual expenditure would have to be \$162,500,000. It is to be emphasized that this expenditure would only apply to State highways, rural and urban, and that the local agencies must also have a considerable backlog of needed construction.

A summary of the immediate needs on State roads by class of work follows:

Class of work	Miles	Total cost
New construction and replacement.....	4,468	\$533,967,000
Major urban construction.....	212	273,184,000
Pavement widening.....	504	50,031,000
Bridge construction.....	50	79,032,000
Railroad grade crossing elimination.....	51	24,362,000
Total.....	5,285	960,576,000

The additional improvements needed to remedy deficiencies which would be expected to accrue during the 10-year program period are as follows:

Class of work	Miles	Total cost
New construction and replacement.....	4,805	\$413,616,000
Major urban construction.....	276	165,584,000
Pavement widening.....	307	41,318,000
Bridge construction.....	44	31,852,000
Railroad grade crossing elimination.....	15	12,466,000
Total.....	5,447	664,836,000

The needs on local roads and city and village streets have not been determined.

Expenditure of the \$960,576,000 mentioned above should provide 461,365,000 hours of employment on and off the job site and might increase employment by at least another 540,525,000 hours of labor in the production and marketing of consumer goods.

Additional work is provided in the maintenance of Pennsylvania's highways. The Commonwealth expends almost \$31,000,000 on maintenance and an additional amount on light reconstruction annually and employs an average of 12,481 persons. The local agencies expend another \$13,500,000 each year on the maintenance of their roads, giving employment to 4,000 people, and the cities and boroughs spend \$20,000,000, employing another 6,000 persons. The total expenditure for maintenance in the Commonwealth of Pennsylvania is, therefore, \$64,500,000, and at least 22,500 people are employed in the work.

There has been increased interest and competition by contractors on the 1949 construction program in Pennsylvania. Bid prices are more than 10 percent below the 1948 figures. The average number of bids per job has increased from 4.2 in 1948 to 5.4 during the first 6 months of 1949.

Rhode Island

The State of Rhode Island has highway work valued at \$1,500,000 under construction at the present time and has another \$20,200,000 worth of work authorized or in the planning state. This work is all on the State highway system, and it is likely that the towns and cities also have work in progress on the roads and streets under their jurisdiction.

The State estimates that it will require approximately \$63,000,000 to rebuild deficient sections of the existing Federal-aid primary system during the next 15 years, \$15,000,000 will be needed for the secondary system, \$4,000,000 will be required on the remaining non-Federal-aid mileage on the constructed State highway system, and about \$18,000,000 to construct the rural mileage on the unconstructed State highway system. In addition, needed improvements on the interstate system of highways are valued at \$80,000,000, which makes the total State highway needs amount to \$180,000,000. This amount includes right-of-way costs. On the local roads it is estimated that another \$99,000,000 will be needed for construction.

The total value of needed improvements on Rhode Island roads and streets, therefore, comes to \$279,000,000. If this expenditure was made, it should produce 123,329,000 hours of employment on and off the job site, and should induce into the economy at least another 150,749,000 hours of labor in the consumer goods industry.

Rhode Island spends approximately \$2,000,000 annually on maintenance of State highways; the towns and cities spend another \$3,000,000 to maintain local roads and streets which come under their jurisdiction. This \$5,000,000 provides regular employment for about 1,500 people, 600 of whom work for the State and the remaining 900 for the local agencies.

Rhode Island finds that there is increased interest and competition among bidders on highway work since the first of the year and reports that bid prices are lower than those received in 1948.

South Carolina

The South Carolina State Highway Department has had a construction program valued at \$74,000,000 authorized since the end of the war, and it is estimated that on June 30 of 1949 only \$15,500,000 worth of work remained unfinished. Their construction program for the 2-year period ending June 30, 1951, totals \$36,500,000, of which about \$23,500,000 will be devoted to secondary or farm-to-market roads. It is probable that local road building agencies in the counties, cities, and villages are also doing some construction work on the roads and streets under their supervision.

South Carolina estimates that the total cost for needed highway improvements on the State system is \$323,000,000. Of this amount \$120,000,000 is required for improvements to the interstate system, \$103,000,000 for the remaining Federal-aid system, and the other \$100,000,000 for State highways, including urban connections not a part of the Federal-aid system. Here again information is not included as to the deficiencies presently in existence on local roads and streets which are not a part of the State highway system, but it is probable that a sizable backlog of needed improvements has accumulated.

Expenditure of the \$323,000,000 mentioned above should provide 196,959,000 hours of on- and off-site employment and should add 186,920,000 additional hours of labor in the consumer-goods field.

Maintenance work also provides employment in South Carolina. The State spends \$8,000,000 annually on its highways, requiring the services of 2,515 people. Other local agencies probably spend another \$4,500,000 and employ about 1,500 persons, making a total maintenance expenditure of \$12,500,000 in the State and a total maintenance employment figure of over 4,000.

There has been a downward trend in construction costs in South Carolina since January 1, 1949. Manpower is now available to take care of more highway work than is presently under way, and it is expected that this trend will become even more marked within the next 2 years.

South Dakota

At the present time there is \$15,863,000 worth of highway construction and reconstruction work under way in the State of South Dakota. State highway work on the interstate and trunk systems is valued at \$6,635,000, and the remaining \$9,228,000 is divided as follows: County roads, \$4,050,000; township roads, \$1,498,000; and municipal streets, \$3,680,000. In addition, there is \$32,467,000 worth of construction or reconstruction authorized or planned, of which \$6,162,000 is on the State highway system, \$12,956,000 on county roads, \$4,688,000 on township roads, and the balance of \$8,661,000 on municipal streets. No information was available as to the amount of work planned on the South Dakota State highway system, but it is probable that its inclusion would increase the above total substantially.

Total highway deficiencies in South Dakota are valued at \$413,648,000. To correct all deficiencies in the State trunk highway system would require the expenditure of about \$293,000,000, while the counties need \$58,156,000, the townships, \$49,460,000, and the cities and villages, \$13,032,000. To make the most essential improve-

ments on the State trunk highway system would cost \$140,161,000, and the type of work needed is shown on the following table:

Type of work	Length in miles	Estimated cost
Grading.....	2,074	\$35,013,000
Gravel surfacing.....	120	245,000
Bituminous base course.....	1,880	27,816,000
Bituminous base with class-A material.....	311	4,379,000
Bituminous surfacing.....	2,179	35,253,000
Concrete surfacing.....	406	29,215,000
Bridges (over 20 feet long).....	5	8,237,000
Total.....	6,975	140,161,000

The following three tables show the mileage, type, and estimated cost of the work necessary to improve local roads and city streets which are not a part of the State highway system.

Type of work	Length in miles	Estimated cost
County highway system:		
Grading.....	9,113	\$20,360,000
Shoulder widening.....	1,055	407,000
Gravel surfacing.....	10,060	12,631,000
Bituminous surfacing.....	645	8,111,000
Surface widening.....	15	6,000
Bridges (over 20 feet long), 1,744.....		16,507,000
Other.....	7	134,000
Total.....	20,895	58,156,000
Township highway system:		
Grading.....	22,883	21,479,000
Shoulder widening.....	1,274	358,000
Gravel surfacing.....	26,376	25,578,000
Bituminous surfacing.....	98	1,702,000
Surface widening.....	820	209,000
Other.....	423	134,000
Total.....	51,874	49,460,000
City street system:		
Grading.....	950	1,651,000
Shoulder widening.....	10	58,000
Gravel surfacing.....	1,089	1,409,000
Bituminous surfacing.....	698	2,760,000
Concrete surfacing.....	95	5,505,000
Bridges (over 20 feet long), 87.....		1,649,000
Total.....	2,842	13,032,000

The State also estimates that to bring the county and township road systems and the municipal streets to full sufficiency within 10 years will cost an additional \$113,271,000.

Expenditure of the \$413,648,000 considered necessary to correct all present highway deficiencies in South Dakota should provide 197,972,000 hours of employment on and off the job site and should increase employment by at least 228,793,000 hours of labor in the consumer-goods industry.

South Dakota expends a little over \$5,000,000 every year to maintain the highways on its State system and employs about 725 people in this work. The counties expend nearly \$3,500,000 and employ over 1,000 people on their roads, while the townships, cities, and villages spend another \$1,500,000 and need about 500 people to maintain the

remaining roads and streets in the State. All maintenance in South Dakota, therefore, costs about \$10,000,000 annually and employs 2,225 people.

Tennessee

The State of Tennessee had highway construction contracts valued at \$87,000,000 under way in July of this year, \$32,300,000 worth of which was not yet completed, and they planned to have another contract letting the latter part of August which would include projects costing another \$5,000,000. Other projects in the planning stage are estimated to cost \$25,000,000. The Rural Roads Program, "strictly for roads not on the State primary or secondary road system" makes \$22,000,000 of State funds available to local agencies for construction work on their roads during the next 2-year period. Of this amount \$2,200,000 is included in the presently contracted total, which leaves \$19,800,000 authorized for future use. Probably the counties have funds of their own planned to add to the State appropriations, and the cities and villages are doubtless planning work on the streets under their jurisdiction.

The Tennessee Department of Highways and Public Works finds that it will take \$30,000,000 per year for 20 years to bring their primary road system up to modern standards. Secondary and rural roads require improvements costing \$20,000,000 yearly for 20 years, and it would take an annual expenditure of \$11,000,000 for a 20-year period to modernize the city streets in Tennessee. It is assumed that the greater portion of this \$1,220,000,000 worth of deficiencies already exists.

If \$1,220,000,000 was spent on highway construction, it should provide 612,062,000 hours of employment on and off the job site and should induce another 682,602,000 hours of labor in the production and marketing of consumer goods.

The State of Tennessee has an annual maintenance budget of about \$8,000,000 for the roads under the jurisdiction of the department of highways and public works. This gives employment to an average of 1,800 people. Tennessee counties spend about \$10,500,000 on the local roads, employing over 3,100 people, and the cities and villages expend approximately \$3,300,000, requiring the services of an estimated 1,000 people. Total maintenance expenditures by all agencies in Tennessee, therefore, amount to about \$21,800,000 and maintenance work employs approximately 5,900 persons.

Tennessee noticed a decided increase in interest and competition among the bidders when they held a contract letting for some \$6,000,000 worth of highway construction projects in June. Prices were lower than those received in December 1948, and the ample supply of materials and equipment available should hold them down or possibly lower them even further for a heavy construction program.

Texas

The Texas Highway Department now has under contract approximately \$50,000,000 worth of State highway construction, and they expect during the next 2 years, with the revenues in sight, to accomplish their objective of \$80,000,000 per year, or a total of \$160,000,000 worth of highway work. They also have plans practically finished covering \$122,000,000 worth of essential work for which funds have not as yet been authorized. Probably the counties, cities, and vil-

lages are also planning construction on the roads and streets for which they are responsible.

It is estimated that it would cost \$1,294,000,000 to correct the present deficiencies on the State highways and another \$1,068,630,000 to make needed improvements on county roads. The city and village needs in Texas have not been surveyed, but it is probable that a considerable backlog has accumulated in the war and postwar period when highway work was severely curtailed.

If county and State highway deficiencies in Texas were to be corrected by an expenditure of \$2,362,630,000, the amount estimated necessary above, 1,207,634,000 hours of on- and off-site employment should be produced, and at least an equal amount of hours of work should be added in the consumer-goods field.

In addition to the employment which would be generated by a construction program for needed improvements, the maintenance of Texas roads and streets keeps a considerable number of people busy steadily. The State spends approximately \$17,000,000 per year on maintenance of the State highway system; the counties spend close to \$22,000,000; and the cities and villages put another \$6,000,000 into the maintenance of their streets. This \$45,000,000 total maintenance expenditure gives work to about 13,300 people. State maintenance work employs about 4,800 of this number, the counties nearly 6,500, and the cities and villages the remainder.

In recent months, Texas has noticed a definite increase in competition and, consequently, a downward trend in construction costs.

Utah

As of August 1, 1949, the State of Utah reports that highway-construction work valued at \$6,870,430 was under contract, \$5,396,000 worth on the State highway system, \$960,830 on county rural highways, and the remaining \$513,600 on city and village streets. At the same time the State road commission had work valued at \$875,000 authorized but not yet contracted and plans for another \$18,097,000 worth of work; the counties had \$218,000 worth of authorized construction and plans for \$398,000 more; and the cities and villages had \$165,000 worth of authorized work and \$165,000 worth of planned work. In the State of Utah, therefore, the total value of authorized construction on August 1, 1949, was \$1,258,000, and plans for work estimated to cost another \$18,660,000 were available.

Present deficiencies on the Utah State highways total \$213,128,000; there are \$48,000,000 worth of needs on the county roads, and \$14,300,000 worth on the city and village streets. It would cost \$275,428,000, consequently, to make all presently needed improvements in the State. The road commission also estimates that if these improvements were corrected in a 10-year program it would be necessary to provide another \$61,466,000 for deficiencies which would occur during that period.

Expenditure of the \$275,428,000 presently needed would probably provide 126,463,000 hours of on- and off-site employment and should induce at least another 157,630,000 hours of labor into the economy in the consumer-goods industry.

Close to \$6,100,000 is spent annually on the maintenance of Utah's roads and streets, and this expenditure provides work for about 1,430 people. The State itself spends almost \$4,500,000 employing an

average of 900 people; the counties spend about \$1,000,000 and employ 330 people, and the cities and villages account for the remaining \$600,000 expenditure and 200 people employed.

The past year has shown a reduction in Utah construction costs amounting to possibly 10 percent over previous postwar years, which the State feels is mainly due to greater ease in securing materials, machinery, and parts promptly, and to labor's greater efficiency.

Vermont

Highway construction costing \$4,762,600 is now under contract in the State of Vermont, and the department of highways is planning additional work valued at \$9,219,300. Although no information is available concerning the plans the towns, cities, and villages have made for construction on roads and streets under their supervision, it seems likely that they, too, have work in progress and will continue with their own programs.

Deficiencies whose correction would cost an estimated \$149,829,525 are found at the present time on the roads and streets of Vermont. \$100,438,350 worth of the needed work is on the State highway system, \$38,870,575 on the State-aid and town roads, and the balance, \$10,520,600, on the city and village streets which are not included in the State system. Vermont also estimates that in the next 10 years another \$94,724,900 would be required to correct all deficiencies which might occur during that period of time.

The presently needed improvements may be broken down into the following classes of work:

State highways, urban and rural (including interstate system):	<i>Estimated cos</i>
Highway construction.....	\$60,039,250
Widening.....	14,880,200
Resurfacing.....	6,000,000
Major structures:	
Construction.....	16,192,000
Widening.....	3,234,400
Stock piling of materials and equipment.....	15,000
Railroad flashing light signals.....	77,500
Total.....	100,438,350
State-aid and town highways:	
Highway construction.....	19,919,800
Widening.....	4,981,200
Resurfacing.....	1,650,000
Major structures:	
Construction.....	9,122,350
Widening.....	3,097,225
Railroad flashing light signals.....	100,000
Total.....	38,870,575
City and village streets:	
Highway construction.....	2,135,000
Widening.....	3,843,600
Resurfacing.....	1,000,000
Major structures:	
Construction.....	2,120,000
Widening.....	1,387,000
Railroad flashing light signals.....	35,000
Total.....	10,520,600

If Vermont were to expend the \$149,829,525 total shown above, 79,691,000 hours of on- and off-site employment should result, and at least another 83,352,000 hours of labor should be induced in the production and marketing of consumer goods.

The Vermont State Department of Highways spends a little over \$3,000,000 on the maintenance of its road system each year, and employs an average of 629 people. The town roads and city and village streets require an annual maintenance expenditure of \$2,200,000 and the work of 700 persons. The total maintenance expenditure in Vermont, therefore, comes to \$5,200,000, and about 1,325 people in the State are regularly employed in maintenance work.

Vermont reports that their recent experience in letting highway contracts shows an increased number of bidders, with prices dropping some, due to the greater competition.

Virginia

The Department of Highways of the Commonwealth of Virginia has highway work valued at \$24,620,054 under construction at the present time, and they expect to place another \$26,608,514 worth of contracts within the next fiscal year. The cities and villages of Virginia probably are planning additional construction on the roads and streets under their jurisdiction.

At the present time it is estimated that it would cost \$320,000,000 to make needed improvements on the State highway system, another \$20,000,000 to correct existing deficiencies on county and local rural highways, and \$60,000,000 for needed work on city and village streets. To this total of \$400,000,000 it would be necessary to add another \$224,000,000 if this construction program were to be planned for a 10-year period, since deficiencies up to that value could be expected to accumulate during that period of time.

Expenditure of the \$400,000,000 needed to eliminate present deficiencies on Virginia's roads and streets should result in 207,060,000 hours of off- and on-site labor, and should add at least another 218,688,000 hours in the consumer-goods field.

The maintenance of Virginia roads and streets provides employment for a large number of people also. The State itself spends about \$20,000,000 on the care of its primary and secondary roads, and employs more than 6,100 people in this work. Another \$4,000,000 is spent by the counties, cities, and villages, and they employ about 1,300 people. The total money expended on maintenance of Virginia's roads and streets comes to \$24,000,000, therefore, and 7,400 people are steadily employed in this work.

In recent months, bidding on highway contracts in Virginia has become more competitive. A letter from the State states:

Contractors are analyzing their bids much closer and are cutting unit costs, taking into consideration reduction in the cost of materials and possibly reducing their anticipated profits. Construction costs may be estimated to have been reduced by about 5 percent. A further reduction of a like amount, possibly larger, may be expected as the equipment and materials markets ease.

Washington

Work now under contract on the Washington State highway system, including primary State highways and secondary State highways, amounts to \$24,500,000. The State legislature has authorized an additional \$48,000,000 for highway construction from the present until March 31, 1951, and there is \$77,000,000 worth of work in the

planning stage. Although we do not know the exact value of work under way and being planned by the counties, cities, and villages, it is probable that they, too, will invest a considerable amount in modernizing the roads and streets under their jurisdiction.

A 10-year highway-construction program to correct all deficiencies in the State of Washington would cost an estimated \$843,228,000, of which \$401,448,000 would be used to eliminate present deficiencies, and the balance to make improvements which would become necessary while the program was in progress. \$300,000,000 of the money currently needed would be used for work on the State highway system, \$62,523,000 for county and local rural roads, and the remaining \$38,925,000 for city and village streets.

In 1947 an engineering study was prepared for the Washington State Legislature, and a complete analysis of the type of work needed in the State within a 10-year construction period can be found in it. A very small part of the needed work shown below has already been accomplished, which accounts for the dollar totals being somewhat higher than those shown as total 10-year requirements in the preceding paragraph. All dollar values used are based on 1947 prices.

Rural State highway needs
ROADWAYS

Type of work	Miles	Cost
Resurfacing	317	\$4,242,000
Widening	47	1,138,000
Resurfacing and widening	1,635	58,565,000
Reconstruction	1,406	119,801,000
Construction on new location	1,945	204,671,000
Total roadways	5,350	388,417,000

STRUCTURES

Type of work	Number	Cost
Reconditioning	29	\$1,920,000
Replace at same location	409	45,256,000
Construction at new location	260	44,541,000
Total structure construction	698	91,717,000

Needs on urban connections—State highways

STREETS

Type of work	Miles	Cost
Resurfacing	33	\$2,565,000
Widening	9	4,316,000
Reconstruction	66	10,334,000
Construction on new location	37	21,645,000
Total	145	38,860,000

STRUCTURES

Type of work	Number	Cost
Redecking	2	\$79,000
Reconditioning	9	269,000
Replace at same location	33	9,932,000
Construction at new location	50	46,049,000
Total	94	56,329,000

County road needs

ROADWAYS

Type of work	Miles	Cost
Resurfacing.....	7,624	\$22,505,000
Widening.....	133	853,000
Resurfacing and widening.....	5,719	37,725,000
Reconstruction.....	4,539	39,772,000
Construction on new location.....	3,666	40,532,000
Total.....	21,681	141,187,000

STRUCTURES

Type of work	Number	Cost
Redecking.....	95	\$321,000
Reconditioning.....	365	3,571,000
Replacement at same location.....	1,249	21,504,000
Construction at new location.....	175	10,152,000
Total.....	1,884	35,548,000

City and village street needs

STREETS

Type of work	Miles	Cost
Resurfacing.....	429	\$9,092,000
Widening.....	53	3,409,000
Reconstruction.....	1,035	58,018,000
Construction on new location.....	345	16,387,000
Total streets.....	1,862	86,906,000

STRUCTURES

Type of work	Number	Cost
Redecking.....	4	\$163,000
Reconditioning.....	16	1,290,000
Reconstruction.....	57	6,260,000
Construction at new location.....	30	21,904,000
Total structures.....	107	29,647,000

Expenditure of the \$401,448,000 presently needed for improvements in Washington would produce about 170,932,000 hours of on- and off-site employment and should inject at least another 229,753,000 hours of labor in the production and marketing of consumer goods.

Highway maintenance provides further employment in the State of Washington. The State itself is now spending over \$6,000,000 each year on maintenance of the State highway system, and it employs more than 1,600 people on this work. Washington counties spend close to \$12,000,000 annually and employ about 3,100 persons to maintain the roads under their jurisdiction. The cities and villages spend another \$4,500,000 yearly and give employment to about 1,200 people. The total maintenance bill in Washington runs about \$22,500,000, and about 5,900 people earn their living in caring for the roads and streets which cover the State.

This year's construction program in Washington is about 30 percent greater than in 1948, and it is believed that this has had a tendency to

increase interest and competition among the bidders on highway work. There has been no appreciable reduction in contract prices, but the State department of highways feels that a slight reduction will be reflected before the year is ended. They believe this will be brought about by greater productivity of labor and increasing availability of road-building equipment and materials.

West Virginia

The State Road Commission of West Virginia now has under contract, including "force account" work, approximately \$11,214,100 worth of highway construction. Another \$14,018,800 worth of projects have been definitely programed and are in various stages of engineering. Projects engineered in part but not definitely programed at present are valued at approximately \$48,025,000. The cities and villages are probably planning additional work on the streets which are their responsibility.

A recent survey indicates that reconstruction of West Virginia's interstate highway system to acceptable standards would cost approximately \$206,609,500. The remaining State primary system contains about 2,800 deficient miles, which the State estimates will cost at least \$100,000 per mile to correct, or a total of \$280,000,000. Absolute minimum improvement needed on the State secondary roads would be the regrading and adequate drainage of about 9,000 miles of dirt roads, at a cost of about \$300,000,000. The total expenditure needed in West Virginia is, therefore, at least \$786,609,500, and this figure does not include any provision for deficiencies on city and village streets which are not a part of the State highway system.

The expenditure of this \$786,609,500 should provide 386,600,000 hours of employment on and off the job site and should inject at least another 445,150,000 hours of work in the consumer-goods industry.

The maintenance of West Virginia's roads and streets costs the State approximately \$23,000,000 and the other local highway agencies close to another \$1,500,000 or a total of \$24,500,000 annually. This expenditure gives steady employment to about 5,600 people, more than 5,100 of whom work for the State and the remainder for the cities and villages.

Competition among bidders on highway work in West Virginia has greatly increased this year as evidenced by a larger number of bids and closer prices. The State report contains the following comments:

This is particularly true on projects which involve grading, due largely to the organizations and equipment built up for coal-stripping operations during the war and postwar period and the slackening off in this industry within the past year. The average number of bidders per project in 1948 was 2.7, and for the first 6 months of 1949 it was 4.1. In each case there are included in the average the bidders on surfacing projects, which may be as low as one or two on some jobs. On secondary road-grading projects this year, we have had as high as 17 bids on a single job. This increased competition, together with greater stability in labor and material costs, assurance of deliveries of material, equipment and parts, and other factors, has resulted in a lowering of unit bid prices. We do not yet have any composite figures indicating this saving on all items. On the grading item it has been substantial. For example, the weighted average low bid for excavation on 12 Federal-aid secondary projects in the last quarter of 1948 was 75 cents per cubic yard. On eight similar projects in the second quarter of 1949 it was 54.6 cents.

Wisconsin

The Highway Commission of Wisconsin estimates that the total program of construction work on the State trunk-highway system for the current year will cost approximately \$30,000,000 and they indi-

cate that they have authorized and under way for the fiscal periods 1949 and 1950 a program of constructing 876 miles of State trunk highways at a probable cost of \$62,400,000. It is likely that the counties, cities, and villages are also planning work to improve and modernize the roads and streets for which they are responsible.

The commission also estimates that their annual needs in the 10-year period 1950 to 1960 will be about \$30,000,000 for constructing and reconstructing 450 miles of highways and \$7,000,000 for stopgap replacements and reinforcement on mileage in the construction program, together with reinforcement of presently nondeficient mileage. Approximately 4,500 miles of State trunk highway are presently in need of improvement, therefore, at a total cost of \$300,000,000, and another \$70,000,000 would be needed to take care of deficiencies expected to accumulate by 1960. The needs of highways not a part of the State trunk-highway system are substantial. The county trunk system contains about 18,000 miles, approximately 8,000 miles of which are on the Federal-aid secondary system. A survey made late in 1947 of these 8,000 miles indicated that 4,764 miles needed major improvement estimated to cost \$45,000,000. The needs on the remaining county roads, the town roads, and city and village streets have so far not been determined.

If the \$345,000,000 which is definitely needed now were to be spent, it should provide 157,386,000 hours of employment on and off the job site and should induce at least another 185,306,000 hours of labor in the production and marketing of consumer goods.

Maintenance work on the roads and streets of Wisconsin provides additional employment. The State expends about \$9,000,000 each year and provides employment for nearly 3,150 people. Other local road-building agencies in Wisconsin counties, cities, and villages spend about \$30,500,000 each year and give work to more than 10,000 persons. The total amount spent for maintenance in Wisconsin is, therefore, approximately \$39,500,000 and the services of nearly 13,150 people are required.

Wisconsin finds that there has been a decided increase in interest and competition among bidders on highway work in 1949 compared to the previous postwar years. In 1948 they averaged about 3.6 bids per improvement project offered and expect this average to increase to eight in 1949. During the last 3 or 4 months there has been a distinct downward trend in prices. Average unit prices for principal items of work contracted in 1949 are 15 to 25 percent below the average unit prices of 1948. The highway commission feels that a substantial factor in the reduced prices is availability of materials and equipment.

Wyoming

In July of this year Wyoming had under contract uncompleted highway construction work amounting to \$9,285,000. In addition, they will be able to award \$4,500,000 more in highway contracts, probably before the end of this year. This work is all on the State highway system, and it is probable that the counties, cities, and villages are also planning construction on the roads and streets under their jurisdiction.

Correction of present deficiencies on the highways, roads, and streets of Wyoming would require the expenditure of \$174,860,800. Of this total, \$137,360,800 is needed for improvements on State

highways, including \$46,713,000 for the interstate system; \$27,500,000 would go into correcting deficiencies on county and local rural highways; and the remaining \$10,000,000 would be used for needed work on city and village streets. If this construction work were to be planned over a 10-year period, it would be necessary to include an additional \$29,661,890 for deficiencies which would accumulate within those 10 years.

Expenditure of the \$174,860,800 presently needed to correct deficiencies on Wyoming's roads and streets should produce 79,005,000 hours of employment on and off the job-site hours and should increase employment by at least another 97,277,000 hours of labor in the consumer-goods industry.

In addition to this construction labor, the maintenance of Wyoming's highways provides steady employment for about 1,400 people. The total cost of maintenance in Wyoming is \$3,857,000 of which the State spends \$2,500,000 and the local agencies the balance. State maintenance employment averages about 900 people; county, city, and village maintenance work requires the services of the other 500 people.

The price of highway construction work in Wyoming is definitely falling, and competition among bidders is much greater. At recent lettings prices were down at least 10 percent from last year's.

District of Columbia

The District of Columbia has under contract at the present time highway construction valued at \$11,475,000. Another \$25,000,000 worth of work has been authorized or is being planned.

The expenditure of \$200,000,000 in the District of Columbia should modernize the present streets and bring them up to adequate standards for present traffic. An investment of this size in highway construction would probably create about 94,604,000 hours of employment on and off the job site and should induce into our economy another 111,262,000 hours of work in the production and marketing of consumer goods.

Maintenance in the District of Columbia requires an annual expenditure of about \$1,800,000 and gives steady employment to around 450 people.

APPENDIX B

JULY 3, 1949.

The Honorable _____,
Governor, State of _____.

DEAR GOVERNOR _____: In appraising the current economic situation, the Joint Committee on the Economic Report would deeply appreciate whatever information you can supply on prevailing conditions of employment and unemployment in your State. A subcommittee of this committee which is investigating the general problem of unemployment is currently assembling the information on national, regional, and local trends available from the Federal statistics-gathering agencies: the Bureau of Labor Statistics, the Bureau of the Census, the Bureau of Employment Security, and the Bureau of Agricultural Economics. It is our hope that you will be able to supplement this general information with more specific information on _____.

The Joint Committee on the Economic Report is also attempting at this time to determine, with the help of various Federal agencies, the

present situation with regard to the need and progress in filling the need for public works generally. Any information you could give us with respect to the situation in your State would be of help to this committee. I am enclosing copy of a letter I have written to Commissioner _____ which gives in somewhat more detail the nature of the committee's interest in respect to maintenance needs for main highways and farm-to-market roads.

Sincerely yours,

JOSEPH C. O'MAHONEY, *Chairman,*
Joint Committee on the Economic Report.

JULY 2, 1949.

COMMISSIONER OF HIGHWAYS,
State of _____.

DEAR MR. _____: In connection with an appraisal of the current economic problem in terms of production and employment, the Joint Committee on the Economic Report is seeking information on the present status of highway construction and maintenance programs. It would be greatly appreciated if you could provide us with a statement with respect to highway construction in your State. What is the extent of highway works now under contract? Now authorized? Now in the planning state? What is the need for future construction?

It would also be appreciated if this information could include main highways, farm-to-market roads, as well as reconstruction and maintenance.

We would also like to have any comments you care to make on your recent experiences in the letting of road contracts—whether or not you feel there has been any increased interest and competition among bidders since the first of this calendar year; whether there have been any recent changes in construction costs in your estimation which reflect changes in the price and availability of road-building equipment and materials.

We will, of course, have full access to the information provided by the Federal Works Agency but hope that you will be able to provide us with a better understanding of the particular conditions which prevail in your State.

Sincerely yours,

JOSEPH C. O'MAHONEY, *Chairman,*
Joint Committee on the Economic Report.

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