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U. S. DEPARTMENT OF AGRICULTURE

OFFICE OF PUBLIC ROADS—BULLETIN No. 41

LOGAN WALLER PAGE, DIRECTOR

MILEAGE AND COST OF PUBLIC ROADS IN THE UNITED STATES

IN 1909

BY

J. E. PENNYBACKER, JR.
Chief of Road Management
(to January 1, 1911)

AND

MAURICE O. ELDRIDGE
Assistant in Charge of Road Management
(since January 1, 1911)

FEBRUARY 29, 1912.—Ordered to be printed

WASHINGTON
GOVERNMENT PRINTING OFFICE
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OFFICE OF PUBLIC ROADS.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Office of Public Roads,
Washington, D. C., July 31, 1911.

Sir: I have the honor to transmit herewith a manuscript giving the results of an investigation which has just been completed by this office, relating to the mileage and cost of public roads in the United States for the year ending December 31, 1909. The work of compiling this information was carried on by Mr. J. E. Pennybacker, jr., until he left the office on January 1, 1911, and was completed by Mr. M. O. Eldridge, assistant in charge of road management since that time. I respectfully recommend that the document be issued as Bulletin 41 of this office.

Respectfully,

Logan Waller Page,
Director.

Hon. James Wilson,
Secretary of Agriculture.

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MILEAGE AND COST OF PUBLIC ROADS IN THE UNITED STATES IN 1909.

INTRODUCTION.

METHOD OF COMPILING STATISTICS.

Bulletin No. 32 of this office, entitled "Public Road Mileage, Revenues and Expenditures in the United States in 1904," has proved so useful that it has been decided to collect and publish similar information from time to time, in order to show what progress is being made in this respect. In pursuance of this plan, the office has just completed the collection and compilation of information showing the mileage of improved and unimproved roads in the United States for the year ending December 31, 1909, and in order to meet the numerous demands for information in regard to the cost of road building, considerable data have also been included on that subject.

It is the purpose of this bulletin to assemble the results of this investigation in such a way as to illustrate the progress in road improvement in the different States for the five-year period from 1904 to 1909. For a more convenient study of the subject and in order that comparisons and deductions may be easily made, the mileage statistics for the various States are presented in Table No. 3 in parallel columns for 1904 and 1909. The progress made by individual counties may be ascertained by comparing the State tables in the appendix with the State tables contained in Bulletin No. 32.

The value and need of accurate road statistics have heretofore been imperfectly understood and consequently only scant records are available in many places. The importance of complete records in regard to expenditures and cost of roads and of a stricter classification of the different kinds of roads has been brought to the attention of every county and township in the United States through these investigations. As a result of this, it is believed that the figures contained in this bulletin are more reliable than those presented in Bulletin No. 32. If the collection of the information contained in these bulletins has no other effect than to induce the local officials to keep more accurate records, it will have served a useful purpose.

The statistics contained in this publication relate to country roads only, except in a few instances where it has been impossible for correspondents to draw the line definitely between country roads and village streets.

The term "improved roads," as used in this bulletin, implies a road which has been graded, drained, and surfaced with a hard mate-

rial or a combination of materials, or to which some preparation has been applied, resulting in a reasonably smooth, firm, and durable surface. Macadam or gravel roads may be cited as examples of hard material applied to earth subgrades; the sand-clay road and bituminous macadam are good examples of the application of combinations of materials to effect the desired result, while the use of oil, tar, and other bitumens, principally on macadam roads, though occasionally on earth roads, illustrates the improvement of a road by the application of preparations.

SOURCES OF INFORMATION.

The information contained in this bulletin has been secured by correspondence, principally with road officials and partly with private citizens of the various States and Territories, counties, townships, districts, and other civil subdivisions of the United States. In many cases, the information was obtained from voluntary county correspondents appointed by this office for the purpose, but in almost every case these correspondents were either road officials or the best informed private citizens in road matters in their respective communities.

The magnitude of this task may be appreciated when it is understood that there are in the United States about 150,000 State, county, and local road officials, and that it was necessary to correspond with most of these in order to secure the desired information. In many cases it was necessary to write a number of individual letters to township and other local road officials before the information could be secured.

Every possible effort has been made to verify the accuracy of the figures given in the tables. When there was any doubt as to the correctness of the figures given, they were returned for correction or approval to the person from whom they were received, or to some other person qualified to give correct information. Upon the completion of the tabulations for the various States, they were submitted to the heads of the State highway departments or geological surveys, or to some well-informed person in the State for correction and approval.

The total mileage statistics are based mainly on approximations or estimates from the various civil subdivisions of the United States, as there are very few States or counties where the roads have been actually surveyed and measured, and it will be impossible to secure accurate data in regard to total mileage until this has been done. The statistics in regard to the mileage of improved roads are based more nearly on facts than on estimates, although in many cases the mileage of improved roads was estimated.

It is quite possible, therefore, that, in spite of the precautions which have been taken, some errors have crept in. The total mileage, as well as the mileage of improved roads, may be in some instances overestimated, and in others underestimated. In view of these facts, the office can not vouch for the absolute accuracy of all of the figures given in the tables, but it is believed that, taken as a whole, they can be accepted as a fairly accurate record on which to base the progress of road building in the various States during the five-year period treated.

MILEAGE OF PUBLIC ROADS.

Table No. 3 of the appendix, in which the road statistics for all the States and Territories are given, shows that at the close of 1909 there were 2,199,645.14 miles of public roads in the United States, which exceeds the mileage reported for 1904 by 48,266.14 miles. This tabulation includes the same States and Territories as those reported in 1904, with the following exceptions: The District of Columbia has been eliminated on account of the fact that there are no roads in it which should be classified as country roads. Indian Territory and Oklahoma have, since 1904, been combined to form the State of Oklahoma and a large number of counties have been organized from which it was impossible to secure reports in 1904. This has had the effect of increasing the total mileage of Oklahoma from 43,554 in 1904 to 71,325 in 1909. A number of new counties have been organized since 1904 in the Middle and far Western States, which has had the effect of increasing the total mileage in those States. Mileage statistics are not included for Alaska, Porto Rico, Hawaii, the Philippines, or Guam. The mileage of roads given in the tables does not include the streets or boulevards in incorporated cities or villages.

Of the total mileage of public roads in the United States at the close of 1909, 102,870.44 miles were surfaced with gravel, 59,237.35 miles with stone, and 28,372.52 with other materials, which makes a total of 190,476.32 miles of improved roads.

By comparing these figures with those collected for 1904, it will be seen that the total mileage of gravel roads reported has decreased by 7,034.66 miles. This is due principally to the fact that in 1904 no information was collected in regard to sand-clay roads, except from the Southeastern States, and it is quite probable that a number of the roads which were reported as gravel roads in 1904 were reported in 1909 as sand-clay roads. This discrepancy is also partly accounted for by reason of a reclassification of the roads in several of the States, by which many of the poorly built and poorly maintained gravel roads have been eliminated from the improved road class. An effort was made in this investigation to exclude all natural gravel roads from the improved class unless they were well graded and drained, but many of these were included in the 1904 statistics.

The total mileage of stone roads has increased from 36,818.4 in 1904 to 59,237.35 in 1909. The mileage of roads surfaced with other materials, including sand-clay, shells, bituminous-macadam, brick, etc., has increased from 6,806.8 miles in 1904 to 28,372.52 miles in 1909.

MILEAGE OF IMPROVED ROADS.

Indiana still leads all other States in total mileage of improved roads with 24,955.75 miles; Ohio still occupies the second place with 24,106 miles; New York is third with 12,787.36 miles; Wisconsin fourth with 10,167.33 miles; Kentucky fifth with 10,114.95 miles; Illinois sixth with 8,914 miles; California seventh with 8,587.75 miles; and Massachusetts eighth with 8,463.18 miles.

The greatest progress in road improvement has been made in the State of New York, which has increased its mileage of improved roads from 5,876 in 1904 to 12,787.36 in 1909 (6,911.36 miles), due partly to the fact that New York has been spending about $5,000,000 a year from a $50,000,000 State bond issue on trunk-line highways, in addi-

tion to the regular annual expenditures from local revenues of about $5,000,000.

The notable increases in the total mileage of improved roads for the five-year period 1904–1909 are shown as follows: Georgia from 1,634 to 5,978 (4,344 miles); Washington from 1,976.5 to 4,520.68 (2,544.18 miles); Missouri from 2,733 to 4,755.5 (2,022.5 miles); South Carolina from 1,878 to 3,534.75 (1,656.75 miles); Alabama from 1,720 to 3,263.93 (1,543.93 miles); Pennsylvania from 2,160.78 to 3,364.76 (1,194.98 miles); Tennessee from 4,285 to 5,353.5 (1,068.5 miles); New Jersey from 2,422.3 to 3,377.86 (955.56 miles); Florida from 885.5 to 1,752.35 (866.85 miles); and Maryland from 1,570 to 2,142.3 (572.3 miles).

A decrease in improved roads is reported from California, Michigan, Minnesota, and Wisconsin. This decrease may be explained as follows: The practice of improving the earth roads by the use of oil in California has been, to a large extent, discontinued, and this has had the effect of cutting down the mileage of that class of roads considerably and so of reducing the total mileage of improved roads. In Michigan and Minnesota the roads have been reclassified by the State highway departments and the mileage of roads which come under the improved class has been reduced. In Wisconsin the mileage of both stone and gravel roads is a little less than was reported in 1904, owing probably to a more careful classification of the roads than it was possible to make at that time. A reclassification of the roads is also responsible for the decrease in gravel roads in Connecticut, Indiana, Massachusetts, Ohio, Oregon, Utah, and Virginia.

In no other class of improved roads has the mileage increased so rapidly during the five-year period as in the case of sand-clay roads. The sand-clay construction consists of mixing sand and clay together in such a way as to produce a road which does not become muddy, and which remains comparatively firm during wet or dry weather. This method of construction is confined principally to the Southeastern States, although it is now being used to some extent in the Gulf Coast and Middle Western States. The progress in this class of construction for the five-year period is shown in Table 4.

From this table it will be seen that the mileage of sand-clay roads has increased from 2,979 in 1904 to 24,601.42 in 1909. Alabama has increased her mileage of sand-clay roads from 12 in 1904 to 1,107 in 1909; Georgia from 513 to 4,326.5 during the same period; and South Carolina from 1,575 to 3,218 in the same length of time. A large mileage of sand-clay roads is shown for Michigan, Washington, and Wisconsin, but it is believed that these are not all new roads, but simply roads which were reported as gravel roads in 1904.

PERCENTAGE OF ROADS IMPROVED.

It will be seen from Table 3 that, at the close of 1909, 8.66 per cent of the roads in the United States were improved, representing a gain in the total road mileage improved for the five-year period, 1904–1909, of 1.52 per cent, or, in other words, the percentage of improved roads has increased during this period from 7.14 to 8.66 per cent.

Rhode Island occupies the first place in the percentage of roads improved, having, as it does, 49.14 per cent; Massachusetts comes next with 49 per cent; and then follow Indiana, 36.7; Ohio,

27.13; Connecticut, 24.08; New Jersey, 22.76; Kentucky, 18.82; Vermont, 18.40; California, 17.87; Wisconsin, 16.64; New York, 16.13; Washington, 13.19; Maryland, 12.77; Utah, 12.23; Tennessee, 11.66; South Carolina, 11.02; Maine, 10.59; and Michigan, 10.01 per cent.

The following States have between 5 and 10 per cent of the roads improved: Alabama, Delaware, Florida, Georgia, Illinois, Minnesota, New Hampshire, and Oregon. There are 22 States which have less than 5 per cent of the roads improved.

COST OF ROAD BUILDING IN VARIOUS STATES.

The cost of road building depends upon a number of factors, the most important of which are the cost of grading, the value of labor and teams, the availability and kinds of materials, the method of construction, the cost of bridges and culverts, the character of the soil and the traffic, the method of supervision, and, to a certain extent, the climatic conditions. There are very few localities in the United States where all these factors are exactly alike, and consequently there are but few places where the cost of road building would be the same, even though the same type of construction be employed. Comparisons of the average cost of roads in two localities are of little value, therefore, unless all the conditions are taken into account.

In many parts of the United States the land is so level that no grading is necessary, except to prepare the foundation to receive the materials and to provide suitable ditches to dispose of surface drainage; but in other sections the cost of grading and the cost of bridges, culverts, and retaining walls often amounts to more than the cost of surfacing.

In the Southern States the cost of labor for road work ranges from 75 cents to $1.25 per day, while the cost of double teams with driver ranges from $2.50 to $4 per day. In the North and West, however, laborers receive from $1.50 to $2 per day for this class of work, while the prices paid for double teams with drivers range from $3.50 to $5 per day. This partly accounts for the fact that roads of the same type frequently cost more in the North and West than in the Southern States, where the cost of labor is generally low.

The distance that road materials have to be hauled determines, to a large extent, the cost of the work. In many parts of the country material is so plentiful that the average haul does not exceed 1 or 2 miles, while in other parts of the country materials have to be transported long distances by rail or water and then hauled several miles by country road. This factor alone very frequently affects the cost to such an extent that a macadam or gravel road will cost considerably more in one part of a county than the same kind of a road will cost in another part of the same county.

In rolling and mountainous sections of the country the cost of bridges and culverts frequently amounts to as much as the cost of surfacing, whereas in level regions and especially where the rainfall is light this item of expense is very small.

At times the temperature falls as low as from 40° to 50° F. below zero in certain parts of the Northern States, while there are many places on the Pacific Coast and in the Southern States where the temperature rarely falls below the freezing point. It is obvious, there-

fore, that heavier and more expensive types of road are required in regions where the ground freezes several feet below the surface than in those sections where the ground is seldom frozen. The annual rainfall ranges all the way from 8 to 10 inches in Arizona, California, Colorado, Nevada, and northwest Texas to from 50 to 60 inches in parts of Florida, Alabama, Georgia, Mississippi, Louisiana, Tennessee, Arkansas, and southeast Texas. The rainfall, as much as any other factor, affects the condition of the road and, while good earth and gravel roads often give entire satisfaction where the rainfall is light, a more durable and expensive type of road must be built where the rainfall is heavier. If the rainfall is light, however, and the traffic is heavy, as is the case in many of the arid regions of the West, special treatment for laying the dust and preserving the surface with oil and other preparations sometimes becomes necessary.

The condition of the soil also affects the cost of road building. For instance, on sandy loams and gravelly soils 4-inch macadam roads are being successfully built and maintained in many parts of the country. In other localities it has been found necessary to macadamize to a depth of from 8 to 10 inches on certain types of clay soils and fine silt loams, while sometimes the Telford method of construction, or the V-shaped drain foundation must be resorted to in order to obtain a solid and durable road. One of the most important factors affecting the cost is that of the traffic. A road which would be satisfactory for light carriage traffic would not always be suitable for heavy wagon traffic and, on the other hand, a road which would be satisfactory for heavy, horse-drawn, steel-tired traffic would not be, as a general rule, suitable for fast automobile traffic. The character and cost of construction is therefore largely determined by the traffic to which the road is subjected.

Table 5 presents a summary of the information secured from the various States in regard to the cost of four of the standard types of construction, i. e., sand-clay, gravel, macadam, and bituminous macadam. Details as to the width and depth are given in the appendix. Information will also be found in the appendix in regard to the special types of construction, such as shell roads, brick roads, etc.

It was impossible to obtain cost data from Illinois, as all information contained in this bulletin relating to that State was secured from the State highway department, which was unable to furnish any cost data, and it was too late, when this fact became known, to collect the information from the various counties and townships.

The cost data obtained from Arizona, Idaho, Iowa, Nevada, New Mexico, North Dakota, South Dakota, and Wyoming were so meager as to be of little value, and are therefore not included.

No information is given for the District of Columbia, as there are no roads in the District which would be classed as country roads.

It will be seen from the tables that the cost of gravel roads is greater in Maine, New Hampshire, and Connecticut than in Indiana, Ohio, and Minnesota. In the States last named the statute labor tax is still used, and many of the gravel roads are built by farmers in working out their tax, while in the States first named the standard of construction is much higher and all road taxes are paid in cash.

It is believed that the figures given in the summary represent approximately the average cost of road building in the respective States, as they are based upon reports received in regard to the

actual cost of road building. Some of the county and township reports are based on one section of road only, but most of them are based on the average cost of construction in the county or township from which the report was received.

In sending out queries in regard to the cost of road building, correspondents were requested to give the cost per mile or per square yard. It is obvious that this information would be more useful, especially to engineers, if the returns were expressed in cost per square yard instead of cost per mile; but, as most of the correspondents stated the cost per mile, it is so given in the summary, although in the State tables considerable data are presented showing the cost of the various types by the square yard.

The cost of large bridges and extraordinary construction, such as retaining walls, etc., is not included, except in a few instances, but the cost of small bridges and all ordinary construction, including surface drainage, is included.

The average cost of the four types of construction referred to in the summary, Table 5 of the appendix, is as follows: The average cost of sand-clay roads for the 17 States from which reports were received is $723 per mile, the average width of surface treated 17 feet, and the average depth of the material 9 inches. It will be noticed that there are quite a number of States for which no report is given. This is due to the fact that the sand-clay method is adapted only to certain portions of the country where the soil and climatic conditions are favorable to its construction. This method of road building seems to be peculiarly adapted to the States embraced in the Atlantic Coastal Plain, although it has been used to some extent in the Middle Western States. In the Middle West, however, this method is still in the experimental stage.[1]

The average cost of gravel roads for the 31 States from which reports were received is $2,047 per mile. The average width of gravel surface is 13 feet and the average depth of the material 7 inches.

The average cost of macadam roads for the 34 States from which reports were received is $4,989 per mile. The average width of macadam surface is 13 feet and the average depth of the material 6 inches.

In view of the fact that the mileage of poorly built macadam, gravel, and sand-clay roads exceeds the mileage of properly constructed roads of the same types, the above figures should not be used as a basis of comparison in communities where the roads are being built according to the latest and most approved methods, for it is safe to say that in such places the cost will considerably exceed the average given above. A better idea of the cost may be gained by a study of the maximum and minimum cost shown in the State tables in the Appendix.

The average cost of bituminous-macadam roads for the 10 States from which reports were received is $10,348 per mile for roads surfaced to a width of 15 feet and to a depth of 6 inches. The information received in regard to bituminous construction, however, is rather meager, and it is believed that it does not represent the average cost of country roads, as do the figures in regard to other methods

[1] See U. S. Dept. Agr., Office of Public Roads Circular 91.

of construction. The reason for this is that this method of construction is new and to some extent experimental. Furthermore, bituminous macadam roads have, up to the present time, been built only in the neighborhood of the larger cities, where the cost of labor is comparatively high, and where the roads would naturally be surfaced to a greater width than the roads farther out in the country. It is believed, therefore, that the cost is greater than will be the case when this method of construction becomes more general and when this type of road building becomes standardized.

EXPLANATION AND ANALYSIS OF MILEAGE AND COST STATISTICS.

In order that the mileage and cost tables contained in the appendix of this bulletin may be better understood, the following digest has been prepared for each State:

ALABAMA.

MILEAGE DATA.

The information for Alabama was received principally from the county surveyors, the probate judges, and the clerks of the circuit courts of the various counties. When complete reports from each county had been received, they were submitted to Dr. William F. Prouty, assistant State geologist, who verified them.

According to Table 6 there were at the close of 1909, 49,639 miles of public roads. The total mileage in 1904 was 50,089. This discrepancy is probably due to the fact that the mileage for some of the counties was slightly overestimated in 1904. Of the 49,639 miles of public roads, 683.5 miles are reported surfaced with stone, 1,398.43 miles with gravel, 1,107 miles with sand-clay, and 75 miles with shell, making a total of 3,263.93 miles of improved roads for 1909 as against 1,720 miles in 1904. There were no sand-clay roads reported in 1904, but the improved roads in the State at that time represented 3.43 per cent. This would indicate that 3.15 per cent of the roads of Alabama were improved between 1904 and 1909.

By referring to Table 6, it will be seen that 31 counties report no roads improved, 17 counties report less than 10 per cent improved, 11 counties report from 10 to 19 per cent improved, 4 counties report from 20 to 29 per cent improved, and 4 counties report 39 per cent and over improved, namely, Baldwin, 39; Cherokee, 50; Montgomery, 52.41; and Madison, 68.33 per cent.

COST DATA.

The cost of earth roads in Alabama, as shown by Table 7, varies from $175 to $300 per mile, and the average for the three counties reporting is $225 per mile. This evidently represents the cost of ordinary surface drainage and shaping, and does not include heavy cuts and fills or rock excavations.

The cost of sand-clay roads varies from $400 to $1,350 per mile and the average for the 6 counties reporting is $680 per mile. The width of the sand-clay road surface varies from 16 to 30 feet, with an average of about 23 feet.

Gravel roads cost from $500 to $4,950 per mile and the average for the 6 counties reporting is $1,483 per mile. The average width of gravel-road surface is 16 feet.

Macadam roads cost from $1,500 to $3,600 per mile with an average for the 4 counties reporting of $2,525 per mile. This is a rather low cost for macadam construction, but the reports indicate that the roads are surfaced to a width of only about 10 feet. Only 1 county, Jefferson, reports on the cost of bituminous construction and the cost for the 1 mile upon which the report is based is $13,250.

ARIZONA.

MILEAGE DATA.

The clerks of the boards of supervisors and the county superintendents of roads furnished the information contained in Table 8. The returns were checked up by Mr. J. B. Girand, territorial engineer.

According to Table 8, there were, at the close of 1909, 5,987 miles of public roads in Arizona—the same mileage as reported for 1904. Of the mileage as given for 1909, 248 miles were reported as surfaced with gravel and 25 miles with sand-clay, making a total of 273 miles of improved roads as against 217 miles in 1904. From the figures it appears that 4.56 per cent of the roads of the State were improved at the close of 1909. The percentage of improved roads in 1904 was 3.62 per cent, which shows a gain for the five-year period of only 0.94 per cent. Only 5 counties in the State report no improved roads, while 6 counties report less than 10 per cent and 2 counties report more than 10 per cent improved, namely, Apache, 12.5, and Yuma, 19.68 per cent.

ARKANSAS.

MILEAGE DATA.

The information contained in Table 9 was received principally from county judges and county clerks. When complete information had been received from each county, the reports were submitted to the State geologist, who verified them.

According to Table 9, there were, at the close of 1909, 36,445 miles of public roads in the State. The total mileage in 1904 was the same as that given for 1909. Of the total mileage for 1909, 170 miles were reported surfaced with stone, 537.25 with gravel, and 378 miles with sand-clay, making a total of 1,085.25 miles of improved roads. There were no sand-clay roads reported for 1904. The total mileage of improved roads reported for 1904 was 236, which shows a gain of 849.25 miles for the five-year period, 1904 to 1909. It appears from these figures that 2.97 per cent of the roads of Arkansas were improved at the close of 1909, whereas in 1904 only 0.64 per cent were reported improved, which indicates a gain of 2.33 per cent for this period.

Forty-five counties report no improved roads, 22 counties report less than 10 per cent improved, 6 counties report between 10 and 19 per cent improved, while 1 county, Craighead, reports 22.85 per cent improved, and 1 county, Pulaski, reports 61.23 per cent improved.

COST DATA.

Cost data for earth, gravel, and macadam roads in Arkansas are shown in Table 10.

Only 2 counties reported on the cost of earth roads, and the average was $225, which includes only ordinary surfacing and draining.

The average cost of gravel roads for the 6 counties reporting is $940 per mile, but it varies from $350 to $3,000 per mile. The average width of graveled surface is about 10 feet.

The cost of macadam construction varies from $1,000 to $6,000 per mile in the 4 counties reporting, with an average of $3,250. The average width of the surface is 17 feet. While $6,000 is considered a little high for macadam construction in Arkansas, $1,000 is too low. It is quite evident that only the crudest sort of macadam road can be built in that State for that price, even though materials are plentiful and labor is cheap.

CALIFORNIA.

MILEAGE DATA.

The mileage statistics for California were secured from the surveyors, auditors, and clerks of the various counties. Mr. Nathaniel Ellery, State engineer of California, rendered valuable assistance in securing part of the information and in checking up the final returns. The information for some of the counties is not altogether satisfactory, but the figures are as accurate and complete as it was possible to obtain at this time.

As will be seen from Table 11, California had, at the close of 1909, 48,069 miles of public roads, which exceeds the total mileage reported for 1904 by 1,416 miles. This gain in total mileage is probably due to the fact that a more careful classification of the roads has been made than it was possible to make in 1904.

Of the total mileage of public roads in the State, 579.25 miles are reported as having been surfaced with stone, 6,054 miles with gravel, 1,289 miles with sand-clay, and 653 miles with oiled earth, making a total mileage of improved roads of 8,587.75 or 17.87 per cent. This is about 1 per cent less than was reported for 1904, and this decrease is due principally to the fact that the oiling of earth roads has been abandoned to a large extent, for, while there were 2,541 miles of earth roads reported as having been oiled in 1904, there were only 653 miles of oiled roads reported for 1909.

The gain in improved roads is as follows: 160.75 miles of macadam, 210.5 miles of gravel, and 1,289 miles of sand-clay. No sand-clay roads were reported in 1904. There are 10 counties in the State which report no improved roads, 21 counties have less than

10 per cent improved, 10 counties have between 10 and 19 per cent improved, 2 counties have from 20 to 30 per cent improved, 6 counties have from 30 to 39 per cent improved, and 9 counties have from 52 to 80 per cent improved, as follows: Colusa, 52.24; Alameda, 55.55; Yolo, 57.72; Sonoma, 59.92; San Mateo, 65.14; San Benito, 68.73; Santa Clara, 68.83; Los Angeles, 72.33; and Napa, 80.89 per cent.

COST DATA.

The types of improved roads ordinarily built in California are sand-clay, gravel, macadam, and bituminous macadam. Cost data in regard to these types of construction are shown in Table 12.

Only 2 counties reported on the cost of sand-clay roads, with an average of $412, while the average width is 17 feet.

Twelve counties furnish information in regard to the cost of gravel roads. Six counties report the cost by the mile, five by the square yard, and one, Glenn, by the cubic yard. The average cost of the counties reporting by the mile is $1,375, and that of the counties reporting by the square yard is 69 cents. The cost in Glenn County is given as 89 cents per cubic yard. The average width of the gravel roads is about 13 feet.

Nine counties report on the cost of macadam construction, 4 by the mile and 5 by the square yard. The average cost per mile for the counties reporting is $5,375, while the average cost per square yard is $1.08. The average width of the macadam roads is 17 feet.

Seven counties report the cost of bituminous macadam, 3 by the square yard and 4 by the mile. The average cost per square yard is about $1.39 and by the mile $8,575. The width of the bituminous surface is 17 feet.

COLORADO.

MILEAGE DATA.

The mileage statistics for Colorado were secured from the county clerks and checked up by Mr. J. E. Maloney, secretary of the State highway commission and special agent of this office. In addition to checking up the returns, Mr. Maloney also rendered valuable service in furnishing information regarding the correct mileage of public roads in the various counties.

The total mileage of all public roads reported for 1909 was 29,693 (Table 13) as compared with 30,214 miles for 1904. There were 320.5 miles of improved roads reported, of which 14 are macadam and 306.5 gravel. The mileage of macadam roads reported for 1909 is less by 43 miles than was reported in 1904, but the mileage of gravel roads is 185.5 miles greater. It will be seen that 1.08 per cent of the roads are improved, which shows a gain for the five-year period from 1904 to 1909 of 0.49 per cent. There are 43 counties in the State which reported no improved roads, while the remainder of the counties, 17 in number, reported less than 10 per cent improved.

Colorado has made greater progress in road improvement than is indicated by these returns. Owing to the light traffic and dry climate, the natural earth roads, if placed on proper grades and provided with suitable culverts and bridges, are satisfactory for all ordinary purposes, and there are many miles of well-graded mountain roads in Colorado which are not included in the total of improved roads.

COST DATA.

As will be seen from Table 14, only 2 counties report on the cost of earth roads, and the average is $600 per mile.

Summit County reports the cost of sand-clay roads to be about $300 per mile.

Four counties report on the cost of gravel roads, with a minimum cost of $700 and a maximum cost of $2,000, while the average is $1,475.

CONNECTICUT.

MILEAGE DATA.

Mileage statistics for Connecticut were secured from the selectmen of the various towns, but there were so many towns from which no information could be obtained and where the information furnished was so unsatisfactory that Mr. C. G. Nichols, who is a special agent of this office and who is also connected with the State highway department, was requested to correspond with the various towns and collect such information as was necessary to complete the report.

Table 15 shows the results of Mr. Nichols's investigations, and the information contained therein is as complete and accurate as it is possible to obtain.

According to this report there are in the State 12,583 miles of public roads, which is 1,505 miles less than was reported in 1904. Of the improved roads, 665.62 miles are reported as surfaced with stone, 774.4 with gravel, 1,214.25 with sand-clay, and 376.27 as specially improved earth roads, making a total of 3,030.54 miles of improved roads, which represents 24.08 per cent of the total, or a gain of 7.33 per cent for the five-year period from 1904 to 1909. The gain in stone roads for this period is 202.12 miles; of sand-clay roads, 1,214.25; and of specially improved earth roads, 376.27.

There is a decrease of a little over 1,100 miles of gravel roads for the five-year period, but this is probably due to a reclassification of the roads. It is quite evident that many of the roads which were reported as sand-clay roads in 1909 were reported as gravel roads in 1904. The specially improved earth roads are surfaced with the best available soil, which usually contains gravel or sand. These roads are graded, provided with bridges and culverts, and are practically as good as the sand-clay and gravel roads, and should therefore be included as improved roads, although earth roads are not ordinarily placed under this classification.

Every county in the State reports some improved roads, and there is only one county with less than 10 per cent of the roads improved. Three counties have from 14 to 19 per cent improved, while those having a still larger percentage are Windham, 26.54; Fairfield, 27.58; Middlesex, 37.32; and Hartford, 44.66 per cent. Fairfield County reports 605.42 miles and Hartford County 796.39 miles of improved roads.

COST DATA.

Information contained in Table 16 was secured from the biennial report of the State highway commission for the years 1907 and 1908.

The figures given in the table represent the cost of roads built under the direction of the State highway department, for which the State paid from three-fourths to seven-eighths of the cost.

The average cost of gravel roads for the 22 townships reporting was $5,411.77 per mile. The average width of the gravel roads is 14 feet and the average depth of material 8 inches.

The average cost of macadam construction for the 50 sections of road shown in the table is $8,219.60 per mile, while the average width of macadam is 14 feet and the average depth 7 inches.

The average cost of the telford roads for the 48 sections referred to in the table is $10,254.87 per mile, the average width 14 feet, and the average depth of material 13 inches. The telford roads are of two kinds—those surfaced with crushed stone and those surfaced with gravel. The average cost of the 34 macadam telford roads shown in the table is $11,322 per mile, while the average cost of the gravel telford construction for the 14 sections of road referred to is $7,659 per mile.

DELAWARE.

MILEAGE DATA.

The information for Delaware was secured from the county road commissioners and from Mr. Francis A. Price, State highway engineer for New Castle County. The total of all public roads for 1909 was reported as 3,000 miles (Table 17), which is the same as that reported for 1904. Of this amount, 96.36 miles are reported as having been surfaced with stone, 49 miles with gravel, 6.075 miles with sand-clay, and 35 miles with shells, making a total of 186.44 miles improved, which represents 6.22 per cent of the total.

The gain in improved roads for the five-year period 1904 to 1909 was as follows: 82.36 miles of stone roads, 47 miles of gravel, and 6.07 miles of sand-clay roads. A reduction of 15 miles was reported in the shell roads. The total gain in improved roads for the five-year period is 120.44 miles, or 4.02 per cent. Kent County reports no improved roads, but New Castle County reports 10.24 and Sussex County 7.63 per cent improved.

COST DATA.

The cost of macadam roads (Table 18) in New Castle County, built of different materials, is as follows: Limestone, 12 feet wide and 6 inches deep, $6,150; granite, 13 feet wide and 7 inches deep, $6,900; trap rock, 12 feet wide and 6 inches deep, $7,500; average for the three types, $6,850.

The average cost of bituminous construction in New Castle County is $10,120. The average width of the road is 12 feet and the average depth 6 inches.

Sussex County reports that sand-clay roads are being built for 15 cents per square yard and that gravel roads are costing about 25 cents per square yard.

No report was received from Kent County.

FLORIDA.

MILEAGE DATA.

Information regarding the mileage of improved roads in Florida was obtained from the county judges, the clerks of the circuit courts, and the road supervisors of the various counties. The reports were then submitted to Mr. E. H. Sellards, State geologist, who verified them.

According to the data contained in Table 19, there were at the close of 1909, 17,579 miles of public roads in the State. Statistics collected from the same source in 1904 showed the total mileage of public roads to be 17,374. This would indicate that the total mileage for 1909 exceeds the total for 1904 by 205 miles.

Of the total mileage of public roads in Florida for 1909, 278.25 miles are reported surfaced with stone, 259.6 with gravel, 1,016.5 with sand-clay, and 198 miles with shells, making a total of 1,752.35 miles of improved roads, or an increase over 1904 of 879.35 miles.

The gain in improved roads of the various classes for the five-year period is as follows: 242.1 miles of gravel, 581.5 miles of sand-clay, and 110 miles of shell. A decrease in the stone-road mileage amounting to 66.75 miles is shown for the five-year period. Only 17.5 miles of gravel roads were reported for 1904, and it is quite probable that this accounts for the decrease in stone-road mileage, as some of the correspondents may have reported roads as surfaced with stone in 1904 which ought to have been reported as gravel roads.

It appears from these figures that 9.97 per cent of the roads of Florida were improved at the close of 1909. According to statistics collected in 1904, the improved roads in the State represented 5.10 per cent, which would indicate that 4.87 per cent of the roads of Florida were improved between 1904 and 1909. In other words, Florida has practically doubled her mileage of improved roads in this five-year period.

By referring to Table 19, it will be seen that 1 county, Monroe, has no county roads, while 18 other counties have reported no roads improved; 16 counties report less than 10 per cent improved, 2 counties report from 10 to 19 per cent improved, and 9 counties report over 20 per cent improved, namely, St. Lucie, 22.5; Orange, 32.85; Leon, 33.33; Escambia, 46.15; Citrus, 56; Dade, 60; Marion, 60; Lake, 64.87; and Volusia, 72 per cent.

COST DATA.

The average cost of roads of different types in Florida is shown in Table 20. Seven counties report in regard to the cost of earth roads. The minimum cost given is $300 and the maximum $1,200, while the average is $786.

Six counties report the cost of sand-clay roads. The minimum cost is $550 and the maximum $1,000, while the average is $829. The average width of the sand-clay roads is about 15 feet, with a depth of about 8 inches.

Three counties report the cost of gravel roads. The minimum cost of this type is $1,700 and the maximum $6,500, with an average of $3,900. The average width of gravel roads is 17 feet. The county reporting the cost of a gravel road as $6,500 per mile is Duval, of which Jacksonville is the county seat.

Seven counties report on the cost of shell roads. The minimum cost is $800 and the maximum $6,500, with an average cost for the counties reporting of $3,186, and an average width of about 10 feet. The county reporting the highest cost of shell roads is Duval.

Eight counties report the cost of marl rock roads, with a minimum cost of $1,000, a maximum cost of $8,000, and an average of $3,112.

Duval County has also constructed some cement roads at a cost of about $10,000 per mile, and in Lake County roads have been improved by spreading pine needles over the sand roads at a cost of about $35 per mile.

GEORGIA.

MILEAGE DATA.

The mileage statistics for Georgia were secured principally from the clerks of the county commissioners, the ordinaries, the superintendents of public roads, and the commissioners of roads and revenues of the various counties. The reports were then verified by the State geologist, Prof. W. S. McCallie.

According to Table 21 there were, at the close of 1909, 82,230 miles of public roads. In 1904 data collected from the same source indicated that the total mileage of public roads of Georgia was 57,203, but this was clearly underestimated and it is believed that the 1909 figures are more nearly correct. Of the total mileage of public roads in the

State in 1909, 880.5 miles are reported surfaced with gravel, 4,326.5 with sand-clay, 522 with stone, 244 with shell, and 5 with bituminous-macadam, making a total of 5,978 miles of improved roads. The gain in improved roads of the various classes for the 5-year period is as follows: 221.5 miles of gravel, 3,813.5 miles of sand-clay, 84 miles of stone, 220 miles of shell, and 5 miles of bituminous-macadam, making a total gain for this period of 4,344 miles.

It appears from these figures that 7.27 per cent of the roads of Georgia were improved at the close of 1909. According to statistics collected in 1904, the improved roaps in the State represented 2.86 per cent, which would indicate that 4.41 per cent of the roads of Georgia were improved between 1904 and 1909. In other words, Georgia has increased her mileage of improved roads during the five-year period by about 275 per cent.

Fifty-four counties in Georgia report no improved roads, 52 counties report less than 10 per cent improved, 21 counties report from 10 to 19 per cent improved, 8 counties report from 20 to 29 per cent improved, while 11 counties report 30 per cent and over improved. These 11 counties are as follows: Coweta, 30; Muscogee, 32.75; Jones, 33.33; Clarke, 37.41; Walker, 41.56; Irwin, 45.71; Chatham, 49.09; Crisp, 55.55; Dougherty, 61.71; Fulton, 76.25; and Glynn, 76.5 per cent.

COST DATA.

The cost of the various types of roads built in Georgia is shown in Table 22.

Eight counties report on the cost of earth roads. The minimum cost given was $200 and the maximum $1,500, with an average of $700. The average width of these earth roads between ditches is about 28 feet.

There are 38 counties in the State which reported on the cost of sand-clay roads. The cost varies from $100 to $1,200 per mile, with an average cost of $387. The average width of the sand-clay roads between ditches is about 27 feet.

Nine counties furnished information regarding the cost of gravel roads, which varies from $200 to $3,500, and the average is $1,250. The highest cost of gravel roads is reported for Chatham County, but the material for these roads is shipped from near Augusta by rail.

Nine counties report on the cost of macadam construction, and the cost given varies from $1,000 to $5,000, with an average of $2,275.

Fulton County reports the average cost of macadam construction to be 33 cents per square yard. This county also reports the average cost of bitumimous macadam to be about $1.25 per square yard.

IDAHO.

MILEAGE DATA.

Mileage statistics for Idaho for 1909 were secured from the county auditors and county clerks of the various counties. The information was then submitted to the State engineer for verification.

The total mileage of public roads in the State at the close of 1909, as shown in Table 23, was 18,403, which exceeds the total reported for 1904 by 240 miles. Of this total, 17 miles are reported as having been surfaced with stone, 95.5 miles with gravel, and 398 miles with sand-clay, making a total of 510.5 miles of improved roads, which exceeds the 1904 figures by 298.5 miles. The mileage of stone roads was the same in 1909 as in 1904. There were 99.5 miles less of gravel roads reported for 1909 than for 1904, whereas there were 398 miles of sand-clay roads reported for 1909, while no sand-clay roads were reported for 1904. This discrepancy is probably due to the fact that some of the roads which were reported as gravel roads in 1904 were classified as sand-clay roads in 1909. In 1904, 1.16 per cent of the roads of the State were reported as having been improved, but the percentage for 1909 is 2.77, which shows a gain of 1.61 per cent, or practically double the percentage for 1904.

It will be seen from Table 23 that 13 counties report no improved roads, and 7 counties report less than 10 per cent, while Bear Lake County reports 33.33; Shoshone, 57.5; and Kootenai, 60 per cent improved.

ILLINOIS.

MILEAGE DATA.

Mileage statistics for Illinois were secured from Mr. A. N. Johnson, State highway engineer.

The total road mileage, as shown in Table 24, is the same as that reported for 1904, that is, 94,141 miles. Of this mileage, 8,914 miles were reported improved at the close

of 1909, which exceeds the total for 1904 by 1,008 miles. This total includes both gravel and stone roads.

It appears from these figures that 9.47 per cent of the roads of Illinois were improved at the close of 1909, which exceeds the 1904 mileage by 1.05 per cent. Twenty-five counties report no improved roads, 52 counties report less than 10 per cent improved, and 12 counties report from 10 to 19 per cent improved. The counties having over 20 per cent improved are as follows: Peoria, 22.99; La Salle, 26.73; Will, 26.72; Bureau, 31.01; Lake, 37.24; Dekalb, 37.86; Winnebago, 43.28; Boone, 48.82; Kendall, 51.13; Cook, 56.41; Dupage, 68.36; McHenry, 68.78; and Kane, 82.38 per cent.

INDIANA.

MILEAGE DATA.

The information contained in Table 25 was secured from the county auditors, county engineers, and the township trustees; information regarding the county roads was secured from county officials and that for the township roads from the trustees. Since Indiana has no State highway department, it was impossible to find anyone in the State sufficiently familiar with road conditions to verify the returns. It is quite evident that the mileage of improved roads is overestimated in some counties and is underestimated in others, but the figures contained in the table are as accurate and complete as it was possible to obtain under the circumstances.

The total mileage of public roads, at the close of 1909, was 67,996, which is 310 miles less than was reported in 1904. Of the improved roads, 4,398.25 miles are reported as surfaced with stone, 48.75 with bituminous-macadam, and 20,508.75 with gravel, making a total of 24,955.75 miles of improved roads, or 36.7 per cent of the total, which represents a gain for the five-year period of 1.74 per cent. There is a gain for this period of 1,103.25 miles of stone roads, and a loss of 73.25 miles of gravel roads. This discrepancy is probably due partly to an overestimate in 1904, and to the fact that, since some of the gravel roads have been neglected, they have passed into the class of unimproved roads.

Table 25 would indicate that Indiana has a large mileage of good roads. As a matter of fact, many of the roads reported as gravel roads are little better than earth roads. In Indiana the farmers are permitted to work out their taxes, and this is usually done by hauling gravel on the roads. The farmer is allowed a certain amount per load, regardless of how the material is spread or of the results obtained. In many places the gravel is merely dumped into the middle of the road and left for the traffic to spread, which results in a rough, uneven surface, and very frequently the gravel entirely disappears into the mud before the winter is past. This practice is repeated from year to year. Good results, however, are being obtained in many of the counties in Indiana in improving the gravel roads. Good road-building gravel is available in almost every county in the State, and where the material is placed on a properly prepared foundation and is properly spread and maintained the results are, in most cases, very satisfactory.

Every county in the State, except Perry, reports some stone or gravel roads, and there are only 10 counties reporting less than 10 per cent improved. Thirteen counties have between 10 and 19 per cent improved, 11 between 20 and 29 per cent, 19 between 30 and 39 per cent, and 11 counties between 40 and 49 per cent improved, while 11 counties have between 50 and 59 per cent improved. The counties reporting more than 60 per cent improved are shown in Table 1.

TABLE 1.—*Counties in Indiana with more than 60 per cent of roads improved.*

County.	Roads improved.	County.	Roads improved.
	Per cent.		*Per cent.*
Putnam	63.11	Wayne	74.87
Marion	65.62	Tipton	75.35
Fayette	70.14	Allen	76.83
Hancock	70.41	Dekalb	77.50
Wells	70.64	Delaware	78.18
Henry	70.75	Jackson	79.92
Clinton	71.42	Owen	82.36
Montgomery	74.69	Boone	90.13

The banner county, as far as mileage of gravel roads is concerned, is Boone, which, out of a total of 816 miles, reports 735.5 miles, or 90.13 per cent, improved.

COST DATA.

Cost data for Indiana are contained in Table 26. The average cost of gravel roads in the 204 townships reporting is $1,887 per mile. The gravel roads are surfaced to a width of from 9 to 15 feet, with an average of 12 feet for the counties reporting, and an average depth of material of 9 inches.

The average cost of macadam roads for the 158 townships reporting is $2,657 per mile. The macadam roads vary in width from 9 to 16 feet, with an average for the townships reporting of 12 feet, while the average depth of material, unrolled, is 9 inches.

The low cost of gravel and macadam roads in Indiana may be attributed to the abundance of material and to the fact that in some of the townships the roads are not carefully constructed. Most of the gravel roads are built by farmers in working out their taxes. In many places the gravel or crushed stone is placed on the road without preparation of foundation and is left for the traffic to consolidate. Moreover, a large number of these roads are so narrow as to be only a single track.

IOWA.

MILEAGE DATA.

Information contained in Table 27 was secured from township clerks and trustees with the assistance of Mr. T. H. MacDonald, State highway engineer. The information is not altogether complete, as there are quite a number of townships from which it was impossible to secure replies.

No special effort was made to correct the total mileage of improved roads since the information for 1904 had been secured from the same source as that for 1909. The total mileage, therefore, remains practically the same as in 1904, i. e., 102,427 miles.

Of this mileage, 357.25 miles are surfaced with stone, 1,572.85 miles with gravel, and 575 miles with sand-clay, making a total of 2,505.1 miles of improved roads, or 2.45 per cent.

The gain in improved roads is 116.25 miles of stone, 169.85 miles of gravel, and 575 miles of sand-clay. No sand-clay roads were reported in 1904. This gives a total gain of 841.1 miles of improved roads, or 0.83 per cent, since the percentage for 1904 was 1.62.

There are 31 counties in the State which report no improved roads, while 62 counties report less than 10 per cent improved. The counties having more than 10 per cent improved are as follows: Dubuque, 10.14; Keokuk, 11; Hancock, 12.25; Bremer, 12.35; Greene, 14.29; and Story, 21.87 per cent.

COST DATA.

The information received from the various townships in Iowa in regard to the cost of gravel and macadam roads is so meager as to render the data of little value. It is, therefore, not included in this bulletin.

The split-log drag has been used to a considerable extent in Iowa, and some valuable information was obtained from the various townships in regard to the cost of dragging per mile and per annum.

The cost of dragging per mile varies from 25 cents to 50 cents. The average cost for the 126 townships reporting is 45 cents per mile for each dragging. The average cost of dragging per mile per annum varies from $2 to $5, while the average for the 195 townships reporting is $3.75. At an average cost of 45 cents for each dragging, this would indicate that the roads are dragged from seven to eight times each year in the townships where this method is practiced.

KANSAS.

MILEAGE DATA.

Information for Kansas was secured from the county surveyors and county clerks of the various counties, and was checked up by Mr. W. S. Gearhart, State highway engineer.

According to Table 28, there were 98,302 miles of public roads in the State at the close of 1909, which is nearly 3,000 miles less than was reported in 1904. Of this amount, 136.95 miles were reported as surfaced with stone, 27.75 miles with gravel, 202.25 miles with sand-clay, 4.76 miles with bituminous-macadam, and 3 miles with brick, making a total mileage of improved roads of 374.71 miles, which represents 0.38 per cent of the total. There was a reduction of about 131 miles of gravel roads

reported, but an increase of about 25 miles of stone roads and about 202 miles of sand-clay roads, which represents an increase of 0.11 per cent for the five-year period.

Kansas, like Nebraska, is not in such great need of hard roads as some of the States farther east, owing to the light rainfall and the dry climate. Earth roads, especially in the western part of the State, appear to be satisfactory for present needs. It will be seen from Table 28 that considerable progress has been made in the eastern and southern parts of the State in the building of stone, gravel, and sand-clay roads, but there are 71 counties in the State which report no improved roads, while 34 counties report less than 10 per cent improved.

COST DATA.

By reference to Table 29 it will be seen that sand-clay roads are being built in Kansas for from $300 to $1,600 per mile, while their average cost in the seven counties reporting is $785 per mile. The average width of the sand-clay surface is 14 feet and the average depth of the material 10 inches.

The cost of macadam roads varies from $2,000 to $7,200 per mile, with an average for the eight counties reporting of $4,070 per mile. The average width of these roads is about 15 feet and the average depth of material 11 inches, unrolled.

Franklin County reports that bituminous-macadam roads, 12 feet in width, are being built in that county for $6,570 per mile, while Neosho County reports that macadam roads, 15 feet wide and 16 inches in depth, are being treated with an oil binder at a total cost of $5,035 per mile.

KENTUCKY.

MILEAGE DATA.

The county court clerks, road supervisors, and county judges furnished the information contained in Table 30. Hon. M. C. Rankin, State commissioner of agriculture, rendered valuable service in checking up the reports from the various counties.

According to Table 30, there were at the close of 1909, 53,744 miles of public roads in the State, which is 3,393 miles less than was reported in 1904, owing probably to an overestimate from some counties. Of this amount 10,114.95 miles are reported as having been improved, and of these 8,709.25 miles were surfaced with stone, 1,404 miles with gravel, and 1.7 miles with bituminous-macadam. It will therefore be seen that 18.82 per cent of the roads of the State are reported as improved. The mileage of gravel roads reported for 1909 is practically the same as for 1904, but 631.25 miles of roads are reported as having been surfaced with stone during the five-year period from 1904 to 1909, which shows that the mileage of improved roads has increased for this period 2.22 per cent.

There are 46 counties in the State which report no improved roads; these are located principally in the eastern and southwestern part of the State. Central Kentucky is well supplied with limestone macadam roads. There are 21 counties in the State which report less than 10 per cent of roads improved; 12 counties with from 10 to 19 per cent; 5 counties with from 20 to 29 per cent; 5 counties with from 30 to 39 per cent; 9 counties with from 40 to 49 per cent; and 21 counties with from 50 to 92 per cent. The counties having 50 per cent and over improved are as follows: Grant, 50; McCracken, 50.66; Garrard, 51.92; Lincoln, 53.3; Carroll, 53.66; Mercer, 55.29; Clark, 56.52; Robertson, 59.09; Fayette, 66.91; Pendleton, 66.44; Jessamine, 70; Bracken, 72; Kenton, 73; Franklin, 76.16; Shelby, 81; Nicholas, 85.33; Harrison, 86.9; Gallatin, 90; Scott, 90.75; Boyle, 91.66; and Mason, 92.5 per cent.

COST DATA.

As will be seen in Table 31, gravel roads in Kentucky cost from $320 to $2,000 per mile, with an average for 20 counties of $1,011 per mile. The average width of gravel roads for the counties reporting is 12 feet.

For the 43 counties reporting on the cost of macadam roads, the minimum is $1,200 per mile and the maximum $6,400 per mile, with an average of $2,158 per mile. The average width for the counties reporting is 14 feet and the average depth of material is 9 inches, unrolled.

This is a rather low cost for macadam construction, but many of the roads in Kentucky are built by hand in the same way that stone roads were constructed before steam rollers and stone crushers were invented. In many parts of the State the rock is broken by hand and is often spread on the old roadbed and left for the traffic to consolidate.

The first cost of roads of this character is less than if the materials were crushed by machinery and rolled with a heavy roller, but the results are less satisfactory. There

are many parts of Kentucky, however, where very satisfactory stone roads have been built, and the low cost, as shown by these reports, is due principally to the fact that material is plentiful and labor comparatively cheap.

LOUISIANA.

MILEAGE DATA.

The clerks of the police juries and parish surveyors furnished the information contained in Table 32. Mr. Charles K. Fuqua, secretary to the governor, rendered valuable assistance in securing information from various parishes.

Table 32 shows that Louisiana had, at the close of 1909, 24,962 miles of public roads, a gain of 65 miles over 1904. Of this amount 82.5 miles are reported as surfaced with gravel, 168 miles with sand-clay, 59 miles with shell, and 5 miles with burnt sulphur ore, while 15 miles have been oiled, making a total of 329.5 miles of improved roads, which represents 1.32 per cent of the total. The gain in improved roads for the five-year period, from 1904 to 1909, is as follows: 56.5 miles of gravel, 168 miles of sand-clay, 51 miles of shell, 5 miles of burnt sulphur ore, and 15 miles of oiled roads, making a total of 295.5 miles, which represents 1.18 per cent of the total.

There are 44 parishes in the State which report no improved roads, and 11 parishes report less than 10 per cent improved, while there are only 4 parishes with more than 10 per cent improved, as follows: De Soto Parish reports 18.75 per cent improved; Richland, 40; St. Bernard, 72; and Orleans, 96.66 per cent. The parish of Orleans, however, embraces the city of New Orleans, and the roads in it can not be classed as strictly country roads.

COST DATA.

Only 2 parishes in Louisiana furnished information showing the cost of earth roads, and the average was about $100 per mile. (Table 33.)

Sand-clay roads cost all the way from $75 to $2,000 per mile. The average for the 6 parishes reporting is $654 per mile. The average width of roadway treated with sand-clay surface is 18 feet.

The average for the 2 parishes reporting on shell roads is $3,000 per mile, and the average for the 2 parishes reporting on gravel roads is $2,100 per mile. The shell roads are about 20 feet wide and the gravel 15.

MAINE.

MILEAGE DATA.

The information for Maine was secured from the selectmen of the various towns (i. e., townships) and was checked up by Mr. Lucius D. Barrows, who is connected with the State highway department.

As will be seen by reference to Table 34, there were, at the close of 1909, 25,528 miles of public roads in the State, which is the same mileage as was reported for 1904. Of this amount 97.07 miles are reported as having been surfaced with stone, 2,493.75 miles as surfaced with gravel, 110.97 miles as being specially improved earth roads, and 1.27 miles as being bituminous-macadam, making a total of 2,703.06 miles, or 10.59 per cent of the total.

The gain in improved roads for the five-year period is as follows: 9.53 miles of stone, 257.75 miles of gravel, 1.27 miles of bituminous-macadam, and 110.97 miles of specially improved earth roads, making a total of 379.52 miles, or 1.49 per cent. Earth roads are not usually classified as improved roads, but the 110 miles referred to are graded, drained, provided with suitable culverts and bridges, and are surfaced with selected soil, such as gravelly loam, sandy clay, etc. They should, therefore, be classified as improved roads as they are practically as good and cost almost as much as the gravel roads.

Every county in the State reports some improved roads, but there are 11 counties which report less than 10 per cent improved, while 5 counties report more than 10 per cent improved, as follows: Franklin, 10.03; Penobscot, 15.12; Androscoggin, 15.48; Washington, 18.62; and Cumberland, 19.85 per cent. Cumberland County reported 443.5 miles of gravel roads and 23.73 miles of stone roads.

COST DATA.

The cost data for Maine were secured from the State highway department and are considered accurate, as the information was obtained from the records of that department.

The average cost of roads of the different types is shown in Table 35 and is as follows: Earth, $3,891; gravel, $3,687; macadam, $9,022; and bituminous-macadam, $19,681. This includes the cost of grading, drainage, bridges, and culverts, where the bridges do not exceed a span of 20 feet. It also includes the cost of constructing V-drain foundations under most of the roads.

The earth roads referred to in Table 35 vary in width from 20 to 25 feet, and are usually surfaced with the best available soil and are practically as good as the gravel roads.

The width of the gravel roads is from 21 to 25 feet from ditch to ditch, with a gravel surface about 15 feet wide. The gravel is placed 8 inches thick in the center, and 6 inches thick at the sides.

The macadam roads vary in width from 15 to 21 feet, and the average depth is about 7 inches, varying from 8 inches in the center to 6 inches at the sides. For the 21-foot macadam roads the broken stone is laid to a depth of about 3 inches only at the sides.

The bituminous roads vary in width from 14 to 40 feet, which accounts for the high average cost. Where the roads are built to a width of 40 feet, the work is usually done on village or city streets, in order to connect important trunk line roads. The average depth of the bituminous construction is 7 inches, including 5 inches of No. 1 stone and 2 inches of bituminous surface, which is placed according to the mixing method. The cost of bituminous roads per square yard varies from 75 cents to $1.40, with an average of about $1.02 per square yard.

MARYLAND.

MILEAGE DATA.

The information contained in Table 36 was secured from county court clerks, county highway engineers, and county surveyors, and was checked up by Mr. W. W. Crosby, State highway engineer.

The total mileage of public roads for 1909 was 16,773, which is the same as that reported for 1904. Of this total 488 miles are reported surfaced with gravel, 1,222.8 miles with stone, 408.5 miles with shell, and 23 miles with sand-clay, making a total of 2,142.3 miles of improved roads, which is a gain of 572.3 miles for the five-year period. The gain in improved roads of the various types is as follows: Eight miles of gravel, 382.8 miles of stone, 158.5 miles of shell, and 23 miles of sand-clay. From this information it will be seen that, at the close of 1909, 12.77 per cent of the roads of the State were improved, which represents a gain for the five-year period of 3.41 per cent.

Baltimore City County has no country roads, but every other county in the State reports some improved roads, though 14 report less than 10 per cent improved and 5 report from 10 to 19 per cent improved. The counties reporting more than 20 per cent improved are as follows: Washington, 20.52; Anne Arundel, 30.23; Harford, 35.54; and Baltimore, 47.48 per cent.

COST DATA.

Frederick County reports the cost of earth roads in that county to be about $800 per mile. Caroline and Wicomico Counties report on the cost of sand-clay roads, and the average for the 2 counties is $1,775 per mile for an average width of sand-clay surface of 24 feet. Anne Arundel and Charles Counties report the cost of gravel roads at $1,000 per mile, with an average width of 12 feet. The cost of shell roads is reported from 6 counties, and the minimum is $500, while the maximum is $5,400 per mile, with an average of $2,984 for the counties reporting. The average width of the shell roads is 13 feet and the average depth is 8 inches. (Table 37.)

The cost of macadam roads varies from $1,500 to $12,800 per mile. The average for the 14 counties reporting is $8,192. The average width of macadam is 13 feet and the average depth is 7 inches.

Baltimore County reports that macadam roads have been treated with 3 gallons of bituminous material to the square yard at a cost of 75 cents per square yard, and that macadam roads are treated with oil at a cost of about 3½ cents per square yard.

MASSACHUSETTS.

MILEAGE DATA.

The information contained in Table 38 was furnished by Mr. Arthur W. Dean, chief engineer of the Massachusetts highway commission.

The total mileage of public roads in this State at the close of 1909 was 17,272, which is 180 miles more than was reported in 1904.

There are two types of improved roads in Massachusetts, those improved by the State and towns (i. e., townships) jointly and those improved by the towns without State aid.

At the close of 1909 there were 780.66 miles of macadam roads which had been improved by the State and towns jointly, and 1,516 miles of macadam roads which had been improved by the towns without State aid. Of the gravel roads there were 61.52 miles improved by the State and towns jointly, and 6,105 miles improved by the towns without State aid. This makes a total of 8,463.18 miles of improved roads, or 49 per cent of the total, which represents a gain for the five-year period of 3.11 per cent.

Between 1904 and 1909 256.93 miles of State-aid macadam roads were constructed, while 827 miles of macadam roads were constructed by the towns without State aid. During this period 19.38 miles of State-aid gravel roads were constructed, but the mileage of gravel roads surfaced by the towns was 474 miles less in 1909 than in 1904. This discrepancy is probably due to an overestimate by some of the towns in 1904 and to the fact that some of the roads have probably been neglected and have passed into the earth-roads class.

Every county in the State reports more than 10 per cent of the roads improved. Two counties report between 10 and 19 per cent, and 6 between 20 and 29 per cent improved. The counties reporting more than 30 per cent improved are as follows: Essex, 79.42; Suffolk, 79.5; Norfolk, 82.86; Bristol, 89.66; Middlesex, 90.64; and Plymouth, 98.24 per cent. It will be noticed from Table 38 that Middlesex County has 1,878.97 miles of improved roads out of a total of 2,073 miles and that Plymouth has 1,432.44 miles of improved roads out of a total of 1,458. Most of the roads, however, in these counties are surfaced with gravel.

COST DATA.

Table 39 shows the cost of 283,407 square yards, or 33.189 miles of macadam, bituminous-macadam, and sand-oil roads which were built in the State of Massachusetts during the years 1907, 1908, and 1909 by the State highway commission. This table is copied from the reports of the State highway commission for 1909.

The average cost of the 24 sections of plain macadam road referred to in Table 39 was $7,451 per mile, exclusive of bridges. The standard macadam road in Massachusetts is surfaced to a width of 15 feet, and the material is spread and consolidated to a depth of 6 inches in the center and about 4 inches at the sides. Most of the roads upon which the above cost data are based were built according to standard specifications.

The average cost of the seven bituminous-macadam roads referred to in Table 39 is $9,714 per mile. These roads are built in practically the same manner as plain macadam roads, with the exception that the surface course is bonded with some bituminous preparation and screenings, instead of screenings alone. The work is usually done by what is known as the penetration method. The crown of the bituminous-macadam roads is only three-eighths inch to the foot, whereas on the plain macadam roads the crown is about three-fourths inch to the foot.

The average cost of the three sand-oil roads referred to in Table 39 is $4,718 per mile. These roads were built for experimental purposes, and consist of a combination of asphaltic oils and sand. The work was done by the penetration and mixing methods, with the object of developing a dustless and durable road for sandy regions, which may be built without using crushed stone or gravel.

MICHIGAN.

MILEAGE DATA.

Mr. F. G. Randall, chief clerk of the State highway department and special agent of this office, furnished the mileage statistics for the State of Michigan.

According to Table 40, it will be seen that there were, at the close of 1909, 68,906 miles of public roads in the State, which is practically the same mileage as was reported for 1904. Of this amount 747.81 miles are reported as having been surfaced with stone, 3,770.58 miles with gravel, 2,381.65 miles with sand-clay, and .5 mile with bituminous-macadam, making a total of improved roads of 6,900.54 miles, or 10.01 per cent of the total mileage of roads in the State.

In 1904, 10.14 per cent of the roads in the State were reported improved, which shows a reduction for the five-year period of 0.13 per cent. This apparent falling off in the mileage of the improved roads is caused by a reduction in the mileage of gravel roads reported. The mileage of gravel roads reported for 1904 exceeded the mileage reported for 1909 by about 3,007 miles. There were, however, no sand-clay roads reported for 1904, and it is possible that some gravel roads have been reclassified as sand-clay roads. Nevertheless, even if the sand-clay and gravel roads are added together, it will be

seen that the mileage of gravel roads reported in 1904 still exceeds the total of gravel and sand-clay roads reported for 1909 by 624.77 miles. This is probably due partly to an overestimate of the mileage of gravel roads in 1904 and partly to the fact that under the new classification many of the roads which were formerly reported as gravel roads have been reclassified as earth roads.

The gain in stone roads for the five-year period is 499.31 miles. Every county in the State reports some improved roads, but there are 50 counties which report less than 10 per cent improved; 17 counties have from 10 to 19 per cent improved; 4 from 20 to 29 per cent; and 12 counties report over 30 per cent improved, as follows: Dickinson, 30.59; Menominee, 31.01; Van Buren, 33.06; Baraga, 34.13; Houghton, 35.11; Schoolcraft, 35.7; Ontonagon, 38.33; Keweenaw, 38.6; Alpena, 45.89; Gogebic, 54.94; Mackinac, 59.45; and Chippewa, 61.71 per cent.

COST DATA.

The cost data for Michigan are shown in Table 41. This information was obtained from the annual report of the Michigan State highway department for 1909, and represents the cost of roads built by the counties and townships under the State reward system, which may be described briefly as follows:

On roads 18 feet in width between ditches and having grades of not over 6 per cent, and which are surfaced to a width of not less than 9 feet, the State pays a reward as follows: Sand-clay or gravel-clay roads, $250 per mile; gravel roads, $500 per mile; stone-base and gravel-surface roads, $750 per mile; gravel or slag base with stone surface, $750 per mile; macadam or bituminous-macadam roads, $1,000 per mile; concrete, with or without brick surface, $1,000 per mile. The depth of materials on the gravel roads must be not less than 8 inches consolidated, and on the stone roads and the stone-gravel roads not less than 7 inches consolidated, and they must be built according to specifications of the State highway department and be accepted by that department before the reward is given.

It will be seen from Table 41 that the cost of gravel roads built under this system in the various townships varies from $461 to $6,422 per mile, with an average of $1,843 per mile for the 75 sections of road referred to in the table.

The cost of the macadam roads varies from $1,421 to $12,128 per mile, with an average cost of $4,346 per mile for the 65 sections.

MINNESOTA.

MILEAGE DATA.

The mileage statistics for Minnesota were secured from county auditors and county surveyors of the various counties and were checked up by Mr. George W. Cooley, State highway engineer.

From the information contained in Table 42, it will be seen that there were, at the close of 1909, 79,323 miles of public roads in the State, of which 5,416.85 miles were improved as follows: 137.35 miles with stone, 4,228 miles with gravel, and 1,051.5 miles with sand-clay.

From these figures it appears that 6.83 per cent of the roads were improved at the close of 1909, as compared with 7.87 per cent in 1904. There were no sand-clay roads reported in 1904. The mileage of gravel roads reported for 1904 exceeds the mileage reported in 1909 by 1,951 miles. Some of these roads have evidently been reported in 1909 as sand-clay roads, but aside from this fact there is still a considerable discrepancy for which there is no way of accounting except on the ground that in many communities gravel roads are being neglected and the people are turning their attention to the construction of stone roads. In many places gravel roads which were built five years ago have so disintegrated owing to improper methods of construction or poor maintenance that they would naturally be reported at this time as earth roads.

There are 17 counties in Minnesota which report no improved roads for 1909; 47 counties report less than 10 per cent improved, and 14 counties report between 10 and 20 per cent improved. The 7 counties reporting more than 20 per cent improved are as follows: Ramsey, 20.53; Dodge, 25.86; Olmsted, 29.64; Roseau, 34; Morrison, 35.31; Cook, 48; and McLeod, 49.01 per cent.

COST DATA.

As shown in Table 43, only 2 counties in Minnesota reported in regard to the cost of earth roads, with an average cost of $275 per mile. Three counties report on the cost of sand-clay roads, with an average of $766 per mile. The average width of the sand-clay roads is 20 feet.

Fourteen counties furnish information in regard to the cost of gravel roads at a minimum cost of $150 and a maximum cost of $1,700 per mile. The average for the counties reporting is $946 per mile, while the average width of the gravel surface is 14 feet. One county, Winona, reports the cost of gravel roads as $0.15 per square yard.

Eight counties furnish information in regard to the cost and width of macadam roads. The minimum cost is given as $1,700 and the maximum as $6,000 per mile, with an average cost of $3,280. The average width is 12 feet and the average depth 6 inches. Winona County reports the cost of macadam roads as 65 cents for country roads and $1.20 per square yard for city streets.

MISSISSIPPI.

MILEAGE DATA.

The mileage statistics for Mississippi were secured from the county surveyors, county supervisors, and the chancery clerks of the various counties and were verified by Mr. E. N. Lowe, State geologist.

The total mileage of public roads at the close of 1909 is reported to have been 39,619 (Table 44), which represents a gain over the mileage in 1904 of 921 miles. This discrepancy is probably due to an underestimate by various county officers in 1904.

Of the total mileage of public roads, 52.5 miles are reported surfaced with stone, 165.75 miles with gravel, 103 miles with sand-clay, 1 mile with burnt clay, and 20 miles with shell, making a total of 342.25 miles, which represents a gain over the improved road mileage in 1904 of 193.25 miles. The increases of improved roads of the various types for the five-year period are as follows: 52.5 miles of stone, 56.75 miles of gravel, 103 miles of sand-clay, and 1 mile of burnt clay. It will be noticed that there were no stone or sand-clay roads reported for 1904. From these figures it appears that only 0.86 per cent of the public roads of Mississippi are improved. This represents a gain for the five-year period of 0.55 per cent.

There are 59 counties in Mississippi which report no improved roads for 1909; 18 counties report less than 9 per cent improved; while only one county, Sunflower, reports more, namely, 10 per cent.

COST DATA.

The cost of earth roads in Mississippi, as shown in Table 45, varies from $16 to $275 per mile, with an average for the 5 counties reporting of $97.

The minimum cost of gravel roads reported is $650 and the maximum $5,000, with an average of $2,058 per mile for the 6 counties reporting.

Only 2 counties furnished information in regard to the cost of macadam roads and the average was $5,135. The average width of the macadam roads is 16 feet.

MISSOURI.

MILEAGE DATA.

The mileage statistics for Missouri were secured principally from county highway engineers and county clerks and were checked up by Mr. Curtis Hill, State highway engineer.

According to Table 46 there were, at the close of 1909, 107,923 miles of public roads. In 1904 data collected from the same source indicated that the total mileage of public roads of Missouri was 108,133. This means a decrease of 210 miles for the five-year period.

Of the total mileage of public roads in Missouri for 1909, 2.25 miles are reported surfaced with sand-clay, 1,240.75 miles with stone, and 3,512.5 miles with gravel, making a total of 4,755.5 miles as against 2,733 miles in 1904. In 1904, 2.53 per cent of the roads of the State were reported as having been improved, but the percentage for 1909 is 4.4, which shows a gain of 1.87 per cent.

By referring to Table 46 it will be seen that 53 counties report no roads improved, 43 counties report less than 10 per cent improved, 8 counties report from 10 to 19 per cent improved, 5 counties report from 20 to 29 per cent improved, while 5 counties report over 30 per cent improved, namely, Gasconade, 31.22; Marion, 31.75; Cole, 33.61; St. Louis, 36.1; and Jasper, 61.55 per cent.

COST DATA.

From Table 47 it will be seen that only 2 counties report the cost of earth roads, with an average cost of $275 per mile for an average width of 28 feet.

Scott County reports the cost of sand-clay roads to be $300 per mile.

The minimum cost of gravel roads is $250 per mile and the maximum $3,168, with an average cost of $1,023 for the 22 counties reporting. The average width of gravel surface is 14 feet.

The cost of the macadam roads varies from $1,000 to $6,700 per mile, and the average cost for the 21 counties reporting is $3,388. The average width of macadam roads is 14 feet and the average depth, unrolled, 10 inches.

St. Charles County reports the cost of Telford macadam roads as $5,000 per mile. These roads have a width of 16 feet and a depth of 14 inches.

Adair County reports the cost of bituminous construction at $2.10 per square yard.

MONTANA.

MILEAGE DATA.

The data for Montana were collected principally from county clerks and county surveyors and were checked up by Hon. E. L. Norris, governor of the State.

The total mileage, as reported for 1909, was 23,319 (Table 48), which exceeded the total reported for 1904 by 900 miles. Only 95 miles of stone and gravel roads are reported for the State, which indicates that only 0.41 per cent of the roads of the State are improved.

Montana is a very large State, with diversified topography, climate, and soil conditions, while the population varies from dense to extremely sparse. It would therefore be expected that road building would be found in various stages of development. It will be seen from Table 48 that very little has been done in the way of building permanent stone and gravel roads, and 19 counties report no roads improved, while the other 9 counties all report less than 10 per cent. Considerable attention, however, has been devoted to the building of bridges and of roads over the natural soil. Gravel is abundant in many sections of the State and is being utilized as funds become available. Natural gravel roads also exist in a few localities. In other sections the material for building hard roads is difficult to obtain.

COST DATA.

As will be seen from Table 49, Dawson County reports the cost of 20-foot earth roads as $300 per mile. Beaverhead County reports the cost of earth-road construction to be about 21 cents per cubic yard.

Sand-clay roads in Rosebud County are built to a width of about 18 feet, and their cost is about 23 cents per cubic yard.

Dawson County reports the cost of gravel roads at $800 per mile, and Beaverhead County at 62 cents and Fergus County at 52 cents per square yard. The average width of these roads is 20 feet.

NEBRASKA.

MILEAGE DATA.

The mileage statistics for Nebraska were secured from the county clerks and county surveyors of the various counties and were checked up by Prof. Erwin H. Barbour, State geologist.

By referring to Table 50 it will be seen that at the close of 1909 there were 80,338 miles of public roads in the State, which exceeds the mileage reported for 1904 by 876 miles. There were only 248.55 miles reported as having been improved, of which 52.5 miles were surfaced with stone, 179.75 miles with sand-clay, .5 mile with gravel, 1 mile with brick, 1.5 miles with concrete, and 13.3 miles with bituminous-macadam, making 0.31 per cent of improved roads in the State. In 1904, .03 per cent of improved roads was reported.

There are 77 counties in Nebraska which report no improved roads for 1909; 12 counties report less than 10 per cent improved; while only one county, Cedar, reports more, namely, 10.74 per cent.

The need for macadam, gravel, and other hard roads is not as great in Nebraska as in many other States. Particularly is this true of the western portion of Nebraska, where the rainfall is light and where the prairie roads are fairly good in all seasons of the year. Stone and gravel roads are needed, however, in many thickly settled regions east of the center of the State, where the loess and gumbo soils prevail and where the rainfall is heavier than on the sandy prairies farther west.

COST DATA.

The cost data for Nebraska are presented in Table 51. Three counties furnished information in regard to the cost of sand-clay roads, which varies from $200 to $1,600 per mile, with an average for the counties reporting of $933 per mile.

Nemaha County reports that macadam roads cost about $6,000 per mile, while Douglas County reports the cost of bituminous construction as $8,448 per mile for roadways 12 feet in width and 7 inches in thickness.

NEVADA.

MILEAGE DATA.

Mileage statistics were secured principally from county clerks and county commissioners. The returns were checked up by Mr. Louis Beaver, State commissioner of agriculture.

According to the figures contained in Table 52, there were, at the close of 1909, 12,751 miles of public roads in the State, which exceeded the total reported for 1904 by 166 miles. Only 46 miles are reported to have been improved—45 miles with gravel and 1 mile with stone. There was, therefore, only 0.36 per cent of improved roads at the close of 1909, and this is a little less than the percentage reported for 1904.

Nine countries in Nevada report no improved roads for 1909; 4 counties report less than 10 per cent; while only 1 county, Ormsby, reports more, namely, 11.88 per cent.

The need for stone and gravel roads is not as great in Nevada as in many other States where the traffic is heavy, and where the soil and climatic conditions necessitate hard roads. Nevada is sparsely settled and is an arid or semiarid region, and a large portion of the country is devoted to mining and stock raising. There are a number of miles of stage road in various parts of the State, but the soil over which these roads pass is composed of gravel or of sand, clay, and soil mixtures, which makes very good natural roads. Nevada's progress in road building should not, therefore, be judged entirely by the percentage of her mileage of stone and gravel roads.

NEW HAMPSHIRE.

MILEAGE DATA.

Mileage statistics for New Hampshire were secured from the selectmen of the various towns (i. e., townships). The reports were then submitted to Mr. H. C. Hill, State highway commissioner, but he was unable to check up the returns except for the total mileage of public roads.

This total for 1909 is the same as that reported for 1904 (Table 53), that is, 15,116 miles. The total mileage of improved roads at the close of 1909 was 1,448.48. Of the improved roads, 201.82 miles are reported to have been surfaced with stone and 1,246.66 with gravel. The gain in improved roads for the five-year period from 1904 to 1909 was as follows: 83.82 miles of stone and 71.66 miles of gravel, making a total gain of 155.48 miles. The percentage of all roads improved at the close of 1909 was 9.58, which exceeded the percentage for 1904 by 1.03.

It will be noticed from Table 53 that every county in the State reports improved roads; 5 counties report less than 10 per cent improved and 5 counties report between 10 and 20 per cent improved. The figures given above are not very satisfactory, however, as there were several towns from which it was impossible to secure complete returns, although numerous letters were written to the selectmen.

COST DATA.

Table 54 shows the cost data for New Hampshire. Cheshire Township reports the cost of earth roads as $1,750 per mile, with an average width of 19 feet. Orange Township reports that sand-clay roads are being built at an average cost of about $620 per mile.

Gravel roads cost from $500 to $4,500 per mile, with an average for the 43 towns reporting of $2,352 per mile. The average width of gravel surface is 18 feet and the average depth 9 inches. Seven towns report the cost by the square yard instead of by the mile; the minimum cost given is 20 cents and the maximum 90 cents, with an average of 60 cents per square yard.

Macadam roads cost from $2,000 to $7,700 per mile, and the average for the 31 towns reporting is $5,016 per mile. The average width of the macadam is 16 feet and the average depth 9 inches. For the 3 towns reporting the cost by the square yard the average is 97 cents.

NEW JERSEY.

MILEAGE DATA.

Mileage statistics for New Jersey were furnished by Col. Edward A. Stevens, State commissioner of public roads.

As shown in Table 55, there were, at the close of 1909, 14,842 miles of public roads, which is the same as was reported for 1904. Of this mileage 3,377.86 miles are reported as having been improved, of which 211.33 miles are surfaced with bituminous-macadam, 2,594.09 miles with plain macadam, and 572.44 miles with gravel.

The gain in improved roads of the various types is as follows: 211.33 miles of bituminous-macadam, 693.04 miles of plain macadam, and 90.97 miles of gravel, making a total gain of improved roads of 955.56 miles for the five-year period. There were no bituminous-macadam roads reported for 1904. It will therefore be seen that 22.76 per cent of the public roads of the State were reported as having been improved at the close of 1909, which shows a gain over the mileage in 1904 of 6.44 per cent.

Every county in the State reports some improved roads; 7 counties have less than 10 per cent improved and 7 others have between 10 and 20 per cent improved. The counties having over 20 per cent improved are as follows: Camden, 34.86; Mercer, 35.36; Union, 36.5; Middlesex, 38.7; Passaic, 45.91; Bergen, 49.13; and Essex, 96.41 per cent.

COST DATA.

The cost data contained in Table 56 were obtained from the annual report of the State commissioner of public roads for 1909 and represent the cost of various roads built in the State of New Jersey under the directions of the State highway department during the years 1907, 1908, and 1909.

The average cost of the gravel roads for the 11 counties reporting is $4,317 per mile. The gravel roads vary in width from 14 to 20 feet, but the majority of them are about 20 feet in width. The gravel is placed to a depth of from 8 to 9 inches in the center and from 3 to 4 inches at the sides.

The average cost of macadam roads is $8,746 per mile for the 10 counties reporting. All of these roads are surfaced to a width of 14 feet and vary in depth from 4 to 8 inches, with an average depth of about 6 inches.

It will be noticed from Table 56 that the Washington Valley Road in Somerset County cost $13,406 per mile. This is above the average cost for macadam-road construction in New Jersey and is due to the fact that it was necessary to relocate the road and reduce the grades. The maximum grade on the old road was 11 per cent, which was reduced to 3.8 per cent.

The average cost of bituminous-macadam roads for the 6 counties reporting is $9,930 per mile. The average width of these roads is about 14 feet and the average depth from 6 to 8 inches. Most of this work was done according to the penetration method.

NEW MEXICO.

MILEAGE DATA.

Mileage statistics for New Mexico were secured principally from the probate clerks of the various counties and were checked up by Mr. C. H. Neel, territorial road engineer.

The total mileage of public roads, for the year 1909, as shown in Table 57, was 16,920, which exceeds the total reported for 1904 by 1,594 miles. There were only 104 miles of improved road reported—25 miles of stone, 8 miles of gravel, and 71 miles of sand-clay, which represents only 0.61 per cent of the total. The improved roads for 1904 amounted to only 2 miles of gravel.

Twenty-three counties in New Mexico report no improved roads for 1909; two counties report less than 10 per cent; while only one, Otero, reports more, namely, 10.2 per cent.

Road building in New Mexico is as yet almost entirely confined to the construction of earth roads. The difficulties encountered by the road builder are many and far from easy of solution. Chief of these are a sparse population, dry climate, and rugged topography. Macadam, gravel, and sand-clay roads have been built to some extent, as will be seen from Table 57, but in general the main efforts have been directed toward the building of the best possible roads with the materials at hand and reducing the grades in mountain sections.

NEW YORK.

MILEAGE DATA.

Mileage statistics for New York were furnished by Mr. T. Warren Allen, a member of the State highway commission.

According to Table 58, there were, at the close of 1909, 79,279 miles of public roads in the State. This exceeds the figures given in 1904 by 5,481 miles. Of the total mileage of public roads in the State, 12,787.36 miles are reported as having been improved at the close of 1909, and of these 2,307 miles were surfaced with macadam under the direction of the State highway department, 2,307.4 miles by the towns without State aid, and 8,172.96 miles with gravel by the towns without State aid.

The gain in improved roads for the five-year period from 1904 to 1909 is as follows: 1,600 miles of macadam road improved under State aid, 830.4 miles of macadam roads

improved by the towns, and 4,480.96 miles of gravel roads improved by the towns without State aid, making a total gain of 6,911.36 miles. It will therefore be seen that, at the close of 1909, 16.13 per cent of the roads were reported as having been improved, which shows a total gain in improved roads for the five-year period of 8.17 per cent.

Improved roads are reported from every county in the State, but there are 24 counties having less than 10 per cent improved, 15 counties having from 10 to 20 per cent improved, and 9 counties having from 20 to 30 per cent improved. The counties having over 30 per cent improved are as follows: Ontario, 30.88; Westchester, 33; Orange, 44.9; Orleans, 47.42; Dutchess, 49.34; Rockland, 51.61; Hamilton, 60.75; Monroe, 63; and Genesee, 72.83 per cent. Kings, New York, Queens, and Richmond Counties lie entirely within Greater New York and so have no country roads.

COST DATA.

The cost data for New York were furnished by the State highway department and are shown in Table 59. The cost of macadam roads per mile varies between wide limits, with an average for the year 1909 of approximately $9,496. The average width of macadam is 14 feet and the average depth about 5 inches. The cost of macadam roads varies considerably with the different materials used, and is, therefore, presented under the following headlines: "Limestone," "Trap rock," "Field stone," and "Miscellaneous."

The average cost of limestone macadam roads for the 29 counties reporting is $9,370 per mile. The average width is 15 feet, and the average depth 5 inches.

The average cost of the trap-rock macadam roads is $10,183 per mile for the 27 counties reporting. The average width of these roads is 15 feet, and the average depth 3 inches of trap-rock surface. The foundation of the trap-rock roads is usually composed of local stone. The average cost per mile of macadam roads built of field stone for the 12 counties reporting is about $8,428. The average width of field-stone macadam roads is 14 feet, and the average depth 5 inches.

The average cost per mile of roads shown under the head of "Miscellaneous macadam" is as follows:

TABLE 2.—*Miscellaneous macadam roads—New York, 1909.*

Material.	Cost per mile.	Average width.	Average depth of foundation.	Material.	Cost per mile.	Average width.	Average depth of foundation.
		Feet.	*Inches.*			*Feet.*	*Inches.*
Local sandstone	$9,009	14	5	Granite	$8,163	14	4
Syenite	11,678	15	2	Local stone	10,346	14	6
Local bluestone	8,112	14	5	Gneiss	9,857	16	4
Quartz	7,980	14	5	Local shale	4,795	12	5

It will be noticed that the average depth of the roads surfaced with syenite is 2 inches. Roads built of this material are provided with foundations composed of local stone.

The average cost of gravel roads for the 5 counties reporting is $5,950 per mile. Their average width is 17 feet, and their average depth 7 inches.

NORTH CAROLINA.

MILEAGE DATA.

Mileage statistics for North Carolina were secured principally from county auditors, road commissioners, and clerks of the superior courts. Dr. Joseph Hyde Pratt, State geologist, rendered valuable assistance in collecting information and in checking up the final returns.

According to Table 60, there were, at the close of 1909, 48,285 miles of public roads in the State, which is less by 1,478 miles than the total reported for 1904. Of this total, 2,313 miles are reported as having been improved at the close of 1909, of which 1,038.5 miles were surfaced with stone, 545 miles with gravel, and 729.5 miles with sand-clay. The gain in improved roads for the five-year period was as follows: 639.5 miles of stone, 123 miles of gravel, and 291.5 miles of sand-clay, making a total gain of 1,054 miles. From these figures it will be seen that, at the close of 1909, 4.79 per cent of

the roads were improved, which represents a gain for the five-year period of 2.26 per cent.

There are 45 counties in the State which reported no improved roads, while 36 counties reported less than 10 per cent improved. Eleven counties reported between 10 and 20 per cent improved. The counties reporting more than 20 per cent improved are as follows: Vance, 22.5; Gaston, 22.66; New Hanover, 25; Mecklenburg, 27.41; Rowan, 29.66; and Richmond, 40.33 per cent.

COST DATA.

The cost data for North Carolina are shown in Table 61. Only 1 county reports on the cost of earth roads—Johnson County—where the average cost for this type is $800 per mile.

Sand-clay roads vary in cost from $250 to $1,200 per mile, with an average for the 13 counties reporting of $506 per mile. The average width of the sand-clay surface is 24 feet.

Eight counties report on the cost of gravel roads, with a minimum cost of $300, a maximum cost of $2,500, and an average of $1,006 per mile. The average width of gravel roads is 20 feet, and the average depth 8 inches.

The minimum cost of macadam roads is $3,000, and the maximum $6,000, while the average is $4,020 per mile. The average width of macadam roads is 12 feet, and the average depth 8 inches. Durham County reports that where macadam roads are built by convict labor the cost is $5,000 per mile, but where the work is done by contract the cost is about $6,000.

NORTH DAKOTA.

MILEAGE DATA.

County auditors and county surveyors furnished the information in regard to road mileage in North Dakota. Dr. A. G. Leonard, State geologist, checked up the returns from the various counties.

The total mileage of public roads as reported from the various counties was, at the close of 1909, 61,593 miles (Table 62), which is a gain over the total reported for 1904 of 2,261 miles. There were only 140 miles of gravel road reported, which is 65 miles less than was reported in 1904. No stone roads were reported for 1909, but 7 miles were reported for 1904. At the close of 1909, .23 per cent of the roads were improved, which represents a loss of .13 per cent for the period from 1904 to 1909.

Twenty counties in the State report no improved roads, while 26 others report less than 10 per cent improved. North Dakota has therefore made very little progress in road building during the last five years.

The need for stone and gravel roads, however, is not so great in this State as in many of the States farther south. The traffic is light, and during the winter months the roads are frequently covered with ice and snow, which makes it impossible to draw large loads to market with a 2-horse team.

OHIO.

MILEAGE DATA.

Information regarding the mileage of improved roads in Ohio was obtained from the county commissioners, surveyors, and auditors, and from the township clerks. The returns were then submitted to the State highway department to be checked. A comparison of the data obtained by the United States Office of Public Roads with that compiled by the State highway commissioner revealed much similarity, and it was therefore decided that, as the State highway commissioner was in close touch with local conditions, it would be better to use his figures as a whole rather than to make individual corrections or to combine the data collected in the two investigations. The information collected by this office has served, however, to verify the data secured by the State highway department.

According to the data contained in Table 63, there were, at the close of 1909, 88,861 miles of public roads in the State of Ohio. Statistics collected by townships in 1904 by this office, and published in Bulletin No. 32, showed the total mileage of public roads to be 69,439. The discrepancy between the 1904 and 1909 figures is greater than was expected, and is probably due to the fact that in 1904 correspondents failed to report many miles of section lines as public roads. It is quite probable that many of these section lines and, in many cases, quarter-section lines have been opened up as public roads since 1904. In Ohio, as well as in many other States, where the land was

laid out by the Government, the roads follow the section lines, and, in thickly settled communities, the quarter-section lines. Most of these section lines have been set apart by law as public roads, whether or not they have been opened up or used for this purpose. The 1904 investigation was the first of its kind ever undertaken and it was of necessity much more in the nature of an estimate than this investigation, in which it has been possible to obtain more reliable data.

Of the 88,861 miles of public roads in Ohio in 1909, 14,188 miles were reported surfaced with gravel, 9,687 with stone, and 231 with brick, making a total of 24,106 miles of improved roads. Only 93.25 miles of brick roads were reported in 1904. It appears, therefore, from these figures that 27.13 per cent of the roads of the State have been improved. According to the statistics collected in 1904, the improved roads in the State represented 33.79 per cent of the total mileage; and while the new figures apparently show a falling off of improved roads, this is not actually the case, as the total mileage of roads reported for 1909 is much larger than the 1904 figures.

In 1904, 16,159 miles of gravel roads were reported for the State, as compared with 14,188 miles for 1909, which shows an apparent falling off of 1,971 miles of gravel roads in the five-year period. It is quite probable, however, that some of these gravel roads have been surfaced with stone since 1904. In 1904, 7,160.5 miles of stone roads were reported, as against 9,687 miles for 1909, an increase of 2,526.5 miles.

The gain or loss in gravel-road mileage is much more difficult to ascertain than the gain or loss in stone-road mileage. Gravel roads, as they are ordinarily built in Ohio, deteriorate rapidly. The term "gravel road," according to the popular conception, covers such a wide latitude that roads are frequently reported as gravel roads which should not be so classified. For this reason, correspondents reporting on gravel roads in the same county could easily submit widely varying reports, according to their respective conceptions of what constitutes a gravel road. It is therefore no more than just that Ohio's progress from 1904 to 1909 should be judged by the increase in the mileage of crushed-stone and brick roads.

Only 3 counties in the State report no improved roads, while 26 counties report less than 10 per cent improved, 42 counties report over 25 per cent improved, 18 counties report over 50 per cent improved, and 8 counties report over 75 per cent improved, as follows: Union, 76.63; Warren, 80; Clinton, 81.32; Greene, 82.66; Madison, 89.2; Butler, 93.35; and Montgomery, 93.8 per cent; while Clark County reports all roads improved. According to the report of the county surveyor of Clark County there are 862 miles of public roads in the county, of which 793 miles are surfaced with gravel and 69 miles with stone.

COST DATA.

The cost data for Ohio are shown in Table 64. Gallia County reports that the average cost of earth roads is about $1,600 per mile.

Gravel roads cost from $500 to $4,000 per mile, with an average for the 16 counties reporting of $1,909 per mile. The average width of gravel roads is 11 feet and the average depth 6 inches.

The cost of macadam roads varies from $2,000 to $9,000 per mile, with an average for the 53 counties of $4,580 per mile. The average width of the macadam roads is about 12 feet and the average depth of loose material 10 inches. The cost of bituminous-macadam construction for the 3 counties reporting is from $5,000 to $10,300 per mile, with an average of $7,766. The average width of the bituminous-macadam roads is about 16 feet and the average depth 9 inches.

The minimum cost of brick roads for the 6 counties reporting is $10,783 per mile, while the maximum is $14,500, and the average is $12,381. The width of brick roads varies from 12 to 20 feet.

OKLAHOMA.

MILEAGE DATA.

Mileage statistics for Oklahoma were secured from county court clerks and county judges, and were checked up by Mr. L. C. Snyder, of the State geological survey.

At the close of 1909 the total mileage of public roads, as reported from the various counties, was 71,325 miles (Table 65), which exceeds the total reported for 1904 by 27,771 miles. This large discrepancy is accounted for by the fact that in 1904 the State of Oklahoma had not been organized. There were only 26 counties in Oklahoma in 1904, but at the close of 1909 there were 76 counties, which included a number of newly organized counties as well as those added to Oklahoma when Indian Territory became a portion of the State.

There were practically no improved roads in Oklahoma in 1904, but at the close of 1909 there were 361 miles, as follows: 23.5 miles of stone, 141.5 miles of gravel, and 196 miles of sand-clay, which represents 0.5 per cent of roads improved.

Sixty counties report no improved roads, while 17 others report less than 10 per cent improved. Pittsburg County heads the list with 21 miles of stone road and 102 miles of gravel, which shows that 9.46 per cent of the roads of that county are improved.

COST DATA.

The cost data for Oklahoma are contained in Table 66, which shows that the cost of sand-clay roads varies from $72 to $800 per mile, with an average for the 5 counties reporting of $389 per mile.

There are only 2 counties which furnished information in regard to the cost of macadam construction, and the average for those 2 was $3,750 per mile.

OREGON.

MILEAGE DATA.

The mileage data for Oregon were secured from county clerks and county judges. It was impossible to find anyone in the State who was sufficiently familiar with conditions to verify the reports from the various counties, and it was therefore decided to accept the reports as they had been received from the county officials.

The total mileage of public roads in 1909, as shown by Table 67, was 29,475, which is a reduction of 4,783 miles from the figures shown in 1904.

Of this total, 2,799.25 miles were reported as having been improved as follows: 451.25 miles with stone, 1,871 miles with gravel, 345 miles with sand-clay, 130 miles with planks, and 2 miles with bituminous-macadam.

The gain in improved roads for the five-year period from 1904 to 1909 was 242.25 miles of macadam and 345 miles of sand-clay, but no sand-clay roads were reported for 1904, and the total mileage of improved roads for 1909 shows an actual gain of only 210.25 miles. It will therefore be seen that 9.49 per cent of the roads of the State were improved at the close of 1909, which shows a gain over 1904 of 1.93 per cent.

Six counties report no roads improved, 15 counties have less than 10 per cent of roads improved, 7 counties report from 10 to 20 per cent improved, and 6 counties report over 20 per cent improved. Of these Linn reports 20.66 per cent improved; Yamhill, 26.66; Clatsop, 30; Columbia, 35.29; Tillamook, 41; and Multnomah, 51.11 per cent. There are very few miles of improved roads reported from central, northern, or eastern Oregon. This is due principally to the sparse population. The greatest progress in road building appears to be confined to the Willamette Valley, which lies in the western part of the State between the Cascade and Coast Ranges of mountains.

All parts of the State are abundantly supplied with splendid road-building material. Trap rock of the very best quality for road building is well distributed throughout the State, and the Willamette, Rogue River, Willowa, and the Grand Valleys are all supplied with gravel of a good quality.

COST DATA.

As will be seen from Table 68, gravel roads vary in cost in Oregon from $600 to $3,500 per mile, with an average for the 6 counties reporting of $1,940 per mile. The average width of gravel surface is from 9 to 10 feet and the average depth of material from 6 to 8 inches.

Macadam roads vary in cost from $2,000 to $5,000 per mile, while the average for the 7 counties reporting is $3,491 per mile. The average width of these roads is 10 feet and the average depth of the material from 5 to 8 inches.

The low cost in some of the counties is due to the abundance of road-building material. Trap rock is within easy hauling distance of the main roads in nearly every county in the State. Benton County reports that bituminous roads are being built at a cost of about $2 per square yard.

PENNSYLVANIA.

MILEAGE DATA.

Mileage statistics for Pennsylvania were secured from Mr. R. D. Beman, deputy State highway commissioner, and Mr. C. E. Douglas, a special agent of this office. This information was supplemented by reports from county commissioners and township trustees.

There were, at the close of 1909, 87,386.79 miles of public roads in the State (Table 69), of which 3,364.76 miles, or 3.84 per cent of the total road mileage, were improved. It

was reported that 741.64 miles were surfaced with macadam and 29.15 miles with brick, and all of these were built under the direction of the State highway department.

It is worthy of note that in 1904 Pennsylvania had only 9.25 miles of macadam roads, built under the direction of the State highway department, which shows a gain of about 732 miles in five years. The gain in improved roads, however, for the five-year period for the whole State is only 1.67 per cent.

There are only 2 counties in the State which reported no improved roads, but 58 counties, however, reported less than 10 per cent improved. The counties reporting more than 10 per cent improved are as follows: Lebanon, 12.99; Blair, 20.38; Berks, 23.13; Montgomery, 23.48; Allegheny, 25.33; and Delaware, 42.84 per cent. Philadelphia County is coextensive with the city and has no country roads.

COST DATA.

Cost data for Pennsylvania are shown in Table 70. The cost of gravel roads varies from $400 to $3,000 per mile, and the average for the 8 townships reporting is $1,575 per mile. There are only 3 counties in the State which report the cost of gravel roads. The average width of these roads is 14 feet and the average depth of material 10 inches.

The minimum cost of macadam construction is $1,425 and the maximum $16,042 per mile. The average for the 38 townships reporting is $9,164 per mile. The average cost of macadam roads for the 6 townships in Delaware County which report the cost by the square yard is 78 cents. The average width of the macadam surface is 16 feet and the average depth of material, unrolled, 10 inches.

Nether Providence, in Delaware County, reports that bituminous-macadam roads are being built there at a cost of $10,000 per mile.

Allegheny, Venango, and Warren Counties report that brick roads are being built within their limits at an average cost of $16,334 per mile. These roads vary in width from 12 to 20 feet, with an average of about 15 feet.

RHODE ISLAND.

MILEAGE DATA.

Mileage statistics for Rhode Island were furnished by Mr. P. J. Lannon, clerk of the State board of public roads.

The total mileage of public roads as reported for 1909 was 2,120.75 miles (Table 71), which shows a loss from the mileage in 1904 of 240.25 miles. The total mileage of improved roads in the State in 1909 was 1,042.07, of which 21.97 miles were surfaced with bituminous-macadam, 409.1 miles with plain macadam, and 605 miles with gravel. There were no bituminous-macadam roads reported for 1904. The loss in gravel roads for the five-year period was 169.5 miles, and the gain in stone roads was 162.1 miles. Therefore, 49.14 per cent of the public roads of the State were improved at the close of 1909, which shows a gain of 5.87 per cent over the mileage in 1904.

Newport County reports 35.38 per cent of improved roads; Bristol County, 52.51 per cent; Washington County, 57.74 per cent; and Providence County, 61.25 per cent.

COST DATA.

Reports received from Mr. Lannon indicate that the average cost of macadam roads in Rhode Island is about 80 cents per square yard, and that bituminous-macadam roads cost on an average about $1.25 per square yard. The cost is about the same in the 4 counties of the State.

SOUTH CAROLINA.

MILEAGE DATA.

The information for South Carolina was secured from county supervisors, clerks of of the county courts, and clerks of the boards of county commissioners. Mr. Earl C. Sloan, State geologist, and Mr. E. J. Watson, State commissioner of agriculture, rendered valuable assistance in collecting and verifying reports from the various counties.

The total mileage of public roads reported for 1909 was 32,075 miles (Table 72). It will be noticed that the figures given for 1904 exceed those given for 1909 by 9,755 miles. This discrepancy is probably due to the fact that a number of the correspondents overestimated the mileage in 1904.

Of the total mileage of public roads in the State in 1909, 153.75 miles were surfaced with stone, 131 miles with gravel, 32 miles with shell, and 3,218 miles with sand-clay, making a total of 3,534.75 miles of improved roads, which represents 11.02 per cent of the total mileage of the State.

The gain in improved roads for the five-year period from 1904 to 1909 was 84.75 miles of stone and 1,643 miles of sand-clay, and this, with the reduction of 48 miles of gravel roads and 23 miles of shell road, makes a total gain of 1,656.75 miles. From these figures it would appear that 6.54 per cent of the roads were improved during the five-year period, but as a matter of fact the gain has not been as great as that, because of the great reduction in the mileage since 1904. Assuming the total mileage of public roads to have been the same in 1904 as was reported in 1909, the gain for the five-year period would be only 5.16 per cent.

There are 6 counties in the State which report no improved roads, 20 counties have less than 10 per cent improved, 6 counties have between 10 and 20 per cent improved, and 3 counties have between 20 and 30 per cent improved. The counties which have 30 per cent and over improved are as follows: Williamsburg, 30; Abbeville, 30.1; Bamberg, 31.24; Calhoun, 33.33; Dorchester, 33.33; Darlington, 46.66; and Richland, 64.35 per cent.

Richland County, which reports 448 miles of sand-clay roads, was one of the first counties in the United States to adopt this type of construction, and the progress which South Carolina and other States have made along this line is largely due to the success of the work in Richland County.

COST DATA.

The cost data for South Carolina are shown in Table 73.

Sand-clay roads cost from $250 to $1,000 per mile, with an average for the 18 counties reporting of $415 per mile. These roads vary in width from 16 to 30 feet, while the average for the counties from which reports were received is 23 feet.

The average cost of sand-clay roads in Richland County is $400 per mile.

Only 3 counties furnished information in regard to the cost of gravel roads, and the average was $1,133 per mile. Macadam roads vary in cost in the 5 counties reporting from $1,800 to $7,000 per mile, with an average of $3,252 per mile.

SOUTH DAKOTA.

MILEAGE DATA.

The information for South Dakota was secured from the county auditors of the various counties and was checked up by Mr. Samuel H. Lee, State engineer.

The total mileage of public roads reported for 1909 was 56,354 (Table 74), which is less by 2,941 miles than the total given for 1904. This discrepancy is probably due to the fact that a number of the counties overestimated the mileage in 1904.

Of the total mileage of public roads in 1909, 147 miles are reported surfaced with gravel, 10 miles with stone, and 129 miles with sand-clay, making a total of 286 miles of improved road or 0.5 per cent. The gravel-road mileage is the same in 1909 as for 1904, that is, 147 miles. During the five-year period 129 miles of sand-clay and 6 miles of macadam roads have been constructed.

It appears from the returns that 50 counties report no improved roads, while 13 counties have less than 10 per cent improved.

TENNESSEE.

MILEAGE DATA.

The information for Tennessee was furnished principally by county court clerks, and was checked up by Mr. George H. Ashley, State geologist.

According to Table 75 there were 45,913 miles of public roads in the State at the close of 1909. The total mileage for 1904 exceeds the total reported for 1909 by 3,076 miles, which is probably due to an overestimate from a number of the counties in 1904. Of the total mileage of public roads in the State in 1909, 2,684 miles were surfaced with stone, 2,542.5 miles with gravel and 127 miles with sand-clay, making a total of 5,353.5 miles, or 11.66 per cent of the roads improved. The gain in improved roads for the five-year period from 1904 to 1909 was 910 miles of stone, 31.5 miles of gravel, and 127 miles of sand-clay, making a total gain of 1,068.5 miles, which would indicate that 2.91 per cent of the public roads have been improved during the period from 1904 to 1909.

Thirty-one counties report no improved roads, 35 counties have less than 10 per cent improved, 11 counties have between 10 and 20 per cent improved, and 8 counties have between 20 and 30 per cent improved. The counties reporting more than 30 per cent improved are as follows: Hamblen, 32; White, 32.43; Jefferson, 34.33; Madison, 38.4; Maury, 38.99; Davidson, 40.33; Sumner, 41.66; Rutherford, 45; Smith, 47.5; Bradley, 55.38; and Marshall, 58 per cent.

The progress in road building in Tennessee is due largely to the fact that a number of counties in different parts of the State have issued bonds for this purpose. This activity has been largely confined to the eastern part of the State, but the central portion has been fairly well supplied with stone roads for a number of years.

COST DATA.

The cost data for Tennessee are shown in Table 76.

Sand-clay roads are reported as costing from $400 to $1,500 per mile, with an average for the 3 counties reporting of $1,050 per mile. The average width of sand-clay roads is about 14 feet, and the average depth of material from 6 to 8 inches.

Gravel roads are reported as costing from $400 to $5,000 per mile, with an average for the 15 counties reporting of $1,697 per mile. Gravel roads have an average width of 14 feet and an average depth of material of 7 inches.

The cost of macadam roads varies from $700 to $5,100 per mile, and the average for the 22 counties reporting is $2,727 per mile. The average width of macadam surface is 13 feet and the average depth of material, consolidated, 7 inches. The cost of macadam roads in Sumner and Williamson Counties is reported as $700 and $800, respectively. It is quite evident that roads built at that cost, however, are not high-grade macadam roads, but are probably built by simply crushing the rock, piling it on the old roadbed, and leaving it for the traffic to consolidate.

TEXAS.

MILEAGE DATA.

The mileage data for Texas were secured from county clerks, county judges, and county surveyors, and were checked up by Mr. Robert J. Potts, of the Agricultural and Mechanical College of Texas.

As shown by Table 77, there were, at the close of 1909, 128,971 miles of public roads in the State, which is 7,562 miles more than were reported in 1904. This increase in mileage is caused partly by the fact that a number of new counties have been established and that many new roads in different parts of the State have been opened up.

Of the total mileage of public roads, 365.25 miles are reported as having been surfaced with stone, 2,126 miles with gravel, 2,253.75 miles with sand-clay, 126 miles with shell, and 25 miles with shell screening, making a total of 4,896 miles of improved roads, which represents 3.8 per cent of the total. The gain in improved roads of the various types is as follows: 198.25 miles of stone, 217 miles of gravel, 74 miles of shell, and 25 miles of shell screening. There were no sand-clay roads reported in 1904. The total gain in improved roads, therefore, is 2,768 miles, or 2.05 per cent for the five-year period.

There are 140 counties in the State which report no improved roads, and 81 counties with less than 10 per cent of roads improved, while 13 counties report from 10 to 20 per cent improved. The counties reporting more than 20 per cent improved are as follows: Starr, 21.42; Aransas, 22.72; Mason, 25; Comal, 26.66; Jackson, 26.66; Tarrant, 27.5; Liberty, 30; Guadalupe, 31.85; Jack, 32.3; Montgomery, 40; and Webb, 54.11 per cent. The counties which appear to have made the greatest progress in road building, however, are Bexar, Dallas, Harris, Tarrant, and Travis.

COST DATA.

Cost data for Texas are shown in Table 78.

The cost of earth roads varies from $60 to $400 per mile. The average for the 5 counties reporting is $168 per mile.

The cost of sand-clay roads varies from a minimum of $60 per mile to a maximum of $2,000 per mile. The average for the 41 counties reporting is $593 per mile. The sand-clay roads are surfaced to a width of about 20 feet, and the sand-clay mixture is placed to a depth of from 8 to 12 inches.

The average cost of shell roads for the 3 counties reporting is $3,083 per mile, with an average width of 14 feet and an average depth of material of 10 inches.

The average cost of gravel roads for the 27 counties reporting is $1,708; the maximum cost is given as $4,000 and the minimum as $100.

Five counties furnish information in regard to the cost of macadam roads; the minimum cost is reported as $1,000, the maximum $3,500, and the average $2,160 per mile. Macadam roads vary in width from 12 to 18 feet and in depth from 6 to 8 inches.

El Paso County reports that bituminous roads are being built at a cost of about $6,000 per mile.

UTAH.

MILEAGE DATA.

The information for Utah was secured principally from county clerks and county surveyors, and was checked up by Mr. David Mattson, who is treasurer of the State and also a member of the State road commission. Mr. Mattson also rendered valuable assistance in securing a part of the information from the various counties.

The total mileage of public roads in 1909 was 8,320 (Table 79), which exceeds the total reported for 1904 by 1,230 miles. This discrepancy is probably due to the fact that a number of roads have been laid out during the five-year period, and that correspondents in a number of counties underestimated the mileage in 1904.

Of the total mileage of public roads, 1,018 are reported to have been improved. Of this mileage, 0.5 mile was surfaced with bituminous-macadam, 42 miles with plain macadam, 332 miles with gravel, and 643.5 miles with sand-clay. There were no sand-clay roads reported for 1904, and, as the mileage of gravel roads for 1904 exceeds the mileage reported for 1909 by 265 miles, it is assumed that quite a number of the roads which were classified as gravel roads in 1904 were classified as sand-clay roads in 1909. It will be seen from these figures that 12.23 per cent of the roads of the State are reported as improved, which exceeds the percentage reported for 1904 by 3.66 per cent.

Six counties in the State report no improved roads, 10 counties have less than 10 per cent improved, 4 counties have between 10 and 20 per cent improved, and 4 counties have between 20 and 30 per cent improved. The counties having more than 30 per cent improved are as follows: Weber, 31.46; Sevier, 42; and Salt Lake, 59.57 per cent.

It will be seen that in spite of its dry climate and sparse population Utah has made considerable progress in the improvement of its public roads.

COST DATA.

Table 80 indicates that in Utah sand-clay roads are being built at a cost of from $160 to $3,000 per mile, while the average for the 6 counties from which reports were received is $718 per mile. Carbon County reports that sand-clay roads are being built at a cost of 20 cents per cubic yard, and that their width is from 18 to 40 feet.

Gravel roads vary in cost from $500 to $5,000 per mile, with an average for the 4 counties reporting of $2,188 per mile, while the width varies from 15 to 25 feet. Beaver County reports that these roads are costing $0.45 per square yard in that county.

Salt Lake and Uinta Counties both report the cost of macadam roads as $5,000 per mile, but no information is given in regard to the width and depth.

VERMONT.

MILEAGE DATA.

Information regarding the mileage of roads improved between 1903 and 1909, inclusive, was furnished by Mr. M. E. Shedd, who is connected with the State highway department and who is also a special agent of this office. To the information furnished by Mr. Shedd, the mileage statistics contained in Bulletin No. 32 for Vermont have been added. The State highway department vouches for the accuracy of the figures for the seven-year period from 1903 to 1909, but was unable to check up the mileage reported previous to that time. (Table 81.)

From this information it appears that there were, at the close of 1909, 14,406 miles of country roads in the State; of this mileage 466.65 miles were surfaced with stone and 2,183.98 miles with gravel, making a total of 2,650.63 miles of improved roads, or 18.4 per cent of the total.

The gain in improved roads is as follows: 185.65 miles of macadam and 511.48 miles of gravel, making a total gain for the seven-year period of 697.13 miles, or 4.95 per cent.

Every county in the State reported some improved roads; 3 counties report less than 10 per cent improved; 5 counties report between 10 and 20 per cent improved; while 6 counties reported over 20 per cent improved, as follows: Washington, 23.8; Addison, 27.85; Chittenden, 30.66; Bennington, 32.58; Rutland, 38.02; and Grand Isle, 56 65 per cent.

COST DATA.

The State highway department is authority for the statement that the average cost of gravel roads in Vermont is about $1,600 per mile and of telford gravel, $2,500 per mile. The width of gravel and telford gravel roads is about 12 feet, with shoulders about 4 feet wide on each side, making a total width from ditch to ditch of 20 feet. The gravel roads are surfaced to a depth of about 8 inches and the gravel telford to a depth of about 15 inches.

VIRGINIA.

MILEAGE DATA.

The information for Virginia was secured from county court clerks and was checked up by Mr. P. St. J. Wilson, State highway commissioner. The total mileage of public roads reported for 1909 was 43,399 miles (Table 82), which is less than the mileage reported for 1904 by 8,413 miles. A number of counties overestimated the total mileage in 1904. Of the improved roads 1,011.5 miles are reported as having been surfaced with stone, 610.75 miles with gravel, 185.5 miles with sand-clay, 91 miles with shell, and 4 miles with bituminous-macadam, making a total of 1,902.75 miles of improved roads, which represents 4.38 per cent of the total.

The gain in improved roads for the five-year period from 1904 to 1909 is as follows: 256.5 miles of stone, 185.5 miles of sand-clay, and 4 miles of bituminous-macadam, making a total of 302.75 miles improved, or 1.29 per cent of the total. There was a slight reduction in the mileage of gravel roads reported.

There are 32 counties in the State which report no improved roads; 54 counties have less than 10 per cent improved, 7 counties have from 10 to 19 per cent, and 7 counties have 20 per cent and over improved, as follows: Chesterfield, 20; Dinwiddie, 24; Clarke, 26.66; Alexandria, 31; Greenesville, 42.04; Elizabeth City, 45.33; and Henrico, 46.88 per cent.

COST DATA.

The cost data for Virginia are contained in Table 83.

Dickenson County reports that earth roads are costing about $500 per mile, with a width of 12 feet from ditch to ditch, while Halifax County reports the cost of earth roads to be about $700 per mile for a width of 16 feet.

Sand-clay roads vary in cost from $400 to $800 per mile, with an average cost for the 7 counties reporting of $607 per mile.

The minimum cost of gravel roads is $800 and the maximum cost $5,000, with an average of $2,200 for the 6 counties reporting. The gravel roads are surfaced to a width of from 12 to 16 feet.

Macadam roads vary from $1,750 to $7,000 per mile, and the average for the 27 counties reporting is $4,920 per mile. Macadam roads are surfaced to a width of from 12 to 16 feet and to a depth of from 6 to 8 inches.

WASHINGTON.

MILEAGE DATA.

The information for Washington was secured from county engineers and county surveyors, and was checked up by Mr. Henry L. Bowlby, State highway commissioner. Mr. Bowlby also rendered valuable service in securing the statistics from the various counties.

The total mileage of public roads, as reported for 1909, was 34,283.6 miles (Table 84), which exceeds the total for 1904 by 2,285.6 miles. This increase is probably due to the fact that a number of roads have been laid out in different parts of the State during the five-year period. The total mileage of improved roads for 1909 was 4,520.68 miles, of which 100.41 miles are reported as having been surfaced with stone, 3,178.92 miles with gravel, 1,223.45 miles with sand-clay, and 17.9 miles with bituminous-macadam. The increased mileage for the different types of improved roads is as follows: 51.91 miles of macadam, 1,250.92 miles of gravel, 1,223.45 miles of sand-clay, and 17.9 miles of bituminous-macadam, making a total gain for the five-year period of 2,544.18 miles.

Of the total mileage of public roads in 1909, it will be seen that 13.19 per cent were improved, which represents a gain over 1904 of 7.01 per cent.

There are 11 counties in the State which reported no improved roads, while 11 counties report less than 10 per cent improved, and 4 counties report between 10 and 20 per cent improved. The counties reporting more than 20 per cent improved are

as follows: Clallam, 22.5; Wahkiakum, 31.73; Skagit, 36.89; Clarke, 42.6; San Juan, 51.06; King, 51.09; Thurston, 51.66; Snohomish, 55.06; Mason, 60; Pierce, 69.77; Whatcom, 79.68; and Chehalis, 91 per cent.

COST DATA.

Cost data for Washington are contained in Table 85.

The average cost of gravel roads for the 7 counties reporting is $2,600 per mile. The gravel roads vary in width from 9 to 12 feet and in depth from 3 to 9 inches. Douglas County reports that gravel roads are being built at a cost of 30 cents per cubic yard, while San Juan County reports the cost to be 30 cents per square yard.

The average cost of macadam roads for the 3 counties reporting is $7,600 per mile. All of these roads are surfaced to a width of 16 feet. King County reports that macadam roads are costing about 85 cents per square yard, while Walla Walla County reports the cost to be about $1 per square yard.

WEST VIRGINIA.

MILEAGE DATA.

The information for West Virginia was secured from county engineers and county clerks, and was checked up by Mr. Edward D. Baker, chief engineer of the State highway department. The State highway department also rendered valuable assistance in collecting information from the various counties.

The total mileage of public roads for 1909 was 32,109 miles, which exceeds the total for 1904 by 5,931 miles. This discrepancy is evidently due to an underestimate in 1904. At the close of 1909 there were reported 591.4 miles of improved roads, and of these 543.9 miles were surfaced with stone, 14 miles with sand-clay, and 33.5 miles with gravel. The gain in improved roads for the five-year period was as follows: 326.9 miles of stone, 14 miles of sand-clay, and 7 miles of gravel, which, with the loss of 11 miles of brick roads reported in 1904, makes a total gain of 336.9 miles.

It will be noticed from Table 86 that 307 miles of road are reported as dragged with a split-log drag. These are not classified, however, as improved roads, as the effects of dragging are only temporary and the work must be kept up if the road is to be maintained in good condition.

It will be seen from Table 86 that 1.84 per cent of the roads of the State were improved at the close of 1909, and this exceeds the percentage for 1904 by .87 per cent.

Thirty-six counties in the State report no improved roads and 15 counties report less than 10 per cent, while 4 counties report over 10 per cent improved, namely: Marshall, 10.76; Berkeley, 14.25; Jefferson, 53.33; and Ohio, 77.5 per cent.

COST DATA.

The cost data for West Virginia are contained in Table 87.

The average cost of earth-road building for the 3 counties reporting is $742 per mile.

Macadam roads vary in cost from $2,400 to $10,000 per mile. The average for the 11 counties reporting is $5,414 per mile. The average width of macadam roads is 12 feet.

McDowell County reports that macadam roads built with paid labor cost about $4,000 per mile, but where they are built with convict labor the cost is about $1,300 per mile.

The average cost of brick roads in Ohio and Brooke Counties is $14,500 per mile.

WISCONSIN.

MILEAGE DATA.

Mileage statistics for Wisconsin were furnished by Mr. A. R. Hirst, State highway engineer.

The total mileage of public roads at the close of 1909, as reported by Mr. Hirst, was 61,090 miles, which is less than the total reported for 1904 by 2,503 miles. The total of improved roads for 1909 was 10,167.33 miles (Table 88), of which 659.33 miles were surfaced with stone, 8,494 miles with gravel, 1,013 miles with sand-clay, and 1 mile with bituminous-macadam. There were no sand-clay roads reported in 1904 and, as the mileage of gravel roads was less in 1909 than in 1904, it is assumed that the classification has been changed by reporting some of the roads as sand-clay rather than gravel. The percentage of roads improved is practically the same as that reported for 1904, that is, 16.64 per cent.

Every county in the State except two reports some improved roads. Thirty-seven counties have less than 10 per cent improved, 13 counties report between 10 and 19 per cent improved, and 6 counties report between 20 and 29 per cent improved. The counties reporting over 30 per cent improved are as follows: Manitowoc, 31.68; Brown, 34.77; Fond du Lac, 38.16; Kewaunee, 40.89; Racine, 42.06; Walworth, 45.31; Milwaukee, 49.36; Waukesha, 53.33; Ozaukee, 60.18; Washington, 61.49; Calumet, 70.5; Sheboygan, 72.22; and Winnebago, 74.05 per cent.

COST DATA.

The cost data for Wisconsin are contained in Table 89.

The average cost of sand-clay roads for the two sections reported is $800 per mile.

The cost of gravel roads varies from $250 to $2,100 per mile, with an average for the 14 counties and townships reporting of $1,135 per mile.

Macadam roads vary in cost from $2,000 to $5,986 per mile, and the average cost for the 14 counties and townships reporting is $2,978 per mile.

It was impossible to obtain information in regard to the width and depth of material and other details of construction for roads in this State.

WYOMING.

MILEAGE DATA.

The mileage data for Wyoming were secured from county clerks, county surveyors, and county supervisors of the various counties. The returns were checked up by Mr. Clarence D. Johnson, State engineer.

The total mileage of public roads reported for 1909 was 10,569 miles (Table 90), which exceeds the total for 1904 by 122 miles. There were practically no stone or gravel roads reported for 1909 or for 1904 except in the Yellowstone National Park.

There are 416 miles of Government roads in the Yellowstone National Park and the adjacent national forests. These are constructed and maintained by the National Government, and as most of them are surfaced with gravel, crushed stone, and selected soil, they should be classified as improved roads.

While no stone or gravel roads were reported for the State, the roads are generally good, since the rainfall is light, the soil porous, and the traffic not very heavy. In many parts of the State the soil is gravelly, so that with very little work the roads can be constructed and maintained in such a way as to meet the present needs. The chief difficulty encountered by the road builder in Wyoming is that of properly locating the roads and providing suitable bridges and culverts.

There are quite a number of mountain roads in different parts of the State which were built at considerable expense on account of the extensive grading and the culverts and bridges, but these roads do not appear on the records as improved roads, though for all intents and purposes they should be so classified.

Thus while the returns from Wyoming show a small percentage of modern improved roads, it should not be inferred that the road condition of the State is especially bad. A road is not bad as long as it answers the need of present traffic, and the majority of the roads of this State are in this class.

APPENDIX.

This Appendix includes mileage and cost statistics for the year ending December 31, 1909. The mileage statistics are presented by counties and the cost data by counties and townships.

TABLE 3.—*Public-road mileage in the United States in 1904 and 1909.*

State.	Total mileage.		Mileage of improved roads.								Percentage of all roads improved.	
			Stone.		Gravel.		Other materials.		Total.			
	1904	1909	1904	1909	1904	1909	1904	1909	1904	1909	1904	1909
Alabama	50,089	49,639	392.5	683.50	1,261.5	1,398.43	66	1,182	1,720	3,263.93	3.43	6.58
Arizona	5,987	5,987	1	.....	216	248	.....	25	217	273	3.62	4.56
Arkansas	36,445	36,445	55	170	181	537.25	.....	378	236	1,085.25	.64	2.97
California	46,653	48,069	418.5	579.25	5,843.5	6,054	2,541	1,954.50	8,803	8,587.75	18.87	17.87
Colorado	30,214	29,693	57	14	121	306.50	.....	.....	178	320.50	.59	1.08
Connecticut	14,088	12,583	463.5	665.62	1,896.5	774.40	.....	1,590.52	2,360.1	3,030.54	16.75	24.08
Delaware	3,000	3,000	14	96.36	2	49	50	41.07	66	186.44	2.20	6.22
Florida	17,374	17,579	345	278.25	17.5	259.60	523	1,214.50	885.5	1,752.35	5.10	9.97
Georgia	57,203	82,230	438	522	659	880.50	537	4,575.50	1,634	5,978	2.86	7.27
Idaho	18,163	18,403	17	17	195	95.50	.....	398	212	510.50	1.16	2.77
Illinois	94,141	94,141	1,106.5	[1] 8,914	6,800	.....	17.5	.....	7,924	8,914	8.42	9.47
Indiana	68,306	67,996	3,295	4,398.25	20,582	20,508.75	.....	48.75	23,877	24,955.75	34.96	36.70
Iowa	102,448	102,427	241	357.25	1,403	1,572.85	20	575	1,664	2,505.10	1.62	2.45
Kansas	101,196	98,302	111.7	136.95	158.5	27.75	3	210.01	273.2	374.71	.27	.38
Kentucky	57,137	53,744	8,078	8,709.25	1,408	1,404	.....	1.70	9,486	10,114.95	16.60	18.82
Louisiana	24,897	24,962	.....	.....	26	82.50	8	247	34	329.50	.14	1.32
Maine	25,528	25,528	87.5	98.34	2,236	2,493.75	.....	110.97	2,323.5	2,703.06	9.10	10.59
Maryland	16,773	16,773	840	1,222.80	480	488	250	431.50	1,570	2,142.30	9.36	12.77
Massachusetts	17,092	17,272	1,212.7	2,296.66	6,621.1	6,166.52	10	.....	7,843 8	8,463.18	45.89	49.00
Michigan	69,296	68,906	248.5	747.81	6,777	3,770.58	.....	2,382.15	7,025.5	6,900.54	10.14	10.01
Minnesota	79,324	79,323	67.5	137.35	6,179	4,228	1	1,051.50	6,247.5	5,416.85	7.87	6.83

Mississippi	38,698	39,619	.....	52.50	109	165.75	40	124	149	342.25	.31	.86
Missouri	108,133	107,923	861.5	1,240.75	1,871.5	3,512.50	.....	2.25	2,733	4,755.50	2.53	4.40
Montana	22,419	23,319	.....	.50	65	94.50	.....	.....	65	95	.28	.41
Nebraska	79,462	80,338	17	52.50	.....	.50	6	195.55	23	248.55	.03	.31
Nevada	12,585	12,751	4	1	60	45	.....	.....	64	46	.51	.36
New Hampshire	15,116	15,116	118	201.82	1,175	1,246.66	.....	.....	1,293	1,448.48	8.55	9.58
New Jersey	14,842	14,842	1,901	2,594.09	481.5	572.44	39.8	211.33	2,422.3	3,377.86	16.32	22.76
New Mexico	15,326	16,920	.....	25	2	8	.....	71	2	104	.01	.61
New York	73,798	79,279	2,184	4,614.40	3,692	8,172.96	.....	.....	5,876	12,787.36	7.96	16.13
North Carolina	49,763	48,285	399	1,038.50	422	545	438	729.50	1,259	2,313	2.53	4.79
North Dakota	59,332	61,593	7	.....	205	140	.....	.....	212	140	.36	.23
Ohio	69,439	88,861	7,160.5	9,687	16,159	14,188	140.5	231	23,460	24,106	33.79	27.13
Oklahoma	43,554	71,325	.....	23.50	.....	141.50	.....	196	.....	361	.....	.50
Oregon	34,258	29,475	209	451.25	2,235	1,871	145	477	2,589	2,799.25	7.56	9.49
Pennsylvania	99,777	87,386.79	2,160.8	2,764.01	.....	436.10	.....	168.65	2,160.8	3,364.76	2.17	3.84
Rhode Island	2,361	2,120.75	247	409.10	774.5	605	.....	27.97	1,021.5	1,042.07	43.27	49.14
South Carolina	41,830	32,075	69	153.75	179	131	1,630	3,250	1,878	3,534.75	4.49	11.02
South Dakota	59,295	56,354	4	10	147	147	.....	129	151	286	.25	.50
Tennessee	48,989	45,913	1,774	2,684	2,511	2,542.50	.....	127	4,285	5,353.50	8.75	11.66
Texas	121,409	128,971	167	365.25	1,909	2,126	52	2,404.75	2,128	4,896	1.75	3.80
Utah	7,090	8,320	11	42	597	332	.....	644	608	1,018	8.57	12.23
Vermont	14,521	14,406	281	466.65	1,672.5	2,183.98	.....	.....	1,953.5	2,650.63	13.45	18.40
Virginia	51,812	43,399	755	1,011.50	720	610.75	125	280.50	1,600	1,902.75	3.09	4.38
Washington	31,998	34,283.60	48.5	100.41	1,928	3,178.92	.....	1,241.35	1,976.5	4,520.68	6.17	13.19
West Virginia	26,178	32,109	217	543.90	26.5	33.50	11	14	254.5	591.40	.97	1.84
Wisconsin	63,593	61,090	733.2	659.33	9,900	8,494	.....	1,014	10,633.2	10,167.33	16.72	16.64
Wyoming	10,447	10,569	.....	.....	.....	.....	153	416	153	416	1.46	3.94
Totals and averages	2,151,379	2,199,645.14	36,818.4	59,237.35	109,905.1	102,870.44	6,806.8	28,372.52	153,530.4	190,476.32	7.14	8.66

[1] This includes gravel roads.

TABLE 4.—*Mileage of sand-clay roads in the United States in 1904 and 1909.*

State.	1904	1909	State.	1904	1909
Alabama	12	1,107	Nebraska	6	179.75
Arizona		25	New Mexico		71
Arkansas		378	North Carolina	438	729.5
California		1,289	Oklahoma		196
Connecticut		1,214.25	Oregon		345
Delaware		6.08	Rhode Island		6
Florida	435	1,016.5	South Carolina	1,575	3,218
Georgia	513	4,326.5	South Dakota		129
Idaho		398	Tennessee		127
Iowa		575	Texas		2,253.75
Kansas		202.25	Utah		643.5
Louisiana		168	Virginia		185.5
Maryland		23	Washington		1,223.45
Michigan		2,381.65	West Virginia		14
Minnesota		1,051.5	Wisconsin		1,013
Mississippi		103			
Missouri		[1] 2.25	Total	2,979	24,601.42

[1] Approximately.

TABLE 5.—*Average cost per mile of improved roads in various States in 1909.*

State.	Sand-clay.	Gravel.	Macadam.	Bituminous.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Alabama	680	1,483	2,525	[1] 13,250
Arkansas		940	3,250	
California	412	1,375	5,375	8,575
Colorado		1,475		
Connecticut		5,412	[2] 8,220	
Delaware	([3])	([4])	6,850	10,120
Florida [5]	829	3,900	[6] 3,112	
Georgia	387	1,250	2,275	
Indiana		1,887	2,657	
Kansas	785		4,070	
Kentucky		1,011	2,158	
Louisiana [7]	654	2,100		
Maine		3,687	9,022	[8] 19,681
Maryland [9]	1,775	1,000	8,192	
Massachusetts			7,451	[10] 9,714
Michigan		1,843	4,346	
Minnesota	766	946	3,280	
Mississippi		2,058	5,135	
Missouri		1,023	3,388	
Montana	([11])	[1] 800		
Nebraska	933		[1] 6,000	[1] 8,448
New Hampshire		2,352	5,016	
New Jersey		4,317	8,746	9,930
New York		5,950	9,496	
North Carolina	506	1,096	4,020	
Ohio	([12])	1,909	4,580	7,766
Oklahoma	389		3,750	
Oregon		1,940	3,491	
Pennsylvania		1,575	9,164	10,000
Rhode Island			([13])	([14])
South Carolina	415	1,133	3,252	
Tennessee	1,050	1,697	2,727	
Texas [15]	593	1,708	2,160	[1] 6,000
Utah	718	2,188	5,000	
Vermont		[16] 1,600		
Virginia	607	2,200	4,920	
Washington		2,600	7,600	
West Virginia			5,414	([17])
Wisconsin	800	1,135	2,978	
Average	723	2,047	4,989	10,348

[1] For 1 section of road only.
[2] Average cost of telford macadam, $11,323.47; telford gravel, $7,659.71 per mile.
[3] $0.15 per square yard.
[4] $0.25 per square yard.
[5] Average cost of shell roads, $3,186.
[6] Marl and coral, sometimes referred to as cocina.
[7] Average cost of shell roads, $3,000.
[8] Some of these roads are 40 feet in width.
[9] Average cost of shell roads, $2,984 per mile.
[10] Average cost of 3 sand and oil roads, $4,718.66 per mile.
[11] $0.23 per square yard.
[12] Average cost of brick roads, $12,381 per mile.
[13] 80 cents per square yard.
[14] $1.25 per square yard.
[15] Average cost of shell roads, $3,083 per mile.
[16] Telford gravel roads, $2,500 per mile.
[17] Average cost of brick roads, $14,500 per mile.

ALABAMA.

TABLE 6.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Autauga	200	.....	10	10	20	10.00
Baldwin	200	.....	.....	78	78	39.00
Barbour	1,500	.....	.....	100	100	6.66
Bibb	500	.....	5	50	55	11.00
Blount	660	.....	7	.....	7	1.06
Bullock	656	.....	20	25	45	6.86
Butler	600	.....	.....	.....	.....	.....
Calhoun	850	.5	10	1.5	12	1.41
Chambers	1,000	.....	.....	.....	.....	.....
Cherokee	700	.....	350	.....	350	50.00
Chilton	715	.....	.....	.....	.....	.....
Choctaw	775	.....	.....	.....	.....	.....
Clarke	750	.....	.....	.....	.....	.....
Clay	1,000	.....	.....	.....	.....	.....
Cleburne	700	.....	.....	.....	.....	.....
Coffee	250	.....	.....	.....	.....	.....
Colbert	528	100	.....	.....	100	18.93
Conecuh	500	.....	.....	86	86	17.20
Coosa	660	.....	.....	.....	.....	.....
Covington	1,150	.....	.....	.....	.....	.....
Crenshaw	488	.....	.....	.....	.....	.....
Cullman	800	.....	.....	.....	.....	.....
Dale	617	.....	.....	66	66	10.69
Dallas	1,000	.....	30	2	32	3.20
Dekalb	800	.....	20	10	30	3.75
Elmore	1,000	.....	.....	.....	.....	.....
Escambia	700	.....	.....	.....	.....	.....
Etowah	700	.....	155	.....	155	22.14
Fayette	850	.....	5	.....	5	.58
Franklin	700	.....	.....	.....	.....	.....
Geneva	1,000	.....	.....	.....	.....	.....
Greene	300	.....	5	50	55	18.33
Hale	200	.....	1	.....	1	.50
Henry	1,000	.....	.....	.....	.....	.....
Houston	700	.....	.....	5	5	.71
Jackson	500	80	40	.....	120	24.00
Jefferson	950	250	.....	.....	250	26.31
Lamar	1,140	.....	15	20	35	3.07
Lauderdale	600	.....	40	.....	40	6.66
Lawrence	600	.....	.....	.....	.....	.....
Lee	600	.....	.....	.....	.....	.....
Limestone	650	10	50	.....	60	9.23
Lowndes	500	.....	9	1	10	2.00
Macon	300	.....	.....	.....	.....	.....
Madison	300	80	125	.....	205	68.33
Marengo	442	.....	.....	.....	.....	.....
Marion	800	.....	.....	.....	.....	.....
Marshall	1,000	.....	10	.....	10	1.00
Mobile	1,600	.....	95	100	[1] 270	16.87
Monroe	1,400	.....	.....	3	3	.21
Montgomery	597	.....	253.43	59.5	312.93	52.41
Morgan	574	60	.....	.....	60	10.45
Perry	400	.....	.....	.....	.....	.....
Pickens	640	.....	.....	.....	.....	.....
Pike	1,010	.....	.....	225	225	22.27
Randolph	800	.....	.....	.....	.....	.....
Russell	600	.....	.....	.....	.....	.....
St. Clair	672	80	.....	.....	80	11.90
Shelby	325	.....	.....	.....	.....	.....
Sumter	600	.....	.....	100	100	16.66
Talladega	800	.....	50	.....	50	6.25
Tallapoosa	2,000	.....	.....	.....	.....	.....
Tuscaloosa	1,140	20	83	115	218	19.12
Walker	850	.....	.....	.....	.....	.....
Washington	500	.....	.....	.....	.....	.....
Wilcox	1,500	3	10	.....	13	.86
Winston	500	.....	.....	.....	.....	.....
Total	49,639	683.5	1,398.43	1,107	[1] 3,263.93	6.58

[1] This includes 75 miles of shell roads.

TABLE 6.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	50,089	392.5	1,261.50	12	[1] 1,720	3.43
1909	49,639	683.5	1,398.43	1,107	[2] 3,263.93	6.58
Gain		291	136.93	1,095	1,543.93	3.15

[1] Includes 50 miles of shell roads and 4 miles of chert roads. [2] This includes 75 miles of shell roads.

TABLE 7.—*Cost data, 1909.*

County.	Average cost per mile.				
	Earth.	Sand-clay.	Gravel.	Macadam.	Bituminous.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Baldwin	175				
Blount	200		800		
Calhoun		400		2,500	
Crenshaw		500			
Dale		750			
Etowah			650		
Jackson			1,250		
Jefferson	300			2,500	13,250
Madison			750	1,500	
Montgomery		[1] 1,350	[2] 4,950		
Morgan				3,600	
Pike		680			
Tuscaloosa		400	500		
Average	225	680	1,483	2,525	13,250

[1] Cost varies from $700 to $2,000 per mile.
[2] Gravel roads, including heavy grading, culverts, and wooden bridges, from $900 to $7,000 per mile, depending largely on length of haul and surfacing material.

ARIZONA.

TABLE 8.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
Apache	400	50		50	12.50
Cochise	600	[2] 22		[2] 22	3.66
Coconino	400	4	3	7	1.74
Gila	260				
Graham	250	3		3	1.20
Maricopa	900	34		34	3.77
Mohave	550				
Navajo	142		12	12	8.45
Pima	500				
Pinal	400				
Santa Cruz	150				
Yavapai	800	10	10	20	2.50
Yuma	635	125		125	19.68
Total	5,987	[3] 248	25	[3] 273	4.56

[1] Greenlee County established in January, 1911, from part of Graham County.
[2] Oiled.
[3] Includes 22 miles of oiled roads.

TABLE 8.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
1904	5,987	216	.....	[1] 217	3.62
1909	5,987	[2] 248	25	[2] 273	4.56
Gain	.....	32	25	56	.94

[1] Includes 1 mile of stone road. [2] Includes 22 miles of oiled roads.

ARKANSAS.

TABLE 9.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Arkansas	900	.....	.....	.....	.....	.....
Ashley	600	.....	.....	.....	.....	.....
Baxter	450	.....	25	.....	25	5.55
Benton	1,000	.....	25	100	125	12.50
Boone	200	.....	.....	.....	.....	.....
Bradley	250	.....	.....	.....	.....	.....
Calhoun	200	.....	.....	.....	.....	.....
Carroll	350	.....	.....	.....	.....	.....
Chicot	277	.....	.....	.....	.....	.....
Clark	780	.....	94	4	98	12.56
Clay	500	.....	5	.....	5	1.00
Cleburne	450	.....	.....	.....	.....	.....
Cleveland	235	.....	.....	.....	.....	.....
Columbia	602	.....	.....	.....	.....	.....
Conway	400	4	5	.....	9	2.25
Craighead	350	.....	80	.....	80	22.85
Crawford	711	.....	.....	.....	.....	.....
Crittenden	200	.....	.....	.....	.....	.....
Cross	252	.....	3	.....	3	1.19
Dallas	800	.....	.....	.....	.....	.....
Desha	270	.....	.....	.....	.....	.....
Drew	1,000	.....	18	.....	18	1.80
Faulkner	525	2	.....	.....	2	.38
Franklin	726	.....	.....	.....	.....	.....
Fulton	150	.....	.....	.....	.....	.....
Garland	500	.....	10	.....	10	2.00
Grant	475	.....	.....	.....	.....	.....
Greene	683	.....	18	.....	18	2.63
Hempstead	500	.....	.....	.....	.....	.....
Hot Spring	400	.....	.....	.....	.....	.....
Howard	400	.....	25	.....	25	6.25
Independence	736	2	25	.....	27	3.66
Izard	700	.....	.....	.....	.....	.....
Jackson	500	1	.....	.....	1	.20
Jefferson	200	10	10	10	30	15.00
Johnson	300	.....	.....	.....	.....	.....
Lafayette	281	.....	.....	.....	.....	.....
Lawrence	300	5	5	.....	10	3.33
Lee	420	.....	.....	.....	.....	.....
Lincoln	310	.....	4	.....	4	1.29
Little River	289	.....	.....	.....	.....	.....
Logan	575	.....	.....	.....	.....	.....
Lonoke	850	10	1	.....	11	1.29
Madison	1,000	.....	.....	.....	.....	.....
Marion	400	.....	20	.....	20	5.00
Miller	100	.....	.....	.....	.....	.....
Mississippi	162	.....	.....	.....	.....	.....
Monroe	200	.....	.....	.....	.....	.....
Montgomery	800	.....	.....	.....	.....	.....
Nevada	300	.....	.....	.....	.....	.....
Newton	750	.....	.....	.....	.....	.....
Ouachita	500	.....	3	.....	3	.60
Perry	125	2	4	10	16	12.80

TABLE 9.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Phillips	490					
Pike	405					
Poinsett	260					
Polk	434					
Pope	300		2.25		2.25	0.75
Prairie	734					
Pulaski	583	90	73	194	357	61.23
Randolph	1,000		5		5	.50
St. Francis	500					
Saline	300		20	20	40	13.33
Scott	200					
Searcy	364					
Sebastian	856	36	3		39	4.58
Sevier	330		12	40	52	15.75
Sharp	300					
Stone	240					
Union	500					
Van Buren	800					
Washington	1,150	4	3		7	.60
White	805	4	4		8	.99
Woodruff	120					
Yell	846		35		35	4.13
Total	36,445	170	537.25	378	1,085.25	2.97

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	36,445	55	181		236	0.64
1909	36,445	170	537.25	378	1,085.25	2.97
Gain		115	356.25	378	849.25	2.33

TABLE 10.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Earth.	Gravel.	Macadam.		Earth.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Clark		350		Sebastian			2,500
Conway			1,000	Sevier		650	
Craighead		800		Washington			3,500
Drew		350		Yell	250	500	
Garland	200						
Independence		3,000	6,000	Average	225	940	3,250

CALIFORNIA.

TABLE 11.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Oiled.	Total.	
Alameda	765	25	400	.....	.....	425	55.55
Alpine	100	.....	.....	.....	.....	.....	.....
Amador	500	15	20	.....	.....	35	7.00
Butte	1,200	5	400	.....	.....	405	33.75
Calaveras	606	5	40	.....	.....	45	7.42
Colusa	578	.....	302	.....	.....	302	52.24
Contra Costa	500	.....	100	10	40	150	30.00
Del Norte	125	.....	30	.....	.....	[1] 42.5	34.00
Eldorado	900	.....	.....	5	.....	5	.55
Fresno	1,500	.....	.....	20	150	170	11.33
Glenn	500	.....	138	.....	.....	138	27.60
Humboldt	1,130	10	300	105	.....	415	36.72
Imperial	726	.....	.....	.....	.....	.....	.....
Inyo	500	.....	.....	.....	.....	.....	.....
Kern	1,100	2	.....	.....	100	102	9.27
Kings	500	.....	.....	.....	92	92	18.40
Lake	488	.....	160	.....	.....	160	32.78
Lassen	720	.....	25	25	.....	50	6.94
Los Angeles	1,500	[2] 85	1,000	.....	.....	1,085	72.33
Madera	410	.....	.....	.....	30	30	7.31
Marin	309	.....	.....	.....	.....	.....	.....
Mariposa	355	.....	.....	.....	.....	.....	.....
Mendocino	1,200	.....	.....	.....	.....	.....	.....
Merced	450	1	136	.....	.....	137	30.44
Modoc	766	.....	10	.....	.....	10	1.30
Mono	380	.....	.....	.....	.....	.....	.....
Monterey	600	50	50	.....	.....	100	16.66
Napa	560	3	450	.....	.....	453	80.89
Nevada	600	30	.....	.....	.....	30	5.00
Orange	500	.....	25	5	.....	30	6.00
Placer	775	7	.....	.....	.....	7	.90
Plumas	385	.....	10	.....	.....	10	2.59
Riverside	800	4	48	2	.....	54	6.75
Sacramento	1,500	86	20	.....	.....	106	7.06
San Benito	451	.....	160	150	.....	310	68.73
San Bernardino	[3] 840	.....	.....	.....	.....	.....	.....
San Diego	5,200	.....	.....	450	.....	450	8.65
San Francisco	[4]	.....	.....	.....	.....	.....	.....
San Joaquin	990	12	25	.....	.....	37	3.73
San Luis Obispo	1,100	.....	162	.....	1	163	14.82
San Mateo	350	131	65	15	17	228	65.14
Santa Barbara	750	16	45	.....	5	66	8.80
Santa Clara	1,200	20	600	200	6	826	68.83
Santa Cruz	420	12.25	25	6	7	50.25	11.96
Shasta	1,575	.....	66	170	.....	236	14.98
Sierra	525	.....	.....	.....	.....	.....	.....
Siskiyou	2,625	.5	20	4	.....	24.5	.93
Solano	630	9	25	1	.....	35	5.55
Sonoma	1,260	35	600	120	.....	755	59.92
Stanislaus	470	.....	55	.....	.....	55	11.70
Sutter	350	8	50	.....	.....	58	16.57
Tehama	650	5	60	1	.....	66	10.15
Trinity	200	.....	5	.....	.....	5	2.50
Tulare	2,285	.....	.....	.....	60	60	2.62
Tuolumne	290	.....	52	.....	15	67	23.10
Ventura	700	.....	.....	.....	100	100	14.28
Yolo	680	2.5	360	.....	30	392.5	57.72
Yuba	1,000	.....	15	.....	.....	15	1.50
Total	48,069	579.25	6,054	1,289	653	[1]8,587.75	17.87

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Oiled.	Total.	
1904	46,653	418.5	5,843.5	.....	2,541	8,803	18.87
1909	48,069	579.25	6,054	1,289	653	[1]8,587.75	17.87
Gain	1,416	160.75	210.5	1,289	.....	.....	.....

[1] Includes 12.5 miles of wood puncheon road.
[2] Bituminous-macadam.
[3] This is exclusive of roads in the Mojave Desert, which comprises about 85 per cent of the county.
[4] Included in the city of San Francisco. No country roads in this county.

TABLE 12.—*Cost data, 1909.*

County.	Average cost per mile.			
	Sand-clay.	Gravel.	Macadam.	Bituminous.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Alameda		[1] 1.35	[1] 1.35	
Del Norte		2,500.00		
Glenn		[2] .89		
Humboldt		[1] .60	[1] .95	[1]
Los Angeles				11,000.00
Merced			9,000.00	
Nevada		1,400.00		
Riverside		[1] .14		[1] .76
Sacramento				7,500.00
San Diego	625.00			[1] 1.62
San Mateo			[1] .59	[1] 1.73
Santa Barbara				7,800.00
Santa Clara	200.00	1,000.00	6,000.00	8,000.00
Santa Cruz			5,200.00	
Shasta		1,500.00		
Siskiyou		1,000.00		
Sonoma		[1] 1.25	[1] 1.87	
Tehama		$50.00	1,300.00	
Yolo		[1] .10	[1] .63	
Average	412.00	1,375.00	5,375.00	8,575.00

[1] Average cost per square yard: Gravel, $0.69; macadam, $1.08; bituminous, $1.37.
[2] Cost per cubic yard.

COLORADO.

TABLE 13.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Macadam.	Gravel.	Total.	
Adams	673		52	52	7.72
Arapahoe	378		16	16	4.23
Archuleta	400				
Baca	2				
Bent	447		6	6	1.34
Boulder	613		40	40	6.52
Chaffee	307				
Cheyenne	200				
Clear Creek	110				
Conejos	822				
Costilla	350		8	8	2.28
Custer	800				
Delta	500				
Denver	[2]				
Dolores	70				
Douglas	576				
Eagle	175				
El Paso	661		30	30	4.53
Elbert	586				
Fremont	382	2		2	.52
Garfield	570		2	2	.35
Gilpin	160				
Grand	212				
Gunnison	700				
Hinsdale	142				
Huerfano	500				
Jackson	1,000				
Jefferson	568	10	5	15	2.64
Kiowa	233				
Kit Carson	23				
La Plata	550				
Lake	88		4	4	4.54
Larimer	719				
Las Animas	958				
Lincoln	264				
Logan	1,042		6.5	6.5	.62
Mesa	933				
Mineral	134				
Montezuma	300				

[1] Moffat County established in March, 1911, from part of Routt Co.
[2] The county of Denver has no rural roads; the entire county is included in the city of Denver.

TABLE 13.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Macadam.	Gravel.	Total.	
Montrose	996				
Morgan	696				
Otero	759		20	20	2.63
Ouray	480				
Park	165				
Phillips	319				
Pitkin	275				
Prowers	375		5	5	1.33
Pueblo	1,400	2	10	12	.85
Rio Blanco	448				
Rio Grande	474		38	38	8.01
Routt	900				
Saguache	958				
San Juan	100				
San Miguel	300				
Sedgwick	216		4	4	1.85
Summit	214				
Teller	214				
Washington	714				
Weld	2,000		60	60	3.00
Yuma	542				
Total	29,693	14	306.5	320.5	1.08

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Macadam.	Gravel.	Total.	
1904	30,214	57	121	178	0.59
1909	29,693	14	306.5	320.5	1.08
Gain			185.5	142.5	.49

TABLE 14.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Earth.	Gravel.		Earth.	Gravel.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Adams		2,000	Pueblo		2,000
Bent		700	Summit		
Boulder		1,200			
Logan	800		Average	600	1,475
Montrose	400				

CONNECTICUT.

TABLE 15.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Graded earth.	Total.	
Fairfield	2,195	80	224.79	197	103.63	605.42	27.58
Hartford	1,783	235.88	189.56	319.25	51.7	796.39	44.66
Litchfield	2,211	31.48	71.31	169	72.46	344.25	15.57
Middlesex	794	73.91	27.1	140	55.29	296.3	37.32
New Haven	1,999	117.24	104.64	120	27	368.88	18.45
New London	1,418	85.02	64.6	31	26.06	206.68	14.60
Tolland	1,002	14.11	43.39	20	21.65	99.15	9.89
Windham	1,181	27.98	49.01	218	18.48	313.47	26.54
Total	12,583	665.62	774.4	1,214.25	376.27	3,030.54	24.08

TABLE 15.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Graded earth.	Total.	
1904	14,088	463.5	1,896.5	.....	.....	2,360.1	16.75
1909	12,583	665.62	774.4	1,214.25	376.27	3,030.54	24.08
Gain	.....	202.12	.....	1,214.25	376.27	670.44	7.33

TABLE 16.—*Cost data, 1909.*

County and township.	Average cost per mile.			County and township.	Average cost per mile.		
	Gravel.	Macadam.	Telford.		Gravel.	Macadam.	Telford.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Fairfield County:				Middlesex County:			
Bridgeport	.....	6,811.00	.....	Chester	.....	7,075.00	10,507.00
Brookfield	3,960.00	.....	[1] 8,712.00	Cromwell	6,019.00	.....	[1] 7,339.00
Danbury	.....	9,845.00	11,721.00	Durham	.....	.....	6,019.00
Do	.....	.....	13,200.00	East Haddam	.....	12,883.00	.....
Fairfield	.....	8,131.00	11,563.00	Middlefield	.....	7,656.00	10,032.00
New Canaan	.....	10,296.00	.....	New Haven County:			
Do	.....	10,560.00	.....	Bethany	5,174.00	.....	.....
Norwalk	4,488.00	.....	[1] 5,280.00	Branford	.....	7,233.00	9,345.00
Ridgefield	5,280.00	.....	.....	Derby	.....	9,556.00	.....
Stamford	.....	10,348.00	12,724.00	Guilford	.....	.....	9,345.00
Do	.....	8,870.00	.....	Do	.....	.....	[1] 6,336.00
Stratford	.....	7,339.00	.....	Hamden	.....	6,600.00	.....
Trumbull	.....	8,976.00	11,880.00	Madison	4,171.00	.....	.....
Do	.....	7,687.00	.....	Meriden	.....	6,336.00	8,817.00
Westport	6,283.00	.....	.....	Naugatuck	.....	9,240.00	11,880.00
Hartford County:				New Haven	.....	5,966.00	.....
Avon	.....	6,230.00	8,448.00	North Branford	.....	.....	9,609.00
Berlin	.....	6,336.00	8,131.00	North Haven	.....	6,547.00	.....
Bristol	.....	6,600.00	9,240.00	Woodbridge	.....	8,712.00	.....
East Granby	5,544.00	.....	[1] 8,712.00	New London County:			
Enfield	.....	9,345.00	15,048.00	Colchester	7,867.00	.....	[1]10,507.00
Granby	.....	7,603.00	9,979.00	East Lyme	.....	8,817.00	.....
Hartford	.....	.....	15,048.00	Franklin	4,382.00	.....	[1] 7,022.00
Newington	.....	7,339.00	9,662.00	Lebanon	.....	.....	[1] 3,960.00
Plainville	.....	.....	10,296.00	Lisbon	5,649.00	6,758.00	.....
Rocky Hill	.....	8,712.00	12,712.00	Montville	.....	11,563.00	15,259.00
Simsbury	.....	11,035.00	17,424.00	New London	.....	10,137.00	13,992.00
Southington	.....	7,339.00	8,184.00	N. Stonington	5,121.00	.....	.....
South Windsor	.....	7,761.00	13,728.00	Norwich	.....	9,820.00	.....
Suffield	.....	6,388.00	.....	Old Lyme	3,168.00	8,289.00	.....
Do	.....	8,606.00	.....	Preston	8,395.00	.....	.....
Do	.....	5,544.00	.....	Sprague	.....	9,768.00	12,936.00
Wethersfield	.....	8,712.00	11,880.00	Stonington	4,171.00	.....	.....
Do	.....	7,392.00	.....	Waterford	.....	6,547.00	9,715.00
Windsor	.....	7,286.00	11,352.00	Windham County:			
Windsor Locks	.....	10,450.00	15,048.00	Killingly	3,537.00	.....	.....
Litchfield County:				Do	5,649.00	.....	.....
Canaan	8,078.00	.....	.....	Plainfield	5,280.00	.....	.....
Litchfield	7,392.00	.....	[1] 9,504.00	Putnam	.....	4,646.00	[1] 7,128.00
Norfolk	.....	.....	9,556.00	Windham	4,699.00	.....	.....
North Canaan	.....	6,072.00	[1] 7,920.00	Woodstock	.....	.....	[1]10,560.00
Roxbury	.....	7,550.00	10,718.00	Do	.....	.....	[1] 6,336.00
Sharon	4,752.00	.....	[1] 7,920.00				
Washington	.....	11,668.00	.....	Average	5,411.77	8,219.60	10,254.87

[1] Surfaced with gravel.

DELAWARE.

TABLE 17.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Shell.	Total.	
Kent	900					
New Castle	1,000	[1] 94.36	3	5	[2] 102.44	10.24
Sussex	1,100	2	46	30	[3] 84	7.63
Total	3,000	[1] 96.36	49	35	[4] 186.44	6.22

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Shell.	Total.	
1904	3,000	14	2	50	66	2.20
1909	3,000	[1] 96.36	49	35	[4] 186.44	6.22
Gain		82.36	47		120.44	4.02

[1] Includes 0.36 mile of bituminous-macadam road.
[2] Includes 0.075 mile of sand-clay road.
[3] Includes 6 miles of sand-clay roads.
[4] Includes 6.075 miles of sand-clay roads.

TABLE 18.—*Cost data, 1909.*

County.	Average cost per mile.					
	Macadam.			Bituminous.[1]	Sand-clay.	Gravel.
	Limestone.[1]	Granite.[2]	Trap rock.[1]			
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Kent [4]						
New Castle	6,150.00	6,900.00	7,500.00	10,120.00		
Sussex					[3] 0.15	[3] 0.25
Average		6,850.00				

[1] Average width of roads, 12 feet; average depth, 6 inches.
[2] Average width of roads, 13 feet; average depth, 7 inches.
[3] Per square yard.
[4] No report submitted.

FLORIDA.

TABLE 19.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Shell.	Total.	
Alachua	900						
Baker	500						
Bradford	500						
Brevard	450			30		30	6.67
Calhoun	250						
Citrus	125		35	35		70	56.00
Clay	200						
Columbia	200						
Dade	300		180			180	60.00
De Soto	650		10	20		30	4.61
Duval	750	15.25	6.6		32	53.85	7.18
Escambia	260		10	110		120	46.15
Franklin	([2])						
Gadsden	225			14		14	6.22
Hamilton	150			2		2	1.33
Hernando	165						
Hillsboro	2,000	91			25	116	5.80
Holmes	1,000						
Jackson	400						
Jefferson	350						
Lafayette	350						
Lake	121			78.5		78.5	64.87
Lee	250	8			12	20	8.00
Leon	450			150		150	33.33
Levy	450				4	4	.88
Liberty	150						
Madison	238						
Manatee	500						
Marion	500	100		200		300	60.00
Monroe	([3])						
Nassau	260						
Orange	350	15		100		115	32.85
Osceola	275	25				25	9.09
Pasco	250			10		10	4.00
Polk	1,000	20		150		170	17.00
Putnam	300		18		5	23	7.66
St. John	200			1	15	16	8.00
St. Lucie	200			20	25	45	22.50
Santa Rosa	255			20		20	7.84
Sumter	250			40		40	16.00
Suwanee	300	4		7		11	3.66
Taylor	250						
Volusia	125			10	80	90	72.00
Wakulla	280						
Walton	400			3		3	.75
Washington	500			16		16	3.20
Total	17,579	278.25	259.6	1,016.50	198	1,752.35	9.97

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Shell.	Total.	
1904	17,374	345	17.5	435	88	885.5	5.10
1909	17,579	278.25	259.6	1,016.50	198	1752.35	9.97
Gain	205		242.1	581.50	110	866.85	4.87

[1] Palm Beach County established from Dade County in 1909, after this investigation was completed.
[2] Reports indicate that there arpractically no roads in this county and that transportation is mostly by water.
[3] The county of Monroe has no rural roads; the entire county is included in city of Key West.

TABLE 20.—*Cost data, 1909.*

County.	Average cost per mile.				
	Earth.	Sand-clay.	Gravel.	Shell.	Marl.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Citrus		800			1,000
Dade					1,467
De Soto		1,000			
Duval			6,500	6,500	8,000
Hillsboro					5,000
Lake	500				
Lee				800	
Leon	300				
Marion	1,000				1,500
Monroe			3,500		
Nassau				4,000	
Orange		550			2,175
Osceola	1,000				1,750
Polk	1,000				
Putnam	1,200		1,700	2,500	
St. John				4,000	
St. Lucie		900		2,000	
Santa Rosa		1,000			
Sumter		725			
Suwanee	500				4,000
Volusia				2,500	
Average	786	829	3,900	3,186	3,112

GEORGIA.

TABLE 21.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Stone.	Total.	
Appling	600		51		15	2.50
Baker	275		35		35	12.72
Baldwin	335		50		50	14.92
Banks	300		14		14	4.66
Bartow	1,000					
Ben Hill	250		50		50	20.00
Berrien	1,200		100		100	8.33
Bibb	500		100		100	20.00
Brooks	450					
Bryan	600		20		20	3.33
Bulloch	900		50		50	5.55
Burke	700		150		150	21.42
Butts	300					
Calhoun	210					
Camden	275			10	[1] 20	7.27
Campbell	465					
Carroll	800			18	18	2.25
Catoosa	200	30			30	15.00
Charlton	200					
Chatham	220	100		1	[2] 108	49.09
Chattahoochee	262					
Chattooga	350	25			25	7.14
Cherokee	1,000	3	10		13	1.30
Clarke	147		50	5	55	37.41
Clay	360		40		40	11.11
Clayton	300					
Clinch	400			10	10	2.50
Cobb	800		6	15	21	2.62
Coffee	950		50		50	5.26
Colquitt	700					
Columbia	350	20			20	5.71
Coweta	800		240		240	30.00
Crawford	300					
Crisp	450		250		250	55.55
Dade	145	25			25	17.24

[1] Includes 10 miles of shell roads.

[2] Includes 7 miles of shell roads.

TABLE 21.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Stone.	Total.	
Dawson	300					
Decatur	1,000		100		100	10.00
Dekalb	1,300	15		13	28	2.15
Dodge	450		25		25	5.55
Dooly	700		150		150	21.42
Dougherty	350		208	8	216	61.71
Douglas	400					
Early	1,000		100		100	10.00
Echols	175					
Effingham	500					
Elbert	700					
Emanuel	1,000		25		25	2.50
Fannin	200					
Fayette	300					
Floyd	800	80		65	145	18.12
Forsyth	600					
Franklin	500					
Fulton	400			300	[1] 305	76.25
Gilmer	1,000					
Glascock	200		35		35	17.50
Glynn	200		130		[2] 153	76.50
Gordon	400					
Grady	400					
Greene	850	4	2	5	11	1.29
Gwinnett	1,000					
Habersham	400			1	1	.25
Hall	600			8	8	1.33
Hancock	750	5	10		15	2.00
Haralson	500					
Harris	500					
Hart	500					
Heard	310		8		8	2.58
Henry	900					
Houston	1,400		50		50	3.57
Irwin	175		80		80	45.71
Jackson	1,000					
Jasper	450					
Jeff Davis	500					
Jefferson	563		50		50	8.88
Jenkins	190		30		30	15.78
Johnson	200		35		35	17.50
Jones	600		200		200	33.33
Laurens	1,310		65		65	4.96
Lee	800		75		75	9.37
Liberty	500		2		2	.40
Lincoln	900					
Lowndes	1,250		50		50	4.00
Lumpkin	400					
McDuffie	400		100		100	25.00
McIntosh	150		.5		[3] 4.5	3.00
Macon	550	.5	32		32.5	5.90
Madison	950				[4] 200	21.05
Marion	300		50		50	16.66
Meriwether	1,400					
Miller	260					
Milton	250					
Mitchell	600		55		55	9.16
Monroe	1,000					
Montgomery	800					
Morgan	1,000	100	25		125	12.50
Murray	250	10			10	4.00
Muscogee	400	53	50	28	131	32.75
Newton	250	50	5		55	22.00
Oconee	350					
Oglethorpe	940		75		75	7.97
Paulding	700					
Pickens	500					
Pierce	250		2		2	.80
Pike	900		20		20	2.22
Polk	600	55	5	5	65	10.83
Pulaski	580		100		100	17.24
Putnam	350	15			15	4.28
Quitman	250					
Rabun	400					
Randolph	650		106		106	16.30
Richmond	900	56	110		166	18.44

[1] Includes 5 miles of bituminous-macadam roads.
[2] Includes 23 miles of shell roads.
[3] Includes 4 miles of shell roads.
[4] Shell roads.

TABLE 21.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Stone.	Total.	
Rockdale	238	.....	7.5	.....	7.5	3.15
Schley	280	.....	3	.....	3	1.07
Screven	625	.....	50	.....	50	8.00
Spalding	1,000	.....	30.5	.....	30.5	3.05
Stephens	340	.....	14	.....	14	4.11
Stewart	690	.....	35	.....	35	5.07
Sumter	1,150	.....	70	.....	70	6.08
Talbot	414	.....	.....	.....	.....	.....
Taliaferro	400	.....	.....	.....	.....	.....
Tattnall	950	.....	55	.....	55	5.78
Taylor	350	.....	5	.....	5	1.42
Telfair	400	.....	50	.....	50	12.50
Terrell	800	.....	125	.....	125	15.62
Thomas	600	.....	50	.....	50	8.33
Tift	350	.....	89	.....	89	25.43
Toombs	380	.....	.....	.....	.....	.....
Towns	150	.....	.....	.....	.....	.....
Troup	650	.....	25	.....	25	3.84
Turner	800	.....	100	.....	100	12.50
Twiggs	300	.....	.....	.....	.....	.....
Union	200	.....	.....	.....	.....	.....
Upson	400	.....	.....	.....	.....	.....
Walker	563	234	.....	.....	234	41.56
Walton	1,400	.....	.....	.....	.....	.....
Ware	300	.....	4	.....	4	1.33
Warren	325	.....	.....	.....	.....	.....
Washington	1,200	.....	200	.....	200	16.66
Wayne	600	.....	8	.....	8	1.33
Webster	228	.....	5	.....	5	2.19
White	250	.....	.....	.....	.....	.....
Whitfield	450	.....	.....	5	5	1.11
Wilcox	800	.....	5	.....	5	.62
Wilkes	900	.....	.....	25	25	2.77
Wilkinson	500	.....	.....	.....	.....	.....
Worth	800	.....	.....	.....	.....	.....
Total	82,230	880.5	4,326.5	522	[1] 5,978	7.27

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Stone.	Total.	
1904	57,203	659	513	438	[2] 1,634	2.86
1909	82,230	880.5	4,326.5	522	[1] 5,978	7.27
Gain	25,027	221.5	3,813.5	84	4,344	4.41

[1] Includes 244 miles of shell roads and 5 miles of bituminous-macadam roads.
[2] Includes 24 miles of shell road.

TABLE 22.—*Cost data, 1909.*

County.	Average cost per mile.			
	Earth.	Sand-clay.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Appling	200.00			
Baker		300.00		
Banks		250.00		
Ben Hill		150.00		
Bibb		800.00		
Bryan		100.00		
Bulloch		450.00		
Camden		300.00		
Campbell	1,000.00			
Carroll				2,000.00
Chatham			[1] 3,500.00	
Chattooga			700.00	
Cobb				4,000.00
Coffee		300.00		
Coweta		400.00		
Decatur		150.00		
Dekalb			1,250.00	5,000.00
Dodge	400.00			
Dooly		130.00		
Dougherty		350.00		1,000.00
Early		100.00		
Emanuel	800.00			
Floyd			1,500.00	1,500.00
Franklin	1,500.00			
Fulton				[2] .33
Glascock		250.00		
Greene		200.00	200.00	
Hall				1,500.00
Hancock		500.00		
Heard		800.00		
Irwin		125.00		
Jefferson		250.00		
Jenkins		400.00		
Johnson		200.00		
Laurens	700.00			
Lee		400.00		
Macon		500.00		
Marion		175.00		
Mitchell		225.00		
Muscogee				2,000.00
Newton			300.00	
Pike	250.00			
Polk		500.00	800.00	1,200.00
Pulaski		250.00		
Rockdale		1,200.00		
Spalding		250.00		
Stephens		350.00		
Sumter		1,000.00		
Taylor		500.00		
Telfair	750.00			
Terrell		350.00		
Thomas		450.00		
Tift		200.00		
Troup		600.00		
Turner		900.00		
Walker			1,500.00	
Ware		350.00		
Whitfield			1,500.00	
Average	700.00	387.00	1,250.00	2,275.00

[1] Material shipped by rail from near Augusta.

[2] Per square yard.

IDAHO.

TABLE 23.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Ada	400	2	5	.....	7	1.75
Bannock	492	.....	.....	.....	.....	.....
Bear Lake	105	.....	35	.....	35	33.33
Bingham	1,000	.....	.....	.....	.....	.....
Blaine	300	.....	.....	.....	.....	.....
Boise	1,000	.....	.....	.....	.....	.....
Bonner	250	.....	.....	.....	.....	.....
Canyon	500	.....	10	20	30	6.00
Cassia	650	.....	.....	.....	.....	.....
Custer	340	.....	.....	.....	.....	.....
Elmore	260	.....	.....	.....	.....	.....
Fremont	3,800	.....	.....	.....	.....	.....
Idaho	1,500	10	1.5	.....	11.5	.76
Kootenai	250	.....	.....	150	150	60.00
Latah	1,056	5	10	.....	15	1.42
Lemhi	400	.....	.....	.....	.....	.....
Lincoln	600	.....	.....	.....	.....	.....
Nez Perce	2,200	.....	2	.....	2	.09
Oneida	800	.....	10	.....	10	1.25
Owyhee	450	.....	.....	20	20	4.44
Shoshone	400	.....	22	208	230	57.50
Twin Falls	650	.....	.....	.....	.....	.....
Washington	1,000	.....	.....	.....	.....	.....
Total	18,403	17	95.5	398	510.5	2.77

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	18,163	17	195	.....	212	1.16
1909	18,403	17	95.5	398	510.5	2.77
Gain	240	.....	.....	398	298.5	1.61

[1] Adams County established in February, 1911, from part of Washington County; Bonneville County established in February, 1911, from part of Bingham County; Clearwater County established in February, 1911, from part of Nez Perce County; and Lewis County established in February, 1911, from part of Nez Perce County.

ILLINOIS.

TABLE 24.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Total mileage of all improved roads.[1]	Approximate percentage of roads improved.	County.	Total mileage of all public roads.	Total mileage of all improved roads.[1]	Approximate percentage of roads improved.
Adams	1,543	177	11.47	Livingston	1,734	77	4.44
Alexander	427	20	4.68	Logan	1,014	6	.59
Bond	674	7	1.03	McDonough	1,196	2	.16
Boone	510	249	48.82	McHenry	1,134	780	68.78
Brown	462	1	.21	McLean	2,069	116	5.60
Bureau	1,583	491	31.01	Macon	1,025	68	6.63
Calhoun	288	2	.69	Macoupin	1,369	.....	.....
Carroll	807	46	5.70	Madison	1,509	46	3.04
Cass	523	.....	.....	Marion	1,145	2	.17
Champaign	1,830	5	.27	Marshall	634	50	7.88
Christian	1,351	17	1.25	Mason	771	.....	.....
Clark	1,063	48	4.51	Massac	403	49	12.15
Clay	922	.....	.....	Menard	411	.....	.....
Clinton	704	.....	.....	Mercer	904	.....	.....
Coles	897	26	2.90	Monroe	703	21	2.98
Cook	1,450	818	56.41	Montgomery	1,220	5	.41
Crawford	715	25	3.49	Morgan	832	.....	.....
Cumberland	687	5	.72	Moultrie	551	.....	.....
Dekalb	1,096	415	37.86	Ogle	1,222	195	15.95
Dewitt	737	.....	.....	Peoria	983	226	22.99
Douglas	709	.....	.....	Perry	668	.....	.....
Dupage	629	430	68.36	Piatt	621	.....	.....
Edgar	1,187	235	19.79	Pike	1,347	51	3.78
Edwards	460	.....	.....	Pope	465	7	1.50
Effingham	930	5	.53	Pulaski	346	4	1.15
Fayette	1,163	4	.34	Putnam	287	37	12.89
Ford	785	95	12.10	Randolph	974	25	2.56
Franklin	740	6	.81	Richland	770	1	.12
Fulton	1,698	1	.05	Rock Island	784	33	4.20
Gallatin	491	2	.40	St. Clair	1,139	29	2.54
Greene	805	.....	.....	Saline	354	2	.56
Grundy	748	98	13.10	Sangamon	1,220	3	.24
Hamilton	744	.....	.....	Schuyler	736	4	.54
Hancock	1,178	24	2.03	Scott	440	.....	.....
Hardin	245	.....	.....	Shelby	1,575	1	.06
Henderson	607	.....	.....	Stark	443	2	.45
Henry	1,430	8	.55	Stephenson	959	103	10.74
Iroquois	1,919	80	4.16	Tazewell	998	53	5.31
Jackson	871	8	.91	Union	626	25	3.99
Jasper	844	.....	.....	Vermilion	1,598	207	12.95
Jefferson	1,174	.....	.....	Wabash	401	.....	.....
Jersey	598	5	.83	Warren	1,045	10	.95
Jo Daviess	1,034	52	5.02	Washington	772	2	.25
Johnson	605	.....	.....	Wayne	1,263	.....	.....
Kane	971	800	82.38	White	600	8	1.33
Kankakee	1,127	157	13.93	Whiteside	1,120	200	17.85
Kendall	530	271	51.13	Will	1,534	410	26.72
Knox	743	3	.40	Williamson	587	.....	.....
Lake	835	311	37.24	Winnebago	931	403	43.28
La Salle	1,919	513	26.73	Woodford	896	12	1.33
Lawrence	636	27	4.24				
Lee	1,189	152	12.78	Total	94,141	8,914	9.47

RECAPITULATION.

Year.	Total mileage of all public roads.	Total mileage of all improved roads.[1]	Approximate percentage of roads improved.
1904	94,141	[2] 7,924	8.42
1909	94,141	8,914	9.47
Gain	.....	1,008	1.05

[1] Stone and gravel roads.

[2] Includes 4½ miles of brick roads, 6 miles of slag roads, 1 mile of road surfaced with cinder, 6 miles of road surfaced with burnt shale, 6,800 miles of gravel roads, and 1,106.5 miles of stone roads.

INDIANA.

TABLE 25.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Adams	675	152.5	102.5	255	37.77
Allen	900	37	654.5	691.5	76.83
Bartholomew	900	43.5	321.5	365	40.55
Benton	775	48	207.5	255.5	32.96
Blackford	360	8	92	100	27.77
Boone	816	.....	735.5	735.5	90.13
Brown	350	.....	10	10	2.85
Carroll	847	15	300	315	37.19
Cass	988	27.5	350	377.5	38.20
Clark	600	84	12	96	16.00
Clay	800	62.75	250	312.75	39.09
Clinton	700	.....	500	500	71.42
Crawford	229	26	.....	26	11.35
Daviess	860	37	127	164	19.06
Dearborn	255	88.5	40	[1] 130.25	51.07
Decatur	600	170	14	184	30.66
Dekalb	360	.....	279	279	77.50
Delaware	800	25.5	600	625.5	78.18
Dubois	700	48.5	.....	48.5	6.92
Elkhart	580	.....	295	295	50.86
Fayette	386	.75	270	270.75	70.14
Floyd	350	26	93	119	34.00
Fountain	1,200	42	332	374	31.16
Franklin	1,000	32	85	117	11.70
Fulton	682	.....	93.5	93.5	13.70
Gibson	1,350	84	41	125	9.25
Grant	900	21.5	434	455.5	50.61
Greene	900	104.75	177	281.75	31.30
Hamilton	700	3	397	400	57.14
Hancock	605	1	425	426	70.41
Harrison	675	58.5	11	69.5	10.29
Hendricks	820	18	335.5	353.5	43.10
Henry	790	1	558	559	70.75
Howard	600	15	272	287	47.83
Huntington	856	11	451	462	53.97
Jackson	650	19.5	500	519.5	79.92
Jasper	600	110.25	103	213.25	35.54
Jay	800	39	342	381	47.62
Jefferson	790	84.5	114	198.5	25.12
Jennings	621	187	57	244	39.29
Johnson	620	.....	155	155	25.00
Knox	760	90	304.5	394.5	51.91
Kosciusko	1,300	3.75	351	354.75	27.28
La Grange	826	.....	130	130	15.73
Lake	700	50.5	[2] 65	115.5	16.50
Laporte	1,200	63	47.5	110.5	9.20
Lawrence	600	175.5	152	327.5	54.58
Madison	900	13	409	422	46.88
Marion	800	25	500	525	65.62
Marshall	800	.....	165.5	165.5	20.68
Martin	400	30	6	36	9.00
Miami	750	.....	308	[3] 320	42.66
Monroe	865	206.25	4.75	211	24.39
Montgomery	827	17.75	600	617.75	74.69
Morgan	500	70.5	180	250.5	50.10
Newton	632	121.5	33.5	155	24.52
Noble	850	.....	220	220	25.88
Ohio	160	26	4	[4] 65	40.62
Orange	700	145	96.5	241.5	34.50
Owen	692	175	395	570	82.36
Parke	1,200	20	558	578	48.16
Perry	800	.....	.....	.....	.....
Pike	1,200	36	.....	36	3.00
Porter	1,000	64.25	100	164.25	16.42
Posey	500	75	73.25	148.25	29.65
Pulaski	875	18.25	74.5	92.75	10.60
Putnam	900	300	268	568	63.11
Randolph	900	79.5	427	506.5	56.27
Ripley	462	127	15	142	30.73
Rush	1,100	24	275	299	27.18
St. Joseph	871	.....	116	116	13.31

[1] Includes 1.75 miles of bituminous-macadam roads.
[2] Includes 1.75 miles of slag roads.
[3] Includes 12 miles of bituminous-macadam roads.
[4] Includes 35 miles of bituminous-macadam roads.

TABLE 25.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Scott	400	10	40.5	50.5	12.62
Shelby	660	17.5	259.5	277	46.16
Spencer	1,008	30	.....	30	2.97
Starke	650	13	110	123	18.92
Steuben	700	.....	40	40	5.71
Sullivan	974	59	324	383	39.32
Switzerland	345	92	30	122	35.36
Tippecanoe	825	1	421.25	422.25	51.18
Tipton	560	22	400	422	75.35
Union	280	35	75	110	39.28
Vanderburg	600	92	60	152	25.33
Vermilion	800	.....	257.5	257.5	32.18
Vigo	725	19	300	319	44.00
Wabash	600	28	300	328	54.66
Warren	610	.5	302.5	303	49.67
Warrick	750	30	.....	30	4.00
Washington	1,500	119	23	142	9.46
Wayne	828	.....	620	620	74.87
Wells	780	51	500	551	70.64
White	750	90	180	270	36.00
Whitley	651	.....	250	250	38.40
Total	67,996	4,398.25	20,508.75	[1] 24,955.75	36.70

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	68,306	3,295	20,582	23,877	34.96
1909	67,996	4,398.25	20,508.75	[1] 24,955.75	36.70
Gain	.....	1,103.25	.....	1,078.75	1.74

[1] Includes 48.75 miles of bituminous-macadam roads.

TABLE 26.—*Cost data, 1909.*

County and township.	Average cost per mile.		County and township.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
Adams County:	*Dollars.*	*Dollars.*	Benton County:	*Dollars.*	*Dollars.*
Blue Creek	.....	3,000	Grant	2,200	.....
Jefferson	200	3,100	Hickory Grove	2,500	3,000
Root	500	1,100	Richland	2,000	3,000
St. Marys	.....	3,500	Union	2,300	2,800
Union	.....	3,000	York	2,000	.....
Washington	2,000	3,000	Blackford County:		
Allen County:			Jackson	2,500	4,000
Aboite	1,250	.....	Boone County:		
Maumee	800	3,200	Center	1,350	.....
Milan	750	.....	Clinton	1,900	.....
Monroe	1,200	3,500	Eagle	2,600	.....
Scipio	600	.....	Harrison	2,000	.....
Washington	600	1,000	Jefferson	1,250	.....
Wayne	900	1,200	Marion	2,000	.....
Bartholomew County:			Union	1,800	.....
Harrison	1,200	.....	Carroll County:		
Jackson	1,000	.....	Burlington	1,750	.....
Nineveh	3,000	.....	Jackson	1,600	4,000
Rock Creek	3,000	5,000	Madison	1,500	.....
Sand Creek	2,000	8,100	Monroe	1,900	.....
Wayne	1,500	.....			

TABLE 26.—*Cost data, 1909*—Continued.

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Cass County:	*Dollars.*	*Dollars*
Clay	2,800	5,000
Deer Creek	1,800	.....
Miami	1,800	.....
Noble	1,000	1,400
Tipton	2,500	5,000
Clark County:		
Bethlehem	900	1,600
Union	1,200	1,300
Utica	500	5,800
Clay County:		
Harrison	3,000	3,000
Perry	.....	3,200
Sugar Ridge	3,500	5,700
Washington	3,300	.....
Clinton County:		
Center	1,000	.....
Jackson	2,300	.....
Kirklin	2,000	.....
Ross	1,400	.....
Sugar Creek	1,800	.....
Crawford County:		
Liberty	.....	1,400
Sterling	.....	1,800
Whiskey Run	.....	1,600
Daviess County:		
Barr	3,500	2,300
Bogard	3,300	.....
Elmore	2,000	2,100
Harrison	4,100	.....
Washington	2,700	2,700
Dearborn County:		
Center	.....	3,640
Clay	.....	3,000
Decatur County:		
Salt Creek	.....	1,950
Dekalb County:		
Jackson	600	.....
Spencer	800	.....
Union	2,200	.....
Delaware County:		
Liberty	1,800	2,000
Mount Pleasant	900	.....
Salem	1,500	.....
Washington	4,500	3,000
Dubois County:		
Cass	.....	4,000
Columbia	.....	2,200
Harbison	.....	3,500
Patoka	.....	3,670
Elkhart County:		
Cleveland	200	.....
Clinton	375	.....
Jefferson	300	.....
Olive	1,250	.....
York	1,125	.....
Fayette County:		
Jennings	500	.....
Posey	1,000	.....
Fountain County:		
Logan	2,000	.....
Richland	.....	6,100
Shawnee	4,000	.....
Wabash	2,500	.....
Franklin County:		
Blooming Grove	.....	3,800
Highland	1,000	2,300
Salt Creek	.....	3,000
Springfield	3,000	4,200
Fulton County:	,200	
Richland	1850	.....
Union	.....	.....
Gibson County:		
Center	.....	3,000
Johnson	.....	3,200
Union	2,000	.....

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Grant County:	*Dollars.*	*Dollars.*
Green	2,500	3,000
Monroe	4,000	.....
Sims	2,000	.....
Greene County:		
Center	.....	1,350
Highland	2,000	.....
Hamilton County:		
Delaware	1,800	8,000
Jackson	3,168	5,600
Harrison County:		
Blue River	.....	1,650
Harrison	.....	1,800
Jackson	.....	1,800
Morgan	.....	1,870
Spencer	.....	1,600
Washington	.....	1,500
Hendricks County:		
Center	2,000	3,000
Liberty	2,500	.....
Washington	.....	5,000
Henry County:		
Franklin	1,000	.....
Henry	960	.....
Jefferson	600	900
Spiceland	750	.....
Howard County:		
Center	2,000	2,000
Howard	2,500	.....
Jackson	2,600	3,500
Huntington County:		
Dallas	1,100	.....
Huntington	1,100	1,200
Salomonie	1,600	.....
Jackson County:		
Brownstown	1,500	.....
Driftwood	1,500	.....
Grassy Fork	2,000	.....
Hamilton	1,000	.....
Washington	2,500	2,640
Jasper County:		
Barkley	1,750	.....
Kankakee	2,500	2,500
Marion	2,500	2,500
Jay County:		
Noble	3,000	.....
Pike	.....	6,000
Wabash	1,900	2,300
Jefferson County:		
Madison	.....	2,000
Jennings County:		
Bigger	.....	1,500
Campbell	.....	2,000
Columbia	200	1,000
Geneva	900	1,400
Montgomery	.....	1,000
Sand Creek	.....	1,200
Vernon	.....	1,500
Johnson County:		
Clark	1,000	.....
Hensley	2,000	.....
Union	150	.....
Knox County:		
Decker	1,150	.....
Harrison	3,700	.....
Vigo	1,650	1,860
Vincennes	2,000	.....
Widner	.....	2,000
Kosciusko County:		
Etna	2,900	.....
Prairie	4,400	.....
Tippecanoe	3,520	.....
Van Buren	4,986	.....
La Grange County:		
Clearspring	640	.....
Greenfield	300	.....
Johnson	400	.....

TABLE 26.—*Cost data, 1909*—Continued.

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Lake County:	*Dollars.*	*Dollars.*
Calumet	3,000	3,000
Center		4,000
Hobart	2,000	3,000
North		5,000
Ross		2,600
St. Johns		6,000
West Creek	4,000	
Laporte County:		
Cool Spring		1,800
Galena	2,346	
Michigan		3,750
Lawrence County:		
Flinn	4,600	
Marion		2,200
Spice Valley		1,500
Madison County:		
Anderson	3,000	
Duck Creek	2,500	
Fall Creek	1,500	
Green	2,500	
Monroe	1,500	2,000
Pipe Creek	2,200	2,300
Union	1,300	
Marion County:		
Lawrence	1,500	2,000
Wayne	1,760	2,200
Marshall County:		
Center	1,400	
Tippecanoe	1,800	
Union	300	
Walnut	1,400	
Martin County:		
Center	2,000	2,000
Halbert		2,700
Miami County:		
Clay	2,800	
Deer Creek	2,000	
Erie	2,000	
Harrison	2,600	
Jackson	4,600	
Jefferson	2,200	
Richland	1,500	
Monroe County:		
Bean Blossom		2,300
Benton		2,000
Bloomington		2,370
Clear Creek		2,000
Indian Creek		2,000
Perry		2,250
Salt Creek		1,000
Washington	1,800	
Montgomery County:		
Coal Creek	1,500	
Franklin	1,800	
Madison	1,760	
Scott	500	550
Walnut	1,000	
Morgan County:		
Adams		2,000
Ashland		1,500
Brown	500	1,500
Gregg	1,700	
Madison	900	
Ray		1,800
Washington	3,000	
Newton County:		
Beaver		2,200
Colfax	2,600	2,700
Grant		1,800
Iroquois		2,000
Lake	1,800	
Noble County:		
Albion	500	
Elkhart	3,285	
Orange	750	
Perry	150	

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Orange County:	*Dollars.*	*Dollars.*
Greenfield		2,000
Northeast	1,250	
Northwest		1,500
Orangeville		1,400
Orleans	1,800	2,000
Paoli		2,000
Southeast		1,400
Owen County:		
Harrison		1,770
Marion		1,600
Montgomery		1,000
Morgan	1,600	1,900
Wayne	1,704	2,560
Parke County:		
Howard	1,200	2,000
Union	1,600	1,860
Pike County:		
Jefferson		3,200
Porter County:		
Boone	4,500	4,000
Jackson		5,000
Pine		4,400
Pleasant		1,000
Portage	3,110	3,450
Porter		4,170
Union	5,000	
Posey County:		
Black		3,300
Harmony	2,700	
Lynn	3,500	
Marrs		3,300
Pulaski County:		
Jefferson	1,100	
Monroe	1,000	
Tippecanoe	1,000	
White Post	2,300	2,500
Putnam County:		
Madison	1,400	2,500
Monroe	2,000	3,000
Warren		2,400
Randolph County:		
Green	1,800	3,500
Stony Creek	2,346	
Ward	1,630	2,500
Washington	1,250	
White River	3,000	3,300
Ripley County:		
Adams	250	2,000
Delaware		2,300
Franklin		2,000
Otter Creek		2,100
Shelby		2,400
Rush County:		
Anderson		4,000
Orange	1,406	4,986
Washington	1,500	
St. Joseph County:		
Center	600	
Clay	320	
Greene	250	
Lincoln	2,000	
Scott County:		
Finley	500	700
Johnson	3,100	3,200
Shelby County:		
Brandywine	1,000	
Noble	1,600	2,300
Washington	130	
Spencer County:		
Ohio		2,650
Starke County:		
Davis	1,800	
Oregon	1,200	
Washington	1,600	
Steuben County:		
Millgrove	1,000	

TABLE 26.—*Cost data, 1909*—Continued.

County and township.	Average cost per mile.		County and township.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
Sullivan County:	*Dollars.*	*Dollars.*	Warren County—Continued.	*Dollars.*	*Dollars.*
Cass	3,500	4,000	Prairie	2,200	.....
Fairbank	1,000	.....	Warren	2,600	.....
Haddon	1,760	2,200	Warrick County:		
Jackson	3,500	4,000	Boon	.....	1,725
Switzerland County:			Washington County:		
Pleasant	.....	1,950	Gibson	2,000	.....
Posey	1,500	2,000	Jefferson	.....	1,200
Tippecanoe County:			Pierce	.....	1,750
Lauramie	1,900	3,100	Posey	.....	2,000
Shelby	2,000	.....	Washington	.....	1,750
Tippecanoe	2,200	.....	Wayne County:		
Tipton County:			Boston	1,600	2,800
Liberty	1,800	2,200	Clay	4,400	.....
Madison	2,500	2,700	Harrison	1,000	.....
Wildcat	2,700	3,200	Jackson	4,400	.....
Union County:			Jefferson	200	.....
Harrison	.....	1,760	Perry	1,000	.....
Vanderburg County:			Wells County:		
Armstrong	.....	2,500	Jefferson	1,800	2,800
Perry	.....	2,800	Nottingham	1,250	1,000
Union	1,760	2,750	Union	1,800	.....
Vermilion County:			White County:		
Eugene	500	.....	Liberty	2,000	.....
Vermilion	1,600	.....	Union	1,500	3,000
Vigo County:			West Point	3,000	.....
Honey Creek	2,400	4,000	Whitley County:		
Prairieton	1,500	.....	Columbia	4,400	.....
Riley	2,000	.....	Richland	4,400	.....
Sugar Creek	4,000	.....			
Warren County:			Average	1,887	2,657
Jordan	3,000	.....			
Kent	2,130	.....			

IOWA.

TABLE 27.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adair	1,200	.....	.....	.....	.....	.....
Adams	720	.....	.....	.....	.....	.....
Allamakee	1,000	0.5	.....	5	5.5	0.55
Appanoose	714	.....	.....	.....	.....	.....
Audubon	880	.....	.....	.....	.....	.....
Benton	1,420	.....	1.5	12.5	14	.98
Blackhawk	1,150	.5	51	3	54.5	4.73
Boone	1,440	.....	71.75	.....	71.75	4.98
Bremer	759	.....	16	77.75	93.75	12.35
Buchanan	1,184	.....	85.25	17	102.25	8.63
Buena Vista	1,040	.....	50	2.5	52.5	5.05
Butler	1,329	.....	[1] 93	2	95	7.14
Calhoun	1,152	.....	40	.....	40	3.47
Carroll	950	.....	73	3	76	8.00
Cass	875	.....	.....	.....	.....	.....
Cedar	952	.5	.....	.....	.5	.05
Cerro Gordo	1,132	.5	18	6	24.5	2.16
Cherokee	980	.....	20	.....	20	2.04
Chickasaw	970	1	64	2	67	6.90
Clarke	936	.....	.....	.....	.....	.....
Clay	1,100	.....	24	.....	24	2.18
Clayton	1,391	2	9	63.5	74.5	5.35
Clinton	1,220	38.75	21.5	2	62.25	5.10
Crawford	1,500	.....	.....	.25	.25	.01
Dallas	854	.....	10	2	12	1.40
Davis	1,500	.....	.....	.....	.....	.....

[1] Includes 10 miles of oiled-gravel roads.

TABLE 27.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Decatur	960					
Delaware	787	7	32		39	4.95
Des Moines	900	3	50		53	5.88
Dickinson	610		40		40	6.55
Dubuque	935	57	37.1	.75	94.85	10.14
Emmet	644		1.5		1.5	.23
Fayette	1,200	3	19.5	55	77.5	6.45
Floyd	1,300	2.5	51.5	1	55	4.23
Franklin	1,152	1	36		37	3.21
Fremont	850					
Greene	1,060		150	1.5	151.5	14.29
Grundy	1,000					
Guthrie	1,600		13.5		13.5	.84
Hamilton	1,225		25		25	2.04
Hancock	934		70.5	44	114.5	12.25
Hardin	2,300		64.5	44	108.5	4.71
Harrison	500			4	4	.80
Henry	900					
Howard	829	11	17	3.5	31.5	3.79
Humboldt	720	12	20		32	4.44
Ida	430					
Iowa	1,008		10	7.5	17.5	1.73
Jackson	1,200	4.5	8		12.5	1.04
Jasper	480		15	2	17	3.54
Jefferson	1,143		3		3	.26
Johnson	252		.25	8.5	8.75	3.47
Jones	1,048	1	1	8	10	.95
Keokuk	1,000	110			110	11.00
Kossuth	1,623		10		10	.61
Lee	1,000	13	2		15	1.50
Linn	1,400	23	8	3.5	34.5	2.46
Louisa	689					
Lucas	800					
Lyon	1,200					
Madison	1,200					
Mahaska	1,206	3			3	.24
Marion	1,800					
Marshall	1,150		1		1	.08
Mills	727					
Mitchell	800		7		7	.87
Monona	1,400		.5		.5	.03
Monroe	864					
Montgomery	839					
Muscatine	882		2	46.5	48.5	5.49
O'Brien	1,082		3.5	1	4.5	.41
Osceola	280		4		4	1.42
Page	1,050					
Palo Alto	904	.25	2		2.25	.24
Plymouth	1,500					
Pocahontas	1,054		2		2	.18
Polk	987		18	1.5	19.5	1.97
Pottawattamie	1,500			10	10	.66
Poweshiek	1,150					
Ringgold	1,152					
Sac	1,152		10.5		10.5	.91
Scott	743	40.25	4	11	55.25	7.43
Shelby	1,392					
Sioux	1,234			10	10	.81
Story	576		126		126	21.87
Tama	1,500		3	6.25	9.25	.61
Taylor	900					
Union	900					
Van Buren	975					
Wapello	725			7	7	.96
Warren	1,050					
Washington	990					
Wayne	800					
Webster	1,244	17	6	6	29	2.33
Winnebago	792		6.5	55	61.5	7.76
Winneshiek	1,019	5	23		28	2.74
Woodbury	1,119		.5		.5	.04
Worth	612		17.5	19	36.5	5.96
Wright	1,150		2.5	20	22.5	1.95
Total	102,427	357.25	1,572.85	575	2,505.1	2.45

TABLE 27.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	102,448	241	1,403	.....	[1] 1,664	1.62
1909	102,427	357.25	1,572.85	575	2,505.1	2.45
Gain	.....	116.25	169.85	575	841.1	.83

[1] Includes 14 miles of brick roads and 6 miles of shell roads.

KANSAS.

TABLE 28.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Allen	570	11	.....	.....	11	1.92
Anderson	1,125	1	.....	.....	1	.08
Atchison	800	10	.....	.....	10	1.25
Barber	812	.....	.....	.....	.....	.....
Barton	1,225	.....	.....	.....	.....	.....
Bourbon	1,500	24.75	.....	.....	24.75	1.65
Brown	700	.....	.....	.....	.....	.....
Butler	1,200	.....	.....	.....	.....	.....
Chase	100	.....	.....	.....	.....	.....
Chautauqua	980	.....	.....	.....	.....	.....
Cherokee	700	.....	[1] 20	.....	20	2.85
Cheyenne	600	.....	.....	0.5	.5	.08
Clark	150	.....	.....	7	7	4.66
Clay	800	.....	.....	.....	.....	.....
Cloud	1,350	.....	.....	.....	.....	.....
Coffey	700	.....	.....	.....	.....	.....
Comanche	412	.....	.....	2	2	.48
Cowley	1,200	.75	.....	.....	.75	.06
Crawford	1,152	.....	.....	.....	.....	.....
Decatur	1,461	.....	.....	.....	.....	.....
Dickinson	1,634	.....	2	10	12	.73
Doniphan	707	1.5	.....	.....	1.5	.21
Douglas	1,000	4	.....	.....	4	.40
Edwards	638	.....	.....	40	40	6.26
Elk	700	1	.....	30	31	4.42
Ellis	700	.....	.....	.....	.....	.....
Ellsworth	921	.....	.....	.....	.....	.....
Finney	801	.....	.....	8	[2] 9	1.12
Ford	634	.....	.....	5	5	.78
Franklin	1,152	.25	.....	.....	[3] 1.41	.12
Geary	500	2.5	.....	.....	2.5	.50
Gove	169	.....	.....	.....	.....	.....
Graham	890	.....	.....	.....	.....	.....
Grant	600	.....	.....	.....	.....	.....
Gray	400	.....	.....	10	10	2.50
Greeley	214	.....	.....	.....	.....	.....
Greenwood	1,800	.....	.....	.....	.....	.....
Hamilton	125	.....	.....	5.5	5.5	4.40
Harper	614	.....	.....	.....	.....	.....
Harvey	1,128	.....	.....	.....	.....	.....
Haskell	500	.....	.....	.....	.....	.....
Hodgeman	500	.....	.....	.....	.....	.....
Jackson	1,000	.....	.....	.....	.....	.....
Jefferson	1,200	.....	.....	.....	.....	.....
Jewell	1,500	.....	.....	.....	.....	.....
Johnson	1,000	5	.....	.....	5	.50
Kearny	625	.....	.....	.....	.....	.....
Kingman	1,500	.....	.....	.75	.75	.05
Kiowa	388	.....	.....	.....	.....	.....
Labette	600	1	.....	.....	1	.16

[1] Galena chats.
[2] Including 1 mile of bituminous-macadam road.
[3] Including 1.16 miles of bituminous-macadam roads.

TABLE 28.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Lane	138					
Leavenworth	850	2			[1] 5	.58
Lincoln	960					
Linn	900					
Logan	1,400					
Lyon	800	5	2		.7	.87
McPherson	1,653					
Marion	1,784					
Marshall	1,600					
Meade	400					
Miami	1,150					
Mitchell	1,320					
Montgomery	1,200					
Morris	800					
Morton	150					
Nemaha	720					
Neosho	1,155	2.2	.25		[2] 5.05	.43
Ness	455					
Norton	900					
Osage	720					
Osborne	1,491					
Ottawa	1,320					
Pawnee	1,353			25	25	1.84
Phillips	1,700					
Pottawatomie	1,400	6	3	30	39	2.78
Pratt	1,000					
Rawlins	270					
Reno	2,448			5	5	.20
Republic	700			1.5	1.5	.21
Rice	1,381					
Riley	1,100					
Rooks	1,560					
Rush	1,326					
Russell	1,250					
Saline	1,275					
Scott	281					
Sedgwick	1,548					
Seward	1,296			6	6	.46
Shawnee	1,200					
Sheridan	1,350					
Sherman	500					
Smith	1,750					
Stafford	1,009			16	16	1.60
Stanton	300					
Stevens	200					
Sumner	1,188					
Thomas	137					
Trego	450					
Wabaunsee	1,500	1	.5		1.5	.10
Wallace	200					
Washington	1,800					
Wichita	608					
Wilson	938					
Woodson	1,000					
Wyandotte	750	[3] 58			58	7.73
Total	98,302	136.95	27.75	202.25	374.71	.38

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	101,196	111.75	158.5		[4] 273.25	0.27
1909	98,302	136.95	27.75	202.25	[5] 374.71	.38
Gain		25.2		202.25	104.46	.11

[1] Includes 3 miles of brick roads.
[2] Includes 2.6 miles of bituminous-macadam roads.
[3] Includes 30 miles of roads which have been treated with oil.
[4] Includes 3 miles of shell roads.
[5] Includes 4.76 miles of bituminous-macadam roads and 3 miles of brick roads.

TABLE 29.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Sand-clay.	Mac-adam.		Sand-clay.	Mac-adam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Allen	.....	3,160	Hamilton	1,000	.....
Anderson	.....	2,000	Johnson	.....	7,200
Atchison	.....	5,400	Neosho	.....	4,300
Bourbon	.....	4,000	Stafford	300	.....
Clark	1,600	.....	Wabaunsee	.....	3,000
Comanche	1,000	.....	Wyandotte	.....	3,500
Edwards	300	.....			
Finney	700	.....	Average	785	4,070
Ford	600	.....			

KENTUCKY.

TABLE 30.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Adair	400	5	20	25	6.25
Allen	400	.....	7	7	1.75
Anderson	450	200	.....	200	44.44
Ballard	400	.....	.....	.....	.....
Barren	600	44	10	54	9.00
Bath	400	165	.....	165	41.25
Bell	375	4	.....	4	1.06
Boone	275	96.75	1	97.75	35.54
Bourbon	500	.....	.....	.....	.....
Boyd	182	14	.....	[1] 15.7	8.62
Boyle	300	100	175	275	91.66
Bracken	250	180	.....	180	72.00
Breathitt	450	.....	.....	.....	.....
Breckinridge	600	.....	.....	.....	.....
Bullitt	380	40	15	55	14.47
Butler	450	.....	.....	.....	.....
Caldwell	550	10	10	20	3.63
Calloway	400	.....	45	45	11.25
Campbell	300	75	.....	75	25.00
Carlisle	200	.....	.....	.....	.....
Carroll	300	141	20	161	53.66
Carter	500	.....	.....	.....	.....
Casey	650	.....	65	65	10.00
Christian	1,000	260	.....	260	26.00
Clark	368	208	.....	208	56.52
Clay	500	.....	.....	.....	.....
Clinton	200	.....	.....	.....	.....
Crittenden	250	.....	.....	.....	.....
Cumberland	400	.....	.....	.....	.....
Daviess	500	30	15	45	9.00
Edmonson	300	.....	8	8	2.66
Elliott	300	.....	.....	.....	.....
Estill	300	.....	.....	.....	.....
Fayette	538	360	.....	360	66.91
Fleming	565	225	.....	225	39.82
Floyd	300	.....	.....	.....	.....
Franklin	300	228.5	.....	228.5	76.16
Fulton	250	.....	.....	.....	.....
Gallatin	190	159	12	171	90.00
Garrard	260	135	.....	135	51.92
Grant	700	350	.....	350	50.00
Graves	1,000	6	6	12	1.20
Grayson	500	3	.....	3	.60
Green	400	12	.....	12	3.00
Greenup	300	1.5	.....	1.5	.50
Hancock	203	.....	.....	.....	.....
Hardin	1,000	155	30	185	18.50
Harlan	500	.....	.....	.....	.....
Harrison	420	365	.....	365	86.90
Hart	400	68	.....	68	17.00
Henderson	550	53	53	106	19.27

[1] Includes 1.7 miles of bituminous-macadam roads.

TABLE 30.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Henry	550	200	50	250	45.45
Hickman	450				
Hopkins	1,250				
Jackson	300				
Jefferson	742				
Jessamine	290	203		203	70.00
Johnson	275	1		1	.36
Kenton	300	219		219	73.00
Knott	300				
Knox	700				
Larue	300	22	13	35	11.66
Laurel	600	4		4	.66
Lawrence	500				
Lee	300				
Leslie	400				
Letcher	350				
Lewis	506	80		80	15.81
Lincoln	530	82.5	200	282.5	53.30
Livingston	380				
Logan	600	75	15	90	15.00
Lyon	225				
McCracken	300		152	152	50.66
McLean	300				
Madison	900	366		366	40.66
Magoffin	550				
Marion	500	125	25	150	30.00
Marshall	432		60	60	13.88
Martin	225				
Mason	400	370		370	92.50
Meade	350	10		10	2.85
Menifee	250				
Mercer	425	235		235	55.29
Metcalfe	250				
Monroe	650				
Montgomery	400	110		110	27.50
Morgan	400				
Muhlenberg	500				
Nelson	700	237	50	287	41.00
Nicholas	300	253	3	256	85.33
Ohio	500	8		8	1.60
Oldham	200	85		85	42.50
Owen	700	315		315	45.00
Owsley	300				
Pendleton	450	310		310	66.44
Perry	300				
Pike	700				
Powell	400				
Pulaski	1,000	30	5	35	3.50
Robertson	110	65		65	59.09
Rockcastle	500				
Rowan	500				
Russell	275		5	5	1.81
Scott	400	363		363	90.75
Shelby	500	405		405	81.00
Simpson	500	83	33	116	23.20
Spencer	270	30	89	119	44.07
Taylor	460	30	25	55	11.95
Todd	200	25	10	35	17.50
Trigg	781		30	30	3.84
Trimble	180		65	65	36.11
Union	483				
Warren	700	225	50	275	39.28
Washington	500	222	27	249	49.80
Wayne	550	25		25	4.54
Webster	624				
Whitley	1,000		5	5	.50
Wolfe	500				
Woodford	675	202		202	29.92
Total	53,744	8,709.25	1,404	[1] 10,114.95	18.82

[1] Includes 1.7 miles of bituminous-macadam roads.

TABLE 30.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	57,137	8,078	1,408	9,486	16.60
1909	53,744	8,709.25	1,404	[1] 10,114.95	18.82
Gain		631.25		628.95	2.22

[1] Includes 1.7 miles of bituminous-macadam roads.

TABLE 31.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Adair	1,100	.....	Lewis	.....	1,300
Allen	1,100	.....	Lincoln	.....	1,600
Barren	600	1,800	Logan	1,200	2,500
Bourbon	.....	2,500	McCracken	500	.....
Boyd	.....	[1] 5,500	Madison	.....	2,500
Bullitt	800	1,500	Marion	.....	2,000
Caldwell	.....	1,750	Marshall	900	.....
Calloway	320	.....	Mason	.....	2,400
Carroll	1,000	1,200	Montgomery	.....	1,500
Clark	.....	2,000	Nelson	1,200	1,200
Daviess	.....	6,000	Nicholas	.....	2,000
Fayette	.....	2,500	Ohio	.....	4,500
Fleming	.....	1,700	Owen	.....	1,200
Franklin	.....	2,000	Pulaski	1,500	1,800
Gallatin	1,100	.....	Robertson	.....	1,800
Garrard	.....	2,000	Scott	.....	1,400
Grant	.....	1,200	Shelby	.....	1,200
Graves	700	.....	Simpson	1,000	1,900
Grayson	.....	3,000	Spencer	1,000	2,000
Green	.....	1,200	Trimble	1,600	.....
Hardin	.....	1,250	Warren	800	.....
Harrison	.....	1,400	Washington	1,400	1,400
Hart	.....	1,200	Wayne	.....	2,500
Henry	400	1,200	Whitley	2,000	.....
Jefferson	.....	3,000	Woodford	.....	1,700
Jessamine	.....	1,900			
Johnson	.....	6,400	Average	1,011	2,158
Kenton	.....	2,200			

[1] 2 gallons of oil per square yard applied.

LOUISIANA.

TABLE 32.—*Mileage of public roads, 1909.*

Parish.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
Acadia	650	.....	.....	.....	.....
Ascension	131	.....	.....	.....	.....
Assumption	200	.....	.....	.....	.....
Avoyelles	800	.....	.....	.....	.....
Bienville	425	.....	.....	.....	.....
Bossier	400	.....	.....	.....	.....
Caddo	487	1	[2] 3	4	0.82
Calcasieu	1,000	.....	.....	[3] 2	.20

[1] La Salle Parish established from Catahoula Parish in 1910. [2] Oiled. [3] Shell road.

TABLE 32.—*Mileage of public roads, 1909*—Continued.

Parish.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
Caldwell	750				
Cameron	175				
Catahoula	1,260		15	15	1.25
Claiborne	750				
Concordia	300				
De Soto	400		75	75	18.75
East Baton Rouge	500	16		16	3.20
East Carroll	285				
East Feliciana	450				
Franklin	500				
Grant	250	2		2	.80
Iberia	400				
Iberville	110	5.5		5.5	5.00
Jackson	500				
Jefferson	100			[1] 5	5.00
Lafayette	250				
Lafourche	215				
Lincoln	500				
Livingston	500				
Madison	400				
Morehouse	364				
Natchitoches	1,500				
Orleans	[2] 60	30		[3] 58	96.66
Ouachita	360	28		28	7.77
Plaquemines	[4] 450				
Pointe Coupee	400				
Rapides	755		3	3	.39
Red River	200				
Richland	150		60	60	40.00
Sabine	400				
St. Bernard	50		12	[5] 36	72.00
St. Charles	75				
St. Helena	300				
St. James	55				
St. John the Baptist	32				
St. Landry	800				
St. Martin	215				
St. Mary	202			[6] 15	7.42
St. Tammany	220				
Tangipahoa	1,200				
Tensas	400				
Terrebonne	220			[7] 5	2.27
Union	250				
Vermilion	1,500				
Vernon	300				
Washington	400				
Webster	500				
West Baton Rouge	100				
West Carroll	250				
West Feliciana	325				
Winn	300				
Total	24,962	82.5	168	[8] 329.5	1.32

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
1904	24,897	26		[9] 34	0.14
1909	24,962	82.5	168	[8] 329.5	1.32
Gain	65	56.5	168	295.5	1.18

[1] Burnt sulphur ore.
[2] This does not include city streets. The city of New Orleans embraces the entire parish of Orleans.
[3] Includes 28 miles of shell roads.
[4] Estimated by the office of public roads.
[5] Includes 24 miles of shell roads.
[6] Oiled.
[7] Shell road.
[8] Includes 59 miles of shell roads, 5 miles of burnt sulphur ore roads, and 15 miles of oiled roads.
[9] Includes 8 miles of shell roads.

TABLE 33.—*Cost data, 1909.*

Parish.	Average cost per mile.			
	Earth.	Sand-clay.	Shell.	Gravel.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Calcasieu	.....	250	1,000	.....
Cameron	.....	75	.....	.....
Catahoula	.....	100	.....	.....
De Soto	.....	500	.....	.....
East Baton Rouge	75	.....	.....	.....
Grant	.....	.....	.....	2,700
Ouachita	.....	.....	.....	1,500
Rapides	.....	1,000	.....	.....
Richland	.....	2,000	.....	.....
St. Bernard	.....	.....	5,000	.....
St. Tammany	125	.....	.....	.....
Average	100	654	3,000	2,100

MAINE.

TABLE 34.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Improved earth.[1]	Total.	
Androscoggin	1,352	[2] 3.68	205	0.65	209.33	15.48
Aroostook	2,317	11	148	16.52	175.52	7.57
Cumberland	2,381	[3] 23.73	443.5	5.45	472.68	19.85
Franklin	1,120	1.5	107	3.9	112.4	10.03
Hancock	1,504	17.37	103.25	2.9	123.52	8.21
Kennebec	1,824	8	127	6.71	141.71	7.76
Knox	816	.5	67	2.2	69.7	8.54
Lincoln	887	2.5	24	4.9	31.4	3.54
Oxford	2,302	6	200	4.72	210.72	9.15
Penobscot	2,565	3.25	365	19.7	387.95	15.12
Piscataquis	888	.4	31	15.64	47.04	5.29
Sagadahoc	548	[4] 1.84	20	1.19	23.03	4.20
Somerset	1,930	[5] 3.94	162	7.44	173.38	8.98
Waldo	1,448	.5	56	14.41	70.91	4.89
Washington	1,338	9	237	3.24	249.24	18.62
York	2,308	[6] 5.13	198	1.4	204.53	8.86
Total	25,528	[7] 98.34	2,493.75	110.97	2,703.06	10.59

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Improved earth.[1]	Total.	
1904	25,528	87.54	2,236	.....	2,323.54	9.10
1909	25,528	[7] 98.34	2,493.75	110.97	2,703.06	10.59
Gain	.....	10.80	257.75	110.97	379.52	1.49

[1] Roads which have been graded and properly drained.
[2] Includes 0.18 mile of bituminous-macadam road.
[3] Includes 0.73 mile of bituminous-macadam road.
[4] Includes 0.09 mile of bituminous-macadam road.
[5] Includes 0.14 mile of bituminous-macadam road.
[6] Includes 0.13 mile of bituminous-macadam road.
[7] Includes 1.27 miles of bituminous-macadam roads.

TABLE 35.—*Cost data, 1909.*

County.	Average cost per mile.			
	Earth.	Gravel.	Macadam.	Bituminous.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Androscoggin	3,062	4,400	17,635	23,073
Aroostook	2,640	3,800	6,864	.....
Cumberland	3,590	2,957	10,771	24,394
Franklin	3,696	4,330	6,650	.....
Hancock	3,010	3,854	12,091	.....
Kennebec	4,541	3,115	8,448	.....
Knox	6,072	6,072	6,494	.....
Lincoln	2,429	4,594	8,342	.....
Oxford	2,112	3,326	5,702	.....
Penobscot	2,376	3,379	5,227	.....
Piscataquis	5,122	3,802	8,606	.....
Sagadahoc	3,538	3,643	7,339	15,154
Somerset	4,277	2,482	7,286	16,104
Waldo	3,696	2,851	18,536	.....
Washington	7,656	2,640	4,541	.....
York	4,435	3,749	9,821	.....
Average	3,891	3,687	9,022	19,681

MARYLAND.

TABLE 36.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Stone.	Shell.	Total.	
Allegany	693	.....	80	.....	80	11.54
Anne Arundel	521	37	8.5	112	157.5	30.23
Baltimore	1,291	.....	483	130	613	47.48
Calvert	335	65	.....	.....	65	19.40
Caroline	706	1	11.5	8.5	[2] 24	3.39
Carroll	800	.....	47	.....	47	5.87
Cecil	638	10	16.5	.....	26.5	4.15
Charles	465	86	.....	1	87	18.70
Dorchester	810	.....	5	40	45	5.55
Frederick	1,280	.....	112	.....	112	8.75
Garrett	940	.....	27.5	.....	27.5	2.92
Harford	830	205	90	.....	295	35.54
Howard	448	5	54.5	.....	59.5	13.28
Kent	427	3	3.3	2	8.3	1.94
Montgomery	835	.....	43	.....	43	5.14
Prince Georges	892	51	19	.....	70	7.84
Queen Annes	839	.....	13	.....	13	1.54
St. Marys	602	25	.....	5	30	4.98
Somerset	515	.....	3	30	33	6.40
Talbot	450	.....	11	40	51	11.33
Washington	799	.....	164	.....	164	20.52
Wicomico	825	.....	9	40	[3] 69	8.36
Worcester	832	.....	22	.....	22	2.64
Total	16,773	488	1,222.8	408.5	[4] 2,142.3	12.77

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Gravel.	Stone.	Shell.	Total.	
1904	16,773	480	840	250	1,570	9.36
1909	16,773	488	1,222.8	408.5	[4] 2,142.3	12.77
Gain	.....	8	382.8	158.5	572.3	3.41

[1] Baltimore City County has no rural roads; the entire county is included in the city of Baltimore.
[2] Including 3 miles of sand-clay roads.
[3] Including 20 miles of sand-clay roads.
[4] Including 23 miles of sand-clay roads.

TABLE 37.—*Cost data, 1909.*

County.	Average cost per mile.				
	Earth.	Sand-clay.	Gravel.	Shell.	Mac-adam.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Allegany	.....	.....	.....	.....	9,600
Anne Arundel	.....	.....	1,000	1,000	7,000
Baltimore	.....	.....	.....	.....	(1)
Caroline [2]	.....	3,000	.....	5,000	[3] 6,000
Charles	.....	.....	[4] 1,000	.....	[5] 7,200
Dorchester	.....	.....	.....	3,000	9,000
Frederick	800	.....	.....	.....	(6)
Harford	.....	.....	.....	.....	7,500
Howard	.....	.....	.....	.....	12,800
Queen Anne	.....	.....	.....	.....	11,000
Somerset	.....	.....	.....	500	12,000
Talbot	.....	.....	.....	3,000	6,500
Washington	.....	.....	.....	.....	1,500
Wicomico	.....	550	.....	5,400	8,900
Worcester	.....	.....	.....	.....	7,500
Average	800	1,775	1,000	2,984	8,192

[1] Bituminous resurfacing and pouring about 3 gallons per square yard, which cost $0.75 per square yard. Oiling macadam road cost $0.03½ per square yard.
[2] Caroline County has one marl road which cost $3,500 per mile.
[3] This is a shell-macadam road.
[4] Not including grading of hills of over 6 per cent; gravel consolidated by traffic.
[5] This is a gravel-macadam road.
[6] County roads cost $2,500 per mile; State roads cost $7,000 per mile.

MASSACHUSETTS.

TABLE 38.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.		Gravel.		Total.	
		By towns.	By State.	By towns.	By State.		
Barnstable	1,024	143	93.24	62	.....	298.24	29.12
Berkshire	1,475	54	47.65	266	11.99	379.64	25.73
Bristol	963	128	62.85	668	4.59	863.44	89.66
Dukes	196	22	17.06	12	.....	51.06	26.05
Essex	1,090	171	59.24	628	7.48	865.72	79.42
Franklin	1,459	65	43.62	55	2.40	166.02	11.37
Hampden	1,143	51	46.76	197	5.54	300.30	26.27
Hampshire	1,186	36	35.35	174	1.92	247.27	20.84
Middlesex	2,073	286	101.56	1,480	11.41	1,878.97	90.64
Nantucket	114	3	6.48	6	.....	15.48	13.57
Norfolk	1,253	151	52.13	833	2.19	1,038.32	82.86
Plymouth	1,458	192	86.08	1,150	4.36	1,432.44	98.24
Suffolk	[1] 80	6	3.60	54	.....	63.60	79.50
Worcester	3,758	208	125.04	520	9.64	862.68	22.95
Total	17,272	1,516	780.66	6,105	61.52	8,463.18	49.00

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		Stone.		Gravel.		Total.	
		By towns.	By State.	By towns.	By State.		
1904	17,092	689	523.73	6,579	42.14	[2] 7,843.87	45.89
1909	17,272	1,516	780.66	6,105	61.52	8,463.18	49.00
Gain	180	827	256.93	.....	19.38	629.31	3.11

[1] This county includes the cities of Boston and Chelsea and the towns of Revere and Winthrop.
[2] Includes 8 miles of shell roads and 2 miles of tarred roads.

TABLE 39.—*Cost data,*[1] *1909.*

Town or city.	Square yards.	Miles.	Cost per mile.	Town or city.	Square yards.	Miles.	Cost per mile.
			Dollars.				*Dollars.*
Agawam [2]	7,705	0.876	11,530.01	Marshfield [2]	6,498	0.738	6,307.77
Attleboro	6,500	.740	5,651.01	Milford [2]	5,488	.624	8,528.00
Becket (1908)	31,083	3.532	12,005.24	Montague	5,308	.603	8,177.18
Billerica (1908)	5,088	.578	9,909.05	Norton (1908)	6,957	.790	5,569.50
Chilmark (1908) [3]	5,332	.814	5,798.46	Oxford (1908)	5,500	.625	8,707.60
Chester - Huntington	11,367	1.292	7,737.47	Oxford (1909) [2]	6,313	.718	8,212.74
Clarksburg (1907–1909)	4,152	.478	15,122.17	Palmer (1908)	30,450	3.441	10,214.65
Deerfield [2]	5,245	.600	14,646.73	Randolph	4,553	.517	5,212.90
Dighton (1908)	5,943	.677	5,920.97	Rowley [6]	12,331	1.401	4,837.42
Duxbury [2]	6,070	.690	7,435.24	Scituate [2]	4,500	.510	11,654.71
Erving	5,755	.654	10,590.24	South Hadley	5,473	.622	11,154.29
Foxboro (1908)	5,963	.677	5,922.62	Sterling	5,333	.606	7,900.64
Harwich - Brewster - Orleans (1908) [4]	10,301	1.951	4,572.35	Sunderland	1,488	.170	9,388.94
Holden (1908)	3,217	.366	7,060.25	Tyngsboro	16,423	1.867	8,026.61
Ipswich	7,750	.881	9,221.06	Wareham - Rochester [4]	13,743	1.562	3,723.92
Littleton	4,583	.521	1,420.40	West Newbury	12,085	1.373	9,461.47
Marlboro (1908) [5]	7,160	.814	5,858.75	Weymouth (1908)	7,750	.881	4,653.42
				Total, or average	283,407	33.189	[7] 8,003.94

[1] These include information concerning the cost of macadam, bituminous-macadam, and sand-oil roads.
[2] Includes cost of bituminous surfacing.
[3] Macadam 12 feet in width.
[4] Sand and oil mixture greater than 3 inches in thickness.
[5] Gravel road with sand-oil surface.
[6] Includes 2,420 feet of gravel; balance macadam.
[7] Exclusive of bridges.

MICHIGAN.

TABLE 40.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Alcona	397			25	25	6.29
Alger	290	7.5	2.83	24.4	34.73	11.97
Allegan	1,665.5		363		363	21.79
Alpena	426		195.5		195.5	45.89
Antrim	723		33.33	20	53.33	7.37
Arenac	457		3	2	5	1.09
Baraga	197	2.25		65	67.25	34.13
Barry	1,109		17	12	29	2.61
Bay	668.5	[1] 148		25	173	25.88
Benzie	514		26.25	11.5	37.75	7.34
Berrien	1,205	.25	110	38.5	148.75	12.34
Branch	1,004		18	2.75	20.75	2.06
Calhoun	1,264	4.13	9.72		13.85	1.09
Cass	907		33.67	16	49.67	5.47
Charlevoix	573.5	2	37	35	74	12.89
Cheboygan	611.5	12.5	21.25	63.75	97.5	15.94
Chippewa	476		[2] 232.25	61.5	293.75	61.71
Clare	656		3.75	1.5	5.25	.80
Clinton	1,171.5		62.5	3	65.5	5.59
Crawford	237.5		6.5	1	7.5	3.15
Delta	501.5	25.75	77.5	20	123.25	24.57
Dickinson	194	[3] 13.66	3.7	42	59.36	30.57
Eaton	1,049.5		28.5	11.5	40	3.81
Emmet	677.5	3	24.5	16.5	44	6.49
Genesee	1,245.5		31	25	56	4.49
Gladwin	395.5		2	34.5	36.5	9.22
Gogebic	136.5			75	75	54.94
Grand Traverse	672		50.25	2	52.25	7.77
Gratiot	1,238		140.5	44	184.5	14.90
Hillsdale	1,232		40.5	48	88.5	7.18
Houghton	309	8	18.25	82.25	108.5	35.11
Huron	1,512	11.8	4	3	18.8	1.24

[1] Includes 5 miles of bituminous-macadam roads.
[2] Includes 50 miles of gravel-stone road.
[3] Includes 1 mile of bituminous-macadam road.

TABLE 40.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Ingham	1,037	1.33	22	50	73.33	7.07
Ionia	1,113.5	3	45.75	29	77.75	6.98
Iosco	412	.....	2	1.5	3.5	.84
Iron	607	1	87	81	169	27.84
Isabella	1,011	.....	12	21	33	3.26
Jackson	1,259	.....	23	32	55	4.36
Kalamazoo	1,041	.....	44.5	22.5	67	6.43
Kalkaska	549.5	2	23.75	11	36.75	6.68
Kent	1,666.5	.....	143.5	67	210.5	12.63
Keweenaw	250	34	46.5	16	96.5	38.60
Lake	553.5	.....	5	4	9	1.62
Lapeer	1,174.5	.....	3.5	12.5	16	1.36
Leelanau	493.5	.....	31.5	21	52.5	10.63
Lenawee	1,492.5	.....	103	10	113	7.57
Livingston	945	.....	24.92	30	54.92	5.81
Luce	193.5	3	7	43.5	53.5	27.64
Mackinac	361	56.9	140	17.75	214.65	59.45
Macomb	875.5	10	40	.....	50	5.71
Manistee	679	1.25	67.5	25.25	94	13.84
Marquette	541.5	11.75	17.5	45	74.25	13.71
Mason	598.5	.....	3	42.5	45.5	7.60
Mecosta	1,096	.....	25	.....	25	2.28
Menominee	579.5	10.75	91	78	179.75	31.01
Midland	633.5	.....	3.5	16	19.5	3.07
Missaukee	328	.....	19.75	1	20.75	6.32
Monroe	1,111.5	9.6	.....	1	10.6	.95
Montcalm	1,514.5	1	23	126.5	150.5	9.93
Montmorency	215.5	.....	25	2	27	12.52
Muskegon	933	29.5	42	22	93.5	10.02
Newaygo	1,272	1	33.75	9.75	44.5	3.49
Oakland	1,662	.....	100.16	36.75	136.91	8.23
Oceana	944.5	11.64	39.5	3.75	54.89	5.81
Ogemaw	599.5	1.5	.....	17.5	19	3.16
Ontonagon	750	.....	19	268.5	287.5	38.33
Osceola	841	2.5	16	48.5	67	7.96
Oscoda	172.5	.....	.....	14.25	14.25	8.26
Otsego	433.5	.....	2.25	26	28.25	6.51
Ottawa	1,192.5	.....	57	3.25	60.25	5.05
Presque Isle	461	2.25	14.75	38	55	11.93
Roscommon	183.5	.....	8.75	14	22.75	12.39
Saginaw	1,545	173.25	31.75	8	[1] 213.5	13.81
St. Clair	1,402.5	1	1	13	15	1.06
St. Joseph	976.5	.....	65	11	76	8.71
Sanilac	1,785	32	9	3	44	2.46
Schoolcraft	285	12	13	76.75	101.75	35.70
Shiawassee	1,043	2	29.5	55	86.5	8.29
Tuscola	1,732	59.75	20.5	31	111.25	6.42
Van Buren	1,275.5	.....	381	40.75	421.75	33.06
Washtenaw	1,300	10	115	6	131	10.07
Wayne	1,373	[2] 20.5	17.25	8.75	46.5	3.38
Wexford	694.5	4.5	78	7.5	90	12.95
Total	68,906	[3] 747.81	3,770.58	2,381.65	[1] 6,900.54	10.01

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	69,296	248.5	6,777	.....	7,025.5	10.14
1909	68,906	747.81	3,770.58	2,381.65	[1] 6,900.54	10.01
Gain	.....	499.31	.....	2,381.65	.....	.....

[1] Includes 0.5 mile of bituminous-macadam road.
[2] Includes 5 miles of bituminous-macadam roads.
[3] Includes 186.75 miles of stone-gravel and gravel-stone roads located in different counties, but not included in the above table.

TABLE 41.—*Cost data, 1909.*

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Allegan County:	*Dollars.*	*Dollars.*
Wayland	2,471	.....
Antrim County:		
Mancelona	2,739	.....
Do	1,856	.....
Star	1,554	.....
Barry County:		
Rutland	1,075	.....
Bay County:		
Bangor	.....	3,253
Beaver	.....	3,972
Frankenlust	.....	3,641
Fraser	.....	3,013
Hampton	.....	2,640
Kawkawlin	.....	2,953
onitor	.....	4,300
ortsmouth	.....	4,528
Do	.....	5,256
Benzie County:		
Benzonia	.....	1,421
Homestead	2,145	.....
Berrien County:		
Royalton	.....	4,844
St. Joseph	.....	4,700
Calhoun County:		
Battle Creek	853	.....
Emmett	2,624	.....
Newton	988	.....
Cheboygan County:		
Benton	[1] 2,460	.....
Do	[1] 2,476	.....
Clare County:		
Grant	1,650	.....
Do	1,535	.....
Delta County:		
Bark River	.....	3,980
Ford River	.....	3,522
Wells	.....	4,778
Dickinson County:		
Breitung	.....	3,696
Do	.....	4,439
Do	.....	4,808
Norway	.....	5,137
Eaton County:		
Eaton	1,091	.....
Eaton Rapids	1,164	.....
Hamlin	838	.....
Grand Traverse County:		
Whitewater	1,340	.....
Gratiot County:		
Arcada	461	.....
Do	749	.....
Bethany	1,870	.....
Emerson	946	.....
Pine River	490	.....
Sumner	656	.....
Huron County:		
Sand Beach	1,965	.....
Sebewaing	.....	.....
Verona	1,494	.....
Winsor	.....	2,528
Ingham County:		
Lansing	1,740	5,742
Meridian	2,028	.....
Iosco County:		
Grant and Reno [2]	.....	2,608
Do	.....	3,820
Isabella County:		
Coe	1,597	.....
Jackson County:		
Henrietta	.....	2,778
Do	[3] 6,422	.....
Kalkaska County:		
Boardman	.....	3,610

County and township.	Average cost per mile.	
	Gravel.	Macadam.
Kalkaska County—Contd.	*Dollars.*	*Dollars.*
Boardman	1,608	.....
Clearwater	1,417	.....
Cold Springs	2,492	.....
Excelsior	[1] 2,943	.....
Orange	2,346	.....
Rapid River	1,884	.....
Wilson	3,206	.....
Kent County:		
Byron	2,494	.....
Grand Rapids	3,488	.....
Paris	[4] 4,013	.....
Sparta	2,087	.....
Tyrone	1,075	.....
Walker	3,007	.....
Lake County:		
Newkirk	610	.....
Macomb County:		
Warren	.....	5,089
Manistee County:		
Bear Lake	1,903	.....
Brown	1,460	.....
Filer	1,180	.....
Manistee	1,710	.....
Onekama	4,905	.....
Pleasanton	3,178	.....
Marquette County:		
Marquette	.....	6,984
Negaunee	.....	9,694
Mason County:		
Amber	.....	3,038
Grant	1,122	.....
Pere Marquette	.....	2,913
Riverton	.....	4,200
Sheridan	1,054	.....
Mecosta County:		
Morton	496	.....
Wheatland	1,900	.....
Menominee County:		
Ingallston	1,517	.....
Menominee	.....	2,042
Nadeau	.....	2,511
Stephenson	1,550	.....
Monroe County:		
Bedford	.....	1,470
Montcalm County:		
Cato	900	.....
Douglass	1,125	.....
Muskegon County:		
Casnovia	2,246	.....
Dalton	.....	4,097
Egelston	.....	3,807
Holton	.....	4,644
Muskegon	.....	3,653
Norton	.....	4,360
Oakland County:		
Bloomfield	1,949	.....
Oceana County:		
Golden	.....	3,323
Hart	.....	4,145
Newfield	617	.....
Shelby	.....	2,071
Osceola County:		
Evart	1,124	.....
Hersey	1,454	.....
Marion	2,115	.....
Orient	1,542	.....
Osceola	1,823	.....
Saginaw County:		
Birch Run	.....	3,600
Blumfield	.....	4,636
Bridgeport	.....	3,841
Buena Vista	.....	2,430
Do	.....	4,265

[1] This is gravel-macadam construction.
[2] These 2 townships report the cost data jointly.
[3] The cost of engineering on this road was $3,563.
[4] The cost of grading on this road amounted to $2,477.

TABLE 41.—*Cost data, 1909*—Continued.

County and township.	Average cost per mile.		County and township.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
Saginaw County—Contd.	*Dollars.*	*Dollars.*	Tuscola County:	*Dollars.*	*Dollars.*
Carrollton	3,320	.....	Almer	.....	4,638
Chesaning	.....	3,140	Arbela	2,514	.....
Frankenmuth	.....	4,019	Elkland	722	.....
James	.....	3,550	Ellington	1,973	.....
Jonesfield	.....	3,963	Elmwood	1,410	.....
Kochville	.....	5,163	Indian Fields	2,748	.....
Maple Grove	.....	3,199	Millington	2,052	.....
Saginaw	.....	2,630	Van Buren County:		
Do	.....	4,405	Geneva	1,927	.....
Thomastown	.....	4,322	Wayne County:		
St. Clair County:			Ecorse	.....	6,580
Port Huron	.....	6,350	Greenfield	.....	12,128
Do	.....	4,504	Hamtramck	.....	6,681
Do	.....	5,925	Monguagon	.....	6,156
Sanilac County:			Wexford County:		
Lexington	.....	2,350	Henderson	1,667	.....
Shiawassee County:					
Bennington	1,125	.....	Average	1,843	4,346

MINNESOTA.

TABLE 42.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Aitkin	690	.....	10	.....	10	1.44
Anoka	578	2	30	65	97	16.78
Becker	1,220	.....	20	.....	20	1.63
Beltrami	500	.....	.....	.....	.....	.....
Benton	649	5	41	.....	46	7.08
Big Stone	779	.....	.....	.....	.....	.....
Blue Earth	1,341	1	40	.....	41	3.05
Brown	965	.....	112	.....	112	11.60
Carlton	436	1	78	.....	79	18.11
Carver	523	.....	50	.....	50	9.56
Cass	940	.....	.....	.....	.....	.....
Chippewa	1,013	.....	.....	.....	.....	.....
Chisago	750	.....	40	.....	40	5.33
Clay	764	.....	139	.....	139	18.19
Clearwater	607	.....	.....	.....	.....	.....
Cook	250	.....	120	.....	120	48.00
Cottonwood	1,170	.....	50	.....	50	4.27
Crow Wing	490	.....	83	7	90	18.36
Dakota	818	.....	100	60	160	19.55
Dodge	812	.....	210	.....	210	25.86
Douglas	1,036	.....	145	30	175	16.89
Faribault	1,174	.....	49	.....	49	4.17
Fillmore	1,500	.....	.....	.....	.....	.....
Freeborn	1,066	.....	27	.....	27	2.53
Goodhue	1,259	2	67	.....	69	5.48
Grant	824	.....	1.5	.....	1.5	.18
Hennepin	952	37	80.5	.....	117.5	12.34
Houston	670	2	10	.....	12	1.79
Hubbard	600	.....	.....	.5	.5	.08
Isanti	600	.....	.....	.....	.....	.....
Itasca	1,200	.....	25	.....	25	2.04
Jackson	1,228	.....	.....	.....	.....	.....
Kanabec	391	.....	.....	.....	.....	.....
Kandiyohi	1,079	.....	134	80	214	19.83
Kittson	1,250	.....	.....	.....	.....	.....
Koochiching	(2)	.....	.....	.....	.....	.....
Lac qui Parle	1,442	.....	36	.....	36	2.49
Lake	300	.....	20	.....	20	6.66

[1] Pennington County established from part of Red Lake County, November, 1910.
[2] This county failed to make a report concerning its roads.

TABLE 42.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Le Sueur	788	.....	36	.....	36	4.56
Lincoln	902	.....	5	.....	5	.55
Lyon	1,208	.....	50	1	51	4.22
McLeod	816	.....	400	.....	400	49.01
Mahnomen	(1)	.....	.....	.....	.....	.....
Marshall	1,820	.....	.....	94	94	5.16
Martin	1,188	.....	100	.....	100	8.43
Meeker	755	1	15	.....	16	2.11
Mille Lacs	595	2	31	15	48	8.06
Morrison	1,305	.75	.....	460	460.75	35.30
Mower	1,240	.....	2	5	7	.56
Murray	1,200	.....	15	.....	15	1.25
Nicollet	612	.....	105	.....	105	17.15
Nobles	1,400	.....	.....	.....	.....	.....
Norman	1,300	.....	.....	.....	.....	.....
Olmsted	1,012	.....	300	.....	300	29.64
Otter Tail	2,500	.....	138	.....	138	5.52
Pine	664	.....	10	.....	10	1.50
Pipestone	850	.....	11	.....	11	1.29
Polk	3,009	.....	233	.....	233	7.74
Pope	1,253	.....	25	.....	25	1.99
Ramsey	261	39.6	14	.....	53.6	20.53
Red Lake	723	.....	60	.....	60	8.29
Redwood	1,447	.....	104	.....	104	7.18
Renville	1,600	2	20	75	97	6.06
Rice	892	.....	133	1	134	15.02
Rock	930	.....	.....	.....	.....	.....
Roseau	150	.....	41	10	51	34.00
St. Louis	879	.....	[2] 125	.....	125	14.22
Scott	600	.....	20	.....	20	3.33
Sherburne	638	1	5	5	11	1.72
Sibley	920	.....	32.5	7	39.5	4.29
Stearns	1,945	.5	50	.....	50.5	2.59
Steele	724	.....	100	30	130	17.95
Stevens	927	.....	10	.....	10	1.07
Swift	823	.....	30	48	78	9.47
Todd	1,083	.....	20	1	21	1.93
Traverse	910	.....	.....	.....	.....	.....
Wabasha	782	20	10	.....	30	3.83
Wadena	750	.....	.....	1	1	.13
Waseca	687	.....	21	.....	21	3.05
Washington	616	.5	.5	.....	1	.16
Watonwan	762	.....	10	50	60	7.87
Wilkin	665	.....	.....	.....	.....	.....
Winona	977	20	6	6	32	3.27
Wright	1,088	.....	140	.....	140	12.86
Yellow Medicine	1,263	.....	82	.....	82	6.49
Total	79,323	137.35	[2] 4,228	1,051.5	5,416.85	6.83

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	79,324	67.5	6,179	.....	[3] 6,247.5	7.87
1909	79,323	137.35	[2] 4,228	1,051.5	5,416.85	6.83
Gain	.....	69.85	.....	1,051.5	.....	.....

[1] This county failed to make a report concerning its roads.
[2] Includes 20 miles of roads dressed with iron ore.
[3] Includes 1 mile of brick road.

TABLE 43.—*Cost data, 1909.*

County.	Average cost per mile.			
	Earth.	Sand-clay.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Anoka			1,500	4,000
Benton				3,500
Blue Earth			500	2,500
Carver			1,500	
Goodhue			600	1,760
Hennepin			1,000	3,500
Kittson	250			
Lincoln			1,000	
McLeod			1,000	
Morrison		1,200		
Nicollet		600	1,200	
Pine	300			
Ramsey				6,000
St. Louis			600	
Sherburne			800	
Sibley			800	
Steele		500	900	
Todd			1,700	
Wabasha				1,700
Waseca			150	
Winona			(1)	(2)
Average	275	766	946	3,280

[1] $0.15 per square yard.
[2] $0.65 per square yard for country roads and $1.20 per square yard for city roads.

MISSISSIPPI.

TABLE 44.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adams	238		20		20	8.40
Alcorn	500		15		15	3.00
Amite	750					
Attala	670					
Benton	560					
Bolivar	1,500			100	100	6.66
Calhoun	600					
Carroll	651					
Chickasaw	350		3		3	.85
Choctaw	375					
Claiborne	450					
Clarke	558					
Clay	351		5.5		5.5	1.56
Coahoma	390		9		[2] 10	2.56
Copiah	840		5		5	.59
Covington	600					
De Soto	550		6		6	1.09
Forrest	200	2			2	1.00
Franklin	250					
Greene	500					
Grenada	300					
Hancock	350					
Harrison	350				[3] 20	5.71
Hinds	800					
Holmes	615					
Issaquena	300					
Itawamba	600		25		25	4.16
Jackson	250					
Jasper	600					
Jefferson	480					
Jefferson Davis	350					
Jones	650					
Kemper	730					
Lafayette	700	.5	.25		.75	.10
Lamar	371					
Lauderdale	800			3	3	.37

[1] George County established from parts of Greene and Jackson counties March, 1910.
[2] Includes 1 mile of burnt-clay road constructed several years ago at Clarksdale, which proved entirely satisfactory.
[3] Surfaced with 20 miles of shell.

TABLE 44.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Lawrence	500					
Leake	600					
Lee	500		8		8	1.60
Leflore	350					
Lincoln	400					
Lowndes	275					
Madison	500					
Marion	300					
Marshall	669					
Monroe	760		20		20	2.63
Montgomery	350					
Neshoba	500					
Newton	700					
Noxubee	650					
Oktibbeha	450					
Panola	700					
Pearl River	325					
Perry	500					
Pike	570					
Pontotoc	600					
Prentiss	425		10		10	2.35
Quitman	300					
Rankin	600					
Scott	200					
Sharkey	225					
Simpson	350					
Smith	600					
Sunflower	500	50			50	10.00
Tallahatchie	600					
Tate	400					
Tippah	600					
Tishomingo	222					
Tunica	225					
Union	662					
Warren	800		36		36	4.50
Washington	500					
Wayne	450					
Webster	500					
Wilkinson	350					
Winston	467					
Yalobusha	400					
Yazoo	975		3		3	.30
Total	39,619	52.5	165.75	103	[2]342.25	.86

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	38,698		109		[1]149	0.31
1909	39,619	52.5	165.75	103	[2]342.25	86
Gain	921	52.5	56.75	103	193.25	.55

[1] Includes 40 miles of shell roads. [2] Includes 1 mile of burnt-clay road and 20 miles of shell roads.

TABLE 45.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Earth.	Gravel.	Macadam.		Earth.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Adams		1,000		Marion	38		
Alcorn			2,000	Marshall	19		
Clay			8,270	Monroe		650	
Coahoma	275	5,000		Prentiss		2,000	
De Soto		1,200		Winston	16		
Jackson	135						
Lee		2,500		Average	97	2,058	5,135

MISSOURI.

TABLE 46.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Adair	900				
Andrew	725	1		1	0.13
Atchison	900				
Audrain	1,170				
Barry	1,350		33	33	2.44
Barton	1,150		5	5	.43
Bates	1,530				
Benton	1,418		8	8	.56
Bollinger	1,125		4	4	.35
Boone	1,381	1	58	59	4.27
Buchanan	1,050	18		18	1.71
Butler	1,242		2	2	.16
Caldwell	855				
Callaway	1,440		25	25	1.73
Camden	1,240				
Cape Girardeau	1,010	11	175	186	18.41
Carroll	1,215	.5		.5	.04
Carter	873				
Cass	1,323	8		8	.60
Cedar	630				
Charlton	1,211				
Christian	900				
Clark	900				
Clay	720	2.5		2.5	.34
Clinton	900				
Cole	540	40.5	141	181.5	33.61
Cooper	852	2		2	.23
Crawford	[2] 1,283				
Dade	630				
Dallas	625				
Daviess	1,000	2		2	.20
Dekalb	704				
Dent	630		5	5	.79
Douglas	1,350				
Dunklin	900		5	5	.55
Franklin	1,553	50	250	300	19.31
Gasconade	900	29	252	281	31.22
Gentry	743				
Greene	1,148	36.5	60	96.5	8.41
Grundy	743				
Harrison	1,260				
Henry	1,300				
Hickory	697		5	5	.71
Holt	800				
Howard	630				
Howell	808				
Iron	450	20	20	40	8.88
Jackson	1,000	[3] 218		218	21.80
Jasper	900	6	[4] 548	554	61.55
Jefferson	1,000	100	40	140	14.00
Johnson	1,455	1.5		1.5	.10
Knox	756				
Laclede	1,033		5	5	.48
Lafayette	1,034				
Lawrence	1,000	6	52	58	5.80
Lewis	863	20	10	30	3.47
Lincoln	1,061	13	35	48	4.52
Linn	954				
Livingston	900	2		2	.22
McDonald	670				
Macon	1,449	2		2	.13
Madison	854		10	10	1.17
Maries	900				
Marion	740		235	235	31.75
Mercer	742				
Miller	1,037				
Mississippi	700			[5] 1	.14
Moniteau	800	75	75	150	18.75

[1] St. Louis City County has no rural roads; the entire county is included in the city of St. Louis.
[2] This county reports 53 miles of rock and gravel roads, and 103 miles of graded and gravel roads. It is understood that these roads are natural gravel and chert, and should not therefore be classed as improved roads.
[3] It is claimed that these are the best roads in the State.
[4] These roads are surfaced with chats, which is a by-product of the zinc mines.
[5] Includes 1 mile of sand-clay road.

TABLE 46.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Monroe	1,150	.....	170	170	14.73
Montgomery	900	.....	6	6	.65
Morgan	1,025	.....	75	75	7.31
New Madrid	1,100	.....	.....	.....	.....
Newton	775	.....	100	100	12.90
Nodaway	1,500	.....	.....	.....	.....
Oregon	775	.....	.....	.....	.....
Osage	1,040	50	50	100	9.61
Ozark	775	.....	.....	.....	.....
Pemiscot	800	1.75	.....	[1] 2.75	.34
Perry	600	.....	175	175	29.16
Pettis	1,188	42	15.5	57.5	4.84
Phelps	1,162	.....	.....	.....	.....
Pike	1,050	2.5	133	135.5	12.90
Platte	600	.....	.....	.....	.....
Polk	1,075	.....	.....	.....	.....
Pulaski	900	.....	20	20	2.22
Putnam	885	.....	.....	.....	.....
Ralls	825	100	100	200	24.24
Randolph	840	2	.....	2	.23
Ray	975	.....	.....	.....	.....
Reynolds	625	.....	.....	.....	.....
Ripley	1,080	.....	.....	.....	.....
St. Charles	720	20	150	170	23.61
St. Clair	1,220	.....	.....	.....	.....
St. Francois	780	32	6	38	4.87
St. Louis	1,180	319	107	426	36.10
Ste. Genevieve	520	5	100	105	20.19
Saline	1,253	.....	.....	.....	.....
Schuyler	475	.....	.....	.....	.....
Scotland	775	.....	.....	.....	.....
Scott	700	1	5	[2] 6.25	.89
Shannon	840	.....	.....	.....	.....
Shelby	705	.....	20	20	2.83
Stoddard	1,065	.....	10	10	.93
Stone	450	.....	.....	.....	.....
Sullivan	1,122	.....	.....	.....	.....
Taney	540	.....	.....	.....	.....
Texas	990	.....	.....	.....	.....
Vernon	1,462	.....	.....	.....	.....
Warren	700	.....	91	91	13.00
Washington	1,290	.....	85	85	6.59
Wayne	1,232	.....	20	20	1.62
Webster	740	.....	6	6	.81
Worth	346	.....	.....	.....	.....
Wright	630	.....	10	10	1.59
Total	107,923	1,240.75	3,512.5	[3] 4,755.5	4.40

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	108,133	861.50	1,871.5	2,733	2.53
1909	107,923	1,240.75	3,512.5	[3] 4,755.5	4.40
Gain	.....	379.25	1,641	2,022.5	1.87

[1] Includes 1 mile of sand-clay road.
[2] Includes 1,190 feet which were surfaced with sand-clay.
[3] Includes about 2.25 miles of sand-clay roads.

TABLE 47.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Earth.	Gravel.	Macadam.		Earth.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Barry		300		Johnson			2,000
Benton		825		Lawrence	150	350	
Boone		2,000	5,000	Lincoln		1,800	2,250
Buchanan			6,700	Madison		600	
Callaway		1,000		Marion		1,000	
Camden		250		Moniteau		900	
Cape Girardeau		1,000	2,500	Monroe		1,200	
Cass			4,250	Osage			1,000
Cole		1,675	2,600	Pemiscot		3,168	
Cooper			3,250	Perry			1,200
Daviess			3,500	Pettis		1,750	4,500
Franklin			3,000	Pike			2,500
Gasconade		650	1,100	St. Charles		350	[1] 5,600
Greene		1,000	2,000	St. Francois			[2] 5,000
Hickory		500		St. Louis			5,000
Jackson			5,000	Webster		600	
Jasper	400	980					
Jefferson		600	3,200	Average	275	1,023	3,388

[1] Telford macadam roads in St. Charles County cost $5,000 per mile. [2] This is a gravel-macadam road.

MONTANA.

TABLE 48.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Beaverhead	700				
Broadwater	500				
Carbon	1,200				
Cascade	1,250				
Chouteau	1,556				
Custer	1,100				
Dawson	425		10	10	2.35
Deer Lodge	200		14	14	7.00
Fergus	2,000		4.5	4.5	.22
Flathead	1,000				
Gallatin	2,000	0.5		.5	.02
Granite	300				
Jefferson	235				
Lewis and Clark	1,150		20	20	1.73
Lincoln	500				
Madison	2,000		25	25	1.25
Meagher	415				
Missoula	700		10	10	1.42
Park	500				
Powell	600				
Ravalli	276		10	10	3.62
Rosebud	1,000		1	1	.10
Sanders	400				
Silver Bow	125				
Sweet Grass	400				
Teton	617				
Valley	1,500				
Yellowstone	670				
Total	23,319	.5	94.5	95	.41

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	22,419		65	65	0.28
1909	23,319	0.5	94.5	95	.41
Gain	900	.5	29.5	30	.13

[1] Musselshell County established from parts of Fergus, Meagher, and Yellowstone Counties, 1911.

TABLE 49.—*Cost data, 1909.*

County.	Average cost per mile.		
	Earth.	Sand-clay.	Gravel.
	Dollars.	*Dollars.*	*Dollars.*
Beaverhead	[1] 0.21		[1] 0.62
Dawson	300.00		800.00
Fergus			[1] .52
Rosebud		[1] 0.23	
Average	300.00		800.00

[1] Per square yard.

NEBRASKA.

TABLE 50.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adams	[1] 1,152					
Antelope	900					
Banner	[1] 1,400					
Blaine	[2] 20					
Boone	[1] 1,000					
Box Butte	[1] 1,160					
Boyd	730					
Brown	140					
Buffalo	[1] 1,728			1	1	0.05
Burt	775					
Butler	[1] 1,000					
Cass	[1] 1,200					
Cedar	[1] 1,215		0.5	130	130.5	10.74
Chase	500	10			10	2.00
Cherry	311					
Cheyenne	1,000					
Clay	[1] 1,152					
Colfax	[1] 850					
Cuming	[1] 979					
Custer	2,540					
Dakota	712					
Dawes	[1] 1,300					
Dawson	[1] 1,400					
Deuel	348	[3]	[3]	[3]	[3]	[3]
Dixon	[1] 1,000					
Dodge	[1] 1,000			.25	.25	.03
Douglas	575	41			[4] 56.8	9.88
Dundy	612					
Fillmore	[1] 1,152					
Franklin	[1] 950			10	10	1.06
Frontier	[1] 1,075					
Furnas	[1] 1,190					
Gage	[1] 1,528					
Garfield	653			1	1	.15
Gosper	[1] 800					
Grant	1					
Greeley	1,200					
Hall	[1] 1,152					
Hamilton	[1] 1,080					
Harlan	[1] 900					
Hayes	600					
Hitchcock	[1] 867					
Holt	1,198					
Hooker	[2] 30					
Howard	700					
Jefferson	[1] 1,040	[3]	[3]	[3]	[3]	[3]
Johnson	756					
Kearney	[1] 1,075			3	3	.29

[1] These figures include a considerable mileage of section lines which have not yet been opened up for use as roads.
[2] This county is but sparsely settled.
[3] No report was received for this county.

TABLE 50.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-day.	Total.	
Keith	440					
Keyapaha	252					
Kimball	104					
Knox	[1] 1,495					
Lancaster	2,000					
Lincoln	[1] 5,000					
Logan	312					
Loup	100					
McPherson	[2]					
Madison	[1] 900			6	6	0.66
Merrick	[1] 900					
Nance	[1] 600					
Nemaha	870	1.5			1.5	.17
Nuckolls	[1] 1,152					
Otoe	1,200					
Pawnee	792					
Perkins	485					
Phelps	540			4	4	.74
Pierce	[1] 1,152					
Platte	[1] 972					
Polk	400					
Redwillow	[1] 1,000					
Richardson	995					
Rock	260					
Saline	[1] 1,150					
Sarpy	336					
Saunders	[1] 1,680					
Scotts Bluff	400					
Seward	[1] 1,000					
Sheridan	779					
Sherman	707					
Sioux	375					
Stanton	621			4.5	4.5	.72
Thayer	[1] 900					
Thomas	200					
Thurston	590					
Valley	[1] 800					
Washington	615					
Wayne	[1] 934					
Webster	[1] 1,100					
Wheeler	432			20	20	4.62
York	[1] 1,152					
Total [3]	80,338	52.5	.5	179.75	[4] 248.55	.31

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	79,462	17		6	23	0.03
1909	80,338	52.5	0.5	179.75	[4] 248.55	.31
Gain	876	35.5	.5	173.75	225.55	.28

[1] These figures include a considerable mileage of section lines which have not yet been opened up for use as roads.

[2] This county is but sparsely settled.

[3] Garden County established from Deuel County in 1910; Morrill County established from Cheyenne County in 1909 after this investigation was completed.

[4] Includes 1 mile of brick road, 1.5 miles of concrete roads, and 13.3 miles of bituminous-macadam roads.

TABLE 51.—*Cost data, 1909.*

County.	Average cost per mile.		
	Sand-clay.	Macadam.	Bituminous.
	Dollars.	*Dollars.*	*Dollars.*
Boyd	1,000		
Buffalo	1,600		
Douglas			8,448
Madison	200		
Nemaha		6,000	
Average	933	6,000	8,448

NEVADA.

TABLE 52.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Churchill	350				
Douglas	150		3	3	2.00
Elko	2,000				
Esmeralda	1,000				
Eureka	400				
Humboldt	1,300				
Lander	2,000				
Lincoln	2,000				
Lyon	[2] 1,000				
Nye	1,000	1	([3])	1	.10
Ormsby	101		12	12	11.88
Storey	250		20	20	8.00
Washoe	600		10	10	1.66
White Pine	600				
Total	12,751	1	45	46	.36

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	12,585	4	60	64	0.51
1909	12,751	1	45	46	.36
Gain	166				

[1] Clark County established from part of Lincoln County in 1909, after this investigation was completed; Mineral County established from part of Esmeralda County, February, 1911.

[2] Many of the roads in the county pass over soils composed of natural gravel or sand and clay mixtures. Two hundred and fifty miles of natural gravel roads and 450 miles of sand-clay roads were reported for this county.

[3] The soil in all parts of the county is largely gravel. The roads are naturally good.

NEW HAMPSHIRE.

TABLE 53.—*Mileage of public roads, 1909.*

County.	Total mileage of all roads improved.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Belknap	792	[1] 10	[1] 80	90	11.36
Carroll	1,090	42.6	[1] 105	147.6	13.54
Cheshire	1,513	[1] 20	[1] 120	140	9.25
Coos	941	[1] 5	[1] 95	100	10.62
Grafton	2,271	23.25	[1] 125	148.25	6.52
Hillsboro	2,463	31	[1] 260	291	11.81
Merrimack	2,301	19.75	[1] 130	149.75	6.50
Rockingham	1,674	23.6	201.96	225.56	13.47
Strafford	934	21.62	44.7	66.32	7.10
Sullivan	1,137	[1] 5	85	90	7.91
Total	15,116	201.82	1,246.66	1,448.48	9.58

RECAPITULATION.

Year.	Total mileage of all roads improved.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	15,116	118	1,175	1,293	8.55
1909	15,116	201.82	1,246.66	1,448.48	9.58
Gain		83.82	71.66	155.48	1.03

[1] These figures were reported for 1904. It was impossible to secure complete information for 1909.

TABLE 54.—*Cost data, 1909.*

County and township.	Average cost per mile.		County and township.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
Belknap County:	*Dollars.*	*Dollars.*	Merrimack County—Contd.	*Dollars.*	*Dollars.*
Tilton		5,000.00	New London	1,200.00	
Carroll County		4,300.00	Northfield	2,600.00	3,300.00
Cheshire County	3,300.00	6,500.00	Pembroke		5,300.00
Grafton County:			Warner	[1] .75	[1] 1.10
Ashland	[1] .30		Wilmot	1,400.00	
Bethlehem		7,700.00	Rockingham County:		
Bridgewater	1,876.00		Atkinson		4,000.00
Canaan	2,000.00	6,000.00	Brentwood	2,000.00	
Enfield	4,000.00		Chester		5,800.00
Hanover	2,640.00	4,700.00	Danville	2,600.00	
Haverhill	2,500.00	5,000.00	Deerfield	[1] .90	
Holderness	2,500.00	7,000.00	Derry		[2] 5,300.00
Lyme	2,500.00		Exeter		[1] 1.25
Monroe	1,200.00		Hampstead	1,200.00	2,000.00
Warren	1,000.00		Hampton	1,500.00	
Hillsboro County:			Hampton Falls	4,300.00	
Amherst	2,500.00		Kingston	3,000.00	
Deering	2,450.00		Newington	2,500.00	
East Weare		2,400.00	Newmarket	[1] .20	5,000.00
Goffstown	2,250.00	7,000.00	Newton	3,000.00	
Greenville		2,500.00	North Hampton	[1] .38	
Hollis	4,000.00		Northwood	[1] .75	
Hudson	1,000.00	7,000.00	Nottingham	3,800.00	
Mason	800.00		Plaistow	1,500.00	
Merrimack	3,300.00	6,800.00	Salem		5,000.00
Milford		[1] .57	Windham	4,200.00	5,300.00
New Ipswich	900.00	6,800.00	Strafford County:		
Peterboro	1,200.00	5,200.00	Madbury	2,200.00	
Merrimack County:			Middleton	2,400.00	
Boscawen	4,500.00	5,500.00	Milton		4,500.00
Bow	1,000.00	3,200.00	New Durham	4,000.00	
Bradford		2,200.00	Rochester	2,100.00	4,200.00
Chichester	2,600.00		Rollinsford	[1] .90	
Dunbarton	500.00		Somersworth		6,000.00
Epsom	3,000.00				
Hopkinton	2,100.00	5,000.00	Average	2,352.00	5,016.00

[1] Per square yard.

[2] 1¼ miles with paved gutters and curbing cost $22,700.

NEW JERSEY.

TABLE 55.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Bituminous-macadam.	Macadam.	Gravel.	Total.	
Atlantic	688	0.6	5	112	117.6	17.09
Bergen	753	20	350	.....	370	49.13
Burlington	1,334	18	193	48	259	19.42
Camden	515	11.25	104.32	64	179.57	34.86
Cape May	380	9	9	55.33	73.33	19.29
Cumberland	691	.....	.....	6.52	6.52	.94
Essex	697	7	665	.....	672	96.41
Gloucester	629	9.6	33.4	43.24	86.24	13.71
Hudson	363	4	30	.....	34	9.36
Hunterdon	777	6.75	33.5	.....	40.25	5.18
Mercer	453	17.52	142.69	.....	160.21	35.36
Middlesex	788	50	225	30	305	38.70
Monmouth	1,058	.....	65	125	190	17.95
Morris	976	9.52	152.92	.....	162.44	16.64
Ocean	821	.....	.....	68	68	8.28
Passaic	500	7.56	222	.....	229.56	45.91
Salem	697	2.2	7.18	12.88	22.26	3.19
Somerset	612	4.48	95.58	.....	100.06	16.34
Sussex	805	3.25	26.75	.....	30	3.72
Union	567	22	178	7	207	36.50
Warren	738	8.6	55.75	.47	64.82	8.78
Total	14,842	211.33	2,594.09	572.44	3,377.86	22.76

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Bituminous-macadam.	Macadam.	Gravel.	Total.	
1904	14,842	.....	1,901.05	481.47	[1] 2,422.30	16.32
1909	14,842	211.33	2,594.09	572.44	3,377.86	22.76
Gain	.....	211.33	693.04	90.97	955.56	6.44

[1] Includes 39.78 miles of roads surfaced with shells.

TABLE 56.—*Cost data, 1909.*

County.	Road.	Cost per mile.		
		Gravel.	Macadam.	Bituminous-macadam.
		Dollars.	*Dollars.*	*Dollars.*
Atlantic	English Creek	2,241	.....	.....
Bergen	Valley	.....	4,923	.....
Do	Yesler Way, etc	.....	7,113	.....
Camden	Camden and Blackwood Turnpike	.....	.....	12,101
Do	Evesham	.....	[1] 9,320	.....
Cape May	Schellenger's Landing	5,561	.....	.....
Do	Goshen	4,363	.....	.....
Do	Tuckahoe	5,761	.....	.....
Do	Rio Grande	5,849	.....	.....
Hunterdon	Whitehouse and Flemington	.....	[2] 7,326	.....
Mercer	Hopewell and Stoutsburg	.....	7,287	.....
Middlesex	Jamesburg and Helmetta	.....	.....	8,168
Do	Trenton Turnpike	.....	.....	9,803
Do	Spotswood and Helmetta	.....	.....	7,916
Do	Plainsboro and Cranbury	.....	.....	8,779
Do	Cranbury and South River Turnpike	2,403	.....	.....
Monmouth	Allentown and Imlaystown	3,911	.....	.....
Do	Lakewood and Adelphia	3,773	.....	.....
Ocean	Lakewood and Alligator	5,261	.....	.....
Salem	Barnesboro Turnpike	3,939	.....	.....
Do	Penn's Grove and Daneer's Mill	.....	8,807	.....
Do	Alloway and Aldine	4,432	.....	.....
Somerset	Stoutsburg and Blawenburg	.....	9,630	.....
Do	Washington Valley	.....	13,406	.....
Sussex	Frankford and Sandyston	.....	10,071	.....
Union	Edgar	.....	.....	12,817
Warren	Morris Turnpike	.....	9,581	.....
Average		4,317	8,746	9,930

[1] 1,200 feet of second course treated with amiesite. [2] Grades reduced from 14 to 6 per cent.

NEW MEXICO.

TABLE 57.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Bernalillo	140					
Chaves	2,998					
Colfax	430					
Curry	500					
Dona Ana	562					
Eddy	475					
Grant	594					
Guadalupe	1,000					
Lincoln	400					
Luna	432		2	1	3	0.69
McKinley	550					
Mora	500					
Otero	500	25	6	20	51	10.20
Quay	300					
Rio Arriba	530			50	50	9.43
Roosevelt	500					
San Juan	160					
San Miguel	1,000					
Sandoval	500					
Santa Fe	105					
Sierra	494					
Socorro	2,500					
Taos	300					
Torrance	400					
Union	350					
Valencia	700					
Total	16,920	25	8	71	104	.61

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	15,326		2		2	0.01
1909	16,920	25	8	71	104	.61
Gain	1,594	25	6	71	102	.60

NEW YORK.

TABLE 58.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Macadam.		Gravel, by town.	Total.	
		By State and county.	By town.			
Albany	1,098	101.6	34.81	18.4	154.81	14.10
Allegany	1,894		5.2	75.99	81.19	4.29
Broome	1,437	58.62	.09	9.49	68.2	4.75
Cattaraugus	1,983	16.19	1.5	100.63	118.32	5.97
Cayuga	1,485	45.14	15.9	225.8	286.84	19.32
Chautauqua	1,949	1.05		84.52	85.57	4.39
Chemung	869	31.43		3.73	35.16	4.04
Chenango	1,746	50.35	5.7	17.86	73.91	4.23
Clinton	1,377	59.9	1.2	109	170.1	12.35

[1] Kings, New York, Queens, and Richmond Counties have no rural roads; they are included in the city of New York.

TABLE 58.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Macadam.		Gravel, by town.	Total.	
		By State and county.	By town.			
Columbia	1,379	27.81	.85	134.17	162.83	11.80
Cortland	1,037	35.79	6	12.25	54.04	5.21
Delaware	2,358	15.39	11.9	44.1	71.39	3.02
Dutchess	1,617	69.54	36	692.42	797.96	49.34
Erie	1,900	162.17	91.92	179.66	433.75	22.82
Essex	1,306	22.84	6.5	146.13	175.47	13.43
Franklin	1,367	14.92	29.95	80.5	125.37	9.17
Fulton	769	41.27	3	104.4	148.67	19.33
Genesee	920	5.58	106.9	557.6	670.08	72.83
Greene	1,059	15.78	37.66	79.75	133.19	12.57
Hamilton	444	3.44	1.25	264.98	269.67	60.75
Herkimer	1,406	60.9	16.92	58.36	136.18	9.68
Jefferson	2,204	69.52	179.21	220.45	469.18	21.24
Lewis	1,445	.....	62.69	45.03	107.72	7.45
Livingston	1,285	19.79	7.85	81.25	108.89	8.47
Madison	1,423	14.58	80.55	110.83	205.96	14.47
Monroe	1,368	158.45	263.19	440.15	861.79	62.99
Montgomery	849	51.29	4.4	22.8	78.49	9.24
Nassau	1,491	34.54	172.3	106.67	313.51	21.02
Niagara	934	30.6	35.7	67.73	134.03	14.35
Oneida	2,317	93.24	62.76	225.43	381.43	16.46
Onondaga	1,635	55.42	117.61	208.21	381.24	23.31
Ontario	1,312	68.33	59.6	277.28	405.21	30.88
Orange	1,595	151.68	62.93	501.5	716.11	44.89
Orleans	720	29.22	128.25	184	341.47	47.42
Oswego	1,714	28.84	50.5	87.75	167.09	9.74
Otsego	2,153	50.03	3.3	30.25	83.58	3.88
Putnam	509	15.17	2	67.75	84.92	16.68
Rensselaer	1,291	88.54	.75	195.8	285.09	22.08
Rockland	371	20.43	47.27	123.79	191.49	51.61
St. Lawrence	3,099	30.55	224.92	371.27	626.74	20.22
Saratoga	1,521	55.05	2.5	153.98	211.53	13.90
Schenectady	412	33.89	9	47	89.89	21.81
Schoharie	1,259	.....	19.9	10.65	30.55	2.42
Schuyler	762	.....	.....	15.75	15.75	2.06
Seneca	704	11.33	2.5	52	65.83	9.35
Steuben	3,094	5.79	.5	52.3	58.59	1.89
Suffolk	1,953	25.73	21.87	449.67	497.27	25.46
Sullivan	1,816	17.92	17.41	171.2	206.53	11.37
Tioga	1,067	.....	8.5	22.8	31.3	2.93
Tompkins	1,091	30.87	5.3	9.1	45.27	4.14
Ulster	1,848	96.16	37.6	323.35	457.11	24.73
Warren	1,010	38.23	.7	32	70.93	7.02
Washington	1,533	22.29	12.4	208.58	243.27	15.86
Wayne	1,348	.....	67.92	170.14	238.06	17.66
Westchester	908	119.81	121.52	58.22	299.55	32.99
Wyoming	1,069	.....	.....	24.66	24.66	2.30
Yates	769	.....	.75	3.88	4.63	.60
Total	79,279	2,307	2,307.40	8,172.96	12,787.36	16.13

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Macadam.		Gravel, by town.	Total.	
		By State and county.	By town.			
1904	73,798	707	1,477	3,692	5,876	7.96
1909	79,279	2,307	2,307.4	8,172.96	12,787.36	16.13
Gain	5,481	1,600	830.4	4,480.96	6,911.36	8.17

TABLE 59.—*Cost data, 1909.*

County.	Average cost per mile.				
	Macadam.				Gravel.
	Limestone.	Trap-rock.	Fieldstone.	Miscellaneous.	
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Albany	9,278	9,151		[1] 9,232	
Broome	9,643	10,034	9,893		
Cattaraugus	10,793				
Cayuga	8,822			[2] 13,446	
Chautauqua	10,153				
Chemung		10,158			
Chenango	10,567	12,996		[1] 11,338	
				[3] 6,451	
Clinton	6,706			[1] 8,820	
Columbia		11,136		[1] 6,756	6,505
Cortland	7,593	11,847		[1] 8,211	
				[4] 7,067	
Delaware		15,216		[1] 9,478	6,240
				[3] 9,854	
Dutchess		9,814	9,224	[1] 9,469	
Erie	10,347	9,226	10,614	[5] 9,612	
Essex				[1] 9,741	
Franklin				[1] 8,735	
Fulton		11,161	9,905	[6] 8,796	
				[5] 9,364	
Genesee	7,627				
Greene				[6] 11,459	
Herkimer		9,993		[6] 13,096	
				[7] 7,038	
Jefferson	7,570		8,010	[6] 9,263	
				[5] 10,297	
Livingston	11,211				
Madison	8,487			[2] 11,055	
Monroe	9,128	9,240	8,342	[5] 7,322	
				[6] 7,123	
Montgomery	8,625	8,935	9,392	[6] 8,031	
Nassau		10,521			
Niagara	8,577				
Oneida	9,352	8,074		[2] 10,156	
				[7] 12,616	
Onondaga	10,283	10,854		[2] 11,441	
Ontario	8,396		8,110	[3] 8,438	
				[5] 7,736	
Orange	10,346		4,396	[6] 10,206	5,071
				[3] 4,795	
Orleans	6,600		6,429	[5] 6,801	
				[6] 7,123	
Oswego	10,763	11,552		[1] 8,306	7,570
				[2] 12,292	
Otsego	10,410	9,614		[6] 9,849	
Putnam				[6] 11,029	
Rensselaer	9,234	9,456	9,081	[4] 9,298	4,366
				[6] 8,797	
Rockland		9,066		[6] 7,649	
				[6] 24,518	
Saratoga		8,557		[5] 5,711	
				[6] 7,499	
Schenectady	9,698	10,020		[6] 7,845	
Seneca	8,823			[6] 13,270	
Steuben	12,170				
Suffolk		9,479			
Sullivan				[6] 8,992	
Tompkins	10,623			[6] 12,233	
Ulster		10,362		[3] 7,706	
				[6] 9,555	
Warren		10,244		[6] 9,631	
Washington	9,919	8,495		[4] 7,574	
				[6] 9,438	
Westchester		9,735	7,739	[5] 8,971	
				[6] 9,529	
Average	9,370	10,183	8,428		5,950

[1] Local sandstone.
[2] Syenite.
[3] Local bluestone.
[4] Quartz.
[5] Granite.
[6] Local stone.
[7] Gneiss.
[8] Local shale.

NORTH CAROLINA.

TABLE 60.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Alamance	540	55	.....	10	65	12.03
Alexander	500	.....	.....	.....	.....	.....
Alleghany	260	.....	.....	.....	.....	.....
Anson	500	[2] 8	2	.....	10	2.00
Ashe	600	.....	.....	.....	.....	.....
Beaufort	350	.....	.....	.....	.....	.....
Bertie	700	.....	.....	35	35	5.00
Bladen	500	.....	.....	.....	.....	.....
Brunswick	800	.....	.....	11	11	1.37
Buncombe	700	65	.....	1	66	9.42
Burke	500	.....	.....	.....	.....	.....
Cabarrus	332	30	30	.....	60	18.07
Caldwell	600	4	40	.....	44	7.33
Camden	200	.....	.....	.....	.....	.....
Carteret	500	.....	.....	.....	.....	.....
Caswell	400	16	.....	.....	16	4.00
Catawba	400	.....	.....	.....	.....	.....
Chatham	700	.....	5	3	8	1.14
Cherokee	400	10	.....	.....	10	2.50
Chowan	150	.....	.....	.....	.....	.....
Clay	150	.....	.....	.....	.....	.....
Cleveland	650	.....	5	.....	5	.76
Columbus	900	.....	.....	12	12	1.33
Craven	600	1	.....	25	26	4.33
Cumberland	500	.....	.....	40	40	8.00
Currituck	140	.....	.....	.....	.....	.....
Dare	500	.....	.....	.....	.....	.....
Davidson	500	2	.....	.....	2	.40
Davie	350	.....	.....	.....	.....	.....
Duplin	800	.....	.....	.....	.....	.....
Durham	550	102	.....	.....	102	18.54
Edgecombe	650	.....	.....	10	10	1.53
Forsyth	400	46	.....	.....	46	11.50
Franklin	550	.....	[3] 80	.....	80	14.54
Gaston	300	68	.....	.....	68	22.66
Gates	350	.....	.....	.....	.....	.....
Graham	200	.....	.....	.....	.....	.....
Granville	650	3	20	75	98	15.07
Greene	300	.....	.....	.....	.....	.....
Guilford	700	102	14	.....	116	16.57
Halifax	700	.....	10	50	60	8.57
Harnett	700	.....	.....	25	25	3.57
Haywood	300	28	4	.....	32	10.66
Henderson	500	.....	.....	.....	.....	.....
Hertford	400	.....	15	.....	15	3.75
Hyde	225	.....	.....	2.5	2.5	1.11
Iredell	500	26	.....	.....	26	5.20
Jackson	340	.....	.....	.....	.....	.....
Johnston	800	.....	44	10	54	6.75
Jones	400	.....	.....	.....	.....	.....
Lee	300	.....	.....	.....	.....	.....
Lenoir	500	.....	.....	.....	.....	.....
Lincoln	450	.....	.....	.....	.....	.....
McDowell	350	26	.....	.....	26	7.42
Macon	750	.....	.....	.....	.....	.....
Madison	300	.....	.....	.....	.....	.....
Martin	400	.....	.....	.....	.....	.....
Mecklenburg	850	233	.....	.....	233	27.41
Mitchell	400	.....	.....	.....	.....	.....
Montgomery	500	.....	.....	.....	.....	.....
Moore	700	.....	.....	25	25	3.57
Nash	600	4	5	25	34	5.66
New Hanover	200	50	.....	.....	50	25.00
Northampton	600	.....	20	.....	20	3.33
Onslow	588	.....	.....	.....	.....	.....
Orange	300	10	10	.....	20	6.66
Pamlico	280	.....	.....	.....	.....	.....
Pasquotank	250	.....	.....	.....	.....	.....
Pender	1,000	.....	.....	.....	.....	.....
Perquimans	325	.....	.....	.....	.....	.....
Person	400	.....	.....	.....	.....	.....

[1] Avery County established from parts of Caldwell, Mitchell, and Watauga Counties, February, 1911; Hoke County established from parts of Cumberland and Robeson Counties, April, 1911.

[2] Poor.

[3] Report for 1904 evidently includes natural gravel roads instead of those which have been surfaced with gravel.

TABLE 60.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Pitt	700			2	2	.28
Polk	200	3.5			3.5	1.75
Randolph	500	4			4	.80
Richmond	300		6	115	121	40.33
Robeson	1,000			50	50	5.00
Rockingham	700	9			9	1.28
Rowan	300	63		26	89	29.66
Rutherford	550					
Sampson	700			50	50	7.14
Scotland	340			55	55	16.17
Stanly	500					
Stokes	500					
Surry	500					
Swain	450					
Transylvania	350					
Tyrrell	300					
Union	600		40		40	6.66
Vance	200		5	40	45	22.50
Wake	1,560	40	140		180	11.53
Warren	400		40		40	10.00
Washington	300			2	2	.66
Watauga	325		10		10	3.07
Wayne	600			30	30	5.00
Wilkes	800					
Wilson	530	30			30	5.66
Yadkin	500					
Yancey	300					
Total	48,285	1,038.5	545	729.5	2,313	4.79

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	49,763	399	422	438	1,259	2.53
1909	48,285	1,038.5	545	729.5	2,313	4.79
Gain		639.5	123	291.5	1,054	2.26

TABLE 61.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Sand-clay.	Gravel.	Macadam.		Sand-clay.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Alamance			4,500	Iredell			3,000
Anson		1,500		Johnston		1,200	
Bertie	500			McDowell			3,000
Buncombe			4,000	Mecklenburg			4,000
Caldwell		1,000		Nash	375		
Cherokee			3,000	New Hanover			3,600
Columbus	450			Orange			5,000
Craven	1,000			Richmond	500	500	
Cumberland	300			Robeson	375		
Duplin	450			Rockingham			3,750
Durham			[1]	Rowan	350		3,200
Edgecombe	500			Scotland	325		
Forsyth			6,000	Wake		400	5,000
Franklin		650		Warren		300	
Gaston			4,750	Wilson			4,000
Guilford		2,500	3,500				
Harnett	1,200			Average	506	1,006	4,020
Hyde	250						

[1] If built by convict labor, these roads cost $5,000; if built by contract, they cost $6,000.

NORTH DAKOTA.

TABLE 62.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Adams	365				
Barnes	3,050		10	10	0.32
Benson	1,000		5	5	.50
Billings	1,000		8	8	.80
Bottineau	3,400		5	5	.14
Bowman	(2)				
Burleigh	525		2	2	.38
Cass	3,450				
Cavalier	3,000		3	3	.10
Dickey	1,064		2	2	.18
Dunn	(2)				
Eddy	350		2	2	.57
Emmons	463				
Foster	1,296		2	2	.15
Grand Forks	2,000		10	10	.50
Griggs	1,100		5	5	.45
Hettinger	(2)				
Kidder	28				
Lamoure	2,340		3	3	.12
Logan	895				
McHenry	1,500		5	5	.33
McIntosh	1,000		3	3	.30
McKenzie	(2)				
McLean	2,916		5	5	.17
Mercer	160				
Morton	1,500		10	10	.66
Mountrail	800				
Nelson	1,750		5	5	.28
Oliver	149				
Pembina	2,600				
Pierce	1,440				
Ramsey	1,637		12	12	.73
Ransom	864				
Richland	2,183				
Rolette	1,500		5	5	.33
Sargent	810				
Sheridan	100				
Stark	202		5	5	2.47
Steele	1,440		3	3	.20
Stutsman	2,400				
Towner	2,088		5	5	.23
Traill	1,593		5	5	.31
Walsh	2,600		5	5	.19
Ward	2,160		10	10	.46
Wells	2,520		5	5	.19
Williams	350				
Total	61,593		140	140	.23

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	59,332	7	205	212	0.36
1909	61,593		140	140	.23
Gain	2,261				

[1] Burke County established from part of Ward County, August, 1910; Divide County established from part of Williams County, December, 1910; and Renville County established from part of Ward County, August, 1910.

[2] This county was recently organized and is but sparsely settled.

OHIO.

TABLE 63.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Brick.	Stone.	Gravel.	Total.	
Adams	1,000		309		309	30.90
Allen	914	1	519		520	56.90
Ashland	1,013		17	1	18	1.77
Ashtabula	1,261	2	34		36	2.85
Athens	1,172	3	107	18	128	10.92
Auglaize	850		15	369	384	45.18
Belmont	1,320	4	121		125	9.47
Brown	978		306		306	31.30
Butler	933	1	82	788	871	93.35
Carroll	1,005					
Champaign	802			462	462	57.60
Clark	862		69	793	862	100.00
Clermont	1,086		435		435	40.05
Clinton	835		52	627	679	81.32
Columbiana	1,338	10	1	7	18	1.35
Coshocton	1,268	3	5	66	74	5.80
Crawford	868		273	17	290	33.40
Cuyahoga	924	135	12	6	153	16.56
Darke	1,257		16	744	760	60.46
Defiance	935		30	429	459	49.10
Delaware	893		332	141	473	52.96
Erie	505		258	24	282	55.84
Fairfield	1,060		44	163	207	19.53
Fayette	688			298	298	43.30
Franklin	1,060	1	264	240	505	47.64
Fulton	921		53	337	390	42.34
Gallia	1,056			159	159	15.05
Geauga	805		6	7	13	1.60
Greene	813		40	632	672	82.66
Guernsey	1,280		30		30	2.34
Hamilton	936		324		324	34.61
Hancock	1,220		378	5	383	31.40
Hardin	939		230	201	431	45.90
Harrison	940		52		52	5.53
Henry	971		225	162	387	39.85
Highland	1,138		327	70	397	34.95
Hocking	910		20	22	42	4.62
Holmes	1,023	1	5	25	31	3.03
Huron	943		105	20	125	13.25
Jackson	864		162		162	18.75
Jefferson	888	5	147		152	17.11
Knox	1,408		2		2	.15
Lake	458	1	4	258	263	57.42
Lawrence	951		152	27	179	18.82
Licking	1,417		54	258	312	22.02
Logan	888		13	472	485	54.60
Lorain	1,007		100	17	117	11.60
Lucas	769	1	120		121	15.73
Madison	612			546	546	89.20
Mahoning	917	12	50		62	6.76
Marion	843		195	120	315	37.37
Medina	858	4	61	45	110	12.82
Meigs	1,000	5	2	6	13	1.30
Mercer	1,085		102	396	498	45.90
Miami	910		4	675	679	74.60
Monroe	1,264					
Montgomery	1,064		60	938	998	93.80
Morgan	1,072		68		68	6.34
Morrow	898		60		60	6.68
Muskingum	1,482	4	36	57	97	6.54
Noble	943	1	23		24	2.54
Ottawa	614		55		55	8.96
Paulding	1,013		336	19	355	35.04
Perry	975		53	4	57	5.84
Pickaway	794			196	196	24.70
Pike	640			124	124	19.40
Portage	1,000		9	5	14	1.40
Preble	931		44	585	629	67.56
Putnam	1,180		389	81	470	39.83
Richland	1,344		81		81	6.03
Ross	1,092			387	387	35.44
Sandusky	980		348	30	378	38.57
Scioto	628		154	57	211	33.60
Seneca	1,260		131	8	139	11.03
Shelby	921			420	420	45.60
Stark	1,375	2	5	5	12	.87

TABLE 63.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Brick.	Stone.	Gravel.	Total.	
Summit	1,050	23	7	.....	30	2.86
Trumbull	1,171	1	117	.....	118	10.08
Tuscarawas	1,617	4	6	.....	10	.62
Union	920	.....	63	642	705	76.63
Van Wert	1,013	.....	657	9	666	65.74
Vinton	879	.....	.....	.....	.....	.....
Warren	824	.....	.....	659	659	80.00
Washington	1,521	4	.....	20	24	1.58
Wayne	1,396	3	2	1	6	.43
Williams	953	.....	29	180	209	21.93
Wood	1,494	.....	525	.....	525	35.14
Wyandot	956	.....	165	108	273	28.55
Total	88,861	231	9,687	14,188	24,106	27.13

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Brick.	Stone.	Gravel.	Total.	
1904	69,439	93.25	7,160.5	16,159	[1] 23,460	33.79
1909	88,861	231	9,687	14,188	24,106	27.13
Gain	19,422	137.75	2,526.5	.....	646	.....

[1] Includes 13.25 miles of bituminous-macadam roads, 31 miles of gravel-macadam roads, and 3 miles of asphalt roads.

TABLE 64.—*Cost data, 1909.*

County and township.	Average cost per mile.			
	Gravel.	Macadam.	Bituminous.	Brick.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Allen	[1] 0.65	[1] 1.20	.....	.....
Ashland	.....	4,250.00	.....	.....
Ashtabula	.....	6,000.00	8,000.00	.....
Athens	2,500.00	3,500.00	.....	12,000.00
Belmont	.....	8,000.00	.....	12,000.00
Brown	.....	3,500.00	.....	.....
Champaign	1,800.00	.....	.....	.....
Clermont	.....	3,500.00	.....	.....
Clinton	3,400.00	4,000.00	.....	.....
Crawford	.....	2,650.00	.....	.....
Cuyahoga	.....	2,342.00	.....	.....
Darke	4,000.00	5,500.00	.....	.....
Gallia	2,500.00	4,000.00	.....	.....
Geauga	.....	6,200.00	.....	.....
Greene	1,900.00	3,850.00	.....	.....
Guernsey	.....	7,500.00	.....	.....
Hamilton	.....	[2] 8,000.00	.....	.....
Hancock	.....	3,000.00	.....	.....
Hardin	1,200.00	4,000.00	.....	.....
Harrison	.....	7,000.00	.....	.....
Hocking	.....	5,000.00	.....	.....
Holmes	.....	[1] .90	.....	.....
Huron	2,000.00	5,000.00	.....	.....
Jackson	.....	3,000.00	.....	.....
Knox	.....	7,000.00	.....	.....
Lake	.....	6,080.00	.....	.....
Lawrence	3,000.00	3,000.00	.....	.....
Licking	.....	5,000.00	.....	.....

[1] Per cubic yard.

[2] This is a bituminous-macadam road.

TABLE 64.—*Cost data, 1909*—Continued.

County and township.	Average cost per mile.			
	Gravel.	Macadam.	Bituminous.	Brick.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*
Logan	2,000.00	4,000.00		
Lorain		7,500.00		
Mahoning		9,000.00		14,500.00
Medina		4,500.00		
Meigs	2,000.00			
Montgomery	700.00	5,000.00		
Morgan		7,000.00		
Muskingum				10,786.00
Noble				12,500.00
Ottawa		5,000.00		
Paulding		3,000.00		
Portage		8,000.00	5,000.00	
Putnam		[1] 1.45		
Richland		3,200.00		
Seneca	750.00	2,533.00		
Seneca, townships:				
Adams	500.00	3,000.00		
Big Spring		2,500.00		
Bloom		2,000.00		
Clinton		2,800.00		
Eden		3,600.00		
Hopewell		3,050.00		
Loudon		3,000.00		
Reed		2,550.00		
Scipio		2,600.00		
Seneca		4,000.00		
Thompson		[2] .75		
Venice		2,250.00		
Summit		7,600.00	10,300.00	
Tuscarawas		[2] .80		[2] .90
Van Wert		2,200.00		
Wayne	1,800.00	7,000.00		12,500.00
Williams	500.00	4,500.00		
Wood		6,000.00		
Wyandot		4,500.00		
Average	1,909.00	4,580.00	7,766.00	12,381.00

[1] Per cubic yard. [2] Per square yard.

OKLAHOMA.

TABLE 65.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adair	500					
Alfalfa	800					
Atoka	900					
Beaver	900					
Beckham	900			6	6	0.66
Blaine	900	0.5		15	15.5	1.72
Bryan	925			30	30	3.24
Caddo	1,400					
Canadian	900			3	3	.33
Carter	800					
Cherokee	750					
Choctaw	400					
Cimarron	1,850					
Cleveland	566					
Coal	650					
Comanche	1,500	2	2		4	.26
Craig	750					
Creek	950					
Custer	1,718					

[1] Swanson County, after not quite a year's existence, was declared illegally formed by the State supreme court and was abolished in 1910. Its mileage is given here separate from other counties because it was in existence at the time of this investigation.

TABLE 46.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved lands.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Delaware	800					
Dewey	1,106					
Ellis	1,200					
Garfield	1,860					
Garvin	500					
Grady	800					
Grant	980			10	10	1.02
Greer	640			5	5	.78
Harmon	550					
Harper	1,000					
Haskell	600					
Hughes	850					
Jackson	775			25	25	3.22
Jefferson	750					
Johnston	650					
Kay	925					
Kingfisher	900					
Kiowa	764					
Latimer	735					
Le Flore	1,500					
Lincoln	1,000		33.5	6	39.5	3.95
Logan	725					
Love	500					
McClain	500			2	2	.40
McCurtain	1,500					
McIntosh	650					
Major	925			10	10	1.08
Marshall	415					
Mayes	675					
Murray	425					
Muskogee	800			25	25	3.12
Noble	864					
Nowata	600					
Okfuskee	625					
Oklahoma	800					
Okmulgee	675					
Osage	2,200					
Ottawa	505		4		4	.79
Pawnee	600					
Payne	675					
Pittsburg	1,300	21	102		123	9.46
Pontotoc	1,000					
Pottawatomie	800					
Pushmataha	1,425			50	50	3.59
Roger Mills	1,296					
Rogers	725					
Seminole	630					
Sequoyah	700					
Stephens	900					
Swanson	650					
Texas	2,000			4	4	.20
Tillman	725					
Tulsa	975			5	5	.51
Wagoner	1,080					
Washington	500					
Washita	2,016					
Woods	1,500					
Woodward	1,500					
Total	71,325	23.5	141.5	196	361	.5

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	43,554					
1909	71,325	23.5	141.5	196	361	0.5
Gain	27,771	23.5	141.5	196	361	.5

TABLE 66.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Sand-clay.	Macadam.		Sand-clay.	Macadam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Beckham	400		Lincoln		3,000
Blaine	800	4,500	Texas	600	
Bryan	72				
Grant	75		Average	389	3,750

OREGON.

TABLE 67.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Baker	1,000		5		5	0.50
Benton	745					
Clackamas	2,000	50	150		[1] 280	14.00
Clatsop	250	45	30		75	30.00
Columbia	425		150	5	150	35.29
Coos	442		30		[2] 85	19.23
Crook	750		10		10	1.33
Curry	150		16		16	10.66
Douglas	2,000	2	75		77	3.85
Gilliam	500					
Grant	500		1		1	.20
Harney	1,675		40	75	115	6.86
Hood River	500		15	18	33	6.60
Jackson	800	7	75	75	157	19.62
Josephine	300		10	2	12	4.00
Klamath	900	4	10		14	1.55
Lake	500		10	70	80	16.00
Lane	2,800	9	500		509	18.17
Lincoln	400					
Linn	1,500	10	200	100	310	20.66
Malheur	500					
Marion	1,500	50	30		80	5.33
Morrow	560					
Multnomah	450	115	115		230	51.11
Polk	1,000	14	110		124	12.40
Sherman	500					
Tillamook	300	3	120		123	41.00
Umatilla	1,215	1			1	.08
Union	653	1.25	18		19.25	2.94
Wallowa	1,800		15		15	.80
Wasco	1,000		10		[3] 12	1.20
Washington	750	40	20		60	8.00
Wheeler	300		6		6	2.00
Yamhill	750	100	100		200	26.66
Total	29,475	451.25	1,871	345	[4] 2,799.25	9.49

[1] Includes 80 miles of plank roads.
[2] Includes 50 miles of plank roads.
[3] Includes 2 miles of bituminous-macadam roads.
[4] Includes 130 miles of plank roads and 2 miles of bituminous-macadam roads.

TABLE 67.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	34,258	209	2,235	.....	[1] 2,589	7.56
1909	29,475	451.25	1,871	345	[2] 2,799.25	9.49
Gain	.....	242.25	.....	345	210.25	1.93

[1] Includes 145 miles of plank roads.
[2] Includes 130 miles of plank roads and 2 miles of bituminous-macadam roads.

TABLE 68.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Clackamas	600	2,000	Polk	2,640	3,520
Douglas	2,400	.....	Union	.....	3,000
Lane	.....	3,000	Washington	1,500	3,000
Linn	3,500	4,920			
Multnomah	1,000	5,000	Average	1,940	3,491

PENNSYLVANIA.

TABLE 69.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		State-aid roads.		Roads improved without State-aid.		Total.	
		Macadam.	Brick.	Macadam.	Gravel.		
Adams	1,065.96	7.3	.....	17.7	.....	25	2.34
Allegheny	1,673.31	10.5	.....	[2] 413.5	.....	[2] 424	25.33
Armstrong	1,723.14	12.1	2.2	.....	2	16.3	.94
Beaver	1,109.21	10	.....	.....	.....	10	.90
Bedford	1,725.05	23.83	.24	.....	.....	24.07	1.39
Berks	2,424.11	30.54	.....	190	340.1	560.64	23.13
Blair	735.86	8.79	.....	111.21	30	150	20.38
Bradford	2,461.93	23.83	.24	.....	.....	24.07	.97
Bucks	1,817.07	30.54	.....	57.3	.....	87.84	4.83
Butler	1,831.43	13.83	.81	.....	.....	14.64	.79
Cambria	1,153.95	8.54	1.67	.....	.....	10.21	.88
Cameron	150.33	1.6	.....	.....	.....	1.6	1.06
Carbon	512.36	5.17	.46	14.37	.....	20	3.90
Center	1,058.28	9.3	.....	.....	.....	9.3	.87
Chester	2,536.11	33.31	.....	136.78	.....	170.09	6.70
Clarion	1,295.35	6.73	.....	.....	.....	6.73	.51
Clearfield	1,699.89	8.54	3.74	.....	.....	12.28	.72
Clinton	574.85	7.45	.....	.....	.....	7.45	1.30
Columbia	1,271.11	6.67	.....	2	.....	8.67	.68
Crawford	2,139.95	14.45	2.11	.....	.....	16.56	.77
Cumberland	1,225.58	12.22	.....	3.78	.....	16	1.30
Dauphin	993.25	7.75	.16	6.6	.....	14.51	1.46
Delaware	513.85	7.8	.....	212.35	.....	220.15	42.84
Elk	542.89	5.5	.....	2	.....	7.5	1.38
Erie	1,671.28	17.35	1.45	.....	.....	18.8	1.12
Fayette	1,674.54	15.05	.....	3	.....	18.05	1.07
Forest	374.45	2.75	.28	.....	.....	3.03	.80
Franklin	1,233.66	12.58	.....	45.67	.....	58.25	4.72
Fulton	714.45	.....	.....	.....	.....	.....	.....

[1] Philadelphia County has no rural roads; the entire county is included in the city of Philadelphia.
[2] Includes 8.5 miles which have been resurfaced with asphalt and bituminous-macadam and 100 miles treated with asphaltic oil; also includes 22 miles of brick roads.

TABLE 69.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		State-aid roads.		Roads improved without State-aid.		Total.	
		Macadam.	Brick.	Macadam.	Gravel.		
Greene	1,498.77	8.91	0.88	6.21		16	1.06
Huntingdon	1,322.24	19.28				19.28	1.45
Indiana	1,929.68	18.10	.49	9.41		28	1.45
Jefferson	1,219.96	5.64	4.17			9.81	.80
Juniata	759.39						
Lackawanna	749.01	4.4				4.4	.58
Lancaster	2,820.67	31.71		184.74		216.45	7.67
Lawrence	865.13	9.35				9.35	1.08
Lebanon	830.77	8.2		99.8		108	12.99
Lehigh	1,200.74	12.15		30.85	15	58	4.83
Luzerne	2,330.00	17.59		8.7	9	35.29	1.51
Lycoming	1,670.98	15.09	.5			15.59	.93
McKean	750.89	8.27		2.73		11	1.46
Mercer	1,626.87	16.87		8		24.87	1.52
Mifflin	506.46	6.66				6.66	1.31
Monroe	962.22	20.53				20.53	2.13
Montgomery	1,754.03	24.93		387.02		411.95	23.48
Montour	357.79	1.71	.22			1.93	.53
Northampton	1,073.47	10.5		21.25		31.75	2.95
Northumberland	1,178.32	11.29	.88			12.17	1.03
Perry	989.67	1.55				1.55	.15
Pike	551.74			4.75		4.75	.86
Potter	1,135.24	10.85	.23	3.92		15	1.32
Schuylkill	1,568.69	10.42				10.42	.66
Snyder	787.85	2.02		3.98	40	46	5.83
Somerset	2,157.94	9.78	1.15	3.82		14.75	.68
Sullivan	552.37	3.15				3.15	.57
Susquehanna	1,993.12			4.4		4.4	.22
Tioga	1,809.42	18.89	.92	3.19		23	1.26
Union	493.75	4.24	.54			4.78	.96
Venango	1,165.55	6.69	3.94			10.63	.91
Warren	1,069.05	12.37	1.03			13.4	1.25
Washington	2,187.42	.23		134		[1] 143.23	6.54
Wayne	1,437.71	13.36		8.64		22	1.53
Westmoreland	2,761.99	28.55	.84			29.39	1.06
Wyoming	742.65	1.54				1.54	.20
York	2,672.04	12.8		7.2		20	.74
Total	87,386.79	741.64	29.15	[2] 2,148.87	436.1	[3] 3,364.76	3.84

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.					Approximate percentage of roads improved.
		State-aid roads.		Roads improved without State aid.		Total.	
		Macadam.	Brick.	Macadam.	Gravel.		
1904	99,777	9.25		2,151.53		2,160.78	2.17
1909	87,386.79	741.64	29.15	[2] 2,148.87	436.1	[3] 3,364.76	3.84
Gain		732.39	29.15		436.1	1,203.98	1.67

[1] Includes 9 miles of brick roads constructed without State-aid.
[2] Includes 8.5 miles which have been resurfaced with asphalt and bituminous-macadam and 100 miles treated with asphaltic oil; also includes 22 miles of brick roads.
[3] Includes 8.5 miles of roads resurfaced with asphalt and bituminous-macadam, 100 miles treated with asphaltic oil, and 31 miles of brick roads.

TABLE 70.—*Cost data, 1909.*

County and township.	Average cost per mile.		County and township.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Adams		11,000.00	Delaware, townships and boroughs—Continued.		
Allegheny		14,000.00	Springfield		6,000.00
Armstrong		12,000.00	Swarthmore		[1] .90
Berks, townships:			Elk		11,500.00
Bern		10,600.00	Franklin		7,000.00
Brecknock	2,240.00		Fulton		8,000.00
Caernarvon	800.00	2,000.00	Greene		10,000.00
District	400.00		Huntingdon		16,000.00
Hereford	2,200.00		Indiana		10,266.00
Muhlenberg	3,000.00		Juniata, township:		
Spring	716.00	4,840.00	Fermanagh	800.00	
Bradford		9,600.00	Lawrence		10,500.00
Butler		12,000.00	Lebanon		5,000.00
Cambria		11,000.00	Luzerne	2,440.00	16,042.00
Chester		9,000.00	McKean		10,000.00
Clarion		13,290.00	Mercer		9,000.00
Columbia		10,560.00	Mifflin		1,425.00
Cumberland		6,000.00	Monroe		9,000.00
Delaware, townships and boroughs:			Perry		16,000.00
Birmingham		4,000.00	Potter		8,000.00
Clifton Heights		[1] .95	Susquehanna		10,306.00
Collingdale		[1] .72	Tioga		8,000.00
Edgemont		3,700.00	Venango		9,800.00
Glenolden		[1] .60	Warren		10,000.00
Morton		[1] .72	Wayne		9,000.00
Nether Providence		8,500.00			
Newtown		6,500.00	Average	1,575.00	9,164.00
Sharon Hill		[1] .80			

[1] Per square yard.

RHODE ISLAND.

TABLE 71.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Bituminous-macadam.	Stone.	Gravel.	Total.	
Bristol	98.25	3.7	29.4	12.5	[1] 51.6	52.51
Kent	395		56.8	12.5	69.3	17.54
Newport	214.5	1.9	63	11	75.9	35.38
Providence	835.5	8.7	155.1	368	511.8	61.25
Washington	577.5	7.67	124.8	201	333.47	57.74
Total	2,120.75	21.97	409.1	605	[1] 1,042.07	49.14

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Bituminous-macadam.	Stone.	Gravel.	Total.	
1904	2,361		247	774.5	1,021.5	43.27
1909	2,120.75	21.97	409.1	605	[1] 1,042.07	49.14
Gain		21.97	162.1		20.57	5.87

[1] Includes 6 miles of road classed as sand-clay.

SOUTH CAROLINA.

TABLE 72.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Abbeville	1,000	20	45	236	301	30.10
Aiken	1,500			250	250	16.66
Anderson	100		5	5	10	10.00
Bamberg	400			125	125	31.24
Barnwell	900			185	185	20.55
Beaufort	900				[2] 15	1.66
Berkeley	1,500			10	10	.66
Calhoun	300			100	100	33.33
Charleston	670		9		[3] 14	2.08
Cherokee	400	3			3	.75
Chester	600	16	4		20	3.33
Chesterfield	700			10	10	1.42
Clarendon	800					
Colleton	1,200					
Darlington	750			350	350	46.66
Dorchester	600			200	200	33.33
Edgefield	700					
Fairfield	850					
Florence	675	2		30	32	4.74
Georgetown	800			45	[4] 57	7.12
Greenville	800	6	1		7	.87
Greenwood	500	10	10	18	38	7.60
Hampton	1,100			250	250	22.72
Horry	1,100			4	4	.36
Kershaw	800		4	119	123	15.37
Lancaster	600	6	6	23	35	5.83
Laurens	700	29	30	30	89	12.71
Lee	480			31	31	6.45
Lexington	1,200			90	90	7.50
Marion	1,200					
Marlboro	500		2	60	62	12.40
Newberry	600	10	10	1	21	3.50
Oconee	800					
Orangeburg	1,500			375	375	25.00
Pickens	600	1			1	.16
Richland	700	2.5		448	450.5	64.35
Saluda	500			10	10	2.00
Spartanburg	800	14			14	1.75
Sumter	900			75	75	8.33
Union	550	8.5			8.5	1.54
Williamsburg	100			30	30	30.00
York	700	25.75	5	108	138.75	19.82
Total	32,075	153.75	131	3,218	[5] 3,534.75	11.02

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	41,830	69	179	1,575	[6] 1,878	4.49
1909	32,075	153.75	131	3,218	[5] 3,534.75	11.02
Gain		84.75		1,643	1,656.75	6.54

[1] Dillon County established from part of Marion County, 1910.
[2] Shell.
[3] Includes 5 miles of shell roads.
[4] Includes 12 miles of shell roads.
[5] Includes 32 miles of shell roads.
[6] Includes 55 miles of shell roads.

TABLE 73.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Sand-clay.	Gravel.	Mac-adam.		Sand-clay.	Gravel.	Mac-adam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Aiken	300			Kershaw	500	600	
Anderson				Lancaster	310		2,460
Barnwell	400			Lexington	400		
Charleston		1,800		Marlboro	400		
Cherokee			2,500	Newberry	480		
Chester	1,000	1,000	2,500	Orangeburg	325		
Darlington	275			Richland	400		
Dorchester	300			Spartanburg			1,800
Florence	250			Sumter	400		
Georgetown	400			Union			7,000
Greenwood	275						
Hampton	600			Average	415	1,133	3,252
Horry	450						

SOUTH DAKOTA.

TABLE 74.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
Armstrong	1,400				
Aurora	700				
Beadle	1,300				
Bonhomme	500				
Boreman	1,000				
Brookings	792				
Brown	1,723				
Brule	800		5	5	0.62
Buffalo	494	5		5	1.01
Butte	1,000				
Campbell	1,000				
Charles Mix	1,100				
Clark	900				
Clay	500	25		25	5.00
Codington	800	5		5	.62
Custer	400				
Davison	432		18	18	4.16
Day	1,500				
Deuel	600				
Dewey	2,000		6	6	.30
Douglas	500				
Edmunds	1,408	24		24	1.70
Fall River	350				
Faulk	1,008				
Grant	700				
Gregory	1,000				
Hamlin	500				
Hand	1,500				
Hanson	500	4		4	.80
Hughes	1,000				
Hutchinson	900				
Hyde	900				
Jerauld	500				
Kingsbury	850				
Lake	566				
Lawrence	500				
Lincoln	66	1		1	1.51
Lyman	3,000				
McCook	575				
McPherson	224				
Marshall	900				

[1] Boreman County has, since this investigation was completed, been absorbed in Corson County; Corson County established from part of the Standing Rock Indian Reservation in 1909; Harding County established from part of Butte County in 1909; Mellette County established from part of the Rosebud Indian Reservation in 1909, and Todd County established from part of the Rosebud Indian Reservation in 1909, all after this investigation was completed; Meyer County has, since 1909, been divided up between Todd and Mellette counties; Zeibach County established from Schuasse and Sterling Counties and part of Armstrong County, February, 1911.

TABLE 74.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
Meade	1,500	15	50	[1] 75	5.00
Meyer	1,500				
Miner	700				
Minnehaha	1,000				
Moody	600				
Pennington	800				
Perkins	900				
Potter	900				
Roberts	1,162	18		18	1.54
Sanborn	800	50		50	6.25
Shannon	1,000				
Spink	1,500				
Stanley	2,600				
Sterling	250				
Sully	1,000		50	50	5.00
Tripp	1,400				
Turner	700				
Union	495				
Walworth	700				
Washabaugh	400				
Washington	([2])				
Yankton	654				
Total	56,354	147	129	[1] 286	.50

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Gravel.	Sand-clay.	Total.	
1904	59,295	147		[3] 151	0.25
1909	56,354	147	129	[1] 286	.50
Gain			129	135	.25

[1] Includes 10 miles of macadam. [2] No report received from this county.
[3] Includes 4 miles of roads surfaced with stone.

TENNESSEE.

TABLE 75.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Anderson	350	70	4	74	21.14
Bedford	475	125		125	26.31
Benton	430		15	15	3.48
Bledsoe	300		10	10	3.33
Blount	550	13		13	2.36
Bradley	325	5	175	180	55.38
Campbell	560	43	12	55	9.82
Cannon	325		7	7	2.15
Carroll	625				
Carter	350				
Cheatham	300		14	14	4.66
Chester	260				
Claiborne	450	5		5	1.11
Clay	350		5	5	1.42
Cocke	400	80		80	20.00
Coffee	375				
Crockett	365				
Cumberland	550				
Davidson	600	182	60	242	40.33
Decatur	350		43.5	43.5	12.42
Dekalb	350	50	25	75	21.41

TABLE 75.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Dickson	500	.....	4	4	.80
Dyer	480	10	10	20	4.16
Fayette	600	.....	.....	.....	.....
Fentress	450	.....	.....	.....	.....
Franklin	600	2	.....	2	.33
Gibson	600	.....	.....	.....	.....
Giles	600	50	125	175	29.16
Grainger	300	5	.....	5	1.66
Greene	600	1	.....	1	.16
Grundy	300	.....	.....	.....	.....
Hamblen	300	96	.....	96	32.00
Hamilton	600	125	20	145	24.16
Hancock	210	.....	.....	.....	.....
Hardeman	750	.....	3	3	.40
Hardin	700	.....	20	20	2.85
Hawkins	700	26	.....	26	3.71
Haywood	555	.....	7	7	1.26
Henderson	400	.....	.....	.....	.....
Henry	400	3.5	.....	3.5	.87
Hickman	707	.....	.....	.....	.....
Houston	215	.....	5	5	2.32
Humphreys	555	.....	.....	.....	.....
Jackson	325	.....	.....	.....	.....
James	166	.....	30	30	18.07
Jefferson	300	103	.....	103	34.33
Johnson	200	.....	.....	.....	.....
Knox	1,026	248	1	249	24.26
Lake	114	.....	.....	.....	.....
Lauderdale	450	4.5	4.5	9	2.00
Lawrence	750	30	10	40	5.33
Lewis	250	.....	20	20	8.00
Lincoln	795	13	140	153	19.24
Loudon	200	.....	.....	.....	.....
McMinn	450	.....	30.5	30.5	6.77
McNairy	570	.....	.....	.....	.....
Macon	250	.....	.....	.....	.....
Madison	500	65	.....	[1] 192	38.40
Marion	500	22	18	40	8.00
Marshall	250	125	20	145	58.00
Maury	836	215	111	326	38.99
Meigs	225	.....	3	3	1.33
Monroe	500	10	.....	10	2.00
Montgomery	700	32	94	126	18.00
Moore	200	.....	10	10	5.00
Morgan	300	.....	.....	.....	.....
Obion	700	.....	.....	.....	.....
Overton	500	.....	.....	.....	.....
Perry	400	.....	.....	.....	.....
Pickett	250	.....	.....	.....	.....
Polk	500	.....	.....	.....	.....
Putnam	400	78	.....	78	19.50
Rhea	342	5	11	16	4.67
Roane	550	45	8	53	9.63
Robertson	500	.....	.....	.....	.....
Rutherford	1,000	275	175	450	45.00
Scott	500	9	.....	9	1.80
Sequatchie	250	.....	12	12	4.80
Sevier	575	25	6	31	5.39
Shelby	2,500	.....	600	600	24.00
Smith	400	.....	190	190	47.50
Stewart	350	1	25	26	7.42
Sullivan	550	75	.....	75	13.63
Sumner	840	100	250	350	41.66
Tipton	300	.....	.....	.....	.....
Trousdale	160	.....	20	20	12.50
Unicoi	89	.....	.....	.....	.....
Union	235	35	.....	35	14.89
Van Buren	250	.....	.....	.....	.....
Warren	533	.....	72	72	13.50
Washington	300	2	1	3	1.00
Wayne	700	.....	16	16	2.28
Weakley	550	.....	.....	.....	.....
White	370	100	20	120	32.43
Williamson	700	35	80	115	16.42
Wilson	1,000	140	.....	140	14.00
Total	45,913	2,684	2,542.5	[1] 5,353.5	11.66

[1] Includes 127 miles of sand-clay roads.

TABLE 75.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	48,989	1,774	2,511	4,285	8.75
1909	45,913	2,684	2,542.5	[1] 5,353.5	11.65
Gain		910	31.5	1,068.5	2.91

[1] Includes 127 miles of sand-clay roads.

TABLE 76.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Sand-clay.	Gravel.	Macadam.		Sand-clay.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Anderson			4,000.00	Marshall			1,000.00
Bradley		1,000.00	2,500.00	Montgomery		1,200.00	3,000.00
Campbell		2,500.00	3,500.00	Overton			1,500.00
Claiborne			4,000.00	Rhea		800.00	
Cocke			3,000.00	Roane			[2] .30
Decatur		1,000.00		Scott			4,000.00
Greene	1,250.00			Sequatchie		1,500.00	
Hamblen			3,000.00	Sevier			2,000.00
Hamilton			2,000.00	Shelby		1,350.00	
Hardin		[1] 1.00		Sullivan			4,000.00
Hawkins			1,500.00	Sumner	400.00		700.00
Henry		1,855.00		Trousdale		2,000.00	
Jefferson		1,600.00	3,100.00	Union			1,800.00
Knox			4,500.00	Warren		2,000.00	2,000.00
Lake		5,000.00		Wayne		750.00	
Lincoln		400.00		Williamson			800.00
Madison	1,500.00		5,100.00				
Marion		2,500.00	3,000.00	Average	1,050.00	1,697.00	2,727.00

[1] This road was built in Shiloh National Park at the rate of $1 per square yard.
[2] Per square yard.

TEXAS.

TABLE 77.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Anderson	750			20	20	2.66
Andrews	[2] 160					
Angelina	350					
Aransas	44				[3] 10	22.72
Archer	475					
Armstrong	175			15	15	8.57
Atascosa	335			60	60	17.91
Austin	1,068			5	5	.46
Bailey	[2] 165					
Bandera	700					
Bastrop	500			25	25	5.00
Baylor	165			.25	.25	.15
Bee	500			5	5	1.00
Bell	2,000					

[1] Brooks County established from parts of Hidalgo, Starr, and Zapata Counties, 1911; Culberson County established from part of El Paso County, 1911; and Jim Wells County established from part of Nueces County, 1911.
[2] Sparsely settled. No report.
[3] Shell.

TABLE 77.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Bexar	1,500		180	20	200	13.33
Blanco	265					
Borden	107					
Bosque	600		15		15	2.50
Bowie	1,000		40		40	4.00
Brazoria	600					
Brazos	750			5	5	.66
Brewster	450					
Briscoe	250					
Brown	700		30		30	4.28
Burleson	600			10	10	1.66
Burnet	900					
Caldwell	500		11	3	14	2.80
Calhoun	95					
Callahan	525			40	40	7.61
Cameron	700					
Camp	300					
Carson	150					
Cass	1,200					
Castro	180					
Chambers	165				[1] 5	3.03
Cherokee	1,125			70	70	6.22
Childress	225					
Clay	1,500		5		5	.33
Cochran	150					
Coke	180					
Coleman	600					
Collin	1,350		2.5		2.5	.17
Collingsworth	200					
Colorado	948					
Comal	375	20	50	30	100	26.66
Comanche	700			105	105	15.00
Concho	200					
Cooke	700		10		10	1.42
Coryell	1,200					
Cottle	325					
Crane	100					
Crockett	250					
Crosby	70					
Dallam	50			1	1	2.00
Dallas	2,500	11	207		218	8.72
Dawson	100					
De Witt	1,000		35	60	95	9.50
Deaf Smith	150			20	20	13.33
Delta	375					
Denton	640		10	5	15	2.34
Dickens	130					
Dimmit	130			20	20	15.38
Donley	300		20		20	6.66
Duval	740					
Eastland	1,260			50	50	3.96
Ector	60					
Edwards	425					
El Paso	310	2		56.5	58.5	18.87
Ellis	2,500		130.5		130.5	5.22
Erath	1,200	1	60		61	5.08
Falls	1,500		50		50	3.33
Fannin	1,500					
Fayette	1,500		50	50	100	6.66
Fisher	318					
Floyd	460					
Foard	400					
Fort Bend	400			3	[2] 23	5.75
Franklin	500					
Freestone	900					
Frio	250			25	25	10.00
Gaines	160			1	1	.62
Galveston	163				[1] 11	6.74
Garza	80					
Gillespie	300			17	17	5.66
Glasscock	78					
Goliad	500			3	3	.60
Gonzales	1,000		30	15	45	4.50
Gray	200					
Grayson	1,600	.25			.25	.01
Gregg	300					
Grimes	800					
Guadalupe	700	3	150	70	223	31.85
Hale	250			5	5	2.00

[1] Shell.

[2] Includes 20 miles of shell roads.

TABLE 77.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Hall	300					
Hamilton	500		30		30	6.00
Hansford	50					
Hardeman	325					
Hardin	700			10	10	1.42
Harris	2,500		180		[1] 265	10.60
Harrison	1,060	3		160	163	16.30
Hartley	40					
Haskell	750					
Hays	600		40		40	6.66
Hemphill	125			7	7	5.60
Henderson	525					
Hidalgo	600					
Hill	1,000		6	2	8	.80
Hockley	60					
Hood	575					
Hopkins	900					
Houston	850			10	10	1.17
Howard	290			10	10	3.44
Hunt	1,600					
Hutchinson	[2]					
Irion	140					
Jack	325	5		100	105	32.30
Jackson	450			120	120	26.66
Jasper	1,000					
Jeff Davis	150					
Jefferson	562	85			85	15.12
Johnson	750		25	10	35	4.66
Jones	800			10	10	1.25
Karnes	800			3	3	.37
Kaufman	1,200			2	2	.16
Kendall	300					
Kent	240					
Kerr	400		7	10	17	4.25
Kimble	200					
King	150					
Kinney	162					
Knox	200					
La Salle	300					
Lamar	1,500			4	4	.26
Lamb	60					
Lampasas	600			25	25	4.16
Lavaca	1,300		.5		.5	.03
Lee	500					
Leon	960					
Liberty	500			150	150	30.00
Limestone	800			4	4	.50
Lipscomb	110					
Live Oak	350					
Llano	488					
Loving	[3]					
Lubbock	180					
Lynn	190					
McCulloch	300					
McLennan	1,200		85		85	7.08
McMullen	105					
Madison	300					
Marion	235					
Martin	40					
Mason	400			100	100	25.00
Matagorda	900					
Maverick	300					
Medina	400			5	5	1.25
Menard	150					
Midland	100					
Milam	1,450		10	25	35	2.41
Mills	450					
Mitchell	250					
Montague	900					
Montgomery	750			300	300	40.00
Moore	60					
Morris	300					
Motley	135					
Nacogdoches	1,000			12	12	1.20
Navarro	1,600					
Newton	300					
Nolan	150					

[1] Includes 60 miles of shell roads and 25 miles of crushed-rock roads with shell screening.
[2] Reports received indicate that there are no public roads in this county.
[3] Sparsely settled. No report.

TABLE 77.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Nueces	900				[1] 20	2.22
Ochiltree	95					
Oldham	200					
Orange	375	15			15	4.00
Palo Pinto	350					
Panola	700					
Parker	875					
Parmer	168					
Pecos	262			15	15	5.72
Polk	600					
Potter	120		1		1	.83
Presidio	327			25	25	7.64
Rains	150					
Randall	80					
Reagan	165					
Red River	1,254					
Reeves	47					
Refugio	110					
Roberts	60					
Robertson	500					
Rockwall	250					
Runnels	350					
Rusk	600					
Sabine	300					
San Augustine	500					
San Jacinto	300					
San Patricio	136					
San Saba	500					
Schleicher	175					
Scurry	500			10	10	2.00
Shackelford	500		.5		.5	.10
Shelby	600					
Sherman	163					
Smith	1,200			20	20	1.66
Somervell	250		5		5	2.00
Starr	350			75	75	21.42
Stephens	300			1	1	.33
Sterling	136					
Stonewall	180			12	12	6.66
Sutton	200					
Swisher	90					
Tarrant	1,200		300	30	330	27.50
Taylor	800		4	6	10	1.25
Terrell	155					
Terry	240			5	5	2.08
Throckmorton	175					
Titus	300			10	10	3.33
Tom Green	400					
Travis	1,500	125	50		175	11.66
Trinity	250					
Tyler	500			25	25	5.00
Upshur	850		3		3	.35
Upton	100					
Uvalde	350					
Val Verde	500		75		75	15.00
Van Zandt	1,021					
Victoria	500		17		17	3.40
Walker	400		1	10	11	2.75
Waller	200					
Ward	125					
Washington	256					
Webb	231		25	100	125	54.11
Wharton	500			1	1	.20
Wheeler	175					
Wichita	300		3		3	1.00
Wilbarger	600		4		4	.66
Williamson	2,000	55	8		63	3.15
Wilson	1,000					
Winkler	125					
Wise	1,700	40	10		50	2.94
Wood	600			8	8	1.33
Yoakum	240					
Young	800		150	6	156	19.50
Zapata	257					
Zavalla	120			1	1	8.33
Total	128,971	365.25	2,126	2,253.75	[2] 4,896	3.80

[1] Shell.
[2] Includes 126 miles of shell roads and 25 miles of crushed-rock roads with shell screening.

TABLE 77.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	121,409	167	1,909		[1] 2,128	1.75
1909	128,971	365.25	2,126	2,253.75	[2] 4,896	3.89
Gain	7,562	198.25	217	2,253.75	2,768	2.65

[1] Includes 52 miles of shell roads.
[2] Includes 126 miles of shell roads and 25 miles of crushed-rock roads with shell screenings.

TABLE 78.—*Cost data, 1909.*

County.	Average cost per mile.				
	Earth.	Sand-clay.	Shell.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Anderson		1,500			
Aransas		450			
Archer		100			
Atascosa		800			
Austin		500			
Bastrop		600			
Bexar		2,000		3,400	
Bosque				700	
Bowie				4,000	
Brown				1,750	
Burleson		400			
Caldwell		1,200		2,000	
Callahan		450			
Carson		100			
Chambers		200			
Cherokee		100			
Collin				1,500	
Comal		1,500		2,500	3,000
Comanche		300			
Cooke				1,000	
Dallam		240			
Dallas		600		2,500	3,500
Eastland		1,500			
El Paso		250			
Ellis				2,500	
Erath				350	1,000
Falls				2,000	
Fayette		1,200		3,000	
Frio		750			
Gaines		500			
Galveston	200		2,750		
Gillespie		800			
Gonzales		950			
Guadalupe		800		1,800	
Harrison		160			
Hays				2,000	
Howard		250			
Jack		100			1,000
Jefferson			5,000		
Jones		200			
Kerr		200		600	
Lamar		900			
Lampasas		400			
McLennan				1,600	
Matagorda			1,500		
Milam				2,000	
Nacogdoches		750			
Potter	80			1,500	
San Patricio	100				
Scurry		100			
Smith		800			
Stephens		250			
Tarrant		900		1,750	
Taylor		400		350	

TABLE 78.—*Cost data, 1909*—Continued.

County.	Average cost per mile.				
	Earth.	Sand-clay.	Shell.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*
Terry		60			
Tyler		100			
Uvalde				800	
Val Verde				100	
Victoria	400			2,500	
Ward	60				
Wilbarger				1,000	
Williamson				2,000	2,300
Wise				900	
Wood		1,000			
Average	168	593	3,083	1,708	2,169

UTAH.

TABLE 79.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Beaver	122			20	20	16.39
Boxelder	500					
Cache	400		35		35	8.75
Carbon	500			125	125	25.00
Davis	250	4	50	20	74	29.60
Emery	100			41	41	25.62
Garfield	100					
Grand	200			11	11	4.23
Iron	200		3		3	1.15
Juab	97			7	7	7.21
Kane	200					
Millard	500			4.5	4.5	.90
Morgan	70		3		3	4.28
Piute	350			50	50	14.28
Rich	150		10	25	35	23.33
Salt Lake	350	33	125	50	[1] 208.5	59.57
San Juan	250			18	18	7.20
Sanpete	215					
Sevier	500		40	170	210	42.00
Summit	200			5	5	2.50
Tooele	1,000		4		4	.40
Uinta	559			13	13	2.32
Utah	400	5	40		45	11.25
Wasatch	200		2	20	22	11.00
Washington	200					
Wayne	200					
Weber	267		20	64	84	31.46
Total	8,320	42	332	643.5	[1] 1,018	12.23

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	7,090	11	597		608	8.57
1909	8,320	42	332	643.5	[1] 1,018	12.23
Gain	1,230	31		643.5	410	3.66

[1] Includes 0.5 mile of bituminous-macadam road.

TABLE 80.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Sand-clay.	Gravel.	Mac-adam.		Sand-clay.	Gravel.	Mac-adam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Beaver		[1] 0.45		San Juan	500.00		
Carbon	[2] 0.20			Sevier	200.00	500.00	
Emery	160.00			Uinta		1,500.00	5,000.00
Grand	200.00			Weber	3,000.00	5,000.00	
Juab	250.00						
Salt Lake		1,750.00	5,000.00	Average	718.00	2,188.00	5,000.00

[1] Per square yard. [2] Per cubic yard.

VERMONT.

TABLE 81.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
Addison	1,112	107.02	202.70	309.72	27.85
Bennington	750	16	228.35	244.35	32.58
Caledonia	1,146	16.93	60.02	76.95	6.71
Chittenden	811	34.96	213.72	248.68	30.66
Essex	425	6.84	16.43	23.27	5.47
Franklin	1,017	37.77	38.53	76.30	7.50
Grand Isle	170	16.68	79.63	96.31	56.65
Lamoille	676	13.41	72.44	85.85	12.85
Orange	1,405	35.26	114.78	150.04	10.67
Orleans	1,114	19.05	139.88	158.93	14.26
Rutland	1,303	73.85	421.66	495.51	38.02
Washington	1,192	39.72	243.98	283.70	23.80
Windham	1,424	21.54	124.51	146.05	10.25
Windsor	1,861	27.62	227.35	254.97	13.70
Total	14,406	466.65	2,183.98	2,650.63	18.40

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.			Approximate percentage of roads improved.
		Stone.	Gravel.	Total.	
1904	14,521	281	1,672.5	1,953.5	13.45
1909	14,406	466.65	2,183.98	2,650.63	18.40
Gain		185.65	511.48	697.13	4.95

VIRGINIA.

TABLE 82.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Accomac	550	5.25			5.25	0.95
Albemarle	700	5	2.5	0.75	8.25	1.17
Alexandria	100	10	21		31	31.00
Alleghany	300		[1] 15		15	5.00
Amelia	375					
Amherst	500	22			22	4.40
Appomattox	300			3	3	1.00
Augusta	1,200	60.5			60.5	5.04
Bath	300	7			7	2.33
Bedford	800	6.5			6.5	.81
Bland	225					
Botetourt	525					
Brunswick	450		5		5	1.11
Buchanan	305					
Buckingham	600					
Campbell	518	11			11	2.12
Caroline	750		15		15	2.00
Carroll	500					
Charles City	200		2	20	22	11.00
Charlotte	600	5			5	.83
Chesterfield	500		100		100	20.00
Clarke	150	40			40	26.66
Craig	200					
Culpeper	450	13.5			13.5	3.00
Cumberland	300		.25		.25	.08
Dickenson	200	10			10	5.00
Dinwiddie	500		120		120	24.00
Elizabeth City	75	4			[2] 34	45.33
Essex	200			2	2	1.00
Fairfax	600	45			45	7.50
Fauquier	500	10.5			10.5	2.10
Floyd	500	10			10	2.00
Fluvanna	250					
Franklin	700					
Frederick	610	78			78	12.78
Giles	400					
Gloucester	200					
Goochland	300	2		25	27	9.00
Grayson	500					
Greene	100					
Greenesville	245		103		103	42.04
Halifax	1,000			[3] 35	35	3.50
Hanover	600	6			6	1.00
Henrico	450	5	203		211	46.88
Henry	586					
Highland	250	5	10		15	6.00
Isle of Wight	500			6	6	1.20
James City	150	4	4	4	12	8.00
King and Queen	400					
King George	350					
King William	275					
Lancaster	175			8	8	4.57
Lee	450	5			5	1.11
Loudoun	750	12	6		18	2.40
Louisa	500			14	14	2.80
Lunenburg	500					
Madison	450					
Mathews	100					
Mecklenburg	690	55			55	7.97
Middlesex	200					
Montgomery	400	27			27	6.75
Nansemond	500			20	20	4.00
Nelson	450					
New Kent	275					
Norfolk	425	30			[2] 60	14.11
Northampton	150					
Northumberland	265					
Nottoway	365	2		18	20	5.47
Orange	480	29			29	6.04

[1] Constructed with slag from blast furnaces.
[2] Includes 30 miles of shell roads.
[3] These roads are built of gray soil, which makes an excellent material. It is said to be superior even to crushed stone. The road-building quality of this material was discovered only within the last few years.

TABLE 82.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Page	300	16			16	5.33
Patrick	500					
Pittsylvania	1,250	9.25			9.25	.74
Powhatan	250		1		1	.40
Prince Edward	300	19			19	6.33
Prince George	350					
Prince William	400					
Princess Anne	200				[1] 25	12.50
Pulaski	400	20			20	5.00
Rappahannock	250	40			40	16.00
Richmond	150					
Roanoke	350	37			37	10.57
Rockbridge	650	25			25	3.84
Rockingham	1,225	72			72	5.87
Russell	600	40			40	6.66
Scott	750					
Shenandoah	550	43			43	7.81
Smyth	350	30			30	8.57
Southampton	700			12	12	1.71
Spotsylvania	400					
Stafford	350	1.5		1.5	3	.85
Surry	350			4	4	1.14
Sussex	600			4	4	.66
Tazewell	600	21.5			21.5	3.58
Warren	300	8			8	2.66
Warwick	60				[1] 6	10.00
Washington	800	40			40	5.00
Westmoreland	250			8.25	8.25	3.30
Wise	300	10			[2] 14	4.66
Wythe	700	54			54	7.71
York	200					
Total	43,399	1,011.5	610.75	185.5	[3] 1,902.75	4.38

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	51,812	755	720		[4] 1,600	3.09
1909	43,399	1,011.5	610.75	185.5	[3] 1,902.75	4.38
Gain		256.5		185.5	302.75	1.29

[1] Shell.
[2] This county reports 4 miles of bituminous-macadam roads.
[3] Includes 91 miles of shell roads and 4 miles of bituminous-macadam roads.
[4] Includes 25 miles of slag roads and 100 miles of shell roads.

TABLE 83.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Sand-clay.	Gravel.	Mac-adam.		Sand-clay.	Gravel.	Mac-adam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Accomac			6,000	James City			6,000
Albemarle			5,000	Lee			4,500
Alexandria		5,000	6,000	Montgomery			6,000
Amherst			4,500	Nansemond	500		
Augusta			4,000	Norfolk			6,000
Campbell			4,000	Nottoway	600		4,900
Charles City	500			Orange			4,000
Charlotte			3,000	Pittsylvania			7,000
Chesterfield		800		Prince Edward			4,400
Culpeper			4,900	Roanoke			4,000
Dickenson			6,000	Russell			6,000
Dinwiddie		1,500		Smyth			3,000
Elizabeth City			7,000	Surry	800		
Essex	700			Sussex		900	
Fauquier			4,000	Tazewell			4,500
Frederick			1,750	Washington			4,500
Greenesville		1,000		Westmoreland	400		
Halifax				Wise			5,400
Henrico		4,000	6,500				
Isle of Wight	750			Average	607	2,200	4,920

WASHINGTON.

TABLE 84.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adams	1,650					
Asotin	350					
Benton	585.6	4.75			4.75	0.81
Chehalis	300		273		273	91.00
Chelan	328		1.33		1.33	.40
Clallam	400		67	23	90	22.50
Clarke	500	5	207		[2]213	42.60
Columbia	400		1.5		1.5	.37
Cowlitz	700	5	4	20	29	4.14
Douglas	1,800		106	228	334	18.55
Ferry	267					
Franklin	500					
Garfield	350					
Grant	1,700		4		4	.23
Island	300		56.64	1.25	57.89	19.29
Jefferson	800					
King	1,200	12.63	600	.50	613.13	51.09
Kitsap	250					
Kittitas	700	.25			.25	.03
Klickitat	1,000					
Lewis	740	6	97.5		103.5	13.98
Lincoln	3,000					
Mason	300		160	20	180	60.00
Okanogan	500					
Pacific	460	1.5	54	2.7	58.2	12.65
Pierce	638	10	420.25	[3]	[4]445.15	69.77
San Juan	165	.25	84		84.25	51.06
Skagit	1,019	4	158	214	376	36.89
Skamania	115	2	2		4	3.47
Snohomish	1,500		417	409	826	55.06
Spokane	3,000	16.5	50	1	[5]69.5	2.31
Stevens	1,500					
Thurston	300		155		155	51.66
Wahkiakum	104	15	18		33	31.73
Walla Walla	1,200	5.13			5.13	.42
Whatcom	662	1.5	222	304	527.5	79.68
Whitman	3,500	8.65			8.65	.24
Yakima	1,500	2.25	20.7		22.95	1.53
Total	34,283.6	100.41	3,178.92	1,223.45	[6]4,520.68	13.19

[1] Pend Oreille County established from part of Stevens County, 1911.
[2] Includes 1 mile of bituminous-macadam road.
[3] This county reports 440.4 miles of sand-clay roads. This is evidently an error, as there are only 638 miles of public roads reported for the county.
[4] Includes 14.9 miles of bituminous-macadam roads.
[5] Includes 2 miles of bituminous-macadam roads.
[6] Includes 17.9 miles of bituminous-macadam roads.

TABLE 84.—*Mileage of public roads*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	31,998	48.5	1,928	.....	1,976.5	6.17
1909	34,283.6	100.41	3,178.92	1,223.45	[1] 4,520.68	13.19
Gain	2,285.6	51.91	1,250.92	1,223.45	2,544.18	7.01

[1] Includes 17.9 miles of bituminous-macadam roads.

TABLE 85.—*Cost data, 1909.*

County.	Average cost per mile.		County.	Average cost per mile.	
	Gravel.	Macadam.		Gravel.	Macadam.
	Dollars.	*Dollars.*		*Dollars.*	*Dollars.*
Benton	.....	4,500.00	Snohomish	3,900.00	.....
Chehalis	2,000.00	.....	Thurston	1,600.00	.....
Douglas	[1] 1.30	.....	Walla Walla	.....	[2] 1.00
King	.....	[2] .85	Whatcom	4,000.00	.....
Lewis	2,000.00	10,000.00	Whitman	.....	8,300.00
Pacific	1,500.00	.....			
San Juan	[2] .30	.....	Average	2,600.00	7,600.00
Skagit	3,200.00	.....			

[1] Per cubic yard. [2] Per square yard.

WEST VIRGINIA.

TABLE 86.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of roads dragged.[1]	Mileage of roads improved.			Approximate percentage of roads improved.
			Stone.	Gravel.	Total.[2]	
Barbour	[3] 636	.....	.....	.....	.....	.....
Berkeley	456	4	65	.....	65	14.25
Boone	[3] 281	.....	.....	.....	.....	.....
Braxton	[3] 780	4	.....	.....	.....	.....
Brooke	[3] 180	.....	16	.....	16	8.88
Cabell	[3] 300	.....	1	1.5	2.5	.83
Calhoun	[3] 500	.....	.....	.....	.....	.....
Clay	[3] 375	.....	.....	.....	.....	.....
Doddridge	[3] 600	3	.....	.....	.....	.....
Fayette	[3] 933	2	2.5	.....	2.5	.26
Gilmer	[3] 575	.....	.25	.....	.25	.04
Grant	311	4	.....	.....	.....	.....
Greenbrier	827	10	.....	.....	.....	.....
Hampshire	[3] 950	2	.....	.....	.....	.....
Hancock	[3] 184	8	.....	.....	.....	.....
Hardy	[3] 500	9	.....	.....	.....	.....
Harrison	760	50	10	.....	10	1.31
Jackson	[3] 1,200	10	.....	.....	.....	.....
Jefferson	315	.....	168	.....	168	53.33
Kanawha	815	10	2	.....	2	.24
Lewis	[3] 650	10	.....	.....	.....	.....
Lincoln	[3] 665	1	.....	.....	.....	.....
Logan	[3] 200	1	.....	.....	.....	.....
McDowell	[3] 300	6	7	.....	7	2.33
Marion	766	17	2.5	.....	2.5	.32
Marshall	678	4	68	5	73	10.76
Mason	[3] 900	.....	.....	.....	.....	.....
Mercer	[3] 375	3	2.4	.....	2.4	.64
Mineral	[3] 300	1	.....	.....	.....	.....
Mingo	[3] 350	.....	.....	.....	.....	.....

[1] With split-log drag.
[2] Not including dragged roads.
[3] Estimated by the State commissioner of public roads.

TABLE 86.—*Mileage of public roads, 1909*—Continued.

County.	Total mileage of all public roads.	Mileage of roads dragged.	Mileage of roads improved.			Approximate percentage of roads improved.
			Stone.	Gravel.	Total.[1]	
Monongalia	[2] 800	13	25	15	40	5.00
Monroe	[2] 700	10				
Morgan	300	1				
Nicholas	[2] 516					
Ohio	200		150		[3] 155	77.50
Pendleton	[2] 417					
Pleasants	[2] 286					
Pocahontas	[2] 500		4		4	.80
Preston	[2] 1,200	4				
Putnam	[2] 525	4				
Raleigh	[2] 600					
Randolph	1,000	2				
Ritchie	[2] 783	3				
Roane	[2] 700	6				
Summers	485					
Taylor	363	14	3		3	.82
Tucker	[2] 915	6				
Tyler	[2] 510	18	6.25		6.25	1.22
Upshur	800	5				
Wayne	[2] 800	6				
Webster	[2] 338					
Wetzel	[2] 656	17	11	6	[4] 26	3.90
Wirt	[2] 413	11				
Wood	[2] 1,140	28		6	6	.52
Wyoming	[2] 500					
Total	32,109	307	543.9	33.5	[5] 591.4	1.84

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of roads dragged.	Mileage of roads improved.			Approximate percentage of roads improved.
			Stone.	Gravel.	Total.[1]	
1904	26,178		217	26.5	[6] 254.5	0.97
1909	32,109	307	543.9	33.5	[5] 591.4	1.84
Gain	5,931	307	326.9	7.0	336.9	.87

[1] Not including dragged roads.
[2] Estimated by the State commissioner of public roads.
[3] Includes 5 miles of sand-clay roads.
[4] Includes 9 miles of sand-clay roads.
[5] Includes 14 miles of sand-clay roads.
[6] Includes 11 miles of brick roads.

TABLE 87.—*Cost data, 1909.*

County.	Average cost per mile.			County.	Average cost per mile.		
	Earth.	Macadam.	Brick.		Earth.	Macadam.	Brick.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Brooke		8,000	15,000	Marion		5,000	
Cabell		8,100		Mercer		10,000	
Fayette		2,400		Mineral	875		
Greenbrier	750			Ohio		3,000	14,000
Harrison	600	2,750		Tyler		4,000	
Kanawha		8,000		Wood		3,500	
Lewis		4,800					
McDowell		[1]		Average	742	5,414	14,500

[1] Macadam roads built with paid labor cost $4,000 per mile, with convict labor, $1,300 per mile.

WISCONSIN.

TABLE 88.—*Mileage of public roads, 1909.*

County.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
Adams	860			6	6	0.69
Ashland	420	5	16	1	22	5.23
Barron	1,300		6	7	13	1.00
Bayfield	530		30	20	50	9.43
Brown	900	38	270	5	313	34.77
Buffalo	900	5	17	12	34	3.77
Burnett	760		21	7	28	3.68
Calumet	600	13	410		423	70.50
Chippewa	1,140		23	9	32	2.80
Clark	1,300	2	28	5	35	2.69
Columbia	1,200	12	130	42	184	15.33
Crawford	790	1	11	4	16	2.02
Dane	1,920	47	260	12	319	16.61
Dodge	1,630	10	415	24	449	27.54
Door	900	39	155	5	199	22.11
Douglas	380	6		8	14	3.68
Dunn	1,300	.33	10	36	46.33	3.56
Eau Claire	760	16	62	18	96	12.63
Florence	280	13	11	2	26	9.28
Fond du Lac	1,200	22	430	6	458	38.16
Forest	150		11	12	23	15.33
Grant	1,670	68	35	12	115	6.88
Green	960	23	22	18	63	6.56
Green Lake	450	2	65	7	74	16.44
Iowa	960		52	9	61	6.35
Iron	120	4	6	3	13	10.83
Jackson	1,010	3	32	55	90	8.91
Jefferson	940	9	235	33	[1] 278	29.57
Juneau	1,020		20	11	31	3.03
Kenosha	420	2	116		118	28.08
Kewaunee	560	6	216	7	229	40.89
La Crosse	570	55	22	32	109	19.12
Lafayette	1,010		54	7	61	6.03
Langlade	540		11	14	25	4.62
Lincoln	530	8	23	22	53	10.00
Manitowoc	1,190	11	350	16	377	31.68
Marathon	1,710	6	32	48	86	5.02
Marinette	590	1	70	16	87	14.74
Marquette	530		16	6	22	4.15
Milwaukee	470	21	208	3	232	49.36
Monroe	1,450	12	21	28	61	4.20
Oconto	850		155	12	167	19.64
Oneida	540					
Outagamie	980	6	230	23	259	26.42
Ozaukee	540	5	310	10	325	60.18
Pepin	370		11	6	17	4.59
Pierce	1,130	20	103	20	143	12.65
Polk	1,270		20	15	35	2.75
Portage	1,120	27	31	28	86	7.67
Price	550		25	16	41	7.45
Racine	580	13	225	6	244	42.06
Richland	830	3	38	20	61	7.34
Rock	1,160	32	280	10	322	27.75
Rusk	350		5	17	22	6.28
St. Croix	1,180	1	75	34	110	9.32
Sauk	1,300	33	6	26	65	4.77
Sawyer	310			6	6	1.93
Shawano	1,110	2	103	5	110	9.90
Sheboygan	900	10	640		650	72.22
Taylor	530		32	26	58	10.96
Trempealeau	1,000	7	37	40	84	8.40
Vernon	1,310	5	32	15	52	3.96
Vilas	130					
Walworth	790		340	18	358	45.31
Washburn	560		11	23	34	6.06
Washington	870	5	530		535	61.49
Waukesha	1,080	16	560		576	53.33
Waupaca	1,120		125	18	143	12.76
Waushara	930	1	61	7	69	7.41
Winnebago	790	10	575		585	74.05
Wood	930	3	12	24	39	4.19
Total	61,090	659.33	8,494	1,013	[1] 10,167.33	16.64

[1] Includes 1 mile of bituminous-macadam road.

TABLE 88.—*Mileage of public roads, 1909*—Continued.

RECAPITULATION.

Year.	Total mileage of all public roads.	Mileage of improved roads.				Approximate percentage of roads improved.
		Stone.	Gravel.	Sand-clay.	Total.	
1904	63,593	733.25	9,900	.....	10,633.25	16.72
1909	61,090	659.33	8,494	1,013	[1] 10,167.33	16.64
Gain	.....	.....	.....	1,013	.....	.....

[1] Includes 1 mile of bituminous-macadam road.

TABLE 89.—*Cost data, 1909.*

County and township.	Average cost per mile.			County and township.	Average cost per mile.		
	Sand-clay.	Gravel.	Macadam.		Sand-clay.	Gravel.	Macadam.
	Dollars.	*Dollars.*	*Dollars.*		*Dollars.*	*Dollars.*	*Dollars.*
Ashland	.....	898	2,286	Oconto townships—Con.:			
Clark	.....	2,100	3,168	Pensaukee	.....	1,680	.....
Dane	.....	1,750	2,750	Spruce	350	.....	.....
Grant	.....	.....	2,560	Stiles	.....	320	.....
Green	.....	.....	2,000	Portage	.....	.....	2,000
Jefferson	.....	1,500	2,500	Price	1,250	.....	.....
Kenosha	.....	700	4,000	Richland	.....	500	2,050
Lincoln	.....	800	.....	St. Croix	.....	250	.....
Marinette	.....	800	2,000	Sauk	.....	1,600	2,600
Monroe	.....	.....	2,000	Waukesha	.....	.....	5,800
Oconto townships: Brazeau	.....	1,000	.....				
Oconto city (South ward)	.....	2,000	5,986	Average	800	1,135	2,978

WYOMING.

TABLE 90.—*Mileage of public roads, 1909.*

County.[1]	Total mileage of all public roads.	Total mileage of all roads improved.	Approximate percentage of roads improved.	County.[1]	Total mileage of all public roads.	Total mileage of all roads improved.	Approximate percentage of roads improved
Albany	949	.....	.....	Sheridan	1,200	.....	.....
Bighorn	1,000	.....	.....	Sweetwater	420	.....	.....
Carbon	250	.....	.....	Uinta	1,000	.....	.....
Converse	600	.....	.....	Weston	250	.....	.....
Crook	396	.....	.....	Yellowstone National Park	416	[2] 416	100.00
Fremont	1,600	.....	.....				
Johnson	600	.....	.....	Total	10,569	[2] 416	3.94
Laramie	1,728	.....	.....				
Natrona	160	.....	.....				

RECAPITULATION.

Year.	Total mileage of all public roads.	Total mileage of all roads improved.	Approximate percentage of roads improved.
1904	10,447	[3] 153	1.46
1909	10,569	[2] 416	3.94
Gain	122	263	2.48

[1] Park County established from part of Bighorn County in 1909, but the organization did not become effective until 1911.

[2] There are 416 miles of Government roads in the Yellowstone National Park and adjacent National Forests constructed and maintained by the National Government. These should be classified as improved roads, as most of them are surfaced with gravel, crushed stone, or selected soil.

[3] Includes improved gravel-macadam or gravel-telford roads in the Yellowstone National Park, many of which have telford or macadam foundations surfaced with gravel.