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REPORT OF THE CHIEF OF THE BUREAU OF PUBLIC ROADS, 1936

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PUBLIC ROADS,
Washington, D. C., September 1, 1936.

Hon. HENRY A. WALLACE,
Secretary of Agriculture.

DEAR MR. SECRETARY: I submit herewith the report of the Bureau of Public Roads for the fiscal year ended June 30, 1936.

Sincerely yours,

THOMAS H. MACDONALD, *Chief.*

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INTRODUCTION

From the designation of the Federal-aid highway system in 1921 until some 3 or 4 years ago the first objective of the cooperating Federal and State agencies remained perforce the extension of a feasible degree of improvement as quickly as possible to the entire system. In the beginning the roads selected to constitute the system were in large part unimproved even to a degree commensurate with the relatively simple needs of the traffic of that time. With the limited funds annually available, the first essential was to complete an initial improvement of the entire system that would permit travel over all its parts with at least some degree of facility.

The most prominent fact concerning the traffic of the earlier period was its rapid increase in volume. The one thing that could be assumed by the road builder was that whatever the traffic might be at any moment, it was certain to be much greater in a few years. But while growth was certain the extent of the probable growth was not so easy to foresee. Under these circumstances a policy of stage construction was wisely adopted under which initial improvements were made to a degree commensurate with existing traffic needs but always in such a way as to permit of additional improvement to the extent justified by future traffic growth and always with the motive of reaching, as promptly as possible, a stage at which the entire Federal-aid system should have been improved at least to some degree.

This stage has been reached within the last 3 or 4 years, and coincidentally there have occurred remarkable improvements in the performance possibilities of motor vehicles. Where formerly growth of traffic was the primary vehicular factor necessitating change in highway design, this suddenly gave way to changes in the design of the vehicles which imposed entirely new requirements upon the highway builder. Where formerly highways could be considered safe if their design provided for speeds of 30 or 40 miles per hour, there was suddenly a need for the safe accommodation of vehicles moving at 50 or 60 miles per hour. Such speeds have become the common practice of users of the highways, and highway builders would be derelict in their duty if they failed to incorporate in the roads they build the elements of design necessary to insure safe operation at these common speeds.

This Bureau and the State highway departments have been fully aware of these changing needs and have given prompt attention to the provision of the altered highway facilities made necessary by them. Fortunately the new demand was deferred until the initial improvement of the main roads had been completed to a degree that would permit a flow of traffic over the entire system with some facility. Important among the changes required are improvements of curvature, both horizontal and vertical, that will permit of the longer view ahead that the new high speeds necessitate. In most cases this can be done by local corrections in the alinement of the existing roads. In some instances, especially where the present roads are crowded closely by property development, it is necessary to select entirely new locations for the trunk lines, preserving the existing roads for service of local traffic only.

Other improvements required and supplied in the current programs are a general widening of road surfaces, the complete separation of lanes for opposing traffic where density of movement requires more than two lanes, the elimination of the more dangerous railroad crossings and the protection of others, the provision of bypass routes around cities, and the improvement of routes of direct access to the centers of cities.

The work of the fiscal year 1936 has been notable for the large amount of work done in improving our highway system in accordance with the changed conditions. The year was marked by a large program of new work financed by authorizations of \$200,000,000 for highways and \$200,000,000 for grade-crossing elimination and protection under the Emergency Relief Appropriation Act of 1935. Coupled with the work provided for by these outright grants, an additional large program was provided for by an authorization of \$125,000,000 of Federal funds to be matched with State funds in accordance with the Federal Highway Act. A third large item in the accomplishment of the year was the work done with remaining portions of the Public Works funds authorized in 1933 and 1934. The Bureau also administered the construction of roads in various Federal areas with funds provided by several legislative acts.

In point of funds involved in projects approved, contracts awarded, and work placed under construction, the progress made considerably exceeded that of 1934, the greatest in any previous year. Plans were approved for 27,000 miles of highway at an estimated cost of \$575,000,000, including \$451,000,000 from Federal funds. Contracts were awarded for 25,200 miles at a cost of \$517,000,000, of which \$407,000,000 was to be supplied by the Federal Government. Work placed under construction totaled 23,400 miles and cost \$483,000,000, of which \$382,000,000 was from Federal funds. The 19,700 miles of road completed at a total cost of \$310,000,000, including \$253,000,000 in Federal funds, did not equal the record made in 1934 when 21,700 miles were constructed.

This work furnished direct employment of 1,673,935 man-months to an average of 139,500 men. The indirect employment in production and transportation of materials brings the total employment to 4,352,000 man-months, equivalent

to an average full-time employment of 362,000 men. Assuming that each worker supports two other persons, highway construction administered by the Bureau supported over a million people.

SUMMARY OF HIGHWAY PROGRAM TO RELIEVE UNEMPLOYMENT

One of the major efforts of the Federal Government to relieve unemployment through a large-scale road-construction program began with an authorization of \$400,000,000 as a direct grant to the States by the National Industrial Recovery Act of June 16, 1933. One year later the Hayden-Cartwright Act of June 18, 1934 authorized a supplementary \$200,000,000. These funds are known as the 1934 and 1935 Public Works highway funds. The Hayden-Cartwright Act also provided \$125,000,000 as Federal aid to the States in each of the fiscal years 1936 and 1937. The emergency program was continued by allocations of \$200,000,000 for highways and \$200,000,000 for grade-crossing work, as direct grants to the States made from funds provided by the Emergency Relief Appropriation Act of April 8, 1935. These various acts also provided lesser amounts for the improvement of highways in national parks, national forests, public lands, and other Federal areas.

The work of highway construction carried out under these several acts had resulted, at the end of the last fiscal year, in the construction of 38,220 miles of road at a total cost of \$636,622,561, of which \$571,276,033 was paid by the Federal Government, and there were under construction, or approved for construction, 17,862 miles additional, involving an estimated total cost of \$357,283,044, of which \$270,336,054 was Federal funds. The remaining Federal funds, available for new projects, including Federal aid for the fiscal year 1937, amounted to \$191,137,913. Under the emergency grade-crossing program, projects approved or under construction included 1,407 new crossing eliminations, the reconstruction of 198 existing structures, and the protection without elimination of 322 crossings, at a total cost of \$133,524,019, of which the Federal portion was \$130,681,697. Begun within the past year, this program had already resulted in the completion of 66 new elimination structures, the reconstruction of 10 existing structures, and the installation of protective devices at one crossing, at a cost of \$3,234,563, including Federal payment of \$3,219,291. For additional work on grade crossings there remained at the end of the year \$62,099,012.

During the last 3 years the road construction described above and that carried on under other appropriations in Federal areas of various kinds has provided nearly 6,000,000 man-months of direct employment, or an average rate of 2,000,000 man-months per year, which is approximately double the average of employment furnished in the 2 years preceding the beginning of the enlarged emergency program.

SOURCES OF FUNDS USED DURING THE FISCAL YEAR

At the beginning of the fiscal year the active construction consisted almost entirely of Public Works highway projects. In this program there had been completed previously 24,600 miles of highway at a cost to the Federal Government of \$365,922,921. Highways under construction totaled 8,530 miles and involved \$168,815,710 of Federal funds. There had been approved for construction 1,427 miles of highway at a cost to the Federal Government of \$26,004,484; and \$33,256,885 remained available for new projects.

Of funds newly available there were the Federal aid authorized by the Hayden-Cartwright Act for the fiscal year 1936 and two sums allocated from the appropriation made by the Emergency Relief Appropriation Act of 1935, one for highways, roads, and streets, and the other for the elimination of hazards at railroad grade crossings.

The Federal-aid authorization was \$125,000,000 of which, after deduction of the administrative percentage, \$121,875,000 was apportioned. The emergency relief allocations for highways, roads, and streets and for grade crossings were each \$200,000,000, of which, respectively, \$195,000,000 and \$196,000,000 were apportioned. These apportionments are shown in table 1.

TABLE 1.—Apportionments of Federal aid for the fiscal years 1936 and 1937 and Works Program highway and grade-crossing funds authorized under the Emergency Relief Appropriation Act of 1935

State	Federal aid		Works Program		Total
	1936	1937	Highways	Grade crossings	
Alabama.....	\$2,604,320	\$2,603,967	\$4,151,115	\$4,034,617	\$13,394,019
Arizona.....	1,781,347	1,783,362	2,569,841	1,256,099	7,390,649
Arkansas.....	2,142,723	2,133,206	3,352,061	3,574,060	11,202,050
California.....	4,756,959	4,751,712	7,747,928	7,486,362	24,742,961
Colorado.....	2,288,811	2,286,333	3,395,263	2,631,567	10,601,974
Connecticut.....	791,253	791,660	1,418,709	1,712,684	4,714,306
Delaware.....	609,375	609,375	900,310	418,239	2,537,299
Florida.....	1,655,723	1,659,835	2,597,144	2,827,883	8,740,585
Georgia.....	3,168,221	3,168,222	4,988,967	4,895,949	16,221,359
Idaho.....	1,531,162	1,534,142	2,222,747	1,674,479	6,962,530
Illinois.....	5,160,696	5,165,226	8,694,009	10,307,184	29,327,115
Indiana.....	3,087,613	3,096,645	4,941,255	5,111,096	16,236,609
Iowa.....	3,231,718	3,234,910	4,991,664	5,600,679	17,058,971
Kansas.....	3,317,054	3,314,031	4,994,975	5,246,258	16,872,318
Kentucky.....	2,304,143	2,307,812	3,726,271	3,672,387	12,010,613
Louisiana.....	1,776,939	1,780,991	2,890,429	3,213,467	9,661,826
Maine.....	1,090,167	1,087,030	1,676,799	1,426,861	5,280,857
Maryland.....	1,025,870	1,025,000	1,750,738	2,061,751	5,863,359
Massachusetts.....	1,741,877	1,743,487	3,262,885	4,210,833	10,959,082
Michigan.....	3,837,292	3,831,476	6,301,414	6,765,197	20,735,379
Minnesota.....	3,423,306	3,426,001	5,277,145	5,395,441	17,521,893
Mississippi.....	2,196,524	2,191,112	3,457,552	3,241,475	11,086,663
Missouri.....	3,800,856	3,800,344	6,012,652	6,142,153	19,756,005
Montana.....	2,560,449	2,561,884	3,676,416	2,722,327	11,521,076
Nebraska.....	2,581,663	2,586,267	3,870,739	3,556,441	12,595,110
Nevada.....	1,595,501	1,593,978	2,243,074	887,260	6,319,813
New Hampshire.....	609,375	609,375	945,225	822,484	2,986,459
New Jersey.....	1,675,751	1,676,718	3,129,805	3,983,826	10,466,100
New Mexico.....	1,999,299	1,990,724	2,871,397	1,725,286	8,586,706
New York.....	6,150,106	6,156,604	11,046,377	13,577,189	36,930,276
North Carolina.....	2,938,657	2,940,809	4,720,173	4,823,958	15,423,597
North Dakota.....	1,960,162	1,958,107	2,867,245	3,207,473	9,992,987
Ohio.....	4,565,435	4,565,769	7,670,815	8,439,897	25,241,916
Oklahoma.....	2,947,521	2,937,406	4,580,670	5,004,711	15,470,308
Oregon.....	2,044,633	2,045,078	3,038,642	2,334,204	9,462,557
Pennsylvania.....	5,348,062	5,347,386	9,347,797	11,483,613	31,526,858
Rhode Island.....	609,375	609,375	989,208	699,691	2,907,649
South Carolina.....	1,692,896	1,688,441	2,702,012	3,059,956	9,143,305
South Dakota.....	2,036,775	2,041,872	2,976,454	3,249,086	10,304,187
Tennessee.....	2,638,159	2,630,111	4,192,460	3,903,979	13,364,709
Texas.....	7,777,504	7,771,317	11,989,350	10,855,982	38,394,153
Utah.....	1,410,752	1,416,208	2,067,154	1,230,763	6,124,877
Vermont.....	609,375	609,375	924,306	729,857	2,872,913
Virginia.....	2,278,475	2,280,725	3,652,667	3,774,287	11,986,154
Washington.....	1,949,957	1,954,781	3,026,161	3,095,041	10,025,940
West Virginia.....	1,356,793	1,359,961	2,231,412	2,677,937	7,626,103
Wisconsin.....	3,045,557	3,044,947	4,823,884	5,022,683	15,937,071
Wyoming.....	1,559,444	1,562,528	2,219,155	1,360,841	6,701,968
District of Columbia.....			949,496	410,804	1,360,300
Hawaii.....	609,375	609,375	926,033	453,703	2,598,496
Total.....	121,875,000	121,875,000	195,000,000	196,000,000	634,750,000

From these several sources, therefore, there was available for new construction, including the \$26,004,484 allotted to approved Public Works projects, a total of \$572,136,369.

CHANGES MADE IN FEDERAL-AID POLICIES

As reported last year two important changes were made in the administration of Federal aid beginning with the fiscal year 1937. Federal-aid funds had previously been limited in application to the Federal-aid system in rural and suburban areas and had not been available for use in the built-up portions of cities. With the initial improvement of the system nearing completion, the movement of traffic through cities had for some years been an important problem, and the Hayden-Cartwright Act removed the restriction on municipal improvements.

In many instances proper development of heavy-traffic routes on the Federal-aid system, routes requiring wide, high-type, costly surfaces, has been made difficult by the restriction of Federal participation to \$15,000 per mile. This restriction was removed, thus permitting participation up to 50 percent of the cost. This change is particularly helpful where additional width is required and an amount close to \$15,000 per mile has already been spent on the initial improvement.

ADMINISTRATION OF WORKS PROGRAM HIGHWAY AND GRADE-CROSSING FUNDS

The \$200,000,000 allocated for highways from funds provided by the Emergency Relief Appropriation Act was apportioned to the States in accordance with the provision of the act as follows: One-eighth on the basis of population and the remaining seven-eighths divided into three equal parts and apportioned on the basis of population, area, and mileage of post roads. The \$200,000,000 for elimination of hazards at grade crossings was apportioned, one-fourth in proportion to the mileage of the Federal-aid highway system, one-fourth in proportion to mileage of railroads, and one-half in proportion to population. These apportionments are shown in table 1.

Regulations for the administration of these funds, approved by the Secretary of Agriculture, the Works Progress Administrator and the President, were issued on July 12, 1935. Further consideration developed the desirability of making certain changes, and the regulations were reissued in final form on September 12.

These regulations followed the general plan of administration employed in the Public Works highway program except that more rigid requirements were made governing the employment of labor and the selection of projects to meet employment needs. Not less than 25 percent of the highway fund was to be expended on secondary roads not included in the State highway systems, not less than 25 percent was to be expended within municipalities, and the remainder was to be expended on the Federal-aid and State systems. The State highway departments were required to prepare highway programs giving preference to projects in those areas where, according to reports of the Emergency Relief Administration, the relief need was greatest. Conferences were to be held with the State relief administrator and the State administrator of the Works Progress Administration in an endeavor to select projects for which labor was available from local relief rolls. Programs were required to be submitted to the district engineer of the Bureau of Public Roads, the State director of the National Emergency Council, and the State administrator of the Works Progress Administration for concurrence before transmission to Washington for final approval.

Each project was to give the equivalent of a man-year of direct employment for each \$1,400 of Federal funds expended, or, under an alternate plan to provide an equivalent total employment in a highway program financed by State and Federal funds. State highway departments were to prescribe minimum wage rates in accordance with standards fixed by the Bureau. With the exception of supervisory, administrative, and skilled workers only labor certified by the United States Employment Service could be employed, and preference was required for those on relief rolls. In general, hours of labor were limited to 130 hours per month.

The funds for grade-crossing work were made subject to regulations of the same general character with regard to selection of projects, employment (excepting the provision requiring a man-year of employment for each \$1,400 expended), wages, and hours of labor. The work was not limited as to location except that not less than 25 percent of the funds had to be expended at railroad crossings on secondary or feeder roads. As far as practicable, projects were to be selected so as to distribute the funds among the railroads in each State approximately in proportion to their respective mileages within the State.

In both highway and grade-crossing work the giving of employment to those on relief rolls was made the primary purpose, and complete safeguards to insure that this purpose could not be subordinated to other objectives were established.

The general plan of operation was based on the time-tested Federal-aid procedure in which the State highway departments propose the projects to be improved, make surveys and plans, provide the right-of-way, let contracts, supervise construction, and agree to maintain the projects properly after completion—all subject to Federal approval.

EMPLOYMENT ON ROAD WORK

Continuing the policy of the last 3 years, all highway construction was administered with employment of those on relief rolls as the primary objective. The various classes of work provided a total direct employment of 1,673,935 man-months, as shown in table 2. This is below the all-time peak of 2,191,264 man-months established in 1935. However, emergency construction work of various kinds completely absorbed the qualified labor from unemployment relief rolls in many areas, and numerous construction jobs for which all preparations had been completed were not started or were delayed in starting because the employment objective of the work was already accomplished.

TABLE 2.—Comparison of employment during the fiscal years 1932, 1933, 1934, 1935, and 1936 on all Federal and Federal-aid highway construction and on all Federal and State road work, including State maintenance, by months

Month	Men employed on all Federal and Federal-aid highway construction					Total men employed on all Federal and State highway construction and maintenance				
	1932	1933	1934	1935	1936	1932	1933	1934	1935	1936
July.....	164,708	81,042	129,205	335,223	191,041	385,349	305,372	332,277	549,203	375,442
August.....	151,418	89,346	111,211	297,224	178,756	389,949	333,403	329,813	531,034	352,846
September.....	116,100	122,193	115,047	247,850	143,455	356,617	374,405	337,973	491,151	340,073
October.....	88,869	124,106	154,016	210,079	135,660	330,104	373,246	384,029	450,322	323,374
November.....	62,466	129,933	185,860	201,046	118,898	289,316	371,667	420,069	426,603	290,523
December.....	35,991	98,271	174,358	147,101	103,493	244,971	290,465	362,031	323,700	252,229
January.....	29,518	75,498	154,154	96,594	82,731	229,189	266,443	315,989	240,414	202,884
February.....	26,673	78,215	156,814	81,257	70,418	218,218	255,256	306,060	221,406	200,451
March.....	28,008	95,704	144,053	90,999	86,050	211,549	279,213	296,265	217,539	227,586
April.....	42,205	122,256	187,657	123,063	132,834	245,843	299,882	345,278	282,740	257,478
May.....	59,008	139,831	271,972	167,535	193,269	259,615	330,138	466,504	331,000	374,191
June.....	71,772	152,276	336,414	193,263	237,330	280,636	359,605	545,013	392,339	423,466
Total (man-months).....	876,736	1,308,671	2,120,761	2,191,264	1,673,985	3,441,356	3,839,095	4,441,331	4,434,451	3,680,543

In the spring of 1936 it became increasingly apparent that there was a definite shortage of certain classes of skilled labor in a number of sections of the country. To obtain the necessary complement of skilled labor and to avoid the part-time closing down of jobs with hardship to unskilled labor, it was decided in June to authorize an extension of hours of employment of selected classes of skilled labor beyond 8 hours per day and 130 hours per month where it could be shown that such action was needed in the interest of common labor.

At the beginning of the year over three-fourths of the employment was on Public Works highway construction. The Public Works employment was already considerably reduced because of the completion of projects, and in the ensuing months there was rapid decline. By the end of the year such work had dropped from major to minor importance. There were 150,876 men employed on this work in July 1935, and in June 1936 there were only 19,009, as shown in table 3.

However, the new Federal-aid program after a slow start in July, August, and September, gained momentum rapidly in October and November and in the spring months employed over 50,000 men. This employment partly offset the loss in Public Works employment. It was not expected that Federal-aid work would entirely replace work completed in the larger Public Works program.

Construction work financed with the \$200,000,000 for highways and \$200,000,000 for grade-crossing work allocated under the Emergency Relief Appropriation Act did not begin until October, since rules and regulations governing the work, in their final form, were not available until September 12. For each of the remaining months of the year there was an increase in employment over that of the preceding month. This trend continued through the unusually severe winter months, reversing the usual trend during freezing weather; by June, 113,800 men were employed on this class of highway work, and 31,600 men were employed on grade-crossing work.

The employment created by the Federal-aid and Works Program construction brought the direct employment on all classes of work administered by the Bureau to 237,300 men in June.

Equal amounts were allocated for highway work and for grade-crossing work under the Emergency Relief Appropriation Act, but at the end of the year the number of men employed on highway work was more than three times the number employed on grade-crossing work. This wide difference arises largely from factors that are inherent in grade-crossing work.

(1) The employment furnished by such work is indirect to a greater extent than is the case with highway work. The indirect employment is in the equipment industries, steel mills, cement mills, and transportation industries. Records show that a given expenditure on grade-crossing work produces only about one-half of the direct employment that is produced by an equal expenditure on highways. However, the indirect employment, which does not show in table 3, fully offsets the low direct employment.

(2) The grade-crossing program has been retarded by a number of circumstances that do not apply to highway work. Many grade-crossing elimination structures require the obtaining of right-of-way in or adjacent to cities and towns where values are high and settlement with landowners must often be made by extended negotiation if a reasonable price is to be obtained. Settlements must also be made for injury to property and to public services resulting from raising or lowering highway grades. The railroads must be consulted both as to the adequacy of the plans from the railroad point of view and as to possible interference with railroad service during construction.

The total employment for the year on work supervised by the Bureau was 1,673,935 man-months or the equivalent of an average, full-time employment each month of 139,500 men. The number of individuals actually employed, on account of part-time employment and other reasons, averaged approximately 195,000 persons per month. Indirect employment in the production and transportation of equipment and materials is estimated at 1.6 times the direct employment for work of the character done during the year. This resulted in an indirect employment of 2,678,000 man-months, and this, added to the direct employment, gives a total employment of 4,352,000 man-months, the equivalent of the full-time continuous employment of 362,000 men.

TABLE 3.—Direct job employment during the fiscal year 1936 on the several classes of Federal and Federal-aid road construction administered by the Bureau of Public Roads and State road construction and maintenance

Month	Men employed on road construction										Men employed on road maintenance by State highway departments	Total men employed
	In whole or in part with Federal funds											
	National-forest highways	National-park highways	Public-lands highways	Federal-aid highways	Public Works highways	Works Program highways	Works Program grade-crossing eliminations	Loan and grant highways ¹	National work relief highways	With State funds only on State highways		
July.....	4,762	5,874	508	1,159	150,876	1,257	-----	14,721	13,141	35,826	148,575	375,442
August.....	4,610	6,270	557	3,715	137,787	1,257	-----	16,416	9,401	40,130	163,960	362,846
September.....	5,118	6,530	523	8,006	105,770	5,244	248	13,019	2,984	40,431	156,187	340,073
October.....	4,895	5,821	417	22,797	80,162	5,244	1,019	12,676	2,629	40,380	147,324	323,974
November.....	3,696	4,124	460	25,241	56,073	13,251	2,653	8,571	4,849	32,487	139,138	290,523
December.....	1,986	2,113	409	22,388	34,600	23,758	5,337	5,600	7,302	27,046	121,690	252,229
January.....	1,046	1,300	60	14,153	19,838	28,257	6,569	3,939	7,059	14,358	105,795	202,884
February.....	469	1,041	-----	11,162	10,968	30,395	6,908	2,399	7,078	10,256	119,777	200,461
March.....	412	871	154	13,754	11,708	38,958	9,792	3,371	7,030	8,150	133,386	227,586
April.....	545	1,508	246	21,875	13,636	64,859	17,540	5,899	6,636	11,539	143,305	287,478
May.....	1,091	2,606	145	37,059	17,516	93,621	26,830	8,143	6,288	16,566	164,356	374,191
June.....	2,048	4,091	209	50,306	19,009	113,820	31,616	10,412	5,819	20,773	165,363	423,466

¹ Projects transferred by the Public Works Administration for engineering supervision.

PRESENT STATUS OF HIGHWAY IMPROVEMENT AND FUTURE POLICIES

Accelerated by the large highway-construction program of the past 3 years, supported largely by Federal funds, the primary State highway systems embracing 324,000 miles, and including the 227,000 miles of the Federal-aid system, have been almost completely improved with some form of surfacing and to some degree of adequacy. At the same time work administered by the Bureau, the Public Works Administration, and the Works Progress Administration has replaced the suspended activities of cities and counties and has made large increases in the mileage of improved local roads and city streets. In the immediate future a large amount of work should be done in making more adequate for traffic that already exists those highways deliberately improved under a policy of stage construction to a degree known to be less than that ultimately desirable. There is also a need for the further extension of improvements to the more useful secondary and land-service roads, many of which still await improvement. Needed improvements on the main highways include considerable improvement of alinement, reduction of grades, and elimination of railroad grade crossings and separation of grades at intersections of heavily traveled highway routes.

While much work of the kind described is necessary there is no reason whatever to assume that the main highway system, as a whole, is substantially inadequate. The need for extensive further improvement exists principally on a limited mileage of heavily traveled highways, especially near large cities in industrial sections and on those roads which, because of their early importance, were the first to be improved and were therefore constructed according to lower standards than have prevailed in more recent years. Viewing the work of past years as a whole, the system of highways created is remarkably adequate, as all who use the highways can themselves observe, and it is serving a tremendous volume of traffic.

The necessary maintenance, further improvement, and extension of the highway system constitutes a public obligation that will call for continued and unremitting expenditure of effort and money. Further improvement and extension can be carried on rapidly or at a slower pace, depending on the funds that are made available for the purpose. However, it must be pointed out that if the work is to be accelerated there can be no avoidance of taxation to produce the necessary funds.

For the past several years there has been a definite trend toward the placing of greater responsibility on the State highway departments. Only a few years ago the responsibility of these departments was confined almost entirely to the main rural highways. Now there is a large mileage of city streets which are extensions of the State systems that have been placed under State control; and 14 States have placed all or a large part of the county and local roads under the supervision of the State highway department. None of these States has turned over to the highway department the full amount of funds formerly used on the roads transferred to State administration. The State highway departments would have found themselves wholly unable to meet this new situation had not large sums of Federal money been provided for highway construction as an employment measure and had not the Federal policy been broadened to permit the improvement of all classes of highways.

State administration of the classes of highways described has very definite advantages, and the trend toward increased State supervision may be expected to continue. However, the policy presents a serious threat to the continued maintenance and stage improvement of the main State highways if funds commensurate with the increased State responsibility are not provided. It cannot be expected that Federal funds will be continued indefinitely on the scale of the last few years, but there is every indication that if Federal support were greatly reduced at this time States would have to spread their funds dangerously thin over the mileage they have undertaken to care for and would be forced greatly to contract their construction programs.

The outlook for the future is further dimmed by diversions and proposed diversions and reductions of gasoline taxes and motor-vehicle revenues. These revenues have been the principal sources of State highway funds. They should not be decreased at a time when the greatly increased highway mileage has imposed additional maintenance burdens and the public demands additional new construction.

HIGHWAY PLANNING SURVEYS BEING MADE

It should be recognized at this time that highway operations must be continuous and must be predicated on the service of highway transportation. Programs of highway improvement should be formulated on the basis of definite knowledge of need. The people of the country must be fully informed of the costs—not only present but future and continuing costs of work to be done from year to year. Recognizing the importance of these matters, the Bureau has urged upon all States the importance of conducting highway planning surveys embracing the entire rural highway mileage and going into all matters that may have bearing upon its improvement.

The surveys are the most comprehensive and important highway investigations yet undertaken. Federal funds are available for such work under the Hayden-Cartwright Act of 1934, which authorizes the use of 1½ percent of certain funds for use in planning future work, and similar authorization is contained in subsequent legislation and rules and regulations.

At the close of the fiscal year 40 States had indicated their desire to carry on such planning surveys, and work was under way in 31 States. The surveys are being conducted by the various State highway departments according to a general plan developed by the Bureau, since it is particularly important that data collected in the various States be on a comparable basis.

A Bureau representative is assigned to each State to keep contact between the Washington organization and the State survey organization. Each State organization consists of a manager, an assistant manager for each of the three main branches of the survey, and an office force and field parties as required.

The three branches of the survey are a road inventory, a traffic survey, and a financial and road-use survey. In the road inventory complete records of all existing roads will be obtained, together with a determination of their condition and the property they serve. Maps will be prepared by the States, giving for the first time a complete picture of our road system.

The traffic surveys will result in information as to the character and volume of traffic on each section of highway from which the present relative importance of each highway may be determined.

In the financial and road-use surveys studies are being made of the sources from which highway revenues come, the purposes for which they are expended, and the extent to which rural and urban residents contribute to each class of road and the amount they travel each class of road. Each State survey is to be carried on for 1 year.

It is believed that the surveys will result in the assembly of all the facts necessary for the formulation of a definite, economically and socially defensible, integrated highway-improvement program.

HIGHWAY SAFETY

One matter that confronts highway officials which is of great present importance and which will be of much concern in the future is the eradication of those conditions that are now or may be conducive to accident, injury, and death. A prominent part of the effort to be made to correct conditions will be the elimination of highway-railroad grade crossings, and the work now begun with Federal funds should be continued. The separation of opposing streams of traffic on the most heavily traveled highways seems also to be essential. The greatly increased speed of motor-vehicle travel requires a general increase in sight distances and the elimination of obstructions to view at intersections. Occasional sharp curves and steep grades on highways that, in general, invite the driver to speed must not be tolerated. Provision for pedestrian travel, separate from that portion of the highway used by vehicles must be made wherever the amount of pedestrian travel justifies it.

The need for corrective measures in these directions is definitely recognized and will be cared for as rapidly as available funds will permit. But this alone does not give assurance of a complete solution of our highway-accident problem, since it must be recognized that such accidents are due, in large measure, not to faults in the highways, but to weaknesses of the drivers of vehicles. Correction of this situation will require the unceasing efforts of all officials concerned with law enactment, law enforcement, and highway administration, and of the great body of highway users themselves.

In line with this thought an appeal to highway users to drive safely has been embodied in a pamphlet issued by the Bureau and given wide circulation. In the future, as in the past, the Bureau will direct its efforts toward the best solution of the accident problem.

During the past year the Bureau continued to urge adoption by all States of the five model uniform motor-vehicle acts prepared by the National Conference on Street and Highway Safety. The adoption of these acts is an obvious step in the interest of safety that is opposed only by local prejudice and inertia.

An act of Congress of June 23, 1936, directed the Secretary of Agriculture to expend not to exceed \$75,000 for study of and research in connection with traffic conditions and measures for their improvement, and, to cooperate with appropriate authorities in this work. The work authorized was being begun at the close of the year.

ROADSIDE IMPROVEMENT

Improvement of the roadsides by landscape grading, seeding, sodding, and planting, has been continued as a phase of highway work on which particular emphasis is laid by the Bureau. Since 1933 it has been required that each State include a reasonable number of roadside-improvement projects in its program of work to be done with Federal funds. The total program—completed, under improvement, and planned—includes 1,391 sections of road improved according to plans prepared by landscape specialists. Roadsides have been, or are being, improved on approximately 5,000 miles of highway at a cost of over \$7,000,000, of which the Federal Government is contributing more than \$6,000,000, as shown in table 4.

TABLE 4.—Roadside-improvement projects completed, under construction, and approved for construction financed with Public Works funds, Works Program funds, and Federal-aid funds, to June 30, 1936

Funds	Projects	Total Federal funds	Estimated total cost
	Number	Dollars	Dollars
Public Works funds under acts of June 16, 1933, and June 18, 1934.....	943	4, 037, 171	4, 313, 591
Federal-aid funds for fiscal years 1936 and 1937.....	199	545, 988	1, 183, 906
Works Program highway funds under act of Apr. 8, 1935.....	230	1, 601, 376	1, 661, 451
Works Program grade-crossing funds under act of Apr. 8, 1935.....	19	67, 517	69, 167
Total	1, 391	6, 252, 052	7, 228, 115

Most of the improvements are located on main arteries of travel at the approaches to the more-important centers of population, and much of the work has been done on existing surfaced highways.

Several features of roadside-improvement work that have come to the attention of highway engineers as a result of the object-lesson demonstrations have been adopted in regular highway-construction practice in several of the States. Among the practices adopted are flatter grading of slopes and slope rounding, reduction in the depth of ditches, elimination of "borrow" pits, a better clean-up of the roadsides after construction is completed, the saving of trees and other volunteer growth, the conservation of topsoil humus where feasible for later use in ground-cover protection, the planting of natural snow barriers, and the construction of small parking areas at scenic outlooks. A number of States are incorporating as much of this work in new construction as right-of-way widths permit.

Provision is being made within the State highway-department organizations for an improved technical approach to the various roadside problems, and more effective methods of handling the work are being used as experience is accumulated. Only a few years ago highways were completed with little thought of the appearance of the finished roadside, and attempts were made at so-called beautification under conditions already bad and often with overemphasis on some particular kind of planting. Far better results have been produced since roadside improvement has been regarded as an integral part of highway improvement to be provided for in planning rather than as an afterthought following construction.

**PROVISION MADE FOR CONTINUING BROADENED HIGHWAY PROGRAM IN
1938 AND 1939**

Continuation of the broadened highway program through the fiscal years 1938 and 1939 has been provided for in the act of June 16, 1936. This act authorizes regular Federal-aid appropriations of \$125,000,000 for each of the 2 years and also authorizes for these years annual appropriations of \$25,000,000 for secondary roads and \$50,000,000 for the elimination of hazards to life at railroad grade crossings.

The funds for highways and secondary roads must be matched by the States and are to be apportioned on the basis provided in the Federal Highway Act. The funds for grade-crossing work are outright grants to the States and are to be apportioned one-half in proportion to population, one-fourth in proportion to mileage of the Federal-aid highway system, and one-fourth in proportion to railroad mileage.

This act also authorizes annual appropriations for each of the fiscal years 1938 and 1939 for various other classes of road work as follows: \$14,000,000 for forest highways, roads, and trails; \$2,500,000 for main roads through public lands; \$7,500,000 for roads in national parks and monuments; \$10,000,000 for parkways; and \$4,000,000 for roads on Indian reservations.

The Hayden-Cartwright Act of 1934 specifies that any State that applies to highway purposes a lesser amount of motor-vehicle fees and gasoline taxes than was provided by law on June 18, 1934, shall be penalized not more than one-third of the Federal-aid apportionment to which it would otherwise be entitled. By a provision of the act of June 16, 1936, those States applying all special taxes on motor-vehicle transportation to highway purposes and lacking funds to match any part of Federal-aid funds for 1936 and 1937 are relieved of the necessity of matching that portion of Federal aid for which they lack funds, provided those special taxes applied to highway construction are used on Federal-aid work.

Further efforts to promote highway safety are made in another provision of this act, which requires that future Federal funds for highway construction shall be spent only on those portions of highways upon which suitable safety-protective devices shall be installed or shall be in operation at railroad grade crossings and drawbridges.

The act also contains a provision that up to 1½ percent of the funds authorized for Federal-aid highways, secondary roads, and grade-crossing work shall be available for making surveys and economic investigations for future construction.

By an act approved June 23, 1936, the Territory of Puerto Rico will be eligible to share in Federal-aid funds beginning with the fiscal year 1938.

STATUS OF MAJOR FUNDS AND PROGRESS IN CONSTRUCTION

During the fiscal year 1936, 13,790 miles of highway were brought to completion, exclusive of work done in Federal areas and with special funds. The completed work included 7,356 miles on the Federal-aid system outside of municipalities, 755 miles on extensions of the Federal-aid system into and through municipalities, and 5,679 miles of secondary or feeder roads. Payments to States for completed portions of construction amounted to \$224,073,259, as shown in table 5.

Details concerning the status of the various funds by States and by classes of highways are shown in tables 6 to 9. The mileages of highway according to status, by States, and by class of highway are shown in tables 10, 11, and 12. Similar information for grade-crossing work is shown in table 13. Tables 14, 15, and 16 show the mileage by types in the different stages leading up to completion. The tables are arranged so that each shows all funds or all mileage in a given status.

TABLE 5.—Funds paid to the States during the fiscal year ended June 30, 1936

State	Federal-aid authorizations for 1933 and prior years	Emergency construction authorization of July 21, 1932	Public Works authorizations for 1934-35	Federal-aid authorizations for 1936-37	Works Program		Total
					Highways	Grade crossings	
Alabama	\$261,259		\$3,403,670		\$1,126,105	\$904,204	\$5,695,238
Arizona	7,454		1,742,485	\$1,208,034	826,232	153,157	3,937,322
Arkansas	116,846		3,023,240		1,141,298	537,865	4,819,249
California	8,239		7,386,230	717,283	1,182,668	1,047,549	10,341,969
Colorado	43,568		1,539,883	733,751	637,236	466,103	3,420,541
Connecticut	194,057		1,025,935				1,219,992
Delaware			291,375				291,375
Florida	46,774		1,733,672	302,168	549,383	522,339	3,154,336
Georgia	51,070		3,153,413	314,350	347,699		3,866,532
Idaho	20,871		1,480,394	378,285	475,020	258,251	2,612,821
Illinois	201,306	\$35,576	7,516,369	518,171	875,956	113,382	9,260,760
Indiana	142,707		5,860,588	652,201	196,722	344,766	7,196,984
Iowa			3,884,050	1,218,779	568,187	365,026	6,036,042
Kansas			2,452,323	310,223	836,565	299,010	3,898,121
Kentucky	14,007		2,644,431	698,278	578,499	115,548	4,050,763
Louisiana	65,084		2,422,137	411,944	36,519		2,935,684
Maine			1,226,770	312,374	341,444	87,482	1,968,070
Maryland			1,268,152		35,580		1,303,732
Massachusetts	39,783		3,307,389	35,960	14,447	121,199	3,518,778
Michigan	32,984		5,577,195	1,318,979	2,841,857	1,811,106	11,582,121
Minnesota	59,637		4,054,003	551,194	659,409	98,994	5,423,237
Mississippi	442,781		3,527,590		857,267	373,103	5,200,741
Missouri	3,431		4,533,534	1,175,184	1,693,568	69,464	7,475,181
Montana	47,968		2,414,107	709,183	1,465,976	938,506	5,575,740
Nebraska			2,821,854	669,365	250,533	372,015	4,113,767
Nevada			1,580,998	646,906	1,007,983	232,055	3,467,942
New Hampshire	1,781		583,408	152,645	115,923	59,453	913,210
New Jersey	118,683		2,043,744	325,159	346,434	7,176	2,841,196
New Mexico	14,844		2,036,587	614,135	1,006,736	201,091	3,873,393
New York	148,894	27,655	9,065,759	609,249	1,052,590	136,178	11,040,325
North Carolina	216,676		3,810,573	274,846	858,039	291,229	5,451,363
North Dakota	241,400		2,005,747		198,872	82,265	2,528,284
Ohio	123,476		5,648,901	208,419	756,515	13,990	6,751,301
Oklahoma	116,453		3,432,698	440,627	460,973	617,769	5,068,520
Oregon	33,236		2,064,330	704,818	539,772	255,269	3,597,425
Pennsylvania	6,308		6,274,979	432,959	88,684	90,811	6,893,741
Rhode Island			866,993		4,560	248,536	1,120,089
South Carolina	8,262		1,829,082		369,786	226,113	2,433,243
South Dakota	78,280		2,974,218	179,575	577,752	171,855	3,981,680
Tennessee	10,997		3,211,709	423,560	688,948	82,155	4,417,369
Texas	144,335		9,680,348	2,035,107	3,088,739	656,411	15,604,940
Utah	20,345		1,325,076	536,920	513,979	75,664	2,471,984
Vermont			752,818	286,678	153,035	194,057	1,386,588
Virginia	262,530		3,398,421	68,084	370,792	66,880	4,166,707
Washington			2,280,186	747,323	940,747	320,824	4,289,080
West Virginia	3,894		1,449,102	146,988	258,764		1,858,748
Wisconsin	3,258		4,126,900	393,979	692,134	367,422	5,583,693
Wyoming	42,315		1,614,400	981,757	625,503	47,194	3,310,809
District of Columbia			416,507		695,958	51,447	1,163,912
Hawaii	85,416		622,143	21,549	155,401	74,072	958,581
Total	3,481,209	63,231	151,386,056	22,466,989	33,106,789	13,568,985	224,073,259

PROGRESS IN PUBLIC WORKS HIGHWAY CONSTRUCTION

At the beginning of the year the active construction administered by the Bureau consisted largely of Public Works highway construction supported by remaining amounts of the \$400,000,000 provided by the National Recovery Act and the supplementary \$200,000,000 provided by the Hayden-Cartwright Act of June 1934.

The year's activity reduced the amount of these funds available for new projects to \$9,791,764. There have been completed since the beginning of the program 33,982 miles of highway, at a cost of \$540,601,802 from Public Works funds. Of this mileage, 17,764 miles, involving \$259,239,173 of the Public Works funds, is on the Federal-aid system outside of municipalities, 2,518 miles, built at a cost of \$142,245,579 from the Public Works funds, is on extensions of the system into and through municipalities, and 13,700 miles are secondary roads on which \$139,117,050 of the Public Works funds was spent.

Of this mileage, 9,382 was completed during the last year, including 4,426 miles on the Federal-aid system outside of municipalities, 614 miles on extensions of the system into and through municipalities, and 4,342 miles on secondary or feeder roads. The work completed during the year involved \$174,707,511 of Federal funds. Payments made to the States for construction work during the year as the work progressed, amounted to \$151,386,056.

At the close of the year, 1,215 miles of Public Works highways, to which \$41,334,192 had been allotted, were under contract and largely under construction, and 105 miles had been approved for construction at an estimated cost to the Federal Government of \$2,272,242, but were not yet under contract. The unobligated balance for new projects was \$9,791,764. Details concerning the funds and mileage completed, under contract, and approved for construction, classified according to the three classes of improvement and by States appear in tables 6, 7, 8, 10, 11, and 12.

As the year closed Public Works highway construction had passed through or was in its final stages in all but a few States, and such work will not be an important factor in 1937.

PROGRESS IN FEDERAL-AID ROAD CONSTRUCTION

Federal-aid road construction during the year was supported almost entirely by the authorization of \$125,000,000 for the fiscal year 1936, made in the Hayden-Cartwright Act of 1934. Federal-aid was not provided for the fiscal years 1934 and 1935, and at the beginning of last year the less than \$7,000,000 remaining from previous authorizations was being used in large part in conjunction with Public Works funds. During the year projects were completed which involved \$5,146,956 of the earlier Federal-aid funds, and only a small amount remains to be paid on the few projects under construction.

Federal-aid for the fiscal year 1936 in the amount of \$121,875,000, after deduction of \$3,125,000 for administrative expenses, was apportioned to the States by the Secretary of Agriculture on December 27, 1934, as shown in table 1. A similar apportionment of 1937 funds was made on December 28, 1935. During the closing months of the preceding fiscal years projects were submitted against these funds and construction started, but payments were not made to the States before July 1.

The matching of the 1936 and 1937 Federal-aid funds was done entirely with State funds since the authorization to match earlier Federal-aid funds with Public Works and emergency advance funds does not extend to Federal-aid for 1936 and subsequent years.

Removal of the prohibition against the use of Federal aid within municipalities led to the initiation of many municipal street improvements, and projects containing rural and urban sections were particularly numerous. Formerly Federal-aid improvement stopped at the built-up portion of a city. In tables 6 to 12 both rural and municipal Federal-aid work are reported under the head "On the Federal-aid highway system outside of municipalities" since separation has not been made between municipal and rural portions of the work.

During the year 2,289 miles of highway financed with \$15,428,116 of the 1936 Federal-aid funds were brought to completion. These projects involved \$13,210,578 of State funds. Payments to the States for completed work including work done on projects still under construction amounted to \$22,466,989.

At the close of the year projects under contract and in large part under construction included 5,742 miles of highway at an estimated cost of \$134,296,182, to be provided as follows: \$68,874,961 from 1936-37 Federal-aid, and \$65,421,221 from State funds. At the same time projects had been approved, but not yet contracted for, covering 877 miles and involving \$11,510,404 of the 1936-37 Federal-aid, and \$11,823,105 of State funds.

On June 30, 1936, there remained available for new projects \$147,936,519 of the 1936-37 Federal-aid funds. In greater part these were funds for 1937. Tables 6 to 12, inclusive, show the status of the work by States.

WORKS PROGRAM HIGHWAY CONSTRUCTION

Although active construction under the \$200,000,000 for highways allocated from funds authorized by the Emergency Relief Appropriation Act did not begin until October and work was retarded by one of the severest winters on record, it was still possible to bring to completion 1,948 miles of highway, and by the end of the year projects completed, under contract, and ready to be placed under contract, totaled 11,870 miles at an estimated cost of \$168,230,573, of which

\$161,590,370 was Works Program funds. State funds and a small amount of Federal aid accounted for less than 4 percent of the total estimated cost. An unobligated balance of \$33,409,630 was available for new projects at the end of the fiscal year.

Of the 1,948 miles completed, 479 miles were located on the Federal-aid highway system outside of municipalities, 139 miles on extensions of the system into and through municipalities, and 1,330 miles were secondary or feeder roads. The respective Works Program funds involved were \$4,581,924, \$3,247,531, and \$7,416,658.

The 8,810 miles under contract and largely under construction were divided as follows: 2,014 miles on the Federal-aid system outside of municipalities, 686 miles of extensions of the system into and through municipalities, and 6,110 miles of secondary or feeder roads. Works Program funds involved were respectively \$38,097,853, \$26,856,840, and \$64,391,492.

Similar information for projects approved for construction but not yet under contract appear in tables 8 and 12. Details for work in all stages by States is presented in tables 6 to 12, inclusive.

GRADE-CROSSING ELIMINATION AND PROTECTION PROGRAM

The work of eliminating hazards to traffic at highway-railroad grade crossings was supported in large measure by the special allocation for the purpose of \$200,000,000 made under the authority of the Emergency Relief Appropriation Act, but other funds, particularly Public Works funds, were involved.

During the year 300 eliminations were completed, 10 elimination structures were reconstructed, and protective devices were installed at 185 crossings. Of these crossings, 228 were eliminated with Public Works funds, 66 with Works Program funds, and 6 with Federal-aid funds. At the end of the year, work under contract, consisting of 1,240 crossing eliminations, 168 elimination structures being reconstructed, and 793 crossings being protected, represented by far the greatest activity to make highways safer in the history of the country. Eleven hundred and eighty-three of the 1,240 crossings being eliminated were financed with Works Program grade-crossing funds. Table 13 shows details of the above work by States and also the number of projects approved but not contracted for at the end of the year.

At the end of the year \$3,219,291 of Works Program grade-crossing funds had been expended on completed projects, \$109,094,302 had been assigned to work under contract, \$21,587,396 to projects approved but not then under contract, and \$62,099,012 remained available for new work. Tables 6 to 9, inclusive, show the assignment of funds to the three classes of work, and tables 10 to 12, inclusive, show the corresponding number of crossings to be eliminated.

SUMMARY

The year's work with the funds apportioned to all States resulted in the completion of 13,790 miles of highway and the elimination of 300 railroad-highway grade crossings at a cost of \$213,747,987 in Federal funds and \$31,274,692 in State funds. The types of highway completed are shown in table 14.

The completed work was divided as follows: 7,356 miles on the Federal-aid system outside of municipalities but including improvements with Federal-aid funds in municipalities, 755 miles of extensions of the system into and through cities, and 5,679 miles of secondary and feeder roads. Federal funds involved in the completed work on the Federal-aid system outside of municipalities were \$107,572,926, on extensions of the Federal-aid system into and through municipalities \$46,385,602, and on secondary and feeder roads \$59,789,459.

The roads under contract at the end of the year totaled 16,709 miles and involved \$349,502,946 of Federal funds, and there were 2,210 miles approved but not yet contracted for, involving \$52,368,113 of Federal funds. Tables 15 and 16, respectively, show the types of road under contract and the types approved but not yet under contract.

TABLE 6.—Funds allotted to projects completed during the fiscal year ended June 30, 1936

ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES¹

State	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program		Total Federal funds	State funds	Estimated total cost
				Highways	Grade crossings			
Alabama.....	\$398,865	\$1,931,168				\$2,330,033	\$57,740	\$2,387,773
Arizona.....		923,677	\$784,504	\$1,382		1,709,563	480,589	2,190,152
Arkansas.....	285,777	1,974,266		462,011	\$293,229	3,015,283	8,396	3,023,679
California.....		3,110,633	326,945	17,600		3,484,353	1,668,893	5,153,246
Colorado.....	36,500	867,052	877,141	156,363	168,864	2,105,920	827,103	2,933,023
Connecticut.....	307,533	1,035,095		3,995		1,346,623	4,180	1,350,803
Delaware.....		153,256				153,256		153,256
Florida.....	37,546	867,541	259,142		15,489	1,179,718	353,407	1,533,125
Georgia.....	35,000	1,588,756	78,812			1,702,568	159,244	1,861,812
Idaho.....	55,877	900,218	270,544	52,823		1,279,462	358,543	1,638,005
Illinois.....	228,712	3,248,496	347,531	323,602		4,148,341	865,409	5,013,750
Indiana.....	454,324	3,277,912	808,060	102,998		4,643,294	1,469,838	6,113,132
Iowa.....		1,941,043	187,819	18,350	7,000	2,154,212	412,622	2,566,834
Kansas.....		1,591,654	184,096	177,168		1,952,918	222,222	2,175,140
Kentucky.....	17,897	1,226,791	549,480	9,919		1,804,087	706,022	2,510,109
Louisiana.....		1,222,923	308,193			1,531,116	472,189	2,003,305
Maine.....		768,629	190,653	17,077		975,759	208,749	1,184,508
Maryland.....		654,343				654,343	34,674	689,017
Massachusetts.....	51,821	1,130,539				1,182,360	34,393	1,216,753
Michigan.....	58,064	3,490,910	727,746	419,250	280,950	4,976,920	1,179,370	6,156,290
Minnesota.....		1,283,952	515,029	224,646	96,733	2,120,360	585,214	2,705,574
Mississippi.....	691,859	2,239,026		46,143		2,977,028	138,355	3,115,383
Missouri.....	73,163	2,754,810	686,250	36,366		3,550,589	843,778	4,394,367
Montana.....	73,522	647,715	536,149	39,913	115,402	1,412,701	472,306	1,885,007
Nebraska.....		1,642,741	545,181	44,866		2,381,289	605,578	2,986,867
Nevada.....		894,374	588,620	404,075	140,085	2,027,154	138,911	2,166,065
New Hampshire.....	17,137	589,604	77,485			684,226	106,714	790,940
New Jersey.....	12,677	1,572,053	43,962			1,628,692	73,404	1,702,096
New Mexico.....		896,826	426,512	323,460	203,329	1,850,127	295,852	2,145,979
New York.....	107,248	4,300,793	27,600	9,600		4,445,241	2,700,091	7,154,332
North Carolina.....	184,872	1,909,148	268,430	7,053	59,286	2,428,789	276,982	2,705,771
North Dakota.....	587,221	605,589		244,926	32,557	1,470,293	9,165	1,479,458
Ohio.....	142,119	3,109,491		60,990		3,312,300	235,202	3,547,502
Oklahoma.....	238,346	2,158,966	445,863	110,011	207,359	3,160,545	567,137	3,727,682
Oregon.....	9,060	983,851	315,246	17,113		1,325,270	315,067	1,640,337
Pennsylvania.....	30,621	3,984,670	115,640			4,130,931	355,891	4,486,822
Rhode Island.....		559,718				559,718	24,857	584,575
South Carolina.....		098,852		22,382		721,234	53,990	775,224
South Dakota.....	69,373	1,623,815		369,732	51,774	2,114,694	16,713	2,131,407
Tennessee.....		1,540,906	276,938	15,078		1,832,922	349,701	2,182,623
Texas.....	162,614	5,701,473	2,484,703	589,451	168,749	9,106,990	2,727,687	11,834,677
Utah.....	53,499	397,767	278,469	109,452	29,757	868,944	247,983	1,116,927
Vermont.....		367,634	53,194	24,864	72,161	517,853	119,306	637,159
Virginia.....	224,874	1,610,901	58,309	30,253	20,824	1,945,161	123,956	2,069,117
Washington.....		1,433,202	452,791	65,868	77,705	2,029,566	502,934	2,532,500
West Virginia.....		700,676	43,581			744,257	95,691	839,948
Wisconsin.....		1,890,362	308,135	23,444		2,221,941	434,347	2,656,288
Wyoming.....	25,600	1,304,855	979,363		55,365	2,365,183	608,792	2,973,975
Hawaii.....	183,588	1,125,211				1,308,799	53,448	1,362,247
Total.....	4,855,309	30,433,283	15,428,116	4,581,924	2,274,294	107,572,926	22,611,635	130,184,561

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 6.—Funds allotted to projects completed during the fiscal year ended June 30, 1936—Continued

ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES¹

State	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program		Total Federal funds	State funds	Estimated total cost
				Highways	Grade crossings			
Alabama		\$983,960				\$983,960	\$47,666	\$1,031,626
Arizona		375,577		\$360,309		735,886	89,236	825,122
Arkansas		907,280		170,996		1,078,276	3,605	1,081,881
California		2,245,953			\$48,675	2,294,628	404,974	2,699,602
Colorado		141,031		274,076		415,107	14	274,076
Connecticut	\$51,171	38,571				192,202	1,933	192,216
Delaware		180,337				180,337	26,917	207,254
Florida		729,765		49,637		786,389	55,440	841,829
Georgia	6,987	168,274		31,087		199,361	8,004	207,365
Illinois		2,089,769		16,526		2,106,295	100,302	2,206,597
Indiana		2,663,746		16,891		2,680,637	115,954	2,796,591
Iowa		1,439,628		21,700		1,461,328	68,111	1,529,439
Kansas		1,308,206		70,389		1,378,595	5,783	1,384,378
Kentucky		814,386		37,864		852,250	78,592	930,842
Louisiana	41,954	1,503,042				1,544,996	14,156	1,559,152
Maine		572,190				572,190	19,007	591,197
Maryland		415,016				415,016	819,185	1,234,201
Massachusetts	24,976	1,188,106				1,213,082	59,368	1,272,450
Michigan		1,751,900		58,250		1,810,150	246,052	2,056,202
Minnesota		625,831		14,307		640,138	91,545	731,683
Mississippi	18,957	858,299		21,889		899,145	47,023	946,168
Missouri		675,955		8,056		684,011	26,684	710,695
Montana	27,292	98,542		24,594		150,428	5,601	156,029
Nebraska		488,423				488,423	15,161	503,584
Nevada		5,785		52,228	45,668	103,681	10,455	114,136
New Hampshire		146,910				146,910	1,040	147,950
New Jersey	19,000	575,330				594,330	117,724	712,054
New Mexico		327,362		142,433		469,795	19,544	489,339
New York		3,221,600		300,733		3,522,333	285,266	3,807,599
North Carolina	30,578	790,376		38,018		858,972	1,511	860,483
North Dakota		630,477		1,382	6,778	638,637	9,423	648,060
Ohio	6,030	1,810,260		85,230		1,901,520	175,788	2,077,308
Oklahoma		936,122		6,004		942,126	125,202	1,067,328
Oregon		620,711				620,711	42,611	663,322
Pennsylvania		1,526,383		1,852		1,528,235	157,922	1,686,157
Rhode Island		127,841		8,750		136,591	448	137,039
South Carolina	13,051	524,469		47,194		584,714	24,574	609,288
South Dakota		562,986		3,024		566,010	4,645	570,655
Tennessee		1,257,585		201,058		1,458,643	23,443	1,482,086
Texas	20,000	2,573,368		322,767	57,637	2,973,772	237,688	3,211,460
Utah		632,814		133,085		765,899	114,079	879,978
Vermont		198,585				198,585	18,554	217,139
Virginia	31,651	1,286,822		80,719	39,971	1,439,163	246,014	1,685,177
Washington		461,715		204,515		666,230	10,385	676,615
West Virginia		349,096				349,096	44,209	393,305
Wisconsin		1,358,221		103,165		1,461,386	71,433	1,532,819
Wyoming		169,462		56,247		225,709	1,052	226,761
District of Columbia		289,623		282,556		572,184		572,184
Total	291,647	42,647,695		3,247,531	198,729	46,385,602	4,093,323	50,478,925

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 6.—Funds allotted to projects completed during the fiscal year ended June 30, 1936—Continued

ON SECONDARY OR FEEDER ROADS

State	Federal aid, 1917-33	Public Works, 1931-35	Federal aid, 1936-37	Works Program		Total Federal funds	State funds	Estimated total cost
				Highways	Grade crossings			
Alabama		\$1, 279, 392			\$9, 124	\$1, 288, 516	\$41, 807	\$1, 330, 323
Arizona		782, 731		\$565, 340	47, 413	1, 395, 484	145, 714	1, 541, 198
Arkansas		1, 120, 673		23, 887	50, 980	1, 195, 540	11, 874	1, 207, 414
California		2, 332, 691		593, 357	96, 017	3, 022, 065	418, 341	3, 440, 406
Colorado		707, 376		244, 532		951, 908	110, 270	1, 062, 178
Connecticut		695, 327				695, 327	1, 288	696, 615
Delaware		291, 210				291, 210	10, 170	301, 380
Florida		629, 639		63, 820		693, 459	71, 473	764, 932
Georgia		1, 095, 240				1, 095, 240	27, 255	1, 122, 495
Idaho		610, 652				610, 652	45, 380	656, 032
Illinois		5, 891, 197		270, 842		6, 162, 039	154, 492	6, 316, 531
Indiana		285, 227		14, 000		299, 227	49, 520	348, 747
Iowa		1, 678, 658		122, 400		1, 801, 058	68, 038	1, 869, 096
Kansas		1, 448, 977		36, 562		1, 485, 539	7, 638	1, 493, 177
Kentucky		1, 211, 087		189, 597	15, 230	1, 415, 974	148, 572	1, 564, 546
Louisiana		994, 263				994, 263	16, 657	1, 010, 920
Maine		125, 809		102, 673		228, 482	71, 199	299, 681
Maryland		445, 266				445, 266	69, 473	514, 739
Massachusetts		909, 327				909, 327	5, 189	914, 516
Michigan		1, 067, 209			166, 450	1, 233, 659	159, 441	1, 393, 100
Minnesota		1, 028, 633		337, 127	57, 535	1, 423, 295	358, 327	1, 781, 622
Mississippi		1, 533, 762		40, 890		574, 652	6, 174	580, 826
Missouri		2, 126, 548		1, 019, 037		3, 145, 535	73, 615	3, 219, 200
Montana		535, 534		498, 597	106, 940	1, 141, 071	20, 354	1, 161, 425
Nebraska		329, 155				329, 155	18, 958	348, 113
Nevada		284, 252		488, 732		772, 984	138, 388	911, 372
New Hampshire		141, 906		15, 547		157, 453	11, 974	169, 427
New Jersey		107, 525				107, 525		107, 525
New Mexico		509, 921		258, 456		768, 377	39, 086	807, 463
New York		3, 879, 189		93, 500		3, 972, 689	663, 974	4, 636, 663
North Carolina		1, 325, 447		164, 428	10, 268	1, 500, 143	2, 700	1, 502, 843
North Dakota		761, 351				761, 351	6, 411	767, 762
Ohio		1, 390, 615		35, 610		1, 336, 225	60, 480	1, 396, 705
Oklahoma		814, 973		33, 059	12, 407	860, 439	267, 208	1, 127, 647
Oregon		348, 980				348, 980	124, 232	473, 212
Pennsylvania		2, 660, 334		118, 685	10, 836	2, 789, 905	272, 861	3, 062, 766
Rhode Island		313, 555		7, 184		320, 739	30, 117	350, 856
South Carolina		1, 133, 287				1, 133, 287	63, 621	1, 196, 908
South Dakota		771, 972		9, 050		781, 022	8, 008	789, 030
Tennessee		965, 498		14, 157		979, 655	80, 740	1, 060, 395
Texas		2, 854, 933		687, 553		3, 542, 486	200, 359	3, 742, 845
Utah		367, 661		187, 571		555, 232	179, 174	734, 406
Vermont		198, 552		111, 867	50, 711	361, 130	74, 794	435, 924
Virginia		696, 628		447, 645	43, 146	1, 187, 419	1, 322	1, 188, 741
Washington		583, 670		172, 239		755, 909	25, 504	781, 413
West Virginia		512, 496				512, 496	14, 252	526, 748
Wisconsin		1, 861, 092		130, 661	69, 151	2, 030, 904	185, 722	2, 246, 626
Wyoming		491, 292				491, 292	607	491, 899
District of Columbia		441, 904			318, 053	759, 957	135	760, 092
Hawaii		143, 867				143, 867	6, 846	150, 713
Total		51, 626, 533		7, 416, 658	746, 268	59, 789, 459	4, 569, 734	64, 359, 193

TABLE 6.—Funds allotted to projects completed during the fiscal year ended June 30, 1936—Continued

State	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program		Total Federal funds	State funds	Estimated total cost
				Highways	Grade crossings			
Alabama	\$398,865	\$4,194,520			\$9,124	\$4,602,509	\$147,213	\$4,749,722
Arizona		2,081,984	\$784,505	\$927,031	47,413	3,840,933	715,539	4,556,472
Arkansas	285,776	4,002,219		656,894	344,210	5,289,099	23,875	5,312,974
California		7,689,276	326,945	610,958	173,867	8,801,046	2,492,208	11,293,254
Colorado	36,500	1,574,428	877,140	674,972	168,864	3,331,904	937,373	4,269,277
Connecticut	358,705	1,871,452		3,995		2,234,152	5,482	2,239,634
Delaware		483,037				483,037	12,103	495,140
Florida	37,546	1,677,516	259,142	63,821	15,489	2,053,514	451,797	2,505,311
Georgia	41,988	3,413,760	78,812	49,637		3,584,197	241,939	3,826,136
Idaho	55,877	1,679,144	270,544	83,910		2,089,475	411,927	2,501,402
Illinois	228,712	11,229,462	347,531	610,970		12,416,675	1,120,203	13,536,878
Indiana	454,324	6,226,885	808,060	133,889		7,623,158	1,635,312	9,258,470
Iowa		5,059,329	187,819	162,450	7,000	5,416,598	548,771	5,965,369
Kansas		4,348,837	184,096	284,119		4,817,052	235,643	5,052,695
Kentucky	17,897	3,252,264	549,480	237,380	15,290	4,072,311	933,186	5,005,497
Louisiana	41,953	3,720,229	308,193			4,070,375	503,002	4,573,377
Maine		1,466,028	190,654	119,749		1,776,431	298,955	2,075,386
Maryland		1,514,625				1,514,625	923,332	2,437,957
Massachusetts	76,798	3,227,971				3,304,769	98,950	3,403,719
Michigan	58,064	6,310,020	727,745	477,500	447,400	8,020,729	1,584,863	9,605,592
Minnesota		2,938,415	515,029	576,080	154,269	4,183,793	1,035,086	5,218,879
Mississippi	710,816	3,631,088		108,921		4,450,825	191,552	4,642,377
Missouri	73,163	5,557,314	686,250	1,063,458		7,380,185	944,077	8,324,262
Montana	100,813	1,281,792	536,149	563,103	222,343	2,704,200	498,261	3,202,461
Nebraska		2,460,319	545,181	44,866	148,501	3,198,867	639,697	3,838,564
Nevada		1,184,411	588,620	945,035	185,753	2,903,819	287,754	3,191,573
New Hampshire	17,137	878,420	77,485	15,547		988,589	119,728	1,108,317
New Jersey	31,677	2,254,908	43,962			2,330,547	191,128	2,521,675
New Mexico		1,734,109	426,512	724,349	203,329	3,088,299	354,482	3,442,781
New York	107,248	11,401,582	27,600	403,833		11,940,263	3,658,331	15,598,594
North Carolina	215,449	4,024,971	268,430	209,500	69,554	4,787,904	281,193	5,069,097
North Dakota	587,221	1,997,418		246,308	39,334	2,870,281	24,999	2,895,280
Ohio	148,149	6,220,366		181,530		6,550,045	471,470	7,021,515
Oklahoma	238,346	3,910,061	445,863	149,074	219,766	4,963,110	959,547	5,922,657
Oregon	9,060	1,953,542	315,246	17,113		2,294,961	481,910	2,776,871
Pennsylvania	30,621	8,171,437	115,639	120,538	10,836	8,449,071	786,674	9,235,745
Rhode Island		1,001,114		15,934		1,017,048	55,422	1,072,470
South Carolina	13,051	2,356,608		69,576		2,439,235	142,185	2,581,420
South Dakota	69,373	2,958,773		381,806	51,774	3,461,726	29,366	3,491,092
Tennessee		3,763,989	276,938	230,293		4,271,220	453,884	4,725,104
Texas	182,614	11,129,775	2,484,703	1,599,770	226,386	15,623,248	3,165,734	18,788,982
Utah	53,499	1,398,242	278,469	430,108	29,757	2,190,075	544,236	2,734,311
Vermont		764,771	53,195	136,731	122,871	1,077,568	212,654	1,290,222
Virginia	256,526	3,594,351	58,309	558,617	103,940	4,571,743	371,292	4,943,035
Washington		2,478,587	452,791	442,622	77,705	3,451,705	538,823	3,990,528
West Virginia		1,562,268	43,581			1,605,849	154,152	1,760,001
Wisconsin		5,109,675	308,135	257,270	69,151	5,744,231	691,502	6,435,733
Wyoming	25,600	1,965,609	979,363	56,247	55,365	3,082,184	610,451	3,692,635
District of Columbia		731,532		600,609		1,332,141	135	1,332,276
Hawaii	183,588	1,269,078				1,452,666	60,294	1,512,960
Total	5,146,956	174,707,511	15,428,116	15,246,113	3,219,291	213,747,987	31,274,692	245,022,679

TABLE 7.—Funds allotted to projects under contract on June 30, 1936¹

ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES²

State	Federal funds					Total Federal funds	State funds	Estimated total cost
	Federal aid 1917-33	Public Works 1934-35	Federal aid, 1936-37	Works Program				
				Highways	Grade crossings			
Alabama		\$547,074	\$39,065	\$1,465,612	\$394,833	\$2,446,584	\$39,065	\$2,485,649
Arizona		8,577	835,595	623,214	514,499	1,981,885	582,643	2,564,528
Arkansas		151,845		982,135	834,893	1,968,873	4,623	1,973,496
California		157,401	4,280,965	721,384	2,253,756	7,413,506	3,376,880	10,790,386
Colorado		6,500	941,106	50,929	885,797	1,884,332	767,651	2,651,983
Connecticut			536,272	143,827	78,774	758,873	551,236	1,310,109
Delaware			219,874	256,726		476,600	219,874	696,474
Florida	\$30,435	197,995	287,221	500,010	1,045,977	2,061,638	319,966	2,381,604
Georgia	48,023	1,156,975	685,131	60,850	178,941	2,129,920	746,179	2,876,099
Idaho	3,207	40,978	989,899	445,604	641,597	2,121,285	691,330	2,812,615
Illinois	67,124	978,969	3,634,812	2,225,641	2,448,956	9,355,502	3,834,219	13,189,721
Indiana	32,852	731,994	2,144,121	645,939	1,650,450	5,205,356	2,294,017	7,499,373
Iowa			3,036,480	965,720	1,394,600	5,396,800	3,507,577	8,904,377
Kansas		14,140	3,078,506	1,957,583	3,006,687	8,056,916	3,527,166	11,584,082
Kentucky		128,024	842,337	31,020	99,930	1,101,311	899,061	2,000,372
Louisiana	256,602	342,764	1,176,361	541,465	1,208,831	3,526,023	1,549,289	5,075,312
Maine		7,234	759,974	108,603	563,504	1,439,315	761,002	2,200,317
Maryland		530,776		134,754		665,530	29,320	694,850
Massachusetts		403,123	166,968	67,272	600,866	1,238,239	166,968	1,405,197
Michigan		673,622	2,831,209	2,509,771	2,583,127	8,597,729	2,920,587	11,518,316
Minnesota		154,605	2,732,599	571,503	1,330,769	4,789,476	3,241,198	8,030,674
Mississippi	41,862	1,044,332		1,413,567	1,517,974	4,017,735	2,903	4,020,638
Missouri		1,037,085	2,791,475	206,828	1,231,729	5,267,117	2,802,967	8,070,084
Montana		504,442	1,828,509	1,109,303	1,485,437	4,927,691	1,498,391	6,426,082
Nebraska		227,797	1,008,565	1,390,969	1,436,639	4,064,020	1,135,671	5,199,691
Nevada		26,187	750,155	47,480	133,651	957,473	116,376	1,073,849
New Hampshire			290,355	52,959	246,878	590,192	300,338	890,530
New Jersey		186,222	1,015,111	538,128	383,662	2,123,123	1,089,696	3,212,819
New Mexico		5,851	1,530,886	549,646	315,334	2,401,717	966,888	3,368,605
New York		320,246	5,821,457	1,384,554	3,063,090	10,589,347	6,603,350	17,192,697
North Carolina		382,137	1,516,461	1,078,174	454,935	3,431,707	1,547,439	4,979,146
North Dakota	53,009	430,146	101,206	768,008	596,023	1,948,392	87,169	2,035,561
Ohio		486,416	2,985,186	1,383,411	586,498	5,441,511	3,420,102	8,861,613
Oklahoma	215,208	180,789	1,121,628	1,307,632	1,201,132	4,026,389	1,407,313	5,433,702
Oregon		231,024	1,646,855	971,625	840,274	3,689,778	1,271,392	4,961,170
Pennsylvania		327,711	3,876,511	366,461	1,220,868	5,791,551	4,050,077	9,841,628
Rhode Island				482,975	234,622	717,597		717,597
South Carolina		413,046	41,094	284,344	864,915	1,603,399	76,585	1,679,987
South Dakota		190,890	723,959	851,014	787,781	2,553,644	543,336	3,096,980
Tennessee	14,300	290,661	570,776	808,103	314,055	1,997,895	652,275	2,650,170
Texas	52,969	500,727	4,439,198	3,439,656	3,400,079	11,732,629	5,079,622	16,812,251
Utah		108,441	1,009,301	223,514	362,512	1,703,768	434,152	2,137,920
Vermont		78,182	544,670	166,057	273,161	1,062,070	576,133	1,638,203
Virginia		63,023	1,142,467	267,503	745,534	2,218,527	1,147,176	3,365,703
Washington		116,190	1,220,949	994,657	609,654	2,941,450	1,110,436	4,051,886
West Virginia		213,440	447,330	416,002	338,306	1,415,078	447,956	1,863,034
Wisconsin		249,046	2,446,469	1,331,670	949,038	4,976,223	2,758,421	7,734,644
Wyoming		52,262	555,380	948,862	227,279	1,783,783	379,718	2,163,501
Hawaii		616,502	230,513	405,189	257,091	1,509,295	315,717	1,825,012
Total	815,591	14,515,391	68,874,961	38,097,853	45,794,988	168,098,734	69,851,453	237,950,237

¹ Most of these projects were under construction.

² For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 7.—Funds allotted to projects under contract on June 30, 1936—Continued
ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES²

State	Federal funds					State funds	Estimated total cost	
	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
				Highways	Grade crossings			
Alabama		\$722,873		\$1,116,423	\$1,821,480	\$3,660,776	\$3,660,776	
Arizona		24,299		161,148	226,049	411,496	537,401	
Arkansas		81,611		442,711	255,837	780,159	781,310	
California		197,215		768,424	1,285,750	2,251,389	3,337,674	
Colorado				473,977	241,916	715,893	715,893	
Connecticut		276,107		36,806		312,913	326,235	
Delaware		88,530				88,530	88,530	
Florida		144,389		787,799	347,772	1,279,960	1,304,275	
Georgia		356,227		13,701		369,928	369,928	
Idaho		219,475		235,574	220,403	675,452	689,327	
Illinois		1,537,990		1,213,700	1,466,135	4,217,825	4,243,605	
Indiana		989,914		1,462,082	1,804,721	4,256,717	4,532,867	
Iowa		339,941		868,036	932,875	2,140,852	2,237,284	
Kansas		68,553		876,466	1,920,885	2,865,904	2,890,516	
Kentucky		627,411		347,456	905,413	1,880,280	1,882,868	
Louisiana		120,137			168,364	288,501	288,501	
Maine				83,940		83,940	83,940	
Maryland		187,101			48,474	235,575	247,426	
Massachusetts		2,298,027			207,520	2,505,547	2,505,547	
Michigan		78,800		1,126,700	781,725	1,987,225	1,987,225	
Minnesota		771,619		551,076	737,899	2,060,594	2,092,023	
Mississippi	\$27,104	184,491		771,004	203,378	1,185,977	1,186,496	
Missouri		1,331,916		629,366	2,188,914	4,150,196	4,294,523	
Montana		40,949		354,793	437,319	833,061	833,061	
Nebraska		197,074		469,242	314,258	980,574	987,747	
Nevada		70,741			62,564	133,305	133,305	
New Hampshire				91,478		91,478	91,952	
New Jersey		1,269,647		1,565,649		2,835,296	2,959,051	
New Mexico		27,858		417,269	431,935	877,062	877,062	
New York		1,291,546		3,955,151	2,365,290	7,611,987	8,015,520	
North Carolina		54,629		375,179	738,707	1,168,515	1,201,104	
North Dakota		156,011		17,374	258,505	431,890	431,890	
Ohio		405,671		866,438	278,800	1,550,909	1,647,499	
Oklahoma		132,517		26,679	202,270	361,466	361,466	
Oregon		89,505		567,200	902,617	1,559,322	1,788,104	
Pennsylvania		519,616		47,778	1,313,915	1,881,309	1,916,234	
Rhode Island		139,983		65,542	236,879	442,404	442,404	
South Carolina		52,730		219,181	186,578	458,489	462,532	
South Dakota		472,031		460,852	5,821	938,704	938,734	
Tennessee		334,863		399,619	98,775	833,257	833,257	
Texas		585,705		2,127,871	1,794,699	4,508,275	4,827,503	
Utah		300		242,822	128,441	371,568	371,604	
Vermont		23,021		152,070	2,534	177,625	208,913	
Virginia		17,523		162,840	425,663	606,026	691,087	
Washington				250,580	33,449	284,029	284,979	
West Virginia	10,611	432,490		251,258		694,359	730,848	
Wisconsin		16,257		1,001,633	69,095	1,086,985	1,163,503	
Wyoming		5,780		368,727	97,732	472,239	472,247	
District of Columbia								
Hawaii		84,699		216,234		300,933	371,409	
				216,992	71,666	288,658	291,389	
Total	37,715	17,067,772		26,856,840	26,223,022	70,185,349	73,618,574	

² For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 7.—Funds allotted to projects under contract on June 30, 1936—Continued
ON SECONDARY OR FEEDER ROADS

State	Federal funds						State funds	Estimated total cost
	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works		Total Federal funds		
				Highways	Program Grade crossings			
Alabama		\$239,903		\$804,218	\$1,067,538	\$2,111,659		\$2,111,659
Arizona		12,500		637,497	185,186	855,183	\$139,296	974,479
Arkansas		12,050		869,946	380,941	1,262,937	17,291	1,280,228
California		64,221		4,264,520	3,451,940	7,780,681	198,974	7,979,655
Colorado				823,655	198,052	1,021,707		1,021,707
Connecticut		177,598		148,986		326,584	27,146	353,730
Delaware				232,006		232,006		232,006
Florida		95,349		775,666	239,135	1,110,150	24,605	1,134,755
Georgia		435,727		531,393	87,011	1,054,131	19,182	1,073,313
Idaho		166,470		1,153,295	165,849	1,485,614	127,157	1,612,771
Illinois		788,083		3,492,928	2,039,694	6,320,705	56,100	6,376,805
Indiana		174,742		2,594,231	1,568,156	4,337,129	318,785	4,655,914
Iowa		37,700		1,596,240	1,019,250	2,653,190	111,135	2,764,325
Kansas		145,910		1,767,487	318,656	2,232,083	20,480	2,252,563
Kentucky		168,668		2,022,868	1,172,664	3,364,200	305,036	3,669,236
Louisiana		113,216		1,558,294	453,264	2,124,774	210,367	2,335,141
Maine				1,217,446	107,371	1,324,817	547	1,325,364
Maryland		338,140		172,131	660,904	1,171,175	10,544	1,181,719
Massachusetts				50,482	647,100	697,582		697,582
Michigan		860,950		1,924,670	1,816,550	4,602,170	78,580	4,680,750
Minnesota				2,701,706	996,373	3,698,079	644,603	4,342,682
Mississippi		328,305		663,319	235,203	1,226,827		1,226,827
Missouri		235,368		2,971,382	1,455,460	4,662,210	92,270	4,754,480
Montana		103,501		1,595,139	455,677	2,154,317	25,957	2,180,274
Nebraska		153,785		997,216	256,526	1,407,527	72,903	1,480,430
Nevada		214,263		769,359	301,704	1,285,326	49,820	1,335,146
New Hampshire				286,494	118,053	404,547	13,547	418,094
New Jersey		213,355		28,807	914,767	1,156,929	613	1,157,542
New Mexico				509,450	535,277	1,044,727		1,044,727
New York		398,200		4,307,120	4,248,528	8,953,848	45,796	8,999,644
North Carolina		93,720		1,763,203	539,086	2,396,009		2,396,009
North Dakota		325,147		182,097	199,126	706,370	162	706,532
Ohio		591,364		1,960,030	574,609	3,126,003	33,475	3,159,478
Oklahoma		426,873		1,708,571	796,254	2,931,698	4,189	2,935,887
Oregon		70,780		1,122,732	458,310	1,651,822	14,814	1,666,636
Pennsylvania		645,623		1,548,199	1,529,181	3,723,003	158,814	3,881,817
Rhode Island				422,894	182,507	605,401		605,401
South Carolina		289,766		1,168,577	279,065	1,737,408	33,429	1,770,837
South Dakota		115,328		420,924	102,321	638,573		638,573
Tennessee		332,550		1,071,041	215,150	1,618,741		1,618,741
Texas		326,610		4,486,564	3,381,809	8,194,953	447,054	8,642,037
Utah		49,853		641,571	106,071	797,495	93,537	891,032
Vermont				425,033	74,872	499,905	83,841	583,746
Virginia		267,738		1,722,513	95,912	2,086,163	26,339	2,112,502
Washington				931,477	1,307,360	2,238,837	256,733	2,495,570
West Virginia		426,737		674,862	108,154	1,209,753	31,437	1,241,190
Wisconsin		103,933		2,032,633	1,734,059	3,870,625	335,878	4,206,503
Wyoming				538,465		538,465	7	538,472
District of Columbia								
Hawaii		207,003		102,155	170,643	272,798	24,030	296,828
					124,944	331,947	870	332,817
Total		9,751,029		64,391,492	37,076,292	111,218,813	4,155,343	115,374,156

TABLE 7.—Funds allotted to projects under contract on June 30, 1936—Continued

State	Federal funds					State funds	Estimated total cost	
	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
				Highways	Grade crossings			
Alabama.....		\$1,509,850	\$39,065	\$3,386,253	\$3,283,851	\$8,219,019	\$39,065	\$8,258,084
Arizona.....		45,376	835,595	1,421,859	925,734	3,228,564	847,844	4,076,408
Arkansas.....		245,507		2,294,791	1,471,671	4,011,969	23,065	4,035,034
California.....		418,836	4,280,965	5,754,328	6,991,447	17,445,576	4,662,139	22,107,715
Colorado.....		6,500	941,106	1,348,561	1,325,765	3,621,932	767,651	4,389,583
Connecticut.....		453,705	536,272	329,619	78,774	1,398,370	591,704	1,990,074
Delaware.....		88,530	219,874	488,732		797,136	219,874	1,017,010
Florida.....	\$30,435	437,733	287,221	2,063,475	1,632,884	4,451,748	368,886	4,820,634
Georgia.....	48,023	1,948,928	685,131	605,945	265,952	3,553,979	765,361	4,319,340
Idaho.....	3,207	426,923	989,899	1,834,473	1,027,849	4,282,351	832,362	5,114,713
Illinois.....	67,124	3,305,042	3,634,812	6,932,268	5,954,786	19,894,032	3,916,099	23,810,131
Indiana.....	32,852	1,896,650	2,144,121	4,702,252	5,023,327	13,799,202	2,888,952	16,688,154
Iowa.....		377,641	3,036,480	3,429,996	3,346,725	10,190,842	3,715,141	13,905,986
Kansas.....		228,603	3,078,506	4,601,536	5,246,258	13,154,903	3,572,258	16,727,161
Kentucky.....		924,104	842,337	2,401,344	2,178,006	6,345,791	1,206,685	7,552,476
Louisiana.....	256,602	576,117	1,176,361	2,099,759	1,830,459	5,939,298	1,759,656	7,698,954
Maine.....		7,234	759,974	1,409,988	670,876	2,848,072	761,549	3,609,621
Maryland.....		1,056,017		306,885	709,378	2,072,280	51,715	2,123,995
Massachusetts.....		2,701,150	166,968	117,754	1,455,486	4,441,358	166,968	4,608,326
Michigan.....		1,613,372	2,831,209	5,561,141	5,181,402	15,187,124	2,999,167	18,186,291
Minnesota.....		926,224	2,732,599	3,824,284	3,065,042	10,548,149	3,917,230	14,465,379
Mississippi.....	68,966	1,557,128		2,847,891	1,956,554	6,430,539	3,422	6,433,961
Missouri.....		2,604,369	2,791,475	3,807,576	4,876,103	14,079,523	3,039,564	17,119,087
Montana.....		648,892	1,828,509	3,059,235	2,378,433	7,915,069	1,524,348	9,439,417
Nebraska.....		578,656	1,008,565	2,857,428	2,007,472	6,452,121	1,215,747	7,667,868
Nevada.....		311,191	750,155	816,839	497,919	2,376,104	166,196	2,542,300
New Hampshire.....			290,355	430,931	364,931	1,086,217	314,359	1,400,576
New Jersey.....	1,669,223	1,015,111	2,132,584	1,298,430	6,115,348	1,214,064	7,329,412	
New Mexico.....		33,710	1,530,886	1,476,304	1,282,546	4,323,506	966,888	5,290,394
New York.....	2,009,992	5,821,457	9,646,825	9,676,908	27,155,182	7,052,679	34,207,861	
North Carolina.....		530,485	1,516,461	3,216,556	1,732,729	6,996,231	1,580,028	8,576,259
North Dakota.....	53,009	911,303	101,206	967,479	1,053,655	3,086,652	87,331	3,173,983
Ohio.....		1,483,451	2,985,186	4,209,879	1,439,907	10,118,423	3,550,167	13,668,590
Oklahoma.....	215,208	740,178	1,121,628	3,042,882	2,199,657	7,319,553	1,411,502	8,731,055
Oregon.....		391,309	1,646,855	2,661,557	2,201,201	6,900,922	1,514,988	8,415,910
Pennsylvania.....		1,492,952	3,876,511	1,962,437	4,063,963	11,395,863	4,243,816	15,639,679
Rhode Island.....		139,983		971,411	654,008	1,765,402		1,765,402
South Carolina.....		755,542	41,094	1,672,102	1,330,558	3,799,296	114,060	3,913,356
South Dakota.....		778,249	723,959	1,732,790	895,923	4,130,921	543,366	4,674,287
Tennessee.....	14,300	958,074	570,776	2,278,763	627,980	4,449,893	652,275	5,102,168
Texas.....	52,969	1,413,043	4,439,198	9,954,091	8,576,586	24,435,887	5,845,904	30,281,791
Utah.....		158,594	1,009,301	1,107,907	597,024	2,872,826	527,730	3,400,556
Vermont.....		101,203	544,670	743,161	350,566	1,739,690	691,262	2,430,862
Virginia.....		348,285	1,142,467	2,152,856	1,267,108	4,910,716	1,258,576	6,169,292
Washington.....		116,190	4,220,949	2,176,715	1,950,462	5,464,316	1,368,119	6,832,435
West Virginia.....	10,611	1,072,666	447,330	1,342,123	446,460	3,319,190	515,882	3,835,072
Wisconsin.....		369,236	2,446,469	4,365,936	2,752,192	9,933,833	3,170,817	13,104,650
Wyoming.....		58,042	555,380	1,856,054	325,011	2,794,487	379,733	3,174,220
District of Columbia.....		84,699		318,389	170,643	573,731	94,506	668,237
Hawaii.....		823,505	230,513	622,181	453,701	2,129,900	319,318	2,449,218
Total.....	853,306	41,334,192	68,874,961	129,346,185	109,094,302	349,502,946	77,440,021	426,942,967

TABLE S.—Funds allotted to projects approved but not under contract on June 30, 1936

ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES¹

State	Federal funds				State funds	Estimated total cost	
	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
			Highways	Grade crossings			
Alabama.....	\$13,769		\$67,614		\$81,383	\$81,383	
Arizona.....			52,649		52,649	135,940	
Arkansas.....				\$254,901	254,901	255,566	
California.....		\$222,458	582,362		804,820	1,031,500	
Colorado.....		95,335			95,335	170,242	
Connecticut.....		5,915	24,424	79,676	110,015	115,931	
Delaware.....		29,551			29,551	59,102	
Florida.....	15,955		26,053	153,842	195,850	195,850	
Georgia.....	237,538	662,632	53,793	28,288	982,251	1,644,883	
Idaho.....	14,360	134,868			149,228	102,211	
Illinois.....		949,972	17,200	1,161,010	2,128,182	3,152,153	
Indiana.....		83,137			83,137	166,274	
Iowa.....				193,400	193,400	196,580	
Kansas.....		149,459	4,718		154,177	377,222	
Kentucky.....	4,624	359,441	13,231	127,672	504,968	924,084	
Louisiana.....		109,873		220,466	330,339	443,925	
Maine.....	10,573		43,999		54,572	54,572	
Maryland.....		90,615	424,362	407,219	922,196	1,102,450	
Massachusetts.....	12,039	136,723			411,038	136,724	
Michigan.....		3,193,695			3,193,695	6,387,389	
Minnesota.....		28,394	2,095	133,225	163,714	194,107	
Mississippi.....	2,261		10,636		194,396	194,396	
Missouri.....	40,403	230,419		465,786	736,608	231,166	
Montana.....		180,691			180,691	142,030	
Nebraska.....		55,648	77,633	10,743	144,024	55,648	
Nevada.....		228,857			228,857	204,361	
New Hampshire.....		70,736			70,736	141,629	
New Jersey.....	303,277	574,163			877,440	1,943,138	
New York.....	11,000	251,335		297,900	500,235	1,056,129	
North Carolina.....	233,575	327,469	1,440	178,185	740,069	1,112,432	
North Dakota.....	85,765		378,289	166,497	630,551	630,551	
Ohio.....	50,000	524,009		716,773	1,290,782	677,226	
Oklahoma.....		315,321	73,793	659,204	1,048,318	1,333,037	
Oregon.....		55,402			55,402	90,823	
Pennsylvania.....	45,700	573,450	27,043	647,614	1,293,807	2,035,572	
South Carolina.....	20,420	95,574	50,000	34,778	200,772	317,585	
South Dakota.....	11,853	95,331	118,348		225,532	304,066	
Tennessee.....		238,309	290,653	2,830	531,792	770,101	
Texas.....		373,622	19,200	314,682	707,504	1,108,203	
Utah.....		61,316			61,316	90,496	
Vermont.....		6,093	6,696	45,881	58,670	64,839	
Virginia.....		245,981		184,979	430,960	676,940	
Washington.....	11,114	3,300	40,176		54,590	67,248	
West Virginia.....	70,960	300,076	53,517	152,529	577,082	878,157	
Wisconsin.....		451,234			451,234	1,043,616	
Wyoming.....	8,855		69,396		78,251	78,923	
Hawaii.....	13,518				13,518	13,518	
Total.....	1,217,559	11,510,404	2,791,596	6,819,579	22,339,138	35,160,289	

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 8.—Funds allotted to projects approved but not under contract on June 30, 1936—Continued

ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES¹

State	Federal funds				State funds	Estimated total cost	
	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
			Highways	Grade crossings			
Alabama.....				\$147,056		\$147,056	
Arizona.....			\$49,953	49,953		49,953	
Arkansas.....	\$30,148		92,244	575,372	\$2,360	700,124	
Delaware.....	52,205			120,000	27,428	199,633	
Florida.....			27,776	111,392	139,168	139,168	
Georgia.....	87,880				87,880	87,880	
Idaho.....	29,905				29,905	46,758	
Illinois.....			29,913	68,405	98,318	98,318	
Indiana.....	11,877		82,784	58,801	153,462	153,462	
Iowa.....			91,500	997,200	1,088,700	1,092,960	
Kentucky.....	723		101,635		102,358	102,358	
Louisiana.....			260,654	61,051	321,705	358,870	
Maine.....			21,317	77,464	98,781	98,781	
Maryland.....	34,816		150,000		184,816	198,471	
Massachusetts.....	22,336		756,504		778,840	778,840	
Michigan.....				437,600	437,600	437,600	
Minnesota.....				118,827	118,827	118,827	
Mississippi.....	7,560		56,668		64,228	64,228	
Missouri.....			477,427	42,179	519,606	519,606	
Nebraska.....	9,784		25,781	1,054,669	1,090,234	1,090,234	
New Jersey.....			35,212		35,212	35,212	
New York.....				71,370	71,370	71,370	
North Carolina.....	40,000			188,107	228,107	232,692	
North Dakota.....	63,198		370,916	73,033	507,147	507,147	
Ohio.....				279,900	279,900	290,500	
Oklahoma.....	6,249		18,541	275,797	300,587	300,587	
Oregon.....			100,000		100,000	276,051	
Pennsylvania.....	175,044			335,801	510,845	627,745	
South Carolina.....	63,082		30,880		93,962	129,618	
Tennessee.....			58,499	108,285	166,784	166,784	
Texas.....			105,330	193,323	298,653	354,361	
Vermont.....			2,331		2,331	3,445	
Virginia.....	9,848		149,518	180,473	339,839	391,804	
Washington.....				315,070	315,070	315,070	
West Virginia.....	18,854		59,177	169,304	247,335	247,335	
Wisconsin.....	2,668				2,668	2,668	
Total.....	666,177		3,154,560	6,060,479	9,881,216	10,535,516	

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 8.—Funds allotted to projects approved but not under contract on June 30, 1936—Continued

ON SECONDARY OR FEEDER ROADS

State	Federal funds				State funds	Estimated total cost	
	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
			Highways	Grade crossings			
Alabama			\$307,339	\$394,219	\$701,558	\$701,558	
Arkansas			250,949	762,106	1,013,055	1,013,659	
California			626,883		626,883	631,394	
Connecticut			95,025		95,025	107,465	
Delaware			50,454		50,454	50,454	
Florida			135,309	182,687	317,996	317,996	
Georgia			207,500	130,007	337,507	337,507	
Idaho			75,000		75,000	95,758	
Illinois	\$55,756		1,100,091	377,783	1,533,630	1,545,812	
Indiana			137		137	137	
Iowa			475,595	312,600	788,195	819,461	
Kansas			94,359		94,359	94,359	
Kentucky			154,470	11,817	166,287	166,287	
Louisiana	12,263		292,215	272,000	576,478	700,593	
Maine			11,624	217,289	228,913	228,913	
Maryland	167,851		334,463	242,109	744,423	816,424	
Massachusetts				157,562	157,562	157,562	
Michigan			128,800		128,800	128,800	
Minnesota			346,770	51,825	398,595	545,376	
Mississippi	30,583		89,970		120,553	120,553	
Missouri			541,415	743,146	1,284,561	1,284,561	
Montana	2,000				2,000	79,527	
Nebraska	13,399		320,982	203,582	537,963	538,102	
Nevada			168,524		168,524	168,524	
New Hampshire			58,690		58,690	64,728	
New Jersey			35,191	107,505	142,696	142,696	
New Mexico			93,636		93,636	93,636	
New York			76,000	90,900	166,900	166,900	
North Carolina			312,454	33,122	345,576	361,749	
North Dakota	32,787		463,838	367,430	864,055	864,055	
Ohio			1,028,826	906,172	1,934,998	2,071,079	
Oklahoma			383,651	148,759	532,410	532,410	
Oregon			159,892	67,471	227,363	227,963	
Pennsylvania			648,662	182,661	831,323	835,361	
South Carolina			352,738	96,034	448,772	449,515	
South Dakota	19,769		123,051		142,820	142,820	
Tennessee			257,438	237,597	495,035	495,035	
Texas	500		146,485	1,375,311	1,522,296	1,582,783	
Utah	32,292		116,000	100,000	248,292	351,976	
Vermont	2,741				2,741	10,935	
Virginia			376,895	134,083	510,978	512,885	
Washington	2,676		202,256	113,630	318,562	378,185	
West Virginia	9,941		333,348		343,289	343,289	
Wisconsin			74,990	449,315	524,305	524,305	
Wyoming	5,948				5,948	10,835	
District of Columbia				238,616	238,616	253,264	
Total	388,506		11,051,915	8,707,338	20,147,759	21,069,927	

TABLE 8.—Funds allotted to projects approved but not under contract on June 30, 1936—Continued

State	Federal funds				State funds	Estimated total cost	
	Public Works, 1934-35	Federal aid, 1936-37	Works Program				Total Federal funds
			Highways	Grade crossings			
Alabama	\$13,769		\$374,953	\$541,275	\$929,997	\$929,997	
Arizona			102,602		102,602	185,893	
Arkansas	30,147		343,194	1,592,379	1,965,720	3,629 1,969,349	
California		\$222,458	1,209,245		1,431,703	231,191 1,662,894	
Colorado		95,335			95,335	74,907 170,242	
Connecticut		5,915	119,449	79,676	205,040	18,356 223,396	
Delaware	52,205	29,551	50,454	120,000	252,210	56,979 309,189	
Florida	15,956		189,138	447,920	653,014		653,014
Georgia	325,417	662,632	261,293	158,296	1,407,638	662,632 2,070,270	
Idaho	44,265	134,868	75,000		254,133	139,822 393,955	
Illinois	55,756	949,972	1,147,204	1,607,198	3,760,130	1,036,153 4,796,283	
Indiana	11,877	83,137	82,921	58,801	236,736	83,137 319,873	
Iowa			567,095	1,503,200	2,070,295	38,706 2,109,001	
Kansas		149,459	99,077		248,536	223,045 471,581	
Kentucky	5,346	359,441	269,337	139,489	773,613	419,116 1,192,729	
Louisiana	12,263	109,873	552,868	553,518	1,228,522	274,866 1,503,388	
Maine	10,573		76,940	294,753	382,266		382,266
Maryland	202,667	90,615	908,825	649,328	1,851,435	265,910 2,117,345	
Massachusetts	34,376	136,723	1,018,779	157,562	1,347,440	136,724 1,484,164	
Michigan		3,193,695	128,800	437,600	3,760,095	3,193,694 6,953,789	
Minnesota		28,394	348,866	303,876	681,136	175,174 856,310	
Mississippi	40,404		157,274	181,499	379,177		379,177
Missouri	40,403	230,419	1,018,842	1,251,111	2,540,775	231,166 2,771,941	
Montana	2,000	180,691			182,691	219,557 402,248	
Nebraska	23,183	55,648	424,397	1,268,993	1,772,221	55,787 1,828,008	
Nevada		228,857	168,524		397,381	35,504 432,885	
New Hampshire		70,736	58,690		129,426	76,931 206,357	
New Jersey	303,276	574,163	70,404	107,505	1,055,348	1,065,698 2,121,046	
New Mexico			93,636		93,636		93,636
New York	11,000	251,335	76,000	460,170	798,505	495,894 1,294,399	
North Carolina	273,575	327,469	313,894	399,414	1,314,352	392,521 1,706,873	
North Dakota	181,750		1,213,044	606,959	2,001,753		2,001,753
Ohio	50,000	524,009	1,028,826	1,902,845	3,505,680	823,907 4,329,587	
Oklahoma	6,250	315,321	475,984	1,083,760	1,881,315	284,719 2,166,034	
Oregon		55,402	259,892	67,471	382,765	312,072 694,837	
Pennsylvania	220,744	573,450	675,705	1,166,076	2,635,975	862,703 3,498,678	
South Carolina	83,502	95,574	433,618	130,812	743,506	153,212 896,718	
South Dakota	31,622	95,331	241,399		368,352	78,534 446,886	
Tennessee		238,309	606,590	348,712	1,193,611	238,309 1,431,920	
Texas	500	373,622	271,014	1,883,317	2,528,453	516,894 3,045,347	
Utah	32,292	61,316	116,000	100,000	309,608	132,864 442,472	
Vermont	2,741	6,093	9,027	45,881	63,742	18,218 81,960	
Virginia	9,848	245,981	526,412	499,536	1,281,777	299,852 1,581,629	
Washington	13,790	3,300	242,431	428,701	688,222	72,281 760,503	
West Virginia	99,756	300,076	446,042	321,832	1,167,706	301,075 1,468,781	
Wisconsin	2,668	451,234	74,990	449,315	978,207	592,382 1,570,589	
Wyoming	14,803		69,396		84,199	5,559 89,758	
District of Columbia				238,616	238,616	14,648 253,264	
Hawaii	13,518				13,518		13,518
Total	2,272,242	11,510,404	16,998,071	21,587,396	52,368,113	14,397,619	66,765,732

TABLE 9.—Unobligated balances of funds available for allotment to new projects on June 30, 1936

State	Public Works authorizations for 1934-35	Federal-aid authorizations for 1936-37 ¹	Works Program		Total
			Highways	Grade crossings	
Alabama.....	\$63,060	\$5,169,222	\$389,909	\$200,367	\$5,822,558
Arizona.....	56,466	1,944,610	118,348	282,953	2,402,377
Arkansas.....	132,773	4,275,929	57,183	165,801	4,631,686
California.....	72,812	4,678,303	173,397	321,048	5,245,560
Colorado.....	82,752	2,661,562	1,371,730	1,136,939	5,252,983
Connecticut.....	218,588	1,040,726	965,646	1,554,233	3,779,193
Delaware.....	-----	969,325	361,125	298,239	1,628,689
Florida.....	134,932	2,769,195	280,711	731,590	3,916,428
Georgia.....	1,330,069	4,909,868	4,072,093	4,471,702	14,783,732
Idaho.....	83,856	1,669,994	229,365	646,630	2,629,845
Illinois.....	208,009	5,393,067	3,567	2,745,200	8,350,383
Indiana.....	69,915	3,148,940	22,193	28,967	3,270,015
Iowa.....	59,599	3,242,329	832,123	743,754	4,877,805
Kansas.....	40,201	3,219,024	10,244	-----	3,269,469
Kentucky.....	107,254	2,860,697	818,210	1,339,602	5,125,763
Louisiana.....	204,411	1,963,504	237,802	829,490	3,235,207
Maine.....	83,441	1,226,569	70,122	461,232	1,841,364
Maryland.....	528,336	1,960,255	535,028	703,045	3,726,664
Massachusetts.....	363,075	3,181,673	2,126,352	2,597,784	8,268,884
Michigan.....	106,540	916,119	133,973	698,795	1,855,427
Minnesota.....	506,865	3,573,286	527,915	1,872,255	6,480,321
Mississippi.....	108,524	4,387,636	343,466	1,103,421	5,943,047
Missouri.....	67,011	3,893,055	122,776	14,940	4,097,772
Montana.....	104,949	2,576,984	54,078	121,551	2,857,562
Nebraska.....	52,796	3,558,536	544,048	131,475	4,286,855
Nevada.....	75,154	1,621,847	312,676	203,587	2,213,264
New Hampshire.....	36,766	780,174	440,057	457,553	1,714,550
New Jersey.....	411,979	1,719,232	926,817	2,577,892	5,635,920
New Mexico.....	257,421	2,032,626	577,047	239,410	3,106,504
New York.....	241,639	6,206,317	919,719	3,440,111	10,807,786
North Carolina.....	254,591	3,767,106	980,222	2,622,262	7,624,181
North Dakota.....	691,393	3,817,063	440,414	1,507,525	6,456,395
Ohio.....	209,379	5,622,009	2,250,579	5,097,145	13,179,112
Oklahoma.....	279,136	4,002,115	912,729	1,501,528	6,695,508
Oregon.....	187,704	2,072,209	100,080	65,531	2,425,524
Pennsylvania.....	624,240	6,129,848	6,589,117	6,242,738	19,585,943
Rhode Island.....	13,848	1,218,750	1,863	45,683	1,280,144
South Carolina.....	284,247	3,244,668	526,716	1,598,586	5,654,217
South Dakota.....	258,067	3,259,357	620,459	2,301,389	6,439,272
Tennessee.....	142,389	4,182,247	1,076,813	2,927,287	8,328,736
Texas.....	170,824	8,251,298	164,474	169,693	8,756,289
Utah.....	228	1,477,873	413,139	503,982	2,395,222
Vermont.....	8,443	614,792	35,387	210,538	869,160
Virginia.....	382,232	3,112,444	414,782	1,903,703	5,813,161
Washington.....	83,993	2,227,697	164,393	638,174	3,114,257
West Virginia.....	162,990	1,925,768	443,247	1,909,645	4,441,650
Wisconsin.....	80,873	2,884,665	125,688	1,752,026	4,843,252
Wyoming.....	77,463	1,587,229	237,458	980,465	2,882,615
District of Columbia.....	60,233	-----	30,498	1,545	92,276
Hawaii.....	10,298	988,237	303,852	1	1,302,388
Total.....	9,791,764	147,936,519	33,409,630	62,099,012	253,236,925

¹ There are no unobligated balances of 1917-33 Federal-aid funds.

TABLE 10.—Mileage of projects completed during the fiscal year ended June 30, 1936, by funds

ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES¹

State	Federal funds used in financing					Total Miles
	Federal aid, 1917-33 Miles	Public Works, 1934-35 Miles	Federal aid, 1936-37 Miles	Works Program		
				Highways Miles	Grade crossings Miles	
Alabama.....		126.0				126.0
Arizona.....		42.4	70.0			112.4
Arkansas.....		102.8		19.5	19.0	141.3
California.....		73.9	9.5	2.9	.1	86.4
Colorado.....		50.3	69.4	9.0	9.2	137.9
Connecticut.....		23.4				23.4
Delaware.....		3.2				3.2
Florida.....		31.1	17.9		.2	49.2
Georgia.....		85.7	10.7			96.4
Idaho.....	10.6	50.2	75.3	4.8		140.9
Illinois.....	23.0	57.9	17.3	18.0		116.2
Indiana.....	31.2	140.1	54.2	2.6		228.1
Iowa.....		115.9	112.8	.2		228.9
Kansas.....		123.8	207.7	36.9		368.4
Kentucky.....		63.0	74.1	1.8		138.9
Louisiana.....		20.4	23.4			43.8
Maine.....		16.9	10.8	.5		28.2
Maryland.....		10.9				10.9
Massachusetts.....		20.2				20.2
Michigan.....	.8	139.0	52.0	20.4	.1	212.3
Minnesota.....		178.7	115.2	36.1	1.1	331.1
Mississippi.....	8.0	159.5		2.7		170.2
Missouri.....		107.6	242.1	15.8		365.5
Montana.....		95.6	169.3	1.2	.5	266.6
Nebraska.....		95.0	71.7	4.7	3.8	175.2
Nevada.....		181.4	113.5	7.6	.6	303.1
New Hampshire.....		13.9	3.8			17.7
New Jersey.....		14.5	1.0			15.5
New Mexico.....		67.8	74.1	38.4	19.0	199.3
New York.....	6.0	118.2	.1	.1		124.4
North Carolina.....		190.6	84.6		.2	275.4
North Dakota.....	1.8	274.1		31.8	.6	308.3
Ohio.....		69.8		1.1		70.9
Oklahoma.....	13.1	90.1	31.5	11.5	2.2	148.4
Oregon.....		52.5	20.2	.1		72.8
Pennsylvania.....		75.5	4.2			79.7
Rhode Island.....		14.3				14.3
South Carolina.....		55.6		6.1		61.7
South Dakota.....		257.8		117.9	.5	376.2
Tennessee.....		61.8	24.5	.6		86.9
Texas.....		434.1	266.2	62.8	8.4	771.5
Utah.....		30.3	23.3	4.5	.2	58.3
Vermont.....		17.7	8.3	.8	.5	27.3
Virginia.....		103.1	4.1	14.9	.1	122.2
Washington.....		23.6	25.0	2.8	.3	51.7
West Virginia.....		22.1	2.9			25.0
Wisconsin.....		85.8	20.6	.9		107.3
Wyoming.....		217.3	178.0		.2	395.5
Hawaii.....		20.6				20.6
Total.....	94.5	4,426.0	2,289.3	479.0	66.8	7,355.6

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 10.—Mileage of projects completed during the fiscal year ended June 30, 1936, by funds—Continued

ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES¹

State	Federal funds used in financing					Total Miles
	Federal aid, 1917-33 Miles	Public Works, 1931-35 Miles	Federal aid, 1936-37 Miles	Works Program		
				Highways Miles	Grade crossings Miles	
Alabama.....	27.9	2.0		8.8		27.9
Arizona.....	18.2			18.1		10.8
Arkansas.....	17.4				0.1	36.3
California.....	9			13.5		17.5
Colorado.....	1.6					14.4
Connecticut.....	7					1.6
Delaware.....	1.9					7
Florida.....	17.9			.8		1.9
Georgia.....	3.9			3.6		18.7
Idaho.....	12.1			.7		7.5
Illinois.....	31.4			.3		12.8
Indiana.....	24.5			.6		31.7
Iowa.....	14.8			1.1		25.1
Kansas.....	14.2			.5		15.9
Kentucky.....	21.0					14.7
Louisiana.....	7.0					21.0
Maine.....	2.1					7.0
Maryland.....	5.8					2.1
Massachusetts.....	19.0			5.3		5.8
Michigan.....	20.3			2.8		24.3
Minnesota.....	28.1			.1		23.1
Mississippi.....	13.2			.1		28.2
Missouri.....	8.7			.6		13.3
Montana.....	8.7					9.3
Nebraska.....	6			.9	.4	8.7
Nevada.....	2.8					1.9
New Hampshire.....	4.1					2.8
New Jersey.....	4.1			8.6		4.1
New Mexico.....	24.6			3.3		27.9
New York.....	13.8			.5		14.3
North Carolina.....	27.7			.3	.2	28.2
North Dakota.....	18.0			.9		18.9
Ohio.....	12.8			.6		13.4
Oklahoma.....	10.8					10.8
Oregon.....	15.0					15.0
Pennsylvania.....	1.5					1.5
Rhode Island.....	15.8			2.4		18.2
South Carolina.....	19.8			.5		20.3
South Dakota.....	11.2			2.6		13.8
Tennessee.....	37.0			27.2	.1	64.3
Texas.....	14.2			4.9		19.1
Utah.....	4.0					4.0
Vermont.....	18.1			1.8	.3	20.2
Virginia.....	7.2			4.2		11.4
Washington.....	4.5					4.5
West Virginia.....	19.6			1.5		21.1
Wisconsin.....	3.1			20.0		23.1
Wyoming.....	.8			2.5		3.3
District of Columbia.....						
Total.....		614.4		139.6	1.1	755.1

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 10.—Mileage of projects completed during the fiscal year ended June 30, 1936, by funds—Continued

ON SECONDARY OR FEEDER ROADS

State	Federal funds used in financing					Total Miles
	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program		
				Highways	Grade crossings	
Miles	Miles	Miles	Miles	Miles	Miles	
Alabama.....		80.1				80.1
Arizona.....		69.0		55.6	0.6	125.2
Arkansas.....		129.2		4.3	.3	133.8
California.....		72.7		57.7	1.2	131.6
Colorado.....		70.3		32.3		102.6
Connecticut.....		16.0				16.0
Delaware.....		19.9				19.9
Florida.....		28.2		5.5		33.7
Georgia.....		67.5				67.5
Idaho.....		60.0				60.0
Illinois.....		312.7		26.1		338.8
Indiana.....		37.6				37.6
Iowa.....		286.9		63.5		350.4
Kansas.....		71.5		22.9		94.4
Kentucky.....		163.3		46.7		210.0
Louisiana.....		41.4				41.4
Maine.....		6.9		6.1		13.0
Maryland.....		28.2				28.2
Massachusetts.....		20.4				20.4
Michigan.....		51.1			.5	51.6
Minnesota.....		113.5		115.4	.4	229.3
Mississippi.....		47.5		2.5		50.0
Missouri.....		401.8		332.8		734.6
Montana.....		62.6		32.5	.5	95.6
Nebraska.....		60.6				60.6
Nevada.....		41.8		24.1		65.9
New Hampshire.....		5.8		1.3		7.1
New Jersey.....		1.7				1.7
New Mexico.....		46.9		27.4		74.3
New York.....		281.5		7		282.2
North Carolina.....		140.6		21.1	.3	162.0
North Dakota.....		215.7				215.7
Ohio.....		97.9		.3		98.2
Oklahoma.....		54.3		4.1	.2	58.6
Oregon.....		21.4				21.4
Pennsylvania.....		138.7		3.7	.5	142.9
Rhode Island.....		11.1				11.1
South Carolina.....		141.9				141.9
South Dakota.....		223.3		13.5		236.8
Tennessee.....		51.0		2		51.2
Texas.....		184.9		114.7		299.6
Utah.....		52.7		12.9		65.6
Vermont.....		14.0		2.8	1.2	18.0
Virginia.....		56.7		256.3	1.2	314.2
Washington.....		24.1		26.4		50.5
West Virginia.....		24.3				24.3
Wisconsin.....		64.5		13.6	.4	78.5
Wyoming.....		120.4				120.4
District of Columbia.....		3.3		2.6		5.9
Hawaii.....		4.6				4.6
Total.....		4,342.0		1,329.6	7.3	5,678.9

TABLE 10.—Mileage of projects completed during the fiscal year ended June 30, 1936, by funds—Continued

State	Federal funds used in financing					Total Miles
	Federal aid, 1917-33	Public Works, 1934-35	Federal aid, 1936-37	Works Program		
				Highways	Grade crossings	
	Miles	Miles	Miles	Miles	Miles	
Alabama		234.0				234.0
Arizona		113.3	70.0	64.5	0.6	248.4
Arkansas		250.3		41.8	19.3	311.4
California		164.1	9.5	60.6	1.3	235.5
Colorado		121.5	69.4	54.8	9.2	254.9
Connecticut		41.0				41.0
Delaware		23.8				23.8
Florida		61.2	17.9	5.5	.2	84.8
Georgia		171.2	10.7	.7		182.6
Idaho	10.6	114.1	75.3	8.4		208.4
Illinois	23.0	382.7	17.3	44.8		467.8
Indiana	31.2	209.1	54.2	2.9		297.4
Iowa		427.3	112.8	64.3		604.4
Kansas		210.1	207.7	60.9		478.7
Kentucky		240.6	74.1	48.9		363.6
Louisiana		82.8	23.4			106.2
Maine		30.9	10.8	6.5		48.2
Maryland		41.2				41.2
Massachusetts		46.4				46.4
Michigan	.8	209.1	52.0	25.6	.7	288.2
Minnesota		312.4	115.2	154.4	1.5	583.5
Mississippi	8.0	235.1		5.3		248.4
Missouri		522.6	242.1	348.7		1,113.4
Montana		166.9	168.3	34.3	1.0	371.5
Nebraska		164.3	71.7	4.7	3.8	244.5
Nevada		223.8	113.5	32.5	1.1	370.9
New Hampshire		22.5	3.8	1.3		27.6
New Jersey		20.3	1.0			21.3
New Mexico		118.7	74.1	74.4	19.1	286.3
New York	6.0	424.3	.1	4.1		434.5
North Carolina		345.0	84.6	21.6	.5	451.7
North Dakota	1.8	517.6		32.0	.8	552.2
Ohio		185.6		2.4		188.0
Oklahoma	13.1	157.1	31.5	16.3	2.4	220.4
Oregon		84.8	20.2			105.0
Pennsylvania		229.1	4.2	3.8	.5	237.6
Rhode Island		26.9				26.9
South Carolina		213.2		8.6		221.8
South Dakota		500.9		131.9	.5	633.3
Tennessee		124.0	24.5	3.4		151.9
Texas		656.1	266.2	204.7	8.4	1,135.4
Utah		97.1	23.3	22.4	.2	143.0
Vermont		35.8	8.3	3.6	1.6	49.3
Virginia		177.8	4.1	273.0	1.7	456.6
Washington		54.9	25.0	33.4	.3	113.6
West Virginia		50.9	2.9			53.8
Wisconsin		169.9	20.6	16.1	.3	206.9
Wyoming		340.8	178.0	20.0	.2	539.0
District of Columbia		4.1		5.1		9.2
Hawaii		25.2				25.2
Total	94.5	9,382.4	2,289.3	1,948.2	75.2	13,789.6

TABLE 11.—*Mileage of projects under contract on June 30, 1936, by funds*¹
ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES²

State	Federal funds used in financing—					Total
	Federal aid 1917-33	Public Works 1934-35	Federal aid 1936-37	Works Program		
				Highways	Grade crossings	
<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	
Alabama.....		25.0		56.3	1.6	82.9
Arizona.....		.2	31.5	54.3	11.5	97.5
Arkansas.....		9.2		75.6	21.0	105.8
California.....		.7	176.6	22.4	8.6	208.3
Colorado.....			48.0		12.4	60.4
Connecticut.....			44.8		.1	14.9
Delaware.....			34.4	10.1		44.5
Florida.....	6.6	2.5	18.4	11.2	5.4	44.1
Georgia.....		58.9	100.1	7.5	.5	167.0
Idaho.....	2.5	1.0	110.4	34.8	8.5	157.2
Illinois.....	9.6	9.1	111.9	87.8	7.5	225.9
Indiana.....	5.3	26.2	147.4	24.0	5.1	208.0
Iowa.....			340.4	36.9	19.8	397.1
Kansas.....		.9	637.8	168.8	23.9	831.4
Kentucky.....		3.3	86.6	10.2	1.5	101.6
Louisiana.....	.4	18.9	78.3	14.6	6.3	118.5
Maine.....			47.0	2.7	5.5	55.2
Maryland.....		15.2		1.6		16.8
Massachusetts.....		2.1	3.1	.5	1.4	7.1
Michigan.....		31.6	212.9	127.7	28.2	400.4
Minnesota.....		9.8	355.7	40.9	37.7	444.1
Mississippi.....		46.9		75.2	65.1	187.2
Missouri.....		19.3	198.3	4.9	6.5	229.0
Montana.....		8.8	243.5	68.6	16.5	337.4
Nebraska.....		14.1	242.2	132.2	81.0	469.5
Nevada.....			86.7		.8	87.5
New Hampshire.....			18.3	1.8	1.1	21.2
New Jersey.....		2.9	28.9	7.5	1.0	40.3
New Mexico.....		1.4	128.8	19.9	6.7	156.8
New York.....		4.6	205.1	12.2	7.6	229.5
North Carolina.....		21.1	355.5	41.1	4.5	422.2
North Dakota.....		48.9	.1	83.7	29.2	161.9
Ohio.....		5.3	85.4	19.5	.7	110.9
Oklahoma.....	23.1	2.1	62.2	95.3	19.3	202.0
Oregon.....		5.0	86.0	16.1	2.3	109.4
Pennsylvania.....		8.7	112.6	5.9	7.3	134.5
Rhode Island.....				5.9	.7	6.6
South Carolina.....		8.1	8.7	29.1	9.1	55.0
South Dakota.....		13.5	158.1	144.9	39.8	356.3
Tennessee.....		3.1	41.6	35.6	5.7	86.0
Texas.....	8.1	11.6	474.4	217.2	50.8	762.1
Utah.....		.3	96.1	25.4	1.6	123.4
Vermont.....		1.7	51.0	4.2	1.2	58.1
Virginia.....		2.5	89.8	9.4	4.6	106.3
Washington.....		.3	88.8	41.6	7.2	137.9
West Virginia.....		4.5	42.3	16.3	1.5	64.6
Wisconsin.....		8.7	177.8	60.3	5.9	252.7
Wyoming.....		1.1	96.6	47.2	.8	145.7
Hawaii.....		4.2	8.2	5.5	1.6	19.5
Total.....	55.6	463.3	5,742.3	2,014.4	586.6	8,862.2

¹ Most of these projects are under construction.

² For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 11.—*Mileage of projects under contract on June 30, 1936, by funds—Con.*
ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES ²

State	Federal funds used in financing—					Total
	Federal aid 1917-33	Public Works 1934-35	Federal aid 1936-37	Works Program		
				Highways	Grade crossings	
<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	
Alabama.....		9.5		12.7	4.8	27.0
Arizona.....		.6		8.7	.5	9.8
Arkansas.....		1.4		33.4	.5	35.3
California.....		.9		6.7	1.4	9.0
Colorado.....				8.6	.4	9.0
Connecticut.....		2.7		.2		2.9
Delaware.....		.5				.5
Florida.....		1.6		10.4	1.4	13.4
Georgia.....		11.7		1.0		12.7
Idaho.....		.6		18.7	1.0	20.3
Illinois.....		4.4		21.4	2.8	28.6
Indiana.....		14.3		23.0	3.8	41.1
Iowa.....		5.2		12.9	3.8	21.9
Kansas.....		1.3		9.0	4.1	14.4
Kentucky.....		3.8		6.5	3.0	13.3
Louisiana.....		.8			.5	1.3
Maine.....				2.1		2.1
Maryland.....		.8			.1	.9
Massachusetts.....		.8			.3	1.1
Michigan.....		1.2		38.3	1.1	40.6
Minnesota.....		4.0		16.1	7.7	27.8
Mississippi.....		6.2		34.1	6.1	46.4
Missouri.....		3.5		6.2	2.3	12.0
Montana.....				6.3	.2	6.5
Nebraska.....		3.4		50.8	6.2	60.4
Nevada.....		.6				.6
New Hampshire.....				2.2		2.2
New Jersey.....		2.3		6.2		8.5
New Mexico.....		.8		37.4	.7	38.9
New York.....		3.5		20.3	1.5	25.3
North Carolina.....		.4		4.9	2.7	8.0
North Dakota.....		6.9		2.9	1.3	11.1
Ohio.....		2.7		8.9	.1	11.7
Oklahoma.....		.8		2.8	.7	4.3
Oregon.....		.2		14.2	1.5	15.9
Pennsylvania.....		1.9		.6	2.2	4.7
Rhode Island.....		1.1		1.1	.3	2.5
South Carolina.....		1.0		6.7	1.7	9.4
South Dakota.....		20.4		47.9	1.0	69.3
Tennessee.....		1.6		10.3	.5	12.4
Texas.....		2.5		116.7	6.9	126.1
Utah.....				11.2	.4	11.6
Vermont.....		1.4		2.0		3.4
Virginia.....		.5		3.5	1.1	5.1
Washington.....				2.7	.3	3.0
West Virginia.....		5.1		4.5		9.6
Wisconsin.....				24.3	.7	25.0
Wyoming.....		.3		21.1	.6	22.0
District of Columbia.....		1.5		2.5		4.0
Hawaii.....				3.5	.2	3.7
Total.....		134.7		685.5	76.4	896.6

² For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 11.—Mileage of projects under contract on June 30, 1936, by funds—Con.

ON SECONDARY OR FEEDER ROADS

State	Federal funds used in financing—					Total
	Federal aid 1917-33	Public Works 1934-35	Federal aid 1936-37	Works Program		
				Highways	Grade crossings	
Miles	Miles	Miles	Miles	Miles	Miles	
Alabama.....		6.5		36.2	5.1	47.8
Arizona.....				68.3	.9	69.2
Arkansas.....		.5		148.9	6.3	155.7
California.....				143.5	4.8	148.3
Colorado.....				33.6	1.2	34.8
Connecticut.....		2.0				2.0
Delaware.....				37.1		37.1
Florida.....		8.0		51.3	1.6	60.9
Georgia.....		47.2		34.3	.5	82.0
Idaho.....		3.1		106.6	2.4	112.1
Illinois.....		31.9		261.9	6.0	299.8
Indiana.....		18.2		181.2	12.6	212.0
Iowa.....		3.3		245.5	18.2	267.0
Kansas.....		14.7		135.6	1.1	151.4
Kentucky.....		11.7		247.0	2.0	260.7
Louisiana.....		7.0		137.4	1.8	146.2
Maine.....				55.8	.5	56.3
Maryland.....		19.6		9.7	3.2	32.5
Massachusetts.....				.6	2.3	2.9
Michigan.....		46.9		86.6	2.0	135.5
Minnesota.....				555.8	40.2	596.0
Mississippi.....		24.3		81.9	15.1	121.3
Missouri.....		7.2		391.4	1.6	400.2
Montana.....		14.5		76.3	1.3	92.1
Nebraska.....		30.5		120.0	3.3	153.8
Nevada.....		12.1		55.9	.6	68.6
New Hampshire.....				15.3	.7	16.0
New Jersey.....		1.1		4.3	1.1	6.5
New Mexico.....				34.8	1.0	35.8
New York.....		7.8		117.3	4.9	130.0
North Carolina.....				164.8	3.4	168.2
North Dakota.....		64.1		47.4	.8	112.3
Ohio.....		29.0		55.3	3.8	88.1
Oklahoma.....		8.4		199.9	6.6	214.9
Oregon.....		1.2		115.7	3.4	120.3
Pennsylvania.....		55.8		73.3	6.9	136.0
Rhode Island.....				12.1	.8	12.9
South Carolina.....		26.5		120.7	2.8	150.0
South Dakota.....		23.5		63.1	7.5	94.1
Tennessee.....		13.4		54.8	2.5	70.7
Texas.....		18.5		559.3	26.1	603.9
Utah.....		4.0		79.6	.8	84.4
Vermont.....				12.0	1.4	13.4
Virginia.....		29.9		714.4	1.2	745.5
Washington.....				67.0	5.3	72.3
West Virginia.....		22.5		30.8	.3	53.6
Wisconsin.....		.4		225.9	5.6	231.9
Wyoming.....				39.4		39.4
District of Columbia.....				.9	.1	1.0
Hawaii.....		1.9			.7	2.6
Total.....		617.2		6,110.5	222.3	6,950.0

TABLE 11.—*Mileage of projects under contract on June 30, 1936, by funds—*
Continued

TOTAL

State	Federal funds used in financing					Total
	Federal aid 1917-33	Public Works 1934-35	Federal aid 1936-37	Works Program		
				Highways	Grade crossings	
<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	
Alabama.....		41.1		105.2	11.4	157.7
Arizona.....		.8	31.5	131.3	12.9	176.5
Arkansas.....		11.1		257.9	27.8	296.8
California.....		1.6	176.6	172.7	14.7	365.6
Colorado.....			48.0	42.3	13.9	104.2
Connecticut.....		4.7	14.8	.2	.1	19.8
Delaware.....		.5	34.4	47.2		82.1
Florida.....	6.6	12.2	18.4	72.8	8.4	118.4
Georgia.....		117.7	100.1	42.9	1.0	261.7
Idaho.....	2.5	4.6	110.4	160.1	12.0	289.6
Illinois.....	9.6	45.4	111.9	371.1	16.3	554.3
Indiana.....	5.3	58.7	147.4	228.2	21.5	461.1
Iowa.....		8.5	340.4	295.3	41.8	686.0
Kansas.....		16.9	637.8	313.4	29.1	997.2
Kentucky.....		18.7	86.6	263.7	6.6	375.6
Louisiana.....	.4	26.6	78.3	152.0	8.7	266.0
Maine.....			47.0	60.5	6.1	113.6
Maryland.....		35.6		11.3	3.3	50.2
Massachusetts.....		2.9	3.1	1.1	4.0	11.1
Michigan.....		79.7	212.9	252.5	31.4	576.5
Minnesota.....		13.7	355.7	612.8	85.7	1,067.9
Mississippi.....		77.4		191.2	86.3	354.9
Missouri.....		30.0	198.3	402.5	10.4	641.2
Montana.....		23.3	243.5	151.2	18.0	436.0
Nebraska.....		47.9	242.2	303.1	90.5	683.7
Nevada.....		12.7	86.7	55.9	1.4	156.7
New Hampshire.....			18.3	19.3	1.8	39.4
New Jersey.....		6.3	28.9	17.9	2.2	55.3
New Mexico.....		2.3	128.8	92.1	8.3	231.5
New York.....		15.9	205.1	149.8	14.0	384.8
North Carolina.....		21.5	355.5	210.8	19.6	598.4
North Dakota.....		119.8	.1	134.1	31.3	285.3
Ohio.....		37.1	85.4	83.7	4.5	210.7
Oklahoma.....	23.1	11.3	62.2	298.0	26.6	421.2
Oregon.....		6.4	86.0	146.0	7.2	245.6
Pennsylvania.....		66.5	112.6	79.7	16.4	275.2
Rhode Island.....		1.1		19.1	1.8	22.0
South Carolina.....		35.7	8.7	156.5	13.5	214.4
South Dakota.....		57.4	158.1	255.9	48.3	519.7
Tennessee.....		18.1	41.6	100.8	8.6	169.1
Texas.....	8.1	32.7	474.4	893.1	83.8	1,492.1
Utah.....		4.4	96.1	116.1	2.8	219.4
Vermont.....		3.1	51.0	18.2	2.6	74.9
Virginia.....		32.8	89.8	727.4	6.9	856.9
Washington.....		.3	88.8	111.3	12.8	213.2
West Virginia.....		32.1	42.3	51.6	1.8	127.8
Wisconsin.....		9.1	177.8	310.5	12.2	509.6
Wyoming.....		1.4	96.6	107.7	1.4	207.1
District of Columbia.....		1.5		3.4	.1	5.0
Hawaii.....		6.1	8.2	9.0	2.5	25.8
Total.....	55.6	1,215.2	5,742.3	8,810.4	885.3	16,708.8

TABLE 12.—*Mileage of projects approved but not under contract on June 30, 1936, by funds*ON THE FEDERAL-AID HIGHWAY SYSTEM OUTSIDE OF MUNICIPALITIES¹

State	Federal funds used in financing				Total
	Public Works, 1934-35	Federal aid, 1936-37	Works Program		
			Highways	Grade crossings	
	Miles	Miles	Miles	Miles	Miles
Alabama.....			2.0		2.0
Arizona.....			4.0		4.0
Arkansas.....				13.8	13.8
California.....		3.4	12.6		16.0
Colorado.....		2.0			2.0
Connecticut.....		2.0		1.1	3.1
Delaware.....		.1			.1
Florida.....	0.8		.3	.7	1.8
Georgia.....	19.6	64.8	4.0	.2	88.6
Idaho.....		17.5			17.5
Illinois.....		33.9		2.9	36.8
Indiana.....		3.9			3.9
Iowa.....				.9	.9
Kansas.....		65.4			65.4
Kentucky.....		18.5	.3	.8	19.6
Louisiana.....		6.0		.9	6.9
Maine.....			1.4		1.4
Maryland.....		3.3	10.3	.5	14.1
Massachusetts.....		1.9	.4		2.3
Michigan.....		192.6			192.6
Minnesota.....		2.3	2.2	2.9	7.4
Mississippi.....			1.5	2.9	4.4
Missouri.....	.3	20.1		2.2	22.6
Montana.....		16.4			16.4
Nebraska.....		15.5	6.1	.2	21.8
Nevada.....		69.0			69.0
New Hampshire.....		1.9			1.9
New Jersey.....	6.7	10.4			17.1
New York.....	5.6	7.8		.9	14.3
North Carolina.....	4.3	69.4		5.9	79.6
North Dakota.....	10.4		49.5	1.6	61.5
Ohio.....	1.4	8.2		2.3	11.9
Oklahoma.....		26.7	4.6	2.6	33.9
Oregon.....		4.1			4.1
Pennsylvania.....	.3	19.6	4.7	3.2	27.8
South Carolina.....	.4	17.4	12.6	1.1	31.5
South Dakota.....	4.0	22.6	16.1		42.7
Tennessee.....		20.7	12.3	.2	33.2
Texas.....		38.9	1.1	1.6	41.6
Utah.....		8.7			8.7
Vermont.....				1.0	1.0
Virginia.....		15.6		3.3	18.9
Washington.....			8.6		8.6
West Virginia.....	1.0	10.8	1.5	.6	13.9
Wisconsin.....		57.4			57.4
Wyoming.....			1.6		1.6
Hawaii.....	.2				.2
Total.....	55.0	877.0	157.7	54.3	1,144.0

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 12.—*Mileage of projects approved but not under contract on June 30, 1936, by funds—Continued*ON EXTENSIONS OF THE FEDERAL-AID HIGHWAY SYSTEM INTO AND THROUGH MUNICIPALITIES¹

State	Federal funds used in financing				Total Miles
	Public Works, 1934-35 Miles	Federal aid, 1936-37 Miles	Works Program		
			Highways Miles	Grade crossings Miles	
Alabama.....				0.3	0.3
Arizona.....			1.0		1.0
Arkansas.....	0.6		3.4	3.2	7.2
Delaware.....	1.1			.3	1.4
Florida.....			1.1	.4	1.5
Georgia.....	1.5				1.5
Illinois.....			.2	.1	.3
Indiana.....	.3		1.9		2.2
Iowa.....			2.1	1.1	3.2
Kentucky.....	.1		1.9		2.0
Louisiana.....			3.4	.4	3.8
Maine.....			1.6	.3	1.9
Maryland.....			1.7		1.7
Massachusetts.....	.2		3.6		3.8
Michigan.....				.2	.2
Minnesota.....				.9	.9
Mississippi.....			1.4		1.4
Missouri.....			5.6	.4	6.0
Nebraska.....	.1		1.9	2.2	4.2
New Jersey.....			.4		.4
New York.....				.1	.1
North Carolina.....	.7			.6	1.3
North Dakota.....	1.2		21.4	1.3	23.9
Ohio.....				.7	.7
Oklahoma.....	.4		.4	.7	1.5
Oregon.....			1.4		1.4
Pennsylvania.....	1.2			1.4	2.6
South Carolina.....	1.7		4.6		6.3
Tennessee.....			.4	.7	1.1
Texas.....			4.0	1.0	5.0
Virginia.....	.5		2.5	.4	3.4
Washington.....				.3	.3
West Virginia.....	.1		2.0	.2	2.3
Total.....	9.7		67.9	17.2	94.8

¹ For those Federal-aid projects financed with 1936 Federal-aid funds separation has not been made between projects and sections of projects within and without municipalities. All such Federal-aid projects are reported under the head "On the Federal-aid system outside of municipalities."

TABLE 12.—Mileage of projects approved but not under contract on June 30, 1936, by funds—Continued

ON SECONDARY OR FEEDER ROADS

State	Federal funds used in financing				Total Miles
	Public Works, 1934-35 Miles	Federal aid, 1936-37 Miles	Works Program		
			Highways Miles	Grade crossings Miles	
Alabama.....			11.0	1.2	12.2
Arkansas.....			52.9	1.4	54.3
California.....			8.1		8.1
Connecticut.....			2.1		2.1
Delaware.....			11.7		11.7
Florida.....			4.1	1.0	5.1
Georgia.....			10.1	1.0	11.1
Idaho.....			5.2		5.2
Illinois.....	21.1		56.0	.7	77.8
Indiana.....			.2		.2
Iowa.....			54.2	6.1	60.3
Kansas.....			.2		.2
Kentucky.....			12.2		12.2
Louisiana.....	2.6		19.1	.5	22.2
Maine.....			.2	2.3	2.5
Maryland.....	4.5		14.8	1.8	21.1
Massachusetts.....				.3	.3
Michigan.....			9.3		9.3
Minnesota.....			95.4	.3	95.7
Mississippi.....	1.0		8.3		9.3
Missouri.....			33.4	1.4	34.8
Montana.....	3.6				3.6
Nebraska.....			47.2	2.3	49.5
Nevada.....			9.4		9.4
New Hampshire.....			4.3		4.3
New Jersey.....			.6	.4	1.0
New Mexico.....			5.2		5.2
New York.....			6.6	.4	7.0
North Carolina.....			20.4	.3	20.7
North Dakota.....			47.7	.3	48.0
Ohio.....			110.2	3.5	113.7
Oklahoma.....			49.4	1.2	50.6
Oregon.....			19.5	.9	20.4
Pennsylvania.....			38.4	.5	38.9
South Carolina.....			31.6	1.5	33.1
South Dakota.....			18.9		18.9
Tennessee.....			9.1	5.4	14.5
Texas.....	7.1		3.7	4.2	15.0
Utah.....			16.7	.4	17.1
Vermont.....	.3				.3
Virginia.....			13.2	4.0	17.2
Washington.....			2.2	.6	2.8
West Virginia.....			19.8		19.8
Wisconsin.....			3.7	.3	4.0
Wyoming.....	.4				.4
District of Columbia.....				.2	.2
Total.....	40.6		886.3	44.4	971.3

TABLE 12.—*Mileage of projects approved but not under contract on June 30, 1936, by funds—Continued*

TOTAL

State	Federal funds used in financing				Total Miles
	Public Works, 1934-35	Federal aid, 1936-37	Works Program		
			Highways	Grade crossings	
Miles	Miles	Miles	Miles	Miles	
Alabama			12.9	1.6	14.5
Arizona			5.0		5.0
Arkansas	0.7		56.2	18.4	75.3
California		3.4	20.7		24.1
Colorado		2.0			2.0
Connecticut		.3	2.0	1.1	3.4
Delaware	1.1	.1	11.7	.3	13.2
Florida	.8		5.5	2.1	8.4
Georgia	21.0	64.8	14.2	1.2	101.2
Idaho		17.5	5.2		22.7
Illinois	21.1	33.9	56.1	3.8	114.9
Indiana	.3	3.9	2.1		6.3
Iowa			56.3	8.1	64.4
Kansas		65.4	.2		65.6
Kentucky	.1	18.5	14.4	.8	33.8
Louisiana	2.6	6.0	22.5	1.8	32.9
Maine			3.2	2.6	5.8
Maryland	4.5	3.3	26.7	2.4	36.9
Massachusetts	.2	1.9	4.0	.3	6.4
Michigan		192.6	9.3	.2	202.1
Minnesota		2.3	97.6	4.1	104.0
Mississippi	.9		11.3	2.9	15.1
Missouri	.3	20.0	39.0	4.1	63.4
Montana	3.6	16.4			20.0
Nebraska	.2	15.5	55.2	4.6	75.5
Nevada		69.0	9.4		78.4
New Hampshire		1.9	4.3		6.2
New Jersey	6.7	10.4	1.0	.4	18.5
New Mexico			5.2		5.2
New York	5.6	7.7	6.6	1.5	21.4
North Carolina	5.0	69.4	20.4	6.8	101.6
North Dakota	11.6		118.7	3.1	133.4
Ohio	1.4	8.2	110.2	6.5	126.3
Oklahoma	.4	26.7	54.5	4.4	86.0
Oregon		4.1	20.9	.9	25.9
Pennsylvania	1.4	19.6	43.2	5.1	69.3
South Carolina	2.1	17.4	48.7	2.7	70.9
South Dakota	4.0	22.6	35.0		61.6
Tennessee		20.8	21.9	6.1	48.8
Texas	7.1	38.9	8.8	6.8	61.6
Utah		8.7	16.7	.4	25.8
Vermont	.3			1.0	1.3
Virginia	.5	15.6	15.7	7.7	39.5
Washington			10.8	.9	11.7
West Virginia	1.2	10.8	23.3	.7	36.0
Wisconsin		57.4	3.7	.3	61.4
Wyoming	.4		1.6		2.0
District of Columbia				.2	.2
Hawaii	.2				.2
Total	105.3	877.0	1,111.9	115.9	2,210.1

TABLE 13.—*Status of grade-crossing elimination and protection projects on June 30, 1936*COMPLETED DURING FISCAL YEAR¹

State	Crossings eliminated, by funds					Separation structures reconstructed	Crossings protected, by funds		
	Public Works, 1934-35	Federal aid for 1936-37	Works Program		Total		Public Works, 1934-35	Works Program grade crossings	Total
			Highways	Grade crossings					
Number	Number	Number	Number	Number	Number	Number	Number	Number	
Alabama	2			1	3				
Arizona	3			1	4				
Arkansas	4			8	12				
California	7			3	10	2			
Colorado				2	2				
Florida						1	5	5	
Georgia	10				10				
Idaho	2				2				
Illinois	41				41				
Indiana	9				9		2	2	
Iowa	7				7	1			
Kansas	4				4		9	9	
Kentucky	3			1	4				
Louisiana	4				4				
Maine	1				1				
Massachusetts	4				4				
Michigan	5			3	8	1	26	26	
Minnesota	8			2	10		9	10	
Mississippi	10				10				
Missouri	18	4			22				
Montana		1			1				
Nebraska	5			3	8				
Nevada	1			4	5				
New Hampshire	1				1				
New Jersey	1				1				
New Mexico	2				5				
New York	12				7				
North Carolina	6				12	2	89	89	
North Dakota				1	1				
Ohio	1				1				
Oklahoma	3			5	8				
Pennsylvania	3			3	6		1	1	
South Carolina	1				1		7	7	
South Dakota	2			1	3				
Tennessee	3				3		5	5	
Texas	17			7	24				
Utah	3				3	1	1	1	
Vermont				3	3	2			
Virginia	7			6	13		2	2	
Washington	5			1	6		3	3	
West Virginia	1				1				
Wisconsin	7	1		1	9		9	9	
Wyoming	4			2	6		16	16	
District of Columbia	1				1				
Total	228	6		66	300	10	184	185	

¹ No projects in this status in Connecticut, Delaware, Maryland, Oregon, Rhode Island, and Hawaii.

TABLE 13.—*Status of grade-crossing elimination and protection projects on June 30, 1936—Continued*UNDER CONTRACT ²

State	Crossings eliminated, by funds					Separation structures reconstructed	Crossings protected, by funds		
	Public Works, 1934-35	Federal aid for 1936-37	Works Program		Total		Public Works, 1934-35	Works Program grade crossings	Total
			Highways	Grade crossings					
	Number	Number	Number	Number	Number	Number	Number	Number	
Alabama.....	1		1	34	36			5	5
Arizona.....				10	10				
Arkansas.....	1			26	27	4		1	1
California.....	1	1		49	51	5	62		62
Colorado.....				21	21				
Connecticut.....	1				1	1			
Delaware.....	1				1				
Florida.....				15	15	4			
Georgia.....	1			5	6	1	7		7
Idaho.....	1			18	19	1			
Illinois.....	8			51	59	3	273		273
Indiana.....	1			38	39	9	50	127	177
Iowa.....				72	72	7			
Kansas.....				53	53	1		3	3
Kentucky.....				19	19				
Louisiana.....				18	18	2			
Maine.....				13	13				
Maryland.....				5	5	2		11	11
Massachusetts.....	1			12	13	2			
Michigan.....		1		37	38	7	2		25
Minnesota.....	2			63	65	7	1	21	22
Mississippi.....	2			42	44	3	4	1	
Missouri.....	1		1	31	33	1			
Montana.....			1	33	34	6			
Nebraska.....				62	62	1		21	21
Nevada.....			1	6	7		2		2
New Hampshire.....			1	3	4	3		1	1
New Jersey.....	5			7	12	2			
New Mexico.....				10	10	1			
New York.....	5	1	2	31	39	32			
North Carolina.....				22	22	9	41		41
North Dakota.....				24	24				
Ohio.....	1			9	10	1			
Oklahoma.....	2			38	40	2			
Oregon.....	1	1		15	17	6	8	2	10
Pennsylvania.....				31	31	8			
Rhode Island.....				4	4	1			
South Carolina.....	2			26	28	5	2		2
South Dakota.....				24	24				
Tennessee.....	1		1	14	16	1		11	11
Texas.....	2			100	102	13		82	82
Utah.....	1			9	10				
Vermont.....				4	4	3		7	7
Virginia.....				21	21	2	2	9	11
Washington.....				18	18	6		7	7
West Virginia.....	1			3	4	1			
Wisconsin.....		1	1	27	29	5	30		30
Wyoming.....				3	3				
District of Columbia.....				2	2				
Hawaii.....				5	5				
Total.....	43	5	9	1,183	1,240	158	484	309	793

² Most of these projects were under construction.

TABLE 13.—*Status of grade-crossing elimination and protection projects on June 30, 1936—Continued*

APPROVED BUT NOT UNDER CONTRACT 3

State	Crossings eliminated, by funds					Separation structures reconstructed	Crossings protected, by funds		
	Public Works, 1934-35	Federal aid for 1936-37	Works Program		Total		Public Works, 1934-35	Works Program grade crossings	Total
			Highways	Grade crossings					
	Number	Number	Number	Number	Number	Number	Number	Number	
Alabama.....				5	5				
Arkansas.....				19	19	1		2	
Connecticut.....				1	1				
Delaware.....				1	1				
Florida.....				11	11				
Georgia.....				3	3		1		
Illinois.....				9	9			1	
Indiana.....						1			
Iowa.....				23	23	2			
Kentucky.....				3	3	2			
Louisiana.....				3	3	2			
Maine.....				5	5				
Maryland.....				1	1	2			
Massachusetts.....				1	1		1		
Michigan.....						1			
Minnesota.....				3	3	2			
Mississippi.....				3	3		3		
Missouri.....	1			9	10			3	
Nebraska.....				11	11	1			
New Jersey.....				1	2	1			
New York.....		1				4			
North Carolina.....				7	7				
North Dakota.....				11	11				
Ohio.....				15	15	2			
Oklahoma.....				11	11	1			
Oregon.....				1	1				
Pennsylvania.....				8	8	3			
South Carolina.....				4	4		1		
Tennessee.....				9	9	1		1	
Texas.....				16	16	2		1	
Utah.....				1	1				
Vermont.....				2	2				
Virginia.....				20	20				
Washington.....				1	1	1			
West Virginia.....				2	2				
Wisconsin.....				3	3	1	1		
District of Columbia.....				1	1				
Total.....	1	1		224	226	30	7	13	

³ No projects in this status in Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, New Hampshire, New Mexico, Rhode Island, South Dakota, Wyoming, and Hawaii.

South Carolina.....	11.8	15.0	127.1	357.2	55.5		4.8	3.4	3.8		.4			221.8
South Dakota.....	161.2			63.9			82.9		31.3		.6			683.3
Tennessee.....	4.9			215.8		5.4		21.0	55.0		1.6			151.9
Texas.....	233.5	16.6		347.2	29.4			19.8	266.0		4.7			1,135.4
Utah.....	5.0			69.8			40.1	15.4	12.7					143.0
Vermont.....				16.8	2.9	1.4	21.6	2.5	2.4		.3			49.3
Virginia.....	6.6	63.1	53.7	214.0	8.0	5.5		5.6	41.5	.1	1.5			456.6
Washington.....	9.7			43.6	8.5		4.8	5.2	40.0		1.7			113.6
West Virginia.....	3.2			7.3	6.1	9.5			27.3		.3			53.8
Wisconsin.....	44.5			72.6				20.6	54.9		1.3			206.9
Wyoming.....	68.1			130.8	100.4		238.4	.1			.6			539.0
District of Columbia.....									2.2		.1			9.2
Hawaii.....	.2							25.0			.2			25.2
Total.....	2,275.9	409.4	371.5	4,960.2	971.7	158.6	1,606.9	417.3	1,929.6	40.4	56.6	21.2	.9	13,789.6

TABLE 16.—Mileage, by types of construction, of projects approved but not under contract on June 30, 1936—Continued

State	Graded and drained		Sand-clay		Gravel		Macadam		Low-cost bituminous mix	Bituminous macadam	Bituminous concrete	Portland cement concrete	Block	Bridges and approaches	Grade separations, railroads and highway	Total
	Miles	Treated	Miles	Treated	Miles	Treated	Miles	Treated								
Mississippi	4.8															15.1
Missouri	16.3		8.8	0.9					1.3		1.7	0.4		0.2		63.4
Montana			35.1						6.0			7.9		0.6		30.0
Nebraska			3.6	10.3					15.5			1.5		.1		75.5
Nevada	15.4		9.4						69.0							78.4
New Hampshire																6.2
New Jersey			6	.3								17.4		.1		18.5
New Mexico			5.2													5.2
New York					6.6					5.5						21.4
North Carolina			12.0	51.8					23.7			9.7		.3		101.6
North Dakota	56.7		1.8						13.0			1.1		.1		133.4
Ohio	3.3		61.9									6.1		.2		136.3
Oklahoma	4.1		98.3		1.7	6.3				2.9		12.0		.4		186.0
Oregon	4.1		54.6		20.3	1.0				14.8		1.4		.1		95.9
Pennsylvania	23.1									4.9		24.9		.4		69.3
South Carolina	13.0									4.9		1.7		.2		70.9
South Dakota	29.0		36.0	19.7					22.6			20.7		.3		161.6
Tennessee			10.0									5.9		.5		61.6
Texas	4.1		23.7							24.8						25.8
Utah	5.0		5.2		20.8				13.6							48.8
Vermont			7.2						1.3							1.3
Virginia																30.5
Washington			3.5	5.8						1.1		1.0		.2		11.7
West Virginia	9.8		8.9							8.9		9.4		.2		36.0
Wisconsin	19.5		13.7						13.3			14.8		.6		61.4
Wyoming	1.5								.4					.1		2.0
District of Columbia														.1		2.0
Hawaii										.2				.2		.2
Total	351.3	98.0	661.3	112.9	8.1	55.6	259.2	37.0	107.0	410.3	9.5	8.5	8.5	8.5	2,210.1	

CONSTRUCTION OF ROADS THROUGH PUBLIC LANDS AND FEDERAL RESERVATIONS

Special authorizations for the survey, construction, reconstruction, and maintenance of main roads through unappropriated or unreserved public lands, non-taxable Indian lands, or other Federal reservations other than national forests have been made by six congressional acts passed up to the end of the fiscal year 1936.

The first two of these authorizations, aggregating \$5,000,000, were made in the Emergency Construction Act of 1930, and the Emergency Relief and Construction Act of 1932. To this sum the National Industrial Recovery Act of 1933 added \$5,000,000, and the Hayden-Cartwright Act of June 18, 1934, added \$2,500,000 for each of the fiscal years 1936 and 1937. The authorization for 1937 was canceled by the Agricultural Appropriation Act of June 4, 1936. The Emergency Appropriation Act for the fiscal year 1935, approved June 19, 1934, provided \$2,500,000 for the fiscal year 1935. Authorizations of \$2,500,000 for the fiscal years 1938 and 1939 were provided by the act of June 16, 1936.

Of the total of \$20,000,000 authorized, \$15,000,000 has been appropriated and apportioned. This includes all funds for all years through 1936. Funds for 1938 and 1939 have not been apportioned. A deduction of \$125,000 for administrative purposes was made from the first \$5,000,000 only. Tables 17, 18, and 19 show the progress made in expending the funds in the several States, together with the unobligated balance by States.

TABLE 17.—Public-lands funds allotted to projects completed during the fiscal year ended June 30, 1936

State	Public-lands funds	Estimated total cost	Miles	State	Public-lands funds	Estimated total cost	Miles
Arizona.....	\$377,865	\$381,717	8.0	Oklahoma.....	\$23,054	\$39,492	1.9
California.....	397,185	440,623	50.1	Oregon.....	285,260	298,786	20.8
Colorado.....	217,657	215,589	9.9	South Dakota.....	133,010	150,452	8.8
Idaho.....	184,234	185,477	34.4	Utah.....	347,308	374,992	53.2
Montana.....	131,585	132,364	11.8	Washington.....	94,560	103,340	3.7
Nevada.....	556,277	601,215	165.9	Wyoming.....	202,545	204,692	52.0
New Mexico.....	43,466	42,573	7.3				
North Dakota.....	25,136	25,195	8.2	Total.....	3,019,142	3,196,507	436.0

TABLE 18.—Public-lands funds allotted to projects under contract and under construction, June 30, 1936

State	Public-lands funds	Estimated total cost	Miles	State	Public-lands funds	Estimated total cost	Miles
Arizona.....	\$280,471	\$290,565	33.7	Oregon.....	\$78,401	\$85,686	7.7
California.....	119,364	119,364	7.7	South Dakota.....	20,529	20,529	5.1
Colorado.....	115,245	120,657	4.4	Utah.....	138,165	140,645	10.1
Montana.....	133,528	133,528	6.7	Wyoming.....	153,137	153,139	39.5
Nevada.....	421,935	421,935	83.6				
New Mexico.....	362,708	409,128	20.2	Total.....	1,845,696	1,917,389	224.7
North Dakota.....	22,213	22,213	6.0				

TABLE 19.—Public-lands funds allotted to projects approved but not under contract, June 30, 1936

State	Public-lands funds	Estimated total cost	Miles	Balance available for new projects	State	Public-lands funds	Estimated total cost	Miles	Balance available for new projects
Arizona.....	\$13,000	\$13,000	-----	\$67,711	Oklahoma.....	-----	-----	-----	\$23,162
California.....	5,000	5,000	-----	272,504	South Dakota.....	-----	-----	-----	75,952
Idaho.....	-----	-----	-----	52,209	Utah.....	\$83,376	\$93,131	3.9	937
Montana.....	-----	-----	-----	11,236	Wyoming.....	-----	-----	-----	18,368
Nevada.....	79,952	85,033	15.4	59,910					
New Mexico.....	-----	-----	-----	12,852	Total.....	186,528	201,364	36.1	635,053
North Dakota.....	5,200	5,200	16.8	40,212					

Some of the outstanding improvements, from the viewpoint of continuous construction, are: The Goldfield-Las Vegas Highway, in Nevada; the Kingman-Boulder Dam Highway, in Arizona; the Correo-to-west-of-Acomita Highway, in New Mexico; the Moapa-Caliente Highway, in Nevada; and the Central Oregon Highway, in Oregon.

Six sections, totaling about 126 miles, on the Goldfield-Las Vegas Highway in Nevada, have been graded, drained, and surfaced with low-cost bituminous mixture. A seventh section is under construction.

The Kingman-Boulder Dam Highway, in Arizona, forming part of an important through route across the Colorado River, has been constructed, to a considerable extent, with Federal-lands funds. About 25.2 miles of graded and drained road have been completed, and a bituminous surface is now being placed.

About 14 miles of grading and surfacing with bituminous mixture has been completed on the Correo-to-west-of-Acomita Highway, in New Mexico. A third section, about 6.3 miles in length, is under construction, and a fourth section, 4 miles long, has been advertised for contract.

The Moapa-Caliente Highway, in Nevada, was constructed largely with Federal-lands funds. Approximately 54 miles have been surveyed, graded, drained, and surfaced with bituminous mixture. Another section, about 30 miles in length, is under construction.

The so-called Central Oregon Highway has been graded, drained, and surfaced with selected material for a length of 18.2 miles. A seventh section is under construction.

Table 20 shows, by types of construction, the mileage of Federal-lands highways completed as of June 30, 1936.

TABLE 20.—Federal-lands roads completed at end of year, by types of construction

State	Graded and drained	Gravel	Bituminous treated	Bituminous mixture	Bituminous macadam	Bituminous concrete	Port-land-cement concrete	Bridges	Total
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles
Arizona.....	26.6	23.3		49.1				0.3	99.3
California.....	7.7	13.8		52.5				.3	74.3
Colorado.....		10.6		7.9				.1	18.6
Idaho.....	1.8	31.7		31.5					65.0
Montana.....		37.3		11.8				.2	49.3
Nevada.....		44.5		304.6				.1	349.2
New Mexico.....		8.6	10.8	18.5			6.0	.2	44.1
North Dakota.....	15.4	10.0						.1	25.5
Oklahoma.....				5.6		1.8	2.5		9.9
Oregon.....	42.4	72.7						.1	115.2
South Dakota.....	8.8	2.8							11.6
Utah.....		32.3		113.6		6.8		.1	152.8
Washington.....	3	14.3			2.6		3.7	.1	21.0
Wyoming.....		36.0	15.6	72.1				.3	124.0
Total.....	103.0	337.9	26.4	667.2	2.6	8.6	12.2	1.9	1,159.8

RESTORATION OF FLOOD-DAMAGED ROADS

The funds authorized in the years 1928 through 1931 for the reconstruction of flood-damaged roads in 11 States are now nearly expended.

At the beginning of the fiscal year all authorized funds had been absorbed in completed work in Vermont, New Hampshire, South Carolina, and Florida. All work planned in Arkansas and Georgia had been completed, and a portion of the funds authorized for these States had lapsed, as reported last year.

During the fiscal year 22 miles of flood-relief construction was completed, and 28 miles was under construction at the end of the year, as shown in tables 21 and 22. Unobligated balances remained available as follows: Arkansas, \$322,306; Louisiana, \$115,390; Mississippi, \$282,733; and Kentucky, \$405,232.

TABLE 21.—*Flood-relief funds allotted to projects completed during the fiscal year ended June 30, 1936*

State	Flood-relief funds	Estimated total cost	Miles
Kentucky.....	\$95, 012	\$211, 302	14. 1
Missouri.....	84, 114	186, 625	7. 9
Georgia.....	18, 213	39, 013	. 5
Total.....	197, 339	436, 940	22. 5

TABLE 22.—*Flood-relief funds allotted to projects under contract and under construction, June 30, 1936*

State	Flood-relief funds	Estimated total cost	Miles
Kentucky.....	\$94, 653	\$212, 986	15. 6
Louisiana.....	65, 920	131, 841	10. 5
Missouri.....	46, 752	104, 735	1. 3
Total.....	112, 672	236, 576	11. 8
Georgia.....	7, 864	23, 620	. 4
Grand total.....	215, 189	473, 182	27. 8

The Hayden-Cartwright Act of June 18, 1934, authorized the Secretary of Agriculture to use not to exceed \$10,000,000 from any funds available for expenditure under the Federal Highway Act in the repair and reconstruction of flood-damaged highways on the Federal-aid system and authorized future appropriation of funds expended for such a purpose. This provision made possible the taking of immediate steps to repair damage caused by the destructive floods in eastern States during the spring of 1936 without waiting for specific authorization of funds. Funds allotted to projects during the year are shown in table 23.

TABLE 23.—*Emergency relief (flood damage) funds allotted to projects during the fiscal year ended, June 30, 1936*

COMPLETED

State	Emergency-relief funds	Estimated total cost	Miles
Colorado.....	\$268, 181	\$481, 567	0. 8
Kansas.....	54, 195	108, 390	. 2
Nebraska.....	13, 820	27, 641	. 1
New York.....	24, 350	59, 174
Total.....	360, 546	676, 772	1. 1

UNDER CONTRACT

Colorado.....	\$207, 904	\$371, 257	0. 3
Kansas.....	103, 231	206, 462	. 4
Nebraska.....	189, 579	379, 158	. 6
New York.....	398, 800	824, 500	. 4
Oklahoma.....	3, 477	6, 953	. 3
Texas.....	158, 835	341, 382	1. 2
Total.....	1, 061, 826	2, 129, 712	3. 2

APPROVED

Kansas.....	\$279, 174	\$705, 362	0. 7
New York.....	21, 950	44, 950
Total.....	301, 124	750, 312	. 7

At the close of the year plans were nearing completion for an extensive program of restoration, both on and off the Federal-aid system. The work was to be financed with the special flood-relief funds provided by the Hayden-Cartwright Act, unobligated Works Program highway funds, funds to be supplied by the Works Progress Administration, and State funds.

WORK RELIEF HIGHWAY PROJECTS

Work Relief highway projects, begun in the fall of 1933 to relieve distress in particular areas stricken by drought and a scourge of grasshoppers, have been continued since in areas needing special relief. Road work has been carried on by an arrangement under which the Public Works Administration has granted amounts necessary to pay costs of materials and equipment, limited to not more than 30 percent of the total expenditure and the labor has been supplied from relief rolls and paid first by the Federal Emergency Relief Administration and later by the Works Progress Administration.

Under this arrangement the Bureau of Public Roads, cooperating with the respective State highway departments, has assumed the responsibility of supervising the road work.

Work of this kind was completed during the year on 2,718 miles of road, bringing the total to date to 4,490 miles. At the close of the year work was in progress on 2,902 miles of such road. The status of the work is shown in table 24.

TABLE 24.—*Status of National-Recovery Work Relief projects*

COMPLETED DURING YEAR

State	Federal funds	Total cost	Miles	State	Federal funds	Total cost	Miles
Florida.....	\$284,493	\$963,833	(1)	Texas.....	\$889,995	\$3,011,353	325.2
Kansas.....	231,690	894,034	243.9	Wisconsin.....	606,909	3,159,498	749.1
Minnesota.....	75,940	267,781	154.8	Total.....	2,942,616	12,018,585	2,718.0
North Dakota.....	554,803	2,339,837	718.5				
South Dakota.....	298,786	1,352,249	526.5				

¹ Repairs to roads and bridges damaged by floods.

UNDER CONTRACT AT END OF YEAR

State	Federal funds	Estimated total cost	Miles	State	Federal funds	Estimated total cost	Miles
Kansas.....	\$365,574	\$1,237,668	328.7	South Dakota.....	\$671,016	\$2,860,128	1,138.7
Minnesota.....	802,995	3,600,014	78.1	Texas.....	1,493,614	4,978,729	770.2
North Dakota.....	98,950	395,569	143.5	Total.....	4,002,149	14,972,108	2,901.9
Oklahoma.....	570,000	1,900,000	442.7				

LOAN-AND-GRANT HIGHWAY PROJECTS

The Public Works Administration continued the policy of financing or aiding, by loans or grants or both, in the financing of the construction of roads in a number of States. Projects of this kind are initiated by their sponsors with the Public Works Administration and, after agreement has been reached and funds allotted, are turned over to the Bureau of Public Roads for detailed administration of construction.

Work of this kind was begun in 1934 under the National Industrial Recovery Act and was continued during the past year with funds allocated under the authorization in the Emergency Relief Appropriation Act of 1935. Up to the present loans and grants of \$39,200,981 have been made for specific projects 7,625 miles in length and estimated to cost \$82,457,583. Loans and grants of \$12,929,791 on 3,225 miles were made during the past year. Details by States are shown in table 25.

TABLE 25.—Status on June 30, 1936, of loan-and-grant Public Works projects transferred by the Public Works Administration to the Bureau of Public Roads for supervision and audit

ALLOTMENTS FROM NATIONAL INDUSTRIAL RECOVERY ACT

State	Funds allotted by Public Works Administration			Miles	Estimated total cost	Funds assigned		
	Tentative allotment by Special Board for Public Works	Allotment by contracts executed				Grant	Loan	Other
		Grant	Loan					
Alabama.....	\$71,147.38	\$20,756.65	\$50,390.73	6.7	\$70,560.13	\$20,756.65	\$49,559.65	\$243.83
California.....	1,310,863.65	1,310,863.65	-----	16.4	4,587,141.59	1,310,863.65	-----	3,276,277.94
Connecticut.....	1,143,853.78	1,143,853.78	-----	68.8	4,503,060.79	1,121,353.78	-----	3,383,707.01
Illinois.....	2,431,895.18	2,431,895.18	-----	99.1	7,830,209.63	2,335,951.73	-----	5,494,257.90
Indiana.....	200,662.04	200,662.04	-----	34.5	765,283.83	200,662.04	-----	564,631.79
Iowa.....	307,586.75	307,586.75	-----	822.6	1,011,287.36	295,276.05	-----	716,011.31
Kansas.....	5,121,588.18	1,296,588.18	3,825,000.00	409.2	5,088,510.40	1,514,821.88	3,252,772.15	320,916.37
Louisiana.....	269,258.33	88,258.33	181,000.00	47.3	300,515.08	88,258.33	181,000.00	31,256.75
Maryland.....	5,411,866.00	1,411,866.00	4,000,000.00	72.2	5,090,357.16	1,408,168.25	3,541,100.08	141,088.83
Massachusetts.....	1,623,644.93	1,623,644.93	-----	105.1	5,542,582.45	1,602,426.45	-----	3,940,155.95
Michigan.....	10,000.00	10,000.00	-----	29.0	39,818.00	10,000.00	-----	29,818.00
Minnesota.....	1,368,671.72	983,671.72	385,000.00	477.0	2,874,823.53	841,377.91	301,280.40	1,732,165.22
Mississippi.....	569,286.00	169,286.00	400,000.00	75.4	2,478,112.92	143,433.55	334,679.07	2,757,762.36
Missouri.....	1,026,000.00	1,026,000.00	-----	50.7	3,780,944.30	1,023,181.94	-----	128,460.22
Montana.....	1,829,000.00	579,000.00	1,250,000.00	697.9	1,955,462.56	579,000.00	1,250,000.00	128,460.22
Nebraska.....	11,500.00	11,500.00	-----	59.5	40,120.22	11,500.00	-----	2,757,762.36
New York.....	1,481,707.31	512,707.31	969,000.00	30.9	1,464,329.72	423,558.25	488,018.83	559,972.64
Ohio.....	794,677.63	138,677.63	656,000.00	30.1	497,345.51	138,677.63	150,850.00	207,817.88
South Carolina.....	81,283.31	21,283.31	60,000.00	28.1	67,316.64	20,194.99	47,121.65	1,755,148.42
Texas.....	1,478,576.81	936,576.81	542,000.00	238.3	3,219,514.55	922,566.13	642,000.00	1,755,148.42
Washington.....	2,355,166.42	2,355,166.42	-----	1,460.4	8,170,478.18	2,297,264.70	-----	5,873,213.48
West Virginia.....	2,000,000.00	2,000,000.00	-----	440.8	6,364,626.67	1,880,137.89	-----	4,479,488.78
Wisconsin.....	454,800.00	17,800.00	437,000.00	88.5	514,671.60	17,800.00	427,625.54	69,746.06
Total.....	31,353,035.42	18,597,644.69	12,755,390.73	5,385.5	64,259,082.77	18,215,332.10	10,566,007.37	35,477,743.30

TABLE 25.—Status on June 30, 1936, of loan-and-grant Public Works projects transferred by the Public Works Administration to the Bureau of Public Roads for supervision and audit—Continued

ALLOTMENTS FROM EMERGENCY RELIEF APPROPRIATION ACT OF 1935

State	Funds allotted by Public Works Administration		Mileage, estimated cost, and funds assigned to specific projects approved under Public Works Administration allotments	Funds assigned				
	Tentative allotment by Special Board for Public Works	Allotment by contracts executed		Estimated total cost	Grant	Loan	Other	
		Grant						Loan
California.....	\$58,854.00	\$58,854.00	0.7	\$149,978.33	\$67,490.25		\$82,488.08	
Florida.....	72,424.00	72,424.00	59.4	392,108.81	173,895.30		218,713.51	
Illinois.....	177,173.00	177,173.00	583.8	578,185.79	257,959.93		320,340.92	
Iowa ¹	312,709.93	287,959.93		1,007,711.37	453,470.12		554,241.25	
Maryland.....	1,000,000.00	1,000,000.00	12.6	31,000.00			18,625.00	
Michigan.....	12,375.00	12,375.00	69.2	267,769.58	117,532.84		150,236.74	
Minnesota ²	158,823.00	131,910.00	406.4	8,190,254.94	3,685,614.15	\$1,466,906.80	3,037,733.90	
Mississippi ³	28,539,836.00	15,039,836.00	365.3	902,522.00	406,134.20		3,496,387.80	
Missouri.....	462,029.00	407,029.00	18.5	15,830.45	7,123.70		8,706.75	
Nebraska.....	12,465.00	12,465.00	5.4	393,132.44	150,406.80		244,725.64	
New York ⁴	226,054.00	120,600.00	229.4	800,632.93	357,498.01		33,393.15	
Ohio.....	363,481.00	363,481.00	69.0	167,232.26	75,254.51		84,473.53	
South Carolina ⁵	768,090.00	391,090.00	298.3	4,360,168.72	1,890,651.91		1,979,516.81	
Texas.....	2,456,011.00	1,964,011.00	20.6	70,737.37	27,000.00		43,737.37	
Utah.....	27,000.00	27,000.00	88.2	869,232.52	368,697.46		505,538.06	
Washington ⁶	386,091.00	363,488.00						
Total.....	35,456,415.93	20,373,675.93	2,239.4	18,198,500.51	8,045,489.12	2,374,152.88	7,778,858.51	

¹ Grant to be increased \$24,750.
² Grant to be increased \$26,883.
³ Loan to be reduced \$5,000,000.
⁴ Loan and grant to be increased \$105,454.
⁵ Loan to be reduced \$101,000.
⁶ Grant to be increased \$82,653.

NATIONAL-FOREST ROAD CONSTRUCTION

The two principal classes of forest roads are designated as forest highways and forest-development roads. The latter, as the name implies, serve primarily for the development of the forests; the former are roads of a higher order of traffic importance, generally those joining sections of the Federal-aid or State highway systems outside of the forests, or important community-service roads requiring improvement generally more expensive than that required on forest-development roads.

In the main, the work supervised by the Bureau is limited to the construction of forest highways; forest-development road work is generally administered by the Forest Service. But, while this definition of the work of the two bureaus is approximately correct, the exact line of separation is drawn between what are termed major and minor projects. Major projects administered by the Bureau include all projects in the forest-highway system except those that do not require the technical services of a highway-engineering organization or those having an estimated average cost of less than \$2,000 per mile. Those forest-development road projects of estimated average cost greater than \$5,000 per mile and those requiring technical services are also classed as major projects.

At the beginning of the fiscal year the major forest-road work under contract amounted to \$7,261,605, and \$8,172,286 was available for new work, of which \$5,386,265 had been assigned to projects for which plans were being prepared. The \$8,172,286 available for new work comprised \$7,000,000 authorized by the Hayden-Cartwright Act of June 18, 1934, for the fiscal year 1936 and \$1,172,286 from previous authorizations.

During the year work costing \$8,431,047 was put under contract, and completed work amounted to \$9,814,024. At the close of the year, work under contract amounted to \$5,878,628, and \$6,741,239 was available for new work of which \$4,700,000 was assigned to work being planned. These funds include \$7,000,000 for forest highways authorized by the Hayden-Cartwright Act of June 18, 1934 for the fiscal year 1937 and made available shortly before the close of the fiscal year.

The act of June 16, 1936 authorized \$14,000,000 for forest highways, roads, and trails for each of the fiscal years 1938 and 1939.

In accordance with requirements of the governing rules and regulations a system of forest highways has been designated by concurrent action of the several State highway departments, the Forest Service, and the Bureau of Public Roads and approved by the Secretary of Agriculture. Also, as required by the rules and regulations, the highways constituting this system have been classified as follows:

Class 1. Forest roads forming sections of the Federal-aid highway system, either wholly within or, when so designated by the Forester and the Chief of the Bureau of Public Roads, partly without and adjacent to the national forests.

Class 2. Forest roads, not of class 1, which are parts of approved State highway systems, when so designated by the Forester and the Chief of the Bureau of Public Roads.

Class 3. All other forest roads of primary importance to counties or communities.

The roads which, according to these definitions, had been classified as forest highways, had an aggregate length at the end of the fiscal year of 17,649 miles, an increase of 286 miles during the year. The mileage by classes is shown in table 26.

During the past year improvements were completed on 236 miles of the forest-highway system, bringing the total mileage improved to date with Federal funds to 6,466 miles. Of the mileage improved during the year, 181 miles were in the Western States and Alaska, and the remaining 55 miles were in the forests of 18 Eastern States. Of the total mileage improved to date, 5,887 miles are in the West, and 579 miles are in the East.

The mileage of forest highways completed during the year and to date by States is shown in table 27.

TABLE 26.—Classification of the mileage of the forest-highway system at end of fiscal year 1936

	Class 1	Class 2	Class 3	Total
	Miles	Miles	Miles	Miles
Western:				
Alaska.....			484.9	484.9
Arizona.....	324.7	281.2	460.8	1,066.7
California.....	618.0	1,302.0	528.2	2,448.2
Colorado.....	524.0	1,166.0	94.0	1,784.0
Idaho.....	721.2	165.3	191.5	1,078.0
Montana.....	666.0	286.8	231.0	1,183.8
Nevada.....	104.6	255.4	100.2	460.2
New Mexico.....	164.0	518.0		682.0
Oregon.....	720.7	324.5	318.6	1,363.8
South Dakota.....	227.0		86.0	313.0
Utah.....	95.6	567.2	67.2	730.0
Washington.....	386.5	135.4	247.9	769.8
Wyoming.....	387.3	37.0	217.7	642.0
Total.....	4,939.6	5,038.8	3,028.0	13,006.4
Eastern:				
Alabama.....	4.0		31.0	35.0
Arkansas.....	192.3	144.3	90.5	427.1
Florida.....	39.7	135.0	36.3	211.0
Georgia.....	41.8	37.5	68.7	148.0
Illinois.....			24.0	24.0
Kentucky.....	41.0	58.0	13.0	112.0
Louisiana.....	48.3	118.7	38.0	205.0
Maine.....			11.0	11.0
Michigan.....	49.9	108.5	150.3	308.7
Minnesota.....	179.4	217.7	207.4	604.5
Mississippi.....	32.0	13.0	69.7	114.7
Missouri.....			8.0	8.0
Nebraska.....			28.8	28.8
New Hampshire.....	41.5	60.5	49.0	151.0
North Carolina.....	102.0	105.3	48.3	255.6
Oklahoma.....	31.5		70.5	102.0
Pennsylvania.....	134.0	250.9	39.0	423.9
Puerto Rico.....			21.0	21.0
South Carolina.....		26.0	15.6	41.6
Tennessee.....	83.8	105.0	79.0	267.8
Texas.....			35.0	35.0
Vermont.....	7.0		12.0	19.0
Virginia.....	79.0	127.9	210.0	416.9
West Virginia.....	137.0	182.0	62.0	381.0
Wisconsin.....	5.0	148.9	136.1	290.0
Total.....	1,249.2	1,839.2	1,554.2	4,642.6
Grand total.....	6,188.8	6,878.0	4,582.2	17,649.0

TABLE 27.—Mileage of forest highways completed during the fiscal year and total completed to June 30, 1936

State	During 1936	Total to June 30, 1936	State	During 1936	Total to June 30, 1936
	Miles	Miles		Miles	Miles
Western:			Eastern—Continued.		
Alaska.....	4.9	253.0	Georgia.....		21.0
Arizona.....	33.9	560.4	Illinois.....		1.5
California.....	14.0	771.9	Michigan.....	4.4	43.3
Colorado.....	20.6	517.2	Minnesota.....	4.2	113.0
Idaho.....	29.6	669.9	Missouri.....	8.1	8.1
Montana.....	24.3	595.4	Nebraska.....		8.7
Nevada.....	4.8	157.7	New Hampshire.....		13.2
New Mexico.....	6.9	305.0	North Carolina.....	1.3	50.9
Oregon.....	10.1	980.2	Oklahoma.....	.7	16.1
South Dakota.....		61.2	Pennsylvania.....	1.1	7.1
Utah.....	17.0	346.7	South Carolina.....		15.6
Washington.....	8.3	316.0	Tennessee.....	7.7	45.1
Wyoming.....	6.4	352.7	Virginia.....	1.9	22.9
Total.....	180.8	5,837.3	West Virginia.....		6.2
Eastern:			Wisconsin.....	14.7	14.7
Alabama.....		5.1	Total.....	54.8	579.1
Arkansas.....	10.7	125.0	Grand total.....	235.6	6,466.4
Florida.....		61.6			

The forest highways completed to the end of the fiscal year by types are shown in table 28. Those under construction at that time are shown in table 29.

TABLE 28.—Completed forest highways by types, by States

State	Graded and drained	Sand clay	Traffic-bound surfaces of miscellaneous materials	Bituminous surface treated	Low-cost bituminous mix	Bituminous macadam	Portland cement concrete	Bridges	Total
Western States:	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
Alaska.....	-----	-----	250.1	-----	-----	-----	-----	2.9	253.0
Arizona.....	227.4	-----	293.7	-----	15.4	23.4	-----	.5	560.4
California.....	255.2	-----	214.6	210.5	89.3	-----	-----	2.3	771.9
Colorado.....	153.6	-----	236.4	56.1	70.7	-----	-----	.4	517.2
Idaho.....	289.2	-----	320.8	58.0	-----	-----	-----	1.9	669.9
Montana.....	208.3	-----	285.4	-----	99.8	-----	-----	1.9	595.4
Nevada.....	44.3	-----	51.4	-----	62.0	-----	-----	(1)	157.7
New Mexico.....	50.5	-----	197.8	3.3	53.3	-----	-----	.1	305.0
Oregon.....	177.2	-----	615.6	135.6	35.2	14.6	0.1	1.9	980.2
South Dakota.....	-----	-----	47.7	13.5	-----	-----	-----	-----	61.2
Utah.....	139.4	-----	184.3	-----	22.5	-----	-----	.5	346.7
Washington.....	72.0	-----	242.7	-----	-----	-----	-----	1.3	316.0
Wyoming.....	43.8	-----	242.6	-----	66.0	-----	-----	.8	352.7
Total.....	1,660.9	-----	3,183.1	477.0	514.2	38.0	.1	14.0	5,887.3
Eastern States:									
Alabama.....	-----	-----	5.1	-----	-----	-----	-----	-----	5.1
Arkansas.....	98.3	-----	26.1	-----	-----	-----	-----	.6	125.0
Florida.....	-----	4.3	-----	26.6	29.8	-----	-----	.9	61.6
Georgia.....	11.2	-----	9.8	-----	-----	-----	-----	(1)	21.0
Illinois.....	-----	-----	1.5	-----	-----	-----	-----	-----	1.5
Michigan.....	-----	-----	43.3	-----	-----	-----	-----	(1)	43.3
Minnesota.....	34.9	3.6	52.4	12.8	9.2	-----	-----	.1	113.0
Missouri.....	-----	-----	8.1	-----	-----	-----	-----	-----	8.1
Nebraska.....	8.7	-----	-----	-----	-----	-----	-----	-----	8.7
New Hampshire.....	-----	-----	-----	13.2	-----	-----	-----	(1)	13.2
North Carolina.....	14.1	-----	6.6	30.2	-----	-----	-----	(1)	50.9
Oklahoma.....	.8	-----	15.3	-----	-----	-----	-----	(1)	16.1
Pennsylvania.....	-----	-----	-----	1.7	5.4	-----	-----	-----	7.1
South Carolina.....	-----	-----	-----	15.6	-----	-----	-----	-----	15.6
Tennessee.....	-----	-----	45.1	-----	-----	-----	-----	-----	45.1
Virginia.....	3.5	-----	2.2	10.7	6.5	-----	-----	(1)	22.9
West Virginia.....	-----	-----	2.6	3.6	-----	-----	-----	(1)	6.2
Wisconsin.....	.5	-----	14.2	-----	-----	-----	-----	-----	14.7
Total.....	172.0	7.9	232.3	114.4	50.9	-----	-----	1.6	579.1
Grand total.....	1,832.9	7.9	3,415.4	591.4	565.1	38.0	.1	15.6	6,466.4

¹ Less than 0.1 mile.

TABLE 29.—Mileage of forest highways under construction, June 30, 1936

State	Graded and drained	Traffic-bound surfaces of miscellaneous materials	Water-bound macadam	Bituminous surface treated	Low-cost bituminous mix	Bituminous macadam	Portland-cement concrete	Total
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles
Western States:								
Alaska.....	16.3	30.7						47.0
Arizona.....	28.2	12.7						40.9
California.....	40.0			52.1	1.9			94.0
Colorado.....		14.8			13.6			28.4
Idaho.....	19.6	25.3			12.2			57.1
Montana.....	6.3			29.8	12.1			48.2
Nevada.....				16.1				16.1
New Mexico.....		18.6						18.6
Oregon.....	43.5	15.8					0.2	59.5
South Dakota.....					7.6			7.6
Utah.....		8.6						8.6
Washington.....	19.5							19.6
Wyoming.....	2.6							2.6
Total.....	176.0	126.5		98.0	47.4		.2	1 448.2
Eastern States:								
Florida.....								1.1
Georgia.....		8.1						8.1
Kentucky.....								(¹)
Michigan.....		13.4						13.4
Minnesota.....	6.0							6.0
New Hampshire.....			14.0					14.0
Pennsylvania.....						2.0		2.0
West Virginia.....	2.4							2.4
Wisconsin.....	1.5							1.5
Total.....	9.9	21.5	14.0			2.0		1 47.5
Grand total.....	185.9	148.0	14.0	98.0	47.4	2.0	.2	495.7

¹ Includes 0.1 mile of bridges.

² Less than 0.1 mile of bridges.

Construction of roads in the national forests is carried on continuously with annual authorizations of funds. The work consists largely of extensions of previous improvements to close gaps in important State and Federal-aid routes and the construction of important recreational highways.

Examples of such construction in Montana are the Clark Fork Highway and the Columbia Falls-Glacier Park Highway; in Oregon, the Willamette, Santiam, North Santiam, and John Day-Burns Highways; in Washington, the Randle-Yakima Highway; in Arizona, the Oak Creek and Clifton-Alpine Highways; in California, the Lava Beds, Howard Gulch, Placerville-Lake Tahoe, and Mount Shasta-Mount Lassen Highways; in Colorado, the South St. Vrain, Berthoud Pass, Loveland-Fremont Pass, and Mount Evans Highways; in New Mexico, the James Canyon Highway; in Wyoming, the Buffalo-Tensleep Highway; in Idaho, the North Pacific Highway, Sawtooth Park Highway, and Yellowstone Park Highway; in Utah, the Logan-Garden City Highway.

The Lewis and Clark Highway in Idaho and the Catalina Highway in Arizona are so located that Federal-prison labor can be conveniently used, and prisoners are being used on a portion of the construction.

A large mileage of clay-bound crushed-stone and gravel roads is being surfaced by applying bituminous materials and blading or processing the existing road material. Additional stone or gravel is added where necessary.

The employment on forest-highway work during the last 12 months will be found in table 2.

ROAD CONSTRUCTION IN NATIONAL PARKS AND MONUMENTS

Under an agreement of several years standing, construction of roads in or leading to national parks and monuments is supervised by the Bureau of Public Roads. During the fiscal year 1936 construction was completed on 204 miles of such roads, making a total of 1,124 miles thus far improved. Tables 30 and 31 show the location and the types of the completed roads.

TABLE 30.—Highways completed in or leading to national parks and monuments

Park or monument	Completed during 1936	Total to June 30, 1936	Park or monument	Completed during 1936	Total to June 30, 1936
	<i>Miles</i>	<i>Miles</i>		<i>Miles</i>	<i>Miles</i>
Acadia.....	4.0	12.4	Meriwether Lewis.....	1.9	1.9
Bryce Canyon.....		21.9	Mesa Verde.....		20.4
Carlsbad Caverns.....		8.4	Morristown.....		1.7
Chickamauga-Chatanooga.....	10.4	10.4	Mount Rainier.....	12.3	75.4
Colonial.....		10.9	National Capital Parks.....	3.1	4.9
Crater Lake.....	7.8	53.6	Petersburg.....	2.3	5.8
Devils Tower.....		.3	Petrified Forest.....		26.3
Fredericksburg-Spotsylvania.....	16.4	16.4	Rocky Mountains.....		43.1
General Grant.....		6.4	Scotts Bluff.....		.6
George Washington Birthplace.....	2.6	2.6	Sequoia.....	3.4	46.1
Gettysburg.....	2.9	2.9	Shenandoah.....	31.2	71.3
Glacier.....		55.7	Vicksburg.....	4.6	4.6
Grand Canyon.....	7.7	162.1	Wind Cave.....		15.9
Great Smoky Mountains.....	7.7	11.7	Yellowstone.....	72.2	250.8
Hawaii.....		35.6	Yosemite.....	9.6	86.3
Hot Springs.....	3.5	3.5	Zion.....		18.9
Lassen Volcanic.....		35.3			
			Total.....	203.6	1,124.1

TABLE 31.—Highways completed in or leading to national parks and monuments at end of fiscal year 1936, by types

Park	Graded and drained	Gravel	Bituminous treated	Bituminous mixture	Bituminous macadam	Bituminous concrete	Portland-cement concrete	Bridges	Total
	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>	<i>Miles</i>
Acadia.....			4.2		8.2				12.4
Bryce Canyon.....				21.9					21.9
Carlsbad Caverns.....				8.4					8.4
Chickamauga-Chatanooga.....				10.4					10.4
Colonial.....	1.2		.7				8.8	0.2	10.9
Crater Lake.....	12.0	25.0	1.9	7.8	6.8			.1	53.6
Devils Tower.....								.3	.3
Fredericksburg-Spotsylvania.....			16.3					.1	16.4
General Grant.....	6.4								6.4
George Washington Birthplace.....			2.6						2.6
Gettysburg.....				.8		2.1			2.9
Glacier.....		30.6	25.0					.1	55.7
Grand Canyon.....		8.3		139.1	14.6			.1	162.1
Great Smoky Mountains.....		7.7		4.0					11.7
Hawaii.....			10.6	9.0	16.0				35.6
Hot Springs.....			3.5						3.5
Lassen Volcanic.....		.6	4.8	29.9					35.3
Meriwether Lewis.....				1.9					1.9
Mesa Verde.....				20.4					20.4
Morristown.....		1.7							1.7
Mount Rainier.....	21.8	25.4			27.9			.3	75.4
National Capital Parks.....	1.1					3.7		.1	4.9
Petersburg.....			5.8						5.8
Petrified Forest.....		26.1						.2	26.3
Rocky Mountain.....		6.9	4.2	32.0					43.1
Scotts Bluff.....	.6								.6
Sequoia.....	6.3		30.6	9.2					46.1
Shenandoah.....	5.5	31.4		34.4					71.3
Vicksburg.....	5.5	.1					4.5		4.6
Wind Cave.....			8.6	7.3					15.9
Yellowstone.....	24.1	20.2	154.3	52.0				.2	250.8
Yosemite.....	13.8		25.9	16.1	14.0	10.0	6.2	.3	86.3
Zion.....				17.8			1.0	.1	18.9
Total.....	92.8	184.0	299.0	422.4	87.5	15.8	20.5	2.1	1,124.1

New highway construction is fast closing the gaps that have existed in the long routes that go to make up the park system of highways. Work in Yellowstone Park is an outstanding example of this development. During the past year 72 miles were completed in this park. This mileage includes construction on the Grand Loop, South Entrance, East Entrance, and Tower Junction-Cooke City roads.

The Red Lodge-Cooke City approach road to Yellowstone and the Cameron-Desert View approach road to Grand Canyon National Park were both completed during the year.

In Shenandoah National Park construction of the Skyline Drive, 96 miles in length, is progressing rapidly. The northern section of this drive, between Thornton Gap and Front Royal, is completed, a total of approximately 64 miles completed to date. Two sections between Swift Run Gap and Jarman Gap totaling approximately 17 miles in length are under construction, leaving only about 15 miles to be awarded to contract; plans for this work are being rapidly developed. The Skyline Drive is the outstanding national-park highway in the East, following closely the crest of the Blue Ridge Mountains and offering spectacular scenic views to the tourist almost continuously throughout its length.

A Blue Ridge Parkway is being planned as an extension of the Skyline Drive, following closely the crest of the Blue Ridge Mountains through Virginia, North Carolina, and Tennessee, to the Great Smoky Mountains National Park, a distance of approximately 460 miles. Surveys are being made rapidly along this route. Contracts have been let for 16 sections, 7 in Virginia and 9 in North Carolina, with an aggregate length of approximately 119 miles, at an estimated cost of \$4,221,000.

Rivaling the Skyline Drive in prominence and scenic beauty is the park highway being constructed across the Great Smoky Mountains through the pass at Newfound Gap and across the boundary line between North Carolina and Tennessee. This highway is approximately 30 miles in length, and is one of the highest park highways in the East.

The old Natchez Trace, obtained by treaty with the Indians in 1801, was used as an early pioneer road between Nashville, Tenn., and Natchez, Miss., and is approximately 470 miles in length. A portion of this historic old road is at present being surveyed.

Table 32 shows the park and monument highways under construction at the close of the fiscal year, segregated by types of construction. Most of this work consists of the further improvement of roads previously improved under the direction of the Bureau.

TABLE 32.—Highways under construction in or leading to national parks and monuments at end of fiscal year 1936, by types

Park	Graded and drained	Gravel	Bituminous treated	Bituminous mixture	Portland-cement concrete	Bridges	Total
	Miles	Miles	Miles	Miles	Miles	Miles	Miles
Blue Ridge Parkway		118.6				0.1	118.7
Chalmette					0.5		.5
Chickamauga-Chatanooga					7.3		7.3
Colonial							1.1
Crater Lake	1.1			20.5			47.0
Fort Donelson	14.2	12.3		2.8			2.8
Fredericksburg-Spotsylvania			5.0	5.0			10.0
Glacier	19.9					.1	20.0
Grand Canyon			9.1	32.0			41.1
Great Smoky Mountains		10.5					10.5
Kill Devil Hill			1.3				1.3
Morristown		.9					.9
Mount Rainier	6.1	11.9					18.0
Petersburg	1.3						1.3
Petrified Forest				25.3			25.3
Rocky Mountain	8.1			4.5			12.6
Scotts Bluff	.9						.9
Sequoia				16.3			16.3
Shenandoah		17.1					17.1
Shiloh				3.5	5.7		9.2
Wind Cave				8.6			8.6
Yellowstone	28.7	19.9	11.6	73.7		.6	134.4
Yosemite	20.2			11.6			31.8
Total	100.5	191.2	27.0	203.8	13.5	.7	536.7

The mileages of approach roads to national parks and monuments completed, under construction, and approved for construction are reported in table 33.

TABLE 33.—*Location and length of approach roads to national parks and monuments*

Road	Park	Approved for con- struction	Com- pleted	Under con- struction
		Miles	Miles	Miles
Cameron-Desert View.....	Grand Canyon.....	28.1	-----	28.1
South Approach.....	do.....	52.3	52.3	-----
Jacobs Lake-North Rim.....	do.....	31.2	-----	-----
Mineral-Lassen Volcanic.....	Lassen.....	8.8	18.8	-----
Sequoia-General Grant.....	Sequoia-General Grant.....	13.5	13.5	-----
Custer-Wind Cave.....	Wind Cave.....	8.6	-----	8.6
Southwest Approach.....	Yellowstone.....	13.9	13.9	-----
Moran-Yellowstone.....	do.....	24.0	5.9	-----
Red Lodge-Cooke City.....	do.....	59.6	48.1	11.5
East Approach.....	do.....	23.0	-----	12.3
Zion-Bryce Canyon.....	Zion-Bryce Canyon.....	35.0	-----	-----
Total.....	-----	298.0	142.5	60.5

¹ Includes 4.2 miles of road completed as a national-forest highway.

At the close of the fiscal year the total park road work completed by the Bureau amounted to approximately \$44,800,000. Work under construction is estimated to cost approximately \$15,750,000. Additional construction is planned that is estimated to cost \$4,800,000.

INTER-AMERICAN HIGHWAY

Considerable progress has been made during the year on the Inter-American Highway from the United States to Panama. A report of a reconnaissance survey through Panama and the republics of Central America, describing a feasible route, was made in the preceding year.

A representative of the Bureau visited the seven countries through which the highway will pass—Panama, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala, and Mexico—during September and October 1935, and interviewed high government officials to ascertain as definitely as possible the nature of the cooperative work most needed and most acceptable to the several governments. The ability of the governments to finance proposed work was studied, and a program was drawn up providing for the construction of a bridge in each of the following countries: Panama, Nicaragua, Honduras, and Guatemala. The program also included a location survey in Panama, and at the special request of Costa Rica and Nicaragua, additional reconnaissance surveys in those countries.

This program, together with proposed terms of cooperation, was submitted to the President and approved. The conditions for cooperation provide that the United States Government will furnish American bridge steel and cement with a small amount of equipment not available in the several countries for the construction of the proposed bridges; and the other countries will provide all local materials, important items of transportation and all labor necessary for the building of the substructures ready to receive the steel. In October 1935 an office was opened in San Jose, Costa Rica, and a bridge engineer was sent into the field to prepare bridge plans and specifications. The cooperative arrangements were accepted by Panama, Honduras, and Guatemala for bridge construction and by Costa Rica for the reconnaissance survey requested. The construction work was started, together with the location surveys in Panama, and before the end of the fiscal year Nicaragua also had given assurances of cooperation on the bridge and reconnaissance survey requested by that Government.

In agreeing to the terms of cooperation the Republic of Panama gave assurance that with the assistance it is receiving it will complete about 60 miles of additional road within its borders, which will complete the Central Highway to the Costa Rican frontier. Honduras agrees to continue work on the short section of the road within its border, and Guatemala has already started reconstruction of that part of the road lying between the proposed bridge and the El Salvador frontier. These assurances covering road construction provide for the completion of approximately 157 miles of highway.

Cooperative agreements cover the construction of bridges over the Chiriqui River in Panama, over the Choluteca River in Honduras, and over the Tamazulapa River in Guatemala.

Plans and specifications for these bridges are complete, and construction of the foundations and substructures of the Chiriqui bridge was started on April 1, 1936, and soon after similar work was started at Choluteca and Tamazulapa. Because of the delay in receiving assurances from Nicaragua, work had not been started on the Ochomogo bridge at the close of the fiscal year. The location survey in Panama has been completed and also the additional reconnaissance survey in Costa Rica. On June 26, 1936, proposals were requested of the leading American bridge concerns for the superstructures of the Chiriqui, Choluteca, and Tamazulapa bridges. The over-all lengths of these structures are: For the Chiriqui bridge, 787 feet; for the Choluteca bridge, 984 feet; and for the Tamazulapa bridge, 486 feet.

In April and May steps were taken to develop a supplementary program as it was apparent that the funds available would, in all probability, provide for additional smaller bridges in several of the cooperating countries. At the close of the fiscal year this supplementary program was pending.

The effects of the cooperative work are already apparent in all of the countries concerned, and especially in Costa Rica and Nicaragua. New administrations in both of those countries have indicated that road construction and improved transportation conditions will constitute major policies of the administrations.

At the end of the fiscal year Mexico had completed an excellent highway 770 miles in length from Nuevo Laredo on the Texas border to Mexico City and had announced its formal opening on July 1. At the invitation of the Mexican Government, Bureau officials participated in the formal ceremonies in connection with this opening.

TRANSPORTATION, ECONOMIC, AND STATISTICAL INVESTIGATIONS

STATE-WIDE HIGHWAY PLANNING SURVEYS

The State-wide highway planning surveys initiated in 40 States during the year constitute the most comprehensive and far-reaching economic investigation yet undertaken by the Bureau. The purposes and scope of these surveys are described on page 10. The States which are engaged in making surveys or have definitely indicated a desire to cooperate in them are listed below.

Alabama.	Kansas.	New Hampshire.	South Dakota.
Arizona.	Kentucky.	New Mexico.	Tennessee.
Arkansas.	Louisiana.	North Carolina.	Texas.
California.	Maryland.	North Dakota.	Utah.
Colorado.	Michigan.	Ohio.	Vermont.
Florida.	Minnesota.	Oklahoma.	Virginia.
Idaho.	Missouri.	Oregon.	Washington.
Illinois.	Montana.	Pennsylvania.	West Virginia.
Indiana.	Nebraska.	Rhode Island.	Wisconsin.
Iowa.	Nevada.	South Carolina.	Wyoming.

CONNECTICUT TRAFFIC SURVEY

A report of a survey of traffic on the State highway system of Connecticut has been completed and submitted to the State highway department. A digest of the report was published by the Bureau. In addition to traffic-flow data, detailed information was obtained for truck and bus traffic, as to the situs of ownership of the vehicle; its classification as owner operated, contract hauler, or common carrier; the gross load of the vehicle and contents; contact with railroad service; classification of the trip as intercity, from country to country or between city and country; and the origin and destination of the trip.

ARKANSAS TRAFFIC SURVEY

A report of a survey of traffic in Arkansas was submitted to the State highway commission and published by the State. The report includes data on the usage of the entire State highway system that will be of basic importance in planning future improvement.

SOUTH CAROLINA TRAFFIC-SAFETY SURVEY

The report on the South Carolina cooperative traffic-safety survey was completed during the year and approved for publication by the State. Volume and type of traffic, speed of vehicles, and obedience of drivers to traffic-control devices, as determined by field observations, are analyzed in detail.

TRAFFIC-CAPACITY STUDIES

Studies of the speed of vehicles in relation to traffic density and highway capacity have been continued. Analysis of field data indicates that there is no apparent correlation between speed and volume of traffic over a wide range of traffic volume and that because of inevitable irregularities in traffic flow and in individual vehicle speeds, practical highway capacity is far below maximum theoretical capacity.

NATIONAL CONFERENCE ON STREET AND HIGHWAY SAFETY

The Bureau continued its cooperation with the executive committee of the National Conference on Street and Highway Safety, especially in the promotion of uniform legislation in the various States.

AMERICAN ASSOCIATION OF MOTOR-VEHICLE ADMINISTRATORS

The Bureau has actively cooperated in the work of the American Association of Motor-Vehicle Administrators, which has undertaken an intensive research and educational program to advance uniformity in legislation, reciprocity, and safety. Under an agreement with the association, a member of the Bureau staff is serving as its executive secretary.

MAINTENANCE-COST STUDIES

Study of highway maintenance costs in relation to traffic volume under agreements with the State highway departments of Connecticut, New Hampshire, and Rhode Island has entered its second year. Traffic records for the first year, covering 52 sections of highway in New Hampshire and 31 sections in Connecticut, were completed in May, and records on 102 sections in Rhode Island were completed in July. Detailed maintenance costs on the same sections are being kept by the States. These studies are to be continued over a period of years. When sufficient data are available an analysis will be made to determine the relation between traffic volume and maintenance costs for the different types of surface.

RAILROAD-LINE ABANDONMENT STUDIES

Nine proposed railroad abandonments, totaling 287 miles, were inspected during July and August 1935 by arrangement with the Interstate Commerce Commission and the American Railway Association, to determine what additional highway facilities might be needed to replace the rail service. The work was suspended in September inasmuch as the highway-planning surveys then being undertaken were expected to supply the necessary highway data which had previously to be compiled in the field for each project separately.

HIGHWAY MANAGEMENT AND PRODUCTION-COST STUDIES**EFFECT OF HIGHWAY EXPENDITURES ON EMPLOYMENT**

Labor and employment studies have been extended so as to trace more fully the effect of highway construction on employment as its effect extends through the many contributory industries. The studies include an intensive analysis of the various progressive transactions that arise from the annual expenditures of public funds for the various types of highway-construction work.

In this analysis it was found that, as an average for all our highway construction work during the past decade, about 24.4 percent of the total cost was paid in salaries and wages to labor engaged directly on the job, 50.3 percent was paid to industrial or indirect labor as compensation for the production, preparation, transportation, and distribution of the materials, supplies, and equipment used in or in connection with the actual building of the road, while practically all of the remaining 25.3 percent of the total outlay eventually reached the workers engaged in connection with a large variety of reinvestment projects that were found to receive a direct stimulus from the construction activities within the highway field.

These are Nation-wide average figures for highway construction as a whole. However, variations on different types of construction are large. For high-type surfaces the average payments to direct labor on the job amounted to only 18 percent of the total cost, but an average of 56 percent of the total cost went to indirect labor. On the other hand, for ordinary grading work an average of 43 percent of the total cost was paid to direct labor on the job, but here only 34

percent went to indirect labor for such items as the production of materials, supplies, equipment, and their transportation and distribution. The studies show that practically all of both the indirect labor and that resulting from reinvestment of funds is in or associated with industrial activities. The stimulating influence on industrial employment of the construction of high-type highway surfaces and structures as well as the fullest utilization of modern equipment is more definitely established by the studies. Where hand labor is permitted to replace modern equipment the amount of improvement obtained with a given expenditure is materially reduced, and the benefit to indirect or industrial labor in cities becomes almost negligible. In low-type construction and grading work a large proportion of the expenditure goes to labor employed on the job. Such employment is largely made up of rural and small-town workers. On the other hand, for high-type construction and structures an equally large proportion of the total cost is eventually paid to labor, but most of this labor comes from cities. The results of these studies have been published in a special report.

EMERGENCY-EMPLOYMENT DATA

Administrative work in connection with the large program of emergency road construction has continued to occupy the time of a considerable portion of the personnel of the Division of Management. However, as administrative work is completed or the necessity for it passes, the suspended normal activities are being resumed.

Collection of information in regard to the number of men employed directly on Federal and State highway work has been continued on a monthly basis (table 2) during the past year.

Much further experience has been gained during the past year in establishing the value of low-cost rural highway construction as a local work-relief measure.

Analysis has been made of work of this kind involving 1,866 miles of grading and 3,280 miles of surfacing in 9 States. The work involved the movement of 13,328,528 cubic yards of excavation at an average cost of 40 cents per cubic yard, or an average cost of \$2,860 per mile, and the application of 4,222,161 cubic yards of gravel, caliche, and other forms of local surfacing materials at an average cost of \$1.45 per cubic yard or \$1,860 per mile.

The communities where the work was done have obtained substantial road improvements fully worth every dollar of their cost, and at the same time their drought-stricken farmers have been provided with sufficient employment to afford a material measure of support for themselves, their families, and their livestock. All labor and teams, as well as the necessary trucks and other equipment not owned by the counties or townships, were hired almost entirely from local residents.

The accumulated experience with this work indicates that certain methods must be followed implicitly if a dollar's worth of highway improvement is to be produced for each dollar of expenditure. A competent highway engineer should prepare plans and specifications after a careful study to determine the best location and the type of construction best adapted to the conditions. The construction work should be properly organized and carefully supervised. Efficient construction methods using adequate mechanical equipment should not be replaced by inefficient hand-labor methods.

ESTIMATING STANDARDS

Work has been continued during the past year on the development of such standard forms, definitions, and subdivision of items as will serve to place the preparation of estimates of highway-construction costs on a more uniform basis. Any means or measures that will increase the accuracy of estimating methods will be of the greatest value not only to the highway engineers and highway constructors but also to the public at large, which in the long run bears the cost of the inefficiencies of our present system. Tentative standards have been worked out that are applicable to a contractor's cost-keeping system designed to show costs during the progress of the construction and final unit costs as a guide in bidding on other work. These proposed standards are being given a field test on a number of jobs in order to determine modifications that may be desirable in order to answer most fully the requirements of both the highway engineer and the highway contractor. Both are greatly in need of more reliable means of estimating the probable cost of proposed work.

INDEX FIGURES

A study of the trend of highway-construction costs during the period 1923 through 1934 for the country as a whole has been completed and published. The data collected have been converted into index numbers and graphs that show the trend not only of the average cost per mile of our highways but also the trend of prices of materials that enter into highway construction, as well as the trend in highway designs as influenced by provisions for the safety, comfort, and speed of travel. More intense use of our highways, with its accompanying public demand for greater safety and convenience of the traffic, has brought about the construction of wider surfaces, the adoption of better alinement, the reduction of steep grades, and the improvement of the roadsides. Additional work of these kinds increase what is called the usage trend. Unit costs of most of materials that enter into the construction of highways have shown, except for the last 2 years, a generally decreasing trend, but the amount per mile which our new roads are costing us has shown a generally increasing trend. For example, while in 1923 the cost index on a per-mile basis was 100, prices were 118 and usage only 87; in 1934 the highway-cost index reached 118, and usage had climbed to 142 although the price index had declined to 86.

STUDIES OF PRODUCTION MANAGEMENT AND UNIT COSTS

Studies of efficiency in the management of highway-construction operations have been greatly curtailed since 1933 in order that the personnel might be used in administrative work in connection with the enlarged program of emergency highway work. These studies are now being gradually resumed. Those completed in past years have been of great value to contractors in obtaining a smooth-running and highly productive organization. Practices recommended by the Bureau some years ago are now widely used. There is still much work to be done in this field and greater attention will be given to it during the coming year.

HIGHWAY-ACCOUNTING METHODS

The Bureau has continued its efforts to further the development and installation of efficient accounting procedures by highway-building agencies. It has a direct interest in this work because of its cooperation with the States in road construction and also because of its collection and dissemination of statistics and general information in the highway field. If the gradual accumulation of experience and data is to be of the greatest practical value, statistical methods, terms, and nomenclature must be uniform from year to year and in all States. The aim of the Bureau is therefore to assist the States in developing and installing a system of records and accounts that will be economical in operation, readily understandable, and at the same time meet all of the legal and accounting requirements. A satisfactory system must give complete statistical information on every activity in which the department is engaged. To be of the greatest practical value, statistical data must be so standardized as to be fully comparable with the corresponding data from any other State. As yet such comparable data are obtainable from only a few States. Cooperative work along these lines was continued during the year insofar as time and opportunities permitted.

PHYSICAL RESEARCH

SUBSURFACE EXPLORATION

Efforts have been continued to improve the methods of subsurface exploration that were mentioned in the last annual report and to extend their application in highway work. The seismic apparatus was successfully employed to locate rock at depths of 300 to 400 feet and also to differentiate between relatively shallow layers of various degrees of density. In the latter work direct comparisons of the indications of the resistivity and seismic methods were made along a section of the Skyline Drive in Virginia, and analysis of the data indicates that the methods will be of assistance in classifying materials in advance of excavation. For work of this character the resistivity method was found to be the simpler and more rapid of the two. A report on these studies has been prepared.

MOTOR-VEHICLE IMPACT INVESTIGATIONS

Study of the elastic action of concrete when subjected to static and to impact forces has been carried on actively throughout the year. Special apparatus built for this difficult research is functioning satisfactorily, and many thousands of test

loadings have been applied. The data obtained in these tests furnish fundamental information concerning the relative effects of loads applied to pavements slowly and those applied quickly. Such information is important in relating test data from slowly applied loads to the loads applied rapidly to highways by motor vehicles. The data are needed for the rational design of highway surfaces.

MEASUREMENT OF ROAD-SURFACE ROUGHNESS

Surface smoothness is a matter of great importance to the highway user, and an accurate method of determining the degree of smoothness that exists is most desirable. Existing devices for this purpose, including the relative-roughness indicator developed by the Bureau, are not entirely satisfactory, and efforts to develop more satisfactory apparatus have been continued. The standardized single-wheel vehicle, mentioned in the last annual report, has been further improved and appears to be satisfactory and attention has been turned to improving the performance of the relative-roughness indicator itself. Studies of a number of possible modifications of this unit are under way.

INVESTIGATION OF CONCRETE-PAVEMENT DESIGN

This detailed study of the structural action of concrete-pavement slabs has been described in preceding annual reports. It has been brought near completion during the past year. Three comprehensive reports have been published, and a fourth report is ready for publication. The fifth and final report of the series is being prepared. These reports make available new information concerning the destructive forces to which pavement slabs are subjected and suggest some means for protection. There is evidence that the information developed in this research is already being put to practical use by State highway organizations and other agencies.

INVESTIGATION OF CORRUGATED-METAL CULVERTS

The study of the erosion test for coated corrugated culvert pipe was mentioned in the last annual report. The study has been continued during the year. Some modifications have been made in the testing equipment, to obtain better temperature and speed control. A number of check tests have been carried on with other agencies equipped for this test in order to learn the degree of concordance to be expected among laboratories. Some results of value have already been obtained from these check tests. Limited tests have been made with abrasives other than that called for in current specifications, and the search for a more suitable abrasive material will be continued.

FLEXIBLE-PAVEMENT DESIGN

The study of the general problem of the structural design of highway surfaces of the so-called flexible type has been continued. The problem is complex, and the information needed is fundamental in character. An extensive review has been made of reports on pertinent researches, particularly those of a number of foreign investigators, dealing with soil bearing power, pressure distribution to soils through rigid and through flexible plates, and on dynamic tests in which the ability of various soils and road surfaces to transmit vibration have been determined. The development of suitable pressure-measuring apparatus is being studied.

NONBITUMINOUS ROAD MATERIALS

Recent technical changes in the process of manufacturing portland cement have resulted in the production and use of cements differing materially in chemical composition from those formerly used in highway work. The possibility that the changes, which were made primarily to increase strength, may have adversely affected the ability of the cement to resist weathering accounts for the wide interest now being manifested in this problem. The Bureau has two series of tests under way. One series is being carried on in cooperation with a number of State highway and university laboratories working under the sponsorship of the Highway Research Board. A report of the Bureau's work will be presented as a portion of a committee report now being prepared for release during the next annual meeting of the board in November 1936.

Considerable work has been done during the year on portland cement blended with various amounts of natural cement for the purpose of imparting certain desirable qualities to the concrete. Research work is also in progress in connection with the use of so-called high-silica cement in lieu of portland cement. No results from either of these investigations are as yet available.

In the field of mineral aggregates for concrete and bituminous work, research activities during the past year have been concentrated largely on two problems: (1) The further development of the Los Angeles abrasion test for quality of coarse aggregates; and (2) critical studies of the present accelerated tests for soundness of aggregates. Largely as the result of the Bureau's work, the Los Angeles abrasion test was recognized this year as a tentative standard of the American Society for Testing Materials. It has also been adopted by a number of State highway departments to replace the old standard Deval abrasion test. Studies of the accelerated-soundness tests have been confined largely to efforts, in cooperation with other laboratories, to eliminate the many variables in the testing procedure which make the results of these tests so uncertain. The amount of time which it has been possible to give to this work has been greatly limited on account of the large volume of routine testing work assigned to the laboratory during the year.

A paper describing a method of making absorption tests of sand, developed in the Bureau's laboratories, was presented at the 1936 annual meeting of the American Society for Testing Materials. The use of this procedure in the field should assist materially in improving the control of the quality of concrete, by increasing the accuracy of the control of the quantity of water used.

The analysis of the large volume of data accumulated in the Bureau's studies of vibration of concrete is still under way. A report is being prepared for publication. In general, the results verify the conclusions reached as the result of the former work done by the Bureau along this line.

The results of the first series of tests of "de-aired" paving brick, to which reference was made last year, were presented in the form of a progress report at the last annual meeting of the National Paving-Brick Association. The results did not reveal the general improvement in quality that had been anticipated, and it has been decided to defer further work until the producers have had an opportunity to eliminate certain technical difficulties that have been encountered in its manufacture.

BITUMINOUS ROAD MATERIALS

Research on bituminous materials and their uses in road construction has continued along the general lines followed in previous years. Work has been done on the improvement of laboratory methods of examining bituminous road materials and the mineral aggregates used with them. Field studies of problems in bituminous-road construction have been conducted. Cooperative work has been carried on with the State highway departments and with committees of technical organizations in the development of specifications and test methods.

Laboratory studies of the properties of asphalt cements, tars, and liquid-asphaltic road materials, including emulsions, are being continued to provide additional information about their physical and chemical properties and to determine those properties that are indicative of quality and service behavior. This information is needed in order that requirements necessary for given conditions may be specified without reference to source of supply or method of manufacture. The materials being studied are representative of the present production fields and of the products manufactured. This study is prompted by the variations in refinery practices resulting from the unbalanced demands for certain petroleum products and by the growing tendency to include in specifications requirements of questionable value for the control of quality. The variations in methods of refining have resulted in the production of road materials which are not greatly different as measured by present tests but show considerable variation in service behavior. The specification requirements that are believed to be of doubtful value tend to restrict unduly the field of supply and eliminate reasonable competition without adequate guarantee of satisfactory quality.

Asphalt cements representing the range of present-day production are being examined for compliance with current specifications, including those requirements commonly specified and others which are of more recent origin and are relatively local in application. Mixtures containing these asphalt cements are being subjected to mechanical tests to study the effect of the properties of the asphalts upon their behavior in mixtures. As a part of this study, a cooperative project has been begun with the Minnesota Department of Highways and the University of Minnesota for the study of bituminous mixtures containing asphalt cements supplied in the upper Mississippi Valley. The primary object of this cooperative work is to study the effect of weathering on different materials by means of accelerated laboratory weathering tests.

Laboratory studies of hot and cold bituminous mixtures are being continued to develop methods of test that will produce uniform results and will be indicators of probable service behavior. The information developed indicates that the

methods of test for mixtures must be more exactly defined and controlled than heretofore if results sufficiently uniform to evaluate variable properties of mixtures are to be obtained. This study includes the investigation of laboratory-prepared mixtures submitted to various mechanical tests and to controlled accelerated traffic on a small circular track, and the observation and examination of actual pavements laid in accordance with current practice.

The two bituminous experimental roads constructed in Berkeley County, S. C., in 1929, and in Holt County, Nebr. in 1929 and 1930, in cooperation with the State highway departments, have been discontinued as experimental projects. Final reports covering their construction, cost, and service behavior are being prepared.

New projects for the study of the use of cotton-fabric reinforcement in the construction and maintenance of low-cost bituminous roads have been initiated in cooperation with several State highway departments. Experimental projects have been started in Alabama, North Carolina, and Tennessee. The Alabama experiment will consist of a bituminous surface treatment of a chert base; the North Carolina experiment will be made on similar construction placed on a sand-clay base; and the Tennessee experiment will include three types of bituminous construction placed upon a clay-chert base. Each experiment includes sections without reinforcement and sections reinforced with each of three grades of cotton fabric. In each group of sections the bases will be made as uniform as possible to eliminate a variable that otherwise might have an important effect on the service behavior of the different sections. The studies include surveys of the subgrade, observation of base and bituminous surface construction, and the accumulation of data on costs of construction and maintenance, and on service behavior.

In addition to these special cooperative experiments many other road surfaces are being constructed by the State highway departments using fabric reinforcement furnished through the cotton diversion program of the Department of Agriculture. Construction and maintenance costs and other pertinent data from these experiments will be furnished to the Bureau for a comprehensive study of the value of cotton fabric in bituminous road construction. A report will be issued when the roads have been in service a sufficient length of time to permit the drawing of conclusions.

Field studies have been made of a number of low-cost bituminous-surfaced roads in Delaware, Pennsylvania, and Virginia that suffered severely during the past winter, to determine the reasons for failure.

A study of bituminous and nonbituminous materials for filling the joints in concrete pavements is being conducted on a section of the Mount Vernon Memorial Highway. A number of materials are being used in this study, and as soon as any of them prove unsatisfactory in service they are removed and replaced by others that have sufficient promise to deserve investigation.

SUBGRADE INVESTIGATIONS

A considerable increase in the use of the methods of soil testing sponsored by the Bureau has been manifested since the adoption of these methods by the American Association of State Highway Officials and the American Society for Testing Materials. The resulting demand for check samples, check tests, and instruction in the technique of soil testing has been met. It is apparent that this service, combined with researches on routine test methods to ascertain the causes of discrepancies in test results obtained by different operators, will become increasingly important in the future.

A number of State highway departments are now specifying soil tests to control the selection of soil materials for highway purposes. The Bureau will continue its work in the development of specifications based on the subgrade soil tests. A report on limerocks for use as bases for bituminous wearing courses was published during the fiscal year. This report contains analyses of samples from roads in service and furnishes a basis for rational design.

Information has been developed concerning the presence of certain chemicals in soils and ground water that seem to be associated with the warping and also with the disintegration of concrete pavements. A report has been published on a microchemical method of analysis for the identification of these chemicals. Further studies are being conducted using a petrographic microscope that makes possible more accurate determinations.

A report on the analysis of the data collected in connection with the investigation of the hydraulic fill at Four Mile Run on the Mount Vernon Memorial High-

way has been published. This report contains a comparison of computed and measured settlements and indicates that the method of analysis described furnishes a satisfactory basis for estimating settlements under similar conditions. A study has been made involving mathematical analyses of stress distribution and compression of soils under loads, and a report on this subject is being prepared for publication.

Surveys have been conducted to determine the foundation conditions existing at the sites of several bridges that are to be constructed under the supervision of the Bureau.

Soil stabilization in general and as applied to the low-cost roads in particular is one of the most important problems occupying the attention of the Bureau's research staff. During the past year a series of laboratory tests has developed information showing: (1) The importance of the grading of constituent materials in producing density and stability in sand-clay and sand-clay-gravel mixtures; (2) the effect of temperature on the stability of compacted soils; (3) the influence of electrolytes and water-soluble binders on the density and stability of soils of the different soil groups, and (4) the value of water-insoluble binders such as bituminous material and portland cement for waterproofing and stabilizing fine-grained soils. This information has been included in a report discussing applications of surface chemistry in soil stabilization and current construction practice.

Experimental soil mixtures and treatments are being tested under accelerated traffic on two circular tracks having a circumference of about 35 feet. These investigations follow the indications developed by the laboratory tests. One of the tracks is located outdoors where field conditions may be duplicated. Here tests are being made to determine: (1) The practicability of maintaining non-plastic-base courses with water-retentive chemicals during the period between base-course construction and surface treatment; (2) the effect of certain chemicals on the physical properties of the base-course material; (3) the effect of the chemicals on bituminous surfacings; (4) the value of chemical admixtures for increasing the density and stability of the base materials; and (5) the effective life of the chemical treatments with various types of base materials. The value of insoluble binders will also be investigated on the outdoor circular track. The indoor track is being used to investigate base-course materials without chemical admixtures. Sand-clay, sand-clay-gravel, chert-gravel, traffic-bound crushed-stone, and traffic-bound crushed-slag base courses will be constructed and tested.

Progress has been made in the preparation of specifications for the selection of soil materials and for moisture control in the construction of fills for highways. While more information is necessary, experience has shown that judicious use of the data at hand has saved many times the cost of the soil investigations.

Study of the chemical properties of subgrade soils in cooperation with the State Highway Commission of Missouri and the Agricultural Experiment Station of the University of Missouri has been continued. A series of homoionic soils has been prepared and tested in order to obtain fundamental data concerning the colloidal chemistry of the materials.

A survey of low-cost stabilized roads has been started, and data have been collected on seven road sections in two States. Field work is being continued to determine the efficiency of various chemicals, primes, and neutralizers in soil stabilization.

Cooperation with the State highway departments in the making of subgrade surveys, in the design of subgrade treatments and road surfaces, and in the establishment of subgrade-soil laboratories, has continued as in past years.

