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First Biennial Report

OF THE

State Highway Commission

OF THE

State of Colorado,
1910

C. P. Allen, Denver, *Chairman*

W. M. Wiley, Holly; Thos. H. Tully, Durango, *Members.*

J. E. Maloney, *Secretary and Engineer.*

William F. Higgins, *Stenographer.*

To the Governor



Issued by order of the Commission
November, 1910

1910

THE SMITH-BROOKS PRINTING CO., STATE PRINTERS
DENVER, COLORADO



COMPLIMENTS OF BOARD OF COUNTY COMMISSIONERS, EL PASO
COUNTY, COLORADO.

Compliments of

STATE HIGHWAY COMMISSION

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1910-1915/16 ✓

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OF THE
1910-1915
State Highway Commission,

2
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LETTER OF TRANSMITTAL.

Denver, Colorado, December 15, 1910.

HON. JOHN F. SHAFROTH,
Governor of Colorado.

Dear Sir—We submit herewith a report of the State Highway Commission of Colorado for the first eleven months of its existence, from January 1, 1910, to November 30, 1910, together with such observations and suggestions as we deem advisable to make.

Respectfully submitted,

C. P. ALLEN,
Chairman.

W. M. WILEY,
THOS. H. TULLEY.

J. E. MALONEY,
Secretary.

First Biennial Report

OF THE

State Highway Commission

OF THE

State of Colorado

1910

The Colorado State Highway Commission was created January 1, 1910, when C. P. Allen, Denver; W. M. Wiley, Holly, and Thos. H. Tulley, Durango, were appointed. The first meeting of the commission was held on January 17, 1910, at which Mr. C. P. Allen was chosen chairman. At a meeting held on January 18th J. E. Maloney, Littleton, Colorado, was appointed secretary and engineer, and William F. Higgins, Denver, Colorado, was appointed stenographer. Meetings thereafter of the commission were held on the following dates: February 15th, March 15th, March 21st, April 15th, April 30th, May 16th, May 17th, June 11th, June 13, June 14th, June 15, July 20th, August 2d, August 5th, August 8th, August 15th, September 1st, September 19th, October 6th, October 19th and November 3d.

Supplies and necessary equipment were purchased and 1,000 copies of the act establishing the Highway Commission were printed and distributed throughout the counties. Letters were sent out to the county commissioners of fifty-nine counties, enclosing copies of the act, and asking their active co-operation in pushing forward the improvement of the roads in the State; also to the commercial clubs and other similar organizations in the State, enclosing copies of the act, and asking their active co-operation.

The result of this campaign was to arouse the attention of the several counties to the importance of the new department, bringing in requests for the commission to visit many of the counties to go over their roads and give advice as to proper methods to pursue in road and bridge construction. The commission responded as soon as possible.

A great number of the counties were somewhat shy at first. Some felt the State should stand all the expense on what was to be declared State roads, overlooking that the residents of the

counties used the roads within their limits ten times as much as those traveling inter-county. But as they began to study the proposition and gained a clearer knowledge of the fact that they were to receive a fifty per cent. bonus as an incentive to action, they gradually began to fall into line and ask for State aid, in some instances putting up as high as four and five dollars to one contributed by the State, without taking into account the moneys they had expended on their roads this year prior to their application.

THE TAYLOR BILL.

Congressman Edward T. Taylor advised our commission of the introduction by him of the following bill in the Congress of the United States, and asked our co-operation in a campaign to effect its passage:

"GRANTING TO THE STATE OF COLORADO PUBLIC LANDS TO BE SOLD UNDER CERTAIN RESTRICTIONS, AND THE PROCEEDS THEREOF USED FOR THE CONSTRUCTION AND IMPROVING OF PUBLIC HIGHWAYS UNDER THE SUPERVISION OF THE STATE HIGHWAY COMMISSION.

Be It Enacted by the Senate and House of Representatives of the United States of America, in Congress Assembled

That there is hereby granted and conveyed to the State of Colorado one million acres of agricultural lands, to be used solely for the purpose of constructing, improving and maintaining public highways and good wagon roads within said State, under the supervision of the State Highway Commission.

Sec. 2. That said lands shall be selected under the authority and direction of the State Land Board of said State within a period of one year after the passage of this act, and may be designated and selected from any lands still belonging to the United States government within the State of Colorado, either within or without the forest reserves. The Secretary of the Interior is hereby authorized and directed to issue United States patent to said lands to the State of Colorado as soon as the designation thereof has been certified to his office by said Colorado State Land Board; and that such designation shall be made by legal subdivision of surveyed land and by metes and bounds of unsurveyed lands.

Sec. 3. That the said lands shall be sold by the State at not less than five dollars per acre, and in not greater amount than one hundred and sixty acres to any one individual or corporation, and under such rules and regulations for the disposal thereof and use of said lands for said purposes as may hereafter be provided by the Legislature of said State."

The Boards of County Commissioners and the commercial bodies throughout the State were appealed to forthwith, a copy of the bill sent to each and resolutions of endorsement were returned from the various bodies in the State. These were for-

warded to Congressman Taylor to show Congress that he has the entire State behind him in this effort.

The good offices of the American Good Roads Association were solicited through Mr. George C. Deihl of Buffalo, N. Y., its chairman, and he gave assurance of friendship. Charles T. Terry of New York City, chairman of the Legislative Boards of the American Automobile Association, was called upon and he presented the matter to their attorneys at Washington, D. C., and received favorable consideration. Mr. Allen of this commission was present at the time.

Another movement was immediately launched among the seventeen states having public lands and Your Excellency caused to be sent to the Governors, United States Senators and Congressmen thereof, the following letter:

Denver, Colo., Apr. 19, '10.

My dear Governor:

There has been introduced in the National House of Representatives by Congressman Edward T. Taylor of Colorado, a bill of which the enclosed is a copy. You will observe that should this bill become a law it appropriates, under certain conditions and restrictions, one million acres of the public domain, the proceeds from the sale of which is to be devoted to the construction and betterment of the public highways within the State.

"It practically creates a continuous income of reasonable dimensions for several years which, supplementing our State and County appropriations for like purposes, will enable us to make our road work more apparent. I say "Continuous Income" because the disposition of one million acres at one hundred sixty acres per entry means that sixty-two hundred and fifty entries must be made to consume the allotment at the maximum, and it is safe to say the average will not be over eighty acres, thereby doubling the number of entries.

In addition to the fund thus created for good roads construction and improvement, the population of our State and the West will be increased from this source alone, directly and indirectly, over one hundred fold. What helps Colorado, helps the West; what helps the West, helps your own State. Increased population means increased consumption, which means that in time this Western section must, as an economic necessity, construct and maintain its own manufacturing plants and the greatest factor in their encouragement is good roads.

The great mass of the thinking public today are awakening to a realization of the fact that good roads are the greatest economic feature entering into the cost of production, marketing and consumption of the necessities of mankind. Improved highways brings closer relations between commonwealths. They tend to make the communities one vast intercouring body. Properly extended they will develop great exchange between the State, and from a tourist standpoint will prove of inestimable value to the

great scenic West, checking the diversion of the nation's wealth to Europe by affording just as good, if not better, attractions at home.

Congressman Taylor's bill is receiving the endorsement of all our Boards of County Commissioners without regard to their political affiliations, of all our Chambers of Commerce, Boards of Trade, Good Roads organizations, Motor clubs and other combinations as well as our most prominent citizens. They are all passing resolutions commending it for enactment into law by the Congress.

I am conscious of the great task which confronts Congressman Taylor, as the desires of a single state are not so impressive as where several states make an united effort along the same lines. It has, therefore, occurred to me to request your good offices and influence with your Senators and Congressmen in support of this measure, with the assurance that should your State, through its national representatives, undertake like legislation, Colorado's representatives will back them up in their efforts.

If you have a Highway Commission in your State, or a Good Roads Commission, they can do a great deal along the same lines we have pursued here as to resolution, etc.

I shall aim to have the Colorado Legislature memorialize Congress in behalf of this policy and suggest like action on your part. It would seem that such an united front on the part of the states in which public lands still exist, would be difficult for Congress to ignore.

Kindly convey to me your views upon this matter. Thanking you for your consideration, I am,

Yours sincerely,

(Signed) JOHN F. SHAFROTH,

Governor.

Some three hundred such letters were sent out and but six unfavorable replies were received.

At the Third Annual National Good Roads Convention held at St. Louis, September 28, 29 and 30, 1910, the Taylor Bill was unanimously endorsed.

We feel that the outlook is bright for this bill becoming a law in the near future, and we assure you that our efforts to that end will not cease. We would recommend that you request the Eighteenth General Assembly to memorialize Congress in its behalf.

Requests for copies of road laws and annual reports were sent to the several states and to Canada, also the Office of Good Roads, U. S. Department of Agriculture, for bulletins relating to road experiments and investigations. From the above sources we have received and have on file the following:

REPORTS.		BULLETINS.
Ohio, 1908-1909.	New York, 1909.	New Jersey, Specifications for Gravel and Stone Roads.
Washington, 1906 and 1908.	Connecticut, 1905-06-07-08.	Ohio, Bulletin No. 2, 5, 12 and 13. Two pamphlets.
Ontario, 1907-1908-1909.	ROAD LAWS.	Missouri, Specifications for Gravel, Rock, Sand-clay Roads, Highway Bridges. Bulletin, Rock and Gravel Roads.
Missouri, 1908-1909.	Pennsylvania, 1905-08.	
Rhode Island, 1907-08-09.	Maryland, 1908.	
New Jersey, 1908-09.	Washington, 1907-08-09.	
Pennsylvania, 1905-07-08.	Missouri, 1909.	
Massachusetts, 1908	New York, 1909.	
Michigan, 1907-08.	Massachusetts, 1906.	
Maine, 1905-06-07-08-09.	Maine, 1909.	
	Connecticut, 1909.	
	Ohio, 1908.	

U. S. REPORTS, DEPARTMENT OF AGRICULTURE.

- Cement, Mortar and Concrete.
- Report of director, Office of Public Roads, 1908 and 1909.
- Macadam Roads.
- Sand-clay and Burnt Clay Roads.
- Split Log Drag on Earth Roads.
- Gazetteer of Colorado.
- Proceedings of North Carolina Good Roads Convention.
- Corrosion of Iron.
- Road-making Materials.
- Dust Preventives.
- Practical Road Building in Tennessee.
- Progress of Road Legislation and Improvement in Different States.
- Building Sand-clay Roads in Southern States.
- Proceedings of National Good Roads Convention, St. Louis, 1903.
- Steel-track Wagon Road.
- Government Co-operation in Object Lesson Good Roads.
- State Laws, Management of Road, 1888-93 and 1894-95.
- Testing of Road Materials.

MISCELLANEOUS.

- Uniform Motor Vehicle Legislation.
- Cost of Adopting Macadam Roads to Auto Traffic.
- Withdrawals of Public Lands.
- Roads and Pavements.
- Concrete Pavements.

All of these publications are kept in the office of the Commission and can be consulted by any one interested.

Requests were made to the Commissioners of all the counties to send in road maps of their county. So far maps have been received from the following counties:

Arapahoe,	Phillips,	Gunnison,
Boulder,	Jefferson,	Morgan,
Chaffee,	Kiowa,	Otero,
Cheyenne,	Kit Carson,	Rio Blanco,
Clear Creek,	Larimer,	Rio Grande,
Conejos,	Las Animas,	Saguache,
Delta,	Lincoln,	Sedgwick,
Douglas,	Logan,	Summit,
El Paso,	Mesa,	Teller,
Fremont,	Mineral,	Washington,
Bent,	Montezuma,	Yuma,

thirty-three counties in all. Additional to these, maps are in progress in fifteen counties and the remainder have not started as yet.

We found that several had never compiled a map of their roads. Some have not even a survey, and in many instances the counties have no title to some of their main highways which precluded our extending State aid, as it would be folly to invest in the improvement of a road that could be cut off at a moment's notice. These conditions are being rectified as rapidly as possible.

Some of the counties that have no maps or surveys will be subjected to an expense of two or three thousand dollars to compile same, and they were not financially situated to do so this year. We have assurances that they will comply soon with our request.

BULLETINS.

The first bulletin was issued by this Commission in May last. One thousand copies containing the general rules and regulations for maps and road construction were printed and distributed. Copies were sent to the County Commissioners of the several counties, to the various organizations in the State, and to several states and other correspondents asking for the same.

The road laws of the State were compiled in this office and were submitted to Mr. James G. Rogers, Assistant Attorney General, who arranged and indexed them. They are now in the printers' hands, and will be issued as Bulletin No. 2. One thousand copies have been ordered. This is the first time the road laws of Colorado have been separately compiled, and it will prove a valuable volume.

STATE PRIMARY ROADS.

The following roads were declared State primary roads:

ROAD NO.	TERMINAL POINTS.	DISTANCE.
1.	Denver to Golden.....	8½ miles
2.	Denver to Ft. Collins.....	58½
3.	Denver to Colorado Springs.....	78
4.	Colorado Springs to Pueblo.....	46
5.	Pueblo to La Junta.....	65
6.	La Junta to Kansas State Line.....	93
7.	Denver to Ft. Morgan.....	90
8.	Sedalia to Palmer Lake.....	26½
9.	Ft. Morgan to Colorado-Nebraska State Line.	112
10.	Leadville to Glenwood Springs.....	93
11.	Glenwood Springs to Grand Junction.....	104
12.	Grand Junction to Montrose.....	67
13.	Durango to Montrose.....	80
	Durango to New Mexico State Line.....	21
14.	Durango to Utah State Line.....	70
15.	Durango to Alamosa.....	145
16.	Alamosa to Walsenburg.....	78
17.	Leadville to Buena Vista and Poncha Pass...	74
18.	Colorado Springs to Buena Vista.....	96
19.	Brush to Wray, Colo.-Neb. State Line.....	98
20.	Gunnison to Montrose and Utah State Line..	140
Total		1,643½ miles

PROCEDURE FOR STATE AID.

Owing to the fact that the commission was not officially notified that the fifty thousand dollar appropriation would be available until May and the further fact that several conditions of the State Highway Commission law could not be complied with by several of the counties, the commission could not apportion the funds as intended. Therefore the Attorney General's office was consulted and furnished the following forms of resolutions to be passed by this Board and also by the County Commissioners applying for State aid. Certified copies of same were filed in each case with the Auditor of State.

RESOLUTION OF HIGHWAY COMMISSION DESIGNATING STATE ROADS.

Whereas, The State Highway Commission is authorized and required by chapter 57 of the Session Laws of 1909, and particularly by section 4 thereof, to select and designate certain highways of the State as State roads and to entitle such State roads so selected to State aid in their construction, improvement and maintenance, and

Whereas, The Highway Commission deems the following described highway of sufficient public importance to entitle it to

State aid under the said act, and to authorize the county commissioners of the counties through which it passes to expend thereon the funds apportioned to those counties from the State road fund, in the manner designated by and subject to the regulation and supervision of this Commission.

Therefore, Be It Resolved, That the following described highway be designated and declared as a State road of the (primary or secondary) class, within the meaning of said act; and that the county commissioners of the counties hereinafter designated, through which the said highway runs or upon which it borders, be informed of this action, by the secretary of this Commission.

FORM OF RESOLUTION APPLYING FOR STATE AID.

Whereas, The Board of County Commissioners of..... County, Colorado, is desirous of complying with and availing itself of the benefits of the provisions of Chapter 57 of the Session Laws of the State of Colorado for 1909, entitled "Highway Commission."

Be It Resolved, That in the judgment of this Board, the following highways in County are especially such as need improvement, namely,

.....
.....
.....

And Be It Further Resolved, That this Board hereby makes an appropriation of..... Dollars, to be expended between the date hereof and..... upon said road under the provisions of the act creating the State Highway Commission and the rules contained in Bulletin No. 1, issued by said Commission, and hereby applies to said Commission for the sum of Dollars as State aid for the accomplishment of said work, the same being on the basis of one dollar from the State to each two contributed by the county.

APPORTIONMENT.

Whereas, The State Highway Commission is authorized to apportion the State Road fund among the several counties, and have provided in its requirements for a manner of remittance known as "Special Disbursements."

Resolved, That a Special Disbursement of..... Dollars be hereby authorized for the purpose and upon the conditions hereinafter described, to County, and the State Auditor is hereby authorized to draw his warrants as directed by this Commission from time to time upon estimates in favor of the County Treasurer of..... County from the said sum from said State Road fund, upon receipt of the certificate of the Chairman of this Commission that this resolution has been accepted and has gone into effect.

The purposes for which the above apportionment is to be expended are as follows: Drainage, Grading and Improvement of State Primary Road No. within the County of together with engineering expenses incident thereto.

This apportionment shall go into effect upon the receipt of a resolution passed by the Board of County Commissioners of County to the effect that said Board accepts this Special Disbursement upon the terms above described and will devote the same only to the purposes so set forth.

This apportionment shall be known as " County Special Disbursement of 1910."

The Chairman is authorized and directed to notify the State Auditor of the passage of this resolution upon receipt of the action of the Board of County Commissioners accepting the same.

The apportionment made herein shall be considered a part of the sum set apart for said county for the fiscal year of 1910.

Chairman.

CERTIFICATE OF STATE HIGHWAY COMMISSION.

I hereby certify that the attached copy of resolution is a true and correct copy of the resolution sent to the Commissioners of County, and accepted by them by resolution dated, a copy of which is herewith attached.

Chairman.

Attest:

Secretary.

RESOLUTION.

At a meeting of the Board of County Commissioners of county, Colorado, held at, Colorado, on, 1910, there being present:

the following resolution was adopted:

Resolved, by the Board of County Commissioners of county, that a special disbursement of, 1910, known as " County Special Disbursement of 1910," out of the State Road Fund, to be expended for the grading, drainage and improvement of roads in county and engineering expenses incidental thereto, is accepted, and this county agrees to spend twice the sum apportioned from the State Road Fund for

said work on State Primary Road No.....as designated by the State Highway Commission in their apportionment of said money and to be used only for said purposes.

..... Chairman.

Attest:

....., County Clerk.

STATE OF COLORADO, } ss.
COUNTY OF..... }

I,, County Clerk and clerk ex-officio for the Board of County Commissioners in and for the county and State aforesaid, do hereby certify that the annexed and foregoing resolution is truly copied from the records of the proceedings of the Board of County Commissioners of said.....county now in my office.

In Witness Whereof I have hereunto set my hand and affixed the seal of said county this.....day of....., 1910.

(SEAL)

STATE AID EXTENDED.

Each of the following counties have expended or by resolution pledged themselves to expend twice the amount set apart for them by this Commission on the State Primary Roads in their county. These resolutions are on file in this office:

The amounts apportioned to the various counties was as follows:

Arapahoe	\$ 1,250.00
Jefferson	4,500.00
Larimer	2,500.00
Douglas	2,800.00
Pueblo	3,000.00
Otero	2,000.00
Bent	1,000.00
Morgan	2,500.00
Adams	3,380.00
Logan	1,250.00
Sedgwick	820.00
Mesa	2,500.00
Delta	750.00
Ouray	1,000.00
San Juan	3,000.00
La Plata	3,000.00
Archuleta	500.00
Park	500.00

Chaffee	1,000.00	
Washington	1,400.00	
Boulder	500.00	
Yuma	1,400.00	
Montrose	700.00	
Garfield	1,500.00	
El Paso	2,500.00	
Montezuma	1,250.00	
		<u>\$46,500.00</u>

The other expenditures for this period are as follows:

Salaries:		
Commission	\$ 2,200.00	
Secretary and engineer and stenographer	2,952.11	
		<u>\$5,152.11</u>
Expenses:		
Furniture and tools	\$ 560.84	
Maps	68.20	
Slides, etc., property acct.....	30.70	
Stamps	63.12	
Stationery, ink, etc.....	99.72	
Blue prints	21.97	
Printing bulletins, etc.....	311.07	
Telephone	73.55	
Telegraph	2.64	
Expenses for Commission and engineers	3,041.85	
		<u>\$ 4,273.63</u>
Total salaries and expenses.....		\$ 9,425.77
Total appropriation to counties		46,500.00
		<u>\$55,925.77</u>
Total appropriation	\$56,000.00	
Balance		\$ 74.23

Amounts vouchered out to the various counties on account of the appropriations set aside for them:

Jefferson	\$ 4,500.00
Larimer	2,000.00
Arapahoe	625.00
Douglas	2,800.00
Pueblo	2,000.00

Otero	1,000.00
Bent	500.00
Morgan	1,000.00
Adams	2,380.00
Logan	650.00
Sedgwick	820.00
Mesa	1,000.00
Delta	625.00
Ouray	500.00
San Juan	500.00
La Plata	500.00
Archuleta	500.00
Park	500.00
Chaffee	1,000.00
Washington	700.00
Yuma	700.00
Montrose	700.00
Garfield	500.00
El Paso	1,750.00
Montezuma	650.00
Boulder	250.00
	28,650.00
Total appropriations to counties	\$46,500.00
Total vouchered out to counties	28,650.00
	\$17,850.00

ENGINEERING WORK.

1. Inspection trips to various parts of the State were made during the past season to inspect roads and bridges.

2. Plans for reinforced concrete bridges were examined, the location gone over and examinations made of the foundations.

3. Plans and specifications have been prepared for several reinforced concrete bridges of the slab and girder types; also for a reinforced concrete pile bridge and two flush bridges of reinforced concrete slabs and piling.

4. Plans and specifications for grading work in several counties have been prepared and others examined.

5. At the request of Mr. C. G. Comstock, State Engineer, the grading work on the North Golden road (S. B. No. 150), (State Primary Road No. 1), was staked out and done under the supervision of this Commission.

6. The work on the Colorado Springs Road (H. B. No. 488) (State Primary Road No. 3) in Douglas county was let and is

being done under the supervision of this Commission at the request of C. G. Comstock, State Engineer.

7. Miscellaneous surveys and drawings of road sections, profiles, road drag, etc., have been made.

BRIDGE PLANS EXAMINED.

Plans for reinforced concrete bridges in Douglas county and El Paso county were submitted to the Commission by the C. G. Sheely Bridge Company, as follows:

Box culvert, 6-foot span.

Slab type, 8-foot span (clear opening).

Slab type, 18-foot span (clear opening).

Girder type, 27-foot span (clear opening).

Girder type, 47-foot span (clear opening).

These bridges are all built with the exception of two 47-foot girder bridges.

Plans for concrete I beam bridges were submitted by Sedgwick county as follows:

14½ foot span and

32½ foot span,

and from Garfield county for a six-foot concrete box culvert. These plans were approved subject to suggested changes.

BRIDGE PLANS AND SPECIFICATIONS PREPARED.

Douglas county, 20-foot span reinforced concrete slab.

Arapahoe county, 20-foot span reinforced concrete slab.

Montezuma county, 2 30-foot spans reinforced concrete girder.

Morgan county, 420 lineal feet reinforced concrete pile and slab.

Adams county, 12-foot span reinforced concrete slab; 6-foot span reinforced concrete box culvert; 2 400-foot lineal foot reinforced concrete slab flush bridges on piles.

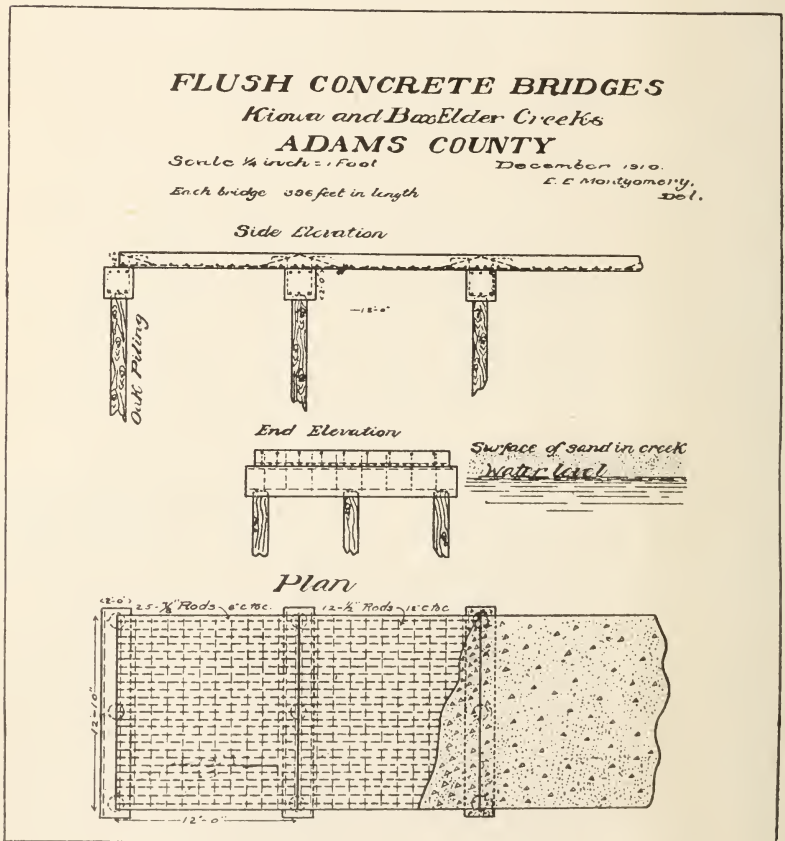
These bridges are all constructed, or in course of construction.

A word as to the Morgan and Adams county improvements. The Box Elder and Kiowa creek crossings have for years been an eye sore to the ranchers and others living on this main artery to the northeast country, as the sand conditions were so bad that a decent load could not be hauled through the creeks without extra teams or an automobile get through without animated assistance. As these crossings are over creeks that seldom flow but are subject to heavy floods concrete flush bridges resting upon wooden piling sunk to the water level, about six feet below surface, were constructed. They much resemble a concrete street crossing; are each four hundred feet long and cost four thousand dollars for one and thirty-five hundred dollars for the other. Raised bridges

would have cost fifteen thousand dollars each and owing to the floods would be in great danger of destruction, whereas the water passes over the flush bridges without any damage or obstruction.

The concrete slabs constituting the floor of the bridge were secured in place by carrying the concrete down to and around the head of the oak piling, which, being cut off below the water level, is not subject to decay.

The entire structures are reinforced and of sufficient strength to carry a fifteen-ton road roller or traction engine without any of the natural support from the bed of the creek on which the slabs were laid when constructed. See drawing herewith.



The Morgan County Commission applied to the State Highway Commission for financial and engineering assistance in construction of a bridge across the Bijou creek near Wiggins, twelve miles west of Fort Morgan. They were induced to abandon the wooden structure idea and initial contracts have been let for a reinforced concrete bridge to rest upon reinforced concrete piling. This bridge will be at an elevation of seven feet in the clear above the bed of the creek. It will be four hundred and twenty feet in length. Concrete piling was ordered for this structure because wooden piling would not endure above water level. Some of these concrete piles are fifty-four feet long. They are now sinking these piling into place.

With the completion of these three bridges all serious embarrassment to travel from these causes are removed between Denver and Julesburg by way of Fort Morgan

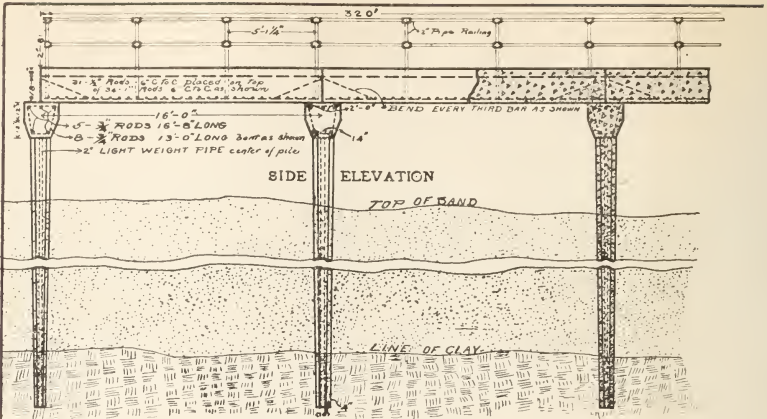
GRADING PLANS AND SPECIFICATIONS.

Grading plans and specifications were prepared, or examined as follows: For Yuma county, Sedgwick county, Garfield county, Logan county. Profiles were examined and grades established for Washington county and Arapahoe county.

NORTH GOLDEN ROAD.

Work on this road was begun by the contractor April 1st, 1910, and their part of the work was finished about the middle of July. This work was carried on under our supervision. The Seventeenth General Assembly appropriated five thousand dollars for the building of this road and when the State Engineer advertised for bids the lowest received was nineteen thousand dollars. He properly declined to start a nineteen thousand dollar job with a five thousand dollar appropriation. This Commission then took the matter up and induced Jefferson County Commissioners to appropriate five thousand dollars additional. Six thousand dollars was raised by subscription and the State Highway Commission extended State aid to the extent of forty-five hundred dollars. This made the construction of the North Golden road possible.

A like condition was found in Montrose county. The last General Assembly appropriated fifteen hundred dollars to relieve the situation across the Mexican draw. This draw was some eighteen hundred feet wide and about forty feet deep with abrupt approaches on either side and swampy in the center. The State Engineer advertised for bids and to make the twenty-two foot fill and eighteen feet cuts on each side, a total length of about three thousand feet. The bid was thirty-seven hundred dollars. The state's fifteen hundred dollars would not go far, it being less than one-half of the cost of the construction, so that work was not started. The Highway Commission took the matter up and after the County Commissioners had appropriated one thousand dollars, and five hundred dollars was raised by subscription, this



CONCRETE BRIDGE
OVER

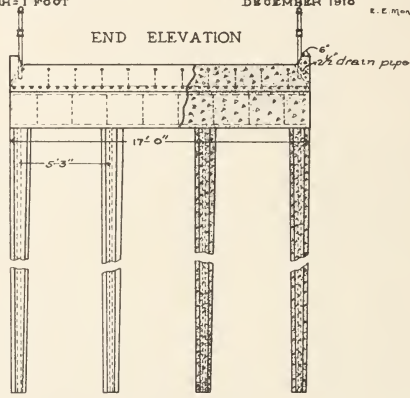
BIJOU CREEK

MORGAN COUNTY STATE ROAD

SCALE 1/4 INCH = 1 FOOT

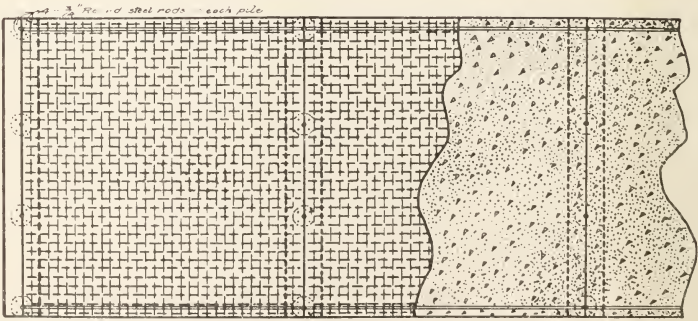
DECEMBER 1910

E. E. Montgomery, Des..



OFFICE STATE HIGHWAY COMMISSION

PLAN



Commission extended State aid of seven hundred dollars, making it possible to do this work. The ranchers on the large fruit mesa can now haul three times the load across this draw with one team that they could formerly haul.

In Larimer county the road funds have been exhausted to an extent that the County Commissioners had decided to only do temporary work in Fossil Creek vicinity, but by our Commission tending State aid in the sum of twenty-five hundred dollars, new heart was given them and work of a permanent nature was started. There was a steep hill and an ugly and extensive curve in the road at this point. When the work now under way is finished this condition will have been done away with and a fine road between Loveland and Fort Collins will be the result. A fill one thousand feet long and twenty feet high, together with a cut sixteen feet deep and about five hundred feet long was necessary to change former conditions.

With the replacement of two dilapidated wooden bridges by concrete structures a complete chain of concrete culverts and bridges will grace this magnificent highway through Larimer county. This work we expect to bring about next year.

This county has agreed to introduce the dragging on this road during the present winter from Fort Collins to the Boulder county line and to keep it in good condition to demonstrate the value of the drag.

Similar conditions confronted the commissioners of Boulder county and the appropriation of thirty-four hundred and eighty dollars by the State to be expended on a convict labor camp was insufficient. Through the agency of this Commission obstacles were overcome and today the camp is established, consisting of twenty convicts, eight teams, rock crushers, elevators, portable bins, dump wagons, plows, graders, wheel scrapers, slip scrapers and general camp equipment, such as stables, tents, sleeping tents, etc., equal to a force of fifty men and twenty teams, to which it is hoped to increase it in the spring.

An outfit consisting of twenty teams, traction engine, elevating grader and twenty-five men is prosecuting the work of road construction in Washington county about four miles west of Akron. This work is heavy grading and good progress has been made.

In Morgan county the work has been practically completed from Fort Morgan west for about twelve miles towards Bijou creek. This work was done with a county outfit of traction engine, elevating grader and teams.

In Logan county the work was let by contract for grading the road from the south county line to about five miles northeast of Merino. The work is finished and the county has surfaced the sandy places by surfacing with adobe soil.

In Sedgwick county the grading work was let by contract for several miles near Sedgwick and Julesburg, and the work is in progress. This county has also let the contract for two bridges.

In Yuma county the contract has been let for several miles of grading between Yuma and Wray, also between Wray and the State line. This work is now in progress.

COLORADO SPRINGS ROAD.

Grading work on this road in Douglas county was let by contract for teams, tools and men, and work was started in August, and is still in progress. Total expended on contract to December was about sixty-five hundred dollars.

An appropriation of sixteen thousand dollars was provided by the Legislature to be expended on the road between Denver and Colorado Springs. Five thousand dollars of this sum was invested between Colorado Springs and Palmer Lake, leaving, exclusive of preliminary expenses, about ten thousand dollars to be expended from Palmer Lake to Denver. This would not accomplish the work and results desired. Therefore this Commission conferred with the County Commissioners of Douglas and Arapahoe counties, and they applied for state aid on this road through their respective counties. As a consequence eleven thousand four hundred dollars additional was raised, making over twenty-one thousand dollars now being expended on this forty-five miles of road.

A part of this amount was invested in eight concrete bridges of various dimensions. We have been highly complimented on the changes effected in this road, such as overcoming excessive grades and abolishing curves.

The work contemplated through Otero county was held up until the State Highway Commission came to the rescue. This was owing to the legislative appropriation being too small. This Commission and the County Commissioners pieced it out until the amount would cover the deficiency, and now good work is being done on this section of the main road from Pueblo to Kansas (the new Santa Fe Trail).

There are many instances of a minor nature where the State Highway Commission was of assistance, but the foregoing suffices to show the necessity and value of such a Commission.

Work is now progressing at twenty-six different points in the State and in as many counties. A frightful condition is being overcome between Delta and Grand Junction over Lava Rock Mesa. Fifty-two miles was made almost impassable by six miles of loose rock so thick that it was impossible to dodge them.

From Debeque to Palisades, in Mesa county, we are building a road around through the beautiful plateau country, which, when completed, will accommodate over three thousand people who have cast their lot with that commonwealth.

In Chaffee county, with the aid of the Reformatory prison labor, a new road was built from Buena Vista to Newitt, a distance of fourteen miles. This new route is up Trout Creek and cuts out the hill where heretofore cloudbursts and waterspouts were continually washing out the roadbed. The Reformatory inmates did excellent work on this road, and next season it is expected to continue the work and reconstruct the road to the top of the divide leading to Hartzel. The saving in one year on horses, harnesses and wagons will more than cover the cost of this construction, as this road is well traveled.

Over Poncha Pass, from Salida to Saguache, there is being constructed a road much resembling that from Manitou up Ute Pass. The road has been practically finished to the top of Poncha Pass, and next season will be continued down into the great San Luis valley.

Work has been started in Archuleta county on the road from Pagosa Springs to Durango, and some nine miles of road has been put in excellent shape. The coming year will see this road in fine condition to the La Plata county line. This highway passes through what was formerly a thickly-timbered section, and its improvement requires the cleaning of stumps and rock to make it a comfortable thoroughfare.

In La Plata, San Juan and Ouray counties the surveys and profile maps are being worked out for the great highway that is to open that region to the outside world. Until the present time that section has been practically isolated from the rest of the State because of its inaccessibility by road.

Plans and specifications for two reinforced concrete bridges in Montezuma county, between Mancos and Cortez, have been submitted and bids advertised for. These are to improve the route to the Mesa Verde National Park wherein are found the famous Cliff Dwellings, in themselves of greater historic grandeur than the Appian Way or the Egyptian Pyramids. Of sufficient importance does the United States government consider the Cliff Dwellers' territory that it set it aside as a great national park and is contributing annually to its reclamation.

Government roads are being constructed there, some nine miles of magnificent highway having so far been completed, and work is still progressing.

In Garfield county a large concrete culvert, covered by a twenty-foot fill, is being constructed over Oasis Creek, just west of Glenwood Springs, and on the main highway from Glenwood Springs to Grand Junction. Improvements have been made on the State road through the canon east of Glenwood Springs to the Eagle county line. It is now in fairly good condition.

On its Western Slope tour this Commission found a serious condition in the South Park section of Park county, between Hartzel and Antero reservoir. At times there existed a veritable lake across the flats in vicinity of the reservoir, and beyond

the old salt works washouts and ruts. The County Commissioners were called upon and State aid offered, which was accepted, and a new road has been constructed around the hillside at an elevation far above the swampy flats. In the spring, when the frost leaves the ground, this work will be extended to relieve the situation from the salt works to the top of the divide towards Buena Vista, after which, in fair weather, there will be little impediment to travel from Denver to Chaffee county, and, in fact, into the San Luis valley via Salida.

MISCELLANEOUS SURVEYS.

A survey and profile was made of the road from Denver to Morrison, but no grading work started. Profiles of State roads were platted through Arapahoe, Jefferson and partly in Adams, Washington, Morgan, Yuma, El Paso, Bent and Prowers counties.

The condition of the work on State primary roads in the several counties that have received money from the State Road fund is as follows:

County.	Road No.	Character of Work.	Remarks.
Arapahoe	.....3 and 7....	Grading and concrete bridge.....	In progress
Archuleta	.....15....	Grading	In progress
Adams	..... 7....	Grading and two 400-ft. conc. brdgs.....	Brdgs finished
	..... 2....	Grading, dragging and conc. culvert.....	In progress
Bent	..... 6....	Grading	In progress
Boulder	..... 2....	Grading and conc. I beam bridges.....	In progress
Chaffee.....	17 and 18....	Grading	Completed
Delta	.....12....	Grading	In progress
Douglas.....	3 and 8....	Grading and concrete bridges.....	.....Bridges finished, grading in progress
El Paso.....	3 and 4....	Grading and concrete bridges.....	In progress
Garfield.....	10 and 11....	Grading and concrete culvert.....	In progress
Jefferson.....	1 and 2....	Grading and surfacing	In progress
La Plata.....	13, 14 and 15....	Grading and surveying.....	In progress
Larimer	..... 2....	Grading and concrete bridges.....	In progress
Logan.....	9 and 19....	Grading	In progress
Mesa.....	11 and 12....	Grading and bridges.....	In progress
Montezuma	.....14....	Grading and concrete bridges.....	In progress
Montrose.....	12 and 13....	Grading	Completed
Morgan.....	7 and 9....	Grading and concrete bridges.....	In progress
Otero.....	5 and 6....	Grading	In progress
Ouray	.....13....	Grading	In progress
Park	.....18....	Grading and culvert.....	Completed
Pueblo.....	4 and 5....	Grading and bridges.....	In progress
Jan Juan	.....13....	Grading, bridges and surveying.....	In progress
Sedgwick	..... 9....	Grading and bridges.....	In progress
Washington	.....19....	Grading	In progress
Yuma	.....19....	Grading	In progress

ROAD MATERIALS.

Samples of road surfacing material were obtained at the following places:

- Boulder county near Longmont.
- Washington county near Akron.
- Yuma county near Wray.
- Delta county near north line of county.
- Jefferson county near Golden.
- El Paso county near Rock Creek hill.
- La Plata county near Rockwood & Wilson gulch.
- Mesa county, on the Mesa-Debeque road.

INSPECTION.

From April to November inclusive, the State roads have been examined in the following counties: In some cases two or three trips were made: Adams, Arapahoe, Jefferson, Boulder, Larimer, Weld, Morgan, Logan, Sedgwick, Washington, Yuma, Douglas, El Paso, Pueblo, Otero, Bent, Prowers, Huerfano, Las Animas, Costilla, Conejos, Rio Grande, Archuleta, La Plata, Montezuma, Dolores, San Miguel, San Juan, Ouray, Montrose, Delta, Garfield, Eagle, Chaffee, Lake, Park, Clear Creek and Fremont. A total of twenty-five hundred miles of road was inspected and traveled over.

June 24th to July 17th inclusive: The Commission made a trip in automobile over the Western Slope. Messrs. Allen, Tulley and Maloney went over the road from Denver to Littleton, Sedalia, Perry Park to Palmer Lake, Colorado Springs, Manitou, Crystola, Divide, Lake George, Hartzel, Bath, Buena Vista, Granite, Leadville, Tennessee Pass, Red Cliff, Wolcott, Eagle, Shoshone, Glenwood Springs, New Castle, Rifle, Debeque, Palisades, Grand Junction, Whitewater, Delta, Olathe, Montrose, Colona, Ridgeway, Ouray; then back to Ridgeway, Leopard Creek, Placerville, Norwood; then around Lone Cone mountain to Woods ranch, in Disappointment country, over Disappointment divide to Dolores, to Cortez, Mancos; then to Hesperus, Porter and Durango. From Durango by automobile and horse to Silverton; from Silverton to Ouray in wagons, also Silverton to Cunningham gulch. From Durango through Bayfield (in auto) Fairview, Dyke, Pagosa Springs, up San Juan river past J. Young's ranch, over Timber hill and Elwood pass (horse power needed), down past Stunner, Jasper to Alamosa. From Alamosa through Valty, Blanca, Ft. Garland, Russell, to top of La Veta pass, then to La Veta and Walsenburg. Walsenburg through Greenhorn to Pueblo. Pueblo through Eden, Pinion, Buttes, Fountain, to Colorado Springs. Colorado Springs through Monument, Palmer Lake, Perry Park, Sedalia, Littleton to Denver.

The material available for surfacing the Primary State roads in the different parts of the State is about as follows:

Road No. and County.	Material Available.
1. Jefferson.....	Basalt and pit and creek gravel
2. Adams.....	Pit, river and creek gravel, sand and adobe
Boulder.....	Pit gravel, sand and clay
Larimer.....	Pit gravel, sand and clay and limestone
3-8. Arapahoe.....	Pit and creek gravel, sand and clay
Douglas.....	Pit and creek gravel, sand and clay
El Paso.....	Pit and creek gravel, sand and clay
4. El Paso.....	Pit and creek gravel, sand and clay
Pueblo.....	Pit and creek gravel, sand and clay
5. Pueblo.....	Pit and creek gravel, sand and clay
Otero.....	Pit and creek gravel, sand and clay
6. Otero.....	Pit and creek gravel, shale and sand-clay
Bent.....	Pit and creek gravel, shale and sand-clay
Prowers.....	Pit and creek gravel and sand-clay
7. Adams.....	Pit and creek gravel and sand-clay
Morgan.....	Pit and creek gravel and sand-clay
9. Morgan.....	Pit and creek gravel and sand-clay
Logan.....	Pit and creek gravel and sand-clay
Sedgwick.....	Pit and creek gravel and sand-clay
10. Lake.....	Pit gravel, granite and other rocks
Eagle.....	Pit gravel, granite and other rocks
Garfield.....	Pit gravel, granite and other rocks
11. Garfield.....	Pit and creek gravel, granite and other rocks
Mesa.....	Pit and creek gravel, shale and sand-clay
12. Mesa.....	Pit and creek gravel, shale and sand-clay
Delta.....	Pit and creek gravel, shale and sand-clay
Montrose.....	Pit and creek gravel, shale and sand-clay
13. Montrose.....	Pit and creek gravel, shale and sand-clay
Ouray.....	Pit and creek gravel, limestone and other rocks
San Juan.....	Pit and creek gravel, limestone and other rocks
La Plata.....	Pit and creek gravel, limestone and other rocks
14. La Plata.....	Pit and creek gravel, limestone and other rocks
Montezuma.....	Pit and creek gravel, shale and sand-clay
15. La Plata.....	Pit and creek gravel, granite, limestone and other rocks
Archuleta.....	Pit and creek gravel, granite, limestone and other rocks
Rio Grande.....	Granite and other rocks
Conejos.....	Pit and creek gravel and sand-clay
16. Conejos.....	Pit and creek gravel, sand-clay and limestone
Costilla.....	Pit and creek gravel, sand-clay and limestone
Huerfano.....	Pit and creek gravel, sand-clay and limestone
17. Lake.....	Pit and creek gravel, granite and other rocks
Chaffee.....	Pit and creek gravel, granite and other rocks

Road No. and County.	Material Available.
18. El Paso.....	Pit and creek gravel, sand-clay, granite and other rocks
Teller.....	Pit and creek gravel, granite and other rocks
Park.....	Pit and creek gravel, sand-clay, granite and other rocks
Chaffee.....	Pit and creek gravel, sand-clay, granite and other rocks
19. Morgan.....	Pit and creek gravel and sand-clay
Washington.....	Pit and creek gravel and sand-clay
Yuma.....	Pit and creek gravel and sand-clay
20. Gunnison.....	Pit and creek gravel, sand-clay, granite and other rocks
Montrose.....	Pit and creek gravel, shale and sand-clay

This Commission is compiling information on the various deposits of road material throughout the State. The location, character of material, adaptability, etc. We present herewith as illustrative of the knowledge we are acquiring, the return on one sample submitted. This test was made in Washington. Other tests have been and are being made by Professor Ketchum of the State University at Boulder.

UNITED STATES DEPARTMENT OF AGRICULTURE.
OFFICE OF PUBLIC ROADS.
WASHINGTON D. C.

Division of Tests. July 26, 1910.
(Report on Sample No. 4724 of Road Material from Larimer County, Colo., in Foothills, Ft. Collins.)

Made at the request of J. H. Dodge, Office Public Roads (Ft. Collins).

Material—Limestone.

DETERMINATIONS.

Specific gravity	2.55
Weight per cubic foot.....	159 pounds
Water absorbed per cubic foot.....	3.24 "
Per cent. of wear.....	6.5
French co-efficient of wear	6.1
*Toughness. . . . .	...
*Hardness. . . . .	...
Cementing value	(32) Good

Maximum, minimum and average results on all rock species tested up to date indicated are given in the accompanying table.

Remarks—Low wearing value and good cementing value. Would probably give fair results when used for roads which have very light traffic.

Respectfully,

VERNON M. PEIRCE,
Acting Director.

* Not enough material for these tests.

The permanent equipment of the Commission contains a photographer's outfit and a stereopticon apparatus. There has been accumulated a fine lot of pictures showing road conditions in different parts of the State. From some sixty of these photographs we have had colored slides made for the stereopticon, and these are used for educational purposes. The display of a couple of these slides, showing, as they do, the contrast between a good and a bad road, takes the place, and with better results, than hours of argument. This outfit will be used at the Good Roads Convention Your Excellency has called for January 13, 1911, as well as at the State Meeting of the County Commissioners to be held about the same time.

The furniture and other office requirements of a permanent character was purchased by the Commission and paid for out of its funds, as the Board of Capitol Managers decreed that we could not be supplied from the funds at their disposal. Accompanying this report are maps showing those counties that have complied with the law as to road maps, those now working on the same, those favored from the Internal Improvement Fund by the Seventeenth General Assembly, and those extended aid by this Commission.

Maps showing the three tourist loops in the State. One showing the main arteries entering the State from the east, north and south, east of the range, and one showing the main highways entering the State west of the range. Two other maps show the Primary Roads already designated by this Commission, amounting in all to sixteen hundred and forty-three and one-half miles, which, with the proposed primary roads to be declared when the Commission goes over them to determine the exact route, approximates some four thousand miles. The Commission declares no highway a State Primary Road until it has gone over and thoroughly inspected the same.

Of course it will be understood that the improvements undertaken this year are of a fundamental character. The roads have been surfaced in no case except short distances in Boulder and Larimer counties, but all roads are being shaped up for this additional improvement as soon as financial conditions will permit it.

Colorado's greatest asset is its incomparable climate. Before many years we believe its next greatest asset will be its scenery and pleasure resorts, which will invite the well-to-do of this and other climes here to spend their vacation and their money.

An improved system of highways is the greatest competitive bid Colorado can offer the pleasure seekers who now seek diversion abroad. Colorado's scenic grandeur is extensive. Its resorts are constantly multiplying and its fishing and hunting area is practically unlimited and inexhaustible. The tourist can spend months here each year and not see it all, and will gladly return season after season. The first essential to inducement is good roads, and while in touring weather the roads east of the moun-

tains are fairly passable, there is here and there in the mountains a link in the great highway contemplated which makes it difficult to get around the scenic sections cheaply and comfortably. In some instances a dozen miles spoils a hundred, and occasionally a thousand feet takes the pleasure out of a whole day's trip. These conditions will be done away with next year.

The idea should not gain a foothold that good roads in Colorado are to bring joy only to the citizens favored with this world's goods as to afford ownership of an automobile. We realize that much of the present agitation might lead to such a conclusion in many minds, but such is not the case. It can readily be seen who is the great beneficiary when one reflects that of the sixteen hundred and forty-three miles of declared State highways less than one hundred miles are purely scenic, while some two hundred miles through scenic country is commercial, and all that vast country east of the mountains surely is not scenic. The real fact is that good roads lightens the burdens and boosts the fortunes of all mankind. The rancher can haul larger loads of sugar beets, hay or potatoes with less wear and tear to his equipment and more comfort to his labors. The real estate man can rejoice because rural improvements develop demand for lands, and the U. S. statistics show that good roads increases land values from three dollars to ten dollars, depending upon proximity to the improvements.

The same statistics recite that "in twenty-five counties showing an increase of population from 1890 to 1900, averaging thirty thousand to the county, forty per cent. of the roads were improved and maintained in first class condition, while in twenty-five counties in the same states showing a loss in the same period of three thousand per county, less than ten per cent. of the roads were improved."

Where grades are excessive, some being as high as thirty per cent., the Commission is ordering them reduced to seven or eight per cent. if possible. We have harped day in and day out against the needless detriment of irrigation water on the public highway; have preached the dragging after storms of the roads; have criticized counties for leaving their graders, scrapers, slips, rollers, plows, and other machinery on the open highway when not in use, to be damaged by weather when they should be put under cover and properly cared for.

We find this campaign of education slow to take root, but there are favorable signs of awakening as the good road doctrine spreads. Already they are dragging the adobe roads in both Douglas and Adams counties and the results are wonderful.

A prominent ranchman by the name of Butterfield had made a demonstration in Montrose county of the results that can be accomplished by the use of the drag on dirt roads.

In some few instances this Commission has caused drags to be put out for demonstration purposes. This simple, but wonderful, little piece of road machinery should be in use all over the

State. There should be from twenty-five to fifty of them to a county and a premium or prize should be offered for the best kept stretch of road as an incentive to their use by the farmers.

CONCLUSION.

The work planned for the next two years throughout the State can be best accomplished if the State Highway Commission is placed on a financial basis equal to its undertakings.

After a year's observation and study of road conditions in the State the members of this Commission are thoroughly convinced that if the Internal Improvement Permanent fund and the Internal Improvement Income fund were appropriated intact to this commission better results would be accomplished than though the disconnected methods of the past by which much has been done, but little permanently or completed, and maintenance was in no case a condition precedent to appropriation.

The Commission feels that in addition to the Internal Improvement Funds they should be strengthened by an appropriation of five hundred thousand dollars direct from the General Revenue fund. If so fortified this Commission will be in position to expend one million dollars per annum for the next two years upon the State highways, as under the law the counties would have to put up two dollars for one the state advanced.

With such a fund at the direction of the Commission it would not take long to induce the counties to get active in a manner that would count.

The Commission is controlled in its estimate of what should be appropriated by returns received from twelve of the average counties in the State, and with these as a basis, not less than three hundred seventy-five thousand dollars per annum will suffice, or seven hundred and fifty thousand dollars for the biennial period. The counties referred to are: Logan, El Paso, Yuma, Washington, Morgan, Delta, Pueblo, Ouray, San Juan, La Plata, Montezuma and Archuleta.

The attention of this Commission has been directed to the enormous cost of maintenance on bridges. In Pueblo county four of the large bridges used by beet handlers have to be refloored annually and it takes seventy-five thousand feet of plank to do the job. Others have to be refloored biennially. If stronger bridges were constructed in the first place and concrete surfacing used the cost of maintenance would be minimized.

The State Highway Commission should be authorized to locate all convict camps, but the Warden of the Penitentiary should have control of all camps. The Commission makes this observation because it feels qualified to designate the points on the public highway at which such class of labor, operating under the conditions necessary, can best be employed.

A law should be enacted which will cause road signs to be placed at the junction of all roads throughout the State similar

to the system established in the larger towns and cities, so the inter-state or inter-county traveler can keep his bearings and not wander miles off his route, as this Commission has learned from experience that travelers sometimes do. Such signs should be of a durable character. Painted ones are very poor as the weather destroys the paint.

The Commission recommends the passage of a premium law on wide tires on wagons. The narrow tire cuts a road, even a hard surface road, badly. The premium could be the cancellation of the poll tax. The poll tax should be collected in cash instead of being worked out and this should be deviated from only in the wide tire premium case.

Your attention is called to the fact that the apportionment to the counties by this Commission of \$46,500 has resulted in the expenditure on the State primary roads of not less than \$175,000, and that the total amount expended by the sixty counties in the State for the year 1910 will be close to \$1,250,000 for roads and bridges.

To Prof. Alderson of the School of Mines at Golden; to Prof. Milo D. Ketchum of the State University at Boulder; to C. G. Comstock, State Engineer; to L. W. Page, Director, Office Public Roads, U. S. Department of Agriculture, Washington, D. C.; to the press of the city of Denver and of the State; also to the various State officers and departments; to the Denver Chamber of Commerce; to the Rocky Mountain Highway Association; Denver Motor Club; Denver Real Estate Exchange, and the various commercial bodies throughout the State we tender our acknowledgments for courtesies extended.

We also desire to acknowledge the assistance received from the following railroads: Denver and Rio Grande, Atchison, Topeka and Santa Fe, Colorado and Southern.

In view of the work accomplished by the State Highway Commission and the responsibilities attached to the same, as compared with other departments of State, the members have sufficiently foregone modesty to suggest to Your Excellency that salaries commensurate with the position should attach to same, and we trust you will recommend such action to the Eighteenth General Assembly.

The office force of this department should be increased one engineer and provision made for his salary in same manner as present salaries are met.

There is every indication and assurance that this department will within the next five years grow into one of the largest and most extensive departments of State, and consideration extended should always have this development in view.

Respectfully submitted,

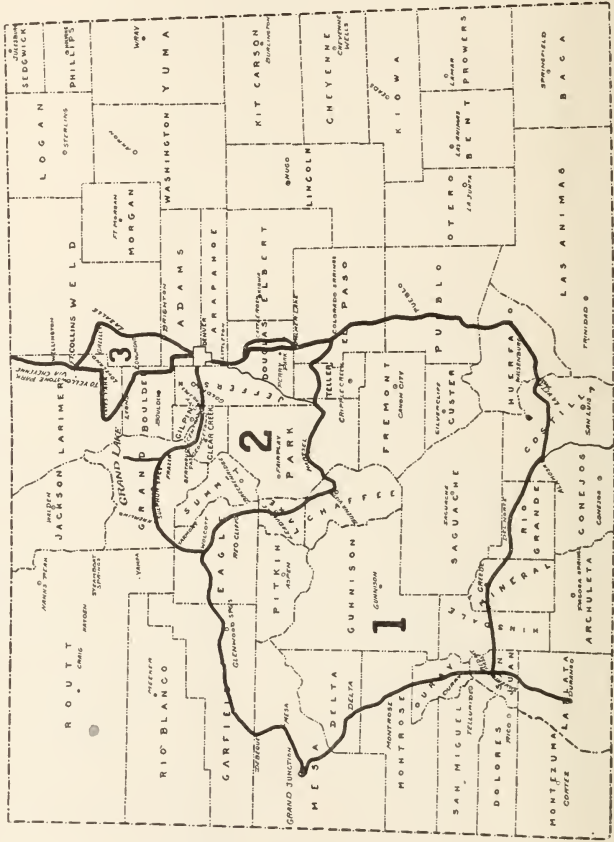
J. E. MALONEY,
Secretary.

C. P. ALLEN,
W. M. WILEY,
THOS. H. TULLEY.

MAP OF COLORADO

SHOWING THREE TOURIST ROUTES

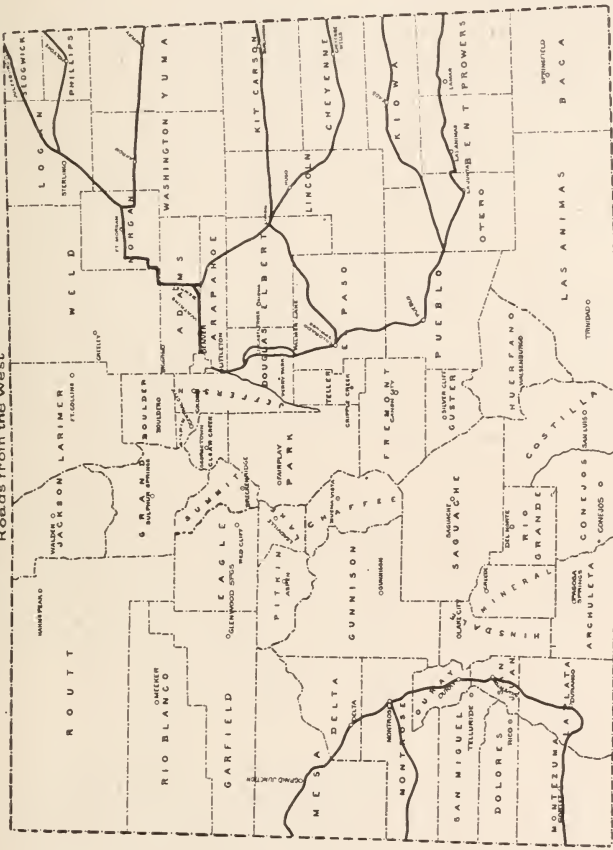
1000-MILE LOOP = No. 1, 500-MILE LOOP = No. 2, 200-MILE LOOP = No. 3.



OFFICE STATE HIGHWAY COMMISSION

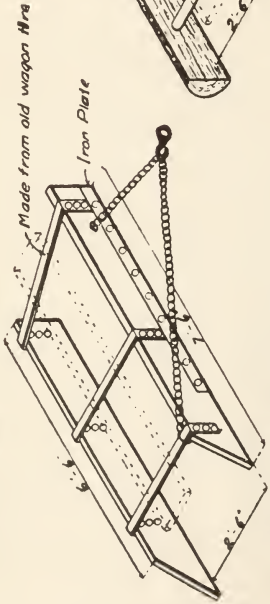
SKETCH MAP OF COLORADO

Showing Seven Routes into Colorado from the East AND Roads from the West

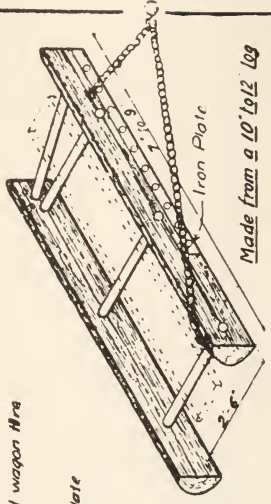


OFFICE STATE HIGHWAY COMMISSION

U. S. GEOLOGICAL SURVEY

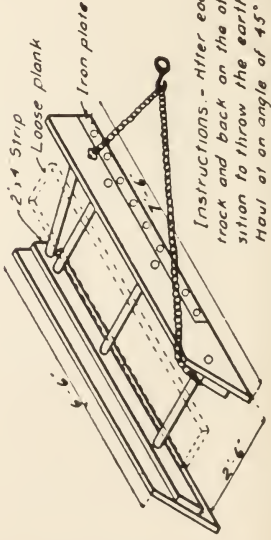


Cut from a 2' x 12' x 14' Plank



THREE PLANS
FOR
THE KING ROAD DRAG
COLO. HIGHWAY COMMISSION

May 1905



Instructions. - After each rain drive up one side of the wheel track and back on the other side at least once, with drag in position to throw the earth to the center. Ride on the drag. Haul at an angle of 45°.

Gradually widen the strip dragged as the road improves.

To round up the road better, plow a shallow furrow occasionally each side of the dragged strip, and work the loose dirt to the center.



COLORADO SPRINGS TO CANON CITY ROAD.—BUILT BY CONVICT LABOR.



DENVER-COLORADO SPRINGS ROAD NEAR SALIDA.



CLIMBING DIVIDE—DISAPPOINTMENT CREEK—1910.



BAD TURN IN ROAD, TOP OF BATTLE MOUNTAIN.



ROAD ALONG ARKANSAS RIVER ABOVE GRANITE.



VIEW IN CANON ABOVE BUENA VISTA ON ROAD TO HARTZEL.



CLIMBING DIVIDE—DISAPPOINTMENT CREEK.



LOGAN COUNTY GOOD ROAD BOOSTERS.

Second Biennial Report
OF THE
State
Highway Commission
OF THE
State of Colorado
1912

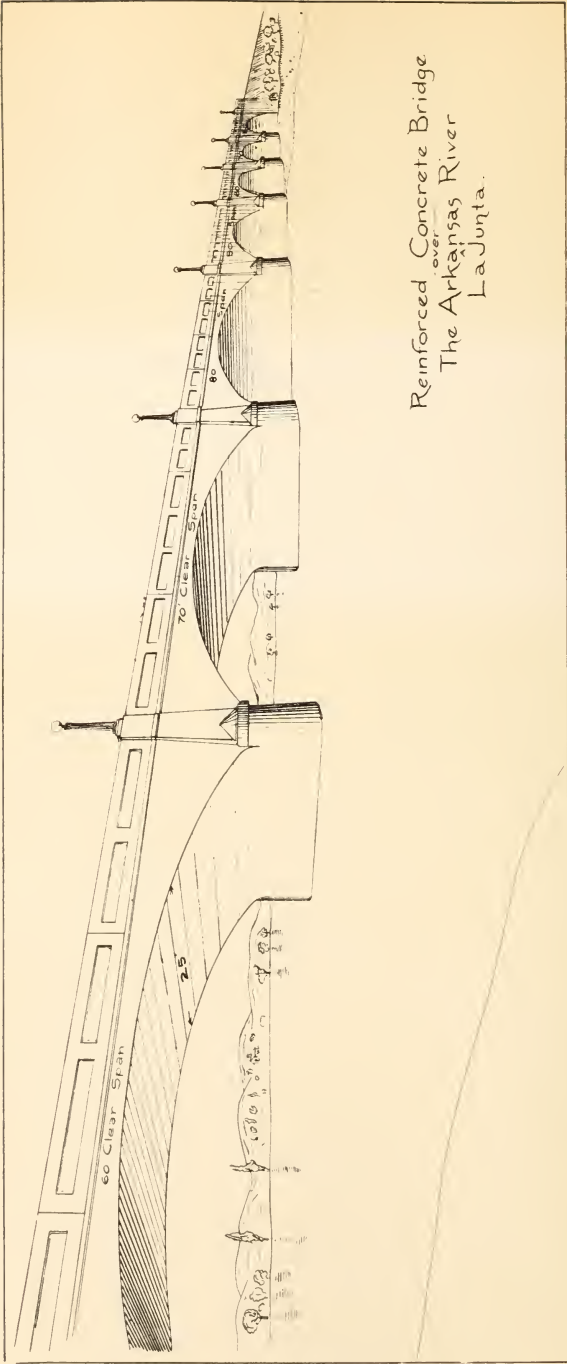
C. P. ALLEN, Denver, Chairman
W. M. WILEY, Holly; THOS. H. TULLEY, Durango, Members
J. E. MALONEY, Secretary and Engineer
WILLIAM F. HIGGINS, Stenographer

To the Governor



Issued by order of the Commission
November, 1912

DENVER, COLORADO
THE SMITH-BROOKS PRINTING CO., STATE PRINTERS
1912



Reinforced Concrete Bridge
over
The Arkansas River
La Junta.

NOW UNDER CONSTRUCTION

COMPLIMENTS OF
State Highway Commission



Second Biennial Report
OF THE
State
Highway Commission
OF THE
State of Colorado
1912

C. P. ALLEN, Denver, Chairman
W. M. WILEY, Holly; THOS. H. TULLEY, Durango, Members

J. E. MALONEY, Secretary and Engineer
WILLIAM F. HIGGINS, Stenographer

To the Governor



Issued by order of the Commission
November, 1912

DENVER, COLORADO
THE SMITH-BROOKS PRINTING CO., STATE PRINTERS
1912

LETTER OF TRANSMITTAL.

Denver, Colorado, December 15, 1912.

HON. JOHN F. SHAFROTH,
Governor of Colorado.

Dear Sir: We submit herewith a report of the State Highway Commission of Colorado for the biennial period ending November 30, 1912, together with our recommendations for the future for the consideration of both yourself and the Nineteenth General Assembly.

Respectfully submitted,

C. P. ALLEN,
Chairman.

W. M. WILEY.
THOS. H. TULLEY.

J. E. MALONEY,
Secretary.

Second Biennial Report
OF THE
State Highway Commission
OF THE
State of Colorado
1912

The past two years with the State Highway Commission of Colorado have been a series of handicaps and disappointments.

The Eighteenth General Assembly, yielding to a popular demand, which has since grown into an emphatic one, passed an amendment to the act creating this Commission, extending its powers by clothing the Commission with discretionary privileges in the apportionment of the funds to be distributed by it, and providing for the financing of this department through a \$25,000 annual appropriation from the General Revenue Fund of the state, as well as appropriating to it the moneys accruing to the Internal Improvement Permanent Fund and the Internal Improvement Income Fund.

The \$25,000 annual appropriation from the General Revenue Fund, being a fifth-class appropriation, was unavailable because the sum-total of the appropriations was far in excess of the revenue income, and therefore the means of operation were confined to the possible revenues accruing to the Internal Improvement Funds.

The bill as passed, generally referred to as House Bill No. 200, made it possible for the Highway Commission to meet emergency conditions in counties that were on the verge of bankruptcy, by authorizing that 10 per cent of all moneys in its control might be expended as conditions warranted, without exacting an equal—or, if need be, any—contribution on the part of the county.

This was a wise provision, if a general and connected road system is ever to be realized in Colorado, as our geographical and topographical conditions are such as to, in many cases, levy the heaviest burdens where the least ability to meet them exists, if

we are to connect the eastern and western, northern and southern, portions of this great commonwealth.

That law authorized the purchase of road-building machinery by the state to the total investment of \$50,000, the same to be rented to the counties at a rate of 5 per cent per annum of its cost, and the cost of maintenance to be borne by the county, which was also to defray the cost of operations. The act was the conception of the legislative committee of the State Good Roads Convention, held in Denver in January, 1911.

This action by the convention and legislature was prompted by the desire to have this money spent to perfect a system of connected roads.

Acting on the assumption that House Bill No. 200 was valid, the State Highway Commission contracted for its first road outfit, consisting of a *Buffalo-Pitts fifteen-ton traction engine and six Pitts cross-dumping road cars, with a carrying capacity of sixty tons, tank wagon and extras*. This order was given the *Elbe Thresher and Machinery Company, of Denver*, which delivered the same in August, 1911, prepaying the freight thereon as an accommodation to this department, the appropriation for which, in the general order of procedure, would not become available before September 5, 1911. Therefore, assurances of assistance were given to many counties that, if they would go ahead with much-needed and much-desired improvements of lasting and permanent character, the Highway Commission would assist them as soon as its funds were released.

As a consequence, some of the counties embarrassed themselves, as they thought temporarily, to get the new work under way.

As notable illustrations might be cited: Morgan County, which undertook improvements on the main highway, involving an expenditure of over \$30,000; Otero County, the construction of a \$50,000 bridge near La Junta; Pueblo County with its \$35,000 in concrete bridges and culverts, as well as grading and surfacing north to the El Paso county line; Mesa County, about \$20,000 in the Plateau country, where an excellent piece of work was prosecuted by a convict camp assigned by Warden Tynan to do the same; Archuleta County, far beyond its means and individual ability; and La Plata County, in the purchase of road-building machinery at a cost exceeding \$5,000.

There are others, but such as we have mentioned will suffice to show the disappointment to all when, on September 5, 1911, it was learned that a flaw existed in the new law which precluded the immediate distribution of the road funds.

The roll-call on the final passage of the measure failed to appear in the printed journal of the Senate, as the Constitution provides. Then began a term of litigation, Prowers County starting the proceedings by bringing an action before the late Judge

Bliss in the Denver District Court, where, upon trial, the act was held to be invalid. An appeal was taken to the Supreme Court.

While the cause was therein pending, and acting upon competent legal advice, the Highway Commission sought to keep itself within the law, which requires the general apportionment of its funds among the counties to be made on or before the first Tuesday in March, in case the Supreme Court should hold the act valid. Therefore, on March 5, 1912, the Highway Commission made the following apportionment after a conference with the State Treasurer, Hon. Rody Kenehan, as to the funds available during the year, and we give with it some other data used in arriving at our conclusion:

SECOND BIENNIAL REPORT

COUNTY	Valuation	Road Levy	Road Tax	Bonded Debt	Miles Road	Apportionment State Road Fund by Commission	Apportionment by Separate Bills
Adams	\$ 6,500,520.00	5	32,502.60	None	673	\$ 10,000.00	\$ 4,000.00
Arapahoe	5,265,270.00	1.25	6,569.09	None	378	5,000.00	2,000.00
Archuleta	1,420,505.00	.....	16,000.00	\$ 25,000.00	(400)	8,000.00	1,000.00
Baca	1,009,133.00	.5	504.56	23,500.00	(42)	1,000.00	.....
Bent	2,811,959.00	7	19,683.71	28,000.00	447	5,000.00	1,533.33
Boulder	13,024,765.00	4	52,099.08	None	613	12,000.00	8,000.00
Chaffee	3,506,964.00	3	10,520.89	255,000.00	307	8,000.00	9,166.67
Cheyenne	2,567,894.00	.....	4,479.52	26,000.00	94	3,000.00	3,000.00
Clear Creek	2,665,605.00	8.5	22,657.64	None	110	10,000.00	7,150.00
Conejos	3,288,151.00	9	29,593.35	105,000.00	822	10,000.00	5,000.00
Costilla	2,381,900.00	7	16,673.30	26,000.00	564	5,000.00	2,000.00
Crowley	2,102,551.00	4	8,410.20	.....	....	4,000.00	.....
Custer	772,150.00	9	6,949.33	None	(800)	6,000.00	3,000.00
Delta	5,169,000.00	8.5	43,936.50	71,700.00	419	8,000.00	2,333.33
Denver	134,276,950.00	.....	.....	302,500.00	(Z)	.....	.....
Dolores	429,330.00	3.9	1,674.38	87,400.00	(70)	7,000.00	.....
Douglas	2,947,500.00	4	11,789.98	15,000.00	576	12,000.00	1,000.00

STATE HIGHWAY COMMISSION

Eagle	1,911,722.00	6	11,470.33	69,000.00	270	6,000.00	8,000.00
Elbert	2,780,014.00	7.5	20,850.10	None	586	3,000.00	.....
El Paso	22,206,160.00	3	66,618.48	None	661	14,000.00	6,000.00
Fremont	6,988,235.00	5	34,941.17	None	382	20,000.00	22,100.00
Garfield	4,652,655.00	12	55,831.98	183,300.00	570	12,500.00	7,500.00
Gilpin	2,024,447.00	10	9,640.48	None	(160)	2,000.00	1,250.00
Grand	1,333,057.00	6.5	8,664.93	None	386	8,000.00	4,000.00
Gunnison	4,464,195.00	5.5	24,553.07	377,900.00	673	11,000.00	2,000.00
Hinsdale	677,204.00	2	1,354.40	144,700.00	143	7,000.00	7,000.00
Huerfano	3,836,939.00	.....	.....	31,000.00	(500)	5,000.00	2,333.33
Jackson	986,408.00	5	4,932.04	None	305	2,000.00	1,500.00
Jefferson	5,959,100.00	7	41,713.70	None	568	12,500.00	5,800.00
Kiowa	1,977,814.00	.....	.....	.....	233	3,000.00	1,400.00
Kit Carson	2,786,615.00	2.2	6,130.55	None	1,076	4,000.00	2,400.00
Lake	5,883,036.00	1.1	6,471.34	595,300.00	198	10,000.00	2,000.00
La Plata	5,504,724.00	7	38,533.07	126,500.00	(550)	15,000.00	3,000.00
Larimer	9,358,535.00	9.5	88,966.08	31,000.00	719	12,000.00	5,900.00
Las Animas	13,924,728.00	1.8	25,064.51	155,000.00	958	10,000.00	3,733.33
Lincoln	2,731,757.00	3	8,197.86	None	264	2,000.00	2,333.33
Logan	5,949,006.00	4.2	24,985.83	40,000.00	1,042	11,000.00	.....
Mesa	8,138,080.00	.....	.....	50,000.00	933	15,000.00	15,000.00
Mineral	746,286.00	2	1,492.57	17,000.00	134	10,000.00	4,000.00
Moffat	1,240,650.00	3.5	4,342.27	None	(400)	3,000.00	.....

COUNTY	Valuation	Road Levy	Road Tax	Bonded Debt	Miles Road	Apportionment State Road Fund by Commission	Apportionment by Separate Bills
Montezuma	2,385,648.00	13	31,013.42	27,000.00	300	7,500.00	1,000.00
Montrose	3,632,730.00	11	39,971.00	144,000.00	509	12,000.00	5,500.00
Morgan	4,745,995.00	10	47,459.95	None	696	14,000.00	.....
Otero	8,261,025.00	7	57,827.17	3,500.00	759	16,000.00	4,000.00
Ouray	2,985,650.00	4.5	13,435.33	230,000.00	229	12,000.00	.....
Park	2,669,912.00	5	13,439.56	None	376	8,000.00	3,400.00
Phillips	1,845,539.00	1	1,845.54	42,800.00	314	2,500.00	.....
Pitkin	2,180,740.00	4.2	9,159.10	409,500.00	(275)	20,000.00	10,000.00
Prowers	4,675,252.00	10	46,752.64	15,500.00	805	8,000.00	2,933.33
Pueblo	27,415,609.00	2.6	71,280.58	350,000.00	967	22,500.00	10,500.00
Rio Blanco	1,164,639.00	10	11,646.39	25,000.00	448	4,000.00	.....
Rio Grande	2,566,550.00	10	24,162.30	193,300.00	474	17,500.00	4,733.33
Routt	3,650,400.00	5	18,252.00	None	(500)	7,000.00	7,000.00
Saguache	3,293,964.00	5	16,469.82	None	955	5,000.00	1,400.00
San Juan	2,193,737.00	6.4	14,040.23	97,000.00	125	25,000.00	3,000.00
San Miguel	3,822,940.00	10	38,240.40	125,000.00	(300)	5,000.00	1,400.00
Sedgwick	1,655,290.00	8.6	14,235.49	None	216	5,000.00	5,000.00
Summit	1,860,923.00	.....	.....	.....	214	4,000.00	.....

Teller	9,790,950.00	2	19,581.90	None	241	8,000.00	7,500.00
Washington	2,713,381.00	3.5	9,490.73	15,500.00	1,150	5,000.00	.....
Weld	19,857,590.00	.....	133,916.53	None	(2,000)	8,000.00	2,500.00
Yuma	2,964,715.00	4	8,301.21	None	542	2,000.00	.....

Mileage in parentheses are approximate. "Z" equals streets and alleys. In the missing county data above, some of the levies are for all county purposes combined, including roads and bridges.

In its distribution, the Commission acted upon what the members knew from personal contact with the situation in the various counties, and after conversation or correspondence with the county commissioners and engineers.

When the Supreme Court, in June, 1912, finally decided the invalidity of House Bill No. 200, efforts were started to have the same initiated, and some opposition developed over the legality of such procedure. The advice of the Attorney General was sought, and the following written opinion was handed down by him to your Excellency:

“STATE OF COLORADO
“LEGAL DEPARTMENT
“DENVER.

“Denver, Colorado, June 18, 1912.

“Hon. John F. Shafroth,
“Governor of Colorado,
“State Capitol.

“Dear Sir: I have your favor of June 14, in which you ask my opinion as to whether the fund in the state treasury known as the ‘Internal Improvement Fund’ can be appropriated under the law by a measure initiated and approved by the people of the state, as provided by the constitutional amendment relating to the initiative and referendum.

“The Internal Improvement Fund is one derived from certain moneys paid by the federal government to the state, which moneys arise from the proceeds of sales of agricultural public lands within the state.

“Section 12 of the Enabling Act provides as follows:

“‘That five percentum of the proceeds of the sales of agricultural public lands lying within said State, which shall be sold by the United States subsequent to the admission of said state into the Union, after deducting all the expenses incident to the same, shall be paid to the said state for the purpose of making such internal improvements within said state as the legislature thereof may direct; Provided, that this section shall not apply to any lands disposed of under the homestead laws of the United States, or to any lands now or hereafter reserved for public or other uses.’

“For our present purposes we may assume that the provisions of the Enabling Act are binding upon the state, and the same should be followed. One of these provisions, as found in section 12, is that the moneys from the fund shall be paid to the state for the purpose of making such internal improvements within the state as the legislature thereof may direct.

“The question arises as to the meaning of the word ‘legislature’ as used in section 12 of the Enabling Act.

"If by this word is meant the General Assembly of the State of Colorado, then it would seem that a measure initiated by the people would not be effective to appropriate these moneys, since the General Assembly consists of the Senate and the House of Representatives.

"If, on the other hand, by the word 'legislature' is meant the legislative power of the state—that is, the power to make and enact laws—it would appear that a measure initiated by the people could lawfully appropriate moneys from the Internal Improvement Fund, since the people, by the constitutional amendment relating to the initiative and the referendum, is a part of the law-making power, as well as the General Assembly. Thus, the first paragraph of section 1 of Article V of the Constitution of the State of Colorado, as it now exists, provides as follows:

"The legislative power of the State shall be vested in the General Assembly consisting of a Senate and House of Representatives, both to be elected by the people, but the people reserve to themselves the power to propose laws and amendments to the Constitution and to enact or reject the same at the polls independent of the General Assembly, and also reserve power at their own option to approve or reject at the polls any act, item, section or part of any act of the General Assembly.' (Session Laws 1910, p. 12.)

"The word 'legislature' has been variously defined by the courts, and the different meanings of the word have been arrived at after considering the circumstances and connections in which the term was used. It has often been referred to as meaning the Senate and the House of Representatives. It has also been construed to mean the legislative power of the state wherever vested, and in that connection the word has been broad enough to cover not only the Senate and the House of Representatives, but also the Governor of the state and the people when acting in their capacity to refer laws.

"The determination, then, of the whole matter in issue rests upon the meaning to be given to the word 'legislature' as used in the Enabling Act. Even prior to the adoption of the constitutional amendment relating to the initiative and referendum, a construction which would limit the word 'legislature' to the House and Senate in this state would be entirely out of accord with the generally recognized practice and custom of legislation in this state ever since its admittance to the Union.

"Thus, no bill passed by the General Assembly appropriating moneys from the Internal Improvement Fund has ever become a law without first being presented to the Governor for his approval or disapproval; and if he has vetoed any such bill, his veto has been given its ordinary effect, as prescribed by section 11 of Article IV of the Constitution, which says in part:

"Every bill passed by the general assembly shall, before it becomes a law, be presented to the governor. If he approve, he

shall sign it and thereupon it shall become a law; but if he do not approve, he shall return it with the objections to the House in which it originated, which House shall enter the objections at large upon its journal and proceed to reconsider the bill. * * *'

"The Governor, when using his veto with reference to bills passed by the General Assembly, appropriating moneys from the Internal Improvement Fund, has, under all of the authorities, acted in a legislative and not in an executive capacity. In other words, he has been exercising legislative power.

"Thus, in *Lukens vs. Nye*, 105 Pacific, 593, it is said, at page 594:

"While engaged in considering bills which have passed both houses of the legislature, and which are presented to him for approval or disapproval, he is acting in a legislative capacity, and not as an executive. He is for that purpose a part of the legislative department of the state. *Fowler v. Pierce*, 2 Cal. 172; *People v. Bowen*, 21 N. Y. 521.'

"And so we find in 36 Cyc., 958, the following:

"Under the system of government adopted in this country the chief executive, either the president or a governor, is a part of the law-making power.'

"The last legislative act which breathes the breath of life into a statute and makes it a part of the laws of the state is the approval of the Governor.

"*Stewart vs. Chapman*, 104 Me., 17.

"The veto power of the President is not executive in its nature, but essentially legislative. It makes him in effect a branch of Congress, although only to a limited and qualified extent.

"Black on Constitutional Law, sec. 67.

"The sovereign in England, who is charged with the duty of approving or disapproving acts of Parliament, is considered a constituent part of the supreme legislative power.

"1 Blackstone's Commentaries, sec. 361.

"If, then, we have regard to the mode of procedure in this state, it will not do to confine the meaning of the word 'legislature,' as used in the Enabling Act, to the General Assembly. It must also include the Governor when acting in a legislative capacity. In other words, it should be construed to mean the legislative power of the state.

"The meaning of the word has also been defined when a bill referred by the people has been involved, and this is the only case I have been able to find in which the word has been construed in such connection.

"Thus, in *State ex rel. Schrader vs. Polley*, Secretary of State, 127 N. W., 848, the word 'legislature' was defined by the Supreme Court of South Dakota, which state has long had in

operation the initiative and the referendum. Section 1 of Article III of the Constitution of South Dakota provides in part as follows:

“The legislative power shall be vested in a Legislature which shall consist of a Senate and a House of Representatives. Except that the people expressly reserve to themselves the right to propose measures, which measures the Legislature shall enact and submit to a vote of the electors of the State, and also the right to require that any of the laws which the Legislature may have enacted shall be submitted to a vote of the electors of the state before going into effect.”

“Section 4 of Article I of the United States Constitution provides as follows:

“The times, place and manner of holding elections for senators and representatives shall be prescribed in each state by the Legislature thereof, but the Congress may at any time by law make or alter such regulations, except as to place of choosing Senators.”

“In that case a law had been passed by the General Assembly of South Dakota relating to nominations for Congress, which law, under the initiative and referendum provision above set forth, had been referred to the people.

“Schrader proceeded under the provisions of the law, and presented a nominating petition to the Secretary of State, and entirely disregarded the fact that the law had been referred to the people, claiming that, the United States Constitution having provided that the time, place, and manner of holding elections shall be prescribed in each state by the legislature, only the General Assembly had the right to pass upon such matters, and such a law could not be referred.

“The Secretary of State refused to file the nominating petition, whereupon mandamus proceedings were brought against him to compel him to file the same. The contention of the parties is best set forth in the language of the court, on page 849, as follows:

“The contention of the defendant is that chapter 223, Laws 1909, is in all things the same as any other law; that it is subject to the same constitutional limitations, as to the manner of passage, and approval, veto and referendum, as any other law that may be passed by the legislature. While, on the other hand, the relator contends that under section 4, art. 1, Const. U. S., the legislature only is authorized and empowered to act in the creation of congressional districts; that the Governor has no veto power, nor the people any referendum power, under the state constitution, over such action of the members of the legislature, and when a majority of the members of the legislature consent and vote to divide the state into congressional districts, the Governor has no veto power over such action; and that such action is not subject to referendum vote of the people, under the power re-

served in the people, over the passage of laws, by section 1, art. 3, Const. S. D., on the theory that the Governor who exercises the veto power, and the people, who exercise the referendum power, are not a part of the legislature, and because the power granted by the United States Constitution says that the time, place and manner of holding elections of Representatives in Congress shall be prescribed in each state by the legislature thereof. It is the contention of the relator that, when the federal Constitution gave power to the "Legislature" this power so given could not be delegated to the people.'

"The court, on page 850, proceeds to define the word 'legislature' as used in the Federal Constitution; and certainly the definition there given should be applicable to the definition of the same word as used in our Enabling Act. The court says:

"We are also of the opinion that the word "legislature" as used in section 4, art. 1 of the federal Constitution does not mean simply the members who compose the legislature, acting in some ministerial capacity, but refers to and means the lawmaking body or power of the state, as established by the state Constitution, and which includes the whole constitutional lawmaking machinery of the state. State governments are divided into executive, legislative and judicial departments, and the federal Constitution refers to the "Legislature" in the sense of its being the legislative department of the state, whether it is denominated a legislature, general assembly, or by some other name. Under section 1, art. 3 of the state Constitution, it will be observed the people of this state have reserved to themselves, as a part of the lawmaking power, the right to vote by referendum upon any law passed by the legislature, with certain exceptions, prior to the going into effect of such law. That the exceptions mentioned are "such laws as may be necessary for the immediate preservation of the public peace, health or safety, support of the state government or its existing state institutions." It is clear that said chapter 223 is not within any of these exceptions. Under the Constitution of this state, the people, by means of the initiative and referendum, are a part and parcel of the lawmaking power of this state, and the legislature is only empowered to act in accordance with the will of the people as expressed by the vote, when the referendum is properly put in operation. The term "Legislature" has a restricted meaning which only applies to the membership thereof, and it also has a general meaning which applies to that body of persons within a state clothed with authority to make the laws (Bouvier's Law Dictionary; Webster's Dictionary; 18 Am. & Eng. Ency., 822; 25 Cyc., 182), and which in this state, under section 1, art. 3, Const. S. D., includes the people. Therefore, we are of the opinion that in the passage of this act dividing the state into two congressional districts, by the lawmaking power of this state, it was necessary that such law be

passed according to the constitutional provisions of this state, and the referendum was applicable thereto.'

"In view of the foregoing, I am of opinion that the moneys in the Internal Improvement Fund may be appropriated by an initiated measure.

"Very sincerely yours,

[Signed] "BENJ. GRIFFITH,
"Attorney General."

Acting upon the opinion given by the Attorney General, petitions were circulated and a sufficient number of signatures obtained to have the bill placed upon the official ballot, and submitted to the people at the November, 1912, election.

In the previous report of the Commission, made on November 30, 1910, some of the work which had been started in that year was left unfinished at that time. This work was as follows:

County	Road No.	Character of Work	Remarks
Arapahoe	.....2 and 7	Grading and concrete bridge.....	Completed 1911
Adams	.....2	Grading and concrete culvert.....	Completed 1911
Bent	.....6	Grading	Completed 1911
Boulder	.....2	Grading and concrete eye-beam bridges	Completed 1911
Delta	.....12	Grading	Completed 1911
Douglas	..... 3 and 8	Grading	Completed 1911
El Paso	..... 3 and 4	Grading and concrete bridges.....	Completed 1911
Garfield	.....10 and 11	Grading and concrete culvert.....	Completed 1911
Jefferson	..... 1 and 2	Grading and surfacing.....	Completed 1911
La Plata	.....13, 14 and 15	Grading and surveying.....	Completed 1911
Larimer	.....2	Grading and concrete bridges.....	Completed 1911
Logan	..... 9 and 19	Grading	Completed 1911
Mesa	.....11 and 12	Grading and bridges.....	Completed 1911
Montezuma	..... 7 and 9	Grading and concrete bridges.....	Completed 1911
Morgan	..... 7 and 9	Grading and concrete bridges.....	Completed 1911
Otero	..... 5 and 6	Grading	Completed 1911
Ouray	.....13	Grading	Completed 1911
Pueblo	..... 4 and 5	Grading and bridges.....	Completed 1911
San Juan	.....13	Surveying.....	Completed 1911
Sedgwick	.....9	Grading and bridges.....	Completed 1911
Washington	.....19	Grading	Completed 1911
Yuma	.....19	Grading	Completed 1911

The above pieces of work have since been completed, and the balance of the state aid which was apportioned to these counties on account of these various road improvements has been paid as

far as the appropriation which was given to the Commission would allow.

During the past two years road locations have been gone over and inspected in the following counties and localities: La Plata County, from Durango in each direction to the county line; Mesa County, from Grand Junction to Salt Lake, and in every direction to the Mesa County line; Ouray, Logan, Otero, Morgan, Montezuma, Archuleta, Boulder, Larimer, Sedgwick, Phillips, Yuma, Park, Jefferson, Chaffee, Elbert, Clear Creek, Delta, Kit Carson, Arapahoe, Gunnison, Montrose, San Miguel, El Paso, Garfield, Rio Blanco, Eagle, Grand, Lake, Fremont, Las Animas, Bent, Prowers, Lincoln, Weld, Conejos, Rio Grande, Mineral, Hinsdale, Pueblo, Adams, Huerfano, Costilla, Saguache, and Pitkin Counties.

These investigations were made in company with the county commissioners in the various counties in which the roads were situated, with their engineers, in some cases by our full Commission, and in others by different members of our Commission.

On these various inspection trips, many of which were made over trails, on horseback and in wagons, and others of which we were enabled to make in machines, we covered approximately 2,600 miles of primary state roads.

Bridge sites and bridge construction and foundations have been examined and inspected in the following counties: Otero, Morgan, Montezuma, Delta, Arapahoe, Adams, El Paso, Kit Carson, Sedgwick, Rio Grande, Eagle, and the city of Mancos.

Plans for bridges have been examined and prepared by this office for the following places: city of Mancos, Delta County, Adams County, Arapahoe County, Morgan County, Otero, County, El Paso County, Sedgwick County, Rio Grande County, and Eagle County.

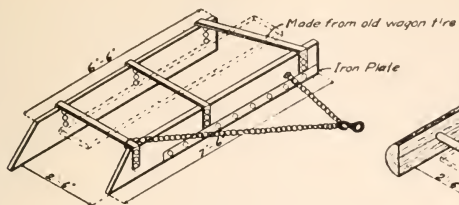
Surveys and profiles were made for the road up Lookout Mountain, and thence to the top of Floyd Hill on the road between Golden and Idaho Springs. The survey was completed on the road in San Juan County from Silverton toward Ouray and from Silverton toward Durango. Surveys were completed on roads from Twin Lakes to Aspen over the Continental Divide. Surveys were also completed from Stunner over Elwood Pass to Silver Creek, and profile was made for improved location of this road. Surveys have been started and partially completed for the road location over the Black Mesa between Delta and Sapinero. Surveys have also been started, and are practically completed at this time, for the road from Montrose west to the Paradox; also from Grand Junction by way of Whitewater and Gateway to Paradox; also from Montrose to Sapinero over the Blue Mesa route. Work is also under way in Routt County on the location of a road from Kremmling to Toponas.



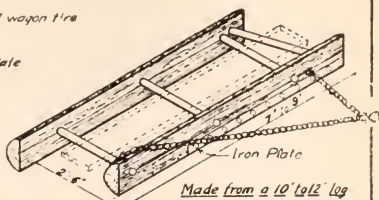
HOGAN'S HOLLOW BRIDGE, PUEBLO COUNTY—PUEBLO-COLORADO
SPRINGS ROAD



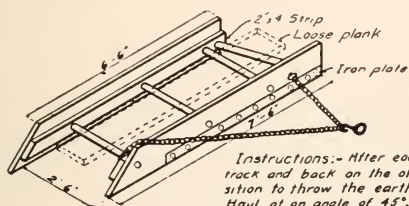
CONCRETE PILE BRIDGE, BIJOU CREEK, MORGAN COUNTY—
DENVER-FORT MORGAN ROAD



Cul from a 2' x 12' x 14' Plank



Made from a 10' x 12' log

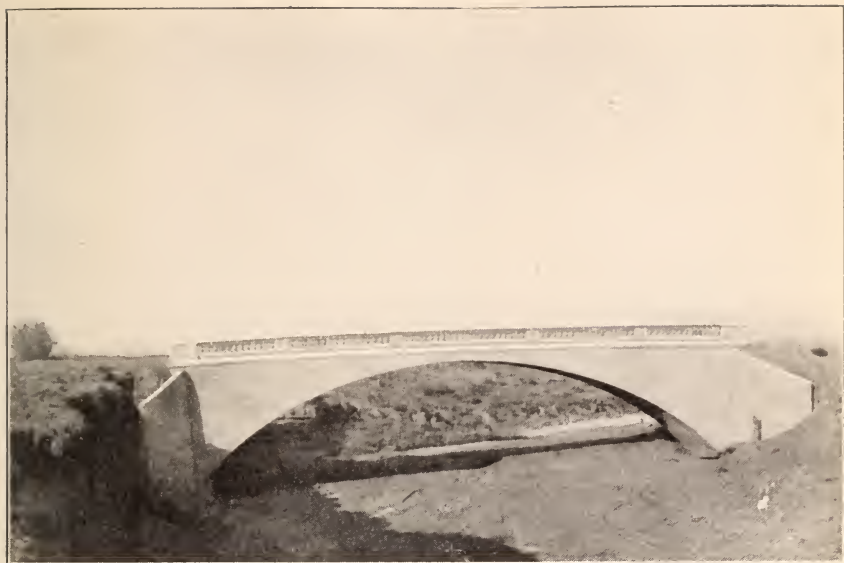


THREE PLANS
FOR
THE KING ROAD DRAG
COLORADO
HIGHWAY COMMISSION

Instructions:- After each rain drive up one side of the wheel track and back on the other side at least once, with drag in position to throw the earth to the center. Ride on the drag. Haul at an angle of 45°. Gradually widen the strip dragged as the road improves. To round up the road better, plow a shallow furrow occasionally each side of the dragged strip, and work the loose dirt to the center.



STATE HIGHWAY, SAN MIGUEL COUNTY



STEELE HOLLOW BRIDGE, EIGHTY-FIVE-FOOT ARCH, LUTEN TYPE—
- PUEBLO-COLORADO SPRINGS ROAD



TOP MONARCH PASS
11,650 feet elevation above sea level

STATE PRIMARY ROADS

The following roads, numbered from 21 to 49 inclusive, have been declared state primary roads in addition to those mentioned in the previous report of this Commission. The total list to date is as follows:

Road No.	Terminal Points	Distance (Miles)
1	Denver to Golden.....	8½
2	Denver to Fort Collins, branch to Boulder.....	68¾
3	Denver to Colorado Springs.....	73
4	Colorado Springs to Pueblo.....	46'
5	Pueblo to La Junta.....	65
6	La Junta to Kansas state line.....	93
7	Denver to Fort Morgan.....	90
8	Sedalia to Palmer Lake, branch to Kiowa.....	53½
9	Fort Morgan to Colorado-Nebraska state line.....	112
10	Leadville to Glenwood Springs.....	93
11	Glenwood Springs to Grand Junction.....	104
12	Grand Junction to Montrose.....	67
13	Durango to Montrose.....	80
	Durango to New Mexico state line.....	21
14	Durango to Utah state line.....	70
15	Durango to Alamosa.....	145
16	Alamosa to Walsenburg, and to south state line.....	124
17	Leadville to Buena Vista and Poncha Pass.....	74
18	Colorado Springs to Buena Vista.....	96
19	Brush to Wray, Colorado-Nebraska state line.....	98
20	Gunnison to Montrose and Utah state line.....	140
21	Golden to Sulphur Springs.....	75½
22	Colorado Springs to Salida.....	122½
23	Sterling to east state line.....	73½
24	Fort Morgan to Loveland.....	86
25	Glenwood Springs via Aspen to Twin Lakes.....	81½
26	Pueblo to south state line.....	109¼
27	Denver to Idaho Springs road via Morrison.....	34
28	Salida to Gunnison.....	69
29	La Junta to Trinidad.....	82¼
30	Colorado Springs to Limon and east state line.....	176¼
31	Limon to Junction with Bennett Road.....	55½
32	Limon to Cheyenne Wells and east state line.....	106
33	Fowler to Eads and east state line.....	113

Road No.	Terminal Points	Distance (Miles)
34	Lamar to Springfield.....	55
35	Morrison to Fairplay.....	73
36	Poncha Pass to Monte Vista, branch to Parlin.....	170½
37	Divide to Cripple Creek, Canon City and Silvercliff.....	49¼
38	Alamosa to Creede, Lake City and Sapinero.....	151.3
39	Sulphur Springs to Wolcott.....	60¾
40	State Bridge to Steamboat Springs.....	75
41	Craig to Steamboat Springs, and to west line of state.....	158
42	Craig to Rifle via Meeker, branch to Angora.....	168
43	Steamboat Springs to Walden and to Granby.....	118
44	Ridgeway to Naturita, branch to Telluride.....	85
45	Cortez to Norwood, branch to Rico.....	95
46	Delta to Sapinero	76
47	Kremmling to Breckenridge.....	55
48	Silverton to Creede.....	62
49	Denver to Brighton.....	21

In addition to these, State Primary Road No. 5 was amended so as to read from La Junta by way of Pueblo to Florence, meeting State Primary Road No. 22 at that point—twenty-eight miles additional. No. 11 was amended to read from Glenwood Springs by way of Grand Junction to west state line of Colorado—thirty-two miles additional. No. 2 was amended to read from Denver by way of Fort Collins to north state line of Colorado—thirty-three miles additional.

The total mileage laid out to date is 4,830 miles.

MAPS

At the time of making the last report, thirty-three counties had turned in their county road maps. Since that time we have received road maps from the following counties: Adams, Costilla, Eagle, Elbert, Garfield, Grand, Hinsdale, Jackson, La Plata, Ouray, Park, Prowers, Pueblo, San Miguel, Weld, Lake and Moffat. Surveys of a portion of the main roads in Pitkin, Archuleta and San Juan Counties have been received and are on file. No road maps have been received from Baca, Custer, Dolores, Gilpin, Huerfano and Routt Counties.

BULLETINS

During the past two years the supply of Bulletin No. 1 was exhausted, and we have been unable to supply the numerous demands which have been coming in for this bulletin, as we have had no money with which to have this printed. Bulletin No. 2, containing the road laws of the state, has also been exhausted,

and we are having a great many demands for the same. This bulletin should also be published after being brought down to date.

Road maps for the illustrated road guide of Colorado were prepared in this office, and turned over to the Clason Map Company to be published, with other descriptive matter and photographs furnished by the Denver Chamber of Commerce.

This was done because the Commission had no funds with which to publish these maps, but by co-operation with the Denver Chamber of Commerce and the Clason Map Company it was enabled to put this road guide before the public.

A set of standard plans for reinforced concrete slab bridges and reinforced girder bridges for spans from one to fifty-five feet has been prepared and is now on file in this office. These plans have been used by several of the counties this past year.

On state primary roads the material available for surfacing is about as follows (Roads No. 1 to No. 20 being taken from the previous report, and No. 21 to No. 46, inclusive, from knowledge gained on our inspection trips and visits to different sections of the state, and from reports from counties) :

Road No.	County	Material Available
1	Jefferson	Basalt, and pit and creek gravel
2	Adams	Pit, river, and creek gravel, sand and adobe
	Boulder	Pit gravel, sand and clay
	Larimer	Pit gravel, sand and clay, and limestone
3-8	Arapahoe	Pit and creek gravel, sand and clay
	Douglas	Pit and creek gravel, sand and clay
	El Paso	Pit and creek gravel, sand and clay
4	El Paso	Pit and creek gravel, sand and clay
	Pueblo	Pit and creek gravel, sand and clay
5	Pueblo	Pit and creek gravel, sand and clay
	Otero	Pit and creek gravel, sand and clay
6	Otero	Pit and creek gravel, shale, and sand-clay
	Bent	Pit and creek gravel, shale, and sand-clay
	Prowers	Pit and creek gravel, and sand-clay
7	Adams	Pit and creek gravel, and sand-clay
	Morgan	Pit and creek gravel, and sand-clay
9	Morgan	Pit and creek gravel, and sand-clay
	Logan	Pit and creek gravel, and sand-clay
	Sedgwick	Pit and creek gravel, and sand-clay
10	Lake	Pit gravel, granite and other rocks
	Eagle	Pit gravel, granite and other rocks
	Garfield	Pit gravel, granite and other rocks
11	Garfield	Pit and creek gravel, granite and other rocks

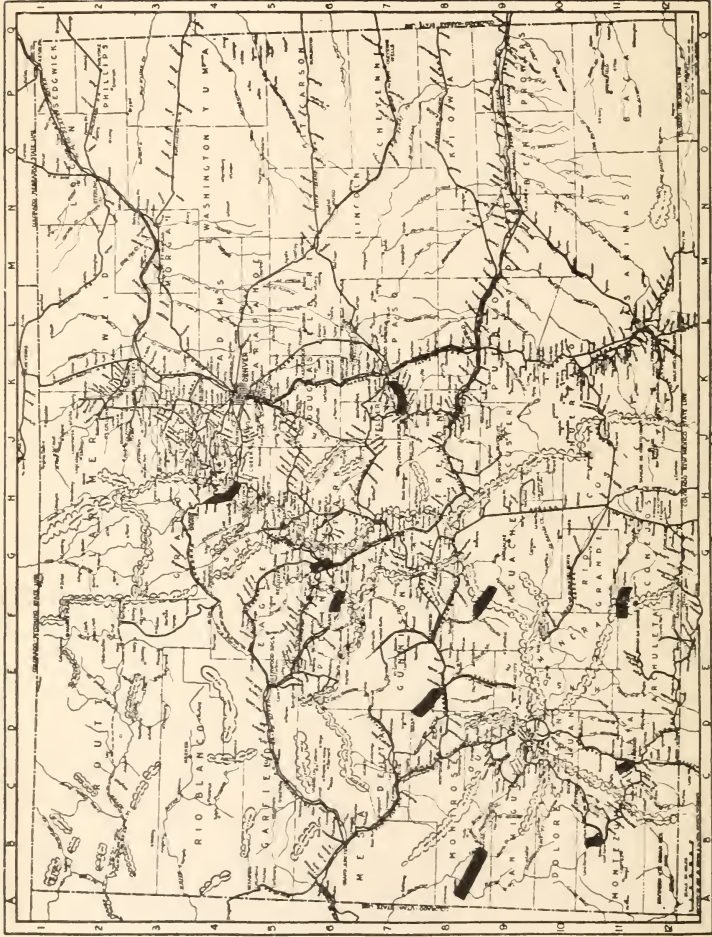
Road No.	County	Material Available
	Mesa	Pit and creek gravel, shale, and sand-clay
12	Mesa	Pit and creek gravel, shale, and sand-clay
	Delta	Pit and creek gravel, shale, and sand-clay
	Montrose	Pit and creek gravel, shale, and sand-clay
13	Montrose	Pit and creek gravel, shale, and sand-clay
	Ouray	Pit and creek gravel, granite and other rocks
	San Juan	Pit and creek gravel, granite and other rocks
	La Plata	Pit and creek gravel, limestone and other rocks
14	La Plata	Pit and creek gravel, limestone and other rocks
	Montezuma	Pit and creek gravel, shale, and sand-clay
15	La Plata	Pit and creek gravel, granite, limestone and other rocks
	Archuleta	Pit and creek gravel, granite, limestone and other rocks
	Rio Grande	Gravel, granite and other rocks
	Conejos	Pit and creek gravel, sand-clay, and limestone
16	Conejos	Pit and creek gravel, sand-clay, and limestone
	Costilla	Pit and creek gravel, sand-clay, and limestone
	Huerfano	Pit and creek gravel, sand-clay, and limestone
17	Lake	Pit and creek gravel, granite and other rocks
	Chaffee	Pit and creek gravel, granite and other rocks
18	El Paso	Pit and creek gravel, sand-clay, granite and other rocks
	Teller	Pit and creek gravel, granite and other rocks
	Park	Pit and creek gravel, sand-clay, granite and other rocks
	Chaffee	Pit and creek gravel, sand-clay, granite and other rocks
19	Morgan	Pit and creek gravel, and sand-clay
	Washington	Pit and creek gravel, and sand-clay
	Yuma	Pit and creek gravel, and sand-clay
20	Gunnison	Pit and creek gravel, sand-clay, granite and other rocks
	Montrose	Pit and creek gravel, shale, and sand-clay
21	Jefferson	Basalt, pit and creek gravel, limestone, and asphaltic sand
	Clear Creek	Trap, granite, pit gravel
	Grand	Trap, granite, clay and gravel
22	El Paso	Pit and creek gravel, clay and sand, shale

Road No.	County	Material Available
	Fremont	Shale, pit, and creek gravel, clay and sand, limestone, granite
23	Logan	Clay, sand, river and pit gravel
	Phillips	Clay, sand, river and pit gravel
24	Morgan	Clay, sand, river and pit gravel
	Weld	Clay, sand, river and pit gravel
	Larimer	Clay, sand, river and pit gravel
25	Garfield	River and pit gravel, clay and sand
	Pitkin	Conglomerate, granite, gravel and clay
	Lake	Gravel, clay, sand, and granite
26	Pueblo	Clay, sand, limestone, and shale
	Huerfano	Clay, sand, limestone, and shale
	Las Animas	Clay, sand, limestone, and shale
27	Jefferson	Clay, limestone, sand, gravel, and asphaltic sand
28	Chaffee	Conglomerate, granite, gravel and clay
	Gunnison	Conglomerate, granite, gravel and clay
29	Otero	Shale, clay, sand, and gravel
	Las Animas	Shale, clay, sand, gravel, and limestone
30	El Paso	Clay, sand, and gravel
	Elbert	Clay, sand, and some gravel
	Lincoln	Clay, sand, and gravel
	Kit Carson	Clay, sand, and some gravel
31	Arapahoe	Clay, sand, and some gravel
	Adams	Clay, sand, and some gravel
	Elbert	Clay, sand, and some gravel
32	Lincoln	Clay, sand, and some gravel
	Cheyenne	Clay, sand, and some gravel
33	Otero	Shale, clay, sand, and some gravel
	Crowley	Clay, sand, and some gravel
	Kiowa	Clay, sand, and some gravel
34	Prowers	Clay, sand, and some gravel
	Baca	Clay, sand, and some gravel
35	Jefferson	Clay, limestone, sand, gravel, and asphaltic sand
	Park	Clay, sand, gravel and conglomerate
36	Saguache	Clay, sand, and some gravel
	Rio Grande	Clay, sand, and some gravel
37	Teller	Clay, some gravel, granite and other rocks
38	Conejos	Granite, clay, sand and gravel
	Rio Grande	Granite, clay, sand and gravel
	Mineral	Granite and other rocks, clay, sand and gravel

Road No.	County	Material Available
39	Grand	Granite, conglomerate, gravel, sand and clay
	Eagle	Granite, conglomerate, gravel, sand and clay
40	Eagle	Granite, conglomerate, gravel, sand and clay
	Routt	Granite, conglomerate, gravel, sand and clay
41	Routt	Conglomerate, gravel, sand and clay
	Moffat	Conglomerate, gravel, sand, clay, and asphaltic rock
42	Garfield	Conglomerate, gravel, sand and clay
	Rio Blanco	Conglomerate, gravel, sand and clay, and asphaltic sand
	Moffat	Conglomerate, gravel, sand and clay, and asphaltic sand
43	Routt	Conglomerate, gravel, sand and clay, and asphaltic sand
	Jackson	Conglomerate, gravel, sand and clay
	Grand	Granite, conglomerate, gravel, sand and clay
44	Ouray	Gravel, granite and other rocks
	San Miguel	Gravel, granite and other rocks, clay and sand
	Montrose	Gravel, clay and sand
45	Montezuma	Gravel, clay and sand
	Dolores	Gravel, clay and sand
	San Miguel	Gravel, clay, sand, granite and other rocks
46	Delta	Gravel, clay and sand
	Montrose	Gravel, clay and sand
	Gunnison	Gravel, clay, sand, granite and other rocks

The tests of road material have been made by Professor Milo S. Ketchum of the State University at Boulder. Tests of cement which were used in various bridge constructions were also made at the university, free of charge. For report of these tests see Appendix No. 1.

In addition to the foregoing, the department has answered numerous inquiries regarding road-work in different sections of the United States and Canada, and has supplied information from our files. It is co-operating at this time with the engineers of the Mountain Park Commission of the city of Denver, and also with the official of the Forestry Service of the United States. It has had some correspondence with the Committee on Postal Roads from the United States Senate in regard to the location of post-roads to be improved in this state. (Correspondence follows.)



OFFICE STATE HIGHWAY COMMISSION
 Showing location of Forest Service work
 on the State Roads.

CORRESPONDENCE

September 17, 1912.

Hon. M. M. Hays,

Acting Secretary, Department of Agriculture,
Washington, D. C.

Dear Sir: In reference to your letter of August 29, 1912, referring to the appropriation of some \$21,000 for roads through the forest reserves within our state, I can advise you that the state forestry officers have consulted with our State Highway Commission about these roads, and we will gladly co-operate in this matter. We heartily indorse the distribution as recommended by your local officers.

Referring to the number of the projects as submitted to you, I find that all but three are on the line of our main system (of which a map is enclosed), viz.:

Nos. 1 and 10, Berthoud Pass road.

No. 3, Cochetopa Pass road.

No. 5, Black Mesa road.

Nos. 6 and 7, Tennessee Pass road.

No. 8, Montezuma County road.

No. 11, Elwood Pass Road.

No. 12, Independence Pass road.

No. 13, Paradox-Montrose road.

These roads will be among the first to be improved this next season, as soon as our state funds become available.

There is at present in the state fund \$500,000, of which some \$105,000 has been apportioned to these projects, in which your expenditures will be a link.

Our money cannot be reached until after January 1, but we can put our surveys at the service of your officers, so that any contract they let will be along the lines laid out by our State Highway Commission.

Yours very truly,

[Signed] JOHN F. SHAFROTH,
Governor.

FORESTRY SERVICE

The local officials of the Forestry Service have conferred with our Commission and are co-operating with us in the construction of these pieces of road. Most of their fund will be expended on the state primary road system within the forest reserve. At this time the work has been started on most of the following projects:

Construction work has been started and is very nearly finished on the Independence Pass road in Pitkin County. Work on surveys has also been started, in El Paso County, on the road from Colorado Springs to Cripple Creek and on the Elwood Pass

road. It is expected that the construction will all be finished by next spring.

The following are the projects as laid out for completion:

1 and 10	Berthoud Pass road.....	\$ 1,500.00	East) State
		1,303.63	West) road
2	Colbran to Delta.....	1,200.00	
3	Cochetopa Pass road.....	3,500.00	State road
4	Orofino District road.....	1,000.00	
5	Black Mesa road.....	1,000.00	State road
6 and 7	Tennessee Pass—East side.....	1,200.00	
	West side	1,000.00	State road
8	Dolores to Northwest.....	500.00	State road
9	Colorado Springs-Cripple Creek.....	2,000.00	
11	Elwood Pass	3,750.00	State road
12	Independence Pass	2,000.00	State road
13	Montrose—Paradox	750.00	State road
Total		\$21,503.63	

POSTAL ROUTES

It is also proposed by the government to set aside a fund for the improvement of the postal routes in each state. From information conveyed by a letter from Senator Jonathan Bourne, Jr., of Oregon, chairman of the Senate Committee on Postal Routes, the fund for Colorado will amount to something over \$300,000. Our Commission has recommended the expenditure of most of this fund on postal routes which are a part of the state primary system of roads. This will comprise something over a thousand miles of road.

CORRESPONDENCE

November 29, 1912.

Senator Jonathan Bourne, Jr.,
Chairman Committee on Postal Routes,
United States Senate,
Washington, D. C.

My Dear Senator Bourne: In response to your letter of August 19, 1912, referring to the matter of the appropriation for improving post-roads in the State of Colorado, I desire to give you the following information:

Our State Highway Commission has gone over the post routes, as shown on the map sent to us, and has marked by a broad red line the post routes which are a part of our system of state highways, and on which they recommended the expenditure of the moneys appropriated.



OFFICE STATE HIGHWAY COMMISSION.
 Showing location of Postal Route Appropriations,
 as recommended by State Highway Commission.

The total length of the routes recommended for improvement is 1,061 miles, and they are as follows:

	Miles
Holyoke to Lamar, Nebr.....	18
Brush to Gary.....	14½
Wiggins to Hoyt.....	20
Bennett to Commanche.....	19½
Julesburg to Holyoke.....	33
Holyoke to Bryant.....	25
Yuma to Ford.....	26
Wray to Idalia.....	30½
Burlington to Newton.....	43¼
Burlington to Cole.....	14½
Firstview to Medill.....	12½
Lamar to Queen Bench.....	14
Lamar to Springfield.....	55
Wellington to Bulger.....	7
Longmont to Moraine Park.....	46
Morrison to Conifer.....	18½
Morrison to Evergreen.....	11
Castle Rock to Franktown.....	8½
Elizabeth to Kiowa.....	7½
Colorado Springs to Lytle.....	21½
Canon City to Micanite (part of).....	23½
Walden to Rand.....	26½
Granby to Grand Lake.....	16
Wolcott to State Bridge.....	14
Granite to Twin Lakes.....	9
Doyleville to Wannita Springs.....	8¾
Creede to Hermit.....	30
Monte Vista to Center.....	14½
Dyke to Piedra.....	12
Cortez to Aneth (part way).....	42¼
Cortez to Dolores.....	12
Norwood to Lavender.....	33
Norwood to Placerville.....	18½
Norwood to Naturita.....	13¾
Naturita to Paradox.....	31¾
Naturita to Nucla.....	6
Gateway to Whitewater.....	58
Hotchkiss to Neaber.....	18½

	Miles
Ouray to Red Mountain.....	12
Dubeque to Mesa.....	15½
Colorado & Southern Railroad to Empire.....	2
Rifle to Meeker.....	44
Meeker to Craig.....	51½
Craig to Steamboat Springs.....	36
Meeker to Rangely.....	62
<hr/>	
Total	1,061

I return by separate package one of the maps sent to us, on which are marked the routes recommended for improvement.

Sincerely yours,

[Signed] JOHN F. SHAFROTH,
Governor.

Work on the state map which is to show the main state primary roads, and also the secondary roads of the various counties, has been started and will be finished during the coming season.

The state traction outfit was in use by Boulder County to finish its graveled road, and demonstrated that quite a saving in haulage of material could be made by power haulage over team haulage.

The present condition of the work started during 1911-1912 on the state primary roads of the various counties is as follows:

COUNTY	CONDITION OF ROADS
Adams	Grading on Road No. 7, finished.
Arapahoe	Graveling Road No. 3; concrete flush bridges in progress on Road No. 31.
Archuleta....	Grading, surveys, and bridges, complete on Road No. 15.
Bent.....	Grading and culverts on Road No. 5, completed.
Boulder	Grading, bridges, and graveling on Road No. 2, completed 4 miles.
Chaffee.....	Grading on Roads Nos. 17, 18 and 22, completed.
Cheyenne....	Grading on Road No. 32.
Clear Creek..	Grading and culverts on Road No. 21, completed.
Conejos	Grading on Road No. 15, in progress.
Costilla	Grading on Road No. 16, in progress.
Crowley.....	Grading and culverts on Road No. 33, in progress.
Delta	Grading and culverts and bridge repairs on Road No. 12, completed; new concrete arch bridge at Hotchkiss, under construction.
Dolores	Grading on Road No. 45, finished.
Eagle	Grading and bridges on Road No. 10, finished.

COUNTY	CONDITION OF ROADS
Elbert.....	Surveying of Road No. 31, finished.
El Paso.....	Grading, bridges, and surfacing on Roads Nos. 3 and 4, finished.
Fremont.....	Grading and bridges on Roads Nos. 22 and 5, in progress.
Garfield.....	Grading on Roads Nos. 25, 11, and 42, finished.
Grand.....	Grading on Roads Nos. 21 and 39, finished.
Gunnison....	Grading on Roads Nos. 20, 38, and 46, part finished and part in progress.
Hinsdale.....	Grading on road between Lake City and Creed, and Lake City and Sapinero.
Huerfano....	Grading on Road No. 26, in progress.
Jackson.....	Grading on Road No. 43, in progress.
Jefferson....	Grading and culverts on Roads Nos. 1, 21, and 27, in progress.
Kiowa.....	Grading on Road No. 33.
Kit Carson..	Grading and bridge on Road No. 30, in progress.
Lake.....	Grading on Road No. 10, in progress.
La Plata.....	Surveys on Roads Nos. 15, 14, and 40, finished.
Larimer.....	Grading and bridges on Roads Nos. 2 and 16, finished.
Las Animas..	Grading and bridges on Roads Nos. 26 and 29, finished.
Lincoln.....	Grading on Roads Nos. 32 and 30, finished.
Logan.....	Grading and culverts on Roads Nos. 9 and 23, finished.
Mesa.....	Grading and bridges on Roads Nos. 11 and 12, partly finished.
Mineral.....	Grading on Road No. 38.
Moffat.....	Grading on Road No. 42.
Montezuma..	Grading and bridges on Road No. 14, partly finished.
Montrose....	Grading and bridges and surveys on Roads Nos. 12, 20, and 44, partly finished.
Morgan.....	Grading and bridges and surveys on Roads Nos. 7, 9, 19, and 24, partly finished.
Otero.....	Grading and bridges on Road No. 5, partly finished.
Ouray.....	Grading on Road No. 13, partly finished.
Park.....	Grading and culverts on Roads Nos. 18 and 35, partly finished.
Phillips.....	Grading and culverts on Road No. 23, partly finished.
Pitkin.....	Grading and surveys on Road No. 25, partly finished.
Prowers.....	Grading, culverts, and surveys on Road No. 5, partly finished.
Pueblo.....	Grading and bridges on Roads Nos. 5, 4, and 26.
Rio Grande..	Grading, bridges, and surveys on Road No. 38, partly finished.
Rio Blanco..	Grading on Road No. 42, partly finished.
Routt.....	Grading on Roads Nos. 41, 43, and 40, partly finished.
Saguache....	Grading on Road No. 36, partly finished.

COUNTY	CONDITION OF ROADS
San Juan.....	Surveys on Road No. 13, partly finished.
Sedgwick	Grading, bridges, and surveys on Road No. 9, partly finished.
Teller.....	Grading and culverts on Roads Nos. 18 and 37, partly finished.
Washington .	Grading and culverts on Road No. 19, partly finished.
Weld.....	Grading and bridges on Road No. 24, partly finished.
Yuma	Grading and culverts on Road No. 19, partly finished.

Attention is directed to the map showing the state primary roads as laid out by the Commission.

It will be noted that the Commission contemplates three state highways north and south, and four complete highways east and west across the state.

There are three additional maps, showing the state divided practically into thirds, with the highways in each section. There also follows a detailed description of the construction to be undertaken, together with the approximate cost thereof.

The system comprises 4,830.25 miles, and of this the road known as the Great North and South Highway, leading from Cheyenne through Fort Collins, Denver, Colorado Springs, Pueblo, Walsenburg and Trinidad, to the New Mexico line, comprises some 327½ miles of the system.

Starting at the north line of the state, this road should be graded and drained through to Fort Collins—a distance of some 33 miles. A portion of this road between Fort Collins and Wellington is in fair shape and partially graveled.

From Fort Collins to Denver, a distance of 67½ miles, the road is in fair condition to 7 miles south of Longmont.

From that point to Denver city line it needs to be graded through to Broomfield, and drained and surfaced from a point 7 miles south of Longmont to Denver city line—a distance of 28 miles.

From Fort Collins to Denver the grading work will start about 5½ miles north from Lafayette, and there will be some grading to be done all the way in to the Denver city limits—a distance of 28 miles. There will be bridges and culverts to be constructed, and this section of the road should be surfaced with gravel.

An additional cost for surfacing should be estimated to connect this road with Boulder, and also to connect this North and South Highway with Greeley—a distance of 21½ miles.

Continuing this Great North and South Highway to the south from Denver city limits to Sedalia, a distance of 19 miles, to be improved by grading, bridges, and surfacing.

From Sedalia to Palmer Lake, 24½ miles, will need grading, drainage, and culverts.

From Palmer Lake to Colorado Springs, a distance of 24½ miles, will need some grading, bridges, and culverts.

James S. Hildner, Commissioner
Showing System of Rivers

Major and Minor South Rivers
Main Connecting Rivers



From Colorado Springs to Pueblo, a distance of 44.3 miles, some grading, culverts and bridges are needed. The Pueblo County end of this piece is nearly completed.

From Pueblo to Walsenburg, a distance of 54 miles, needs grading and culverts.

From Walsenburg to Trinidad, a distance of 41 miles, to be improved by grading and culverts.

From Trinidad to the south line of the state, on the road to Raton, a distance of 14.1 miles, to be improved by grading and culverts.

On the Great North and South Highway, Larimer, Boulder, Arapahoe, El Paso, Pueblo, and Las Animas Counties have done a great deal of work in road- and bridge-building during the past two years.

The North and South Highway is comprised of State Primary Roads Nos. 2, 3, 8, 4, and 26.

The connections to the North and South Highway from the east would be along the Santa Fe Trail from the Kansas line, following the Arkansas River to Pueblo.

The Golden Belt Route from the Kansas line through to Limon, thence to Colorado Springs, and branching at Limon; also to Denver.

The Denver-Omaha Transcontinental Road from the Nebraska line through Holyoke, Sterling, Fort Morgan to Denver, and via the Platte Valley road from the Nebraska line through Julesburg to Sterling, joining at that point the Omaha-Denver road. These are the principal roads into the state from the east, north-east, and southeast.

The southern route, following the Arkansas River from the Kansas line, would be through Holly to Lamar, thence through Las Animas and La Junta, Rocky Ford, Manzanola, and Fowler to Pueblo, comprising State Primary Roads Nos. 5 and 6.

From the Kansas line to Lamar is $38\frac{1}{2}$ miles. This work would be drainage, grading, culverts, and small bridges.

From Lamar to Las Animas, a distance of 38 miles, there would be grading, drainage, culverts, and small bridges.

From Las Animas to La Junta, $22\frac{1}{2}$ miles, there would be grading, drainage, culverts, and one large bridge over the Arkansas River, which is now being constructed.

From La Junta to Rocky Ford, a distance of $10\frac{1}{2}$ miles, there would be surfacing and bridges.

From Rocky Ford to Pueblo, a distance of 55 miles, will need some grading, culverts, bridges, and surfacing for certain sections of the road which are now very sandy.

The Counties of Pueblo, Otero, Bent, and Prowers have been working on this piece of road the past two years and have accomplished a great deal.

The Golden Belt Road from the Kansas line through Burlington and Flagler to Limon, a distance of 92.2 miles, will need

some grading, culverts, bridges, and surfacing. This stretch is comprised entirely in State Primary Road No. 30.

From Limon to Colorado Springs, a distance of 81.7 miles, needs grading, culverts, bridges, and some surfacing. This stretch is comprised in State Primary Road No. 30. El Paso County has started considerable work on this stretch of road, some of which is now in progress.

From Limon to Denver, a distance of 88.8 miles, will need grading, culverts, bridges, and some surfacing. This stretch of road is comprised in State Primary Road No. 31 and part of State Primary Road No. 7 from Bennett to Denver. On this stretch of road Arapahoe and Elbert Counties have started some road-work and bridges. Limon to Bennett, 56.5 miles, is on State Primary Road No. 31.

On the Omaha-Denver line the road from Holyoke to Sterling through Fort Morgan, meeting the Golden Belt road at Bennett. The piece from the Nebraska line to Sterling is 73½ miles. It needs to be graded, surfaced in places, and with some culverts. This stretch of road is comprised in State Primary Road No. 33.

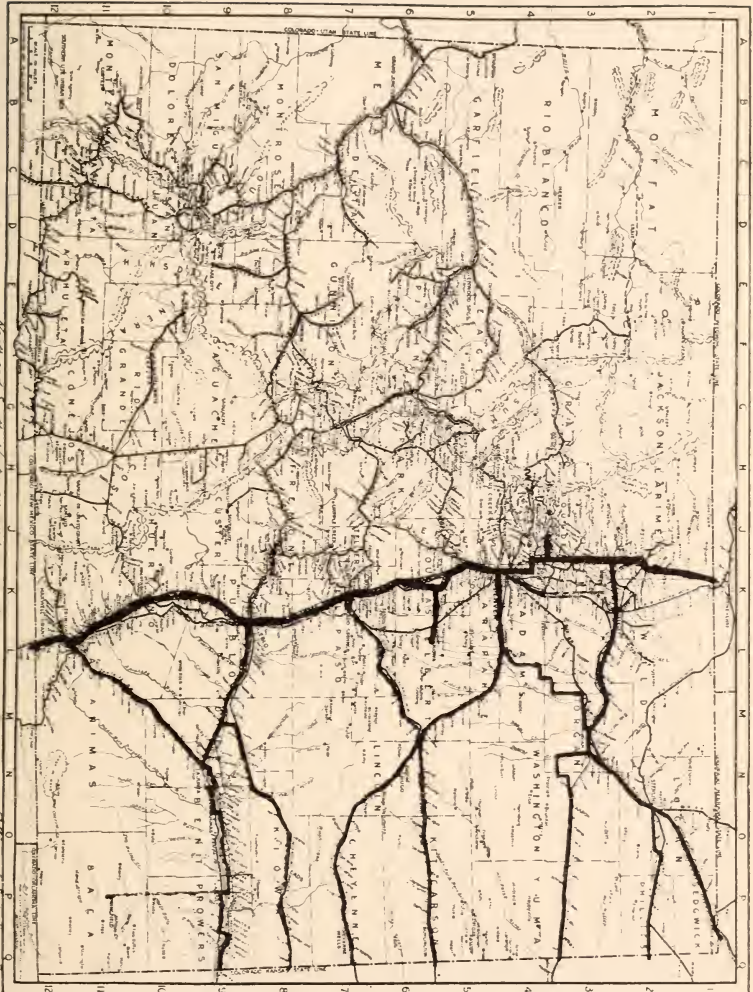
From Sterling to Fort Morgan, a distance of 51.8 miles, the road needs some grading, culverts and bridges, and surfacing in places.

From Fort Morgan to the junction of the through road from Limon at Bennett is a distance of 61.8 miles, and needs to be graded and drained, culverts and bridges. This stretch of road is comprised in State Primary Road No. 7, and from Sterling to Fort Morgan, in State Primary Road No. 9.

On the Platte Valley road from the Nebraska line to Sterling, where it meets the Omaha-Denver road, would be a distance of 66½ miles, and needs to be graded, some bridges and culverts. This road is comprised of State Primary Road No. 9. In all this stretch of road the Counties of Sedgwick, Phillips, Logan, Morgan, and Adams have constructed several bridges, and graded and improved the road to a considerable extent.

SUMMARY OF THE MAIN ROADS CONNECTING WITH THE GREAT NORTH AND SOUTH HIGHWAY, AND INCLUDING THAT HIGHWAY. (OTHER CONNECTING ROADS FROM THE EAST ARE SHOWN FARTHER ON.)

	Mileage
Great North and South Highway.....	327.5
Santa Fe Trail.....	164.5
Golden Belt Road.....	173.9
Denver Branch.....	88.8
Omaha-Denver Road.....	187.1
Platte Valley Road.....	66.5
—	
Total	1,008.3



North and South systems of main trunk lines from the East
Office of Transportation



North and South road, and western connections.

State Highway Commission.

The North and South Road in the western portion of the state has been laid out, running from the north line of Colorado, from Baggs, Wyoming, through to Craig, thence to Meeker, Rifle, down the Grand River to Grand Junction, and from there to Delta, Montrose, Ouray, Silverton, Durango, and thence south to the southern state line.

From the northern state line to Craig, a distance of about 44 miles: improvements to consist of grading, drainage, and culverts.

From Craig to Meeker, a total distance of $51\frac{1}{4}$ miles; improvements to consist of drainage, grading, and culverts.

From Meeker to Rifle, a distance of 42 miles: improvements to consist of grading, drainage, and culverts.

From Rifle to Grand Junction, a total distance of $73\frac{3}{4}$ miles; improvements to consist of grading, drainage, culverts, and some surfacing. The route between these two points follows the north side of the river down to Una; thence to Debeque on the south side of the river; thence to Palisade via Plateau Creek and Mesa; Palisade to Grand Junction over the main traveled road.

From Grand Junction to Delta, a distance of $43\frac{3}{4}$ miles, this improvement consists of drainage, grading, culverts, and some surfacing.

From Delta to Montrose, a distance of $22\frac{1}{2}$ miles, the improvements will consist of grading, drainage, culverts, and some surfacing.

From Montrose to Ouray, a distance of 37.9 miles, the improvements will consist of grading, drainage, culverts, and some surfacing.

From Ouray to Silverton, a distance of 24 miles: improvements to consist mainly of grading, widening the present road, and reducing the present grade; this piece of work requires some heavy grading, a portion of it being in solid rock.

From Silverton to Durango, a distance of $51\frac{1}{2}$ miles, requires some heavy grading, drainage, and culverts, and will include several miles of new road construction.

From Durango to the south line of the state, $23\frac{1}{2}$ miles, the improvements would consist of grading, drainage, and culverts.

The connection of the west from this line of road would be a main connection from Grand Junction via Fruita and Mack to the Utah line, a total distance of 32 miles, the improvement of which would be grading, drainage, and culverts. This stretch of road comprises State Primary Road No. 11.

The northern inlet from the west would be via the "K" Ranch into Meeker, a distance of 84 miles, and branching north about Mobley to Maybell and Craig, a distance of 86 miles; the improvements would be grading, drainage, and culverts. This stretch of road comprises State Primary Road No. 42.

The southern inlet from the west would be via Cortez and Mancos to Durango, a distance of 84 miles; the improvements of

which would consist of some heavy grading, drainage, culverts, and bridges. This stretch of road comprises State Primary Road No. 14.

These will be the three main connections from the west and with the main North and South Road for the western part of the state, the summary is as follows:

RECAPITULATION		Mileage
Main Western North and South Highway.....	415.1	
Main western Outlet via Grand Junction.....	32.0	
Northwestern outlet via "K" Ranch to Meeker and to Craig.....	84.0	
Main southwestern outlet via Mancos and Cortez.....	84.0	
Total		615.1

CENTRAL CONNECTING ROADS

From the Great North and South Highway on the east to the Great North and South Highway on the west, we recommend the construction of the following connecting roads:

Following the Arkansas River, starting at Pueblo, running up through Canon City, Salida, Buena Vista, over Tennessee Pass, down via Red Cliff, Wolcott, Dotsero to Glenwood Springs and to Rifle; meeting the Western North and South Highway at that point. This stretch of road is comprised mainly in State Primary Roads Nos. 5, 22, 17, 10 and 11.

Also, starting at Colorado Springs, up through Ute Pass and South Park to a connection with the first main road at Buena Vista. This road is comprised in State Primary Road No. 18.

Also, starting at Denver, to Morrison, Baileys, Jefferson, Fairplay, meeting the first-named road at Buena Vista. This stretch of road is comprised in State Primary Roads Nos. 27 and 35.

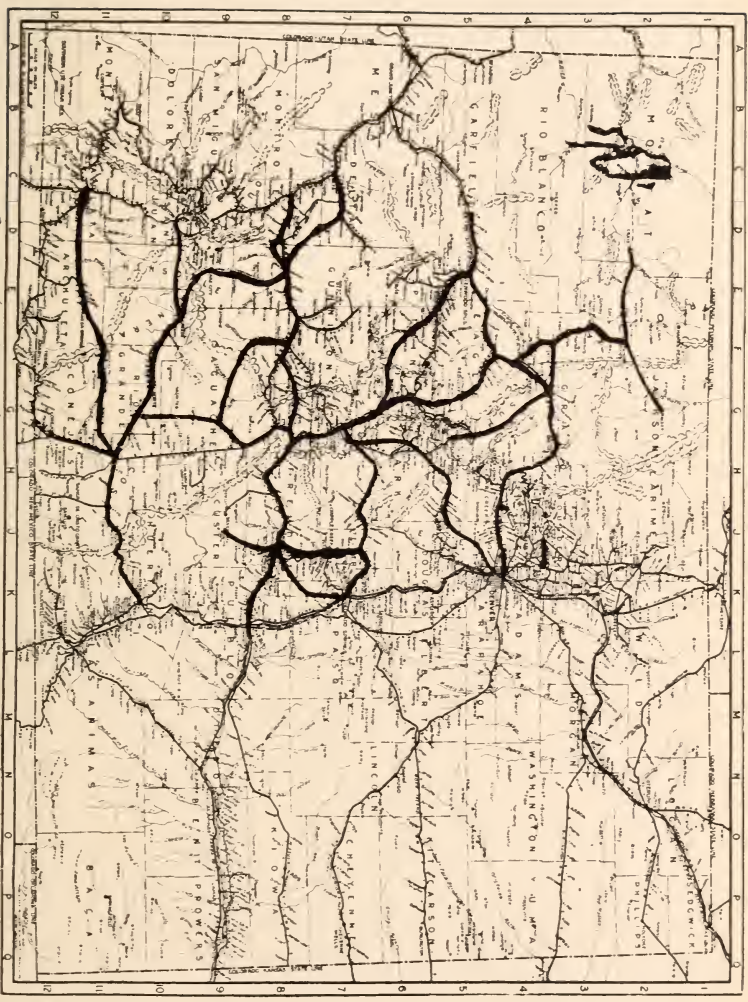
Also, starting at Denver, running through Golden, Idaho Springs, Berthoud Pass, Sulphur Springs, Kremmling, and meeting the first main road at Wolcott or at Eagle. This road is comprised in State Primary Roads Nos. 1, 21 and 39.

Also, leaving the first main road at Salida, passing over Monarch Pass through Gunnison, Sapinero to Montrose, being comprised in State Primary Roads Nos. 20 and 28.

Leaving the Eastern North and South Road at Walsenburg, passing over La Veta Pass to Alamosa, and thence through Jasper and over Elwood Pass into Pagosa Springs, Piedra, Bayfield, and Durango, meeting the Western North and South Road at that point.

Also, leaving State Primary Road No. 39 at Kremmling, passing over the Gore Range to Toponas, thence up to Steamboat

Connecting Lines Between Lines and Stations - Roads and Water Highways - Census - 1900 - Major Rivers - 1900



Springs, thence west to Craig; comprised in State Primary Roads Nos. 40 and 41, and meeting the Western North and South Road at that point.

Also, leaving State Primary Road No. 17 at Granite, passing thence via Twin Lakes to Aspen, and meeting the first-named road again at Glenwood Springs; all of this road being comprised in State Primary Road No. 25.

Also, leaving the Southern Road at Alamosa, running thence up to Monte Vista, Del Norte, Creede; thence over the divide to Lake City; thence down Lake Fork to Sapinero; all of this road being comprised in State Primary Road No. 38.

Also, leaving the above-mentioned road at Poncha Springs, running thence south over Poncha Pass through Saguache to the town of Monte Vista; being comprised in State Primary Road No. 36.

From Pueblo to Canon City, a distance of $42\frac{1}{2}$ miles, the improvements will consist mainly of grading, drainage, and culverts.

From Canon City to Salida, a distance of 67 miles: This stretch will include some heavy grading along the Arkansas River above Parkdale, and will consist of grading and culverts.

From Salida to Buena Vista, a distance of 26 miles, the improvements will consist of drainage, grading, and culverts.

From Buena Vista to Granite, a distance of 18 miles, there will be grading, drainage, and culverts.

From Granite via Twin Lakes to Leadville, a distance of 25.2 miles, the improvements will consist of grading, drainage, and culverts, with an additional cost for the bridge across the river at Granite, the abutments of which are now in place.

From Leadville to Wolcott, a distance of 50 miles, some fairly heavy grading is required; also drainage, culverts and a few small bridges.

From Wolcott to Glenwood Springs, a distance of $43\frac{1}{2}$ miles, the improvements will consist of grading, drainage, and culverts.

From Glenwood Springs to Rifle, a distance of $28\frac{3}{4}$ miles, the improvements will consist of grading, drainage, and culverts.

From Colorado Springs to Buena Vista via Divide and Lake George, a total distance of 96 miles: improvements to consist of grading, drainage, culverts, and some small bridges.

From Denver, connecting with the road from Colorado Springs to Buena Vista, at the Salt Works, via Morrison, Baileys, Jefferson, Fairplay, a total distance of 109.7 miles: improvements to consist of drainage, grading, culverts, and bridges.

From Denver to Idaho Springs, a distance of 39.3 miles, improvements would be grading, drainage, culverts, and bridges. On this stretch there would be the building of a new grade up and over Lookout Mountain and the improvements of the road to Idaho Springs.

From Idaho Springs to Sulphur Springs, a total distance of 52.7 miles, the improvements will consist of drainage, grading, culverts, and bridges, and there will be some heavy grading near Empire, and also at the top of the pass.

From Hot Sulphur Springs to Wolcott, a distance of 60.75 miles, the improvements will consist of drainage, grading, culverts, and bridges; and on this stretch it is expected that some new location will have to be made and a new road constructed between Kremmling and Wolcott, or from Kremmling via Toponas to Eagle.

From Kremmling to Craig, a distance of 130 miles, some heavy work will be needed over the Gore Range. The balance will be grading, drainage, and culverts.

From Granite to Glenwood via Independence Pass and Aspen, a total distance of 90½ miles, there will be some heavy work at the top of the pass; the balance will be grading, culverts, drainage, and bridges.

From Salida to Montrose via Monarch Pass and Gunnison, a total distance of 132.7 miles: improvements to consist of grading, drainage, culverts, and bridges.

From Walsenburg to Alamosa, a distance of 77.7 miles: improvements to consist of grading, drainage, culverts, and some surfacing.

From Alamosa to Pagosa Springs, a distance of 85.7 miles: improvements to consist of grading, drainage, culverts, and bridges; and also heavy work at the top of the pass, with new location for part of road.

From Pagosa Springs to Durango, a distance of 64.9 miles: improvements to consist of drainage, grading, bridges, and culverts.

From Alamosa to Sapinero via Del Norte, Creede, and Lake City, a distance of about 151.3 miles: improvements to consist of drainage, grading, culverts, and bridges.

From Poncha Springs to Monta Vista, a distance of 88 miles: improvements to consist of grading, drainage, culverts, and bridges.

From the Divide south through Cripple Creek, thence to Canon City, route being comprised in State Primary Road No. 37, a total distance of 45.7 miles: improvements to consist of grading, drainage, culverts, and bridges.

From Cortez to Dolores, Norwood, and Ridgeway, a distance of 102.9 miles, comprised in State Primary Road No. 45: improvements to consist of grading, drainage, bridges, and culverts.

From the above road at West Fork to Rico, some 24 miles: improvements to be grading, drainage, and culverts.

From Sapinero via Hotchkiss to Delta, comprised in State Primary Road No. 46, a distance of about 72 miles: improvements to consist of grading, drainage and culverts, and bridges.

From Steamboat Springs to Walden over the Divide, a distance of about 46 miles, comprised in State Primary Road No. 43: improvements to consist of grading, drainage, and culverts.

From Lamar to Springfield, a total distance of about 55 miles, being comprised in State Primary Road No. 34: improvements to consist of drainage, grading, and culverts.

From Montrose to Paradox, via Nucla and Naturita, a distance of about 92 miles, comprised in State Primary Road No. 20: improvements to consist of drainage, grading, culverts, and bridges.

From Brush via Akron, Yuma, and Wray to the Nebraska state line, being a total distance of 112 miles, comprised in State Primary Road No. 19: improvements to consist of grading, drainage, and culverts and bridges.

From Limon via Hugo, Kit Carson, and Cheyenne Wells, to the Kansas state line, a total distance of about 109 miles, comprised in State Primary Road No. 32: improvements to be in grading, drainage, culverts, and bridges.

From Manzanola via Olney Springs, Sugar City, Eads, to the Kansas state line, a total distance of about 102 miles, comprised in State Primary Road No. 33: improvements to consist of drainage, culverts and grading, and bridges.

The road from Morrison to Creswell, a distance of 22 miles, included in State Primary Road No. 27, to be improved by grading, drainage, and culverts.

The road from Kremmling to Breckenridge, a distance of about 55 miles: improvements to consist of grading, drainage, and culverts.

The road from Idaho Springs to Central City, a distance of about 12 miles: improvements to consist of grading, drainage, and culverts.

The road from Canon City to Silver Cliff, a distance of 31.4 miles, to be improved by grading, drainage, and culverts.

The road from Castle Rock east to Kiowa, a distance of 27 miles, to be improved by grading, drainage, culverts, and bridges.

The road from La Junta to Trinidad, a distance of 82.1 miles and part of the old Santa Fe Trail, comprised in State Primary Road No. 29, to be improved by grading, drainage, culverts, and bridges.

The road from Greeley to Fort Morgan, 64½ miles, comprised in State Primary Road No. 24, to be improved by grading, drainage, culverts, and bridges.

The road from Placerville to Telluride, a distance of about 22 miles: grading, drainage, and culverts.

The road from Creede to Silverton, a distance of 62 miles, to be improved by grading, drainage, culverts, and bridges.

The road from Saguache over Cochetopa Pass to Parlin, a distance of about 72 miles, to be graded, drained, and have culverts and bridges.

This will put the system of state primary roads, as laid out to date, in passable condition; so that communication by wagon-road between all sections of the state, without serious obstacle, will be an accomplished fact.

The system comprises 4,830 miles.

The following estimates are submitted to give an approximate idea of the cost of improving the roads as laid out by the Commission. These estimates are not an apportionment, the apportionment as made by the Commission on March 5, 1912, being shown on page 8.

In these estimates nothing has been allowed for bridges on any of the roads. A separate estimate has been made for the bridges, which is given herewith.

These figures, while approximate, will, we believe, be very close to the total actual cost. In some of the details they may be too large or too small.

Terminal Points	Miles	Counties	Approximate Cost
Eastern North and South Road—			
North State line to Fort Collins.....	33.00	Larimer	\$ 13,200.00
Fort Collins to Denver.....	17.25	Larimer	6,900.00
	39.25	Boulder	18,500.00
	1.00	Jefferson	1,500.00
	10.00	Adams	15,000.00
Lafayette to Boulder.....	11.00	Boulder	6,600.00
Loveland to Greeley.....	7.00	Larimer	4,200.00
	14.50	Weld	8,700.00
Denver to Sedalia.....	7.20	Arapahoe	7,200.00
	11.80	Douglas	5,900.00
Sedalia to Palmer Lake.....	24.00	Douglass	14,400.00
Palmer Lake to Colorado Springs.....	25.00	El Paso.....	10,000.00
Colorado Springs to Pueblo.....	26.80	El Paso.....	13,400.00
	17.50	Pueblo	7,000.00
Pueblo to Walsenburg.....	32.60	Pueblo	16,300.00
	21.40	Huerfano	8,560.00
Walsenburg to Trinidad.....	13.80	Huerfano	5,520.00
	27.20	Las Animas.....	10,880.00
Trinidad to South line of State.....	14.10	Las Animas.....	5,640.00
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	354.30		\$ 179,400.00

Approximate

Terminal Points	Miles	Counties	Cost
Main eastern connections (Santa Fe Trail)—			
East line of state to Lamar.....	38.50	Prowers	\$ 11,550.00
Lamor to Las Animas.....	8.50	Prowers	3,400.00
	29.50	Bent	8,850.00
Las Animas to La Junta.....	12.50	Bent	5,000.00
	10.00	Otero	4,000.00
La Junta to Rocky Ford.....	10.50	Otero	6,300.00
Rocky Ford to Pueblo.....	19.70	Otero	11,820.00
	35.30	Pueblo	14,120.00
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	164.50		\$ 65,040.00
Golden Belt Road—			
East line of state to Limon.....	63.70	Kit Carson.....	\$ 12,740.00
	31.00	Lincoln	6,200.00
Limon to Colorado Springs.....	23.20	Elbert	4,640.00
	55.50	El Paso.....	11,100.00
	3.00	Lincoln	600.00
Limon to Bennett.....	27.70	Elbert	6,925.00
	39.60	Arapahoe	9,900.00
Bennett to Denver.....	20.00	Adams	5,000.00
	1.50	Lincoln	450.00
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	265.20		\$ 57,555.00
Omaha-Denver Road—			
East line of state to Sterling.....	36.00	Phillips	7,200.00
	37.50	Logan	7,500.00
Sterling to Fort Morgan.....	18.40	Logan	3,680.00
	10.10	Washington	2,020.00
	23.40	Morgan	4,680.00
Fort Morgan to Bennett.....	35.00	Morgan	10,500.00
	23.80	Adams	7,140.00
	3.00	Weld	900.00
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	187.20		\$ 43,620.00
Platte Valley Road—			
Northeast state line to Sterling.....	30.20	Sedgwick	\$ 7,550.00
	36.30	Logan	9,075.00
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	66.50		\$ 16,625.00

Terminal Points	Miles	Counties	Approximate Cost
Western North and South Road—			
North state line to Craig.....	44.00	Moffat	\$ 13,200.00
Craig to Meeker.....	30.00	Moffat	9,000.00
	18.00	Rio Blanco.....	5,400.00
Meeker to Rifle.....	21.00	Rio Blanco.....	6,300.00
	21.00	Garfield	6,300.00
Rifle to Grand Junction.....	22.00	Garfield	7,700.00
	53.00	Mesa	21,200.00
Grand Junction to Delta.....	23.50	Mesa	4,700.00
	20.25	Delta	6,075.00
Delta to Montrose.....	6.25	Delta	2,500.00
	16.00	Montrose	6,400.00
Montrose to Ouray.....	12.50	Montrose	5,000.00
	25.40	Ouray	10,160.00
Ouray to Silverton.....	13.00	Ouray	16,250.00
	11.00	San Juap.....	16,500.00
Silverton to Durango.....	21.00	San Juan.....	\$ 21,000.00
	30.50	La Plata.....	15,250.00
Durango to south line of state.....	23.50	La Plata.....	7,050.00
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	411.90		\$ 180,085.00
Main connections from the west—			
West line of state to Grand Junction..	32.00	Mesa	\$ 9,600.00
West line of state to Meeker.....	84.00	Rio Blanco.....	
		Moffat.....	
			21,000.00
Junction with Meeker Road to Craig..	86.00	Moffat	21,500.00
West line of state to Durango.....	58.00	Montezuma	17,400.00
	26.00	La Plata.....	10,400.00
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	286.00		\$ 79,900.00
Main cross-state roads, connecting East- ern North and South Highway with Western North and South Highway (Pueblo to Rifle)—			
Pueblo to Canon City.....	23.00	Pueblo	\$ 9,200.00
	19.50	Fremont	7,800.00

Terminal Points	Miles	Counties	Approximate Cost
Canon City to Salida.....	61.50	Fremont	55,350.00
	5.50	Chaffee	3,850.00
Salida to Buena Vista.....	26.00	Chaffee	6,500.00
Buena Vista to Granite.....	18.00	Chaffee	10,800.00
Granite to Leadville.....	1.50	Chaffee	1,200.00
	23.70	Lake	9,480.00
Leadville to Wolcott.....	10.20	Lake	10,200.00
	39.80	Eagle	27,860.00
Wolcott to Glenwood Springs.....	28.25	Eagle	19,775.00
	15.25	Garfield	15,250.00
Glenwood Springs to Rifle.....	28.75	Garfield	14,375.00
	300.95		\$ 191,640.00
Colorado Springs to Buena Vista.....	16.8	El Paso.....	\$ 6,720.00
	20.2	Teller	8,080.00
	16.2	Chaffee	6,480.00
	42.8	Park	12,840.00
	96.0		\$ 34,120.00
Denver to connection with Colorado Springs Road to Buena Vista.....	34.0	Jefferson	\$ 13,600.00
	69.7	Park	20,910.00
	1.5	Arapahoe	450.00
	4.5	Denver .....	.....
	109.7		\$ 34,960.00
Berthoud Pass Road—			
Denver to Idaho Springs.....	31.5	Jefferson	\$ 25,200.00
	7.8	Clear Creek.....	7,410.00
Idaho Springs to Sulphur Springs.....	18.7	Clear Creek.....	15,000.00
	34.0	Grand	20,400.00
Sulphur Springs to Wolcott.....	39.0	Grand	19,500.00
	21.75	Eagle	10,875.00
	152.75		\$ 98,385.00

Terminal Points	Miles	Counties	Approximate Cost
Kremmling to Craig.....	130.00	Grand and Routt..	\$ 26,000.00
Independence Pass Road—			
From Twin Lakes Junction to Aspen			
and Glenwood Springs.....	20.50	Lake	\$ 19,250.00
	33.00	Pitkin	36,800.00
	6.00	Eagle	3,000.00
	17.00	Garfield	6,800.00
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	81.50		\$ 65,850.00
Monarch Pass Road—			
Salida to Montrose.....	23.7	Chaffee	\$ 16,425.00
	33.0	Gunnison	40,200.00
	26.0	Montrose	10,400.00
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	132.7		\$ 67,025.00
Elwood Pass Road—			
Walsenburg to Alamosa.....	31.60	Huerfano	\$ 11,060.00
	1.00	Conejos	400.00
	45.10	Costilla	13,530.00
Alamosa to Pagosa Springs.....	40.40	Conejos	22,800.00
	17.30	Rio Grande.....	22,500.00
	19.00	Archuleta	7,600.00
	9.00	Mineral	14,500.00
Pagosa Springs to Durango.....	33.00	Archuleta	18,200.00
	31.90	La Plata.....	17,760.00
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	228.30		\$ 128,350.00
Creede, Lake City Road—			
Alamosa to Sapernero via Creede and			
Lake City.....	10.3	Conejos	\$ 3,090.00
	43.3	Rio Grande.....	12,990.00
	40.1	Mineral	20,050.00
	30.6	Hinsdale	15,300.00
	27.0	Gunnison	8,100.00
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	151.30		\$ 59,530.00

Terminal Points	Miles	Counties	Approximate Cost
Other connecting roads—			
Poncha Springs to Monte Vista.....	9.50	Chaffee	\$ 2,850.00
	66.50	Saguache	16,625.00
	12.00	Rio Grande.....	2,400.00
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	88.00		\$ 21,875.00
Divide to Cripple Creek and Canon City..	30.50	Teller	\$ 15,250.00
	12.20	Fremont	8,540.00
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	42.70		\$ 23,790.00
Cortez to Ridgway via Norwood and branch to Rico.....	26.00	Montezuma	\$ 6,500.00
	22.50	Dolores	6,750.00
	69.75	San Miguel.....	20,925.00
	9.00	Ouray	2,700.00
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	127.25		\$ 36,875.00
Saperno to Delta via Hotchkiss.....	18.00	Gunnison	\$ 7,200.00
	12.00	Montrose	4,800.00
	42.00	Delta	12,600.00
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	72.00		\$ 24,600.00
Steamboat Springs to Walden.....	12.00	Routt	\$ 6,000.00
	36.00	Jackson	18,000.00
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	48.00		\$ 24,000.00
Lamar to Springfield.....	38.00	Prowers	\$ 3,800.00
	17.00	Baca	1,700.00
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	55.00		\$ 5,500.00
Colorado Springs to Canon City.....	23.50	El Paso.....	\$ 4,700.00
	32.00	Fremont	8,000.00
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	55.50		\$ 12,700.00

Terminal Points	Miles	Counties	Approximate Cost
Paradox to Montrose.....	87.00	Montrose	\$ 26,100.00
	5.00	Ouray	1,500.00
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	92.00		\$ 27,600.00
East state line to Brush via Wray.....	47.00	Yuma	\$ 9,400.00
	42.00	Washington	6,300.00
	23.00	Morgan	3,450.00
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	112.00		\$ 19,150.00
Alamosa to south state line.....	46.00	Conejos	\$ 7,000.00
Limon to east state line via Cheyenne			
Wells	41.00	Lincoln	\$ 6,150.00
	61.00	Cheyenne	9,150.00
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	102.00		\$ 15,300.00
Manzanola to east state line via Eads....	74.00	Kiowa	\$ 11,100.00
	1.00	Otero	150.00
	27.00	Crowley	4,050.00
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	102.00		\$ 15,300.00
Morrison to Creswell.....	22.00	Jefferson	\$ 10,000.00
Kremmling to Breckenridge.....	11.50	Grand	\$ 3,450.00
	43.50	Summit	13,050.00
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	55.00		\$ 16,500.00
Idaho Springs to Central City.....	4.00	Clear Creek.....	\$ 2,400.00
	8.00	Gilpin	5,600.00
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	12.00		\$ 8,000.00
Canon City to Silver Cliff.....	17.40	Fremont	\$ 5,220.00
	14.00	Custer	4,200.00
	<hr/>		<hr/>
	31.40		\$ 9,420.00

Terminal Points	Miles	Counties	Approximate Cost
Castle Rock to Kiowa.....	15.50	Douglas	\$ 6,200.00
	11.50	Elbert	4,600.00
	<hr/>		<hr/>
	27.00		\$ 10,800.00
La Junta to Trinidad.....	39.30	Otero	\$ 7,860.00
	42.80	Las Animas	8,560.00
	<hr/>		<hr/>
	82.10		\$ 16,420.00
Greeley to Fort Morgan.....	34.60	Weld	\$ 6,920.00
	29.90	Morgan	5,980.00
	<hr/>		<hr/>
	64.50		\$ 12,900.00
Placerville to Telluride.....	22.00	San Miguel.....	\$ 13,200.00
Creede to Silverton.....	20.50	Mineral	\$ 10,250.00
	22.50	Hinsdale	11,250.00
	19.00	San Juan.....	28,500.00
	<hr/>		<hr/>
	62.00		\$ 50,000.00
Saguache to Parlin via Cochetopa Pass...	65.50	Saguache	\$ 13,100.00
	6.50	Gunnison	1,300.00
	<hr/>		<hr/>
	72.00		\$ 14,400.00
Denver to Brighton.....	19.00	Adams	\$ 11,400.00
	<hr/>		<hr/>
Total	4,830.25		\$1,784,315.00

In addition to the above, there will be needed for bridge construction in the various counties about \$228,000. The largest items are for the reinforced concrete arches over the Arkansas at La Junta, which will take \$36,000 to complete, and a similar structure near Hotchkiss, which will cost \$24,000; both bridges being on state primary roads.

CONCLUSIONS

This estimate of \$2,012,315 will provide for the drainage, grading, culverts, and bridges which are now in course of construction, or which will have to be built during the next two years. The total mileage of all wagon-roads in the state is approx-

imately 30,421. Of these, about 224 miles are at present surfaced, mostly with gravel, a few miles with crushed basalt, and a few miles with shale.

The drainage and grading being completed, the next step will be the surfacing of the state primary roads—some 4,600 miles—using the material and form of construction most suitable to the traffic and location. This will cost approximately \$15,000,000.

Following the completion of the primary system will come the location, grading, and surfacing of the secondary system of state roads, reaching from the primary system to sections of the counties of the state which are not reached by the primary system.

It is estimated that this system will comprise some 10,000 miles, and that the grading, drainage, culverts, bridges, and surfacing will cost approximately \$1,000 per mile, or a total cost of \$10,000,000.

The completion of the plans outlined for the improvement of this system of roads will involve the expenditure of at least \$25,000,000, in addition to the \$2,012,315 estimated for immediate work.

It is estimated that it will require ten years to complete the primary road system, and another ten years to complete the secondary system.

As the system is gradually completed, the roads should be properly maintained, and provision should be made for this purpose. It is our judgment that this work can be more satisfactorily accomplished under state supervision.

It is requested that the Commission be given funds sufficient to build at once short stretches of finished, surfaced roads, leading to the principal cities of the state, to demonstrate the character of roads best suited to this state. We estimate that \$60,000 will be needed for this purpose.

For the state to obtain the full benefit of the State Highway Commission, funds should be provided to enable the Commission to carry out its plans for the improvements of the state road system as herein set forth.

If the funds are made available for the Commission to go ahead with the work outlined, we request authority to employ two assistant engineers, one at \$6 per day and one at \$4 per day.

Careful consideration is invited to the fact that the system of roads already planned and laid out will take twenty years to complete, and that, if this generation is to derive any benefit from them, prompt action is necessary in the matter of a comprehensive financial plan.

The Commission recommends the passage of a bill to provide for the licensing of motor vehicles and chauffeurs, the funds to be used for the maintenance of the state roads, under the supervision of the State Highway Commission.

We also recommend the passage of a wide-tire law, to encourage the use of wide tires in this state.

Constant communications are being received from other states, requesting information regarding the progress of road-building in Colorado. Evidently there is great interest being taken by the residents of other states regarding our roads, and the desire to tour our state is growing at a remarkable rate.

The Commission desires to acknowledge its obligations to: Professor Milo S. Ketchum, of the State University, for work and assistance; C. G. Comstock, State Engineer; L. W. Page, director of Office of Public Roads, United States Department of Agriculture; S. G. Elbe, E. E. Montgomery, and R. A. Howe, for patiently waiting for money earned; Denver & Rio Grande Railroad and Santa Fe Railroad, for transportation; Governor and state officers, county commissioners and engineers; Denver Chamber of Commerce; Dr. F. A. Bartlett; Rocky Mountain Highway Association and good-roads organizations of the state; Denver Motor Club; Real Estate Exchange; Rotary Club; the press of the city of Denver and the state; George C. Anderson, engineer.

The Commission begs to tender its acknowledgments for the many courtesies extended to them from the adjoining states having connecting roads. We appreciate their efforts and large expenditures of money in planning their roads to meet the trans-continental roads through Colorado.

Appended hereto will be found Appendices Nos. 1, 2, 3, 4, 5, 6, 7:

Appendix No. 1—Report on tests of road-making, rocks and materials, by Professor Milo S. Ketchum.

Appendix No. 2—Reports, bulletins, etc., on file at Highway Commissioners' office.

Appendix No. 3—Elevation of passes.

Appendix No. 4—Financial statement.

Appendix No. 5—Regulations of State Highway Commission; forms and resolutions used in applying for state aid.

Appendix No. 6—Rules for surveys and maps; cross-sections for roads; miscellaneous notes.

Appendix No. 7—Road laws of the state to date

APPENDIX NO. 1.

REPORT ON TESTS ON ROAD MATERIALS MADE FOR THE STATE
HIGHWAY COMMISSION BY THE CIVIL ENGINEERING DEPART-
MENT, UNIVERSITY OF COLORADO.

M. S. KETCHUM, PROFESSOR; C. C. WILLIAMS, ASSISTANT PROFESSOR.

ROADS-TESTING LABORATORY AT THE UNIVERSITY OF COLORADO.

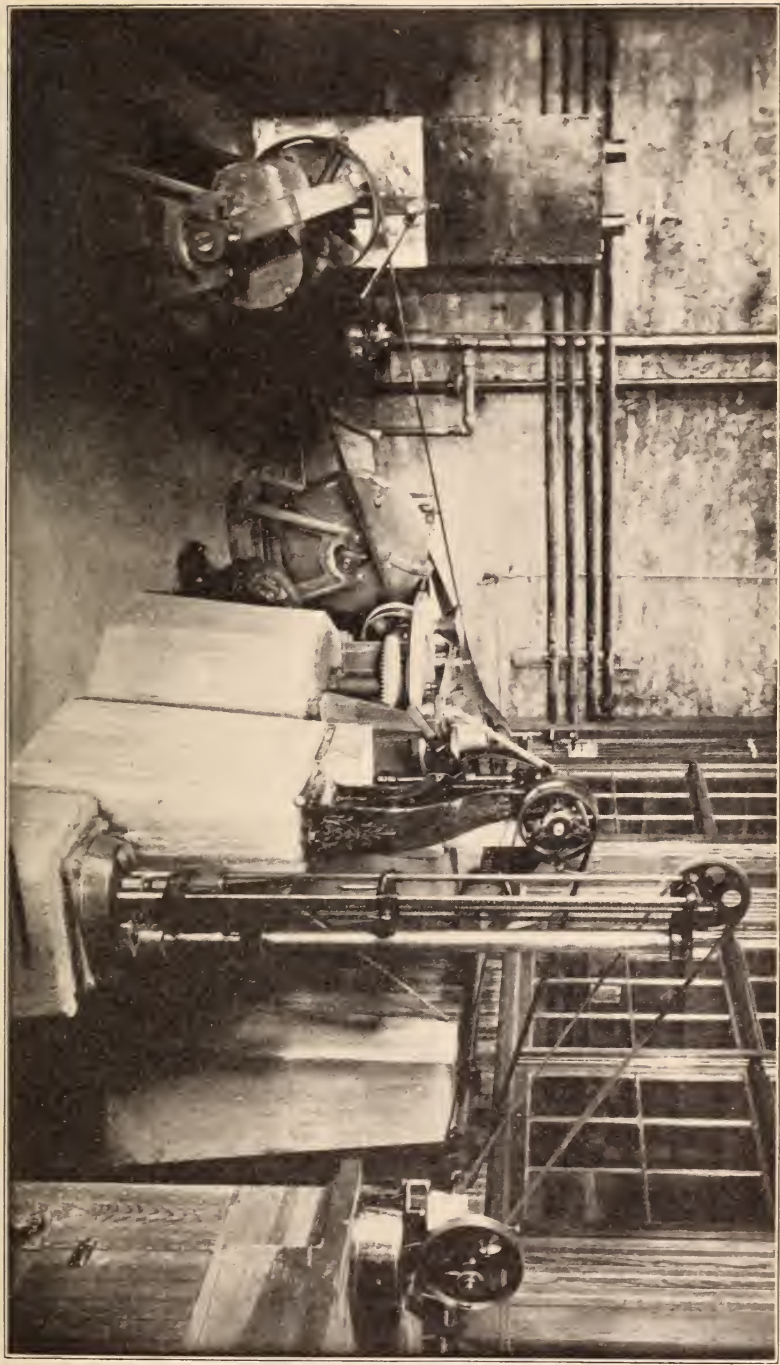
The roads-testing laboratory at the University of Colorado was established with two objects in view: the first and primary object being to facilitate and improve the regular instruction in highway engineering given at the university; the second being to furnish means for conducting an investigation of the road-building materials of the State of Colorado. The first aim is being satisfactorily realized, and the latter, in conjunction with the State Highway Commission and with various interested county and city officials, is being gradually accomplished.

This is the only roads-testing laboratory in the Rocky Mountain region, and a brief description of the apparatus and the methods of making the tests may be of interest and of value. A good road metal should be hard and tough, in order to resist wear of wheels and the blows from horses' hoofs, and should have a strong binding capacity, so that the road surface will not ravel and form dust. A full description of the tests to determine these properties would require considerable space, but a brief outline of the mode of procedure will be presented. The methods used are the standard tests adopted by the American Society for Testing Materials and by the office of public roads of the United States Department of Agriculture. A general view of the laboratory is shown in Fig. 1.

HARDNESS TEST.

The Dorry machine for testing hardness—Fig. 2 (a)—consists chiefly of a circular steel disk about twenty-four inches in diameter, which revolves in a horizontal plane upon which the specimens are abraded. A cylindrical core twenty-five millimeters (one inch) in diameter, which has been cut by a diamond core drill from the rock that is being tested, is held perpendicularly against this revolving steel disc under a constant pressure of 1,250 grams (two and three-quarter pounds), while standard quartz sand is fed on the disc to act as an abrasive agent. At the end of 1,000 revolutions the loss in weight is determined, and the average of two such runs is taken as the measure of the hardness. The hardness is obtained by the formula—

ROAD-MATERIAL TESTING LABORATORY, COLORADO UNIVERSITY, BOULDER



Hardness equals $20 - \frac{1}{3} W$

where W is the loss in grams per 1,000 revolutions. Rocks having a hardness below 14 are called soft; from 14 to 17 medium, and above 17 hard.

TOUGHNESS TEST.

As applied to road materials, toughness is understood to mean ability to resist fracture due to impact. The Page impact machine consists essentially of a two-kilogram hammer (4.4 pounds), guided by two vertical rods, which is allowed to fall from a certain height and strike a plunger which rests upon the specimen. The portion of the plunger which rests on the core is hemispherical in form, having a radius of one centimeter (0.4 inch). The hammer is raised by means of a revolving sprocket chain, with a lug attached, which engages the hammer and lifts it to the tripping device. The height of fall is automatically increased from an initial value of one centimeter by an amount equal to one centimeter at each blow, and the number of blows required to break the specimen measures the toughness. The test specimen is a core twenty-five millimeters (one inch) in diameter and twenty-five millimeters long, cut by a diamond drill and squared at the ends by the diamond stone saw and the grinding lap.

If the toughness (number of blows) falls below 13, the toughness is said to be low; from 13 to 19, medium, and above 19, high.

ABRASION TEST.

The Deval abrasion machine—Fig. 2 (b)—consists essentially of two cast-iron cylinders twenty centimeters (eight inches) in diameter and thirty-four centimeters (fifteen inches) deep inside, mounted upon a frame in such a manner that the axes of the cylinders are inclined to the axis of rotation at an angle of 30 degrees. The rock is broken in as nearly uniform pieces as practicable, and about fifty pieces constitute a test, the whole weighing as near five kilograms (eleven pounds) as can be obtained conveniently. The broken stone, which is just about the size of the coarser fragments used in road construction, is put in one of the cylinders and rotated 10,000 times at thirty revolutions per minute. The amount of abraded material—that which will pass a one-sixteenth-inch mesh sieve—is considered as measuring the rate of wear. The coefficient of wear (sometimes called the French coefficient) is found from the formula

$$\text{Coefficient} = \frac{400}{W} = \frac{40}{\text{per cent of wear}}$$

where W is the weight of detritus in grams per kilogram of rock tested.

In this test the sample is thrown the length of the cylinder twice at each revolution, so that the individual fragments grind against each other as well as against the sides of the cylinders.

A coefficient of 8 is considered low; from 8 to 13, medium; from 14 to 20, high; above 20, very high.

CEMENTING VALUE.

The binding power of a road material is the property possessed by the rock dust to act as a cement on the coarser fragments composing crushed stone or gravel roads. The method of preparing the test specimen consists in crushing the stone to fine particles and then grinding to dust in the ball mill—Fig. 2 (d). The ball mill consists of a large cast-iron annular casing, in which are two twenty-pound cast-steel shot. When the material is introduced, ninety cubic centimeters of water is added to each 500 grams of the stone, in order to make the dust into a stiff paste. The grinding is continued for two and one-half hours, at a rate of 2,000 revolutions per hour. Then the "dough" is removed and molded into cylindrical briquettes twenty-five millimeters (one inch) long and twenty-five millimeters in diameter in a special briquette machine. The briquettes are molded under a pressure of 132 kilos per square centimeter (about 1,800 pounds per square inch). After the five briquettes which constitute a test are molded, they are allowed to dry twenty hours in air and four hours in a hot-air bath at 200 degrees Fahrenheit.

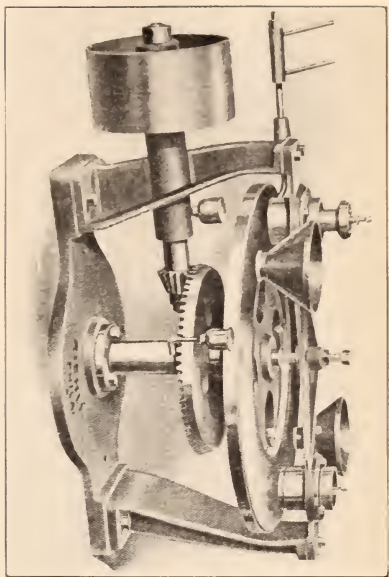
The Page impact machine for testing cementation is shown in Fig. 2 (C). It consists essentially of a one-kilogram hammer, which is allowed to drop repeatedly upon the briquette, molded as described above, through a height of one centimeter. The number of blows required to break the briquette is the measure of the cementing value.

Cementing values (number of blows) below 10 are considered low; from 10 to 25, fair; from 26 to 75, good; from 76 to 100, very good; and above 100, excellent

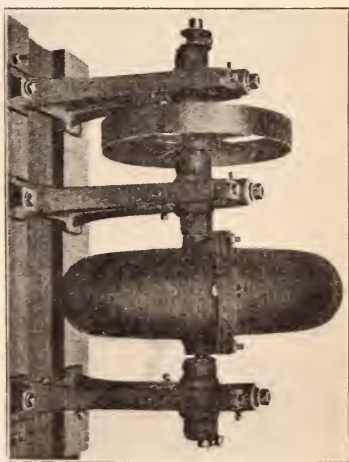
Additional tests consist in determining the specific gravity of the rock; the per cent of absorption and porosity, and the mineralogical composition. The apparatus, for the most part, employed in these determinations is not special in its character, and hence need not be described.

TESTS OF GRAVEL.

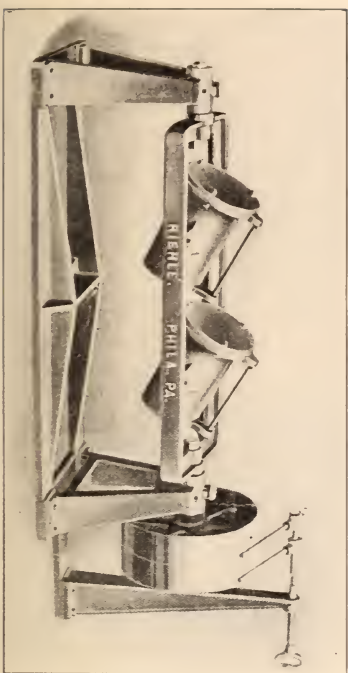
The composition of the gravel is, perhaps, the most important determination, and is usually stated in terms of the name of the stone which forms the principal constituent, such as granite, sandstone, limestone, gravel. The specific gravity and the percentage of voids also are determined in the usual manner. The cementing value is ascertained in essentially the same way as it is determined for broken stone. A mechanical analysis is made by



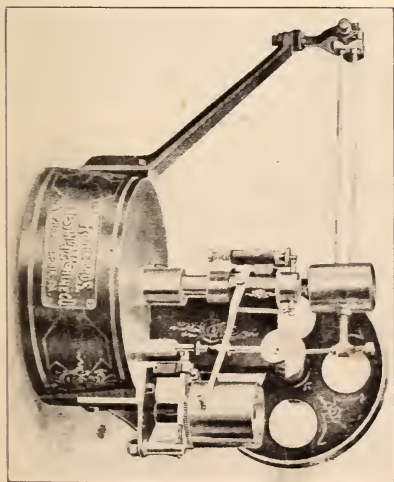
(a)



(c)



(b)



(d)

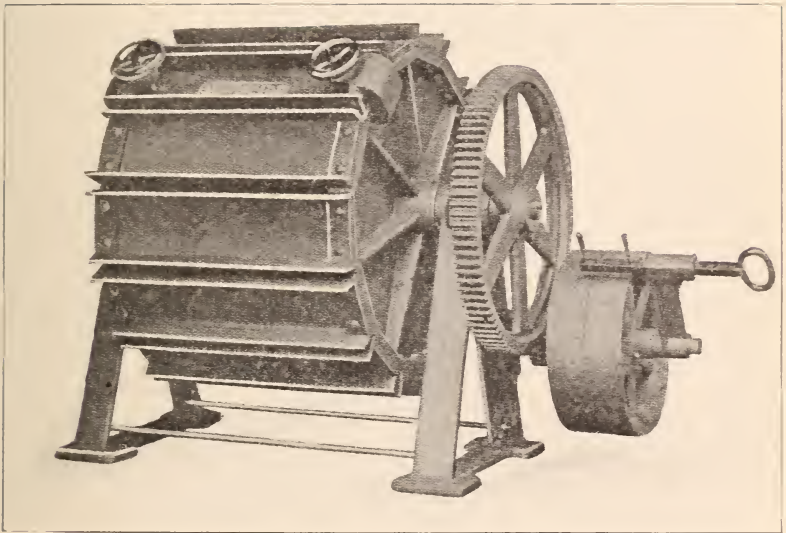


Fig. 3.

screening through graduated sizes of sieves, and the results plotted in a curve. The character of the curve indicates the uniformity of graduation, etc. The percentage of clay and loam is determined by elutriation; that is, by determining the amount washed away by water.

BITUMINOUS MATERIAL.

Bituminous road materials are variable in their composition. They include petroleum and petroleum products, malthas, asphalts and materials having an asphaltic base, tar and tar products, mixtures of tar with petroleum or with asphaltic products, bituminous emulsions, etc.

The tests applied vary, of course, with the nature of the material to be tested. The laboratory at the University of Colorado is not equipped with facilities for making tests of bituminous materials further than determining the specific gravity, the total bitumen, and the cementing value. The apparatus required in order to make complete tests are the consistometer and a tensometer—instruments for determining the consistency and tensile strength and ductility, respectively, of bituminous materials.

The only bituminous materials native to Colorado which have been tested in the laboratory are a gilsonite rock, which occurs in Rio Blanco and Grand counties, and an asphaltic sand from Jefferson County.

TESTS OF BRICK.

The tests on paving brick include the determination of specific gravity; the per cent of absorption; the crushing strength; the transverse strength, and the rattler test, the last of which will be briefly outlined.

The apparatus for making the test is the standard brick rattler (Fig. 3), consisting of a cast-iron barrel twenty-eight inches in diameter and twenty-four inches long, which is rotated on trunions. A charge consists of enough brick to make up 1,000 cubic inches in volume; 225 pounds of small cast-iron one and one-half-inch cubes, and seventy-five pounds of large cast-iron blocks $2\frac{1}{2} \times 2\frac{1}{2} \times 4\frac{1}{2}$ inches in size. After the charge is introduced, the rattler is rotated 1,800 revolutions at the rate of thirty revolutions per minute. Then the bricks are removed and weighed, and the percentage of wear indicates the susceptibility to impact and abrasion. This test is the most important one that is made upon paving bricks, and shipments are frequently accepted and rejected according as the bricks pass or fail to pass the test. A common specification is that the brick shall not lose more than 25 per cent in weight while undergoing this test. This specification is very liberal.

TESTS OF ROAD MATERIAL.

Name of Sample	Average Abrasion Per Cent. Detritus	French Coef.	Cementation Number of Blows	Specific Gravity Average	Per Cent. Absorption Average	Kind of Material
Akron No. 1.	36.2	1.1	42	2.15	8.41	Volcanic ash and pebbles
Akron No. 2.	6.7	6.0	37	2.39	6.10	Volcanic tuff
Akron No. 3.	30.6	1.3	68	*	*	Volcanic tuff
La Plata No. 1.	6.4	6.3	128	2.46	5.65	Conglomerate
La Plata No. 2.	5.3	7.5	10	2.71	0.05	Limestone dolomitic
Otero County.	12.2	3.3	41	2.44	6.54	Volcanic tuff
Golden.	2.2	18.6	21	2.74	0.98	Basalt
Boulder.	4.5	8.9	37	2.61	2.26	Limestone
La Junta.	1.9	21.6	20	2.43	4.5	Limestone, non-crystal-
	Weight per cu. ft.=151 lbs. voids 34%					line argillaceous
	Bitumen	Clay	Limestone	Sp. Gr.	Cementation	
†Rio Blanco.	8.3%	4%	0.0	1.96	200	Asphaltic sand, gilsonite
	Toughness 6. This is a very fine sand, all passing a 20 sieve and nearly all a 30 screen					
	Bitumen					
Jefferson County	11.14%					
	11.27%					Asphaltic sand
	10.48%					

TESTS OF GRAVEL.

	Per Cent. Voids	Specific Gravity	Suspended Material	Cementation
Unknown.	48.5	1.86	13.9	73 (Wellington)
Boulder County No. 1.	29.2	1.89	6.4	206

GRANULOMETRIC ANALYSIS OF GRAVELS.

	Per Cent. Retained on Sieves.						
	2 in.	1 in.	½ in.	¼ in.	1-16 in.	1-32 in.	1-100 in.
Unknown.	0.0	3.8	8.4	13.4	21.2	22.9	23.0
Boulder.	21.3	3.8	7.2	24.1	35.1	5.5	3.0

*Too soft to test.

†When this material was mixed in equal proportions with fine crushed sandstone (such as passed a ½-inch screen) and ground together no very noticeable binding effect was observed. However, when the mixture was heated to a temperature of 300° F the whole mass cemented together in one cake.

CEMENT TESTS.

BRAND	No. of Samples	Setting		Fineness			Soundness	Specific Gravity	Color	Temperature		Per Cent. Water		24-hr. Test		7-day Test		28-day Test				
		Initial	Final	Held by 100 Mesh	Held by 200 Mesh	Passing 200 Mesh				Steam Pat	Water Pat	Air Pat	Air	Water	Neat	1:3 Lbs. per sq. in.	Neat	1:3 Lbs. per sq. in.	Neat	1:3 Lbs. per sq. in.	Neat	1:3 Lbs. per sq. in.
Kansas, no brand...	1	1 40	6 30	6.5	14.20	79.3	OK	OK	OK	19°C	24	1.3	1 175 2 152 3 181 4 158 5 152	26 26 Broke 17 Broke	576 541 550 560 673	114 115 120 105 121	800 840 805	370 360 260				
Colorado, no brand.	1	1 59	5 49	7	24	69	OK	OK	OK	21°C	22	10	A 315 B 360 C 305		685 705 765	305 270 310	800 840 805	370 360 300				
Colorado, no brand.	1	3 40	7 00	6	22	72	OK	OK	OK	22°C	22	11	A 250 B 300 C 275		830 790 815	215 215 240	970 870 850	370 360 260				
Colorado, no brand.	2	3 30	6 40	7	23	70	OK	OK	OK	22°C	23	.11	A 175 B 50		720 860	275 320	600 1025	400 350				

REVIEW OF TESTS.

Akron No. 1.—This material is a volcanic ash, containing water-worn pebbles. It is a rather soft rock, having a hardness of about 4 on the Dana scale; contains a little lime, and the pebbles are mostly quartz. It is too soft—French coefficient being only 1.1—to make a good road material. The cementation qualities are fair. The absorptive properties also condemn it. Might be used for light traffic.

Akron No. 2.—This rock is a volcanic tuff, practically free from lime, and a little softer than No. 1. It is about the same grade of material as No. 1 in general.

Akron No. 3.—A volcanic tuff having a hardness of about $2\frac{1}{2}$. Its cementation qualities are its only recommendation.

La Plata No. 1.—A conglomerate composed chiefly of basaltic rock and kaolin. It has acceptable abrasive qualities and good cementation. Lacks somewhat in toughness and hardness. On the whole, a fairly good road material.

La Plata No. 2.—A dolomitic limestone, with fair abrasive properties but poor cementation. If mixed with a good cementing material, such as Akron No. 3 or La Plata No. 1, would be a good road material.

Otero County.—A volcanic tuff, very soft, having fair cementing properties, with a high absorption. Would serve, perhaps, for light traffic.

Golden.—A heavy basaltic rock of extreme hardness and abrasive qualities, having a French coefficient of 18.6, but of low cementing value. It has a very low absorption, and would make a very good road metal if mixed with a good cementing material.

Clear Creek Silt.—This is a silt of recent formation, and has practically nothing to commend it as a road material except as a binder.

Delta County Lava and the sample from Wray, Yuma County, have not been tested. The only test possible on such material is the cementing properties, which in these instances appear to be high. The sample from Cortez, Montezuma County, is not of sufficient quantity for testing.

Boulder Limestone.—This is a fairly hard limestone of fair abrasive properties and fair cementation and a reasonably low absorption—on the whole, an acceptable road material. (The sample was submitted by the city of Boulder, and not by the State Highway Commission.)

Gravel.—The name of this sample had been lost from the sack. It would be classed, however, as a ferruginous gravel with flinty pebbles. Has excellent cementation qualities, and would make a good road material.

Boulder Gravel.—A clayey gravel with good cementation qualities.

Test of Asphaltic Sand.—The only test performed on this material was to ascertain the percentage of bitumen the sample contained. This was ascertained by dissolving the bitumen in carbon-disulphide. The sample submitted was fairly uniform, none of the three tests made varying more than 4.5 per cent from the mean.

The following table will give a general idea of the value for road material of the various rocks:

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF PUBLIC ROADS

Division of Tests.

Maximum and Minimum Results on Rock Samples, Corrected to January 1, 1910.

No. of Samples	NAME	Specific Gravity		Weight—Pounds Per Cubic Foot			Water Absorbed—lbs. per Cubic Foot		Per Cent. of Wear		French Coefficient of Wear		Hardness		Toughness		Cementing Value		NAME	
		Max.	Min.	Max.	Av.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		Max.
15	Amphibolite.....	3.10	2.70	3.00	193	168	187	1.65	0.04	10.3	1.0	41.7	3.9	19.0	13.5	29	7	235	11	Amphibolite
40	Andesite.....	2.95	2.20	2.70	184	137	168	6.59	0.05	8.1	1.5	26.0	4.9	19.4	7.9	44	6	500 +	11	Andesite
83	Basalt.....	3.00	2.40	2.85	187	150	178	6.32	0.04	14.7	1.3	30.4	2.7	19.2	5.9	39	6	500 +	4	Basalt
48	Chert.....	2.95	2.00	2.55	184	125	159	11.10	0.26	29.2	2.7	14.6	1.4	19.7	12.7	26	5	500 +	2	Chert
5	Conglomerate.....	2.65	2.50	2.60	165	156	162	3.71	0.60	12.7	3.5	11.6	3.2	18.4	9.3	10	10	500 +	20	Conglomerate
183	Diabase.....	3.20	2.60	2.90	200	162	181	2.73	0.03	6.3	1.1	36.4	6.4	19.4	12.3	54	4	500 +	2	Diabase
57	Diorite.....	3.35	2.70	2.85	209	168	178	1.03	0.05	7.3	1.6	25.0	5.5	19.4	16.6	38	5	148	5	Diorite
140	Dolomite.....	2.90	2.30	2.75	181	143	172	9.40	0.07	18.6	1.2	33.3	2.2	18.4	1.8	27	3	179	9	Dolomite
6	Ecolite.....	3.65	2.95	3.20	228	184	200	0.28	0.10	2.9	1.8	22.7	13.8	18.7	17.4	31	14	130	10	Ecolite
6	Epidosite.....	3.30	2.70	3.00	206	168	187	1.10	0.22	7.4	2.0	19.6	5.4	19.3	10.7	23	10	83	14	Epidosite
11	Felsite.....	2.80	2.50	2.65	175	156	165	3.13	0.02	3.4	1.9	21.3	11.8	.....	.....	.....	.....	.....	.....	Felsite
90	Fieldstone.....	.....	.....	.....	.....	.....	.....	.....	.....	10.3	2.1	19.0	3.8	.....	.....	.....	.....	12	12	Fieldstone
36	Gabbro.....	3.65	2.75	2.95	228	172	184	0.97	0.04	5.9	1.3	30.8	6.8	18.8	16.2	23	9	115	6	Gabbro
115	Gneiss.....	3.20	2.60	2.75	200	162	172	1.24	0.02	16.4	1.7	23.0	2.4	19.3	9.0	25	2	110	1	Gneiss
168	Granite.....	3.00	2.00	2.65	187	125	165	2.77	0.04	24.6	1.1	37.0	1.6	19.6	13.6	33	2	255	2	Granite
117	Gravel.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500 +	3	Gravel
573	Limestone.....	2.90	2.00	2.70	196	125	168	13.22	0.02	34.2	1.8	21.7	1.2	19.1	0.0	25	2	500 +	10	Limestone

20	Marble	2.85	2.65	2.75	178	165	172	1.04	0.10	14.0	2.5	16.0	2.8	17.3	7.1	23	3	85	15	Marble
9	Marl																	500 +	96	Marl
19	Mixed stone									10.3	2.1	19.1	3.9							Mixed stone
5	Peridotite	3.55	2.65	2.95	221	165	184	1.02	0.27	5.3	3.0	13.2	7.6	15.0	13.3	12	9	91	25	Peridotite
78	Quartzite	3.15	2.50	2.70	196	156	168	1.89	0.05	7.6	1.6	24.5	5.3	19.7	16.5	30	5	45	0	Quartzite
35	Rhyolite	2.90	2.05	2.55	181	128	159	7.15	0.03	9.7	1.7	23.0	4.1	19.7	15.3	42	6	500 +	10	Rhyolite
244	Sandstone	3.25	2.00	2.65	203	125	165	11.60	0.02	41.7	1.0	40.8	1.0	19.5	0.0	60	2	500 +	1	Sandstone
114	Schist	3.20	2.65	2.90	200	165	181	1.35	0.06	18.2	1.3	31.7	2.2	19.0	0.9	35	3	232	5	Schist
9	Shale	2.70	2.50	2.65	168	156	165	4.84	0.50	16.2	3.2	12.6	2.5	17.7	13.9	12	3	367	28	Shale
43	Slag	3.90	2.00	3.00	243	125	187	4.40	0.04	13.5	2.7	14.6	3.0	18.3	10.7	21	3	500 +	1	Slag
45	Slate	3.35	2.60	2.75	209	162	172	2.10	0.05	12.4	1.6	24.4	3.2	19.7	1.1	56	1	500 +	1	Slate
26	Syenite	3.05	2.15	2.70	190	134	168	4.21	0.08	14.4	1.7	23.5	2.8	19.2	17.3	34	8	375	16	Syenite

APPENDIX NO. 2

REPORTS, BULLETINS, ETC., ON FILE AT HIGHWAY COMMISSION
OFFICE

REPORTS

- | | |
|---|------------------------|
| Ohio, 1908-1909. | New York, 1910-1911. |
| Washington, 1906, 1908. | Washington, 1910. |
| Ontario, 1907, 1908, 1909. | Michigan, 1909, 1910. |
| Missouri, 1908-1909. | New Jersey, 1910-1911. |
| Rhode Island, 1907, 1908, 1909. | Maine, 1910-1911. |
| New Jersey, 1908-1909. | Colorado, 1909-1910. |
| Pennsylvania, 1905, 1907, 1908. | Ontario, 1910. |
| Massachusetts, 1908. | Ohio, 1910. |
| Michigan, 1907-1908. | Minnesota, 1909-1910. |
| Maine, 1905, 1906, 1907, 1908,
1909. | Utah, 1909-1910. |
| New York, 1909. | Louisiana, 1910-1912. |
| Connecticut, 1905, 1906, 1907,
1908. | |

ROAD LAWS

- | | |
|-------------------------------|---|
| Pennsylvania, 1905-1908. | Ohio, law recommended, 1910. |
| Maryland, 1908. | Washington, 1911. |
| Washington, 1907, 1908, 1909. | Pennsylvania, 1907. |
| Missouri, 1909. | Massachusetts, auto law, 1910. |
| New York, 1909. | Wisconsin, law, 1911. |
| Massachusetts, 1906. | Colorado, law, 1910 |
| Maine, 1909. | Colorado laws concerning road
districts, 1911. |
| Connecticut, 1909. | |
| Ohio, 1908. | |

BULLETINS

- New Jersey—Specifications for Gravel and Stone Roads.
Ohio—Bulletins Nos. 2, 5, 12, and 13.
Two pamphlets.
Missouri—Specifications for Gravel, Rock, Sand-Clay Roads.
Highway Bridges.
Bulletin—Rock and Gravel Roads.
New York—Instructions, etc., to Supervisors.
Pennsylvania—Bulletin for Road Supervisors.
Missouri—Bulletin, Highway Association Meeting.
Washington—Bulletin.
Iowa—State Commission, Bridge Specifications.
Missouri—Bridge Specifications.
Road Building Material of Coshocton County, Ohio.
Michigan—Care of Earth Roads.

Minnesota—Bridge Specifications.
 Michigan—Concrete Road.
 Brick Paving.
 Rhode Island—Tar Macadam.
 Ohio—Experiments, Road Binders, etc.

U. S. BULLETINS

Wide Tires—Sand-Clay Roads—Highway Bridges and Culverts.
 Road Materials of Southern and Eastern Maine.
 Methods for Examination of Bituminous Road Material.
 Preservation of Iron and Steel.
 Methods for Macadam Roads.
 Progress of Road Construction.
 Concrete Fence Posts.
 Syllabus—Illustrated Lecture on Roads and Road-Building.
 Arkansas Road-Making Material.
 Rocks for Road-Building.
 Earth Roads, Construction and Repair.
 Roads, Materials and Rates on Railroad. Nos. 5 and 6.
 Roads and Materials in Eastern and Southern States.
 Convicts' Work on Roads.
 Road-Building in United States.
 Decomposition of Feldspars.
 Construction of Macadam Roads, Nos. 21 and 29.
 Spirit Leveling in Colorado.
 Corrosion of Fence Wire.
 Exhibit of Public Roads Office, Alaska-Yukon Exposition.
 Road Mileage Revenues and Expenditures in United States, 1904,
 1909, 1911.
 Good Roads for Farmers.
 Brick Paving for Country Roads.
 Useful Properties of Clay.
 Effect of Water on Rock Powders.
 Cementing Power of Road Material.
 Texas Good Road Convention.
 Table of Rock Tests.
 New Hampshire Highways.
 State Laws on Management of Roads.
 Coke-Oven Tars of United States.
 Road Materials of Minnesota.
 Testing Rock for Road-Building.
 Cement, Mortar and Concrete.
 Report of Director, Office of Public Roads, 1908 and 1909.
 Macadam Roads.
 Sand-Clay and Burnt-Clay Roads.
 Split Log Drag on Earth Roads.
 Gazetteer of Colorado.
 Proceedings of North Carolina Good Roads Convention.
 Corrosion of Iron.

Road-Making Materials.
Dust Preventives.
Practical Road-Building in Tennessee.
Progress of Road Legislation and Improvement in Different States.
Building Sand-Clay Roads in Southern States.
Proceedings of National Good Roads Convention, St. Louis, 1903.
Steel-Track Wagon-Road.
Government Co-operation in Object-Lesson Good Roads.
State Laws, Management of Road, 1888-1893 and 1894-1895.
Testing of Road Materials.

MISCELLANEOUS

Auto Roads and Drives at Colorado Springs.
Good Roads for Maine.
Colorado Agricultural Resources (Santa Fe Railroad).
Colorado Resources and Population.
Report of State Reformatory.
Report of Department Health and Sanitation.
Second Manual Good Roads Convention, Cleveland (A. A. A.).
Regulation and Registration of Autos (Committee of Congress).
Roads and Pavements (by Flagg).
State Road Systems (by Johnson).
C. J. Hughes, Jr., Speech on Lands.
The Greeley District.
Taylor's Speech on Western Rights.
Motor Vehicle Laws.
California State Auto Tour Book.
Turner System of Reinforced Concrete.
Results of Spirit Levels in Colorado (U. S. Geological Survey).
Concrete Pavements.
Omaha-Denver Highway Guide.
International Conciliation—Taxation and Armaments.
South Dakota H. B. 161—Roads.
Adopting Macadam to Auto Traffic.
Sulzer's Speech on National Aid.

APPENDIX NO. 3

ELEVATION OF PASSES

Feet

Alpine Pass .....	.....
Alpine Tunnel	11,606
Argentine Pass	13,286
Boreas Pass	11,489
Breckenridge Pass	11,503
Berthoud Pass	11,306
Cochetopa Pass	10,032
East River Pass (Gunnison County).....	11,163
Elwood Pass	11,678
Fremont Pass	11,320
Gove Pass	9,570
Hoosler Pass	10,313
Hayden Pass	10,780
Hilltop Junction	9,839
Independence Pass	12,095
La Veta Pass.....	9,378
Lake Creek Pass (Lake and Gunnison Counties).....	12,226
Mosquito Pass	13,188
Mosea Pass (Huerfano and Saguache Counties).....	9,713
Marshall Pass	10,950
Molas Lakes	10,488
Monarch Pass	11,650
Muddy Pass (Larimer and Grand Counties).....	8,772
Ohio Pass	10,033
Poncha Pass	8,945
Pearl Pass (between Pitkin and Gunnison Counties).....	12,715
Red Mountain	11,018
Rollins Pass	11,680
Sangre de Cristo Pass.....	9,454
Stony Pass	12,590
San Francisco Pass (Las Animas County).....	8,560
Tennessee Pass	10,276
Tarryall (Park County).....	12,466
Trout Creek (Park and Chaffee Counties).....	9,346
Weminuche Pass	10,628

	Feet
Weston Pass	12,109
Willow Creek Pass.....	9,653
Yellow Jacket Pass (Rio Blanco County).....	7,493
Georgia Pass	
Webster Pass	
Loveland Pass	
Jones Pass	
Taylor Pass	
Cottonwood Pass	
Williams Pass	
Veta Pass	
Cumbres	10,003
Lulu Pass	
Buffalo Pass	10,650

APPENDIX NO. 4

FINANCIAL STATEMENT FOR 1911 AND 1912

Balance left to be vouchered of the appropriation made in 1910	\$15,573.23	
Deduct \$6,000.00 which treasurer held as not part of available appropriation	6,000.00	
		<u>2</u>
Amount on hand December 1, 1910.....		\$ 9,573.23
Vouchered out on completion of work in 1911:		
Pueblo County	\$ 1,000.00	
Otero County	1,000.00	
Morgan County	1,500.00	
Washington County	700.00	
Adams County	250.00	
Larimer County	500.00	
Montezuma County	600.00	
Garfield County	1,000.00	
San Juan County.....	1,023.23	
Yuma County	700.00	
Bent County	500.00	
Mesa County	800.00	
		<u>9,573.23</u>

Road appropriations made in 1911 not being available, the work was done by the counties during the past two years with the expectation of receiving state aid when the money became available. Approximately \$500,000 of bridge and road work was completed, or is now under construction under the supervision of the Commission.

Appropriation and expenditures for the past two years for salaries were as follows:

SALARIES FOR TWO YEARS

	Appropriated	Expended
Commissioners	\$ 4,800.00	\$ 4,800.00
Secretary-engineer	5,000.00	5,000.00
Stenographer	2,400.00	1,800.00
	<u>12,200.00</u>	<u>11,600.00</u>
Balance to transfer.....	\$ 600.00	.....

COMMISSIONERS' AND ENGINEERS' EXPENSE FUND FOR 1911 AND 1912

Appropriated expense fund.....	\$ 5,000.00
Incidental fund	600.00
Expended—	
Commissioners' and engineers' expense.....	\$4,735.34
Maps, blue-prints, etc.....	135.71
Photos, cards, and slides.....	103.50
Stationery, inks, tracing-cloth, etc.....	227.26
Telephone	196.55
Stamps (about \$250.00 included in personal account).....	50.00
Telegraph	29.37
Livery and auto hire.....	685.34
Express	9.30
Exhibit at Chamber of Commerce.....	86.85
Printing	357.50
	<hr/>
	\$ 6,616.72

Machinery and Labor—

Machinery (road outfit and drags).....	\$ 6,987.79
Engineering services	1,562.17
Labor on dragging state road.....	427.25
	<hr/>
	\$ 8,977.21

APPENDIX NO. 5

FORMS AND RESOLUTIONS USED IN APPLYING FOR STATE AID IN ROAD CONSTRUCTION

RESOLUTION OF HIGHWAY COMMISSION DESIGNATING STATE ROADS

Whereas, The State Highway Commission is authorized and required by Chapter 57 of the Session Laws of 1909, and particularly by section 4 thereof, to select and designate certain highways of the state roads, and to entitle such state roads so selected to state aid in their construction, improvement, and maintenance; and

Whereas, The Highway Commission deems the following-described highway of sufficient public importance to entitle it to state aid under the said act, and to authorize the county commissioners of the counties through which it passes to expend thereon the funds apportioned to those counties from the State Road Fund, in the manner designated by and subject to the regulation and supervision of this Commission;

Therefore, Be It Resolved, That the following-described highway be designated and declared as a state road of the (primary or secondary) class, within the meaning of said act; and that the county commissioners of the counties hereinafter designated, through which the said highway runs or upon which it borders, be informed of this action, by the secretary of this Commission.

FORM OF RESOLUTION APPLYING FOR STATE AID

Whereas, The Board of County Commissioners of..... County, Colorado, is desirous of complying with and availing itself of the benefits of the provisions of Chapter 57 of the Session Laws of the State of Colorado for 1909, entitled "Highway Commission;"

Be It Resolved, That, in the judgment of this board, the following highways in County are especially such as need improvement, namely.....

And Be It Further Resolved, That this board hereby makes an appropriation of.....dollars, to be expended between the date hereof and..... upon said road under the provisions of the act creating the State Highway Commission and the rules contained in Bulletin No... issued by said Commission, and hereby applies to said Commis-

sion for the sum of.....dollars as state aid for the accomplishment of said work, the same being on the basis of one dollar from the state to each..... contributed by the county.

The regular apportionment is made on or before the first Tuesday of March of each year.

SPECIAL APPORTIONMENTS MADE AT OTHER TIMES

Whereas, The State Highway Commission is authorized to apportion the State Road Fund among the several counties, and has provided in its requirements for a manner of remittance known as "Special Disbursements;"

Resolved, That a special disbursement of.....dollars be hereby authorized for the purpose and upon the conditions hereinafter described, to.....County, and the State Auditor is hereby authorized to draw his warrant as directed by this Commission from time to time upon estimates in favor of the county treasurer of.....County, from the said sum from said State Road Fund, upon receipt of the certificate of the chairman of this Commission that this resolution has been accepted and has gone into effect.

The purposes for which the above apportionment is to be expended are as follows: drainage, grading, and improvement of State Primary Road No.....within the County of, together with engineering expenses incident thereto.

This apportionment shall go into effect upon the receipt of a resolution passed by the Board of County Commissioners ofCounty to the effect that said board accepts this special disbursement upon the terms above described, and will devote the same only to the purposes so set forth.

This apportionment shall be known as ".....County Special Disbursement of.....191.."

The chairman is authorized and directed to notify the State Auditor of the passage of this resolution, upon receipt of the action of the Board of County Commissioners accepting the same.

The apportionment made herein shall be considered a part of the sum set apart for said county for the fiscal year of 191..

(SEAL)

..... Chairman.

Attest:

..... Secretary.

CERTIFICATE OF STATE HIGHWAY COMMISSION TO STATE AUDITOR

I hereby certify that the attached copy of resolution is a true and correct copy of the resolution sent to the commissioners

of.....County, and accepted by them by resolution dated....., a copy of which is herewith attached.

.....
Chairman.

Attest:

.....
Secretary.

RESOLUTION OF ACCEPTANCE BY COUNTIES OF ANNUAL OR SPECIAL APPORTIONMENT

At a.....meeting of the Board of County Commissioners of.....County, Colorado, held at....., Colorado, on..... 19...., there being present:

.....
the following resolution was adopted:

Resolved, by the Board of County Commissioners of.....County, that an apportionment of.....19...., known as '.....County apportionment of 19....,' out of the State Road Fund, to be expended for the grading, drainage, and improvement of roads in.....County and engineering expenses incidental thereto, is accepted, and this county agrees to spend.....the sum apportioned from the State Road Fund for said work on State Primary Road No....., as designated by the State Highway Commission in their apportionment of said money, and to be used only for said purposes.

.....
Chairman.

Attest:

.....
County Clerk.

State of Colorado, County of....., ss.

I.....County Clerk and clerk ex-officio for the Board of County Commissioners in and for the county and state aforesaid, do hereby certify that the annexed and foregoing resolution is truly copied from the records of the proceedings of the Board of County Commissioners of said.....County now in my office.

In Witness Whereof, I have hereunto set my hand and affixed the seal of said county this.....day of..... 19....

(SEAL)

REGULATION OF THE STATE HIGHWAY COMMISSION REGARDING THE
APPORTIONMENT OF THE STATE ROAD FUND.

1. Payments to the county treasurers of the several counties from the State Road Fund may be ordered by the Commission, if funds shall be available in the hands of the State Auditor and to the credit of said fund, at such convenient times and in such amounts as the condition of the work will warrant.

2. All contracts or agreements for construction or employment, or expenses of any nature whatsoever payable out of the State Road Fund, wholly or in part, must be reduced to writing and be submitted to, and have indorsed thereon the approval of, the Highway Commission, before the same are entered into or adopted by the County Commissioners. The Highway Commission may require modification, or alterations, or approve or disapprove agreement or contract as a whole, and shall return the same to the County Commissioners with such suggestions and action.

No payments whatsoever shall be allowed by the board of County Commissioners from the fund so apportioned to them, or paid by the county treasurer from such sources, unless the account and voucher has been approved by the State Highway Commission after rendering of the services covered by the account, and is endorsed with such approval. This rule applies regardless of the fact that the contract or agreement under which the work is performed may have been previously approved by the Highway Commission, and even in cases wherein the materials supplied, or construction done, under such arrangement has been accepted and approved by the Highway Commission.

3. The Commission may from time to time authorize the State Auditor to transmit to the treasurer of any county special sums of money to be expended for certain designated purposes. Such payments may be made from money or funds available to the Commission either as additional to the annual apportionment to the county concerned, or may be made on account of and as a part of such annual apportionment as the Commission may provide. Payments made under this regulation shall be known as "Special Disbursements," and shall be designated in the correspondence and proceedings incident to their payment by the date of the resolution authorizing them and the name of the county benefited, such as "Grand County Special Disbursement of March 15, 1910." In the case of such disbursements, the Commission will authorize the same by resolution, which resolution will describe also the purposes for which the payment is made, and provide for the taking effect of such resolution upon the acceptance of its terms by the Board of County Commissioners for the county benefited. Upon the passage of such resolution, the chairman of this Commission will enclose a copy of the resolution, together with a copy of this section of the regulations, to the Board of County Commissioners, and inform them that,

upon receipt of a properly certified copy of a resolution passed by such board, accepting the terms of the proposed special disbursement, the payment of the same will be authorized. Such resolution of acceptance shall be entered upon the minutes of the Highway Commission at the next meeting, but immediately upon receipt of it the chairman will authorize the remittance of the money by notification to the State Auditor. Payments and contracts made under special disbursements are subject to the same rules as proceedings under other methods of apportioning the State Road Fund, and require the approval of the Highway Commission.

4. In case the County Commissioners of any county shall purchase any machinery, implements, outfit, or equipment of any kind, to be used in the construction of any highways specified by the Highway Commission, and which has been or is to be paid for wholly or in part by the state, the title to such machinery, implements, outfit, or equipment shall be taken in the name of the people of the State of Colorado for the use of the State Highway Commission, and the same shall be subject to control of the said Highway Commission, after the completion of the work in the county purchasing the same.

Any contract for such purchase or proposed purchase shall be submitted to the State Highway Commission for their approval, the same as other agreements and contracts, as specified in section 2 hereof.

5. On or before December 1 of each year the county clerk of each county in the state shall send to the State Highway Commission a report showing:

All moneys spent on state primary roads, mileage and location of the work.

All moneys spent on culverts on state primary roads, giving number and kind of culverts.

All moneys spent for bridges (ten feet and over in span) on state primary roads, giving span, location, and kind.

Also the same information for all other roads in the county.

APPENDIX NO. 6

RULES FOR MAKING STATE ROAD MAPS AND PROFILES

Maps of the roads of the state, made in the office of the State Highway Commission, should be made according to the following general requirements:

Material—Tracing linen is to be used for the finished map.

Size of map—The map is to be made in sheets forty-two inches square, with a three-inch margin on left-hand side, and a one-inch margin around the other three sides.

Scale—For the sheets a scale of one inch equals four miles shall be used.

Legend—The primary roads shall be designated by a heavy full red line for those roads now open, and by a heavy-dashed red line for any new route not now open to travel. The secondary roads shall be designated by a light full red line for the roads now open, and by a light-dashed red line for any new route not now open to travel.

Roads improved with state aid shall be shown in red, using heavy lines for primary, and light lines for secondary roads. All other roads shall be shown in black.

The general map heading shall be:

ROAD MAP OF THE STATE OF COLORADO

Scale Date

All lines, letters, and figures must be large and black enough to print well, and to show plainly when reduced to one-quarter size.

Special maps—Maps of special sections to be drawn to a scale of one inch equals 400 feet.

Detail drawing—Detail drawings to be made to any scale that will show the object plainly, and that will fit the sheet or half-sheet. The scale to be marked on each drawing.

Profiles—Profiles to be made on any standard profile paper: Horizontal scale one inch equals 400 feet, and vertical scale one inch equals 30 feet.

COUNTY ROAD MAPS

Material—The maps should be made on tracing linen.

Size—Sheets to be forty-two inches square, and half-sheets to be twenty-one inches by forty-two inches.

Margin for binding—A three-inch margin is to be left on the left side of the full-size sheets, and the same three-inch margin to be left on the left twenty-one-inch side of the half-size sheets. A one-inch margin to be left around the other three sides of the map.

Scale—The scale to be no smaller than two miles to the inch nor larger than one mile to the inch. It is preferred that a scale of one inch equals one mile be used.

In locating road material on the map, the following abbreviations shall be used, with a ring around the letters:

P. Gr.....	Pit Gravel
R. Gr.....	River Gravel
Sh	Shale
Lm	Limestone
Cy	Clay
Ad	Adobe
Ba	Basalt
Gt	Granite
Sd	Sand

General—The maps should have the date and scale marked thereon. Roads which the County Commissioners designate as main roads should be marked by heavy full lines, the other roads by lighter lines. All water-courses, railroad crossings, and ditch crossings should be shown.

SURVEYS

A survey for state highway must show:

1. Alignment on map showing all waterways, ditches, railroads, and road intersections or crossings. Starting-point and termination to be located by reference to some section corner and frequent ties made. Rivers closely adjacent or parallel to the road should be shown or indicated by notes on map.

2. Profile must give the elevations every one hundred feet, and at intermediate point when necessary, to show the exact surface. All ditches crossing the road must be shown, elevations of top and bottom, and grade of ditch.

3. Cross-sections should be taken at least every one hundred feet, and a sufficient number of elevations taken to show the ground surface accurately.

4. Information should be noted on the map, giving the drainage area or probable amount of water that will have to be provided for at each culvert.

5. Condition of all bridges crossed by survey line, and description of bridge.

6. Notes on character and location of road material along the line of survey, or within easy hauling distance.

7. Bench-marks should be left along the line about every half-mile. These bench-marks must be plainly marked, and accurately noted in the notebook, so as to be readily picked up, and to be of as permanent a character as possible.

8. The cost of every survey must be accurately kept by the engineer in charge. All expenses must be covered by receipts.

9. Stream crossings should be shown on map with details as to direction of stream in reference to road; elevations on bed of stream, and all data possible as to high-water flow and depth to bed-rock, if possible, or to material on which bridge is to have foundation.

CROSS-SECTIONS FOR EARTH, GRAVEL, AND MACADAM ROADS, DRAINAGE AND GRADES

The section for an earth road sixty feet wide shall be as shown by Section No. 1, giving a traveled way of twenty-four feet.

Where the road is in heavy cut, the section should follow No. 2, giving a traveled way of twenty feet.

When an embankment is necessary, Section No. 3 should be followed.

In side-hill work a modification of Section 2 will be necessary, but in general a combination of section shown for cut and fill will answer.

On side hill the surface is inclined to the hillside one-half inch to the foot, and the road made sixteen feet wide, with ditch on upper side.

These sections are designated so that any grading-machine or scraper can be used for the earth-work.

After the sections are properly graded, the road is to be gone over with a drag, working from the sides first, until it is well smoothed and compacted.

A roller should be used to compact the road-bed.

Cuts—In cuts where the side hill is of any considerable area, an intercepting ditch should be made well above the road, and large enough to take any water that might otherwise cut the slope and fill the road ditch with dirt.

Fills—In making the fills, the material in each load is to be spread as much as possible, and teams, wagons, scrapers, etc., driven over the fill in the course of the work so as to consolidate it.

Drainage—The drainage of a road is the important feature, beside which all others are but secondary considerations.

The side ditches must be run to a true grade, and must lead to and empty into some line of drainage which will carry the water entirely away from the road.

Cross-culverts will be placed wherever necessary to carry the water across the road. The culverts should be of permanent construction, concrete preferred, and have waterway sufficient for the area to be drained. All pipe culverts should have at least twelve inches of covering.

Where the ground-water plane is so high as to keep the road moist, sub-drainage will be necessary. Ordinary drain tile can be used for this purpose. The size of pipe and fall per one hundred feet to be determined for each case, as the conditions will vary.

When the grade of a side ditch is over two feet in a hundred feet, care must be taken to see that the ditch does not cut out or gully. Ditches with heavy grades must be protected by paving, or by paved or concrete drops.

Slopes may be protected by sowing to grass or any other plant that will mat and not be objectionable to occupants of lands along the road.

The idea to be always kept in mind in all provisions for the drainage of a roadway is that the water must be carried entirely off of, and away from, the road. Any ditch or drain that does not accomplish this is of little use. Pools of water standing in the ditches along the roadside are a nuisance, and damage any and every road.

Ditches, culverts, and drains must be kept open and ready at all times to do the work they were constructed to do.

Grades—A rise of six feet in one hundred feet as a maximum, and of 0.5 per one hundred feet as a minimum is desired.

In locations where these grades are not economically possible, careful surveys and estimates will be made to determine the best possible grade and alignment.

On grades of over three feet rise in one hundred feet, it may be necessary to construct the road surface so as to throw all drainage to the side ditches and to keep the water from flowing down the center of the road; sufficient cross-drain shall be put in to carry the water across and under the road.

Rock Excavation—When any excavation is in rock, it shall be excavated to six inches below the surface grade of the road, the surfacing material being used to bring the road to proper grade and crown.

DIRECTIONS FOR MAKING SAND AND CLAY ROADS

A sand road will be improved by mixing clay with it in the following manner:

Crown the sand road to the desired shape; then spread the clay over the sixteen feet to a depth of about six inches; spread about three inches of sand over the clay, and work it together by disk-harrowing and puddling, driving the teams back and forward over it to puddle it, and mix the sand and clay together, adding sand until the clay ceases to ball, or mud to form on the surface when wet. The surface should then be crowned and shaped with a road machine or drag, and gone over with a roller. Any kind of roller will help.

The idea is to get the voids in the sand filled with clay, using the clay as a binder.

After the surface has been formed, an inch of sand should be spread over the surface.

The clay should be wet and sticky to work properly.

A clay or adobe road can be improved by shaping to proper crown, and plowing or disking the surface about four inches deep; then spread or work in sand until the sand is slightly in excess; the road then to be shaped, and an inch of sand spread over the surface, to be worked in the traffic.

A light, sandy gravel can be worked into a good surfacing for a clay or adobe road by properly shaping the road first, then distributing the sand and gravel in about a three-inch layer, and harrowing it in with the road surface; then rolling and applying enough sand to mix with any excess of clay that shows up.

GRAVEL ROADS

All gravel should be screened, and all stones refused by a two-and-one-half-inch screen shall be broken. Particles less than one-half inch, or which pass the one-half-inch screen, may be used for surfacing and binding the top course.

The gravel is to be laid in two courses, the first, or lower one, to be four inches in thickness, and the upper course to be four inches at the center and two inches at the sides.

The earth will be graded to section as shown, and the gravel applied to give eight inches at the center and six inches at the sides for a width of sixteen feet. The shoulders to be made of the earth graded from road to have a fall of one inch per foot. All the stone between one and one-half inch and two and one-half inches in largest dimension shall be used to make the lower four-inch course, which is to be laid across the full sixteen-foot width; this course to be rolled until thoroughly compacted. The second course shall be made of the stone from one-half to one and one-half inches, and will be four inches thick at the center, running to two inches at the edges.

All depressions shall be filled with gravel, and the road shall be wet and rolled until thoroughly compacted by a roller, giving a compression of at least 400 pounds per square inch.

If the old road-bed is solid and needs but the crowning, it will be better not to plow the old bed, but to form the shoulders with material from the road-sides, leaving the solid top undisturbed.

Crushed gravel makes a very good road-covering. It should be screened, if possible, to remove all large stones; not over 30 per cent of material smaller than one-half inch will be found necessary to fill the voids and bind the gravel together.

Pit gravel is generally found superior to river gravel in binding qualities.

For roads of secondary importance the construction can be cheapened by allowing the traffic to consolidate the gravel, and this saves the cost of wetting and rolling. This is not so satisfactory as rolling the gravel in four-inch courses.

In all cases the ditching and drainage must be thoroughly done, and the road surface properly formed and compacted.

The loads of gravel should be distributed over the roadway as evenly as possible, and not dumped in a pile.

If the gravel is compacted by the traffic, the ruts must be kept filled and leveled as they occur, so that the traffic will not cut through the surfacing to the earth.

A ten to fifteen-ton roller will do efficient work on the gravel.

Rolling should start at the sides and shoulders, and work toward the center.

A layer of sand on the subgrade will help to keep the gravel from being forced into the earth.

BROKEN STONE

The section of broken stone pavement will be the same as for gravel road.

The road-bed is to be brought to grade, crowned, and thoroughly compacted. No low or soft spots must remain. A roller is to be used on this surface.

Ditches and drains must be properly constructed. Culverts and bridges must be of a permanent character.

All crushed rock and screenings must be carefully dumped and distributed over the road surface.

The bottom layer of broken stone shall be four inches in thickness, and the stone used will run from one and one-half inches to three inches in largest dimensions. Enough stone, approximately 25 per cent, of size one inch to one and one-half inches, may be added when rolling to fill the voids as much as possible, a ten to fifteen-ton roller being used.

The top course will be two inches at the center, running to one inch at the edges, and will be composed of stone varying from one-half inch to one and one-half inches in largest dimension. Screenings up to one-half-inch size and free from all dirt are to be added to fill all spaces as nearly as possible.

The top course is to be wet and rolled with a ten to fifteen-ton roller, the rolling to start at the shoulders and work towards the center.

The stone for road-surfacing should be examined carefully, and samples procured (about twenty pounds) and sent to the Highway Commission office to be examined and tested.

Width—For the roads designated as primary roads the width surfaced shall be sixteen feet. This, with the shoulder width of two feet on each side, will give twenty feet.

It will be the same width for gravel or broken stone.

The roads designated as secondary will be surfaced for nine feet in width, and with the earth shoulders will give twenty feet width.

The width will be the same for gravel and broken stone.

In the mountain districts of the state the width on primary roads will be sixteen feet, with a ditch on the upper side as given

in the cross-sections. Single-track road of nine feet width, with turnouts visible one from the other, may be used in some sections.

GENERAL NOTES AND REQUIREMENTS

The roadway is to be cleared of all trees, stumps, logs, and brush for a distance of ten feet on each side of the road ditches, and the same are to be entirely taken off the road or burned.

Classification—All excavation is to be in one of two classes—either earth or rock.

Earth will be considered to include all excavations not classified as rock excavation.

Rock excavation will be all solid, well-defined ledges or masses of rock more than one cubic yard in contents.

All material from cuts shall be used in making fills, when the fill is within 600 feet of the center of gravity of the cut; when material is to be hauled over 600 feet from cut to fill, a price shall be bid for over-haul per cubic yard per 100 feet.

The road to be graded for the width and form, as shown by the drawings, and grade as given by the engineer in charge.

Quantities—Quantities are figured as closely as possible, but it is to be noted that they are to be taken as approximate, and the final quantities may be greater or less.

Drains—When considered necessary by the engineer in charge, the tile subdrains are to be laid on one-inch board, six inches wide, and a price shall be bid for supplying and laying this lumber.

The ends of all culverts must be protected by wing walls, and have a cut-off wall under the culvert ends.

Slopes may be protected by hand-laid riprap, under the direction of the engineer.

Rolling should be continued until there is no settlement under the action of the roller.

Material not in accordance with the specifications must be removed from the work. All material and work is to be subject to inspection.

On any work the right is reserved to discharge any employe of the contractor for doing inferior work, for cruelty to animals, or for any other proper reason.

If tile is laid in quicksand, the joints should be covered by sod or sacking, or otherwise protected.

Guard-Rails—Steep hillsides and high embankments should have a guard-rail or wall placed along the edge of the road to protect vehicles from falling down the slope. These guard-rails can be of wooden or concrete posts, spaced about eight feet apart, and set two feet in the ground, and three feet above the surface. The rails can be two-inch by four-inch lumber nailed to the posts, or can be of pipe or concrete, one rail at top, and one midway between the top rail and the ground.

For both gravel and stone roads the roadbed should be prepared for the surfacing. The grading and draining should be completed before the surfacing is started.

Less than four inches of broken stone is not to be recommended in any case, and six to eight inches at the center, with four to six inches at the sides, will give better results.

Guide-posts should be placed often enough to show the distance and direction to be nearest town or city. They are to be erected in a substantial manner, and be large enough to be easily read.

NOTES ON GRAVEL AND BROKEN-STONE ROAD REPAIRS

The repairs of any road should be made of the material of which the road surface is constructed.

This is not meant to apply when the road is to be entirely resurfaced, but for general repairs of chuck holes, ruts, etc.

In all cases thorough drainage comes first and is the important point to be looked after.

Ditches, culverts, and drains must be always ready to carry the water away from the road surface and road-side.

It will be better in all cases to screen the gravel, sending all the large stones to the crusher, and wasting all excess of screenings.

The gravel can generally be taken to a platform by scrapers and dumped into a bin feeding the screen, or fed to an elevator and carried to the screen. Below the screen, bins are arranged to receive the different sizes, and high enough to load the wagons by pulling a trap door. The large stones run out the end and are dumped into the crusher feed to be broken.

This entire operation can be done without any handling from the scraper to the wagon, or to the crusher.

In filling the ruts in the gravel or broken-stone road, it is better to rake the stones from the shoulder of the rut into the depression.

Stone for road-surfacing should be tested as to their physical properties.

NOTES AND SUGGESTIONS ON THE MAINTENANCE OF EARTH ROADS

Drainage—For all classes of roads the drainage is the important item, and must be carefully looked after.

The ditches, culverts, and drains must be kept open and clean at all times.

Brush, weeds, and leaves, or any other obstruction, should be removed from the ends of all culverts.

Irrigation ditches—The road overseer or superintendent should also see that the irrigation ditches are kept clear of obstructions, and should notify the parties responsible for such ditches to keep their crossing clear.

All the distributing laterals along the road should be watched, so that the water will not overflow the public roads.

This overflow from irrigation ditches is one of the causes of bad stretches of road in this state, and can be corrected by care and attention to the ditches and crossings.

Watchfulness on the part of the irrigator will save considerable expenses on the roads, and no one is more interested or concerned in a good road than the irrigator himself.

From the fields along a highway the waste or excess water is allowed to run directly to the road ditch, and if, as often is the case, the road ditch is obstructed, this water gets over the road, making a muddy road, which under the traffic soon becomes impassable. This can be prevented by running a ditch—a single furrow may answer—along the fence line, and discharge the water into the culvert at a point where it will drain away. This condition also emphasizes the necessity of keeping all the road ditches open and ready to carry water.

Special attention is called to the following law on the subject of allowing irrigation or waste water to flood the public roads, and this law should be rigidly enforced:

Section 5862, page 1372, Revised Statutes of Colorado, 1908:

“Obstructing Highway—Penalty—Sec. 40. No person or persons or corporation shall erect any fence, house or other structure, or dig pits or holes in or upon any highway, or place thereon any stones, timber, trees or any obstruction whatsoever, and no person or persons or corporation shall tear down, burn or otherwise damage any bridge of any highway, or cause waste water, or the water from any ditch, road, drain or flume, or other place to flow in or upon any road or highway so as to damage the same, and any such person or persons, or corporation, so offending or violating any of the provisions of this section, or any of the sections of this act, for which there is no specific penalty provided, shall pay a fine of not less than (\$10) ten dollars, or more than (\$300) three hundred dollars, for each offense, and a like fine of (\$10) ten dollars for each day that such obstruction shall be suffered to remain in said highway, and shall also be liable to any person or persons, or corporation, in a civil action, for any damages resulting therefrom; and it shall be the duty of the road overseer in the district in which such violation shall occur, to prosecute any person, persons, corporation or corporations violating the provisions of this act.”

The roads should be dragged immediately after rain or snow storms, all ruts filled, and the road crowned by working from the sides toward the center.

If the center should become too high, work from the center toward the sides.

Use the drag often, so that the road will not get into bad condition.

Drag the road late in the fall, before the road freezes. It will be in better condition to go through the winter.

Thorough and well-timed work with the drag will keep dirt roads in good condition.

Many of our roads are troughs, and the water, instead of running off to the side ditches, runs down the ruts in the road, destroying it.

Keep the road well crowned, all drains open, and the ditches clean.

On earth roads, the drag will be found to be a very useful and cheap machine, and should be used all the time.

APPENDIX NO. 7

ROAD LAWS OF COLORADO TO DATE

NOTE

This pamphlet, which is intended to comprise the Constitutional and Legislative Regulations of Colorado governing Public Highways and certain subjects closely related thereto, is subdivided into five divisions. Division I contains the Act of 1909 establishing the State Highway Commission. Division II and III are selections from the Enabling Act and the Constitution which seem to bear on the subject. Division IV consists of extracts from the Revised Statutes of 1908, arranged almost without exception in the order in which they occur in that volume, and supplemented at the end by some extracts from the Session Laws of 1909. The pamphlet therefore includes all the statutory enactments on the subject to date. The sections are numbered consecutively throughout. Each section is followed by a citation to the source from which it is drawn, and a reference to that source will give such further information as may be desired for any study of the statutes. There are included the amendments made to the Road Laws by the Eighteenth General Assembly, 1911.

I

ACT ESTABLISHING THE COLORADO STATE HIGHWAY COMMISSION

(Chapter 57, Laws of 1909, approved and in effect May 5, 1909.)

Sec. 1. Within thirty days after the passage of this act, the Governor shall appoint a board of three commissioners, representing the eastern, central and western portions of the State, to be known as the State highway commissioners. One shall serve two years, one four years, and the other six years. Biennially thereafter he shall appoint one commissioner for six years or until his successor has qualified. The Governor shall fill all vacancies and may remove a member for inefficiency, malfeasance or neglect of duty. A majority of said commission shall constitute a quorum and be empowered to act on all matters pertaining to the duties of said commission.

The chairman of said highway commission shall receive a salary of \$1,200 per annum and the other two members of said highway commission shall each receive a salary of \$600 per annum. The members of said highway commission shall also re-

ceive their actual and necessary expenses while away from their respective residences in discharge of their duties, and the same shall be audited and allowed by said commission before the State Auditor shall be authorized to issue a warrant for the same. (Sec. 1, Chap. 57, L. of '09.)

Sec. 2. Said highway commission shall elect one of its number chairman and shall have a common seal. The members thereof shall have power to administer oaths, and it shall be provided with a suitable office at the State Capitol; it shall hold regular meetings not less than once in each month; and said office shall, so far as is practicable, be kept open during business hours. (Sec. 2, Chap. 57, L. of '09.)

Said commission shall employ a secretary who shall be a civil engineer and practical road builder, who shall hold his office subject to the pleasure of said commission, and who shall receive a salary of not to exceed \$2,500 per annum, and it may also employ a stenographer at a salary of not to exceed \$75 per month, to serve during the pleasure of said commission.

The commission shall keep a record of every vote and official act of said commission, shall file and safely keep all maps and papers belonging to it. It shall be the duty of the said highway commission and their assistants to give such advice, assistance and supervision with regard to road construction, improvement and maintenance throughout the State as time and conditions will permit, and as the rules and regulations of the commission may prescribe.

Employees of said commission shall, in addition to the salaries herein provided for, be allowed and paid their actual and necessary expenses while away from their respective residences in discharge of their duties under the direction of said commission.

All of the files and records of said commission shall, under reasonable regulations, be kept open for public inspection, and certified copies thereof shall be received in evidence in any court.

The Attorney General of the State shall be an ex-officio attorney for the commission, and shall render to it such legal counsel, advice and services as it may from time to time require.

Sec. 3. The board of county commissioners of each county in this State shall, within six (6) months after the passage of this act, be required to have prepared duplicate road maps showing, with approximate correctness, all public roads within said county, and also all public roads which constitute a part of the boundary between same and adjoining counties, and designate thereon such of said roads as are, by the said board, deemed of sufficient public importance to justify their improvement under this act, and which will, in their opinion, when so improved, provide an appropriate system of main or market roads within such county.

One of said maps shall be filed with the county clerk and recorder of such county and the other, duly certified to by said

county clerk and recorder, shall be by the board of county commissioners forwarded to the office of the State highway commission, together with a statement of the location within such county of all deposits of road material and the nature and extent of the same so far as known, and said board shall forward to said commission, on its request, samples of such material. If the board of county commissioners of any county shall fail to prepare such map and statement for the State commission within the time stated, to forward said samples at its request, it shall be the duty of said commission to procure the necessary information and samples and prepare such map for its office, and deduct the amount thus expended from the amount of the first appropriation to such county. (Sec. 3, Chap. 57, L. of '09.)

Sec. 4. The State highway commission shall, on or before January 1, 1912, prepare and keep on file in its office, subject to public inspection, a map showing all open public roads in each county in the State, and in color, all roads and proposed roads which the said commission deem of sufficient public importance to entitle them to State aid in their construction, improvement and maintenance under this act, and which, when completed, will provide an adequate system of State roads to the various market and business centers of the State, and connect such centers with each other.

The highway commission may divide such roads into two classes, one class to include those of primary importance, and the other of secondary importance, and, unless otherwise ordered, the roads of primary importance shall be first constructed or improved, and the map so prepared shall be followed, unless otherwise changed by order of the said commission.

All roads constructed or improved under this act shall be known and designated as State roads. (Sec. 4, Chap. 57, L. of '09.)

Sec. 5. For the purpose of State aid in the construction, improvement and maintenance of public highways under this act, there shall be appropriated the sum of fifty thousand dollars (\$50,000), from the general funds of the State, not otherwise appropriated, which shall constitute the State road fund. (Sec. 5, Chap. 57, L. of '09.)

Sec. 6. There is hereby appropriated out of the general funds of the State six thousand dollars (\$6,000), or so much thereof as may be necessary, to pay the expenses of said commission and salaries and expenses of its employes, until the appropriation in section 5 of this act is available, and thereafter such salary and expenses shall be paid out of the State road fund.

All accounts and expenditures shall be certified by the chairman of said commission, and paid by the State Treasurer upon orders drawn by the State Auditor. (Sec. 6, Chap. 57, L. of '09.)

Sec. 7. No member of the State highway commission, nor any person in the employ of the highway commission, shall be either directly or indirectly interested in any contract for con-

structing, improving or maintaining any road under this act. (Sec. 7, Chap. 57, L. of '09.)

Sec. 8. On or before the first Tuesday in March of each year, the highway commission shall apportion the State road fund among the different counties of the State, as herein provided, and shall immediately send a notice to the board of county commissioners of each county stating the amount that such county shall be entitled to receive for said year out of said fund.

In making an estimate of the amount of the State road fund, accruing to the several counties in the State, and determining the amount to be expended in any one county, the said highway commission shall take into consideration the extent of the area of such county, the amount of money expended by it in road construction, the difficulty and expense of such road construction, and the extraordinary expenses connected with the development of new territory; provided, however, that no money shall be expended by said commission out of said funds upon roads within the corporate limits of any city or town, nor expended in any county in which the county commissioners of such county have not provided for the raising, by taxation by said county, of an amount equal to twice the amount set aside by the said highway commission for the construction, improvement and maintenance of State roads in said county, and, in the event that the county commissioners of any county shall not, within ninety (90) days after the mailing of the said notice above provided for, notify said highway commission of the amount said county will expend for said year upon State roads, the amount set aside for said county, for such year may be distributed by the said highway commission among the other counties in the State which have so complied with the act.

In the event that any road designated by the highway commission for improvement as a State road, is located on the boundary between two counties, it shall be the duty of the county commissioners of each county to provide for the payment by the respective counties for the construction, improvement and maintenance of such boundary road, and, in case either of said counties shall fail to make the necessary provisions for the payment of its proportion of the construction, improvement and maintenance of such road, the highway commission may pay for the work expended upon said road, and deduct from the amount apportioned for State roads in the county failing to make such provision, such counties' proportion of the amount paid by the State in the construction of said road. (Sec. 8, Chap. 57, L. of '09.)

Sec. 9. As soon as practicable after the passage of this act, the highway commission shall ascertain the location of the road material available throughout the several parts of the State, and the best methods of road construction for the various sections of the State as far as the same may be practicable, and shall prepare and adopt such rules and regulations for the construction, improvement and maintenance of State roads as shall be most

suitable for the requirements of, and bring the most practical results to, the several parts of the State.

Such rules and regulations shall be printed and not less than fifty copies thereof forwarded to the county commissioners of each county in the State, for distribution therein.

Such rules and regulations may be amended from time to time, and on the first day of March in each year, not less than fifty copies of such amended rules and regulations shall be forwarded to the county commissioners of each county. (Sec. 9, Chap. 57, L. of '09.)

Sec. 10. The board of county commissioners of the several counties shall make the necessary surveys, establish grades, prepare plans and specifications and preliminary estimates of cost for all work upon State roads within their respective counties, in accordance with the rules and regulations adopted by the State highway commission, and report the same to said commission. The State highway commission may make such changes therein as they may see fit, or adopt the same without change, or may order such further surveys, plans and specifications or estimates as in their opinion may be necessary, and such road shall be constructed or improved according to the plans, specifications and estimates finally approved by said commission.

All road construction, improvements, or maintenance on State roads in the several counties shall be under the direction of the board of county commissioners of the county in which work is done, in accordance with the rules and regulations and subject to the supervision and approval of the State highway commission; Provided, that if any such construction, improvement or maintenance is upon a road on the boundary between two counties, the boards of county commissioners of said counties shall determine by mutual agreement the portion of said road to be constructed, improved or maintained by each, and if said boards cannot agree, said apportionment shall be made by the State highway commission.

For the purpose of carrying out the provisions of this act, the board of county commissioners of any county may employ a competent civil engineer and road builder who shall be paid for his services not to exceed \$7.00 per day; who shall serve during the pleasure of said board, whose duty it shall be, under the direction and control of said board to make all surveys, establish grades, prepare plans and specifications and estimates, supervise the construction and repair of all roads within the county; prescribe the time and place when and where all work shall be done on such roads; report any delinquency or inefficiency of any road overseer or other person employed upon such roads to the board of county commissioners, and perform such other duties as may be prescribed by said board.

All contracts for work on State roads shall be let by the board of county commissioners of the county where such work is to be done, but shall first be approved by the State highway com-

mission. Where the estimated cost of such work exceeds \$1,000 upon any road or part thereof, it shall be the duty of the county commissioners letting such contract, to give 14 days' notice in at least two newspapers, one published at the State Capital, of general circulation throughout the State, and the other published in the county where the proposed road is located and of general circulation therein, calling for sealed bids upon such work, and if the lowest responsible bidder does not exceed the estimate of cost, the contract may be let to such bidder. All of the bids may be rejected and new bids called for in the same manner, or the work may be done by day labor or convict or prison labor as may be deemed for the best interests of the general public.

The contractor shall at once after being awarded a contract for construction, improvement or maintenance work on a State road, and before entering upon the work thereunder, execute to the people of the State of Colorado a bond in a penal sum equal to one-half of the amount of such contract price, with approved securities, conditioned upon the faithful discharge of his duties under such contract.

All payments made upon contract work upon State roads shall be made by the board of county commissioners of the county in which such road is located (except where the road is a county line between two counties, in which case each county shall pay its pro rata of the cost as fixed by the highway commission), upon estimates furnished by the engineer or superintendent in charge of such construction and approved by the highway commission, but at least 10 per cent. of the amount of each estimate shall be withheld until the final completion and acceptance of the work, and then paid with the final estimate. The said commission may from time to time, as work progresses, under contracts on State roads, direct the State Auditor to draw warrant in favor of the treasurer of the county in which such work is being done, and charge the same to the amount set aside for such county. (Sec. 10, Chap. 57, L. of '09.)

Sec. 11. The board of county commissioners of each county in the State, shall, on or before November 30th of each year, make to the highway commission two detailed reports of all moneys expended by such county for the current year in the construction, improvement and maintenance of roads in said county. One of said reports shall cover all items expended upon State roads under this act under the supervision and direction of the highway commission, and the other report shall cover all moneys expended by the county for other roads in said county or upon the line thereof.

The said commission shall also in such reports make recommendation as to the roads in said county which in their judgment should be improved or constructed the following year, under this act, and report all new discoveries of road material, giving location, character and extent or amount of same as nearly as possible.

The State highway commission shall, on or before December 15th of each year, certify to the State Auditor the amount of the State road fund which each of the counties is to receive for the current year under the provisions of this act, and the State Auditor shall at once draw his warrant on said fund in favor of the county treasurer of each county for the amount due the several counties in the State, remaining to the credit of such county. (Sec. 11, Chap. 57, L. of '09.)

Sec. 12. That the State highway commission shall on the 1st of December preceding the biennial session of each Legislature, make to the Governor a detailed report of the work of such commission for the time intervening between its prior report, and such suggestions and recommendations as to legislation as will in the judgment of the commission advance the interest of good roads in the State. (Sec. 12, Chap. 57, L. of '09.)

Sec. 13. All acts and parts of acts inconsistent with this act are hereby repealed. (Sec. 13, Chap. 57, L. of '09.)

II

EXTRACT FROM THE ENABLING ACT OF COLORADO

Sec. 14. Internal Improvement Fund.—That five per centum of the proceeds of the sales of agricultural public lands lying within said state, which shall be sold by the United States subsequent to the admission of said state into the Union, after deducting all the expenses incident to the same, shall be paid to the said state for the purpose of making such internal improvements within said state as the legislature thereof may direct; Provided, That this section shall not apply to any lands disposed of under the homestead laws of the United States, or to any lands now or hereafter reserved for public or other uses. That all mineral lands shall be excepted from the operation and grants of this act. (Enabling Act, Sec. 12.)

III

EXTRACTS FROM THE CONSTITUTION OF COLORADO

Sec. 15. Special Legislation Prohibited.—The general assembly shall not pass local or special laws in any of the following enumerated cases, that is to say; * * * laying out, opening, altering or working roads or highways; vacating roads, town plats, streets, alleys and public grounds; * * * regulating county or township affairs; * * * chartering or licensing ferries or toll bridges * * * . In all other cases, where a general law can be made applicable, no special law shall be enacted. (Constitution, Art. V, §25.)

Sec. 16. County Indebtedness for Roads. How Created. Limit.—No county shall contract any debt by loan in any form except for the purpose of erecting necessary public buildings,

making or repairing public roads and bridges; and such indebtedness contracted in any one year shall not exceed the rates upon taxable property in such county following, to wit: Counties in which the assessed valuation of taxable property shall exceed five millions of dollars, one dollar and fifty cents on each thousand dollars thereof; counties in which such valuation shall be less than five millions of dollars, three dollars on each thousand dollars thereof, and the aggregate amount of indebtedness of any county for all purposes, exclusive of debts contracted before the adoption of this constitution, shall not at any time exceed twice the amount above herein limited, unless when in manner provided by law, the question of incurring such debt shall, at a general election, be submitted to such of the qualified electors of such county as in the year last preceding such election shall have paid a tax upon property assessed to them in such county, and a majority of those voting thereon shall vote in favor of incurring the debt; but the bonds, if any be issued therefor, shall not run less than ten years, and the aggregate amount of debt so contracted shall not at any time exceed twice the rate upon the valuation last herein mentioned; Provided, That any county in this State which has an indebtedness outstanding, either in the form of warrants issued for the purposes provided by law prior to December 31, A. D. 1886, or in the form of funding bonds issued prior to such date for such warrants previously outstanding, or in the form of public building, road or bridge bonds outstanding at such date, may contract a debt by loan by the issuance of bonds for the purpose of liquidating such indebtedness, providing the question of issuing said bonds shall, at a general or special election called for that purpose, be submitted to the vote of such of the duly qualified electors of such county as in the year last preceding such election shall have paid a tax upon property assessed in such county, and the majority of those voting thereon shall vote in favor of issuing the bonds. Such election shall be held in the manner prescribed by the laws of this State for the issuance of road, bridge and public building bonds, and the bond authorized at such election shall be issued and provision made for this redemption in the same manner as provided in said law. (Constitution, Article XI, Sec. 6.)

(See also Section 27 herein, the same being R. S., '08, Sec. 1364.)

IV

EXTRACTS FROM THE LEGISLATIVE ENACTMENTS OF COLORADO

Corporations for Highway Purposes

(See, also, Toll Roads.)

TOLL ROAD COMPANIES

Sec. 17. Additional Statements in Certificate. Establishment and Regulation of Toll.—When any three or more persons shall associate to form a company for the purpose of constructing a

wagon road under the provisions of this act, their certificate of incorporation, in addition to the matter hereinbefore required to be stated therein, shall specify the termini of said road and the route of the same, as near as may be; and the said company shall have the right of way over the line named in the certificate, to erect toll gates, not to exceed one in every ten miles of road, and to collect toll for such gate, either thereat, or by a traveling toll gatherer, at the rate prescribed by the county commissioners of the county in which said road is located, upon the application of such corporation; Provided, That whenever such corporation shall have constructed and completed one mile or more of roads by such corporation to be constructed, it shall be lawful for the county commissioners of the county in which the portion of the road so constructed shall lie, to prescribe the rates of toll to be charged and collected by such corporation upon each mile of that portion of the road so constructed, and, as other portions of the road to be constructed by such corporation shall be completed, the rates of toll shall be prescribed in manner aforesaid, and such corporations shall have power to collect tolls at the rates prescribed until such road is completed. When said road shall have been fully completed, the county commissioners of the county in which the same shall be located shall prescribe the rates of toll such corporation shall be entitled to charge and collect, and such rates of toll shall remain in force and be collected from persons traveling such road for two years, from the time of completing such road, and thereafter, at the expiration of every two years, the county commissioners in each county through which said road passes may fix and regulate such rates of toll; Provided, however, That if said toll or wagon road company, or any twenty-five citizens of the county, shall be dissatisfied with the rates of toll fixed by the county commissioners, or tribunal transacting county business, said company, or the owners of said toll or wagon road, or said twenty-five citizens, may appeal to the county court for the county or counties, or either of them, in which said road shall be located, and the said court shall forthwith appoint three disinterested persons as a committee to view the premises, hear such testimony as may be offered, and prescribe the rates of toll to be charged and collected on such road, for the two years next ensuing, and such committee, on oath, shall report the same to the county court aforesaid, at its first session thereafter, and, if their report shall be accepted by the court, the court shall render judgment thereon, and the rates of toll shall be such as reported and accepted by said court, and, in case any toll road company shall take an appeal from the decision of the county commissioners, the expense of such appeal shall be paid by the said toll road company; And Provided, further, That nothing in this act shall be so construed as to authorize any corporation, formed under the provisions of this act, to locate their road, railroad, ditch or flume, or any part

thereof, upon any toll road previously existing, nor upon any public highway heretofore, and at the time of the organization of such corporation, used and traveled as such, except it may be necessary to cross such toll road, or public highway; all such rates of toll shall be conspicuously posted at every gate upon said road. Nothing in this act shall be so construed to prevent the erection of a toll gate and check gate on each branch toll road of any toll road company in this State. (R. S., '08, §1002.)

(This and the next following sections are parts of the general incorporation law of the State, to which reference should be made.)

Sec. 18. Commencement of Work After Organization.—Any corporation organized under this act for the construction of a toll road, shall, within ninety days after its organization, commence work on said proposed road, and continue said work from day to day until at least five hundred dollars shall have been expended on such road, and in case of a failure to perform such work such corporation shall forfeit its right acquired under their certificate of incorporation. (R. S., '08, §1003.)

Sec. 19. Penalty for Failure to Keep Road in Repair.—No company formed under this act shall demand and receive toll whenever said wagon road is not in reasonably good repair, which fact is to be determined as herein provided. Any person having paid toll on said road, and shall find the same in bad condition and unsafe for travel with loaded teams, shall have the right to make complaint before any justice of the peace in the county in which the road is located and it shall be the duty of said justice of the peace to summon the said company, or any agent of said company, to appear before him in answer to said complaint, within five days from the date of said complaint, and if it be found that said road is in bad condition or unsafe to travel it shall be the duty of said justice to impose a fine of not less than ten nor more than twenty-five dollars, to be collected from said company, one-half to be paid to the complainant and the other half to be paid into the school fund of the county in which the fine is collected, and said justice shall issue his order that no toll be collected upon said road or upon any part thereof until it is put in good repair. (R. S., '08, §1004.)

BRIDGE AND FERRY COMPANIES

Sec. 20. Additional Statements in Certificate.—When three or more persons shall associate, under the provisions of this act, to form a company for the purpose of constructing a bridge, or establishing a ferry over any of the streams of water in this State, their certificate, in addition to the matters required in the second section of this act, shall specify as follows: The place where said bridge, or places at which such bridges or ferry is to be built or established, and on what streams, and that the banks on both sides of the stream where the said bridge or ferry is to be built or established are owned by said company, or that they

have obtained in writing the consent of the owners of the banks where the said bridge is to be built, to erect the said bridge, or establish the said ferry as aforesaid, or that the banks at such place are a public highway. (R. S., '08, §1005.)

(See note to Sec. 17.)

Sec. 21. Shall Be Kept Open. Repairs. Rebuilding. Any bridge built, or ferry established, under the provisions of this act, shall at all times be kept in good and safe condition for travel, both night and day, unless the same be rendered impassable by reason of flood or high water, and any bridge or ferry so built or established, shall, if destroyed by flood, fire or other causes, be rebuilt or established within a period of nine months from such destruction, or the rights acquired under this act shall be forfeited and cease to exist. (R. S., '08, §1006.)

Sec. 22. Rate of Toll. Penalty for Overcharge.—The company, previous to receiving any toll upon said bridge or ferry, shall set up and keep in a conspicuous place on said bridge or ferry, a board, on which shall be written or printed in a plain, legible manner, the rates of toll which have been prescribed by the county commissioners of said county, and if any company shall demand or receive any greater rate of toll than the rate prescribed by said tribunal, then they shall be subject to a fine of ten dollars, and no company formed under the provisions of this act shall demand or receive toll whenever said bridge or ferry is not in a good and safe condition for travel, and any person having paid toll on such bridge or ferry, and finding the same in a bad or unsafe condition for loaded teams, shall have the right to make complaint before any justice of the peace in the county in which the bridge or ferry is located, who shall proceed as is provided in section eighty-one (81) of this act. (R. S., '08, §1007.)

(Section 81 is Sec. 19 herein.)

Sec. 23. Shall Not Obstruct Ford.—No charter for a ferry or bridge company, granted by the legislature of this territory, shall be so constructed as to authorize such company to exclude or prevent the public from the free use of any ford that may cross any stream at or near the ferry or bridge of such company. (R. S., '08, Sec. 1008.)

Sec. 24. Penalty for Obstructing Ford.—The owner or keeper of such bridge or ferry shall not in any way obstruct the passage to or from any ford across any stream; and any person, upon conviction of thus obstructing such passage, shall be liable to a fine of not less than ten nor more than fifty dollars. (R. S., '08, §1009.)

Sec. 25. Penalty for Damaging Road, Ditch or Flume.—Any person who shall wilfully or maliciously damage or interfere with any road, ditch, flume, bridge, ferry, railroad or telegraph line, or any of the fixtures, tools, implements, appurtenances of any property of any company which may be organized under the provisions of this act, upon conviction thereof before any court

of competent jurisdiction in the county where the offense shall have been committed, shall be deemed guilty of a misdemeanor, and shall be punished by a fine or imprisonment, or both, at the discretion of the court, said imprisonment not to exceed one year, and said fine not to exceed five hundred dollars, which fine shall be paid into the county treasury for the use of the common schools, and said offender shall also pay all damages that any such corporation may sustain, together with costs of suit. (R. S., '08, §994.)

(The Act referred to is the original general incorporation act of Colorado.)

DUTIES OF COUNTY COMMISSIONERS

Sec. 26. Claims Presented to Board Before Action Commenced. Claims, How Paid. County Fund. Road Fund.—All claims and demands held by any person against a county shall be presented for audit and allowance to the board or county commissioners of the proper county, in due form of law, before an action in any court shall be maintainable thereon, and all claims, when allowed, shall be paid by a county warrant, or order, drawn by said board on the county treasurer, upon the proper fund in the said treasury, for the amount of such claim. Such warrant or order shall be signed by the chairman of the board, permanent or temporary, attested by the county clerk, and when presented to the county treasurer for registry, be countersigned by him; said warrant or order shall specify the amount and value of the claim or service for which it is issued, and be numbered and dated in the order in which it is issued. The general county fund shall be known and designated on the books of the county treasury as the "Ordinary county revenue fund," and the general road fund shall be known and carried on the books of said county treasury as the "Road purposes revenue fund." Such warrants and orders, payable on demand, shall hereafter be drawn and issued upon the county treasurer, or against any funds in his hands, only when at the time of drawing and issuing the same there shall be sufficient moneys in the appropriate fund in the treasury to pay such warrants and orders. Whenever there are no moneys in the county treasury of a county to the credit of the proper fund to meet and defray the necessary expenses of the county, it shall be lawful for the board of county commissioners of such county to provide that county warrants and orders of such county may be drawn and issued against and in anticipation of the collection of taxes already levied for the payment of such expenses, to the extent of eighty per centum of the total amount of the taxes levied; Provided, That warrants and orders so drawn and issued, under the provisions of this section, shall show upon their face that they are payable solely from the fund upon which the same is drawn, and the taxes levied to form the same when collected, and not otherwise. County warrants and orders may be in such form as the county commissioners may

provide, and may be made payable to the order of the payee, or to the bearer. The person or persons to whom such last named warrants and orders shall be allowed and delivered shall be held to have accepted the same in full payment and satisfaction of the claim, to pay which the same was issued, and the obligation of said warrants is hereby limited as stated, and said warrants shall be paid only by, through and from the fund drawn upon, and the collected and uncollected taxes levied, appropriated, collected or paid into the county treasury to create, constitute and form said fund, and the taxes provided by law therefor shall be covered into said fund until all warrants drawn shall be fully paid, satisfied and discharged, both principal and interest. Said limited and last named warrants and orders shall not operate as a debt of said county, and shall not be held to add to or increase the debt or indebtedness of said county; Provided, That the provisions of this law shall in no wise affect the lawful warrants and orders of any county which were issued prior to the passage of this law, and are outstanding and unpaid, but such warrants, unless redeemed under the funding statute, shall first be paid, both principal and interest, in the order of their registry. (R. S., '08, §1226.)

COUNTY INDEBTEDNESS

Sec. 27. Question of Creating Debt for Buildings, Roads, Etc., Submitted to Electors. Aggregate Amount.—When the county commissioners of any county shall deem it necessary to create an indebtedness for the purpose of erecting necessary public buildings, making or repairing public roads or bridges, they may, by an order entered of record specifying the amount required and the object for which such debt is created, submit the question to a vote of the people at a general election; and they shall cause to be posted a notice of such order in some conspicuous place in each voting precinct in the county, for at least thirty days preceding the election, and all persons voting on that question shall vote by separate ballot, whereon is placed the words "For County Indebtedness," or "Against County Indebtedness," such ballots to be deposited in a box provided by the county commissioners for that purpose, and no person shall vote on the question of indebtedness unless he shall have the necessary qualifications of an elector as provided by law, and shall have paid a tax upon property assessed to him in such county for the year immediately preceding, and if, upon canvassing the vote (which shall be canvassed in the same manner as the vote for county officers), it shall appear that a majority of all the votes cast are for county indebtedness, then the county commissioners shall be authorized to contract the debt in the name of the county; Provided, That the aggregate amount of indebtedness of any county, exclusive of debts contracted prior to July first, 1876, in which the assessed valuation of property shall exceed one

million of dollars, for all purposes, shall not be in excess of the following ratio, to wit: Counties in which the assessed valuation of property shall exceed five millions of dollars, six dollars on each thousand dollars thereof; counties in which the assessed valuation of property shall be less than five millions, and exceed one million of dollars, twelve dollars on each thousand dollars thereof. (R. S., '08, §1364.)

Sec. 28. Issuance of Bonds. Limitation. Interest. Redemption.—The county commissioners, when authorized as provided in section twenty-one of this act, shall make and issue coupon bonds of the county, not exceeding the amounts specified in the preceding section, in counties which have an assessed property valuation exceeding one million dollars, payable at the pleasure of the county ten years after the date of their issuance, but absolutely due and payable twenty years after such date, bearing interest at the rate of not exceeding ten per cent. per annum from their date until paid, said interest payable on the first day of April of each year, or semi-annually on the first day of April and the first day of October in each year; such interest and principal, when due, to be payable at the office of the county treasurer of the county, or in New York City, at the option of the holders of the bonds, and the county commissioners shall prescribe the form of said bonds, and the coupons thereto; and to provide for the interest accruing on the bonds, they shall levy annually a sufficient tax to fully discharge such interest; and for the ultimate redemption of such bonds, they shall levy annually, after ten years from the date of such issuance, such tax upon all taxable property in their county as shall create a yearly fund equal to ten per cent. of the whole amount of such bonds issued; and all taxes for interest on and the redemption of such bonds shall be paid in cash only, and shall be kept by the county treasurer as a special fund, to be used in the payment of interest on and redemption of such bonds only; such taxes to be levied and collected as other taxes. (R. S., '08, §1365.)

Sec. 29.—Redemption of Bonds. Notice. Interest. Order of Payment.—When it shall appear to the board of county commissioners upon examination of the books and accounts of the county treasurer that there are sufficient funds in his hands to the credit of the redemption fund to pay in full the principal and accrued interest of any of such bonds, it shall be the duty of such board immediately to call in and pay as many of such bonds and accrued interest thereon as the funds ascertained to be on hand will liquidate, and said board shall thereupon cancel such redeemed bonds and all uncanceled interest coupons issued therewith. The bonds shall be called in and paid in the order of their issuance, as nearly as may be practicable, and when it is desired to redeem any of such bonds by said board they shall cause to be published for thirty days in some newspaper at or

nearest the county seat of the county a notice that certain county bonds (specifying the number and amounts) will be paid upon presentation, and at the expiration of such thirty days said bonds shall cease to bear interest. (R. S., '08, §1366.)

Sec. 30. Bonds. Signed. Attested. Sealed. Denomination. Amount.—The bonds issued as heretofore provided shall be signed by the chairman of the board of county commissioners and attested by the clerk of the county and bear the seal of the county upon each bond, and shall be numbered and registered in a book kept for that purpose, in the order in which they are issued. Each bond shall state upon its face the amount for which the same is issued, to whom issued, and the date of its issuance; but no bond shall be of a less denomination than fifty dollars, and, if issued for a greater amount, then for some multiple of that sum; and the aggregate amount of such bonds issued shall not exceed the sum entered of record by the board of county commissioners, as required in section 21 of this act, and any bond issued in excess of said sum shall be null and void. (R. S., '08, §1367.)

Sec. 31. Selling Bonds. Rate. Redemption. Cancellation. How Funds Used.—The board of county commissioners shall have the right to sell any of such bonds, but no bond shall be sold unless for cash, and not then at a discount of more than 15 per cent. of its par value. The money arising from the sale of such bonds shall be forthwith used for the objects for which the debt was created, and for no other purpose whatever. When any such bonds or any coupons shall be redeemed, the board of county commissioners shall, in the presence of the clerk of said board or his deputy, cancel such bonds or coupons by writing the word "Cancelled" on the face of such bonds or coupons, and said board shall make a record of the proceedings, stating what bonds or coupons were cancelled. (R. S., '08, §1368.)

Sec. 32.—Highway. Obstructing. Polluting Water Course, Lake, Sewer. Penalty.—If any person shall obstruct or injure or cause to procure to be obstructed or injured, any public road or highway or common street or alley of any town or village, or any public bridge or causeway, or public river or stream, declared navigable by law, or shall continue such obstruction so as to render the same inconvenient or dangerous to pass, or shall erect or establish any offensive trade or manufacture or business, or continue the same after it has been erected or established, or shall in anywise pollute or obstruct any water course, lake, pond, marsh or common sewer, or continue such obstruction or pollution, so as to render the same offensive or unwholesome to the county, town, village or neighborhood thereabouts; every person so offending shall, upon conviction thereof, be fined not exceeding three hundred dollars; and every such nuisance may, by order of the district court before whom the conviction may take place, be removed and abated by the sheriff of the proper county, and any inquest and judgment thereon had under the provisions of any

law authorizing a writ of ad quod damnum shall be no bar to a prosecution under this section. (R. S., '08, §1816.)

DEFACING NATURAL SCENERY

Sec. 33. Painting on Bridge, Rock or on the Ground. Penalty.

—Any person who shall paint or print upon, or in any other manner place upon or affix to any stone or rock, or to any bridge, tree or upon the ground, any letter, character or device, stating, referring to or advertising, or intended to state, refer to or advertise the sale or manufacture of any property or article, profession, business, exhibition, amusement or place of amusement, or other thing, and any who shall, directly or indirectly, cause any such act to be done, or shall aid therein, shall be deemed guilty of a misdemeanor, and upon conviction shall for each and every offense be punished by a fine not less than fifty (50) dollars, nor exceeding three hundred (300) dollars for each separate offense, or by imprisonment not to exceed six (6) months, nor less than one (1) month, or by both such fine and imprisonment. (R. S., '08, §1905.)

CONVICT LABOR ON ROADS

Sec. 34. Employment of Convicts on Streets, Quarries, Mines.

—The keeper of said prisons shall respectively have power, with the consent of the county commissioners of said counties, from time to time to cause such of the convicts under their charge as are capable of hard labor to be employed on any of the public avenues, streets, highways or other works, quarries or mines, in the county in which such prisoners shall be confined, or in any of the adjoining counties, upon such terms as may be agreed upon between the said keepers and the officers or other persons under whose directions such convicts shall be placed. (R. S., '08, §2022.)

Sec. 35. Warden May Detail Convicts to Work on Public

Highways.—Upon the written request of a majority of the board of county commissioners of any county in the State of Colorado, the warden of the Colorado State Penitentiary, situated at Canon City, in Fremont County, shall detail such convicts as in his judgment shall seem proper, not exceeding the number specified in said written request, to work upon such public roads and highways of such county or streets or alleys of any city or incorporated town within such county as shall be designated in said written request of said county commissioners; Provided, That such county shall pay all additional expenses of guarding said convicts while working upon said public roads and highways within such county, and shall furnish all tools and materials necessary in the performance of said work; and, Provided, That when said work is done within the limits of any city or incorporated town within such county, or city or incorporated town where said work shall be done shall likewise pay all additional

expenses of guarding such convicts while performing said work, and shall furnish all necessary material used in said work. (R. S., '08, §4879.)

EMINENT DOMAIN

Sec. 36. Use of Public Highways by Companies. Sec. 37.—Any telegraph, telephone, electric light or power or pipe line company chartered or incorporated under the laws of this State, shall have the right to construct, maintain and operate lines of telegraph, telephone, electric light, wire or power or pipe line along, across, upon and under any public highway in this State subject however to the provisions of this act, but such lines of telegraph, telephone, electric light, wire, power or pipe line shall be so constructed and maintained as not to obstruct or hinder the usual travel on such highway. (R. S., '08, §2451.)

Sec. 37. Companies That May Condemn Rights of Way. Sec. 47.—If any corporation formed for the purpose of constructing a road, ditch, reservoir, pipe line, bridge, ferry, tunnel, telegraph line or railroad line, shall be unable to agree with the owner for the purchase of any real estate or right of way or easement or other right necessary or required for the purpose of any such corporation, for transacting its business, or for the right of way or any lawful purpose connected with the operations of the company, such corporation may acquire title to such real estate or right of way, or easement or other right, in the manner provided by law for the condemnation of real estate, or right of way, and any ditch, reservoir, or pipe line company may in the same manner condemn and acquire the right to take and use any water not previously appropriated. (R. S., '08, §2461.)

DUTIES OF OWNERS

Sec. 38. Ditch Must Be Bridged in Three Days. Duty of Supervisors.—When any such ditch or watercourse shall be constructed across any public traveled road, and not bridged within three days thereafter, it shall be the duty of the supervisor of the road district to put a bridge over said ditch or watercourse, of the dimensions specified in section ten of this chapter, and call on the owner or owners of the ditch to pay the expenses of constructing such bridge. (R. S., '08, §3236.)

NATIONAL GUARD

Sec. 39. Guardsmen Exempt From Duty on Juries and Highways.—Active members of all companies, troops and batteries, shall during their membership, be exempt from labor on the public highways and from service as jurors. (R. S., '08, §4387.)

ELECTRIC AND STREET RAILROADS

Sec. 40. County Commissioners May Grant Right of Way. Condemnation.—The board of county commissioners in their

respective counties in the State of Colorado with the written consent of a majority, measured by the front foot of the property holders abutting on each side of such county roads, shall have the power to grant to any person or persons, company or corporation or association outside of cities and towns, the right of way and franchise for the construction, operation or maintenance of an electric railroad over, along and across any county road in their respective county, upon the terms and conditions hereinafter provided, and when necessary to enter upon and use private property in the construction and operation of such roads, such person or persons, company or corporation or association, shall have the same power of operation and condemnation that the railroad companies have. (R. S., '08, §5432.)

Sec. 41. Petition for Franchise and Right of Way. Plans and Specifications Filed. Notice of Filing.—Any person or persons, company or corporation or association desiring in good faith to construct, maintain and operate an electric railroad over, along or across any county road within any county in this State, may petition the board of county commissioners of such county for a franchise and right of way for the construction, maintenance and operation of an electric railroad. And the board of county commissioners may in accordance with the conditions hereinafter provided, grant said right of way and franchise for a period not exceeding twenty (20) years. Provided, That before any such person, association or corporation shall commence the construction of any such electric railroad, there shall be filed with and approved by the board of county commissioners of any such county, specifications and surveys with maps, showing all grades and curves of such proposed line of road, together with the exact location and description of all track, culverts, bridges, and poles, and the difference, if any, in all grades between such county road or roads and the said proposed line of railroad; and, Provided, further, That before such specifications, surveys or maps shall be so approved, at least ten days' public notice of the filing thereof shall be given by such county commissioners by publication in some newspaper of general circulation in such county, and by the posting of a copy thereof in the office of the county clerk and recorder of such county. (R. S., '08, §5433.)

Sec. 42. Railroad Maintain and Keep Joint Road and Bridges in Good Repair.—Any person or persons, company or corporation or association to whom any such right of way and franchise shall be granted, shall construct and maintain its said railroad on either side of the county road, and shall at their own expense, and in a good, substantial manner strengthen and repair any and all bridges and culverts on said county road which shall be used or occupied jointly by said electric railroad, and shall thereafter during the existence of said franchise contribute and pay not less than one-half of the necessary expense of keeping said bridges and culverts in good repair and shall pay all expenses of keeping

public and private crossings planked and in good repair and shall at their own expense widen to not less than twenty-four (24) feet any and all bridges, culverts, cuts and embankments on said public highway which are used or occupied jointly by said electric railroad and the traveling public.

Any person, firm, company or corporation so building said road shall whenever the traveled part of the public road is crossed or interfered with by such electric road, the said electric road shall so cross and so construct its road and so repair said county road that the county road will be in as good condition as before the said crossing or interfering. (R. S., '08, §5434.)

Sec. 43. New Bridges. Railroad Pay One-Half Expense of Construction and Maintenance.—Whenever it shall become necessary to build or construct any new bridges or culverts on any county road over or along which any person or persons, company or corporation shall be operating and maintaining an electric railroad, said person or persons, company or corporation shall contribute and pay to the party constructing or erecting the same one-half of the expense for the erection and construction of the bridges or culverts which shall be used jointly by the public and said railroad, and shall thereafter contribute and pay one-half of the necessary expense of keeping said bridges or culverts used jointly by the public and said railroad in good repair, and the county in which said county road is situated shall contribute and pay out of the county road fund the other one-half of the expense for the construction, and thereafter maintaining any such culverts or bridges when the same are used jointly by the public and said railroad. Said bridges or culverts shall be constructed under the joint supervision of the owner or operator of said electric railroad, and the board of county commissioners of such county. (R. S., '08, §5435.)

Sec. 44. Width of Joint Bridges.—Any bridge or bridges, culvert or culverts hereafter constructed upon any county road or public highway, and which are to be used jointly by any electric railroad and the traveling public, shall not be less than twenty-four (24) feet in width whenever the same are used jointly by the public and said railroad. (R. S., '08, §5436.)

Sec. 45. Company Failing to Construct or Maintain Road in Good Condition Forfeit Franchise and Right of Way.—Whenever any person or persons, company or corporation who shall have obtained a franchise and right of way to operate an electric railroad over or along any county road as hereinbefore provided, in any county in this State, who shall fail, refuse or neglect for the period of six months after the granting of any such franchise to commence the work of constructing such electric railroad, and in good faith continuously prosecute the construction thereof to a final completion, or who shall fail, refuse or neglect to operate or maintain said railroad in good condition and in good faith, for the period of one year at any one time after the granting of said

franchise or right of way, such person or persons, company or corporation or their assigns shall forfeit all their right, title and interest in and to such franchise and right of way, and the same shall become null and void, and it shall be the duty of the board of county commissioners of the county granting such franchise and the district attorney of the judicial district in which the county is situated to immediately institute the proper legal proceedings to cancel said franchise and all right, title and interest of said person or persons, company or corporation or their assigns to use or occupy any portion of said county road. (R. S., '08, §5437.)

Sec. 46. Each Day a Separate Offense. Penalty.—For each day that any car is permitted to be operated contrary to the provisions of this act, it shall be deemed to be a separate offense, and any person, partnership or corporation, or the superintending officers or managing agents thereof operating any such line of street railway or the cars thereupon, who shall violate any of the provisions thereof, upon being convicted, in any court of competent jurisdiction, shall be deemed guilty of a misdemeanor, and shall be fined not less than fifty (50) dollars, nor more than one hundred (100) dollars or imprisonment in the county jail not to exceed thirty (30) days for each and every offense. (R. S., '08, §5441.)

ROADS AND HIGHWAYS

Sec. 47. Public Highways Defined.—The following are hereby declared to be public highways:

First: All roads over private land, dedicated to the public use by deed to that effect, filed with the clerk and recorder of the county in which such roads are situate, when such dedication has been accepted by the board of county commissioners; Provided, however, That a certificate of the clerk and recorder with whom such deed is filed, showing the date of such dedication and the lands so dedicated, shall be filed with the county assessor of the county in which such roads are situate.

Second: All roads over private or other lands dedicated to public uses by the process of law, and not heretofore vacated by an order of the board of county commissioners duly entered of record in the proceedings of said board.

Third: All roads over private lands that have been used adversely without interruption or objection on the part of the owners of such lands for twenty consecutive years.

Fourth: All toll roads or portions thereof, which may be purchased by the county commissioners of any county from the incorporators or charter holders thereof are thrown open to the public domain, whether agricultural or mineral, that are now or may be hereafter established according to the provisions of this act. (R. S., '08, §5787.)

Sec. 48. Kept in Repair by Counties.—All public highways, except such as are owned and operated by private corporations, and highways within the corporate limits of any incorporated city or town, shall be maintained and kept in repair by the respective counties in which they are located. (R. S., '08, §5788.)

Sec. 49. Road Districts. Amount to Be Expended in District. Overseer. Term. Compensation. Bond.—The board of county commissioners of the respective counties of the State may divide their counties into such suitable road districts as, in their judgment, will best subserve the interests of the people of the whole county; and said commissioners shall fix by resolution, from time to time, the amount of money deemed necessary to be expended in any particular road district, but in no event shall the amount of money expended in any district be less than fifty (50) per centum of the road tax collected in said district, and limit the road overseer of such district to the sum named in such resolution. In each district so formed there shall be appointed annually, by the board of county commissioners, a road overseer of such district who shall receive not to exceed three (3) dollars per day for each day's actual service, to be paid out of the general road fund of the county; and who shall hold his office for a period of one (1) year, or until his successor is duly qualified, unless sooner removed by the board of county commissioners for reasons satisfactory to themselves, who shall file with the county clerk a sufficient bond, approved by the board of county commissioners, for the faithful performance of his duties as such road overseer, and to secure payment of any money that he may receive under the provisions of this act. (R. S., '08, §5790.) (This act includes Sections 50 to 52 inclusive herein.)

Sec. 50. Tax Levy for Road Purposes.—The board of county commissioners of the respective counties of the State may levy a property tax for road purposes, which shall not exceed one (1) dollar on each one hundred (100) dollars to be levied and collected in the same manner and at the same time as other property taxes are levied and collected in each year. (R. S., '08, §5791.)

Sec. 51. Employers Furnish Overseer Names of Persons Subject to Road Tax. Failure. Penalty.—All persons, corporations, companies and individuals are hereby required, on application of the road overseer of his, her or their road district, to furnish to said overseer the names of persons in his, her or their employment, who are liable to the payment of road tax, under the provisions of this chapter, and, in the event of a wilful refusal, failure or neglect so to do within ten days after such demand in writing, shall forfeit and pay to the county the sum of one hundred dollars for such refusal, failure or neglect so to do, such sum to be recovered by said county as in other civil actions, brought or maintained in any court of competent jurisdiction, and when collected, such money shall be paid into the said special fund,

to be used in the same manner as moneys collected in said judgments for tax. (R. S., '08, §5795.)

Sec. 52. Repeal. Act Not Apply to Towns and Cities.—Section five of an act of the eighth general assembly, upon the subject of roads and highways, approved April 13th, 1891, (Which said act was Senate Bill 174) is hereby repealed. But the provisions of this act shall not relate to persons residing within the corporate limits of cities and towns. (R. S., '08, §5798.)

(This includes Sections 50 to 52, inclusive.)

CORPORATE ROAD DISTRICTS

Sec. 53. Road District. Powers.—Every regularly organized road district hereinafter organized and formed as herein provided, is hereby declared to be a body corporate by the name and style of "Road district No. _____ of the county of _____ and the state of Colorado," and in that name may hold property, sue and be sued, and make contracts. (R. S., '08, §5804.)

(This Act includes Sections 53 to 74.)

Sec. 54. Superintendent of Roads and Bridges. Duties. Compensation.—Upon the organization of a county into road districts under the provisions of this act, the office of road overseer shall be abolished and the county commissioners shall appoint a superintendent of roads and bridges who shall be a competent man, who shall have general supervision over the construction and maintenance of bridges and such roads as said commissioners may direct, and such superintendent shall receive such compensation as said commissioners may fix not exceeding five dollars per day. (R. S., '08, §5805.)

Sec. 55. Petition for Road Districts. Notice of Hearing.—Whenever a petition duly and regularly signed by a majority of the qualified electors of any county of this state shall be presented to the board of county commissioners of their county, praying for the organization of said county into road districts under this act, it shall be the duty of the county commissioners to receive said petition and immediately set the same for hearing at a date not less than twenty nor more than forty days from the date of the presentation thereof; and said commissioners shall give notice of said hearing by printing said notice in a newspaper published in the county seat of such county. (R. S., '08, §5806.)

Sec. 56. Hearing. Boundaries of Districts.—The hearing provided in the preceding section hereof shall be limited in its scope to an examination of the regularity of the said petition and its sufficiency under this act. Upon the determination of the said county commissioners that the petition is sufficient as herein provided, it shall be the duty of said commissioners to immediately proceed to divide the county into road districts with such boundaries as shall best subserve the interests of the citizens of the respective districts and to name a board of directors for each district, which board shall hold office until the next election herein provided for. (R. S., '08, §5807.)

Sec. 57. Directors. Qualifications. Term. Officers.—There shall be elected in each road district created under the provisions of this act a board of directors consisting of three members, who shall hold office for two years, or until their successors are elected and qualified. Said directors shall be freeholders and taxpayers within their district, and shall be actual residents therein. The said board of directors shall, from their own number, elect a president and secretary, which secretary shall be ex-officio treasurer of said road district. (R. S., '08, §5808.)

Sec. 58. Powers and Duties of Directors.—Within the limits of its road district the said board of directors shall be paramount in authority over roads and highways; they shall have all the powers heretofore granted by law to road overseers now elected by the board of county commissioners. The said board of directors shall have complete and sole charge of all public roads, highways and bridges, as herein limited, except such roads as may be designated by the county commissioners, within its district boundaries, and shall construct and have charge of all bridges not more than twelve feet in length within its district, as heretofore limited; and it shall be the duty of said board of directors herein created to keep all roads, highways and bridges, not more than twelve feet in length, within the limits of its district, in a state of proper repair and safety so that the same may be used by the general public for necessary travel thereover. (R. S., '08, §5809.)

Sec. 59. Materials and Supplies Contracted for. Supervision of Employes.—The said board of directors shall have the further power and authority to enter into contracts for purchase of materials and supplies, necessary for the construction, maintenance, operation and repair of roads, highways and bridges as heretofore limited within the limits of its district. They may employ and discharge such laborers, overseers, foremen, employes or other persons, as they may deem necessary in the carrying out and the proper performance of their duties under this act. (R. S., '08, §5810.)

Sec. 60. Road Tax.—The board of county commissioners of any county organized into road districts under the provisions of this act shall levy a special property tax for road purposes, which property tax shall not exceed fifty cents on each hundred dollars and shall be levied in the amount as shall be requested of said commissioners in writing by the board of directors of each respective road district hereunder. The said tax shall be levied and collected under the law, in each year. (R. S., '08, §5811.)

Sec. 61. Road Fund. How Expended.—The county treasurer shall keep each of said funds so collected in a separate fund for each district, each entitled, "Road fund of road district No. — of the county of — and state of Colorado," and whatever sums are so collected and placed in each of said respective funds shall be used in the creation, maintenance, oper-

ation and repair of the public highways and bridges, within the limits of such districts, and not otherwise, or in any other road district. (R. S., '08, §5812.)

Sec. 62. Order on Road Fund.—The county treasurer shall pay out money from said fund upon the written order of the president of the board of directors of said road district, countersigned and attested by the secretary thereof, which said orders shall be drawn after bills have been regularly allowed at regular monthly meeting as hereinafter provided for. (R. S., '08, §5813.)

Sec. 63. Persons Liable to Road Tax. Work in Lieu of Payment.—Every able-bodied man between the age of 21 and 50 years shall annually pay to the treasurer of the board of directors of his road district wherein he resides, and it shall be the duty of said treasurer to collect a road tax of three dollars, or in lieu of such sum every man shall labor two days upon the public roads whenever notified by the secretary of said board of directors to do so, and failure to either pay or labor shall subject such person to all the penalties now prescribed by law for such failure. (R. S., '08, §5814.)

Sec. 64. Election of Directors. Notice.—The regular election for the electing of members of the board of directors of such road district shall be held bi-ennially in such district on the first Monday in June, following the organization of a county into such road districts. The secretary of such board shall cause written or printed notice to be posted at six different conspicuous and public places, in said road district, specifying the date and place of such election, and the time during which the ballot box or boxes shall be opened, not less, however, than seven hours, at each election. Said notices shall be posted in at least six conspicuous and public places, as aforesaid, in such district, and whenever a newspaper is published within ten miles of such road district, it shall be the duty of the president and secretary of said board to cause a notice to be published therein at least once ten days previous to said election giving notice of such election; and if the said officers of said district fail to give such notice required by this act, then any two legal voters in and being freeholders therein, may give such notice over their names and signatures, whereupon said election may be held at the date fixed by this act for said election. (R. S., '08, §5815.)

Sec. 65. Ballot. Hours of Election.—All elections shall be by written ballot, and in the absence of a notice specifying the exact hours during which such election is to be held, then the ballot boxes shall be opened at the hour of 9 o'clock a. m. and shall be closed at 4 o'clock p. m. (R. S., '08, §5816.)

Sec. 66. Qualifications of Voters. Challenges. Oath of Challenged Voter.—Every elector, a freeholder, who is legally qualified to vote at any general election, who is a bona fide resident and taxpayer and freeholder, as aforesaid of the road district for

thirty days preceding the day of election, shall be entitled to vote. Any person offering to vote may be challenged by any legal and qualified elector of the district, or by any judge of election, and any judge of such election shall, to determine the qualifications of a voter, administer to the person challenged, an oath as follows:

You do swear (or affirm) that you are a citizen of the United States; that you have resided in this state for the period of one year, or over, preceding this election; that you are over the age of 21 years; that you have resided in this county ninety days, and that you are a freeholder, and resided in this road district thirty days next preceding this election; and that you have not voted at this election, so help you God (or under the pains and penalties of perjury.) (R. S., '08, §5817.)

Sec. 67. Challenged Voter Refusing to Take Oath. Illegal Voting. Judges of Election.—If any person challenged shall refuse to take said oath his vote shall be rejected; and if any person shall be guilty of voting illegally, he shall be punished as provided in the general election laws of this state. The three members of the board of directors of the road district shall act as judges of election, but should any of them be absent, for any cause, at the time of opening of the polls, the electors present thereat shall appoint a legal voter to fill such vacancy. (R. S., '08, §5818.)

Sec. 68. Canvass of Votes. Tie. Ballots Preserved.—Immediately after the closing of the polls the said judges shall proceed to count the votes, and the person or persons qualified to be elected under this act, who shall receive the largest number of votes, shall be declared elected, and a report of said election, signed by said judges, shall forthwith be transmitted to the county clerk and recorder of the county where such election is held, to be presented to the board of county commissioners for action and hearing as to the regularity of the election so held, and to be confirmed by said county commissioners. If upon counting the votes there shall be a tie vote, the two persons having received such tie vote shall meet within twenty-four hours before the board of directors of such road district and one of such persons shall be selected by lot. All ballots shall be carefully preserved, and after said count, shall be placed in the ballot boxes, and the ballot boxes shall be delivered to the county clerk of the county wherein said election is held, and said ballots shall be preserved by him for 90 days, at the end of which time, if there is no contest, all such ballots shall be destroyed. (R. S., '08, §5819.)

Sec. 69. Road on Boundary Line of Contiguous Districts.—In all cases where a public road or highway shall be the boundary line between contiguous road districts, the board of county commissioners shall at the time of fixing the boundaries thereof, divide such boundary road and shall provide that part of said

road shall fall within the jurisdiction of each of said districts and such decision may be appealed from to the district court whose decision shall be final therein. (R. S., '08, §5820.)

Sec. 70. Compensation of Directors.—The respective members of the board of directors of such road districts shall be entitled to no fee or compensation for acting as such directors, except a fee of one dollar for each meeting of the board actually attended. (R. S., '08, §5821.)

Sec. 71. Meetings of Board.—Regular meetings of the boards of directors shall be held on the first Monday of each month for the consideration and transaction of necessary business. Special meetings of boards of directors may be called at any time by the president thereof. (R. S., '08, §5822.)

Sec. 72. Fund of District Until Tax Levied.—In order to provide the several road districts organized under the provisions of this act with funds for the purpose of maintaining the roads and bridges therein until such time as they may be able to levy and collect a tax for such purpose, the county commissioners shall set aside and place to the credit of each district 75 per cent. of the amount of taxes collected in such districts for road and bridge purposes. (R. S., '08, §5823.)

Sec. 73. Commissioners May Open Road as Now Provided.—The county commissioners shall have the sole and exclusive power to open and establish new roads in manner as now provided by law. Said roads when so opened, established and constructed shall be maintained at the expense of said road district and shall thereafter be within the exclusive jurisdiction of said road district and the board of directors thereof, as herein provided. (R. S., '08, §5824.)

Sec. 74. Act Not Apply to Cities or Towns.—The provisions of this act shall not relate to nor in any wise affect territory lying within the boundaries of the corporate limits of cities or incorporated towns, nor shall it relate to persons residing within the same. (R. S., '08, §5825.)

ROADS AND HIGHWAYS OFFENSES

Sec. 75. Obstructing Highway. Penalty.—No person or persons, or corporation, shall erect any fence, house or other obstructure, or dig pits or holes in or upon any highway, or place thereon any stones, timber, trees or any obstruction whatsoever, and no person or persons, or corporation, shall tear down, burn or otherwise damage any bridge or any highway, or cause waste water, or the water from any ditch, road, drain or flume, or other place, to flow in or upon any road or highway so as to damage the same, and any such person or persons, or corporation, so offending or violating any of the provisions of this sec-

tion, or any of the sections of this act, for which there is no specific penalty provided, shall pay a fine of not less than ten (10) dollars, nor more than three hundred (300) dollars, for each offense, and a like fine of ten dollars for each day that such obstruction shall be suffered to remain in said highway, and shall also be liable to any person or persons, or corporation, in a civil action for any damages resulting therefrom; and it shall be the duty of the road overseer in the district in which such violation shall occur, to prosecute any person, persons, corporation or corporations violating the provisions of this act. (R. S., '08, §5826.)

Sec. 76. Braces Over Public Highways.—It shall be unlawful for any telegraph or telephone company or corporation, or any other company or corporation, or any person or persons, in using wire to brace any telegraph, telephone or other pole or post, except anchor wires, to place such wire over any part of any right of way for public roads at a less distance than twenty feet from the ground; Provided, however, That anchor wires shall not be placed over the usually traveled portions of any right of way for public roads at a less distance than twenty feet from the ground. Any corporation, person or persons who shall violate the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof in any court of competent jurisdiction, shall in the discretion of the court, be fined in any sum not to exceed fifty dollars for each offense. (R. S., '08, §5827.)

Sec. 77. Not Dam Stream to Cause Overflow. Penalty.—No person or persons, corporation or company, shall dam the waters of any stream so as to cause the same to overflow any road, or damage or weaken the abutments, walls or embankments of any bridge of any highway. Any person or persons, corporation or company, violating any of the provisions of this section, shall forfeit the sum of fifty dollars to the county, and shall be liable to any person or persons, corporation or company, in a civil action, for any damages resulting therefrom. (R. S., '08, §5828.)

Sec. 78. Ditch Owners Must Construct Bridges. Penalties for Failure.—Any person or persons, corporation or company, owning or constructing any ditch, race, drain or flume in, upon or across any highway, shall keep the highway open for safe and convenient travel by constructing bridges over such ditch, race, drain or flume; and, within five days after any ditch is constructed across, in or upon any highway, at any point thereof, so as to interfere with or obstruct such highway, the person or persons owning or constructing such ditch shall erect a good and substantial bridge, of not less than twenty feet in width, across the same, which shall thereafter be maintained by the county; Provided, That all such bridges which shall be of greater length than twenty (20) feet shall be constructed as herein provided, and thereafter maintained in proper condition for safe

travel by the owner or owners of said ditch. Any person or persons, corporation or company, constructing any ditch, race, drain or flume in, upon or across any highway, and failing to keep the highway open for safe and convenient travel, as in this act provided, shall forfeit the sum of twenty-five dollars to the county, for each and every day of failure to keep the same open for safe and convenient travel, as aforesaid. And any person or persons, corporation or company, who shall fail to erect a good and substantial bridge across any ditch, race, drain or flume, within five days after the same is constructed in, upon or across any highway, and keep the same in proper condition and repair, as herein provided, shall forfeit the sum of twenty-five dollars to the county for each and every day of failure to erect such bridge and keep the same in repair, as aforesaid, together with the cost of constructing there a good and substantial bridge, or making necessary repairs, which the road overseer of the district shall at once proceed to build or repair, and such party or parties so neglecting, shall also be liable in damages to any person or persons damaged by such neglect. (R. S., '08, §5829.)

Sec. 79. Fines, Penalties, Etc., How Recovered.—All fines, penalties and forfeitures incurred under any provisions of this act, except as otherwise provided, shall be recoverable by an action of debt in the name of the people of the State of Colorado, in any court of competent jurisdiction, and the county treasurer shall set the same apart to the district wherein the same accrued. (R. S., '08, §5830.)

(The Act referred to includes Secs. 75, 77, 78 herein.)

Sec. 80. Protection of Highway When Transporting Heavy Machines.—It shall be the duty of all persons, associations and corporations operating steam threshing machines or vehicles, or using the public roads for transporting such machines, or other heavy machinery, to use a sufficient number of heavy planks, wherever necessary, to protect all sidewalks, bridges, culverts and causeways from being broken by said steam threshing machines, or other heavy machinery, in passing over the same. (R. S., '08, §5831.)

Sec. 81. Destruction or Injury of Highways. Penalty.—If any person, association or corporation shall purposely destroy or injure any sidewalk, bridge, culvert or causeway, or remove any of the timber or plank thereof, or obstruct the same, he shall forfeit a sum of not less than one hundred dollars, nor more than three hundred dollars; and shall be liable for all damages occasioned thereby and for all necessary costs for rebuilding or repairing the same. And all forfeitures and sums of money recovered under this act shall be turned into the county road fund. (R. S., '08, §5832.)

VACATION, ALTERATION AND ESTABLISHMENT OF HIGHWAYS

Sec. 82. Vacation of Public Highway.—The board of county commissioners may vacate any established road, or part thereof, when petitioned by any number of freeholders, not less than two-thirds, owning land adjoining said road, or part thereof, to be vacated; Provided, That no established road, or part thereof, shall be vacated so as to leave any land adjoining said road without an established public road connecting said land with another established public road, unless the owner of such land sign the petition therefor; And, Provided, further, That if such road runs on the county line between two counties, the concurrence of the county commissioners of both such counties shall be necessary to vacate it. (R. S., '08, §5833.)

Sec. 83. Alteration of Highway: New Road Laid Out: Petition by Freeholders.—The board of county commissioners may alter, widen, or change any established road, or lay out any new road, in their respective counties, when petitioned by ten (10) freeholders residing within two (2) miles of the road sought to be altered, widened, changed or laid out. Said petition shall set forth a description of the road sought to be altered, widened or changed; and if the petition be for a new road, it shall set forth the points where the road is to commence and terminate, its general course and distance; Provided, The commissioners of the county may, at any regular meeting, by an order of the board, declare any section, or township line on the public domain, a public highway; and on and after the date of such order, which shall be attested by the clerk, under the seal of the county, and recorded in the office of recorder of deeds, the road so laid out shall be a public highway. (R. S., '08, §5834.)

Sec. 84. Petitioners Deposit Money for Expenses of Viewing, Etc.—The petitioners shall deposit with the county clerk of the county in which any road is sought to be altered, widened, changed or laid out and established, a sufficient sum of money, which shall be fixed by the board of county commissioners, to defray the expense of viewing the proposed road, which sum shall be paid into the county road fund in case the prayer of the petitioner be refused, but if the board of county commissioners alter, widen, change or lay out such road, then such sum shall be returned to the person or persons depositing the same. The petitioners in lieu of such deposit may file with the county clerk aforesaid a good and sufficient bond conditioned for the payment of the expenses of viewing such road should the prayer of the petitioners be refused. (R. S., '08, §5835.)

Sec. 85. Road on County Line, Petition to Be Sent to Both Counties.—If any proposed highway be on the county line between two counties, the board of county commissioners of each county

interested shall be petitioned, and each of such boards shall appoint three viewers, qualified as in other cases, who, or a majority of them, shall meet at a time and place named by the board of county commissioners first interested, and proceed to view and mark out the road, and report to the board of county commissioners of both counties, as in other cases, and the concurrence of the county commissioners of both such counties shall be necessary to establish it. And if any such road be established, each of such counties shall open and maintain a definite part thereof, which the board of county commissioners of such counties shall apportion by mutual agreement between the two counties, and if the boards of county commissioners cannot agree upon the apportionment, they may refer the matter to three disinterested freeholders as arbitrators, whose duty it shall be to apportion the same and report thereon to the boards of county commissioners of both counties. (R. S., '08, §5836.)

Sec. 86. Commissioners to View and Mark Out Road. Notice.—It shall be the duty of the board of county commissioners of any county in this State, at their next meeting after a petition, as required in section four of this act, is received, to appoint a board of commissioners of three freeholders of the county to view and mark out the roads prayed for in the petition, and fix a time for such view, and to cause notice to be posted in three of the most public places along the proposed new road, at least five days previous to the day fixed for the view thereof, giving parties in interest notice that at the time fixed by the board of county commissioners the viewers so appointed will meet at the point designated in the petition as the starting point of such road to attend to their duties as viewers. (R. S., '08, §5837.)

Sec. 87. County Clerk Direct Warrant to Viewers.—The county clerk shall issue a warrant directed to the viewers appointed, setting forth their appointment, and requiring them to meet at the time and place named by the board of county commissioners, and to proceed to view and mark out such road, to assess the damages and benefits accruing to the owner or owners of any of the lands over which the same may pass, by reason of the alteration, widening, changing of location thereof, and the probable cost of opening such road for travel. (R. S., '08, §5838.)

Sec. 88. Sheriff to Serve Warrant Upon Viewers.—The sheriff of the proper county shall serve the warrant mentioned in the preceding section, by delivering a copy thereof to each of the viewers named therein, and the original he shall return to the county clerk, with his endorsement of service made thereon. Any appointed road viewer, and duly served with a warrant, who shall wilfully neglect or refuse to act, shall forfeit the sum of twenty-five dollars to the county; Provided, That nothing in this section, or in section eleven of this chapter, shall be so construed as to invalidate any act or acts of said viewers, if they serve as viewers after receiving notice of their appointment, directed to

them by the county clerk, as provided in section eight of this chapter. (R. S., '08, §5839.)

Sec. 89. Viewers Meet. Mark Out. Assess Benefit and Damages.—The viewers appointed and served with warrant as hereinbefore provided shall meet at the time and place specified in the warrant, and commencing at the place designated in said petition as the starting point of the road sought to be altered, widened, changed or laid out and established, the said viewers shall proceed to view and mark out the same by setting stakes, blazing trees, turning a furrow, or other appropriate monuments to the terminus named in the petition by the most practicable and convenient route that they in their judgment can find. They shall assess the benefits and damages accruing to all persons by reason of the alteration, widening, changing or laying out of such road, and award to any person or persons damages in excess of the benefits accruing to him or them, a sum equal to such excess. And if the viewers or a majority of them be of opinion that the road should be altered, widened, changed or laid out and established, they shall cause a survey and plat of the same to be made by the county surveyor or other competent person, giving the courses and distances and specifying the land over which the road extends. (R. S., '08, §5840.)

Sec. 90. Viewers Fill Vacancy in Commission.—If any viewer duly appointed and served with warrant refuses to act, or is disqualified or does not appear, the other two viewers may fill such vacancy, or if but one of the viewers appears who is qualified and consents to act he shall appoint two others who shall be freeholders to assist him and they shall proceed to view such road. (R. S., '08, §5841.)

Sec. 91. Viewers' Report. Contents. Fees.—The viewers shall file a report of the view in the office of the county clerk and recorder of the county in which such view was made ten days before the next regular meeting of the board of county commissioners held after the same is completed, which shall be signed by a majority of viewers and shall contain a full statement of their proceedings, a description of the land over which such road extends, an estimate of the cost of opening it for travel, and assessment of the damages and benefits accruing to any person or persons by reason of the alteration, widening, changing or laying out of such road, and the sum awarded any person or persons for damages in excess of the benefits assessed to him or them, and if such road be practicable and the establishment of it be recommended by them. To this report the viewers shall annex the plat, survey and report of the surveyor. For their services the viewers shall receive a warrant on the county treasurer for a sum to be fixed by the county commissioners not exceeding five dollars per day. (R. S., '08, §5842.)

Sec. 92. Objections to Report. Board of Commissioners Hear and Determine.—The board of county commissioners, at their

next regular meeting after the return of such report, shall proceed to consider the same and all objections that may be made thereto, and they shall determine whether or not such road shall be established and opened for travel. And they may refer the matter of viewing to the same or other viewers with instructions to report in like manner as herein required, or specially upon some particular matter. (R. S., '08, §5843.)

Sec. 93. Report, Plat, Etc., to Be Filed.—If the board of county commissioners determine to open any such road, they shall cause the full and final report of the viewers, including the plat and report of the surveyor, to be recorded in the office of the county clerk and recorder in a book kept for that purpose. (R. S., '08, §5844.)

Sec. 94. Damages, How Paid: Notices: Not Open Through Fields of Growing Crops.—The board of county commissioners having considered the report of any road view, and the compensation to which any person or persons damaged having been ascertained and paid to the owner or owners or into court for him or them, may order the road to be opened for travel. And if they do so order they shall cause notices to be posted at three public places along the line of such road, giving all parties notice that they have or will direct their proper officers to open and work the same from and after sixty days from the date of such notice; Provided, No such road shall be ordered opened through fields of growing crops or along a line where growing crops would thereby be exposed to stock until the owner or owners of such crops shall have sufficient time to harvest and take care of the same. (R. S., '08, §5845.)

Sec. 95. Damages Exceeding Benefits, How Paid. Owner Unknown.—If the damages assessed to any person or persons by reason of the alteration widening changing or laying out of any road shall exceed the benefits, the excess shall be paid to such person or persons by warrant on the county treasurer for the amount. If any person or persons to whom damages are awarded be under disability, or can not be found, the same shall be set apart to such person or persons in the county treasury. (R. S., '08, §5846.)

Sec. 96. Appeals from Estimates of Viewers.—If any person or persons be of opinion that the damages awarded him or them by the viewers are inadequate and insufficient, the board of county commissioners may agree with such person or persons upon the measure of the same. (R. S., '08, §5847.)

Sec. 97. Jury Determine Compensation. Condemnation. Commissioners Authorized to Condemn Without View or Proceeding.—Any person or persons owning or having an interest in any land over which any proposed road extends, who shall be of opinion that the damages awarded him or them by the road viewers are inadequate and insufficient, may personally, or by

agent or attorney, on or before the first day of the next regular meeting of the board of county commissioners held after the report is filed in the office of the county clerk and recorder of the county in which the view was made, file a written request addressed to the board of county commissioners for a jury to ascertain the compensation which he or they may be entitled to by reason of damages sustained by altering, widening, changing or laying out such road. Thereupon the board of county commissioners shall apply to the judge of the district or county court of the same county by filing a petition, as in other cases under the act of the general assembly of the State of Colorado entitled "An Act to provide for the exercise of the right of eminent domain," approved February 12, 1877, and the compensation to be paid such person or persons shall be ascertained and the land condemned, the rule of court or decree rendered, and all condemnation proceedings thereupon shall be according to the proceeding of said act, as in other cases. The board of county commissioners of any county may, and they are hereby authorized, to take and condemn, or cause to be condemned, the lands of private persons under and according to said eminent domain act in the first instance without view or other proceeding under this act. (R. S., '08, §5848.)

Sec. 98. Highways Sixty Feet Wide.—All public highways hereafter laid out in this State shall be sixty feet in width, unless otherwise ordered by the board of county commissioners. (R. S., '08, §5849.)

Sec. 99. Petition by All Owners.—Whenever a petition shall be presented to the board of county commissioners of any county of this State praying for a public highway, and the names of all the owners of all the land through which said road is to be laid out, shall be signed by the owners thereof to said petition, giving the right of way through the lands, and accompanied by a plat of the road, it shall be the duty of the board of county commissioners, if in their opinion the public good requires it, to declare the same a public highway, and thereupon the plat shall be filed and recorded and the said road shall become a public highway from and after that date. (R. S., '08, §5850.)

Sec. 100. Ways of Necessity. Petition. Fees of Viewers.—The manner of laying out any private wagon road from the dwelling of any person to any public road, and of condemning the lands necessary therefor, shall be the same as hereinbefore provided, excepting that the viewers of the same shall only receive compensation for one day's service, and mileage to and from their respective places of residence; and the petition in such cases need be signed only by such person, and the expense of viewing and surveying such road and the damages which may accrue, to any person by reason of laying out the same, and the expense of opening such road, shall be paid by such petitioner. (R. S., '08, §5851.)

Sec. 101. Alteration of Highway. Notice to Overseer. Fee of County Clerk.—When any highway is to be altered, widened, changed or laid out, the county clerk shall notify the overseer of the proper district, and for such notice the clerk shall receive fifty cents from the county treasury. (R. S., '08, §5852.)

Sec. 102. Crossing Streams.—When any public road heretofore laid out or traveled as such, or hereafter to be laid out or traveled, crosses any creek or stream of water, and such stream during any part of the year is usually fordable where such road crosses, or shall cross the same, the said ford and the banks of the stream adjacent thereto, and the roadway or track usually traveled leading thereto from such highway shall be deemed and taken to be part of such highway, and any person who shall obstruct any such ford, or the road leading thereto, or shall dig down the banks of such ford, or who shall erect any dam or embankment or other obstruction in such stream or wing dam or other obstruction on the banks of said stream, for the purpose of raising the water of said stream upon the said ford, so as to render the said ford impassable, or more difficult of passage than heretofore, or who shall maintain any such dam, wing wall, embankment or obstruction heretofore erected, after being by the road overseer of the district, notified to remove or abate the same, shall be liable to the same penalties as are hereinafter prescribed for obstructing a public highway, and no person or corporation, upon any pretense or authority, shall be permitted to erect a toll bridge over any stream at or upon any public ford, or road crossing, or so near thereto, as by the abutments, embankments, or piers of such bridge, to obstruct or render impassable the said ford, or roadway leading thereto. (R. S., '08, §5853.)

Sec. 103. Contract for Construction. Advertise for Bids.—When any bridge or road is to be built or constructed, or any grading or repairing to be done upon any highway, the estimated cost of which shall exceed three hundred dollars, the work shall be let by contract, and the board of county commissioners shall advertise for sealed proposals for performing the work, in some newspaper published in the county, for a period of not less than ten days; Provided, That if there is no newspaper published in the county where such bridge or road is to be built or constructed, or such grading or repairing is to be done, the board of county commissioners shall cause to be posted in five of the most public places in said county such advertisement, the same to be posted up at least ten days before the said contract is let. Such advertisement shall describe the bridge or road to be built or constructed, or such work to be done, its location, and shall refer all persons to the person or persons holding the plans and specifications therefor, and such contract so to be let shall be awarded to the lowest and best responsible bidder (the board reserving the right to reject any and all bids proffered), to be paid out of the road fund or general fund, as the county commissioners may determine. (R. S., '08, §5854.)

SANTA FE TRAIL

Sec. 104. Santa Fe Trail. Route. Public Highway.—There is hereby established a public highway through the State of Colorado which shall have for its southern terminus a point in the Raton Mountains on the State line between Colorado and New Mexico, where the old Barlow and Sanderson stage line, known as the "Santa Fe Trail," crosses the State line, being the northern end of what is known as "El Camino Real" in New Mexico, running thence in a northerly direction as nearly as practicable through the following cities and towns:

Trinidad, Walsenburg, Pueblo, Colorado Springs, Denver, Longmont, Loveland and Fort Collins. (R. S., '08, §5855.)

(This Act includes Sections 104 to 111 inclusive.)

Sec. 105. Convict Labor Used to Construct Highway.—The construction, repair and maintenance of said public highway shall be done under the authority and control of the board of commissioners of the penitentiary of the State of Colorado, and the warden of said penitentiary, subject to the provisions of section 6 of this act, who are hereby authorized and required to construct said highway by the use of the labor of the penitentiary convicts, as well as also in like manner to construct such extensions of said highway and such other roads leading to said highway as may from time to time be provided for by further enactments of the general assembly. (R. S., '08, §5856.)

Sec. 106. Convict Labor Used on State Road, Denver to Grand Junction.—The board of commissioners of the State penitentiary and the warden of said penitentiary are hereby authorized and required to use and employ all such prisoners in the said penitentiary as they may deem practical in and upon the further construction, widening and improvement of the State road from Denver to Grand Junction, established by an act entitled An act to construct, improve and repair a State wagon road from the city of Denver, Arapahoe County, Colorado, to the city of Grand Junction, Mesa County, Colorado, with certain branch roads therefrom and making an appropriation therefor, approved May 3, 1899. (R. S., '08, §5857.)

Sec. 107. Supervision of Work. Working Hours of Convict.—The supervision of all such work shall be under such competent persons as may be selected by the said board of commissioners; Provided, That no supervisor shall cause or permit any prisoner under his direction to be employed for more than eight hours of any day. (R. S., '08, §5858.)

Sec. 108. Additional Good Time.—The said board of commissioners shall have the power, and they are hereby authorized to adopt rules and regulations providing for the granting of privileges to prisoners employed upon the roads or in the mines which shall especially refer to the granting of an additional "Good

Time" allowance in the case of short time men, and better food for prisoners serving life sentences, such privileges to be conditioned upon their good behavior and efficient work. (R. S., '08, §5859.)

Sec. 109. Plans and Specifications. Deputy Engineer. Compensation. Record of State Engineer.—The said highways and such additional roads in connection therewith, as may be provided for shall be located and surveyed under the direction of the State engineer, who shall cause plans and specifications of said highways and roads to be prepared, and in designating the materials to be used in their construction, he shall take into consideration the climate, soil, materials to be had in the vicinity and the extent and nature of the probable traffic on said highways and roads, with a view to the most economic construction thereof, consistent with efficiency. The State engineer shall furnish a deputy engineer, who shall be paid six (6) dollars per day, and legitimate expenses for each day actually and necessarily employed, to be paid by the respective counties in which said work is done.

On or before the tenth day of every month the State engineer shall certify to said board of commissioners the number of days of service rendered and the expense incurred by him during the month next preceding, which certificate shall separately state the items of service and the expense rendered and incurred, in respect to said highways or roads in each county through which the same may pass.

The board of county commissioners of any county through (which) said highways or roads pass are hereby authorized and required to pay to the said State engineer, upon vouchers drawn by said board of commissioners, in accordance with said certificates, the amount due said State engineer for the work done in said county, out of the road fund or general fund of the county. (R. S., '08, §5860.)

Sec. 110. Right of Way. Bridges. Payment for Material.—The boards of county commissioners of the several counties of this State through which said public highways or roads pass, are hereby authorized and required to secure the right of way of said highways or roads wherever necessary, and to construct the necessary bridges, in accordance with the laws of the State now in force relative to procuring the right of way of public roads, and the construction of bridges; Provided, That all bridges shall be constructed under the supervision and in accordance with the plans approved by the State engineer; And, provided, further, That so far as practicable bridges across arroyas and smaller streams shall be constructed by convict labor.

Any material necessary to be purchased for said bridges shall be paid for by the respective counties. (R. S., '08, §5861.)

Sec. 111. Cities and Towns Maintain Highways.—In incorporated cities and towns along public highways and roads, the

municipal authorities shall construct and maintain said public highways and roads. (R. S., '08, §5862.)

Sec. 112. Monuments for Marking Santa Fe Trail.—The sum of two thousand (2,000) dollars, or so much thereof as may be necessary, is hereby appropriated out of any money in the State treasury, not otherwise appropriated, for the purpose of procuring suitable monuments to mark the Santa Fe Trail in the State of Colorado, and providing for a survey of the Santa Fe Trail in the State of Colorado through the following counties: Prowers, Bent, Otero, Las Animas and any other counties in the State of Colorado through which said trail may extend. (R. S., '08, §5863.)

(This Act includes Sections 112 to 114 inclusive herein.)

Sec. 113. Supervision of Construction.—The erection of said monuments and the survey of said trail shall be under the supervision of the State regent of the Daughters of the American Revolution in the State of Colorado, the State engineer of the State of Colorado and the chairman of the Daughters of the American Revolution Santa Fe Trail committee. (R. S., '08, §5864.)

Sec. 114. Penalty for Damaging Monuments.—Any person who shall destroy, deface, remove or injure the monuments or marks erected as herein provided, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of one hundred (100) dollars, or by imprisonment in the county jail for a period of not less than 30 days nor more than 90 days, or by both such fine and imprisonment at the discretion of the court. (R. S., '08, §5865.)

TOLL ROADS

(See also Toll Road Companies, beginning Sec. 17 above.)

Sec. 115.—Maximum Grade. Minimum Width. Turn Outs.—That all toll roads which shall hereafter be constructed within the boundaries of the State of Colorado shall have a maximum grade of not to exceed fifteen feet in the hundred feet, a minimum width of roadway of not less than ten feet, and shall be provided at points visible one from the other, and distant not more than one-fourth of a mile apart, with turnouts or passing points, not less than sixteen feet in width and fifty feet in length, sufficient for the passing of teams and vehicles. (R. S., '08, §6461.)

Sec. 116. County Surveyor Examine and Report. When Rates Granted.—Upon the completion of such toll road, or any part thereof, the county surveyor of the county in which such toll road is located shall make an examination thereof at the expense of the owners of such toll road, and report to the board of county commissioners of such county if the requirements of section one of this act have been fully complied with. No rates of toll shall be granted by the county commissioners of any county, or the

county judge thereof, or persons acting under authority derived from said judge, until the requirements as hereinbefore specified have been fully complied with and certified to by the county surveyor of such county. (R. S., '08, §6462.)

Sec. 117. When Owners Have Lien for Tolls.—The owners of any toll road shall have a lien on any animals or vehicles, passing over their respective roads, for the lawful tolls due thereon; Provided, That this shall not apply to estrays nor to stolen animals or vehicles, nor to any animals or vehicles, the property of, or in the employ of, the State of Colorado or the United States. (R. S., '08, §6463.)

Sec. 118. When Owners and Collectors Act as Constables.—The owner or owners of any toll road, or any person appointed by them to collect toll, upon any toll road in the state of Colorado, shall have the authority, and be empowered to act as constables; Provided, That he shall be appointed with the consent of the board of county commissioners, and be subject to removal at their pleasure; And, Provided, That he shall give good and sufficient bond for the proper discharge of his duties, in the sum of one thousand dollars. (R. S., '08, §6464.)

Sec. 119. Unlawful Collection of Tolls.—Penalty.—The unlawful collection of tolls, or the taking or collection of unlawful tolls, shall be punishable by a fine not less than ten dollars, nor more than one hundred dollars. A suit may be brought before any justice of the peace within the county in which such unlawful toll may have been collected, by any person or persons who may have been compelled to pay such unlawful toll, for the recovery of such unlawful tolls, and for the recovery of such fines as may be imposed by the magistrate or justice of the peace, which fine shall be paid to the complainant in such action. (R. S., '08, §6465.)

Sec. 120. Refusing to Pay Toll. Penalty.—Any person traveling on any toll road and refusing to pay toll after such toll shall have been demanded by the regularly authorized toll gatherer, shall be subject to a fine in any sum not exceeding twenty dollars for such offense, the same to be collected before any justice of the peace in the county wherein such road is located. (R. S., '08, §6466.)

Sec. 121. Complaint to County Commissioners if Road Not Repaired. Examination. Notice to Owner. Repaired. Forbid Toll.—That the county commissioners of the several counties of this state, upon the complaint of not less than twenty-five citizens of either of said counties, to the said commissioners of such county, that any road or bridge, or any part thereof, of any incorporated company situated in, or through either of which said counties the same may pass, representing to the said commissioners that the said corporation or company are neglecting or refusing to keep such road or bridge in good and proper repair and

condition, it shall be the duty of the county commissioners in the county in which such road or bridge is situated, to proceed forthwith, or within five days, to examine the road or bridge concerning which complaint shall have been made, and ascertain the truth of the facts therein set forth; and if they shall find the matters and things complained of in said petition or complaint to be true, and that said road or bridge is not in proper condition, according to the nature of the ground and the season of the year in which such examination is made, then it shall become the duty of the said county commissioners to give notice in writing to said corporation or company to repair or put said road or bridge in good order or condition in five days, or a reasonable time, and if, in five days, the repairs shall not have been commenced, and in a reasonable time completed, then it shall become the duty of the said county commissioners, and they are hereby authorized, to either take the possession of the said road or bridge, in the name and for the use of the county in which the same is situated, or they may prohibit the said company or corporation from demanding, collecting or receiving any toll for the use of or passage over the same until the said road or bridge shall be put in proper order or condition, and they authorized to do so in writing. (R. S., '08, §6467.)

Sec. 122. Road Seized. County Repair. Receive Toll.—After any road or bridge in either of the aforesaid counties shall be taken as aforesaid, into the possession of either of said counties, it may and shall be the duty of the said county to immediately proceed to put the said road or bridge into proper repair and condition for travel or use, and it may, and is hereby authorized, to keep such possession thereof, and keep it in good and proper repair, and receive the tolls thereof, until the said company or corporation shall fully repay the said county for the repairs so done as aforesaid, after deducting the said tolls so received, together with interest on the money so expended for said repairs, at the rate of two per cent. per month. (R. S., '08, §6468.)

Sec. 123. Pay of County Commissioners. Charged to Owners.—The said county commissioners shall be entitled to receive from the proper counties for their services five dollars per day, for the time actually and necessarily employed in the discharge of said duties, which said sum shall be charged as the expense of the corporation or company whose property has been taken into custody. (R. S., '08, §6469.)

Sec. 124. When County May Sell Road. Notice.—If the company or corporation whose property has been so taken into custody or possession of the county, as aforesaid, shall not, within two years, reimburse the said county for the said repairs, then the said county may sell the said property at public auction, to the highest bidder, after giving sixty days' notice of such sale in some newspaper, as sheriffs are required to give notice of sales on execution, and pay any excess of the moneys received from

such sales over the said expenditure to the said corporation. (R. S., '08, §6470.)

Sec. 125. Appeal to District Court. Bond. Trial De Novo.—If said company or corporation feel aggrieved at the decision of said county commissioners, they shall have the right to appeal from such decision to the district court, upon filing a good and sufficient bond to be approved by the clerk of the district court, conditioned in like manner as provided in cases of appeals from justices of the peace, and conditioned further for keeping such road in good repair, and for all damages that may accrue to any person or persons for a neglect to keep such road in good repair during the pendency of such appeal; and said clerk shall thereupon issue a summons as in other cases, directed to said county commissioners, and such appeal shall stand for trial before such court, de novo, in the same manner as if such suit had been appealed from a justice of the peace. (R. S., '08, §6471.)

Sec. 126. Toll Roads Must Be Kept in Repair.—It shall be the duty of all owners or operators of roads upon which toll is charged, to keep their roads in good repair at all points, fit for the proper and easy hauling of loaded freight wagons thereon, and the condition of such road shall be determined by the grade thereof and the season of the year in which they are used. (R. S., '08, §6472.)

Sec. 127. Complaint to County Court if Road Out of Repair. Duty of Overseer. Repair.—Whenever eight residents, freeholders of a county, shall file a complaint in the county court, verified by one of their number, averring that any road within the county upon which toll is charged, is not constructed according to law, or that any such road is not in good repair and fit for the proper and easy hauling of loaded freight wagons thereon, taking into consideration the grade of the road and the season of the year, the county judge shall issue his summons, which may be served upon the person authorized to collect toll on such road, notifying the corporation, company or person owning or operating such road, to appear on the first day of the next term of said court, to answer and defend such complaint; and it shall not be necessary to file any answer to said complaint, but the allegations in such complaint shall be considered as denied, and the county judge shall, upon the first day of said term issue his venire for twelve jurors, who shall be residents of the county, to try the issue made by said complaint, and said jurors may be challenged peremptorily, or for cause, as is provided in other civil cases; and if by challenge, or other cause, the said jurors summoned are exhausted before the jury is selected, the county judge shall forthwith issue his venire for a sufficient additional number to complete the said jury; or the residents of the county may proceed as follows, viz.: Upon complaint to the road overseer of the proper district, of ten electors and taxpayers in any county, that any toll road in said county is in bad or dangerous condition for

travel, the road overseer shall examine the same; and if complaint is found sufficient and reasonable, taking into consideration the grade of the road and the season of the year, he shall, by notice in writing, which shall be served by delivering a copy of said notice thereof, to the president, secretary, or any other officer of the corporation or company, or to any stockholder thereof, or to any person owning or interested in said road, requiring the toll road company to repair the same; and if such requirement is not complied with to the satisfaction of the overseer, by said company within twenty days from the notice thereof, the road overseer shall, as in case of county roads, have power to put said road in repair, and the costs of examination and repair, together with any sums expended for repair of such road, shall be a lien upon the property, franchises, road-bed, and effects of such toll road company, and may be collected as in case of a delinquent taxpayer, as provided by law, and execution shall issue to enforce said lien, and said lien shall have priority to all other liens. (R. S., '08, §6475.)

Sec. 128. When Judgment Is Against Toll Road Company, No Toll Shall Be Charged Until Road Is Put in Repair.—The issue to be tried by any such jury shall be: "Is the charge contained in the said complaint true?" If the verdict of the jury shall be in the affirmative, the county court shall render judgment against such corporation, company or individual for costs; and, further, that no toll whatever shall be charged upon any part of such road within said county until the road shall have proper width and grade, and is put in good repair, and then only upon an order being entered by the board of county commissioners that said road has been brought to the proper grade, or has been made of the proper width, or has been placed in the state of repair contemplated by this act. If the verdict of the jury shall be in the negative, the parties making the complaint shall be assessed for the cost of said suit. (R. S., '08, §6474.)

Sec. 129. Judgment Certified. Commissioners Examine Road.—The county judge shall immediately certify any such judgment to the county commissioners, who shall file it with the records of the county. Such commissioners shall examine the said road, and if the condition of the road warrants it, make the entry provided for in the last preceding section. (R. S., '08, §6475.)

Sec. 130. Appeals or Writs of Error.—Upon the trial of any such cause, exceptions may be taken, and appeals or writs of error shall be allowed to the district or supreme courts, as in civil cases. (R. S., '08, §6476.)

Sec. 131. Penalty for Wrongful Collection of Toll.—If any person shall offer or attempt to collect toll upon a road, when a judgment has been entered against the owners or operators of said road, such person shall be guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not to exceed one hundred dollars, or imprisoned in the county jail for a term not

to exceed ninety days, or both, in the discretion of the court. Every offer or attempt to collect such toll shall be held a separate offense. (R. S., '08, §6477.)

Sec. 132. Execution Against Toll Road Companies. Property Levied Upon.—In all cases where any judgment has heretofore been rendered against any toll road or wagon road company in this state, which shall remain unsatisfied for thirty days after the taking effect of this act, and in all cases where a judgment shall hereafter be rendered against any such company, which shall remain unsatisfied for thirty days after the rendition thereof, it shall be lawful to issue execution thereon against the goods and chattels of such company, which shall be levied upon and sold as in other cases; but if sufficient goods and chattels can not be found to satisfy such execution, then it shall be lawful for the officer holding such execution to levy upon the right of such company to take toll at any toll road gate, or gates, within the jurisdiction of such officer, which right he shall advertise and sell as personal property; and the person who will pay the amount due upon such execution, for the right of using such gate or gates and of taking tolls at the same for the shortest time, shall be the purchaser. The right under said purchase to take and collect tolls shall extend over the whole length of the road, although such road runs and extends beyond the limits of the county wherein the sale was made. (R. S., '08, §6478.)

Sec. 133. Effect of Certificate of Purchase.—That the officer making sale of the right to take toll at any gate or gates aforesaid shall give to the purchaser a certificate thereof, which certificate shall be sufficient to authorize the purchaser to take possession of such gate or gates and to hold the same during the time for which the same was sold, and the person so purchasing, as aforesaid, shall have the full right to demand and receive the same toll of and from all passengers passing through said gate or gates which shall have been established and posted up by said county; and during the possession thereof such purchaser, or his agent, shall conform to all the rules and regulations of such company in the same manner as required of the gatherers of said company, excepting that such purchaser shall hold for his own use all tolls collected at such gate or gates for and during the time for which such purchaser purchased the same. The purchaser may require penalties imposed by law for any injuries to the franchise or a violation of its rules and regulations, in the name of the corporation; if the road is owned by a company, and in his own name, as purchaser, if the road and franchise is owned by an individual. (R. S., '08, §6479.)

Sec. 134. Obligations of Owner Not Impaired by Sale.—The obligation imposed by law upon the owner of such roads and franchise to keep the same in repair shall in no way or manner be impaired or lessened by reason of such sale, but, said owner and corporation shall be liable to all the penalties and forfeiture,

after the sale, to the same extent and in the like character of actions the same as though no sale had been made. (R. S., '08, §6480.)

Sec. 135. Owner May Redeem.—The owner of such road, his or its assigns, and his or its judgment creditors, shall have the right to redeem from such sale, in the same way and manner and under like conditions as redemptions are now made from sales of real estate under the laws of the State of Colorado. (R. S., '08, §6481.)

Sec. 136. Markets. Wagons Bring Produce, Free. Forestalling. Huckstering. Arrest. Seizure of Unsound Food.—No charge or assessment of any kind shall be levied on any wagon or other vehicle, or the horses thereto attached, or on the owner thereof, bringing produce or provisions to any of the markets in the city, for standing in or occupying a place in any of the market places of the city or in the streets contiguous thereto, on market days and evening previous thereto; but the city council shall have full power to prevent forestalling, to prohibit or regulate huskstering in the markets, to prescribe the kind and description of articles which may be sold, and the stands and places to be occupied by the vendors, and may authorize the immediate seizure or arrest, or removal from the markets, of any person or persons violating its regulations as established by ordinance, together with any article of produce in their possession, and the immediate seizure and destruction of tainted or unsound meat or other provisions. (R. S., '08, §6576.)

AUTOMOBILES

Sec. 137. For the purpose of this act the term "automobile" shall be held to embrace and mean and is hereby defined to mean any vehicle driven by motive power other than by animal power or motive power supplied solely by the muscular exertion of a human being. (Laws of '09, Chap. 137, §1.)

Sec. 138. Any person or persons who shall tamper with, or who shall enter upon and start in motion, or aid or abet another in so doing, any automobile without the knowledge and consent of the owner thereof or person or persons or corporation as the case may be, operating such automobile, shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished for each offense by a fine of not less than fifty dollars (\$50.00), nor more than three hundred dollars (\$300.00), or by imprisonment in the county jail for a period not less than thirty (30) days, nor more than ninety (90) days, or both such fine and imprisonment. (Laws of '09, 'Chap. 137, §2.)

Sec. 139. Justices of the peace in their respective jurisdiction shall have power to hear and determine all cases arising under the provisions of this act. (Laws of '09, Chap. 137, §3.)

IMPROVEMENT DISTRICTS, IN COUNTIES, CITIES AND TOWNS

Sec. 140. Public Improvement Districts May Be Established.

—Whenever in the opinion of the board of public works, city council, or board of trustees of any incorporated town or city, whether incorporated under any general law or special charter of this State, or the board of county commissioners of any county in this State, it shall be necessary to make any public improvement, including the establishment, widening, grading, paving or otherwise improving any road, street or alley, or the constructing, enlarging or completing of any tunnel, bridge or viaduct, or the establishing or improving of any public park, of especial benefit to lands lying within the territorial jurisdiction of such board or council to declare the necessity for such improvement, and the location, nature, character and uses thereof, and to establish and define the territorial boundaries of a district of land lying within such town, city or county to be benefited thereby, and to designate such district a public improvement district by a suitable name or number. (R. S., 1908, Sec. 5297.)

Sec. 141. Election for Voting Bonds, Qualifications of Voters, Judges.—Said board of public works, city council, board of trustees, or county commissioners, may thereupon call a special election of such property owners residing within said improvement district as are legal voters and have paid a realty tax within one year of the day of such election, for the purpose of voting upon the question of creating a bonded indebtedness in and for said district wherewith to make said improvement, and shall designate the hour and time, not less than four hours by daylight of any one day, and place of such election, and appoint three of the said property owners as judges of said election. (R. S., 1908, Sec. 5298.)

Sec. 142. Notice of Election.—Notice of such election shall be given by publication of said call at least fifteen days prior to said election in some daily newspaper, or, if there be no daily newspaper, then at least three times in some weekly newspaper at that time published in the county and designated in said call. (R. S., 1908, Sec. 5299.)

Sec. 143. Absence of Judge, Vacancy, How Filled.—The judges so appointed shall attend at the time and place, and during the hours designated in the call, and in case of absence, for any cause, of any such judge at the earliest hour so designated, it shall be competent for the by-standing property owners aforesaid to fill the vacancy by a majority viva voce vote. The judges shall elect one of the number as presiding judge and another as secretary, and all the judges shall be sworn to discharge their duties faithfully. (R. S., 1908, Sec. 5300.)

Sec. 144. Amount of Indebtedness, Form of Ballots, Majority Vote.—At the opening of said meeting such of the property owners as may then be present shall first, by a resolution, declare what, if any, amount of bonded indebtedness of said district shall be created for the purpose of making said improvement, and a majority vote of such property owners present and voting, shall be sufficient for the adoption of said resolution. The ballot box shall then be opened and kept open by the judges during the remainder of the time designated in the call and all such property owners residing within said district so established as are legal voters, and shall have paid a realty tax within one year of the day of election, shall be entitled to vote upon the question of creating the amount of bonded indebtedness determined by said resolution. All ballots shall be "For the bonds," or "Against the bonds," and at the hour designated in the call, the ballot box shall be closed, the ballots publicly counted, and the result thereof announced by the judges. If a majority of the votes so cast shall be for the bonds, then the creation of a bonded indebtedness of said district for the purpose of making said improvement, shall be considered as duly authorized in the amount designated by said resolution. (R. S., 1908, Sec. 5301.)

Sec. 145.—Report of Judges, Expenses of Election, Protest.—The judges shall, within forty-eight hours, make a verified report to the board or council of the proceedings of said election, and shall accompany their report with the original resolutions, ballots and tally list adopted or used at said election, and a statement of their reasonable expenses in the conduct of said election, which expenses shall be paid by the municipality appointing said judges. Any person or corporate body interested may, within two days of the filing of such report, file a written protest against the approval of the same. (R. S., 1908, Sec. 5302.)

Sec. 146.—Judges' Report May Be Approved or Disapproved, New Election.—The said board or council may approve or disapprove said report, and in case of disapproval, may at their option, order a new election to be held in the same manner as above provided. If it shall appear from said report, or otherwise, that the proceedings or otherwise, were substantially regular and fair, said board or council shall approve said proceedings and declare what, if any, amount of bonded indebtedness was authorized at said election for the purpose aforesaid. (R. S., 1908, Sec. 5303.)

Sec. 147. Cost of Improvement Assessed on Land, Notice, Lien.—Said board or council shall, as soon thereafter as the cost of said improvement can be definitely ascertained, assess the cost thereon equally upon all the lots or land situated within said district only, and within the territorial jurisdiction of said board or council, and in proportion to the benefits to said lots or land accruing by reason of the making of said improvement. Said assessment, when completed, shall be subject to inspection by any

person interested. Notice of the making and completion of said assessment shall be given by publication of a notice to the effect that said assessment has been made upon the lands within said district and is ready for inspection, without specifically designating any of the lots, lands, or amounts assessed. Said notice shall be published at least thirty days in some daily newspaper, or if there be no daily newspaper, then in some weekly newspaper, then published within the territorial jurisdiction of the body making such assessment, and shall designate a day or days upon which the board or council levying the same shall sit for the purpose of hearing objections thereto, and making corrections therein. Upon the day designated said board or council shall sit for said purpose and hear any objections that may be made, as aforesaid, and shall thereupon make any such changes in said assessment as may, in their judgment, be necessary, equitable or just, and shall thereupon finally determine the amount of such assessments. Such assessment, when so finally determined, shall be a lien upon all the lots or lands in said district, for the purpose of making said improvement and payable out of the revenues to be derived from the special taxes hereinafter provided for. (R. S., 1908, Sec. 5304.)

Sec. 148. Improvement Bonds, Conditions, Approval by Board of Public Works.—It shall thereupon be lawful for every such town, city or county to issue, in convenient denominations, its district improvement bonds in an amount not greater than the amount authorized at said election, payable in fifteen years, and redeemable in ten years, with interest not greater than six per cent. per annum, therein providing that the same shall be paid out of the revenue to be derived from the special taxes hereinafter provided for, together with such coupons as may be convenient or necessary to evidence said interest, and to sell said bonds and use the proceeds of the sale thereof in making said improvement. *Provided, however,* that whenever a lawfully constituted board of public works shall exist in and for any such incorporated town or city, then the approval of such board of public works shall be necessary to the validity of all proceedings to establish such district, to call and approve or disapprove said election, to issue or sell said bonds, to contract for or make said improvement, and to make said apportionment and assessment. (R. S., 1908, Sec. 5305.)

Sec. 149. Registration of Bonds.—All such bonds shall, previous to the sale thereof, be presented to the clerk of the county to be duly registered by him in a book kept for that purpose in his office, noting the improvement district and the time of payment and rate of interest upon said bonds, and all of the said bonds shall state on their face that they are issued under the provisions of this act. (R. S., 1908, Sec. 5306.)

Sec. 150. Bonds a Lien, Special Tax Levy.—All such bonds, when authorized and issued as required by this act, shall consti-

tute a lien upon such of the lands lying within said improvement district as are also within the territorial jurisdiction of the corporate body issuing the same, and it shall thereafter be the duty of the corporate authorities of the municipality within which any such improvement district is situated, annually to levy and assess a special tax upon all the lots and land situated within said improvement district, in accordance with the apportionment and assessment so made, in an amount sufficient to pay the interest or principal to accrue during the next calendar year, according to the tenor and effect of the bonds issued by said corporate body or board of public works, and the expense of collecting said special taxes. And the amount of said public improvement bonds shall not be considered as a part of the general indebtedness of such town, city or county. (R. S., 1908, Sec. 5307.)

Sec. 151. A Special Tax for Interest and Redemption, Order of Redemption.—It shall be the duty of the County Treasurer to collect said special taxes as other taxes are collected, keeping the same separate and apart from all other funds received by him, and he shall receive for such collections the same compensation as for the collection of city taxes. If there shall be any surplus after paying said coupons and expenses of collecting such special taxes, the treasurer shall pass the same to the credit of said improvement district. At the expiration of ten years next after the issuing of said bonds, and annually thereafter until the full payment thereof, said municipality shall provide by taxation for, and said treasurer shall collect twenty per cent. of the principal of said bonds from the property so assessed, which amount shall be assessed and collected the same as taxes for the payment of interest, and in case of default in the payment of any such special taxes, whether for principal or interest, any lands concerning which such default is made, may be sold by the county treasurer of the county in which the same may be situated, for the payment thereof in the same manner and with the same effect that lands are sold for other taxes under the general laws of this State. At the expiration of ten years from the issue of said bonds, and thereafter, the said bonds shall be paid or redeemed in numerical order by the corporate body issuing the same. (R. S., 1908, Sec. 5308.)

Sec. 152. Exercise of the Right of Eminent Domain.—For the purpose of making improvements authorized, as above provided, any such town, city or county may exercise the right of eminent domain, and may condemn, take or damage any private property that may necessarily be condemned, taken or damaged in the making of said improvement, and whenever the proposed improvement shall consist of an elevated railway, bridge or viaduct, may at their option, condemn and take such parts only of the property to be crossed as may be necessary for the foundations and supports of the said improvement, together with such right

of way over and other interests and easements in said property as may be necessary for the construction, maintenance, repair and perpetual use of said improvement, and the manner of proceeding in such cases shall be as prescribed by the laws of this State for the condemnation of lands in other cases. (R. S., 1908, Sec. 5309.)

Sec. 153. Use of Improvements.—Said improvements when made shall be subject only to such uses as were originally designated by said board of public works, city council, board of trustees or county commissioners, as hereinabove provided, and shall not be modified or subjected to other uses except upon petition of the owner of a majority of the lands lying within said improvement district, and the approval of the municipality or municipalities issuing said bonds. (R. S., 1908, Sec. 5310.)

Sec. 154. Joint Improvement Districts.—Whenever two or more public improvement districts immediately adjoining one another are established in the manner provided in section one of this act, for the purpose of making a common improvement, situate in one or more of such towns, cities or counties, under the same name or number and for the same purposes, then all said districts shall constitute a joint public improvement district under the said name and for said purposes. Whenever a joint public improvement district shall have been so created, it shall be lawful for the board of public works, city council, board of trustees or county commissioners of each of the said municipalities in apportioning and assessing the cost of making said improvement, to consider and determine the same with reference to the comparative benefits accruing to the several districts constituting said joint district, and to act separately or jointly in contracting for and making said improvement, but each municipality shall contract for no sum greater than the amount by it apportioned to or assessed upon the lots or lands lying within its own territorial boundaries, and all contracts for such improvements shall recite that they are made in pursuance of this act. (R. S., 1908, Sec. 5311.)

Sec. 155. Other Rights Not Abridged.—Nothing in this act contained shall be so construed as to abridge or otherwise affect any right to make public improvements by virtue of any other law of this State. (R. S., 1908, Sec. 5312.)

CHAPTER 199, LAWS 1911

ROAD DISTRICTS

A N A C T

TO AMEND SECTIONS 1, 2, 3, 4, 5, 6, 11, AND 20, OF "AN ACT RELATING TO ROADS, HIGHWAYS AND BRIDGES, AND THE ORGANIZATION AND MAINTENANCE OF ROAD DISTRICTS," APPROVED APRIL 15, 1907; AND TO REPEAL SECTIONS 5792, 5793, 5794, 5796, 5789, 5799, 5800, 5801, 5802, AND 5803 REVISED STATUTES OF COLORADO OF 1908, CONCERNING ROADS AND HIGHWAYS; AND TO REPEAL ALL ACTS AND PARTS OF ACTS IN CONFLICT WITH THIS ACT.

Be it Enacted by the General Assembly of the State of Colorado:

Section 1. That section 1 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 1. Every regularly organized road maintenance district hereinafter organized and formed as herein provided, is hereby declared to be a body corporate by the name and style of "Road Maintenance District No.of the County of.....and the State of Colorado," and in that name may hold property, sue and be sued, and make contracts. The purpose of such road districts is to provide for the proper care, supervision and maintenance of existing public highways within such road districts, it being the intention of this Act that County Commissioners and Road Overseers now provided by law shall continue to have and exercise the authority now provided by law for them, in laying out, establishing and constructing new roads and bridges, and repairing such existing roads and bridges in the county, as the county commissioners may, at any time, by resolution, determine. A copy of any such resolution by said commissioners, when passed, shall be by them sent to the secretaries of the districts through which such new road or road repair may extend. Bridges over twenty feet in length shall be known as county bridges and be constructed by the county, and be not less than twenty feet

Body corporate may hold property, sue and be sued.

Purpose of such districts.

County Commissioners.

Road overseers.

Copy of resolutions by Commissioners to secretaries of road districts.

Bridges 20 feet and over county bridges.

in width, and provided with proper substantial guard rails on the sides thereof. Bridges twenty feet and under in length shall be known as district bridges, and be constructed by the road maintenance district wherein same is located, and shall be not less than sixteen feet in width, and constructed parallel with the line of road wherein built. Provided, that nothing in this act shall be construed to exempt any ditch company or owners from the duty of construction or maintenance of any bridges as now provided by law. Except as herein limited, all supervision, repair and maintenance of roads and highways shall be done by and be a charge upon the road maintenance districts; Provided, that where the Superintendent of Roads may estimate any repair or construction work on any bridge or road to exceed three hundred dollars per mile in cost, in any one year, such repair or construction shall be a charge upon the county.

Ditch
companies
not exempt.

Section 2. That Section 2 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 2. Upon the organization of a county into road districts under the provisions of this Act, the County Commissioners shall appoint a County Superintendent of Roads and Bridges, who shall be a competent man, preferably a civil engineer, and who shall understand road building, who shall have general supervision over road overseers, and over the construction and maintenance of county bridges, and over such roads as the County Commissioners may direct, and upon request therefrom, he shall act as general road advisor to the district directors and road masters hereinafter mentioned. Such Superintendent of Roads and Bridges shall receive such compensation as said County Commissioners may fix, not to exceed five dollars per day, to be paid out of the general road fund of the county.

County
Superintendent
of roads and
bridges.

Duties.

Compensation.

Section 3. That section 3 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 3. Whenever a petition duly and regularly signed by thirty-five per cent of the qualified electors of any county of this State, shall be presented to the Board of County Commissioners of their county, praying for the organization of said county into road districts for road maintenance, under this act, it shall be the duty of the County Commissioners to receive said petition and immediately set the same for hearing at a date not less

Petition of 35
per cent.

Commissioners
set hearing.

than twenty nor more than forty days from the date of presentation thereof; and said County Commissioners shall give notice of said hearing by printing said notice in a newspaper published in such county.

Section 4. That Section 4 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Commissioners
determine
sufficiency
of petition.

Section 4. The hearing provided in the preceding section hereof shall be limited in its scope to an examination of the regularity of the said petition and its sufficiency under this act. Upon the determination of the said County Commissioners that the petition is sufficient as herein provided, it shall be the duty of said Commissioners to immediately proceed to divide the county into road districts, with boundaries corresponding to the boundaries of one or more school districts, as shall best subserve the interests of the citizens of the respective road districts, and whenever thereafter, the boundary lines of any school district in said county shall be changed, the County Commissioners, at their first regular meeting in each year, shall re-arrange the boundary lines of the road districts affected thereby, to correspond with the new boundary lines of the school districts. At the time of forming said districts, as aforesaid, the County Commissioners shall name a board of directors for each district which board shall hold office until the next election herein provided for.

Section 5. That Section 5 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Officers,
how elected.

Section 5. There shall be elected in each road district, created under the provisions of this act, a board of directors, consisting of three members, for one, two and three years, respectively, a successor to be elected each year thereafter, to hold office for three years, or until his successor is duly elected and qualified. Said directors shall be freeholders and taxpayers within their districts and shall be actual residents therein. The said board of directors shall, from their own number, elect a president, secretary and treasurer of said road district, and said board of directors shall have power to fill any vacancy occurring in said board, by appointment, such appointments to continue only until the next election of directors, when such vacancy shall be filled by election. Before entering upon his duties, the treasurer shall give a bond to his district in the sum of Five Hundred

Treasurer
give bond.

(\$500.00) Dollars, with good and sufficient sureties to be approved by the president and secretary of said district, and conditioned for the faithful performance of his duties as such treasurer, and to secure all moneys that may come into his hands as such treasurer; after approval, such bond to be filed with the County Clerk.

Section 6. That Section 6 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 6. Within the limits of its road district, the said board of directors shall have all of the powers heretofore granted by law to road overseers, and shall have full authority of, and are hereby charged with the duty of the general repair and maintenance of all roads and public highways, and of all bridges of twenty feet in length and under, within their district, and they shall keep same in a state of proper repair and safety for public travel thereover. The said board of directors shall have authority to appoint Road Masters to oversee and superintend the actual construction and repair work authorized by the board of directors of said districts, and said board shall have authority to borrow from, and the County Commissioners shall, when practicable, loan to said districts, any road graders, or other necessary road machinery belonging to said county, for not to exceed thirty days at any one time, said machinery, when so borrowed, shall be by said district returned to some convenient place to be designated by the County Commissioners. All road districts, borrowing tools or equipment from the county, shall return the same in as good condition as when received, ordinary wear excepted, and any repairs necessary to place same in such condition shall be paid for by the district borrowing same.

Section 7. That section 11 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 11. Every able bodied man between the ages of 21 and 50 years shall annually pay to the treasurer of the board of directors of his road district wherein he resides, and it shall be the duty of said treasurer to collect a road tax of three dollars, or in lieu of such sum every man shall labor two days of eight hours each, or eight hours work with a team, upon the public highways of his road district, under the direction of the road master of his road district, whenever given not less than twenty-four hours notice by the secretary of said board

of directors, or by the road master, to do so, Provided, that nothing in this section shall prevent the secretary or road master from calling out any such persons to perform such work at any time when he shall consider the same needed. The district treasurer shall pay all moneys received by him in payment of said road tax, monthly, to the county treasurer, to be by him placed in the district road fund. Said district treasurer shall be paid a commission of ten per cent on all moneys so collected by him, under the provisions of this section, to be paid by the county treasurer out of the moneys so collected, at the time they were paid into the county treasury; but no other pay shall be allowed for time spent in collecting such road tax; and when personal notice is required to be served on persons to work the roads, no more than \$3.00 per day shall in any event be allowed any person for serving notice on less than ten persons, where such persons are found in two or more places. At the first regular meeting in January of each year, the board of directors shall direct the treasurer, and it shall be his duty, with or without direction, to proceed to collect said road tax, as herein provided, and to make a list of all persons desiring to labor in lieu of payment thereof; said list, duly certified by the treasurer, shall be filed with the secretary not later than March first of each year.

Section 11a. Any person subject to a road tax, as herein provided, after due notice has been given him, and refusing or neglecting to pay the same, and failing to perform the work in lieu thereof for a period of ten days after being notified, shall be considered delinquent. It shall be the duty of the secretary, or road master, to report to the board of directors a list of all such delinquents in said district. Every such delinquent shall be subject to a penalty of five dollars for such delinquency, which penalty, together with the tax added shall be recoverable in a civil action, by the district, as in other civil actions, in any court of competent jurisdiction. Upon an affidavit being filed by any officer, or agent of the district, that said action was brought to recover a road tax, and the same is justly due and owing to the district, writs of attachment and garnishment shall issue, as in other civil actions.

Section 8. That Section 20 of "An Act Relating to Roads, Highways and Bridges, and the Organization and Maintenance of Road Districts," Approved April 15, 1907, be amended to read as follows:

Section 20. In order to provide the several road districts organized under the provisions of this act with

District
treasurer
to collect.

Penalty for
failure to pay
or work.

Recoverable in
civil action.

funds for the purpose of maintaining the roads and bridges therein and until such time as they may be able to levy and collect a tax for such purpose, the County Commissioners shall set aside and place to the credit of each district, twenty-five per cent of the amount of taxes collected in such districts for road and bridge purposes. County Commissioners furnish funds.

Section 9. That Sections 5792, 5793, 5794, 5796, 5789, 5799, 5800, 5801, 5802, and 5803 Revised Statutes of Colorado of 1908, be and the same hereby are repealed. Repealing clause.

Section 10. In the opinion of this General Assembly an emergency exists; therefore this act shall take effect and be in force from and after its passage. Emergency clause.

Approved May 28th, 1911.

CHAPTER 22, LAWS 1911

APPROPRIATION

HIGHWAYS

AN ACT

CONCERNING STATE HIGHWAYS, AND MAKING AN APPROPRIATION THEREFOR.

Be it Enacted by the General Assembly of the State of Colorado:

Section 1. That, whereas by Act of the General Assembly approved May 5th, 1909, a State Highway Commission was created, and under that act many inter-county highways have been declared within the State; and whereas it is deemed advisable, in order to systematize the highways and in order to expedite the opening up of the scenic beauties and natural resources of the State, to establish and complete, as soon as practicable, a continuous circle highway, extending through the mountains and embracing the central portion of the State and thus forming a basis for connecting with and opening to travel all portions of Colorado; Therefore there is hereby declared and established the "Colorado Scenic Highway," as follows:

Commencing at the City of Denver, thence southerly through the cities of Castle Rock, Colorado Springs and Pueblo to the City of Walsenburg; thence westerly to the City of Alamosa; thence extending westerly up the Alamosa River, crossing the divide at Summitville, thence to Pagosa Springs, thence to Durango, thence northward to Silverton; thence from Silverton northerly through Ouray, Montrose and Delta to Grand Junction; thence northeasterly up the Grand River to Glenwood Springs; Thence easterly and along the Eagle River to Red Cliff; thence southerly through Leadville to Buena Vista; thence southeasterly down the Arkansas River through Salida and Canon City to Pueblo.

Said Highway shall be laid out, declared and established by the State Highway Commission, as soon as the same can be practicably accomplished. Where such highway is covered by the line already declared by the State

Circle
highway
established.

Route to be
followed.

State Highway
Commission—
duties.

Highway Commission, no further declaration of the road shall be required of that Board; but where the same has not been so previously declared, the Highway Commission shall cause the same to be declared and established, in the same manner as that Commission is empowered to declare highways under the existing laws.

Section 2. Except as herein otherwise provided, such Colorado Scenic Highway shall be constructed under the direction of said Highway Commission, under the laws existing or to exist for the construction of inter-county highways of primary importance as "State Roads"; and to that end the Highway Commission shall make such apportionment to the several counties through which said Scenic Highway extends of funds properly distributable to each such County in proportion to the amount of money expended or to be expended by such county, as will serve to complete the "ordinary Construction" expense within such county. As some of the counties along the line of said Scenic Highway would be compelled to make heavy and unusual expenditures in order to complete such highway, out of proportion with the other counties along the line, there is hereby appropriated out of any funds in the State Treasury not otherwise appropriated the sum of Twenty-five Thousand Dollars (\$25,000.00) to be used as direct State aid in the completion of such Scenic Highway; and said Highway Commission shall cause the said sum, or so much thereof as may be necessary, to be applied to the construction and completion of said highway as follows: Said Highway Commission shall ascertain, estimate and fix the cost per mile of construction of highways through the valley and plains section of the route, which sum or estimate shall not be less than Three Hundred Dollars (\$300.00), nor more than One Thousand Dollars (\$1,000.00) per mile and which shall be known as "Ordinary Construction" expense; then said Commission shall carefully ascertain and estimate the excess of actual cost of constructing such highway in each county over and above such ordinary construction expense, which excess shall be known as "extraordinary construction" expense; then said Highway Commission shall apportion to each county having such "extraordinary construction expense its proper proportion of the special fund hereby appropriated, dividing and apportioning said fund to each such county in the proportion which the extraordinary construction expense within such county bears to the total of such extraordinary construction expense. After having made such apportionment of said special fund, the State Highway

Commission shall then, commencing with the counties having the heaviest burden of such extraordinary construction expense, select and designate in each County the most expensive and difficult sections or portions of the highway to be constructed therein, and cause such sections or portions to be constructed in the same manner and under the same system as other highways under their supervision under present existing laws, but shall cause same to be paid for out of said special fund so apportioned to such county. In laying out, commencing upon and constructing the several sections or portions of roadway to be so paid for out of said special fund hereby appropriated, the Highway commission shall give preference to the portions or sections of said Scenic Highway situated at high altitude in the mountains, in order that such portions may not retard the completion of the entire highway.

Approved June 5th, 1911.

Third Biennial Report
OF THE
State
Highway Commission
OF THE
State of Colorado
1914

T. J. EHRHART, Commissioner
J. E. MALONEY, Secretary-Engineer
ANNIE A. ROSS, Stenographer

ADVISORY BOARD

J. M. KUYKENDALL, Chairman
District No. 1, Denver

LEONARD E. CURTIS
District No. 2, Colorado Springs

CHAS. R. McLAIN
District No. 3, Canon City

CHAS. E. HERR
District No. 4, Durango

L. BOYD WALBRIDGE
District No. 5, Meeker

To the Governor



Issued by order of the Commission
November, 1914

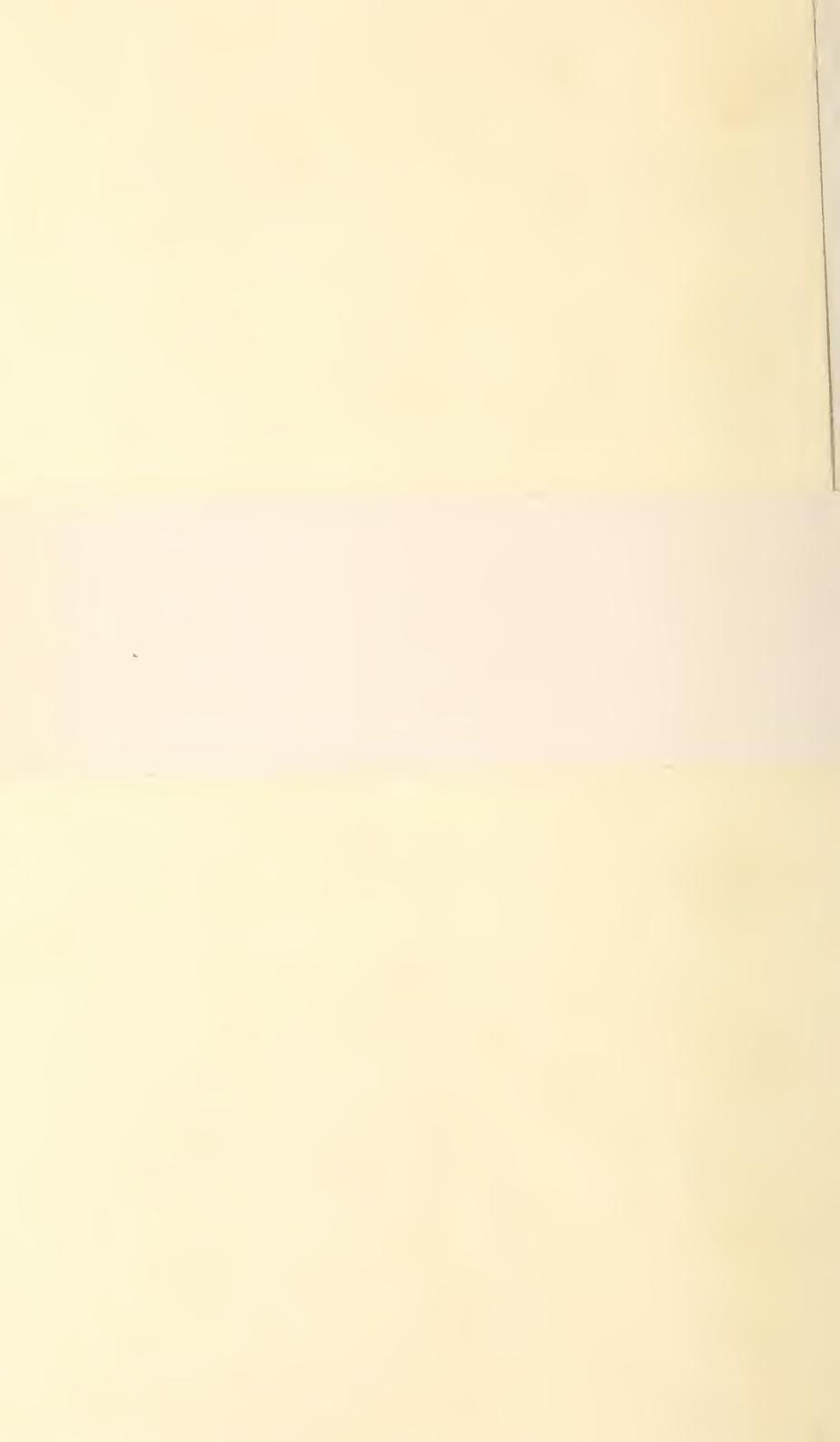
DENVER, COLORADO
THE SMITH-BROOKS PRINTING COMPANY, STATE PRINTERS
1915



LOOKOUT MOUNTAIN, LOOKING OVER GOLDEN TOWARDS DENVER, FROM STATE PRIMARY ROAD NO. 21.

COMPLIMENTS OF

State Highway Commission



MAR 23 7015

Third Biennial Report
OF THE
Colorado. State
Highway Commission
OF THE
State of Colorado
1914

T. J. EHRHART, Commissioner
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District No. 5, Meeker

To the Governor



Issued by order of the Commission
November, 1914



BRIDGE OVER EAGLE RIVER, EAGLE COUNTY—STATE PRIMARY ROAD NO. 10.

LETTER OF TRANSMITTAL

Denver, Colo., December 1, 1914.

TO THE HONORABLE
THE GOVERNOR AND THE LEGISLATURE
OF THE STATE OF COLORADO.

In compliance with Section 12, Chapter 88 of the Session Laws of 1913 (House Bill No. 254), we have the honor to submit herewith the biennial report of the State Highway Commission for the period April 7, 1913 to November 30, 1914 inclusive.

T. J. EHRHART,

State Highway Commissioner.

(SEAL)

J. M. KUYKENDALL,

Chairman State Highway Commission.

LEONARD E. CURTIS,

CHARLES R. McLAIN,

CHARLES E. HERR,

L. BOYD WALBRIDGE,

Members of Advisory Board.

Attest:

JAMES E. MALONEY,

Secretary-Engineer.

Third Biennial Report
OF THE
State Highway Commission
OF THE
State of Colorado
1914

BILL ESTABLISHING COMMISSION

The bill establishing the present Highway Commission was passed and signed by Governor E. M. Ammons March 17, 1913.

APPOINTMENT AND ORGANIZATION OF COMMISSION

The Governor appointed Mr. T. J. Ehrhart State Highway Commissioner on March 25, 1913, and appointed the following gentlemen as members of the Advisory Board on April 1, 1913.

John M. Kuykendall, from District No. 1.

Leonard E. Curtis, from District No. 2.

Chas. R. McLain, from District No. 3.

Charles E. Herr, from District No. 4.

L. Boyd Walbridge, from District No. 5.

A meeting of the Commission was held on April 7, 1913, at the office of the State Highway Commissioner, at the Capitol Building.

The Commission organized on this date, electing John M. Kuykendall, Chairman; J. E. Maloney, Secretary-Engineer; and Annie A. Ross, Stenographer.

MEETINGS

The Advisory Board held thirteen meetings, both regular and special, during the years 1913 and 1914, at the office of the State Highway Commissioner in the State Capitol.

MILEAGE OF ROADS

The total mileage of roads designated as State Roads (Primary and Secondary) to date is 5,842.45.

Total road mileage of State: In this State there are 30,733 miles of road of all classes, State and County.

APPORTIONMENTS

Before making any apportionments the Commission consulted with Mr. Bouck, Deputy Attorney General, and also with the State Treasurer and State Auditor.

Apportionments were made at the several meetings for 1913, as follows, by Advisory Board Districts.

District No. 1.....	\$122,300.00
District No. 2.....	98,700.00
District No. 3.....	98,550.00
District No. 4.....	170,000.00
District No. 5.....	94,650.00

and for 1914, as follows:

District No. 1.....	\$ 52,600.00
District No. 2.....	44,500.00
District No. 3.....	34,000.00
District No. 4.....	56,145.25
District No. 5.....	34,900.00

making a *total* for the years 1913 and 1914, as follows:

District No. 1.....	\$174,900.00
District No. 2.....	143,200.00
District No. 3.....	132,550.00
District No. 4.....	226,145.25
District No. 5.....	129,550.00

A total of \$806,345.25 as State aid for these two seasons. To avail themselves of these apportionments the counties provided for raising, by taxation or otherwise, the following sums, (by Advisory Board districts).

	Dist. No. 1	Dist. No. 2	Dist. No. 3	Dist. No. 4	Dist. No. 5
1913	\$102,140.00	\$ 58,250.00	\$ 87,250.00	\$114,700.00	\$ 75,200.00
1914	34,300.00	29,500.00	23,333.33	24,500.00	24,066.67
Total	\$136,450.00	\$ 87,750.00	\$110,883.33	\$139,200.00	\$ 99,266.67

A total for all counties of \$573,550. This represents only the amount the counties pledged to meet the State Fund, but they have in many cases expended much more than this amount. This makes a total for State and Counties for the State roads of—\$1,379,895.25—appropriated during 1913 and 1914.

Of this amount there remained unexpended on Nov. 30, 1914—

State Fund.....	\$ 73,082 86
County Fund.....	17,725 30
	\$120,808 16

The total actually expended for the two years 1913 and 1914, was \$1,999,549.96.

The expenditures for salaries, traveling expenses, office fixtures and supplies for the biennial period were—

1913.....	\$13,755 07*
1914.....	15,422 77*
	\$29,177 84

This amount being 1.5% of the total fund expended, or 4% of the State expenditure.

Inspection trips were made by the Members of the Board, the Commissioner, Engineer or Supervisor, to the work in nearly every county in the State. In many cases several trips were made to some of the counties. We were unable to go to a few of the eastern counties on account of lack of time.

MILEAGE TRAVELED ON INSPECTION TRIPS

In view of the necessity of going over the roads of the State, the Commission, with the consent of the Auditing Board, purchased an automobile for the department's use, at a cost of \$2,401.85.

In the past two seasons 17,000 miles have been covered in the machine at an average cost of 8.9c per mile traveled. This cost includes all expenses of maintenance, gasoline and repairs for the two seasons. As there were from one to four persons on these trips, the cost would run about 3c per mile per person. This is the same as the average railroad mileage, and has saved the livery bills which would otherwise be necessary in going over the roads, as well as a great deal of time.

In addition, the Commissioner, Engineer and Supervisors have traveled 46,000 miles by railroad in covering the work on the State roads.

CAMPING SITES

Letters were addressed to the various cities and towns of the State, suggesting that some suitable place be designated as

* Included in these amounts are expenditures to the total amount of \$1,728.44 for the season of 1911 and 1912.

a camping ground for those tourists who desired to avail themselves of the privileges.

The following cities and towns have answered, and designated a site for campers use:

Holyoke, Brush, Fort Morgan, Greeley, Castle Rock, Colorado Springs, Cheyenne Wells, Pueblo, Alamosa, Salida, Steamboat Springs, Rifle, Montrose, Ounay, Lake City, Creede, Pagosa Springs and Cortez.

ADVERTISING SIGNS

The question of advertising signs on the State Roads was taken up with the Boards of County Commissioners throughout the State, and they were urged to see that the law in regard to signs on Public Highways was observed.

STANDARD SECTIONS FOR ROADS, BRIDGES AND CULVERTS

Bulletins Nos. 3 and 4 containing rules and standard sections were sent to all the County Commissioners, and to the Road Overseers of the several counties of the State, so that all their work would conform to the general standard adopted.

ROAD ACCOUNTS

It is essential that the counties keep their road accounts as nearly uniform as is possible, and a form for County Road Overseers was printed in Bulletin No. 4 as a suggestion, with that end in view. This is a very important matter, as many of the counties are unable to tell where their road fund was expended, or to separate the cost of grading and dragging from the cost of bridges and culverts.

GENERAL ROAD MAPS

Road maps have been received from all the counties; most of these are good county maps. There are a few, however, which this office will have to make over.

DETAIL MAPS AND PROFILES

Alignment maps and profiles have been received of many of the State Primary roads. These maps give detail section, and the profiles show the grades, bridges, etc. It is intended to get this detail information for every State Road in each county.

PLANS EXAMINED AND CONTRACTS APPROVED

Plans were examined, specifications and contracts approved for the following counties during the past two years.

Adams, Alamosa, Archuleta, Arapahoe, Bent, Boulder, Crowley, Douglas, Dolores, Eagle, El Paso, Fremont, Garfield, Grand, Gunnison, Huerfano, Jackson, Jefferson, Lake, La Plata, Larimer, Las Animas, Logan, Mesa, Moffat, Morgan, Park, Pitkin, Pueblo, Prowers, Rio Blanco, San Juan, Sedgwick, San Miguel—35 counties, or a total of 99 contracts for grading, bridges and culverts, in 35 counties.

TRAFFIC CENSUS REPORTS

The response to letters sent to the counties and towns, asking for a census of the traffic on the roads leading into the main cities and towns, has not been as good as desired. Answers and some records were received from—

Longmont, Pueblo, Grand Junction, Durango, Littleton, Leadville, Montrose, and the Blue Mesa road. This line of inquiry will be continued.

ENGINEERING AND INSPECTION

Plans and specifications and contracts have been prepared in this office for bridges and culverts for—Adams, Arapahoe, Douglas, El Paso, Pueblo, Garfield, Lincoln, Park, Morgan, Elbert, Boulder, Kit Carson counties; and plans for bridges and culverts were examined, checked over and changed, or approved for—Larimer, Logan, Sedgwick, Archuleta, La Plata, Rio Blanco, Mesa, Boulder, Gunnison, Rio Grande, Las Animas, and Fremont. Surveys, profiles, contracts and specifications were prepared for grading work in Pitkin County; in Archuleta, Conejos, Rio Grande and Mineral counties for the Elwood Pass road; in Douglas, Adams and Rio Blanco counties; and for surfacing with gravel in Adams, Douglas and Boulder counties.

Surveys, profiles, contracts and specifications were examined and changed or approved for—Jefferson, Arapahoe, Elbert, Douglas, Bent, Prowers, Baca, Lake, Eagle, Garfield, Grand and La Plata counties.

General specifications were prepared; also standard plans for culverts, and small bridges, and standard road sections; these were issued as Bulletins Nos. 3 and 4.

Foundations for bridges were examined, and lines of survey for new roads or suggested changes were gone over with the county officials.

OFFICE WORK

During the past two years, the accounts with the 63 counties have been kept, 900 vouchers being issued in payment for county expenditures; county statements checked, resolutions of apportionment and notices sent to each county; letters of inquiry or request answered; minutes of meetings were recorded and sent out; annual report blanks were sent to each county each year; letters and catalogues filed; minutes of road builders convention recorded and sent out.

In keeping our accounts with the counties, we adopted the system in use after conferences with the Deputy State Auditor.

WIDTH OF WAGON TIRES

The destructive effect of heavy loads on narrow tires is a serious factor in the upkeep of our roads, and any method leading to the adoption of a law for a maximum load per inch of tire,

say not to exceed 500 lbs. would result in a large saving in maintenance. Attention is called to the tables appended, which will give an idea of the great loads on the road from narrow tires.

SUMMARY OF WORK ACCOMPLISHED 1913 AND 1914

In Advisory Board District No. 1, 942.75 miles of road graded, 55 miles of road surfaced, 49 bridges of all sizes constructed, and 248 culverts of all sizes.

In Advisory Board District No. 2, 1024.9 miles of road graded, 191½ miles surfaced, 48 bridges built, 414 culverts placed.

In Advisory Board District No. 3, 581.6 miles of road graded, 70¼ miles surfaced, 40 bridges built, 327 culverts placed.

In Advisory Board District No. 4, 1,226½ miles of road graded, 16 1/6 miles surfaced, 80 bridges built, 668 culverts placed.

In Advisory Board District No. 5, 1,038.65 miles of road graded, 47½ miles surfaced, 39 bridges built, 462 culverts placed.

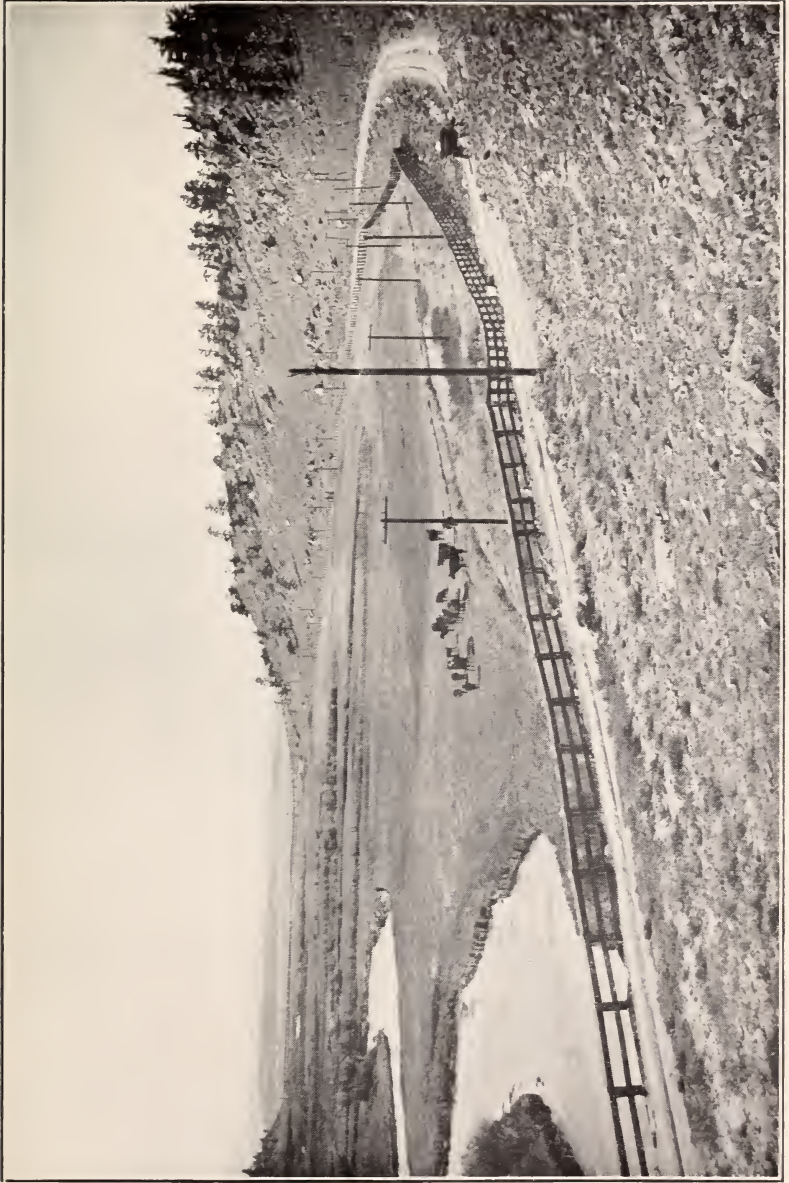
Making a total of 5,014 miles of road worked upon and graded for the State, at an average cost of about \$258.00 per mile. This work means the crowning, ditching, and bringing of the road to a moderate grade, including heavy cuts in many places, and a great deal of rock work in the mountain sections. The ruling grade is 6%. There has been 380.4 miles of State road surfaced with gravel, or sand-clay, most of it with gravel, at an average cost of \$350.00 per mile, not including the grading, bridges or culverts. There has been 306 bridges built and repaired, of all sizes, from 6 ft. to one 540 ft. in length, across the Arkansas River, at an average cost of \$1,300 per bridge. There has been 2,114 culverts of all sizes placed, from an 8 inch pipe to a 6 ft. culvert, at an average cost of \$45.00 per culvert.

The work on the main roads across the State may be briefly outlined as follows:

On the great North and South Highway running from Cheyenne to Raton, N. Mexico, work has been in progress in every county along the line. This road is now graded for nearly the entire distance in the State of Colorado. A short stretch of this road remains to be graded in the following counties: Larimer, near the north line of the county; a few miles in Pueblo, and some in Huerfano and Las Animas counties. This road has been graveled in Larimer, Boulder, Adams, Arapahoe, Douglas, El Paso, Pueblo and Las Animas counties. Work was in progress this year in all these counties.

The road between Denver and Colorado Springs has been placed in excellent condition, with the exception of a few miles between Littleton and Sedalia, which are now being improved.

The road between Denver and Greeley has been surfaced and graded in Adams and Weld counties; also the Platte Valley road.



HARTZEL-BUENA VISTA ROAD, PARK COUNTY—STATE PRIMARY ROAD NO. 18.

running from Greeley thru Weld, Morgan, Logan and Sedgwick counties. Work has been in progress in each of these counties this year on this road.

The connecting roads from the east to Denver, Colorado Springs and Pueblo have all been improved during the season.

Work has been in progress in Larimer County on the Fall River and Poudre roads; these roads lead over the divide into Grand County, and when completed will form one of the grandest scenic drives in the United States. The Berthoud Pass road has been placed in excellent condition, and considerable work has been done in Clear Creek and Grand counties. Work has also been in progress on the Rabbit Ear Pass road in Grand, Jackson and Routt counties. This road is now open to travel, so that a direct route is open from Steamboat Springs to Denver. The extension of this road to Vernal, Utah, has had considerable work done upon it this year. This road is now open between Steamboat and Vernal. The connecting road from Meeker to Rifle is being improved.

In the Grand River Valley the road from Glenwood Springs to Debeque has had a good deal of work done upon it, and in Mesa County the road between Grand Junction and the Utah line has been improved; also the road between Grand Junction and Delta.

The Tennessee Pass road has been placed in excellent condition on the eastern side in Lake and Chaffee counties; the heavy grades being removed and the road graded and surfaced.

Monarch Pass road has been improved by the cutting down of the grades and widening of the roadbed in Chaffee and Gunnison counties, and this road has been extended over the Blue Mesa to Montrose, and was opened to traffic this last year. The road has also been opened up over the Black Mesa to Delta.

The road from Salida by way of Poncha Pass to the San Luis Valley has been widened and improved in Chaffee and Saguache counties. This road is the main road to the north from Alamosa.

From the San Luis Valley the road over the Cochetopa Pass to Gunnison county is now being improved.

From Walsenburg to Alamosa the road over La Veta Pass has been improved in Costilla and Huerfano counties, and is now in good travelable condition. From Alamosa south to the New Mexico line the State road has been graded and surfaced in part during the past year.

The road up the Rio Grande from Alamosa to Creede has been widened, shifted in location in one or two places, and greatly improved during the past season.

On the east side of Elwood Pass the Alamosa River road by way of Jasper and Stunner was worked during the past season by the counties and State; and from Alamosa to the top of the Pass. This was designed to be part of the main connection from the San Luis Valley to the San Juan district.

On the western side of this divide the road from Pagosa Springs to the divide was surveyed and work is now in progress on this side of the range.

Archuleta and La Plata counties have made a splendid road from Pagosa Springs to Durango, and Montezuma has continued the road to the Utah line. Some work was done on the road between Silverton and Durango, about two miles of the heaviest rock work being done on the Silverton end, and between Silverton and Ouray the road in San Juan county has been put in excellent condition to the top of Red Mountain, some work being also done on the Ouray county side.

Considerable work was done in San Miguel and Dolores counties on the road leading from Ridgway to the Montezuma and Paradox Valleys.

Montrose county has done a great amount of road work during the past two seasons, opening up the Blue Mesa route, and also the north and south road to Delta, and to Ouray; also starting on the road from Montrose west to the Paradox Valley.

In Pitkin county, work has been in progress on the road over Independence Pass, which will make a short connecting link between the Arkansas River Valley and Glenwood Springs. The heaviest portion of this work is now completed on the west side.

In Summit and Park counties work has been in progress on the road over Hoosier Pass—the Park county side being completed.

In conjunction with the Mountain Park Commission of Denver, and the County Commissioners of Jefferson county, the north Golden road and the road up Lookout Mountain and over Genesee Park, was completed during this past season, and work is now in progress upon the main road to Morrison.

CONVICT WORK

Practically all of the work of the convict road crews has been upon State Highways during the past two years. There were six camps at work in the following counties: Larimer, Weld, Boulder, Pueblo, Garfield, and Fremont.

These six camps have had from 200 to 250 men at work during the past two years; the average number employed varying from 30 to 40 for each camp.

In Larimer county the men have been at work on the Fall River road above Estes Park, and are now at work on the Poudre Canon Highway.

In Weld County, the men have worked on the Platte River road from the Morgan county line to Greeley. This piece of work is nearly finished.

In Boulder county the work is on the Boulder Canon road between Boulder and Nederland.

In Fremont county work is being continued on the road along the Arkansas River, between Parkdale and Texas Creek. There remains about five miles of this road to connect.

The Pueblo county camp has worked on the Pueblo-Fowler, the Pueblo-Beulah, and the Colorado Springs roads. The Fowler and Colorado Springs roads are finished, and work is now being completed on the Beulah road.

In Garfield county the work has been on the Glenwood Springs-Rifle road; the road is nearly complete from Glenwood to Newcastle, and work is now in progress on some heavy grades and hills below Newcastle.

In Mesa county the convict camp completed a portion of the work up Plateau Creek during 1913.

The work accomplished has been of a satisfactory character, and the continuation of these camps is hoped for. However, we are of the opinion that these camps should be kept to a minimum force in all cases, of at least 35 or 40 men, as the overhead charges are about the same for large and small camps.

STATE ROAD FUND

When admitted to the Union, by Constitutional grant, Colorado was given 500,000 acres of land, the proceeds of which were to be devoted to Internal Improvements. These lands were selected and located in fifteen counties; about 325,000 acres have been sold; there remain 175,000 acres.

Up to two years ago the income and receipts from this source was divided and parceled out about the State by special legislative acts. There was in this manner distributed about \$1,250,000. The State Highway Commission has allotted among the sixty-two counties, outside of Denver County, in round figures, \$800,000 in the past two years. This sum represents the income to 1914, or about \$133,000 per annum, including \$76,060 from the automobile license for 1913 and 1914.

Our resources for 1915 will be about \$120,000. This will not be sufficient to enable us to complete the main projects which have been started during the past two seasons, and we will be able to extend State aid to but a few counties in the State. As there is some \$265,000 due the road fund from the Capitol Building Fund, we urge that it be made available for 1915 so that the road work may be continued.

WORK PLANNED FOR 1915 AND 1916

Along the lines laid down in the past by the Commission we hope to be able to complete the following projects:

1st: Complete grading and graveling of the great North and South Highway.

2nd: The completion of the road from the San Luis Valley into Durango and the San Juan district, with a connection to the southeast from Pagosa Springs. This is known as the Ellwood Pass road.

3rd: Also the completion of the road from Durango to Silverton and from Silverton to Ouray.

4th: A connection from Dolores to Rico and by way of Placerville to Montrose.

5th: The completion of the road from Creede to Lake City, connecting with the Blue Mesa road at Sapinero; also with the Black Mesa road.

6th: Completion of the road from Fall River and the Poudre to Grand Lake.

7th: The further improvement of the Platte Valley road from the Nebraska line to Greeley and Denver.

8th: The completion of the improvements on the line of the Midland Trail, from the Kansas line to Denver and Colorado Springs.

9th: The completion of the improvements on the Santa Fe Trail from the Kansas line to Pueblo.

10th: The completion of the work along the Arkansas River to Salida from Canon City.

11th: The completion of the work over Independence Pass to Twin Lakes, and the further improvement of the road thru Lake County and Chaffee county.

12th: The further improvement of the road down the Eagle River from the top of the Tennessee Pass to Glenwood Springs, and the completion of the improvement on the line to Grand Junction, and to the west line of the State.

13th: The completion of the work from Rifle to Meeker and Craig, and from Craig west to the Utah line; also between Craig and Steamboat Springs.

14th: The further improvement of the road from Steamboat Springs to Walden in Jackson county, and from Walden south to the Grand county line, and also the completion of the Rabbit Ear Range road, and of the road from Steamboat Springs to Wolcott.

15th: The further improvement of the road from La Junta to Trinidad, and from Trinidad to the southeast.

16th: The completion of the work on the Black Mesa road from Sapinero to Delta.

In general, it is desired to continue the improvements already begun on the State Highways, replacing wooden and light structures with more permanent construction, grading and draining the roads, so that all the 5,840 miles of State Highways which traverse every valley and connect every county seat and important town in the State, will be crowned, ditched, have permanent culverts and bridges, and be on reasonable grades, and surfaced, so that people can travel them in all kinds of weather with comfort and safety.

These roads should be first completed before attempting the rebuilding of ordinary county roads. It is better that we build ten miles well, than repair temporarily twenty miles. It is an urgent necessity that all roads be improved, but it is a physical and financial impossibility to accomplish all this at once. We must begin somewhere on some systematized plan. We think the

system we have laid out will be of the greatest benefit to the greatest number, and that it should be built first; then will follow rapidly the development of our tributary system.

Colorado's interests are mutual. Any development in the State, no matter where, will help the whole. The mountain sections are attractive to our own people, and much more so to the inhabitants of the East and lower altitudes. We have 56,000 square miles of mountain territory, pure air and water, a climate cool and pleasant during the Summer months, and the most beautiful, grand, and attractive scenery in the world. It is our greatest undeveloped resource.

FUTURE DEVELOPMENT

In 1916 the half mill levy voted becomes available, and the Commission will have funds to push these projects to completion.

The policy of the State Highway Commission in relation to this half mill levy fund is explained by the following resolution.

"Resolved, That if the bill providing for the half mill levy is approved by the people of the State at the coming election, it will be the policy of this Commission to expend upon the State roads in each county of the State, excepting the City and County of Denver, the amount collected from the half mill levy, in each county. To expend the amount collected from such levy from the City and County of Denver, upon the principal State Highways leading to Denver, and in which the City and County of Denver is most directly interested; and to expend the balance of the said fund, consisting of contributions from the Internal Improvement Fund, the State tax on automobiles, and otherwise, in improving the State Highways in counties which are not financially able to bear the necessary expenses of improving the same." (Adopted by the State Highway Commission September 26, 1914.)

The State system will be gradually extended in each county as the present roads are improved, bringing the main connecting roads into the State system, and so providing for laterals, reaching in every direction from the main State line. It is expected that the ultimate development will include about 16,000 miles of State road, or over 50% of the total mileage in the State. As these roads are improved the proper maintenance becomes of the greatest importance, and it is to be expected that the maintenance of 16,000 miles of road will cost about \$640,000 a year; an average of \$40.00 per mile per year. It will be seen that as the State system is improved each year, thus putting an increased mileage under maintenance and leaving a gradually decreasing amount in the construction fund, that it will be necessary to have the cooperation of the counties in the maintenance of State Highways in order that further development may be continued in the future.

To appreciate the importance of the work of the State Highway Commission the development of one of the great resources of

Colorado—automobile tourist travel must be considered. This is already important, but in five years I am confident that at least \$20,000,000 will be distributed in the business channels of Colorado annually, resulting in increased markets for our products, and business activity in all channels.

RECOMMENDATIONS

The present Highway Law has thus far proven very satisfactory in its operation. The County Commissioners of the State have acted in harmony with the State Highway Commission, to the end that splendid and satisfactory results have followed, with every prospect of much improvement in the future.

I am not in favor at this time of radical legislative action, but recommend that in order to increase the efficiency of the State Highway Department that the annual continuing appropriation be increased to \$20,500, enabling us to employ one additional Engineer, and one more field supervisor. That as fast as the State Highways are completely graded and drained, the cost of properly maintaining them should be borne equally by the State and County; the best method to be agreed upon by the County Commissioners and the Highway Commission. Said maintenance to be under the supervision of the State Highway Commission or its representatives; and also that the State Highway Commission be given the power to condemn rights of way on State Highways. I believe this is all that should be undertaken at this time. Two years more will develop more clearly future necessities in relation to improvement of the present law.

It is important that the county records of the expenditures upon the State and County roads be kept so that each item of cost upon each piece of work can be obtained.

A detailed statement of the work of the department is submitted herewith.

Respectfully submitted,

T. J. EHRHART,

State Highway Commissioner.



REINFORCED CONCRETE ARCH BRIDGE AT LA JUNTA, OVER
ARKANSAS RIVER—STATE PRIMARY ROAD NO. 6.



REINFORCED CONCRETE BRIDGE AT LA JUNTA, OVER ARKANSAS
RIVER—STATE PRIMARY ROAD NO. 6.

Denver, Colo., December 1, 1914.

HONORABLE T. J. EHRHART,

State Highway Commissioner,

Denver, Colo.

Dear Sir: The accompanying tables show in detail the apportionments by the State and Counties and the amount actually expended during 1913 and 1914; also giving the detail of the expenses of the department for the biennial period.

The county valuations are from the report of the State Tax Commission, while the county road levy and expenditures on county roads are from the county reports. Where no report was sent in last year's figures were used, and noted as approximate.

TRAFFIC CENSUS

The data on the traffic over the State roads is not as complete as desired, but is included so as to serve as a basis for more complete observation in the future. Data on this subject is important, and we expect to obtain more complete returns through the cooperation of the commercial organizations of the State.

TESTS OF ROAD MATERIAL

The matter of the testing of road material is also important, and I suggest that the counties, cities and towns be urged to take advantage of the offer of the University of Colorado and send samples of material available for road surfacing to be tested.

WIDE TIRES

Data, experiments and expression of opinions by various authorities are included in the notes on this subject appended hereto. Recognizing the difficulty of arbitrary legislation on this subject, it was thought the placing of this data in accessible form might be useful in the drafting of any legislative acts on this subject. The width of tire is an important factor in the maintenance of our roads, and the use of wide tires should be encouraged in every way possible.

BRIDGES

Great improvement has been shown in the State in the character of the bridges and culverts built, but there are still many counties where the bridges are constructed of material too light and unsuited to the loads they have to carry. In many cases of bridge failure, the cause has been faulty foundations; in fact 90% of the failures have been owing to this cause.

The practice of many counties in accepting the plan which appears to them the cheapest, without any check by an Engineer, is a bad practice, and is not really economical in the end. All

bridge plans should be gone over by an Engineer and checked before being adopted by any county. On all State Highways I wish to suggest that no State moneys be paid for any structure that has not been submitted to this office for approval *before being contracted for and built*.

In the matter of foundations, the data supplied, as a general rule, has been insufficient as to the character of the foundation material, being based, as a rule, upon hearsay or superficial examinations. Every proposed site should be thoroughly examined, and sufficient borings made to be reasonably certain of the underlying material, and the depth to bed rock, and these investigations should be made by some one experienced in these matters.

SURVEYS AND MAPS

While we have received and have filed surveys and profiles of many of our State Roads, there are still a great many miles which are not surveyed.

I respectfully suggest that the counties be urged to have their surveys of all the State Roads completed, according to the Rules and Regulations of the department, and that when new work is to be undertaken that the surveys and plans be made before the work is started, instead of after completion, as has been done in some cases.

Under the law, the making of all surveys is in the hands of the County Commissioners, and should be made and submitted to this department, so that an intelligent idea of the proposed work would be at hand, and this should apply whether the work is done by County forces or by contract.

RECORDS OF COST ON ROADS AND BRIDGES

Great difficulty has been experienced in obtaining from the counties accurate statements of the moneys expended upon state and county roads, bridges and culverts. Some counties seem unable to give anything but the total amount expended during the year, and one county did not send in even the total amount spent upon county roads.

Methods for obtaining the detailed costs have been suggested by this Commission to the County Commissioners of the State, and copies of the bulletin sent to every Commissioner, Clerk and Overseer in the State. The County Commissioners have the authority to insist upon the Road Overseers turning in definite information on their bills and reports, as to where the labor and material was used, and what each piece of work cost, and they can and should refuse to pay any bill, or accept any report which does not contain this information.

On the state roads, I suggest that the County Commissioners be required to have their expenditures recorded along the lines laid down for our annual reports. If the records are kept for



LOOKOUT MOUNTAIN ROAD, JEFFERSON COUNTY, MOUNTAIN
PARK COMMISSION OF DENVER, CLEAR CREEK SIDE—
STATE PRIMARY ROAD NO. 21.



LOOKOUT MOUNTAIN ROAD, SHOWING HAIRPIN CURVES TOWARD
TOP (MAXIMUM GRADE 6 PER CENT)—STATE PRIMARY ROAD NO. 21.

the state roads they will be extended to the county roads, and the Commissioners will have a clearer idea of the cost of each piece of work.

GENERAL

The work of the past two years has included the inspection of the proposed improvements in various parts of the State. Considerable time was spent on the line connecting the San Juan section with the San Luis Valley, and in the selection of the Wolf Creek line for this highway. I believe we have the best route over the range for that locality. The survey for the balance of this line is almost complete, and I believe we will be able to contract the balance the first thing in the Spring.

Bridge sites and foundations were examined for many counties, and advice given on these matters.

Plans and specifications for bridges as submitted were checked over and approved or modified.

Plans and specifications for bridges, culverts and grading or graveling were prepared and sent out to many of the counties.

A separate table of the contract work is appended, which gives the essential items of each piece of work.

In the office, a great deal of correspondence has been handled, letters and catalogues filed; all county bills checked, vouchers issued, and the accounts with the 62 counties kept; in addition to the records of the Commission and issuance of circular letters and bulletins relating to State and county work.

On all of this work, our stenographer, Miss Annie A. Ross, has worked hard and skillfully, and I desire to commend her work.

Respectfully yours,

JAMES E. MALONEY,
Secretary-Engineer.

RECEIPTS FOR THE YEARS 1913 AND 1914

	1913	1914	
Internal Improvement and Internal Improvement Income Fund.....	\$490,000.00*	\$210,000.00	
Motor Vehicle License.....	27,974.35	38,302.44	
Motor Vehicle Fines.....	6.50	47.75	
	<hr/>	<hr/>	
Totals for year.....	\$517,980.85	\$248,350.19	
Total for 1913 and 1914.....			\$766,331.04

PROBABLE RECEIPTS FOR 1915

Internal Improvement and Internal Improvement Income Fund	\$115,000.00	
Motor Vehicle License.....	40,000.00	
	<hr/>	
Total.....		\$155,000.00

*NOTE.—Includes 1911, 1912, 1913 and 1914 and accumulation of balances carried forward from previous years.

STATEMENT OF APPORTIONMENTS AND EXPENDITURES BY THE STATE HIGHWAY
COMMISSION FOR THE YEARS 1913 AND 1914.

(Arranged according to Advisory Board Districts, as to apportionments and expenditures.)

DISTRICT NO. 1

COUNTY	Apportioned Year Ending Nov. 30, 1913	Apportioned Year Ending Nov. 30, 1914	Total Sum Apportioned	State Money Expended to Nov. 30, 1913	State Money Expended to Nov. 30, 1914	Total Sum State Money Expended 1913 and 1914
Adams.....	\$ 13,000	\$ 10,500	\$ 23,500	\$ 11,091.10	\$ 8,129.44	\$ 19,220.54
Arapahoe.....	11,200	3,000	14,200	7,352.11	5,219.71	12,571.82
Boulder.....	13,500	8,550	22,050	8,739.71	11,348.50	20,088.21
Clear Creek.....	8,000	1,000	9,000	5,441.81	3,558.18	8,999.99
Gilpin.....	4,200		4,200	3,719.61		3,719.61
Jefferson.....	19,500	7,550	27,050	17,500.00	7,100.00	24,600.00
Larimer.....	15,200	6,500	21,700	1,673.10	20,026.90	21,700.00
Logan.....	7,800	2,000	9,800	7,800.00	1,795.80	9,595.80
Morgan.....	2,300	5,000	13,300	8,179.26	3,945.13	12,124.39
Phillips.....	2,700	1,000	3,700	2,106.07	533.82	2,639.89
Sedgwick.....	3,800	1,500	5,300	3,800.00	1,500.00	5,300.00
Washington.....	4,400	1,000	5,400	4,250.42	662.34	4,912.76
Weld.....	8,500	4,000	12,500	4,413.82	7,086.18	11,500.00
Yuma.....	2,200	1,000	3,200	2,200.00	1,000.00	3,200.00
Totals.....	\$ 122,300	\$ 52,600	\$ 174,900	\$ 88,267.01	\$ 71,906.00	\$ 162,173.01

STATEMENT OF APPORTIONMENTS AND EXPENDITURES BY THE STATE HIGHWAY
COMMISSION FOR THE YEARS 1913 AND 1914—Continued.

COUNTY	DISTRICT NO. 2				Total Sum State Money Expended 1913 and 1914	
	Apportioned Year Ending Nov. 30, 1914	Apportioned Year Ending Nov. 30, 1913	Total Sum Appropriated	State Money Expended to Nov. 30, 1913		
Chaffee.....	\$ 8,200	\$ 4,000	\$ 12,200	\$ 8,200.00	\$ 3,828.25	\$ 12,028.25
Cheyenne.....	3,500	1,000	4,500	3,500.00	1,000.00	4,500.00
Douglas.....	27,000	20,000	47,000	18,615.43	25,212.27	43,827.70
El Paso.....	14,500	8,000	22,500	14,500.00	8,000.00	22,500.00
Elbert.....	5,000	3,000	8,000	5,000.00	2,388.26	7,388.26
Kit Carson.....	4,500	1,500	6,000	4,000.00	2,000.00	6,000.00
Lincoln.....	5,000	1,500	6,500	3,450.78	3,049.22	6,500.00
Lake.....	13,000	1,000	13,000	4,566.60	8,433.40	13,000.00
Park.....	8,000	2,000	10,000	6,114.96	3,885.04	10,000.00
Teller.....	10,000	3,500	13,500	9,000.00	271.75	9,271.75
Totals.....	\$ 98,700	\$ 44,500	\$ 143,200	\$ 76,947.77	\$ 58,068.19	\$ 135,015.96

STATEMENT OF APPORTIONMENTS AND EXPENDITURES BY THE STATE HIGHWAY
COMMISSION FOR THE YEARS 1913 AND 1914—Continued.

DISTRICT NO. 3

COUNTY	Apportioned Year Ending Nov. 30, 1913	Apportioned Year Ending Nov. 30, 1914	Total Sum Apportioned	State Money Expended to Nov. 30, 1913	State Money Expended to Nov. 30, 1914	Total Sum State Money Expended 1913 and 1914
Baca	\$ 1,600	\$ 1,000	\$ 2,600		\$ 1,933 31	\$ 1,933 31
Bent	3,000	2,000	5,000	\$ 2,015 03	2,981 97	5,000 00
Custer	2,200	1,000	3,200	1,223 77	1,463 97	2,687 74
Crowley	3,000	1,500	4,500	1,193 53	1,890 86	3,084 39
Fremont	30,650	12,000	42,650	13,864 49	19,783 02	33,647 51
Huerfano	6,000	3,000	9,000	4,463 73		4,463 73
Kiowa	2,000	1,000	3,000	1,788 05	1,129 03	2,917 08
Las Animas	10,000	3,000	13,000	5,368 71	7,631 29	13,000 00
Otero	17,600	2,000	19,600	15,108 85	2,491 15	17,600 00
Pueblo	16,500	1,000	17,500	12,075 11	8,421 86	20,500 00
Prowers	6,000	3,500	9,500	6,000 00	3,500 00	9,500 00
Totals	\$ 98,550	\$ 34,000	\$ 132,550	\$ 63,101 30	\$ 51,232 46	\$ 114,333 76

STATEMENT OF APPORTIONMENTS AND EXPENDITURES BY THE STATE HIGHWAY
COMMISSION FOR THE YEARS 1913 AND 1914—Continued.

DISTRICT NO. 4

COUNTY	Apportioned Year Ending Nov. 30, 1913	Apportioned Year Ending Nov. 30, 1914	Total Sum Apportioned	State Money Expended to Nov. 30, 1913	State Money Expended to Nov. 30, 1914	Total Sum State Money Expended 1913 and 1914
Archuleta.....	\$ 7,800	\$ 1,000	\$ 8,800	\$ 7,800.00	\$ 1,000.00	\$ 8,800.00
Alamosa.....	3,000	500	3,500	.....	1,479.44	1,479.44
Costilla.....	3,000	1,000	4,000	.....	2,054.57	2,054.57
Conejos.....	6,750	1,000	7,750	6,671.77	468.37	7,140.14
Dolores.....	4,200	1,000	5,200	4,168.05	1,031.95	5,200.00
Delta.....	5,800	1,500	7,300	5,800.00	1,500.00	7,300.00
Elwood Pass..	28,000	30,500	58,500	25,630.09	14,650.77	40,280.86
Gunnison.....	20,100	2,645.25	22,745.25	20,100.00	2,500.00	22,600.00
Hinsdale.....	4,200	1,000	5,200	4,200.00	1,000.00	5,200.00
La Plata.....	15,000	2,000	17,000	9,784.94	7,214.56	16,999.50
Montrose.....	10,700	3,500	14,200	10,700.00	3,500.00	14,200.00
Montezuma..	6,500	1,000	7,500	4,276.97	3,223.03	7,500.00
Mineral.....	4,000	2,000	6,000	3,951.94	2,004.41	5,956.35
Ourray.....	9,200	2,000	11,200	7,727.35	2,290.98	10,018.33
Rio Grande..	6,750	1,000	7,750	6,750.00	1,000.00	7,750.00
San Miguel..	7,000	1,000	8,000	7,000.00	861.75	7,861.75
San Juan.....	19,000	2,500	21,500	17,689.10	1,101.91	18,791.01
Saguache.....	9,000	1,000	10,000	8,249.18	1,750.82	10,000.00
Totals.....	\$ 170,000	\$ 56,145.25	\$226,145.25	\$ 150,499.39	\$ 48,632.56	\$ 199,131.95

STATEMENT OF APPORTIONMENTS AND EXPENDITURES BY THE STATE HIGHWAY
 COMMISSION FOR THE YEARS 1913 AND 1914—Concluded.

DISTRICT NO. 5

COUNTY	Apportioned Year Ending Nov. 30, 1913	Apportioned Year Ending Nov. 30, 1914	Total Sum Apportioned	State Money Expended to Nov. 30, 1913	State Money Expended to Nov. 30, 1914	Total Sum State Money Expended 1913 and 1914
Eagle.....	\$ 13,600	\$ 1,500	\$ 15,100	\$ 6,586.08	\$ 8,057.71	\$ 14,643.79
Grand.....	9,800	3,000	12,800	9,800.00	1,418.47	11,218.47
Garfield.....	14,000	5,500	19,500	14,000.00	5,500.00	19,500.00
Jackson.....	2,850	2,000	4,850	1,965.36	2,884.64	4,850.00
Mesa.....	10,000	3,500	13,500	10,000.00	3,500.00	13,500.00
Moffat.....	5,500	8,800	14,300	4,461.87	8,838.13	13,300.00
Pitkin.....	12,000	1,500	13,500	2,489.62	11,010.38	13,500.00
Rio Blanco.....	13,400	4,600	18,000	7,741.49	8,861.45	16,602.94
Routt.....	8,500	2,500	11,000	6,550.89	3,941.62	10,492.51
Summit.....	5,000	2,000	7,000	5,000.00	2,000.00	7,000.00
Totals.....	\$ 94,650	\$ 34,900	\$ 129,550	\$ 68,595.31	\$ 66,012.40	\$ 124,607.71

SUMMARY.

AMOUNT APPORTIONED FOR YEAR ENDING NOVEMBER 30, 1913

District No. 1.....	\$122,300.00	
District No. 2.....	98,700.00	
District No. 3.....	98,550.00	
District No. 4.....	170,000.00	
District No. 5.....	94,650.00	
	<hr/>	
Total amount apportioned in 1913.....		\$584,200.00

STATE MONEY EXPENDED IN YEAR ENDING NOVEMBER 30, 1913

District No. 1.....	\$ 88,267.01	
District No. 2.....	76,947.77	
District No. 3.....	63,101.30	
District No. 4.....	150,499.39	
District No. 5.....	68,595.31	
	<hr/>	
Total amount expended in year ending Nov. 30, 1913.....		\$447,410.78

AMOUNT APPORTIONED FOR YEAR ENDING NOVEMBER 30, 1914

District No. 1.....	\$ 52,600.00	
District No. 2.....	44,500.00	
District No. 3.....	34,000.00	
District No. 4.....	56,145.25	
District No. 5.....	34,900.00	
	<hr/>	
Total amount apportioned in 1914.....		\$222,145.25

STATE MONEY EXPENDED IN YEAR ENDING NOVEMBER 30, 1914

District No. 1.....	\$ 71,906.00	
District No. 2.....	58,058.19	
District No. 3.....	51,232.46	
District No. 4.....	48,632.56	
District No. 5.....	56,012.40	
	<hr/>	
Total amount expended in year ending Nov. 30, 1914.....		\$285,851.61



DRAGGING PUEBLO-BEULAH ROAD, CONVICT LABOR—STATE
SECONDARY ROAD NO. 7 s.



PUEBLO-BEULAH ROAD—STATE SECONDARY ROAD NO. 7 s.

SUMMARY—Concluded.

TOTAL APPORTIONMENTS 1913 AND 1914

District No. 1.....	\$174,900.00	
District No. 2.....	143,200.00	
District No. 3.....	132,550.00	
District No. 4.....	226,145.25	
District No. 5.....	129,550.00	
	<hr/>	
Total.....		\$806,345.25

TOTAL PAYMENTS 1913 AND 1914

District No. 1.....	\$162,173.01	
District No. 2.....	135,015.96	
District No. 3.....	114,333.76	
District No. 4.....	199,131.95	
District No. 5.....	124,607.71	
	<hr/>	
Total.....		\$735,262.39

BALANCES UNEXPENDED TO NOVEMBER 30, 1914

District No. 1.....	\$ 14,726.99	
District No. 2.....	8,184.04	
District No. 3.....	18,216.24	
District No. 4.....	27,013.30	
District No. 5.....	4,942.29	
	<hr/>	
Total.....	\$ 73,082.86	

NOTE.—Of this total \$163,445.25 was out of the 25% fund, and the balance—\$642,900 at from 1 to 1, to 5 to 1 ratios.

Amount spent on State roads in 1913 and 1914 by State.....	\$ 735,262.39
Amount spent on State roads in 1913 and 1914 by counties.....	1,264,287.57

Total amount spent by both counties and State on State roads, 1913 and 1914.....	\$1,999,549.96
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All salaries and expenses of the State Highway Commission for the years 1913 and 1914, amount to 4% of the State money expended upon the improvement of the State Highways; and 1.5% of the State and County expenditures.

DETAILS OF SALARIES AND EXPENSES FOR 1913 AND 1914.

Salaries:	Year 1913	Year 1914	Total 1913 and 1914
Commissioner.....	\$ 2,056.45	\$ 3,000.00	\$ 5,056.45
Secretary-Engineer.....	1,439.51	2,100.00	3,539.51
Stenographer.....	800.00	1,200.00	2,000.00
Two Supervisors.....	1,440.87	3,000.00	4,440.87
Assistant Engineer.....		187.19	187.10
Total.....	\$ 5,736.83	\$ 9,487.10	\$15,223.93
Expenses—Traveling:			
Advisory Board (5 members).....	\$ 1,079.90	\$ 688.65	\$ 1,768.55
Commissioner.....	566.81	430.90	997.71
Secretary-Engineer.....	458.45	443.83	902.28
Two Supervisors.....	832.65	1,434.50	2,267.15
Automobile (original cost).....	2,401.85		2,401.85
(Running expense).....	488.95	1,015.77	1,504.72
Total.....	\$ 5,828.61	\$ 4,013.65	\$ 9,842.26
Expenses—Office:			
Stamps.....	\$ 85.95	\$ 97.00	\$ 182.95
Stationery, pens, ink, etc.....	86.73	193.62	285.35
Blue printing.....	76.51	104.48	180.99
Maps.....	64.47	227.00	291.47
Drafting, supplies, and pocket level.....		53.00	53.00
Filing cases.....		49.85	49.85
Typewriter, adding machine, and duplicator.....	445.80	66.83	512.63
Old bills of former Commission, 1911 and 1912.....	1,133.00	615.24	1,748.24
Printing.....	102.22	208.47	310.69
Telephone.....	149.20	203.75	352.95
Telegraph.....	13.55	7.27	20.82
Expressage.....	1.60	18.36	19.96
Films and photo prints.....	15.10	41.70	56.80
Exhibit at Atlanta Road Congress.....		30.45	30.15
Tent.....	15.50		15.50
Total.....	\$ 2,189.63	\$ 1,922.02	\$ 4,111.65
Total salaries and all expenses, for Biennial period, 1913 and 1914.....			
	\$13,755.07	\$15,422.77	\$29,177.84

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914.

DISTRICT NO. 1 FOR 1913

COUNTY	Grading		Bridges		Culverts		Surrounding		Drugging	Total	
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
Adams.....	30	\$ 11,280.60	7	\$ 3,100.80	22	\$1,311.60	6½	\$ 4,903.53	\$ 156.15	\$ 225.00	\$ 20,977.68
Arapahoe.....	11	1,812.20	5	10,587.35	14	551.19			35.65		12,986.39
Boulder.....	(7)	4,208.90	Inc. in culverts		(5)	1,867.91	7	11,149.93	252.65		17,479.42
Clear Creek.....	35	10,538.85							799.25		11,338.10
Gilpin.....	16	7,107.07			(10)	330.66					7,437.73
Jefferson.....	18	61,135.34	Inc. in grading								61,135.34
Larimer.....	186	17,758.90	3	1,568.25	(10)	300.00			461.20		20,088.35
Logan.....	92	8,013.02	5	6,696.24	(20)	600.00				600.00	15,909.26
Morgan.....	(10)	13,239.01	Inc. in grading								13,239.01
Phillips.....	35	2,908.62			1	74.40					2,983.02
Sedgewick.....	14½	3,969.13	2	996.00			3	1,314.83	437.48		6,717.44
Washington.....	(15)	6,040.36			(2)	579.15	(1)	100.00	157.50		6,877.61
Weld.....	31	14,175.24	7	Inc. in grading convict work			3				14,175.24
Yuma.....	(30)	4,558.61									4,558.61
Totals (14 counties).....	530½	\$166,745.85	29	\$ 22,948.64	81	\$5,614.94	20½	\$17,468.29	\$ 2,299.88	\$ 825.00	\$215,902.60

NOTE.—Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 2 FOR 1913

COUNTY	Grading—		Bridges—		Culverts—		Surfacing—		Drugging	Total
	Miles	No.	Cost	No.	Cost	Miles	Cost	Cost		
Chaffee	98		\$ 13,590.55						\$ 366.20	\$ 13,956.75
Cheyenne	63	3	3,367.05	10	\$ 1,080.97	10	\$ 400.50		299.10	5,147.62
Douglas	52	5	21,519.98	5	2,500.00	25	2,508.22	1	\$ 112.00	29,750.51
Elbert	40	2	9,813.29	2	400.00	18	578.08		319.25	11,110.62
El Paso	182	5	48,648.55	5	16,041.10	85	2,697.37	78	3,150.00	70,687.02
Kit Carson	25		5,596.31			70	1,278.58		626.10	7,501.19
Lake	6		5,642.10				946.29		2,184.66	8,773.05
Lincoln	20	4	5,004.48		2,334.18					7,338.66
Park	145	5	10,074.95		1,375.00	22	674.00	1/2	400.00	13,248.20
Teller										42,834.52

Totals (10 counties)	631	24	\$123,257.46	24	\$ 23,731.25	230	\$ 9,083.04	79 1/2	\$3,662.00	\$7,779.87	\$207,848.14
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EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 3 FOR 1913

COUNTY	Grading		Bridges		Culverts		Surfacing		Surveying	Drainage	Total
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
Baer.....	(5)	\$ 100.00			10	\$ 600.00			\$ 110.00		\$ 710.00
Beul.....	6	4,294.79			(25)	1,400.00	3	1,000.00	326.00		7,020.79
Crowley.....	(5)	975.70	1	1,429.00							2,404.70
Custer.....	16	6,959.21			19	302.76					7,261.97
Fremont.....	7	10,978.17	3	12,020.00	(20)	2,000.00	4	1,400.00	1,141.58	900.00	29,039.75
Huerfano.....	28	9,977.73	2	619.60	(10)	2,330.40			633.40		13,561.13
Kiowa.....	8	1,423.55	1	30.00	9	295.00	4	1,638.95	148.60		3,536.10
Las Animas.....	11½	5,060.76	Inc. culverts		(5)	7,227.07			614.30		12,902.13
Otero.....	19½	577.50	5	38,555.84	6	472.50	½	587.00		754.40	40,917.24
Prowers.....	29	8,196.85	1	2,645.80	(40)	1,121.11			1,294.74		13,258.50
Pueblo.....	31½	9,221.44	7	11,828.12	38	2,504.96	16½	6,786.20	383.75		30,724.47
Totals (11 counties).....	270	\$ 57,765.70	20	\$ 67,728.36	182	\$ 18,253.80	28	\$ 11,412.15	\$ 4,652.37	\$ 1,654.40	\$ 161,366.78

NOTE.—Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 4 FOR 1913

COUNTY	Grading—		Bridges—		Culverts—		Surfacing—		E		
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost	Surveying	Drugging	Total
Archuleta.....	33	\$ 12,910.07	2	\$ 5,700.00		\$3,000.00	1	\$ 300.00	\$ 306.40		\$ 22,276.47
Alamosa.....	Not organized in 1913										
Costilla.....	45.5	2,556.94	1	682.86					520.75		3,760.55
Concejos.....	(80)	13,492.70									13,492.70
Delta.....	76	7,349.02	2	2,955.75	(40)	1,260.92			495.60		12,061.29
Dolores.....	13	4,596.35	1	35.00	1	72.00			506.65		5,210.00
Gunnison.....	(80)	33,571.44	1	3,300.00	(40)	1,657.00			2,421.31		40,949.75
Hinsdale.....	(10)	4,700.00	11	690.00	(40)	459.00					5,849.00
La Plata.....	23	15,270.30	5	980.00	93	1,520.00	1	1,449.87	1,155.00		20,375.17
Montezuma.....	(20)	6,193.55							730.35	\$ 31.50	6,955.40
Montrose.....	27	24,978.74	11	6,820.55			1.6	68.13	3,084.55	438.53	35,390.50
Mineral.....	41	6,603.40							1,267.50		7,870.90
Ouray.....	(36)	12,953.86	1	160.00	34	1,141.35	2	1,175.00	24.00		15,454.21
Rio Grande.....	69	14,126.86	Inc. in amount given								14,126.86
San Miguel.....	15	17,732.57	2	700.00	87	459.00			903.40		19,794.97
Saguache.....	(10)	15,411.66							1,086.73		16,498.39
San Juan.....	(8)	25,522.55									25,522.55
Elwood Pass.....	} 4	16,288.00	3	341.70	43	848.20			1,308.59		18,786.49
		2	7,482.96								7,482.96
Totals (17 counties).....	592.5	\$241,940.96	40	\$ 22,365.86	378	\$ 10,417.47	4 1-6	\$ 2,993.00	\$13,870.83	\$ 470.03	\$291,868.15

NOTE.—Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 5 FOR 1913

COUNTY	Grading—		Bridges—		Culverts—		Surfacing—		Drugging	Total
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost		
Eagle	(25)	\$ 9,100.38								\$ 9,100.38
Garfield	(40)	29,072.41			60	\$2,299.23	Inc. in grading			31,371.64
Grand	(50)	17,909.11	Inc. in grading					\$ 724.75		18,633.86
Jackson	(40)	2,160.23	14	\$ 1,129.01	2	10.55	1 $\frac{1}{2}$	285.95		3,878.96
Mesa	40	18,658.61		11,007.15	Inc. in bridges			760.50		30,426.26
Moffat	19	6,838.49	3	1,105.41	Inc. in bridges			894.50		8,838.40
Pitkin	15	6,293.55	Inc. in grading					889.50		7,183.05
Rio Blanco	12	6,503.99	1	4,906.25	1	650.00		1,614.25		13,674.49
Rout	15 $\frac{1}{2}$	11,868.64	5	4,439.26	149	3,164.94		2,416.02		21,888.86
Summit	(20)	10,274.38	(4)	2,292.67	(20)	505.15		519.00		13,501.20
Totals (10 counties)	412.5	\$118,679.79	27	\$ 24,789.75	232	\$6,629.87	1 $\frac{1}{2}$	\$ 285.95	\$8,111.69	\$158,497.05

NOTE.—Figures in parentheses are approximate.

SUMMARY OF EXPENDITURES DURING SEASON OF 1913 ON STATE ROADS.

	Grading—		Bridges—		Culverts—		Surfacing—			Total
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost	Surveying	
District No. 1, 14 counties...	530½	\$166,745.85	29	\$ 5,614.94	84	\$17,468.29	20½	\$ 825.00	\$ 2,299.88	\$215,902.60
District No. 2, 10 counties...	631	123,237.46	24	23,731.25	230	9,083.04	79½	3,662.00	7,779.87	207,848.14
District No. 3, 11 counties...	270	57,765.70	20	67,728.36	182	18,253.80	28	11,412.15	4,652.37	161,366.78
District No. 4, 17 counties...	572½	241,940.96	40	22,365.86	378	10,417.47	4 1-6	2,993.00	13,870.83	291,858.15
District No. 5, 10 counties...	412½	118,679.79	27	24,789.75	232	6,629.87	½	285.95	8,111.69	158,497.05
	2,416½	\$708,389.76	140	\$161,563.86	1,106	\$ 49,999.12	132½	\$35,821.39	\$36,714.64	\$2,949,438,103.5,472.72

NOTE.—Does not include any moneys expended by Cities and Towns for streets and roads.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 1 FOR 1914

COUNTY	Grading		Bridges—		Culverts—		Surfacing—		Dragging	Total	
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
Adams.....	54	\$ 8,679.37	3	\$ 3,112.79	(8)	\$ 230.40	(2)	\$1,453.32	\$ 495.50	\$1,712.70	\$ 15,634.08
Arapahoe.....	56	1,608.90	3	5,487.10	(50)	2,234.70	2½	Inc. in grading	218.85	151.65	9,701.50
Boulder.....	13	10,924.39	2	980.40	10	1,518.97	10	9,593.03	239.10	1,313.86	24,652.97
Clear Creek.....	(388)	9,958.22	Inc. in grading								9,958.22
Golden.....	25	1,114.25			(4)	206.24					1,320.49
Jefferson.....	11	10,898.62	1	1,249.74	44	1,279.76	6	12,133.52			25,561.64
Larimer.....	19½	40,880.49	5	3,220.17	1	130.63	11¾	11,856.95	1,942.10	8,717.23	66,747.57
Logan.....	(10)	2,364.70			(12)	600.00	2	650.00	75.00	1,000.00	4,689.70
Morgan.....	(8)	10,000.00	1	8,946.89	Inc. in grading						18,946.89
Phillips.....	36	1,877.43	1	65.80*						435.37	3,076.93
Sedgewick.....	(40)	2,117.98	Inc. in grading		(5)	167.07		Inc. in grading			2,285.05
Washington.....	42	1,708.81	1	274.30							1,983.11
Weld.....	(40)	31,299.01	2	1,126.78	(30)	1,602.00					34,027.79
Yuma.....	(20)	2,476.45	1	400.00				Inc. in grading			2,876.45
Totals	412.25	\$135,858.62	20	\$35,686.82	164	\$7,969.77	31.25	\$35,686.82	\$2,970.55	\$13,330.81	\$221,462.39

NOTE.—Figures in parentheses are approximate. * Including repairs.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 2 FOR 1914

COUNTY	Grading—		Bridges—		Culverts—		Surfacing—		Drainage	Total	
	Miles	Cost	No.	Inc. in grading	Cost	No.	Miles	Cost			
Chaffee.....	63	\$ 7,556.79	2	373.70	13	324.49	10	Inc. in grading	7.50	14.50	\$ 7,656.79
Cheyenne.....	104	3,228.61	3	7,826.48	40	1,290.51	12	Inc. in grading	2,379.95	347.15	3,948.80
Douglas.....	33	22,416.44	..	..	20	894.96	10	Inc. in grading	109.35	..	34,260.53
Elbert.....	173	13,796.00	8	19,562.34	24	1,593.00	67	\$21,150.00	1,262.68	5,462.00	62,826.02
El Paso.....	(40)	5,547.45	Inc. in grading	(20)	916.42	Inc. in grading	121.30	..	203.00	..	6,788.17
Kit Carson.....	3	8,826.82	4	311.70	26	1,206.70	3	Inc. in grading	1,297.38	120.00	11,702.60
Lake.....	77	3,360.29	2	1,300.00	10	344.11	10	Inc. in grading	..	..	5,004.40
Lincoln.....	(50)	10,000.00	5	1,860.80	31	520.00	..	..	623.55	4,000.00	17,004.35
Park.....	50.7	29,062.83	Inc. in grading—no division made.	..	..	..	..	..	..	..	29,062.83
Teller.....	593.7	\$109,187.80	24	\$ 31,235.02	184	\$7,090.19	112	\$21,150.00	\$5,801.71	\$10,146.65	\$184,711.37
Totals.....											

NOTE.—Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 3 FOR 1914

COUNTY	Grading—		Bridges—		Culverts—		Surfacing		Drugging	Total	
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
Bacon	48	\$ 1,164.46	1		2	\$ 537.94		\$ 174.80	\$2,023.00	1,877.20	
Bent	40	2,115.00	1	\$ 460.53	(4)	200.00			1,442.20	4,798.53	
Crowley			1	1,693.20	(10)	246.70		87.05	6.00	3,469.15	
Custer	16	1,050.75	2	655.73	15	317.52	17	\$ 238.50		2,330.50	
Fremont	15.1	55,701.66	Inc. in grading							55,701.66	
Kiowa	24.5	685.32			3	50.00	3	1,291.55	41.20	2,258.07	
Huerfano	9	7,474.97	1	770.42	56	1,567.20			2,362.53	12,175.12	
Las Animas	126	5,883.77	**3	11,104.10	(See bridges)			741.05	3,965.73	21,694.65	
Otero	37	1,659.10	5	7,286.85*	3	363.95	6½	2,607.05	1,003.61	12,920.56	
Pueblo	19	5,168.28	7	24,608.20	52	3,837.39	15¾	9,555.10	5,802.85	53,264.27	
Prowers	7	(a) 7,279.68	Inc. in grading					1,268.85		8,548.53	
Totals	311.6	\$ 88,182.99	20	\$ 45,579.03	145	\$ 7,120.70	42¼	\$ 13,692.20	\$ 6,816.20	\$ 16,647.12	\$179,038.24

**Includes culverts. *Includes repairs. (a) Includes culverts and surfacing. NOTE: Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Continued.

DISTRICT NO. 4 FOR 1914

COUNTY	Bridges			Culverts			Surfacing			Total	
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost	Surfacing		
Alamosa.....	61½	\$ 4,560.40	1	\$ 42.47	7	\$ 101.16	1	Inc. in grading \$14,483.45	1,031.75	\$ 7,219.33	
Archuleta.....	(10)	2,650.82			(10)	415.10	Inc. in grading			3,065.92	
Costilla.....	33	1,604.15	1	599.80	Inc. in bridge		Inc. in grading	174.00	12.50	2,390.45	
Conejos.....			1	430.00	2	48.00	4	\$ 187.50		1,790.70	
Delta.....			5	7,003.60*	(20)	2,075.92			1,681.23	10,760.75	
Dolores.....	1	2,583.44			5	35.00	1	Inc. in grading	101.50	3,590.23	
Gunnison.....	80	15,143.28	1	1,410.30	(40)	2,025.37			400.00	18,978.95	
Hinsdale.....	20	2,631.30	2	190.00	30	300.00				3,121.30	
La Plata.....	(50)	8,176.78	3	1,050.00	27	1,200.00		1,100.00		11,526.78	
Montezuma.....	(20)	9,952.16	Inc. in grading							9,952.16	
Montrose.....	192	7,610.37	19	2,626.92	(100)	2,824.72	3	962.37	860.92	15,797.19	
Mineral.....	35	4,533.35		2.00					143.00	4,723.35	
Ouray.....	12	2,817.89	Inc. in grading						153.50	4,776.98	
Rio Grande.....	Inc. in drugging									2,566.25	
Saguache.....	(100)	12,028.84	(1)	1,779.00	Inc. in bridges		(1)	72.00	800.12	15,040.01	
San Juan.....	(10)	2,382.82	Inc. in grading							2,362.82	
San Miguel.....	1.5	11,547.80	3	210.00	24	215.00	2	2,600.00	1,789.90	16,362.70	
Elwood Pass Road.....	5	13,659.07	3	800.00	(20)	200.00			Inc. in grading	14,659.07	
Totals.....	634	\$101,862.57	40	\$ 16,144.09	285	\$ 9,440.27	12	\$3,821.87	\$6,606.39	\$ 10,809.25	\$148,684.74

*Includes repairs. NOTE.—Figures in parentheses are approximate.

EXPENDITURES ON STATE ROADS BY COUNTIES FOR 1913 AND 1914—Concluded.

DISTRICT NO. 5 FOR 1914

COUNTY	Grading—		Bridges—		Culverts—		Surfacing—		Drugging	Total	
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
Eagle	96	\$ 12,567.84								\$ 12,567.84	
Garfield	93	45,407.41	4	580.15*	(60)	4,060.40	47	12,760.89	\$ 5,682.20	68,551.75	
Grand	31.75	4,952.50	7	5,543.00	Inc. in bridges	Inc. in grading	Inc. in grading	Inc. in grading	500.00	10,995.00	
Jackson	14.5	3,418.45	4	2,575.75	24	963.52				6,957.72	
Mesa	109	21,322.92	5	2,923.65	56	1,191.04*			945.20	28,193.76	
Moffat	33	7,463.27	32	10,729.53	26	939.20			1,198.42	24,185.00	
Pitkin	6	22,315.31	2	650.00	Inc. in grading	Inc. in grading			2,086.50	25,051.81	
Rio Blanco	30	9,772.92	1	336.53	(40)	2,481.67			2,492.35	17,413.79	
Routt	153.4	7,007.65	4	5,473.47	(10)	1,003.74			533.20	22,890.20	
Summit	59.5	11,283.48	(3)	362.73	(14)	627.42			1,100.00	13,373.63	
Totals	626.15	\$145,511.25	62	\$ 29,174.81	230	\$ 11,267.19	47	\$12,760.89	\$ 14,037.87	\$ 17,428.49	\$230,180.50

*Note: Including repairs. Does not include any expenditures for streets or bridges in towns and cities.

NOTE.—Figures in parentheses are approximate.

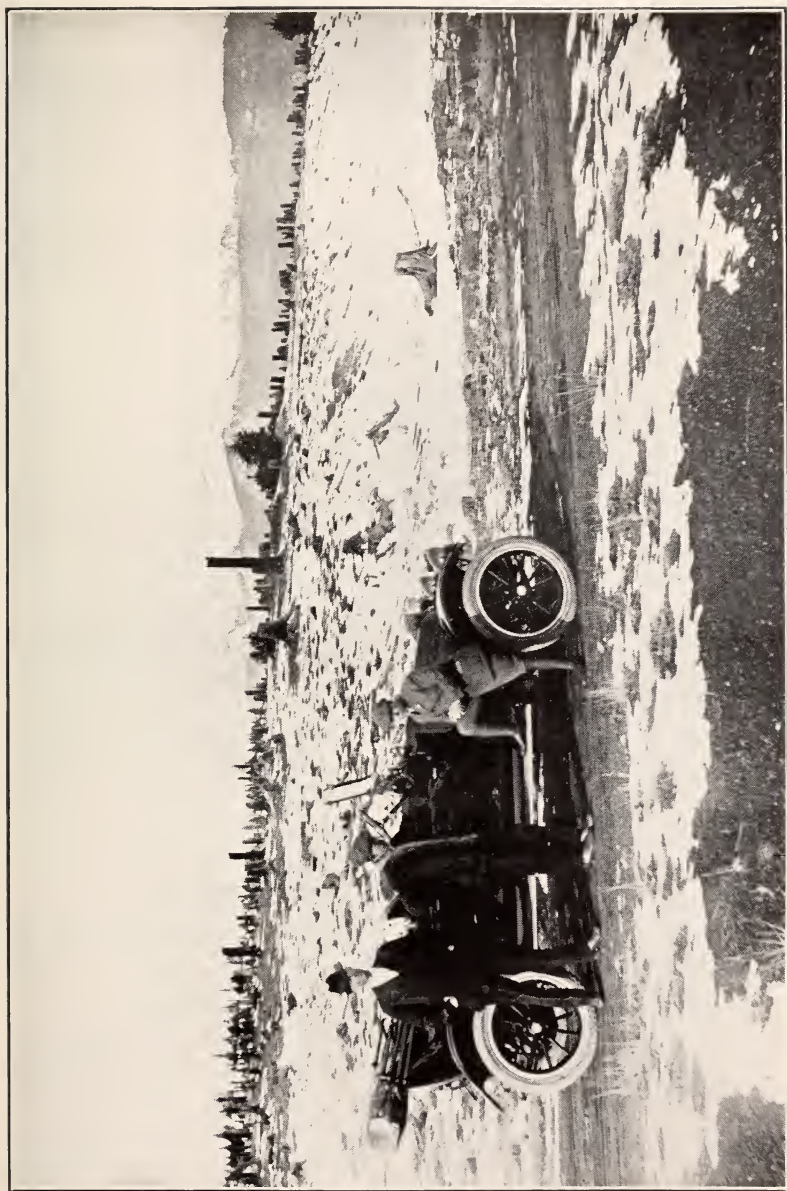
SUMMARY OF EXPENDITURES DURING SEASON OF 1914 ON STATE ROADS.

	Grading—		Bridges—		Culverts—		Surfacing—		Surveying	Drainage	Total
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
District No. 1, 14 counties...	412 1/4	\$135,858.62	20	\$ 24,864.27	164	\$ 7,969.77	34.5	\$ 35,686.82	2,970.55	\$ 13,330.81	\$221,462.39
District No. 2, 10 counties...	593.7	109,187.80	24	81,235.02	184	7,090.19	112	21,150.00	5,801.71	10,146.65	184,711.37
District No. 3, 11 counties...	311.6	88,182.99	20	46,579.03	145	7,120.70	42 1/4	13,692.20	6,816.20	16,647.12	179,038.24
District No. 4, 17 counties...	634	101,862.57	40	16,144.09	285	9,440.27	12	3,821.87	6,606.39	10,809.25	148,684.74
District No. 5, 10 counties...	626.15	145,511.25	62	29,174.81	230	11,267.19	47	12,760.87	14,037.87	17,428.49	230,180.50
Totals.....	2,577.70	\$580,602.23	166	\$ 197,997.22	1,008	\$ 42,888.12	247.75	\$ 87,111.76	36,232.72	\$ 68,362.32	\$964,077.24

SUMMARY OF EXPENDITURES ON STATE ROADS—1913 AND 1914.

	Grading—		Bridges—		Culverts—		Surfacing—		Surveying*	Drainage	Total
	Miles	Cost	No.	Cost	No.	Cost	Miles	Cost			
District No. 1.....	942.75	\$302,604.47	49	\$ 47,812.91	248	\$ 13,584.71	55	\$ 53,155.11	5,270.43	\$14,155.81	\$ 437,364.99
District No. 2.....	1,224.7	232,425.26	48	104,966.27	414	16,173.23	191.5	24,812.00	13,581.58	10,146.65	392,559.51
District No. 3.....	581.6	145,948.69	40	114,307.39	327	25,374.50	70 1/4	25,104.35	11,468.57	18,301.52	340,405.02
District No. 4.....	1,226.5	343,803.53	80	38,509.95	663	19,857.74	16 1-6	6,814.87	20,477.22	11,279.28	440,542.89
District No. 5.....	1,038.65	264,191.04	89	53,964.56	462	17,897.06	47.5	13,046.82	22,149.56	17,428.49	388,677.55
Totals.....	5,014.2	\$1,288,972.99	306	\$359,561.08	2,114	\$ 92,887.24	380.41	\$122,933.15	72,947.36	\$71,311.75	\$1,999,549.96

*NOTE.—Surveying includes supervision and administration charges in all cases.



TOP OF TENNESSEE PASS, LAKE COUNTY—STATE PRIMARY ROAD NO. 10 (NOV. 18, 1913).

AMOUNTS EXPENDED BY THE COUNTIES OF THE STATE ON ALL COUNTY ROADS
OTHER THAN STATE ROADS.

(By Advisory Board Districts.)

DISTRICT NO. 1

COUNTY	1913			1914		1913 and 1914	
	Grading and Drugging	Bridges and Culverts	Total	Grading and Drugging	Bridges and Culverts	Total	Total
Adams.....	\$ 18,683.58	\$ 12,053.40	\$ 30,736.98	\$ 24,654.65	\$ 7,610.62	\$ 32,265.27	\$ 63,002.27
Arapahoe.....	.....	.....	9,778.35	8,339.00	10,743.00	19,082.00	28,860.55
Boulder.....	39,792.22	10,500.05	50,292.27	46,794.93	4,349.36	51,144.29	101,436.56
Clear Creek.....	.....	.....	9,815.32	Included in total	.....	11,370.48	21,185.80
Copiah.....	2,965.58	183.81	3,149.39	8,937.04	108.00	9,045.04	12,194.43
Jefferson.....	26,529.14	6,461.98	32,991.12	29,890.18	4,054.80	33,944.98	66,936.10
Larimer.....	.....	.....	45,753.72	58,937.39	6,836.58	65,773.97	111,527.69
Logan.....	6,135.00	6,000.00	12,135.00	8,953.67	8,074.62	17,028.69	29,163.69
Morgan.....	.....	.....	16,228.34	12,806.39	4,792.44	17,598.83	33,827.17
Phillips.....	3,522.83	413.85	3,936.68	2,483.83	261.91	2,745.74	6,682.42
Sedgwick.....	10,523.83	603.67	11,127.50	6,584.84	1,641.80	8,226.84	19,354.14
Washington.....	.....	.....	12,476.15	4,384.99	774.40	5,159.39	17,635.54
Weld.....	75,529.91	27,048.21	102,578.12	96,306.36	34,734.93	131,041.29	233,619.41
Yuma.....	.....	.....	3,202.99	No report received	.....	.....	3,202.99
Totals.....	\$ 183,682.09	\$ 63,264.97	\$ 344,201.93	\$ 309,093.27	\$ 83,982.46	\$ 404,426.81	\$ 748,628.76

AMOUNTS EXPENDED BY THE COUNTIES OF THE STATE ON ALL COUNTY ROADS
OTHER THAN STATE ROADS—Continued.

COUNTY	1913			1914			1913 and 1914	
	Grading and Drugging	Bridges and Culverts	Total	Grading and Drugging	Bridges and Culverts	Total	Total	Total
Chaffee			\$ 10,204.36	\$ 21,095.11		\$ 21,095.11	\$ 31,299.47	
Cheyenne	\$ 3,098.90	\$ 1,620.13	4,719.03	1,265.38	None	1,265.38	5,984.41	
Douglas	4,214.24	2,050.55	6,264.79	8,919.48	2,192.31	11,111.79	17,376.58	
Elbert	7,020.00	8,940.00	15,960.00	10,246.50	7,737.55	17,984.05	33,944.05	
El Paso	14,458.35	750.00	15,208.35	2,850.00	3,075.00	5,925.00	21,133.35	
Kiŕ Carson	2,832.38	973.04	3,805.42	3,013.73	Included in grading	3,013.73	6,819.15	
Lake				5,465.25	385.40	5,850.65	5,850.65	
Lincoln	8,823.17	1,603.00	10,426.17	8,496.60	1,124.68	9,621.28	20,047.45	
Park	7,562.33	320.00	7,882.33	7,800.45	180.00	8,070.45	15,952.78	
Teller			500.79	1,412.98	Included in grading and drugging	1,412.98	1,913.77	
Total	\$ 48,009.37	\$ 16,256.72	\$ 74,971.24	\$ 70,655.48	\$ 14,694.94	\$ 85,350.42	\$ 160,321.66	

AMOUNTS EXPENDED BY THE COUNTIES OF THE STATE ON ALL COUNTY ROADS
OTHER THAN STATE ROADS—Continued.

DISTRICT NO. 3

STATE HIGHWAY COMMISSION

COUNTY	1913			1914			1913 and 1914	
	Grading and Dragging	Bridges and Culverts	Total	Grading and Dragging	Bridges and Culverts	Total	Total	Total
Baca.....	\$ 57.00		\$ 57.00	\$ 86.30		\$ 86.30	\$	\$ 143.30
Bent.....	8,727.10	\$ 11,575.03	20,302.13	9,094.65	\$ 1,216.82	10,821.47		31,123.60
Crowley.....	5,122.27	1,126.31	6,248.58	5,786.37	3,356.87	9,143.24		15,391.82
Custer.....			4,746.75	3,018.10	2,076.92	5,095.02		9,841.77
Fremont.....	27,938.87	913.19	28,852.06	13,244.39	1,727.47	14,971.86		43,823.92
Huertfano.....	3,947.55	406.50	4,354.05	7,245.22		7,245.22		11,599.37
Kiowa.....	730.00	638.60	1,368.60	817.50	1,758.00	2,575.50		3,944.10
Las Animas.....	20,925.41	14,675.00	35,600.41	19,134.89	18,442.80	35,577.69		73,178.10
Otero.....	4,062.00	6,767.09	10,829.09	16,054.45	17,083.94	33,138.39		43,967.48
Prowers.....	17,521.57	5,896.45	23,418.02	19,114.03	Included in dragging	19,114.03		42,532.05
Pueblo.....	8,934.50	54,246.29	63,200.79	25,659.34	13,428.28	39,087.62		102,287.62
Total.....	\$ 97,986.27	\$ 96,244.46	\$ 198,977.48	\$ 119,765.34	\$ 59,080.10	\$ 178,856.44		\$ 377,833.13

AMOUNTS EXPENDED BY THE COUNTIES OF THE STATE ON ALL COUNTY ROADS
OTHER THAN STATE ROADS—Continued.

DISTRICT NO. 4

COUNTY	1913		1914		1913 and 1914	
	Grading and Dragging	Bridges and Culverts	Grading and Dragging	Bridges and Culverts	Total	Total
Archuleta	\$ 7,484.90	\$ 2,770.00	\$ 6,479.99	\$ 434.15	\$ 14,360.14	\$ 24,615.04
Alamosa		County not organized				
Costilla	6,643.76	1,203.28	4,858.33	3,210.38	6,914.74	6,914.74
Conejos	6,783.64	1,417.09	4,273.13	3,007.49	8,068.71	15,915.75
Delta	17,630.08	4,231.21	738.75	2,365.96	7,280.62	15,481.35
Dolores	1,102.31		2,167.61		3,104.71	24,966.00
Gunnison	16,215.43		16,597.87	700.05	2,167.61	3,269.92
Hinsdale	1,500.00	235.00	1,761.91		17,297.92	33,513.35
La Plata	19,024.81	3,801.72		2,100.00	1,761.91	3,496.91
Montezuma	10,893.74	4,768.50			2,100.00	24,926.53
Montrose	18,718.58	4,287.42	14,491.18	9,448.22	13,056.13	28,718.37
Mineral	1,101.98	15.00	1,270.82	100.00	23,939.40	46,945.40
Ouray			10,819.03		1,370.82	2,487.80
Rio Grande			13,871.29	2,566.25	15,596.01	25,178.58
San Miguel			24,128.53	1,610.00	16,437.54	28,627.02
Saguache			14,799.46	3,300.82	25,728.53	51,382.23
San Juan			Included in total		18,100.28	44,037.61
Totals	\$ 107,099.23	\$ 22,729.22	\$ 116,307.90	\$ 28,843.32	\$ 182,475.68	\$ 387,918.94

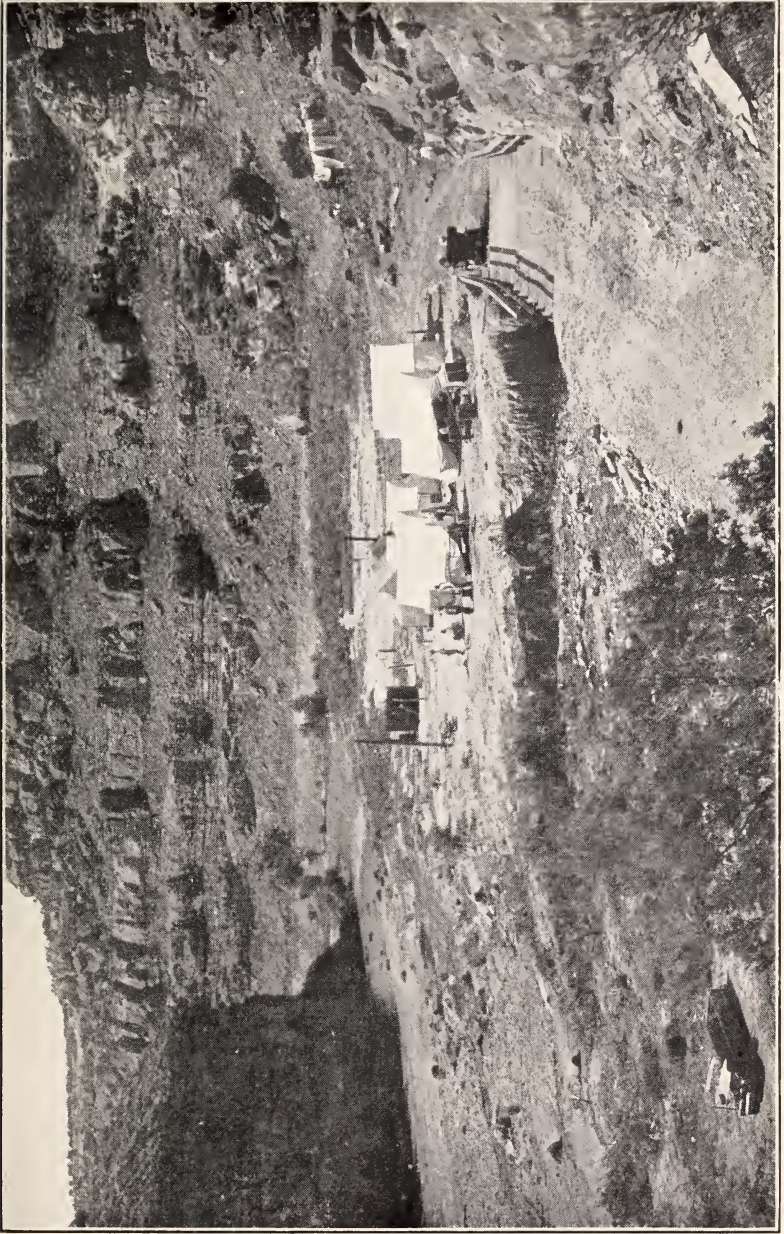
AMOUNTS EXPENDED BY THE COUNTIES OF THE STATE ON ALL COUNTY ROADS
OTHER THAN STATE ROADS—Concluded.

DISTRICT NO. 5

COUNTY	1913			1914			1913 and 1914	
	Grading and Dragging	Bridges and Culverts	Total	Grading and Dragging	Bridges and Culverts	Total	Total	Total
Eagle.....			\$ 4,223.10	\$ 6,726.57		6,726.57	\$ 10,949.67	
Garfield..	\$ 5,709.88	\$ 18,000.00	23,709.88	6,286.48	Included in grading\$ 17,772.75	24,059.23	47,769.11	
Grand.....			6,733.37	9,423.75		9,423.75	16,157.12	
Jackson.....			3,167.21	3,908.23	75.00	3,983.23	7,150.44	
Mesa.....	19,052.21	44,836.51	64,488.72	18,735.69	5,808.54	24,544.23	89,032.95	
Moffat.....			3,082.00	No report received			3,082.00	
Pitkin.....			3,297.23	2,569.36	1,362.24	3,931.60	7,228.83	
Rio Blanco.....			8,136.39	4,344.77	None	4,344.77	12,481.16	
Routt.....	8,841.26	2,449.60	11,290.86	5,858.91	5,564.20	11,423.11	22,713.97	
Summit.....	2,016.38	433.59	2,449.97	3,243.47	934.72	4,178.19	6,628.16	
Totals.....	\$ 36,219.73	\$ 65,719.70	\$ 130,578.73	\$ 61,097.23	\$ 31,517.45	\$ 92,614.68	\$ 223,193.41	

SUMMARY OF EXPENDITURES ON COUNTY ROADS—ALL OTHER THAN STATE PRIMARY
AND SECONDARY ROADS.

	1913			1914			1913 and 1914	
	Grading and Dragging	Bridges and Culverts	Total	Grading and Dragging	Bridges and Culverts	Total	Total	Total
ADVISORY BOARD								
District No. 1.....	\$ 183,682.09	\$ 63,264.97	\$ 344,201.93	\$ 309,093.27	\$ 83,982.46	\$ 404,426.81	\$ 745,425.77	
District No. 2.....	48,009.37	16,256.72	74,971.24	70,655.48	14,694.94	85,350.42	160,321.66	
District No. 3.....	97,986.27	96,244.46	198,977.48	119,765.34	59,090.10	178,856.44	377,833.13	
District No. 4.....	107,099.15	22,729.22	265,544.18	116,307.90	28,843.32	182,475.68	387,918.94	
District No. 5.....	36,219.73	65,719.70	130,378.73	61,097.23	31,517.45	92,614.68	223,193.41	
Totals.....	\$ 472,996.61	\$ 264,215.07	\$ 954,273.56	\$ 676,919.22	\$ 218,128.27	\$ 943,724.03	\$ 1,897,895.90	



MESA COUNTY CONVICT CAMP, PLATEAU CREEK—STATE PRIMARY ROAD NO. 11.

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS
AND ROAD LEVY FOR 1915.

DISTRICT NO. 1

COUNTY	Valuation		County Road		Miles all		Miles State		Miles of		Area in		Boned		Population	
	1914	1915	Levy for	Roads	1914	Roads	1914	Roads	1914	Roads to Date	Square	Miles	Indebtedness	1910	1910	Population
Denver*	\$ 403,866,385	All in City limits									59		\$302,500	213,381		
Adams	22,301,130	1.5	673		89.0	(a) (46)	1,253	None	8,892							
Arapahoe	16,590,195	1.25	378		56.2	(16)	823	None	10,263							
Jefferson	20,536,545	2.25	568		89.5	20	858	None	14,231							
Clear Creek	5,269,300	2.00	110		38.8	(6)	425	None	5,001							
Gilpin	3,678,835	3.00	124		25.25	(2)	130	None	3,131							
Boulder	40,040,490	1.64	613		57.25	30	751	None	30,330							
Larimer	34,479,410	2.55	719		167.75	(18)	2,937	31,000	35,270							
Weld	76,405,810	1.30	2,364		191.10	(60)	3,918	None	39,177							
Morgan	16,848,617	2.9	696		111.30	(25)	1,264	None	9,577							
Logan	18,608,715	2.00	1,042		92.20	15	1,733	40,000	9,549							
Sedgwick	5,873,043	2.10	216		30.20	(5)	535	None	3,061							
Phillips	7,368,879	0.70	314		36.00	(5)	677	42,800	3,179							
Washington	10,840,741	1.00	1,150		52.00	(12)	1,074	15,500	6,002							
Yuma	9,948,850	1.00	542		166.50	(10)	1,162	None	8,499							
Totals	\$ 692,656,945		9,509		1,203.05	270	17,599	431,800	399,543							

*NOTE—City and County of Denver. (a) Improved roads include all those which have some kind of surfacing.

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS
AND ROAD LEVY FOR 1915—Continued.

DISTRICT NO. 3

COUNTY	Valuation 1914	County Road		Miles all		Miles State		Miles of		Area in		Boned Indebtedness	Population 1910
		Levy for 1915	Roads 1914	Roads 1914	Roads 1914	Roads to Date	Square Miles	Square Miles	Improved Roads to Date	Square Miles			
											Roads			Roads
Fremont.....	\$ 20,110,835	2.0	382	133.7	(10)	1,478	None	18,181					
Custer.....	2,582,980	2.50	(351)	60.0	(17)	696	None	1,947					
Pueblo.....	65,770,336	1.40	967	158.4	32	2,447	350,000	52,223					
Huerfano.....	12,236,885	0.50	(500)	66.8	(2)	1,537	31,000	13,320					
Las Animas.....	39,493,960	1.00	958	112.1	(6)	4,802	155,000	33,643					
Otero.....	27,904,028	2.55	759	80.8	11	1,237	3,500	20,201					
Crowley.....	8,347,183	1.30	333	32.0	(2)	805	Inc. in Otero Co.						
Kiowa.....	7,093,305	0.55	460	97.0	7	1,780		2,898					
Bent.....	11,263,175	1.34	447	41.7	(8)	1,497	28,000	5,043					
Prowers.....	18,749,355	1.80	805	117.1	7	1,602	15,500	9,520					
Baca.....	2,369,285	0.40	117	63.0		2,531	29,500	2,516					
Totals.....	\$ 216,993,992		6,079.0	962.60	102	20,412	\$612,500	159,492					

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS
AND ROAD LEVY FOR 1915—Continued.

COUNTY	Valuation 1914	County Road		Miles State		Miles of Improved Roads to Date	Area in Square Miles	Boned Indebtedness	Population 1910
		Levy for 1915	Miles and Roads 1914	Roads 1914	Roads to Date				
Archuleta.....	\$ 4,367,686	3.0	208	46.7	(4)	1,209	\$ 28,000	3,302	
Alamosa.....	6,703,421	1.50	564	64.5	(1)	991 (See Conejos Co.)	Inc. in Conejos	5,498	
Costilla.....	5,471,250	2.45	126	36.0	(5)	887	26,000	11,285	
Conejos.....	8,208,523	1.19	595	107.0	4	1,275	105,000	13,688	
Delta.....	15,116,335	2.00	419	68.5	(3)	1,201	71,700	632	
Dolores.....	1,508,238	2.40	100	41.0	1	1,000	87,400	5,897	
Gunnison.....	14,629,029	2.30	673	130.5	(5)	3,277	377,900	646	
Hinsdale.....	910,310	3.00	143	53.1	.....	1,003	144,700	10,812
La Plata.....	15,450,930	2.50	488	111.9	(5)	1,848	126,500	5,029	
Montezuma.....	6,262,489	3.00	300	100.2	(3)	2,113	27,000	10,291	
Montrose.....	14,552,480	3.10	509	169.0	(4)	2,290	144,000	1,239	
Mineral.....	1,719,479	1.90	134	94.1	(2)	880	17,000	3,514	
Ouray.....	5,730,476	2.50	229	52.4	2	557	230,000	6,563	
Rio Grande.....	10,462,580	2.00	474	93.6	(3)	1,331	193,300	4,700	
San Miguel.....	9,309,120	4.00	300	92.5	(3)	1,310	125,000	4,160	
Saguahe.....	11,613,973	2.80	955	148.0	(3)	2,767	None	3,063	
San Juan.....	4,745,575	2.00	125	51.0	(2)	438	97,000	90,319	
Totals.....	\$ 130,761,894		6,342	1,460.0	50	24,377	\$ 1,800,500		

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS
AND ROAD LEVY FOR 1915—Concluded.

DISTRICT NO. 5

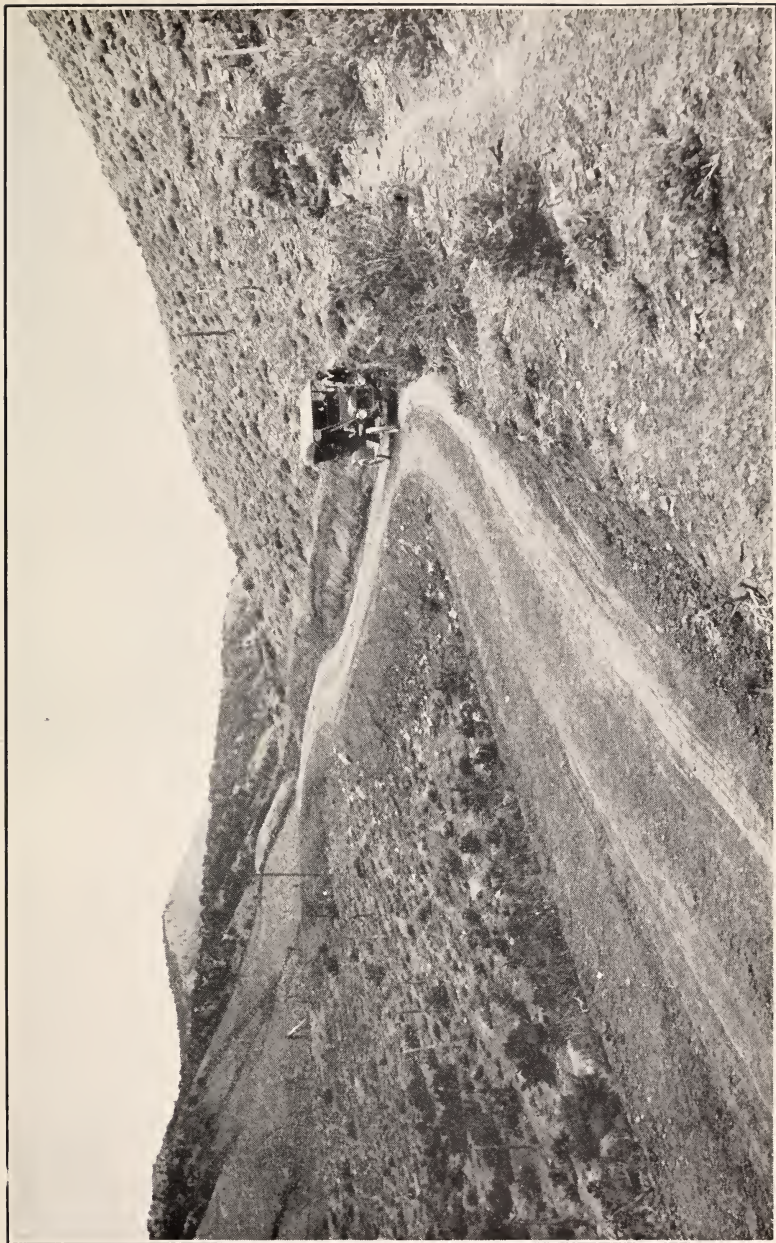
COUNTY	Valuation 1914	County Road Levy for		Miles all Roads		Miles State Roads		Miles of Improved Roads to Date		Area in Square Miles		Bonded Indebtedness		Population 1910
		1915	1914	1914	1914	1914	1914	1914	1914	1914	1914	1914	1914	
Eagle	\$ 6,505,710	1.80	270	104.25	104.25	104.25	104.25	(3)	1,586	69,000	2,985			
Garfield	18,725,385	3.40	570	104.00	104.00	104.00	104.00	47	3,049	183,300	10,144			
Grand	5,107,115	1.75	386	182.50	182.50	182.50	182.50	(5)	1,873	None	1,862			
Jackson	3,949,015	2.00	305	111.00	111.00	111.00	111.00	(1)	1,400	None	1,013			
Mesa	28,210,010	1.53	933	108.50	108.50	108.50	108.50	(3)	3,309	50,000	22,197			
Moffat	4,161,500	2.00	650	181.00	181.00	181.00	181.00	(2)	4,740	None	(Inc. in Routt)			
Pitkin	6,912,515	1.00	193	38.00	38.00	38.00	38.00	6	983	409,500	4,566			
Rio Blanco	4,834,572	2.66	448	123.00	123.00	123.00	123.00	(10)	3,249	25,000	2,332			
Routt	12,465,619	2.69	456	153.00	153.00	153.00	153.00	(3)	2,240	None	7,561			
Summit	5,819,225	3.00	214	59.50	59.50	59.50	59.50	(3)	603	..	2,003			
Totals	\$ 96,690,666		4,425	1,164.75	1,164.75	1,164.75	1,164.75	83	23,032	\$ 736,800	54,663			

All figures in parentheses are approximate.

SUMMARY OF VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS
AND ROAD LEVY FOR 1915.

	Valuation 1914	County Road Levy for		Miles all Roads		Miles State Roads		Miles of Improved Roads to Date		Area in Square Miles		Boned Indebtedness		Population 1910
		1915	1914	1914	1914	1914	1914	1914	1914	1914	1914	1914	1914	
DISTRICTS														
District No. 1.....	\$ 692,656,945		9,509	1,203.05	270	17,599	\$ 431,800	399,543						
District No. 2.....	167,528,208		4,378	1,052.05	150	15,635	891,300	103,696						
District No. 3.....	216,993,992		6,079	962.60	102	20,412	612,500	159,492						
District No. 4.....	136,761,894		6,342	1,460.00	50	24,377	1,800,500	90,319						
District No. 5.....	96,690,666		4,425	1,164.75	83	23,032	736,800	54,663						
Totals.....	\$1,310,631,705		30,733	5,842.45	655	101,055	\$4,472,900	807,713						

NOTE—Improved roads of all kinds, crowned and drained dirt roads, amount to 5,014 miles.



ROAD EAST FROM MONTROSE UP CEDAR CREEK—STATE PRIMARY ROAD NO. 20.

STATE ROAD SYSTEM.

PRIMARY AND SECONDARY ROADS.

Giving Road Number, Termini and Mileage.

(The figures are approximate in some instances, but are as close as our available information warrants.)

STATE PRIMARY ROADS.

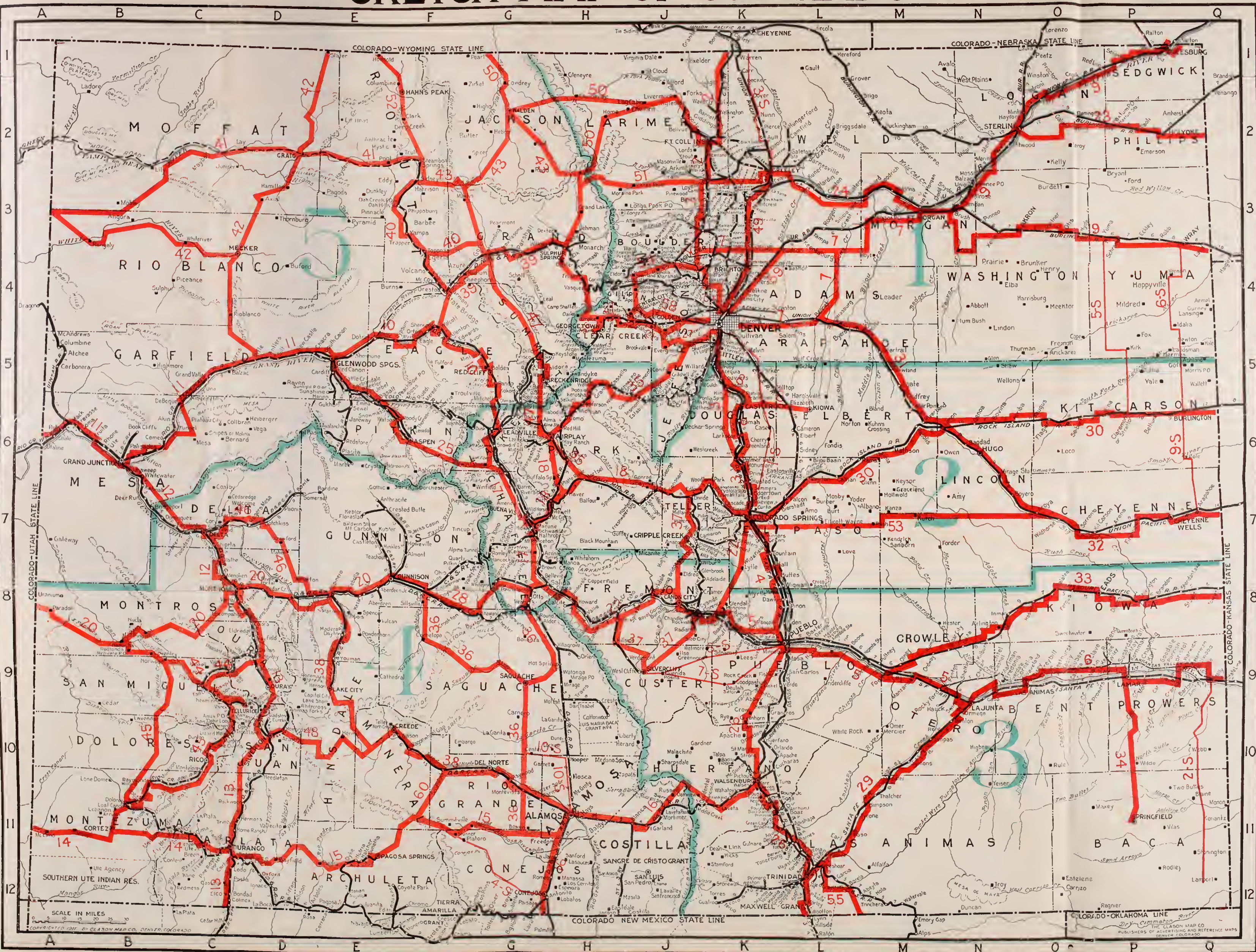
Road No.	Distance—Miles
1 Denver to Golden.....	8.5
2 Denver to Fort Collins and north line of State.....	} 103.0
Branch to Boulder.....	
3 Denver to Colorado Springs.....	66.0
4 Colorado Springs to Pueblo.....	44.3
5 Pueblo to La Junta (and Pueblo to Florence).....	93.5
6 La Junta to Kansas line.....	99.1
7 Denver to Fort Morgan.....	130.0
8 Sedalia to Palmer Lake, branch to Kiowa.....	53.5
9 Fort Morgan to Colo.-Nebraska State line (via Sterling and Julesburg) ..	118.3
10 Leadville to Glenwood Springs.....	93.95
11 Glenwood Springs to Grand Junction, west line of State.....	135.75
12 Grand Junction to Montrose.....	66.0
13 Durango to Montrose.....	} 136.9
Durango to New Mexico State line.....	
14 Durango to Utah State line.....	81.2
15 Durango to Alamosa.....	155.9
16 Alamosa to south State line, via Conejos, and to Walsenburg, via La Veta	117.6
17 Leadville to Buena Vista and Salida to Poncha Pass.....	83.5
18 Colorado Springs to Buena Vista (via Ute Pass and Trout Creek).....	96.0
19 Brush to Wray, Colorado-Nebraska State line.....	111.5
20 Gunnison to Montrose and Utah State line, via Naturita and Paradox ..	159.0
21 Golden to Hot Sulphur Springs.....	78.5
22 Colorado Springs to Salida.....	122.5
23 Sterling to east State line (via Haxtun and Holyoke).....	73.5
24 Fort Morgan to Greeley and Loveland.....	86.0
25 Glenwood Springs to junction with No. 17 at Twin Lakes (via Aspen and Independence Pass).....	81.5
26 Pueblo to south State line via Walsenburg and Trinidad.....	109.1
27 Denver to Morrison and Evergreen, to junction with No. 21.....	24.5
28 Gunnison via Monarch Pass to junction with No. 17.....	70.2
29 La Junta to Trinidad, "Santa Fe Trail".....	82.1
30 Colorado Springs to Limon and to east State line.....	176.4
31 Limon via Deer Trail and Byers to junction with No. 7 near Bennett ..	60.2

Road No.	Distance—Miles
32 Limon via Cheyenne Wells and east State line.....	104.0
33 Fowler to Eads and east State line.....	130.0
34 Lamar to Springfield.....	55.0
35 Morrison via Turkey Creek to Fairplay, and to join with No. 18, and to Hartzel.....	112.7
36 Poncha Pass to Monte Vista via Saguache and to junction with No. 15; also Saguache over Cochetopa to junction with No. 28.....	174.0
37 Divide to Cripple Creek and Canon City; also junction with No. 5 to Westcliffe, and Silvercliff to Texas Creek.....	104.7
38 Alamosa to Creede, Lake City and Sapinero.....	151.5
39 Hot Sulphur Springs to Wolcott via State bridge.....	60.75
40 State bridge to Steamboat Springs, and branch Toponas to Kremmling..	88.5
41 Craig to Steamboat Springs and to west line of State.....	138.0
42 Craig to Rifle via Meeker; Meeker to west joining No. 41, and Craig to north line of State.....	223.0
43 Granby to Rand and Walden, to Hebron and Rabbit Ear Pass, to junc- tion with No. 40 near Sydney.....	120.0
44 Ridgway to Placerville and Naturita, and Placerville to Telluride.....	60.0
45 Norwood via Disappointment to Cortez and Dolores to Vance Junction..	143.0
46 Delta via Black Mesa to Sapinero.....	72.0
47 Kremmling to Breckenridge and to Fairplay.....	83.0
48 Creede to Silverton.....	62.0
49 Denver to Brighton and Greeley.....	52.0
50 Walden to north State line, and Walden to Fort Collins via Poudre....	108.0
51 Loveland to Granby via Estes Park and Fall River.....	54.0
52 Steamboat Springs to north line.....	45.0
53 Colorado Springs easterly to junction with No. 32.....	98.0
54 Idaho Springs, Central City, Nederland to Boulder.....	43.75
55 Trinidad to Clayton, N. M.....	28.0
56 Empire to Silver Plume.....	8.3
57 From Road No. 40 at or near Kremmling to Rabbit Ear Pass Road No. 43	28.0
58 Golden to Central City via Guy Hill.....	19.0
59 From junction at Sec. 6-3, with No. 49 to junction with No. 7 at Hudson	25.5
60 South Fork Station to junction with No. 15.....	17.0
<hr/>	
Total mileage State Primary roads.....	5,326.70

SECONDARY ROADS

18 Denver to Colorado Springs via Cherry Creek.....	61.0
28 Holly south to south State line near east line of State.....	78.0
3S Greeley to north State line along Union Pacific Railroad.....	48.0
4S Antonita to junction with No. 15 near Stunner.....	47.0

SKETCH MAP OF COLORADO



STATE HIGHWAYS - PRIMARY
STATE HIGHWAYS - SECONDARY
ADVISORY ROAD DISTRICTS

MAP ISSUED BY STATE HIGHWAY COMMISSION

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DENVER, COLORADO

Road No.	Distance—Miles
58 Yuma to Stratton...	80.0
68 Wray to Burlington via Idalia...	58.0
78 Pueblo to Silvercliff via Beulah.....	45.0
88 Pueblo to junction with No. 37 via Greenwood...	26.0
98 Burlington to Cheyenne Wells....	37.75
108 Alamosa via Mosca, Hooper, and Center to Primary Road No. 36...	35.0
	<hr/>
Total mileage State Secondary roads.....	315.75
	<hr/>
Total mileage of all State roads.....	5,842.45

RECEIPTS FROM THE MOTOR VEHICLE LICENSE TAX FOR 1913 AND 1914,
WERE AS FOLLOWS:

(From Secretary of State's Office.)

1913.

COUNTIES	Automobiles				License Receipts	Expense of Collection
	Reissues	Owners and Dealers	Motorcycles	Drivers		
Adams.....		109	36	3	\$ 507.50	\$ 28.18
Arapahoe.....		140	35	20	610.00	38.43
Archuleta.....		21			75.00	7.73
Alamosa.....						
Baca.....		18	4	2	60.00	8.22
Bent.....		116	18	19	480.00	39.22
Boulder.....	6	548	137	73	510.00	197.25
Chaffee.....	1	119	8	15	511.50	41.69
Cheyenne.....		33	1		144.50	10.44
Clear Creek.....		33	6	3	140.00	10.88
Conejos.....	1	128	44	21	569.50	48.80
Costilla.....		50	10	3	233.00	13.51
Crowley.....		91	6	5	367.00	25.30
Custer.....		22			90.00	8.03
Delta.....		159	18	31	692.00	79.91
Denver.....	55	4,968	1,013	1,118	22,953.50	1,636.54
Dolores.....						
Douglas.....	52	52	5	6	196.00	17.65
Eagle.....		17	1	1	70.50	6.15
Elbert.....		48	3		166.00	14.75
El Paso.....	13	1,018	313	161	5,058.50	293.69
Fremont.....	1	301	54	20	1,241.00	84.02
Garfield.....		97	7	13	374.50	27.80
Gilpin.....		2	3		13.50	1.85
Grand.....		20			70.00	7.11
Gunnison.....		48	2	3	194.50	16.27
Hinsdale.....		4			10.00	1.62
Huerfano.....	1	83	15	4	364.50	22.92
Jackson.....		14		4	64.00	6.20
Jefferson.....	1	158	26	11	638.50	42.36
Kiowa.....		47	6	1	178.00	13.98
Kit Carson.....		80	4	5	273.00	25.15
Lake.....		37	14	2	200.00	13.55
La Plata.....	1	85	7	16	375.50	25.28

1913.

COUNTIES	Automobiles				License Receipts	Expense of Collection
	Reissues	Owners and Dealers	Motorcycles	Drivers		
Larimer.....	9	779	169	46	\$ 3,393 50	\$ 208.73
Las Animas.....	1	256	22	45	1,104.50	78.22
Lincoln.....		79	2	11	321.00	23.28
Logan.....		247	28	21	1,084.50	69.37
Mesa.....		215	52	13	987.50	72.01
Mineral.....		7	4	1	36.50	3.63
Moffat.....		18		2	82.00	6.15
Montezuma.....		48	2	13	179.50	17.73
Montrose.....	1	141	20	16	516.50	42.67
Morgan.....		211	42	5	951.50	54.99
Otero.....		369	110	31	1,658.50	107.88
Ouray.....		19	5		62.50	6.21
Park.....		55	4	5	243.00	18.60
Phillips.....	4	103	4	13	405.50	40.39
Pitkin.....		14	1		67.00	4.66
Prowers.....	2	176	52	18	740.50	69.85
Pueblo.....	1	600	98	33	2,599.50	194.94
Rio Blanco.....		13		5	57.50	5.92
Rio Grande.....		182	11	13	750.00	63.22
Routt.....		45		3	168.00	15.51
Saguache.....		105	7	6	392.50	32.75
San Juan.....		2			7.50	1.00
San Miguel.....		13			47.50	4.05
Sedgwick.....	1	88	6	5	312.50	24.99
Summit.....		11	4	2	40.00	4.56
Teller.....		135	52	41	792.50	45.01
Washington.....		82	7	4	298.00	25.65
Weld.....	5	800	248	52	3,588.00	214.15
Yuma.....		145	4	16	514.00	40.99
Totals	105	13,624	2,753	1,980	\$60,833.00	\$ 4,313.80

1914.

COUNTIES	Automobiles				License	Expense of
	Reissues	Owners and Dealers	Motoreycles	Drivers	Receipts	Collection
Adams.....	5	201	58	6	\$ 892.00	\$ 44.19
Alamosa.....		133	16	17	506.50	17.73
Arapahoe.....	3	210	64	22	874.00	32.80
Archuleta.....		24	1	8	102.50	7.22
Baca.....		37	7	3	122.00	5.23
Bent.....	2	183	37	42	764.50	33.17
Boulder.....	21	781	166	69	3,329.00	119.41
Chaffee.....	4	189	10	17	774.00	28.31
Cheyenne.....		36	1		134.50	10.51
Clear Creek.....	1	49	13	5	229.00	7.31
Conejos.....	1	79	20	13	313.50	16.39
Costilla.....		37	12	3	187.00	12.13
Crowley.....	1	110	13	3	424.50	20.58
Custer.....		32			125.00	4.58
Delta.....		203	31	23	842.50	40.67
Denver.....	233	6,120	1,313	1,074	27,881.00	1,355.65
Dolores.....			1		2.00	
Douglas.....	1	78	8	6	290.00	11.78
Eagle.....	1	45	2	1	178.00	5.09
Elbert.....	1	78	3		261.50	10.27
El Paso.....	48	1,441	447	201	6,934.00	246.10
Fremont.....	13	389	80	15	1,613.00	73.79
Garfield.....		167	10	18	625.50	23.21
Gilpin.....		2	1		9.50	1.31
Grand.....		38	1	1	133.00	5.07
Gunnison.....		84	1	2	344.00	12.20
Hinsdale.....		4			10.00	.77
Huerfano.....		113	16	9	478.50	18.73
Jackson.....		22	2	3	92.00	4.56
Jefferson.....	9	242	43	9	947.00	35.76
Kiowa.....	1	67	3	5	222.50	10.46
Kit Carson.....		103	3	7	335.50	17.02
Lake.....		73	14	6	344.00	8.99
La Plata.....		121	8	34	547.50	21.56
Larimer.....	45	1,025	236	43	4,505.00	175.13
Las Animas.....	4	334	15	27	1,364.00	64.76
Lincoln.....	1	97	4	12	390.50	26.54



TOP OF MONARCH PASS (ALTITUDE 11,500 FEET)—RAINBOW ROUTE—NEAR SALIDA, COLORADO.
CHAFFEE COUNTY—STATE PRIMARY ROAD NO. 28.

1914.

COUNTIES	Automobiles				License Receipts	Expense of Collection
	Reissues	Owners and Dealers	Motorcycles	Drivers		
Logan	5	331	38	20	\$ 1,368.50	\$ 51.66
Mesa	6	316	88	16	1,437.50	39.56
Mineral		8	3	2	35.50	2.11
Moffat		30		4	141.50	5.03
Montezuma		69	3	15	263.50	14.88
Montrose	3	205	27	14	742.00	34.47
Morgan	5	276	50	2	1,197.00	45.96
Otero	2	458	104	35	1,974.00	85.09
Ouray	2	36	8		132.00	5.03
Park		60	5	4	264.00	12.25
Phillips	5	162	5	11	618.50	27.05
Pitkin		17			65.00	3.78
Prowers	8	219	51	13	884.00	39.62
Pueblo	9	1,014	258	54	4,409.50	164.98
Rio Blanco		38		5	142.50	10.88
Rio Grande		199	11	3	780.00	44.57
Routt		48		3	190.50	11.29
Saguache	2	127	8	11	473.00	24.81
San Juan		3	1		12.00	0.98
San Miguel		30			102.50	4.57
Sedgwick	1	103	11	5	365.00	19.58
Summit		13	5	1	48.50	3.73
Teller	2	214	30	47	1,028.00	34.95
Washington	5	113	10	3	400.50	18.59
Weld	27	1,170	302	63	5,055.50	173.13
Yuma	5	228	5	23	788.00	33.06
Total—1914	482	18,433	3,683	2,058	\$80,047.00	\$ 3,440.59
Total—1913	105	13,624	2,753	1,980	\$60,833.00	\$ 4,313.80

TOTAL FOR 1913 AND 1914

	1913	1914	1913 and 1914
Total receipts	\$ 60,833.00	\$ 80,047.00	\$ 140,880.00
Expense of collection	4,313.80	3,440.59	7,754.39
Available for road work	\$ 56,519.20	\$ 76,606.41	\$ 133,125.61

One-half of this sum goes to the county in which it is collected, and the other half to the State Road Fund.

FOREST RESERVE FUNDS.

Twenty-five per cent of the receipts from Forest Reserves are turned over to the State by the National Government, and distributed pro rata, according to the acreage of forest reserve in each county. This money is divided by the County Commissioners between the School Fund and the Road Fund, but at least 5% must go to the schools. We have no information as to the exact division of this fund between the schools and roads.

	1913	1914
Adams.....		
Arapahoe.....		
Archuleta.....	\$ 2,815.89	\$ 2,741.48
Alamosa.....		
Boulder.....	191.87	239.90
Baca.....		
Bent.....		
Clear Creek.....	338.56	390.22
Chaffee.....	1,776.67	1,597.74
Cheyenne.....		
Custer.....	294.25	321.80
Crowley.....		
Costilla.....	46.36	50.70
Conejos.....	1,379.35	1,374.00
Douglas.....	359.72	414.61
Dolores.....	1,526.45	2,097.48
Delta.....	896.95	924.44
El Paso.....	283.54	326.81
Elbert.....		
Eagle.....	3,669.12	3,787.76
Fremont.....	107.90	118.00
Gilpin.....	88.90	102.43
Gunnison.....	3,863.98	3,408.26
Grand.....	4,064.81	3,080.02
Garfield.....	2,149.99	2,220.52
Huerfano.....	274.63	300.40
Hinsdale.....	2,412.08	2,422.66
Jefferson.....	211.60	243.90
Jackson.....	2,253.08	2,428.05
Kit Carson.....		
Kiowa.....		
Larimer.....	727.31	970.97
Logan.....		

	1913	1914
Lincoln.....		
Lake.....	\$ 600.00	\$ 536.26
Las Animas.....	40.06	43.80
La Plata.....	1,128.42	1,674.32
Morgan.....		
Montrose.....	1,426.36	1,379.03
Montezuma.....	1,230.01	1,690.22
Moffat.....	309.87	324.99
Mineral.....	2,667.95	2,637.13
Mesa.....	2,333.63	2,347.57
Otero.....		
Ouray.....	605.46	598.51
Phillips.....		
Park.....	1,878.38	1,974.93
Pueblo.....	65.40	71.53
Prowers.....		
Pitkin.....	1,876.71	2,111.73
Rio Grande.....	1,158.42	1,153.65
Rio Blanco.....	1,431.68	1,483.55
Routt.....	2,641.37	2,771.73
Sedgwick.....		
San Miguel.....	903.04	1,203.20
San Juan.....	422.76	606.10
Saguache.....	2,760.02	2,569.92
Summit.....	1,435.00	1,283.45
Teller.....	275.09	317.08
Washington.....		
Weld.....		
Yuma.....		
Total.....	\$ 54,922.64	\$ 56,340.42

The Forest Reserves in the various counties, and the area and earnings for 1913, are as follows:

Reserve	Earnings	County	Acres	Amount	
				Per Acre	Apportionment
Arapahoe.....	\$ 5,030.34	Grand.....	565,440	.0066237	\$ 3,745.30
		Jackson.....	194,000		1,285.04
Battlement.....	2,812.53	Delta.....	206,980	.0041523	859.43
		Garfield.....	48,000		199.32
		Gunnison.....	95,760		397.64
		Mesa.....	326,000		1,356.14

Reserve	Earnings	County	Acres	Amount	
				Per Acre	Apportionment
Cochetopa	\$ 3,136.47	Chaffee	89,920	.0033717	\$ 303.18
		Gunnison	32,640		110.10
		Hinsdale	115,340		388.89
		Saguache	692,320		2,334.30
Colorado	889.82	Boulder	78,600	.0013101	102.97
		Jackson	45,440		59.54
		Larimer	555,160		727.31
Durango	1,601.02	Archuleta	5,400	.0022741	12.34
		Hinsdale	61,596		140.07
		La Plata	473,980		1,077.88
		San Juan	163,024		370.73
Gunnison	2,741.73	Delta	20,500	.0028825	37.51
		Gunnison	917,810		2,645.12
		Montrose	13,000		59.10
Hayden	460.70	Jackson	75,700		460.70
Holy Cross	3,597.84	Eagle	546,820	.00594	3,248.10
		Garfield	49,920		296.52
		Pitkin	8,960		53.22
La Salle	157.05	Mesa	7,500	.0051495	38.60
		Montrose	23,000		118.45
Leadville	4,223.16	Chaffee	364,080	.0039964	1,455.00
		Grand	2,000		8.00
		Lake	150,000		600.00
		Park	181,440		725.16
		Summit	359,000		1,435.00
Montezuma	3,593.20	Dolores	345,000	.0044245	1,526.45
		La Plata	7,100		31.49
		Montezuma	278,000		1,230.01
		San Miguel	182,000		805.25

STATE HIGHWAY COMMISSION

63

Reserve	Earnings	County	Acres	Amount	
				Per Acre	Apportionment
Pike.....	\$ 2,799.53	Boulder.....	42,000	.002116	\$ 88.90
		Clear Creek.....	160,000		338.56
		Douglas.....	170,000		359.72
		El Paso.....	134,000		283.54
		Gilpin.....	42,000		88.90
		Jefferson.....	100,000		211.60
		Park.....	545,000		1,153.22
Teller.....	130,000		275.09		
Rio Grande.....	5,615.41	Conejos.....	300,000	.0045978	1,379.35
		Hinsdale.....	225,000		1,034.51
		Mineral.....	401,000		1,843.75
		Rio Grande.....	250,000		1,149.50
		Saguache.....	45,300		208.30
Routt.....	3,645.03	Grand.....	80,000	.0038938	311.51
		Jackson.....	115,000		447.80
		Moffat.....	76,100		296.33
		Routt.....	665,000		2,589.39
San Isabel.....	1,064.51	Chaffee.....	11,300	.0016346	18.49
		Costilla.....	28,350		46.36
		Custer.....	180,000		294.25
		Fremont.....	66,000		107.90
		Huerfano.....	168,000		274.63
		Las Animas.....	24,500		40.06
		Pueblo.....	40,000		65.40
		Saguache.....	133,050		217.42
San Juan.....	4,250.57	Archuleta.....	491,385	.0057054	2,803.55
		Hinsdale.....	104,260		594.85
		La Plata.....	3,355		19.05
		Mineral.....	144,460		824.20
		Rio Grande.....	1,560		8.92
Sopris.....	2,378.16	Eagle.....	87,500	.0036252	317.21
		Gunnison.....	65,500		237.46
		Pitkin.....	503,000		1,823.49
Uncompahgre.....	3,670.42	Gunnison.....	112,000	.0042292	473.68
		Hinsdale.....	60,000		253.76
		Mesa.....	222,000		938.89

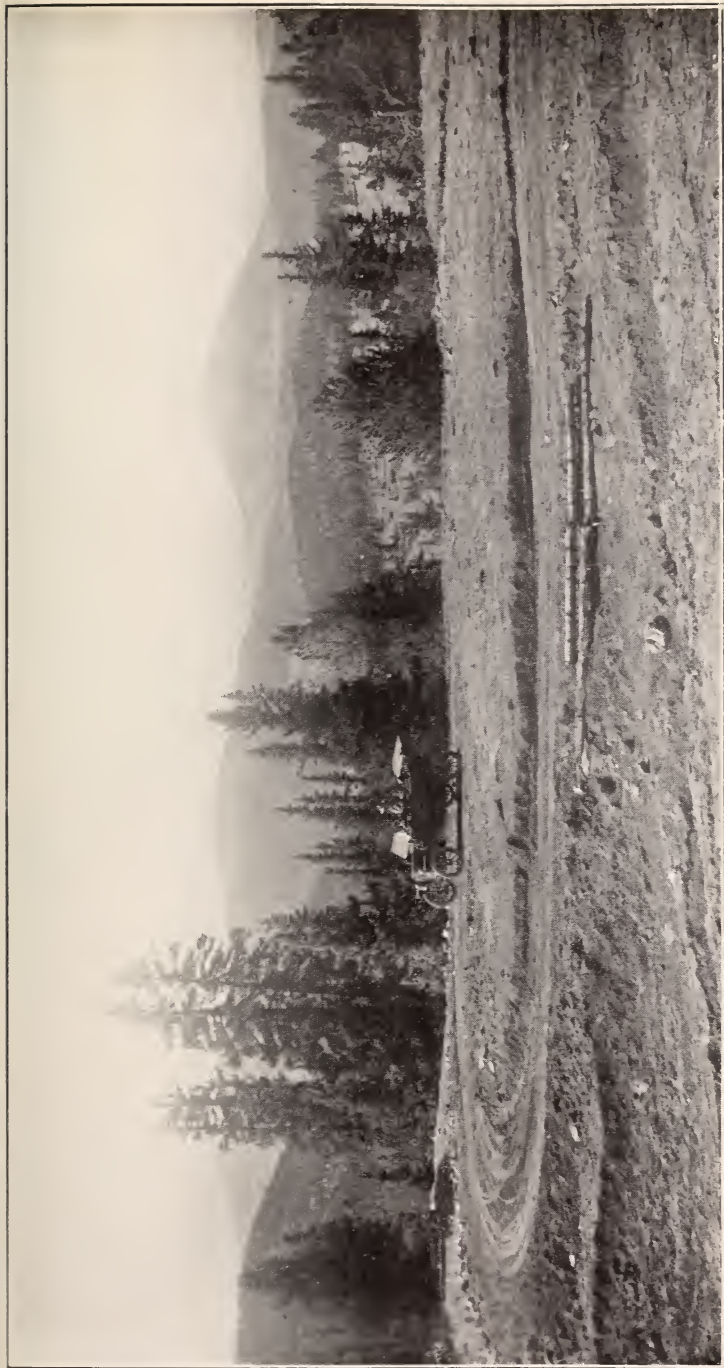
Reserve	Earnings	County	Acres	Amount	
				Per Acre	Apportionment
Uncompahgre— (Concluded)		Montrose.....	295,280		\$ 1,248.81
		Ouray.....	143,160		605.46
		San Miguel.....	23,120		97.79
		San Juan.....	12,300		52.03
White River.....	\$ 3,255.15	Eagle.....	28,000	.0037075	103.81
		Garfield.....	446,160		1,654.14
		Moffat.....	3,649		13.54
		Rio Blanco.....	386,160		1,431.68
		Routt.....	14,021		51.98
			\$54,922.64	14,559,480	\$ 54,922.64

FOREST RESERVE—ADDITIONAL 10% FUND.

In addition to the twenty-five per cent, there is spent 10% of the receipts expended by the Forestry Department on roads through the Forest Reserves. During 1913 and 1914 this fund was expended in the following counties by the U. S. officials, and on the projects as given in the table; all of these projects are on the State road system, except those in the Battlement, Durango, and Uncompahgre Forests.

(BY COURTESY OF MR. SMITH RILEY, DISTRICT FORESTER)

Forest	County	Project	Disbursements			Total
			1913	1914	1913 and 1914	
Arapahoe.....	Grand.....	Berthoud Pass.....	\$ 1,285.64		\$ 1,285.64	
Pike.....	Clear Creek..	Berthoud Pass.....	3,569.82		3,569.82	
Battlement	{	Garfield.....	Garfield-Buzzard Cr..	674.65		674.65
		Mesa.....	Grand Mesa.....		1,825.00	1,825.00
Cochetopa.....	Saguache.....	Cochetopa Pass.....	3,500.04	6,160.83	9,660.87	
Durango.....	La Plata.....	Oro Fino.....	4,905.53		4,905.53	
Gunnison.....	Gunnison.....	Black Mesa.....	934.96	65.00	999.96	
Holy Cross.....	Eagle.....	Tennessee Pass.....	995.07	4.93	1,000.00	
Leadville.....	Lake.....	Tennessee Pass.....	1,163.38		1,163.38	
Montezuma.....	Dolores.....	Dolores River.....	47.44	4,785.88	4,833.32	
Routt.....	Routt.....	Rabbit Ear.....	5,938.79	5,759.73	11,698.52	
San Isabel.....	Custer.....	Hardserabble.....	4,954.83	1,656.19	6,611.02	
San Juan.....	Hinsdale.....	Alamosa-Durango	3,689.82	25.00	3,714.82	
Sopris.....	Pitkin.....	Independence Pass.....	1,999.96		1,999.96	
Uncompahgre	{	Mesa.....	25-Mesa.....		780.62	780.62
		Montrose.....	Paradox-Montrose.....	757.88		757.88
Total.....			\$34,417.81	\$21,063.18	\$55,480.99	



TOMICHI DOME, LOOKING WEST FROM TOP OF MONARCH PASS—RAINBOW ROUTE—NEAR SALIDA, COLORADO. GUN-
NISON COUNTY—STATE PRIMARY ROAD NO. 28.

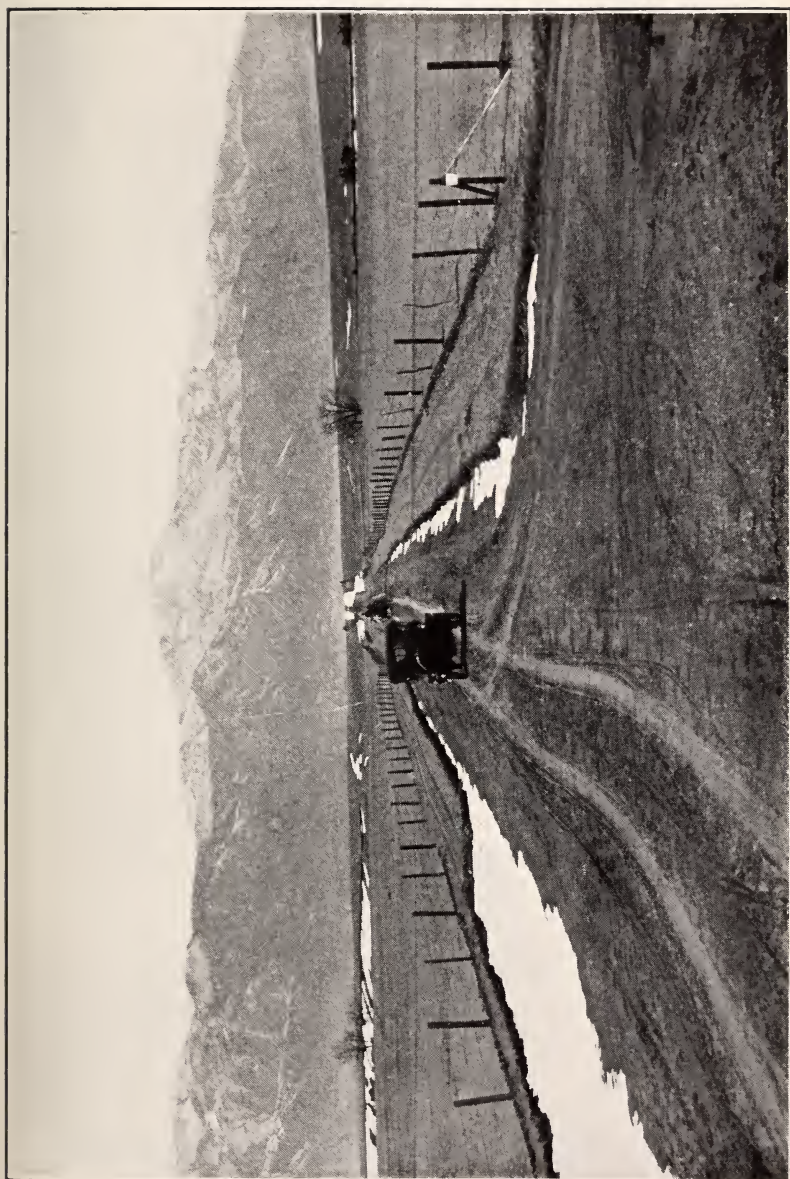
ROAD OVERSEERS.

A law was passed by the last Legislature, permitting the County Commissioners to appoint a competent man as General Overseer or Superintendent for all roads and bridges, and having all work done under his supervision and direction; this general overseer to act under the direction of the Board of County Commissioners. El Paso, Pueblo, Jefferson and Mesa Counties are the only counties who have appointed a General Overseer.

The following table gives the number of overseers for each county, as far as replies were received by this office. In counties where no general overseer is appointed, the District Overseers are under the immediate direction of the County Commissioner of that district.

COUNTY	General Road	Number of
	Overseer	Road Overseers
Adams.....	No	4
Arapahoe.....	No	2
Archuleta.....	No	3
Alamosa.....	No	..
Boulder.....	No	22
Baca.....	No	3
Bent.....	No	7
Clear Creek.....	No	
Chaffee.....	No	
Cheyenne.....	No	3
Custer.....	No	6
Crowley.....	No	3
Costilla.....	No	3
Conejos.....	No	1
Douglas.....	No	16
Dolores.....	No	2
Delta.....	No	
El Paso.....	Yes	1
Elbert.....	No	18
Eagle.....	No	16
Fremont.....	No	10
Gilpin.....	No	
Gunnison.....	No	3
Grand.....	No	
Garfield.....	No	3
Huerfano.....	No	
Hinsdale.....	No	
Jefferson.....	Yes	18

COUNTY	General Road	Number of
	Overseer	Road Overseers
Jackson..	No	2
Kit Carson..	No	15
Kiowa..	No	3
Larimer..	No	24
Logan..	No	
Lincoln..	No	13
Lake....	No	2
Las Animas..	No	3
La Plata..	No	
Morgan..	No	15
Montrose..	No	13
Montezuma..	No	3
Moffat.....	No	8
Mineral.....	No	1
Mesa.....	Yes	17
Otero.....	No	
Ouray.....	No	3
Phillips.....	No	6
Park.....	No	7
Pueblo.....	Yes	1
Prowers.....	No	6
Pitkin.....	No	11
Rio Grande..	No	6
Rio Blanco..	No	3
Routt.....	No	11
Sedgwick.....	No	8
San Miguel..	No	9
San Juan..	No	2
Saguache..	No	
Summit.....	No	1
Teller.....	No	4
Washington..	No	(36 road districts)
Weld.....	No	6
Yuma.....	No	14
	—	—
62 Counties	4	397



PIKE'S PEAK ROAD, EAST OF COLORADO SPRINGS, EL PASO COUNTY—STATE PRIMARY ROAD NO. 39.

CAMPING SITES.

A general letter was sent to ninety (90) cities and towns of the State, inquiring as to what provision, if any, had been made for a camping site for touring visitors. In reply, the officials of the following cities and towns stated that they have provided a site for camping parties.

CITY OR TOWN	COUNTY	
Holyoke.....	Phillips.....	See Mayor or Clerk
Bflush.....	Morgan.....	City Park or see Clerk
Fort Morgan.....	Morgan.....	City Park or see Clerk
Greeley.....	Weld.....	Inland Grove Park
Castle Rock.....	Douglas.....	
Cheyenne Wells.....	Cheyenne.....	See Mayor
Colorado Springs.....	El Paso.....	Prospect Lake
Pueblo.....	Pueblo.....	Fairmount Park
Salida.....	Chaffee.....	Old Race Track Grounds
Alamosa.....	Alamosa.....	See Mayor or Clerk
Pagosa Springs.....	Archuleta.....	See Town Clerk
Creede.....	Mineral.....	Along Rio Grande River
Lake City.....	Hinsdale.....	
Ouray.....	Ouray.....	See City Clerk
Cortez.....	Montezuma.....	See Mayor or Clerk
Montrose.....	Montrose.....	See Mayor or Clerk
Rifle.....	Garfield.....	See Mayor or Clerk
Steamboat Springs.....	Routt.....	See Mayor or City Clerk

The National Forest Reserves are also open to campers, under reasonable regulations, regarding camp fires and pollution of streams.

TRAFFIC CENSUS.

Letters were sent to the various commercial bodies of the State, asking their co-operation in obtaining a census of the traffic on the principal roads leading into their towns. The following data has been received up to date. This line of inquiry is important, and will be continued. Time of observation not given, but assumed as 10 hours.

LEADVILLE—LAKE COUNTY

(By Joseph W. Clark, Leadville, Colorado)

Vehicles passing Durning Ranch, Tennessee Park, north of Leadville on State Highway No. 40

		4-Horse		2-Horse	1-Horse	Bicycles	Total
1914		Automobiles	Teams	Teams			
July 3		11		7	15	1	34
4		13		6	40		59
5		15		8	14	2	39
6		7		5	9		21
7		8	2	4	17	2	33
8		6		6	11		23
9		7		2	8	2	19
10		4		5	17		26
11		8		6	6	2	22
12		11		4	26		41
13		3		4	5		12
14		7		7	17		31
15		3		5	3		11
16		13		1	5		19
17		4		5	5	1	15
18		4		2	8		14
19		6		4	20		30
20		5		6	6		17
21		11		2	5		18
22		4		5	8		17
23		12		2	16		30
24		6		5	9		20
25		7		8	15		30
26		12		8	26	4	50
27		12		4	11	1	28
28				4	9		13
29		9		9	13	6	37
30		7		6	14		27
31		12		9	11		33
Total		227	2	149	369	21	768



DURANGO-SILVERTON ROAD, SAN JUAN COUNTY—STATE PRIMARY
ROAD NO. 13.

PUEBLO, PUEBLO COUNTY

(By J. H. Jenkins, Pueblo, Colorado, Secretary Commercial Club)

All for Sunday, April 30, 1913 (assumed as 10 hours). Road Pueblo east, State Road No. 5.

	2-Horse		Motor-	Bicycles	Total
	Automobiles	Teams	cycles		
Both ways.....	256	519	120	67	962
N. & S. road, State Road No. 26					
both ways.....	73	50	32		155
Beulah road, State Road No. 78,					
both ways.....	94	60	26	20	200
Colorado Springs road, State					
Road No. 4, both ways.....	232	21	49		302
Canon City road, State Road No.					
5, both ways.....	86	3	13		102

LONGMONT, BOULDER COUNTY

(By D. W. Thomas, Secretary Commercial Association, Longmont)

Longmont-Denver Road, State Road No. 2:

	2-Horse		1-Horse	Motor- cycles	Bicycles	Threshing Machine	Total
	Automobile	Team					
Wednesday							
Aug. 20, 1913.....	107	76	90	4	7	1	215
Saturday							
Aug. 30, 1913.....	126	57	94	11	20		311
Saturday							
Sept. 13, 1913.....	93	64	100	3	24		284
Longmont-Loveand Road, State Road No. 2:							
Saturday							
Aug. 23, 1913.....	151	105	124	25			405
Wednesday							
Aug. 27, 1913.....	109	125	110	13	16		373
Saturday							
Sept. 6, 1913.....	127	62	125	17	16		347
Saturday							
Sept. 20, 1913.....	98	66	103	12	13		292

MONTROSE, MONTROSE COUNTY

(By Lynn Monroe, Secretary Chamber of Commerce, Montrose)

Time—8 A. M. to 6 P. M.

Saturday, June, 1913

At Main St. Bridge on State Roads Nos. 13 and 20:

Automobiles	4-Horse		2-Horse		Motorcycles	Bicycles	Total
	Teams	Teams	1-Horse	Teams			
61	12	171	230	12	38	524	

Road to Delta, State Road No. 12:

17	..	41	65	1	2	126
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Blue Mesa Road, State Road No. 20, at Cimarron, Colo.:

(By R. M. Wright, Cimarron, Colo.)

July 8 to August 1, 1913—10 hours per day

		Automobiles
July	8.	4
	9.	17
	10.	9
	11.	4
	12.	4
	13.	4
	14.	2
	15.	2
	15.	7
	20.	6
	21.	6
	22.	7
	23.	3
	24.	4
	25.	9
	26.	6
	27.	3
	29.	5
	30.	3
	31.	4
Total		109

No record kept of other class of traffic

LITTLETON, ARAPAHOE COUNTY

(By John Maloney, Sunday, December 17, 1912)

Weather clear—roads good

Denver-Colorado Springs Road, State Road No. 3:

2-Horse

	Automobiles	Teams	1-Horse	Motorcycles	Bicycles	Total
10 to 12 A. M.	14	10	4	6		34
2 to 4 P. M.	18	10	5	4		37
	—	—	—	—	—	—
	32	20	9	10		71

(By John and Catherine Maloney, Sunday, April 20, 1913)

Weather clear—roads fair

10 to 12 A. M.	53	5	5	8		69
2 to 4 P. M.	326	40	21	51		438
	—	—	—	—	—	—
	379	45	24	59		507

Sunday, May 4, 1913

Weather clear—roads good

8 to 12:30 A. M.	135	40	20	40	Not taken	235
12:30 to 6:30 P. M.	445	64	32	147	do	688
	—	—	—	—	—	—
	580	104	52	187		923

Sunday, July 23, 1913

Weather clear—roads good

10 to 12 A. M.	100	40	20	25	Not taken	185
3:45 to 6:45 P. M.	100	30	10	20	do	160
	—	—	—	—	—	—
	200	70	30	45		345

Sunday, Nov. 16, 1913

Weather clear—roads good

2 to 5 P. M.	252	12	6	25	Not taken	295
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AURORA, ADAMS COUNTY

(By Dr. F. L. Bartlett, Denver, December 17, 1912)

Limon and Denver-Ft. Morgan Road, State Road No. 7:

Automobiles

3 to 4 P. M.

180

Other vehicles not taken.

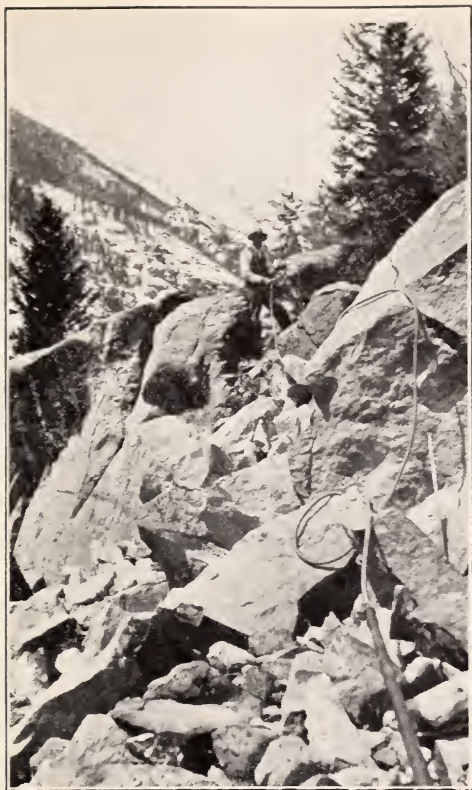
WATKINS, ADAMS COUNTY

(By E. E. Montgomery, Littleton, Colo.)

Denver-Limon and Ft. Morgan Road, State Road No. 7:

1910	Automobiles	2-Horse Teams	Motorcycles	Total
Oct. 10, P. M.		4	..	4
11, A. M.	2	1	..	3
17, P. M.	4	6	1	11
18, all day	7	9	..	16
20, all day	4	8	..	12
25, P. M.		4	..	4
26, all day	6	6	..	12
31, P. M.	3	2	1	6
Nov. 4, all day	4	13	..	17
5, all P. M.	1	3	1	5
	—	—	—	—
	31	56	3	90

These fragmentary observations are published so as to serve as a beginning for a complete record for every section of the State. The records should show separately 6-horse, 4-horse, 2-horse teams, and single horses, automobiles, motorcycles, bicycles, threshing and roller engines; weather conditions and road conditions. It is hoped to be able to make a complete record of all the principal roads of the State, and to show the traffic in tons per foot of width per hour.



PORTABLE AIR COMPRESSOR AND DRILLING WORK ON FALL RIVER ROAD, LARIMER COUNTY (CONVICT WORK)—STATE PRIMARY ROAD NO. 51.

WIDTH OF TIRES.

This question of wide tires has been discussed a great deal, particularly in reference to the effect of narrow tires upon the road surface, but there is also the question of tractive resistance to be considered.

These notes are recorded here so that information bearing on this question might be available in convenient form. In regard to tractive resistance of broad and narrow tires the following experiments are instructive.

TRACTIVE RESISTANCE OF BROAD AND NARROW TIRES IN POUNDS
PER TON OF 2,000 LBS.*

(Bulletin No. 39, July, 1897, Missouri Agricultural Station)

Ref. No.	Description of Road Surface	Width of Tires		No. of Trains
		1½ in.	6 in.	
Broken Stone Road:				
1	Hard, smooth, no dust, no loose stones, nearly level.	121	98	2
Gravel Roads:				
2	Hard and smooth, few loose stones, size of walnuts	182	134	2
3	Hard, no ruts, large quantity of sand which prevents packing	239	157	1
4	New gravel, not compact, dry	330	260	1
5	Wet, loose sand, 1" to 2½" deep	246	254	2
Earth Roads:				
6	Loam, dry, loose, dust 2" to 3" deep	90	106	2
7	Loam, dry, hard, no ruts, no dust, nearly level	149	109	3
8	Loam, stiff mud, drying on top, spongy below	497	307	1
9	Loam, mud 2½" deep, very sticky, firm below	251	325	1
10	Clay, sloppy mud, 3" to 4" deep, hard below	286	406	1
11	Clay, dry on top, but spongy below, narrow tires cut in 6" to 8"	472	422	2
12	Clay, dry on top, but spongy below	618	464	5
13	Clay, stiff, deep mud	825	551	1
Mowing Land.				
14	Timothy sod, dry, firm, smooth, narrow tires cut in 1"	317	229	1
15	Timothy sod, moist, narrow tires cut in 3½"	421	305	1
16	Timothy sod, soft and spongy, grass and stubs 3" high, nar- row tires cut in 6"	569	327	1
Pasture Land:				
17	Blue grass sod, dry, firm, smooth	218	156	2
18	Blue grass sod, soft, narrow tires cut in 3"	420	273	2
19	Blue grass sod, narrow tires cut in 4"	578	436	1

*From Baker's "Roads and Pavements"

Ret No	Description of Road Surface	Width of Tires		No. of Trials
		1½ in.	6 in.	
Stubble Land:				
20	Corn stubble, no weeds, nearly dry enough to plow	631	418	2
21	Corn stubble, some weeds and stalks, dry enough to plow	423	362	1
22	Corn stubble, in autumn, dry and firm	404	256	2
23	Plowed land, freshly plowed, not harrowed, surface rough	510	283	1
24	Plowed land, freshly plowed, harrowed, smooth and compact	466	323	1

It is to be noted that only in the deep, sticky, clay mud or dust was the resistance of the narrow tire equal to or less than the 6-inch tire; for every other condition the 6-inch tire offered the least resistance.

Morrison, in his "Highway Engineering," has the following, based upon the foregoing experiments:

	No. of Trials	Load Hauled	Load Hauled
		on 6" Tire	on 1½" Tire
Macadam Road.	2	2,518 lbs.	2,000 lbs.
Gravel Road	6	2,482 lbs.	2,000 lbs.
Dirt Road:			
(Except when very muddy, or very dusty)		2,530 lbs.	2,000 lbs.
(When dry on top and spongy below)		3,200 lbs.	2,000 lbs.

"On clay road, dry surface, with deep ruts cut by narrow tires in the ordinary use of the road. In every trial, the first run of the broad tire showed materially increased draught when compared to the narrow tire run in its own rut. The second run of the broad tire completely eliminated this disadvantage, and showed a lighter draught for the broad tire than the narrow tire showed in the first run.

"It appears that six inches is the best width for a combination farm and road wagon, and that both axles should be the same length, so that front and hind wheels will run in the same track.

"It is therefore evident that wide tires not only tend to diminish the draught under most conditions, but that they also aid in the preservation of the road surface.

"An Act of the N. J. Legislature dated March 24, 1896, permits township committees to pass an ordinance allowing a rebate of taxes to owners or possessors of wagons or carts with tires not less than 4 inches in width."

In "Roads and Pavements" by F. P. Spaulding (1908):

"Narrow tires have a much more destructive effect upon a road surface than wide tires, and from the point of view of road maintenance, wide tires are very desirable.



COLORADO SPRINGS-PUEBLO ROAD, EL PASO COUNTY—FORM WORK FOR CONCRETE ARCH AT BUTTES, OVER
FOUNTAIN CREEK—STATE PRIMARY ROAD NO. 4.

"The concentration of a heavy load upon narrow wheel tires affords very little surface of contact between the wheel and road, and causes the wheel to indent the road surface, giving a powerful cutting action. The same load on a tire of sufficient width would tend to compact the road, acting like a roller. * * *

"The general introduction of wide tires upon vehicles traveling over highways would greatly simplify the problem of road maintenance, particularly upon earth roads.

"The usual width of tire upon ordinary wagons is 11½" or 13¼". For the best effect upon the highways, these should be increased so as to vary from about 3 to 5 or 6 inches, according to the load for which the wagon is designed."

EFFECT OF WIDTH OF TIRE UPON TRACTIVE POWER
RESISTANCES IN POUNDS PER TON*

Ref. No.	Description of the Road Surface	Diameters of the Front and Rear Wheels, Respectively										
		3' 6" and 3' 10"		3' 6" and 3' 10"		3' 8" and 4' 6"		3' 6" and 3' 10"		3' 8" and 4' 6"		
		Width of Tire										
		11½"	4"	11½"	4"	11½"	4"	11½"	3"	13¼"	3"	
1	Sod								283	239	189	228
2	Earth roads, hard		108						152	152	114	114
3	Earth roads, muddy		243	268	304	236	254				265	228
4	Sand road, hard	199	162	171	164	141	168					
5	Sand road, deep	371	351									
6	Gravel road, good			98	117	83	80				66	76
7	Wood block, round	51	49	61	70	35	46		54	28	38	

*From Baker's "Roads and Pavements," Proc. of Inst. of Mechanical Engineers (London) 1890, Part No. 2, p. 195. Pamphlet by Studebaker Bros. Manufacturing Co., South Bend, Ind., 1892.

Baker, in "Roads and Pavements," 188 and 189:

"It is desirable that a wagon in passing over the road should help to make or preserve it, and not to destroy it; and therefore as far as the road is concerned within reasonable limits, the broader the tire, the better."

"In England for one hundred years the law required one inch of tire for each 500 lbs of load, but all laws regulating width of tires have been repealed.

"The Massachusetts Highway Commission (1893) says: 'It is a matter of doubtful expediency to endeavor, in the present State of our Highways, by general legislation to control the width of tires or the diameter of wheels.'

"It is probably best to leave the matter to private individuals, and the enterprise of manufacturers.

"According to wagon manufacturers (1903) about 60% of the wagons used on county roads have tires 1½" to 1¾ inches wide; those of the remaining 40% being 2 to 4 inches.

"In France, the tires of market carts vary from 3 to 10 inches in width, being generally 4 to 6 inches, with the rear axle about 14 inches longer than the forward one.

"In Bavaria the legal width is as follows:

Minimum width of tire of 2-wheel carts with 2 horses.....	4.13 inches
Minimum width of 2-wheeled carts with 4 horses.....	6.18 inches
Minimum width of 4-wheeled wagons with 2 horses.....	2.60 inches
Minimum width of 4-wheeled wagons with 3 or 4 horses.....	4.13 inches
Minimum width of 4-wheeled wagons with 5 to 8 horses.....	6.18 inches

The following is the legal width in Ohio:

Minimum width of tire for load of 2500 to 3500 lbs.....	3 inches
3500 to 4000 lbs.....	3½ inches
4000 to 6000 lbs.....	4 inches
6000 to 8000 lbs.....	5 inches
8000 or more.....	6 inches

N. S. Shaler (Dean of Lawrence Scientific School, Harvard University, former Pres. Massachusetts Highway Commission) in "American Highways" (1896):

"The matter of width of tires has been the subject of much remark. There has, indeed, been no end of idle talk concerning this matter; much of it directed to the point that our American wagon builders have shown a lack of judgment in building with narrow tires, while they should provide their vehicles with broad treads such as are in use in Europe.

"The fact is that in this, as in many other ways in which our people have departed from ancient and old world customs, they have been led by wisdom and not by folly. This will, on a little consideration, be made evident.

"Where there is no definite pavement, as in ninety-nine hundredths of the mileage of American roads, the wheels have in muddy weather to descend into the earth, until they find a firm foundation on which to rest. In doing so they have to cleave sticky mud, which often has a depth of a foot or more. If these wheels were broad-tired, the spokes would also have to be thick

and the felloes wide, so that the aggregate holding power of the mud upon the vehicle would be perhaps twice what it is at present.

"It is useless to talk about the advantages of a broader tread to the wheels of our wagons until we have a thoroughly good system of roads, which they are intended to traverse. Any laws looking to this end would be disobeyed, because of private needs so general that they would amount to a public necessity. When the roads of a district are made good only as to main lines of communication, the side roads and farms still demand the peculiar advantages afforded by the narrow tire."

Austin T. Byrne in "Highway Construction" (1908):

"Vehicles with narrow tired wheels carrying heavy loads cause much damage, particularly on roads where they run in one track: the knife-like tire cuts into the road covering, forming ruts which each succeeding vehicle deepens; thus the cost of maintenance is considerably increased.

"The proper width of tire, or proper load for a given width of tire is a question that deserves more attention than is usually accorded to it.

"The best width of tire, measured when new, is shown in table.

Load on Each Wheel	DESCRIPTION OF VEHICLES			
	Two Wheels	Two Wheels	Four Wheels	Four Wheels
	Without Springs,	With Springs,	Without Springs,	With Springs,
	Inches	Inches	Inches	Inches
$\frac{1}{4}$ ton.	6	3	5	3
$\frac{1}{2}$ ton	6	3	5	3
1 ton.			5	3½
1½ ton			5	4
2 ton.			6	4½

"The French Commission, presided over by Morin and Depuit, recommends as maximum width of tire, $4\frac{3}{4}$ inches, and as minimum width $2\frac{3}{8}$ inches.

"The width of tires should be established by law."

"In June, 1892, the Studebaker Bros. Mfg. Co. of South Bend, Ind., made a series of tests, to determine the relative merits of wide and narrow tires, with regard to the resistance they offered to traction upon different road surfaces. The tests showed that the width of tire has very little effect upon the power required to move loads upon hard surfaces, such as stone blocks, hard sand, or gravel, the power required to move one ton. (2240 lbs.) being:

	1½-inch Tire	4-inch Tire
Stone blocks	168 lbs.	180 lbs.
Hard sand	383 lbs.	360 lbs.
Hard gravel	344 lbs.	311 lbs.

“Upon soft ground, such as mud, and grass sods, into which the narrow tires would cut, the wide tires have a slight advantage: (to move 2240 lbs.)

	1½-inch Tire	4-inch Tire
Soft mud	476 lbs.	412 lbs.
Sod	610 lbs.	537 lbs.

“The power to keep the load in motion after being started, was found to range from 25 to 50 per cent less than that required to start it. It was also found that less power was required to start the load when wheels of large diameter were employed.”

The following table was made up to give an idea of the pressures on the road surface, for various loads on several different widths of tire, compared with the pressure per square inch of a 15 ton road roller.

PRESSURE PER SQUARE INCH OF TIRE FOR ALL FOUR WHEELS
OF A WAGON

Width of Tire	Area per Lin. Inch of Tire	LOADS				
		2 Tons	3 Tons	4 Tons	5 Tons	6 Tons
		Pressure per Square Inch of Tire				
1½ inch	6 sq. in.	667	1,000	1,333	1,667	2,000
2 inch	8 sq. in.	500	750	1,000	1,250	1,500
2½ inch	10 sq. in.	400	600	800	1,000	1,200
3 inch	12 sq. in.	333	500	667	833	1,000
3½ inch	14 sq. in.	286	429	572	714	857
4 inch	16 sq. in.	250	375	500	625	750
4½ inch	18 sq. in.	222	334	445	555	667
5 inch	20 sq. in.	200	300	400	500	600

A 15 ton road roller will have 20,000 lbs. on its rear wheels of 20 inches width each, equal to 40 sq. inches per lineal inch, giving a pressure on the road surface of 500 lbs. per sq. inch.

In the mountain districts of our State, on side hill roads, where it is sometimes sidling, and where there is a tendency of the wheels to slew and slip, especially, in wet and winter weather, it is a fact that narrow tires afford a better grip on the road, and lessen the chance of slewing off, but even in this case, a 2 or 2½ inch tire would be as efficient as the 1½ inch, and certainly be better on other roads, while in all except a few conditions the 5 inch tire would be better for general conditions.



ROARING FORK ROAD, PITKIN COUNTY—STATE PRIMARY ROAD
NO. 25.



ROARING FORK ROAD, PITKIN COUNTY
—STATE PRIMARY ROAD NO. 25, NEAR
THE "PUNCH BOWL."

TESTS OF ROAD MATERIAL.

Through the courtesy of Prof. Milo S. Ketchum, the use of the testing laboratory of the Engineering Department, University of Colorado, at Boulder, was offered to the State Highway Commission, together with the active co-operation of the faculty and students, for the testing of material for road surfacing, as well as for the testing of cements used in the construction work.

It is desirable that as complete information as possible be obtained as to the characteristics of our road surfacing materials, and during the coming season, County Commissioners and Road Overseers will be requested to forward samples of all available road surfacing materials to this office.

During the past season, tests of gravel from Wellington, Larimer County, and gravel from near Morrison, have been received by this office. In the various tests the maximum, minimum, and average conditions are as follows:

Hardness (loss of weight)	Above 17, hard	14 to 17, medium	Below 14, soft
Toughness (No. of blows)	Above 19, high	13 to 19, medium	Below 13, low
Abrasion (per cent of wear)	14 to 20, high	8 to 13, medium	Below 8, low
Cementing value (No. of blows)	25 to 75, high	10 to 25, medium	Below 10, low
	76 to 100, very good		

The following table of tests is published to give a general idea of the characteristics of the various rocks.

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF PUBLIC ROADS

Division of Tests.

Maximum and Minimum Results on Rock Samples, Corrected to January 1, 1910.

No. of Samples	NAME		Specific Gravity			Weight—Pounds per Cubic Foot			Water Absorbed—Lbs. per Cubic Foot			Per Cent. of Wear			French Coefficient of Wear			Hardness			Toughness		Compressing Value		NAME
			Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Max.	Min.		Max.	Min.
15	Amphibolite.....		3.10	2.70	3.00	193	168	187	1.65	0.04	10.3	1.0	41.7	3.9	19.0	13.5	29	7	235	11					Amphibolite
40	Andesite.....		2.95	2.20	2.70	184	137	168	6.59	0.05	8.1	1.5	26.0	4.9	19.4	7.9	44	6	500+	11					Andesite
83	Basalt.....		3.00	2.40	2.85	187	150	178	6.32	0.04	14.7	1.3	30.4	2.7	19.2	5.9	39	6	500+	4					Basalt
48	Chert.....		2.95	2.00	2.55	184	125	159	11.10	0.26	29.2	2.7	14.6	1.4	19.7	12.7	26	5	500+	2					Chert
5	Conglomerate.....		2.65	2.50	2.60	165	156	162	3.71	0.60	12.7	3.5	11.6	3.2	18.4	9.3	10	10	500+	20					Conglomerate
183	Diabase.....		3.20	2.60	2.90	200	162	181	2.73	0.63	6.3	1.1	36.4	6.4	19.4	12.3	54	4	500+	2					Diabase
57	Diorite.....		3.35	2.70	2.85	209	168	178	1.03	0.05	7.3	1.6	25.0	5.5	19.4	16.6	38	5	148	5					Diorite
140	Dolomite.....		2.90	2.30	2.75	181	143	172	9.40	0.07	18.6	1.2	33.3	2.2	18.4	1.8	27	3	179	9					Dolomite
6	Eclotite.....		3.65	2.95	3.20	228	184	200	0.28	0.10	2.9	1.8	22.7	13.8	18.7	17.4	31	14	130	10					Eclotite
6	Epidosite.....		3.30	2.70	3.00	206	168	187	1.10	0.22	7.4	2.0	19.6	5.4	19.3	10.7	23	10	83	14					Epidosite
11	Felsite.....		2.80	2.50	2.65	175	156	165	3.13	0.02	3.4	1.9	21.3	11.8	.....	.....	.....	.....	.....	.....					Felsite
90	Fieldstone.....		.....	.....	.....	.....	.....	.....	.....	.....	10.3	2.1	19.0	3.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Fieldstone
36	Gabbro.....		3.65	2.75	2.95	228	172	184	0.97	0.04	5.9	1.3	30.8	6.8	18.8	16.2	23	9	115	6					Gabbro
115	Gneiss.....		3.20	2.60	2.75	200	162	172	1.24	0.02	16.4	1.7	23.0	2.4	19.3	9.0	25	2	119	1					Gneiss
168	Granite.....		3.00	2.00	2.65	187	125	165	2.77	0.04	24.6	1.1	37.0	1.6	19.6	13.6	33	2	255	2					Granite
117	Gravel.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Gravel
573	Limestone.....		2.90	2.00	2.70	196	125	168	13.22	0.02	34.2	1.8	21.7	1.2	19.1	0.0	25	2	500+	10					Limestone



CONCRETE GIRDER BRIDGE OVER SAND CREEK, ADAMS AND ARAPAHOE COUNTIES—STATE PRIMARY ROAD NO. 7.

20	Marble	2.85	2.65	2.75	178	165	172	1.04	0.10	14.0	2.5	16.0	2.8	17.3	7.1	23	3	85	15	Marble
9	Marl																	500+	96	Marl
19	Mixed stone									10.3	2.1	19.1	3.9							Mixed stone
5	Peridotite	3.55	2.65	2.95	221	165	181	1.02	0.27	5.3	3.0	13.2	7.6	15.0	13.3	12	9	91	25	Peridotite
78	Quartzite	3.15	2.50	2.70	196	156	168	1.89	0.05	7.6	1.6	21.5	5.3	19.7	16.5	30	5	15	0	Quartzite
35	Rhyolite	2.90	2.05	2.55	181	128	159	7.15	0.03	9.7	1.7	23.0	4.1	19.7	15.3	12	6	500+	10	Rhyolite
244	Sandstone	3.25	2.00	2.65	203	125	165	11.60	0.02	41.7	1.0	40.8	1.0	19.5	0.0	60	2	500+	1	Sandstone
114	Schist	3.20	2.65	2.90	200	165	181	1.35	0.06	18.2	1.3	31.7	2.2	19.0	0.9	35	3	232	5	Schist
9	Shale	2.70	2.50	2.65	168	156	165	1.81	0.50	16.2	3.2	12.6	2.5	17.7	13.9	12	3	367	28	Shale
43	Slag	3.90	2.00	3.00	213	125	187	4.40	0.01	13.5	2.7	14.6	3.0	18.3	10.7	21	3	500+	1	Slag
45	Slate	3.35	2.60	2.75	209	162	172	2.10	0.05	12.4	1.6	21.4	3.2	19.7	1.1	56	1	500	1	Slate
26	Syenite	3.05	2.15	2.70	190	131	168	4.21	0.08	14.4	1.7	23.5	2.8	19.2	17.3	34	8	375	16	Syenite

ELEVATION OF PASSES.

(THIS TABLE IS COMPILED FROM THE BEST INFORMATION AT HAND
AND IS BELIEVED TO BE CORRECT)

	Feet
Alpine Pass.....	11,606
Alpine Tunnel.....	13,286
Argentine Pass.....	11,489
Boreas Pass.....	11,503
Breckenridge Pass.....	11,306
Berthoud Pass.....	10,032
Cochetopa Pass.....	11,163
East River Pass (Gunnison County).....	11,678
Elwood Pass.....	11,320
Fremont Pass.....	9,570
Gove Pass.....	10,313
Hoosier Pass.....	10,780
Hayden Pass.....	9,839
Hilltop Junction.....	12,095
Independence Pass.....	9,378
La Veta Pass.....	12,226
Lake Creek Pass (Lake and Gunnison Counties).....	13,188
Mosquito Pass.....	9,713
Mosca Pass (Huerfano and Saguache Counties).....	10,950
Marshall Pass.....	10,488
Molas Lakes.....	11,650
Monarch Pass.....	8,772
Muddy Pass (Jackson and Grand Counties).....	10,033
Ohio Pass.....	8,945
Poncha Pass.....	12,715
Pearl Pass (between Pitkin and Gunnison Counties).....	11,018
Red Mountain.....	11,680
Rollins Pass.....	9,454
Sangre de Cristo Pass.....	12,590
Stony Pass.....	8,560
San Francisco Pass (Las Animas County).....	10,276
Tennessee Pass.....	12,466
Tarryall (Park County).....	9,346
Trout Creek (Park and Chaffee Counties).....	10,628
Weminuche Pass.....	12,109
Weston Pass.....	9,683
Willow Creek Pass.....	



NORWOOD HILL ROAD, SAN MIGUEL
COUNTY—STATE PRIMARY ROAD NO.
44.



SILVERTON-OURAY ROAD, OURAY COUNTY—STATE PRIMARY ROAD
NO. 13.

	Feet
Yellow Jacket Pass (Rio Blanco County)	7,493
Georgia Pass	
Webster Pass	
Loveland Pass	
Jones Pass	
Taylor Pass	
Cottonwood Pass	
Williams Pass	
Cumbres	10,003
Lulu Pass	
Buffalo Pass	10,650
Wolf Creek	10,850

CONTRACT WORK

COUNTY	State Road No.	Character of Work	Unit Price Per Cu. Yd.	GRADING AND	
				Total Sum	Length, Miles
Adams	2	Grading	.....	\$ 565 00	2½
		Graveling	\$1.62	3,456.00	2½
		Force account at cost plus 10%	.....	.....	.....
Alamosa	16	Grading	0 09	1,347 40	6 63
Arapahoe	27	Graveling	1 00	400 00	1
	27	Graveling and grading (includes 40-ft. retaining wall, pipe culverts and rolling gravel)	.....	2,804 33	1
Bent	6	Grading—Estimated haul, 1,800	0.25	3,090 85	6 1-8
		Surfacing (shale), borrow	0.10	.....	.....
		Surfacing (shale), in place	0.80	420 00	.....
		(Shale and clay), 4,500' haul	0.40	440 00	.....
Boulder	2	Graveling, 16' wide, Boulder road	1 09	15,538 04	9
		Graveling, 16' wide—			
		North and South road—Miles 1 and 2	1 06½	3,373 92	2
		Miles 3, 4 and 5	1 12½	5,346 00	3
		Graveling, North and South road	1 12½	4,455 00	2½
Douglas	8	Grading, earth	0.20	471 48	¼
		loose rock	0.40		
	8	Grading, earth	0.14	2,887.12	-
		loose rock	0.35		
		solid rock	0.80		
	3	Grading, earth fill	0 18	189 72	1-8
	3	Grading, earth fill	0 16	4,052 66	½
	8	Grading (Superintendent, \$125 per mo.; man and team, 50c per hr.; man and two teams, 85c per hr., and all tools and equipment; man, 25c per hr.)	.....	5,727 32	.....

DURING 1913 AND 1914.

SURFACING

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
2,500	\$ 226.00	7-20-14	H. L. Kuykendall, Denver, Colo.	Hard adobe, ditch and crown
About 2,200	1,425.60		H. L. Kuykendall	Pit gravel, crush and haul 3 miles
			H. L. Kuykendall	For extra work. All about 60% completed
.....	203.23	6-10-14	H. Albright, Atamosa, Colo.	Loam and sand; ditch and crown. Finished
About 400	400.00	2-00-14	Green & Olin, Denver	Pit gravel, not crushed or spread. Haul about 2½ miles. Finished
1,978 of gravel	2,804.33	7-3-14	City of Denver; city paid ½; county paid ½	Haul gravel, 2 miles. Finished
19,295	505.05	10-00-13	Beck & Wright, Las Animas	Also includes placing 18 culverts. Finished
.....				
525				
1,100				Finished
	1,726.56	5-8-13	E. J. Carver, Boulder	Crush, haul and spread; average haul, 2½ miles. Finished
42	1,782.00		O'Neil & Co., Boulder	Crush, haul and spread; average haul about 3 miles
3,960	1,782.00	4-10-14	H. L. Kuykendall, Denver	Crush, haul and spread; average haul about 2 miles. Finished
.....		6-30-13	P. D. Pugh and E. J. Andrews, Castle Rock, Colo.	Short piece of adobe and rock excavation, 3' cut, between Larkspur and Greenland. Finished
.....		7-7-13	Ed. O'Neil, Sedalia	Larkspur Hill
.....		1-13-14	Ed. O'Neil, Sedalia	Approach to bridge near Gann Finished
.....		2-4-14	Ed. O'Neil, Sedalia	Approach to bridge near Wolhurst. Finished
.....		4-27-14	Ed. O'Neil, Sedalia	Between Larkspur and Castle Rock by day work for outfit. Finished

CONTRACT WORK DURING

GRADING AND

COUNTY	State Road No.	Character of Work	Unit		Length, Miles		
			Price Per Cu. Yd.	Total Sum			
Dolores	3	Graveling.....	80 75	84,188 37	2		
		Grading, earth.....	0 14		1		
		Force account at cost, plus 10%					
	45	Grading, earth.....	0 155	}			
		borrow fill.....	0 155				
		overhaul.....	0 100				
		Grading, earth.....	0 30		243 ft.		
		solid rock.....	0 75				
		earth.....	0 30		100 ft.		
	Eagle	10	solid rock.....	0 75	}	400 ft.	
earth.....			0 30				
solid rock.....			0 75				
earth.....			0 30	500 ft.			
10		Grading (inc. 14 box culverts 2'x16' span bridges)—		}	700 ft.		
		Sec. 1—earth,			2,540 00	5,400 ft.	
		rock					
		Sec. 2—earth,			1,050 00	14,357 ft.	
10	rock.....						
	Grading, Sec. 1 (inc. 1 box culvert, 1'x1') ..		295 00	284 ft.			
	Sec. 2 (inc. 1 box culvert, 2'x2' and 56 ft. guard rail).....		295 00	1,357 ft.			
Elwood Pass Road	15	Grading—	Per day	}	Day labor force		
		Men, rock work	83 00			}	
		Men, laborer.....	2 50				
		Foreman.....	3 75				
		Team.....	3 00				
		Blacksmith.....	3 75				
		General foreman.....	4 75				
		4-horse team and driver.....	7 50				
		2-horse team and driver.....	5 00				
		And 5% for outfit and superintendent					
15	Grading—		}				
	2-horse team and driver.....	5 00		3,652 48	14,178.80 ft.		
	Foreman.....	5 50					
	Labor, per hour.....	25					

1913 AND 1914—Continued.

SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
.....	\$2,094.18	2-9-14	Louis F. Bertolett, Littleton, Colo.	South of Aecquia, and to place all culverts by force account
29,950	7-15-13	H. E. Owen, Denver	Greenland to Palmer Lake. Roadway 28' between ditch. Finished
4,505			
900	1913	Geo. Branston, Rico	Near Rico, Colo.
.....	1913	Andy and J. Davidson, Rico, Colo.	Near Rico, Colo. Finished
.....	1914	J. H. Cothran and A. D. Davidson, Rico.....	Near Rico, Colo. Finished
.....	1914	Rohde & Pantelone, Rico, Colo.	Near Rico, Colo. Finished
.....	1914	C. W. Pinkerton, Rico	Near Rico, Colo. Finished
6,096	7-28-13	Frank Smith, Redeliff, Colo.	Tennessee Pass to Pando. Sec. 2
1,617			was regrading old grade of D. &
7,646			R. G. R. R. Finished
235	11-11-13	Joe Johnson, Redeliff, Colo.	Near Minturn, Colo. Finished
.....	8-00-13	L. J. Chapman, Monte Vista, Colo.	Between Jasper and Pass-me-by- and Mine. Finished
.....		W. C. Christensen, Monte Vista, Colo.	On east side, up Alamosa River
.....	9-00-13	Pagosa Lumber Co., Pagosa Springs	West Fork bridge up West Fork for 3 miles. Finished

CONTRACT WORK DURING

GRADING AND

COUNTY	State Road No.	Character of Work	Unit		
			Price Per Cu. Yd.	Total Sum	Length, Miles
	15	Grading—			
		Sec. 1.....	\$.....	645 00	5,000 ft.
		2.....	.....	515 00	3,800 ft.
		4.....	.....	1,590 00	5,400 ft.
		5.....	.....	1,045 00	3,000 ft.
		6.....	.....	800 00	975 ft.
		Culverts by force account, plus 10%			
	15	Grading—			
		Sec. 1.....	.....	3,040 00	2,975 ft.
		2.....	.....	3,082 00	5,000 ft.
		3.....	.....	2,587 00	5,000 ft.
		4.....	.....	1,805 00	5,000 ft.
		5.....	.....	3,130 00	7,000 ft.
		6.....	.....	3,052 00	9,000 ft.
		7.....	.....	2,995 00	10,317 ft.
		Culverts by force account plus 10%			
Garfield	42	Grading—			
		Clearing and grubbing, per acre.....	\$20 00	.....	.....
		Earth and borrow.....	0 23	.....	.....
		Rock.....	1 00	.....	.....
		Concrete.....	12 50	.....	.....
		Dry wall.....	0 85	.....	.....
		Overhaul, per 100 ft.....	0 05	.....	.....
Grand	39	Grading—10 ft. road, solid.....	.....	1,850 00	11,400 ft.
		14 ft. road.....	.....	1,500 00	4,500 ft.
Huerfano	16	Right of way from the D. & R. G. Railroad Co.	.....	.....	5¼ mi.
Jackson	40	Grading, earth.....	0 0975	.....	.....
		earth fill.....	} 0 24	.....	.....
		wagon haul.....		.....	.....
Jefferson	27	Graveling, crushing and spreading.....	1 125	.....	8½ mi.
	27	Concrete, 18' wide, 7" thick.....	.....	7,500 00	1 mi.
		Not including grading, bridges or culverts. Work done for Mountain Park Com. of			

1913 AND 1914—Continued.

SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
	\$	9-14-14	Logan & Lowell, Durango, Colo.	End of present road on West Fork to the Cliffs, Sta. 0+25.14 ft. road in flat, 8 and 10 ft. on side hill. Nearly finished
		10-29-14	Logan & Lowell, Durango, Colo.	"Cliffs" to top of Wolf Cr. Divide (except bridges), Road 8' and 10', with 1' ditch, in solid clearing 40 ft. wide. In progress
35 acres 24,473 cu. yds. 6,800 cu. yds.		7- 7-13	C. W. Fravert, Rifle, Colo.	Rifle, towards Mecker. Finished
		6-3-13	Bernard Kuhner	Trough road, Sta. 45 to 160
		3-00-14	Sam'l Monnier, Kremmling Huerfano County and D. & R. G. R. R. Co.	Trough road, Sta. 390 to 435 Use of old narrow gauge grade for wagon road
		6-31-13	J. R. Clyde, L. and S. R. Hockley, Walden, Colo.	Finished
1,300 to 1,500 c. y. per mile	From \$1,462 50 to \$1,687 50	7-21-14	H. L. Kaykendall, Platteville	Morrison road, by Mountain Park Com., County and State; average haul, 2 miles. Finished
		7513 ✓	1914	

CONTRACT WORK DURING

GRADING AND

COUNTY	State	Character of Work	Unit	Total	Length,
	Road		Price			Sum	Miles
	No.		Per Cu. Yd.		
Lake	17	Grading, earth and loose rock	\$0 50	}	200 ft.
		dry wall	0 50		
	17	Grading, earth and loose rock	0 50		
		dry wall	0 50		
17	Grading, earth and loose rock	0 50	}	800 ft.	
		dry wall			0 45
La Plata	15	Grading, 16' roadway, and hauling and placing culverts		6,350 00	2 1-5 mi.
Larimer	50	Grading, earth	0 245	}	3 Mi.
		solid rock	0 73		
		borrow fill	0 18		
		overhaul for 100'	0 02		
	16' roadway, ditches 2' wide and 1 ft. deep				
	2	Grading, earth	0 1475	}	6 mi.
solid rock			0 85		
borrow			0 1225		
overhaul per 100'			0 02		
24' between ditches, grading per 100', \$4.90					
Las Animas	26	Grading, except rock, or filling in arroyos (24' between ditches)			7 mi.
		29	Grading (approaches to bridge)	0 15		1/4 mi
Mesa	11	Grading (culverts furnished by county)		6,000 00	3,400 ft.
Pitkin	25	Grading, earth	0 34	}	17 mi
		loose rock	0 74		
		solid rock	0 99		
		overhaul per 100 ft.	0 25		
Prowers	6	Grading and Surfacing—		}	17,800 ft.
		Earth fill	0 11		
		Fill 16'	0 12		
		Overhaul per 100'	0 05		
(Exc. between ditches, 27')					

1913 AND 1914—Continued.

REFACING—Continued

Total Cu. Yds.	Cost Per Mile \$	Date	Contractor's Name	Remarks
.....	.....	9-25-13	J. R. Bond, Leadville	Leadville, south. Finished
.....	.....	1-15-14	J. R. Bond, Leadville	Leadville, south. Finished
.....	.....	1-2-14	Joseph Stalk	Leadville, south. Finished
.....	\$2,886.40	11-15-13	A. R. Skidmore, Durango, Colo.	Durango to Carbon Jet. Material, earth and rock. Finished
.....	14,270.11	5-16-14	The Engineers' Const. Co., Gree- ley, Colo.	Upper Dixon Canon to Heulett's Gulch. (For culverts, see table of bridge contracts.) Finished
12,200 Ex. 4,700 borrow	.....	8-4-14	Odeil Bros., Fort Collins, Colo.	From 9 miles northeast of Wellin- ton, extending northward. Fin- ished
.....	60.00	6-3-13	E. C. Hopkins, Trinidad, Colo.	Aguilar to N. county line. County to furnish grader. Finished
.....	.....	8-2-13	Juan B. Vigil, Trinidad, Colo.	½ mile. Finished
.....	.....	3-19-13	Marshall B. Chapman, De Beque, Colo.	Finished
20,000 15,000 5,570	.....	8-14-13	McIlduff & McKillip, Denver; Colo.	From near Aspen to top of Inde- pendence Pass, quantities given are approximate. In progress
1,300 8,136 900	.....	8-14-13	W. G. Allison, Lamar, Colo.	Granada bridge to Sta. 220. Fin- ished

CONTRACT WORK DURING

GRADING AND

COUNTY	State	Character of Work	Unit	Total	Length,
	Road		Price			Sum	Miles
	No.		Per Cu. Yd.		
		28 Grading and Surfacing—			
Prowers		Sec. 1, earth	\$0 14		6,100 ft.
		2	0 14		9,900 ft.
		3	0 14		7,400 ft.
		4	0 14		9,300 ft.
		Hauled in Material—			
		Sec. 1	0 50		
		2	0 84		
		3	0 65		
		4	0 80		
	6	Grading—Sec. 1, earth ex.	0 1125		7,725 ft.
		Sec. 1, surfacing	0 38		9,707 ft.
		Sec. 2, earth ex.	0 095		13,500 ft.
		Surfacing 0 to 135	0 45		13,500 ft.
Rio Blanco	42	Grading—Sec. 1, earth	0 24		20,000 ft.
		Overhaul, over 100'	0 025		
		Sec. 2, earth	0 24		30,000 ft.
		Overhaul, per 100'	0 025		
		Sec. 3, earth	0 24		25,000 ft.
		Overhaul, per 100'	0 025		
		Sec. 4, earth	0 30		32,300 ft.
		Overhaul, per 100'	0 025		
San Juan	13	Grading, earth	0 25		1 1/2 mi.
		loose rock	0 40		
		solid rock	1 40		
		dry wall	1 00		
		cribbing, \$0.09 ft.			
		overhaul, per 100'	0 05		
		lumber in place, \$40.00 per M.			
	13	Grading, earth	0 28		2 1/2 mi.
		loose rock	0 45		
		solid rock	1 40		
		dry wall	1 00		
		cribbing, \$0.09 per ft.			
		overhaul, per 100'	0 05		
		lumber in place, \$42.00 per M.			

1913 AND 1914—Continued.

SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
700	\$	7-28-13	L. McDowell Const. Co., Lamar, Colo.	Holly, south to county line. Fin- ished
528				
1,865				
762				
702				
933				
873				
		2-3-14	Wilcox & Stephenson, Lamar, Colo.	Lamar to Granada. Finished
6,846.8			Filoon & Ford, Lamar	
7,939.6			Wilcox & Stephenson, Lamar, Colo.	Lamar to Granada. Finished
23,300		3-10-14	C. W. Fravert, Rifle	Rifle and Meeker. Finished
25,300				All culverts furnished by county on ground. For culverts and bridges, see Bridge Sheet. Fin- ished
29,300				
29,700				
		7-18-13	Loftus, Skidmore & Hall, Durango, Colo.	Silverton, towards Red Mountain. Finished
		7-19-13	Loftus, Skidmore & Hall, Durango	Silverton, toward Durango. Fin- ished

CONTRACT WORK DURING

GRADING AND

COUNTY	State	Character of Work	Unit	Total	Length.
	Road		Price			Sum	Miles
	No.		Per Cu. Yd.		
San Miguel	44	Grading and culverts	\$	\$8,979.00	9,900 ft.
	44	Grading and culverts		5,890.00	68,559 ft. (See note)
	44	Grading and culverts		7,250.00	15,030 ft.

BRIDGES AND

COUNTY	State	Character of Work	Concrete,	Piling,	Length
	Road		Cu. Yd.	Per Ft.	
	No.				
Adams	7	Concrete girder, reinforced			200 ft.
		Piers, abutments and wings	\$ 7.90		4-50' spans
		Girders and floors	9.85		
		Piling, 15 ft.		\$0.35	
		Piling, 30 ft.		0.75	
		2" railing, complete, per ft. in place	0.95		
		2" Oregon lumber—\$25.00 per M			
		Grading approaches	0.18		
	7	Piled wings to flush bridge			
Archuleta	15	Steel truss bridge, 14' roadway			100 ft.
Arapahoe	31	Flush bridge, 16' roadway			288 ft.
		Bridge, extra length, \$9.50 per ft. of bridge			
		Extra piling, \$0.50 per ft. of pile			480 ft.
	3	Eye beam, concrete 20' roadway			
Crowley	33	Eye beam, concrete bridge, 20' roadway			26' span
Douglas	3	Eye beam, concrete in abutments	\$ 6.00		26' span
		Including reinforcing in floor	28.40		
		Extra concrete	8.00		
		2½" Railing, complete in place, per lineal ft.	1.35		
		Spruce piling	0.30		
		Extra work, cost plus 10%, 20' roadway			

1913 AND 1914—Continued.

SURFACING—Concluded

Total Cu. Yds.	Cost Per Mile \$	Date	Contractor's Name	Remarks
		7-8-13	S. J. Adams, Placerville	Norwood Hill. Culverts included. Finished
		7-10-13	W. H. Nelson, Norwood, Colo.	Placerville-Dalias road. Note-- Widening at various points along line. Finished
		3-9-14	W. H. Doyle, Telluride, Colo.	Keystone Hill. Finished

CULVERTS

Total Cost	Date	Contractor's Name	Remarks
	6-11-13	Colo. Bridge & Const. Co., Denver, Colo.	Sand Creek; also for Arapahoe County. Finished. \$1,400 extra work on force account at cost plus 10%. Bridge de- stroyed by flood, August, 1913, when almost completed and before forms were taken out. Rebuilt by contractor.
\$ 830 00	3-11-13	Colo. Bridge & Const. Co.	Box Elder Creek. 20' piles, 2" Oregon planks Finished
3,395 00	9-14-13	Missouri Valley B. Co., Denver, Colo.	Through truss and one tubular pier. Fin- ished. (Plans filed after bridge and abutment was constructed)
2,500 00	11-14-12	Levy Const. Co., Denver, Colo.	Middle Bijou Cr. Finished
4,250 00	1-2-13		Concrete slab, reinforce, 12' bents, piled foundation
1,964 50	1-9-13	Frank Ford, Littleton, Colo.	Little Dry Creek, near Petersburg. Piled foundation. Finished
1,693 20	4-00-14	J. H. Peck	Bob Creek. Finished
3,774 25	9-22-13	F. C. Brown, Denver, Colo	Sand Creek, near Wolhurst. Finished

CONTRACT WORK DURING

BRIDGES AND

COUNTY	State	Road	Character of Work	Concrete,	Piling,	Length
	No.			Cu. Yd.	Per Ft.	
		8	Reinforced concrete cattle run Extra work at cost plus 10%, 20' roadway	\$9 00	.....	7' span
		8	Reinforced concrete cattle runs and culverts 2" Railing pipe, 18c per lineal ft. of pipe Barbed wire fence, 4 wires, 7' posts, 16' apart. at \$140.00 per mile Extra work at cost plus 10%, 20' roadway	9 00	.....	.....
		3	Piled bridge, complete 20 ft. roadway—3" Native floor—concrete abutments on piers—16ft. bents.	.....	.....	200 ft
		8	Reinforced concrete cattle run and culverts, 20 ft. roadway	9.00	.....	.....
Eagle		10	Reinforced concrete arch, 20' roadway . . . . .	.....	.....	100 ft. 2-50' spans
Elwood Pass Road.		15	Red spruce log stringers and floor, 16' roadway— 4 bridges, 18' wide 2 bridges, 18' wide 1 bridge, 18' wide . . . . .	.....	.....	30' spans 40' spans 50' span
		15	A-frame, 2 spans of 45' each, red spruce stringers, 3" native floor, 16' roadway . . . . .	.....	.....	90'
El Paso		18	Reinforced concrete arch, 20' roadway, piled foundation . . . . .	.....	.....	155 ft. 2-75' spans
		4	Reinforced concrete arch, 20' roadway . . . . .	.....	.....	200 ft. 2-60' spans 1-70' span
		30	Reinforced concrete girder, 20' roadway . . . . .	.....	.....	100 ft. 2-50' spans
		3	Reinforced concrete girder, 20' roadway . . . . .	.....	.....	104 ft. 2-50' spans
		18	Reinforced concrete arch, 20' roadway . . . . .	.....	.....	40 ft., 1 span
		3	Reinforced concrete girder, extension of old bridge, 16' roadway . . . . .	.....	.....	42' span
		30	Reinforced concrete arch, 20' roadway . . . . .	.....	.....	25' span
Fremont		22	Reinforced concrete arch Piling extra, but not to exceed \$500.00	.....	.....	135 ft

1913 AND 1914—Continued.

CULVERTS—Continued

Total Cost	Date	Contractor's Name	Remarks
.....	8-22-13	Farrell & Ellis, Castle Rock, Colo.	Between Larkspur and Greenland. Fin- ished
.....	7-15-13	Chas. H. Allis, Greenland, Colo.	Between Greenland and Palmer Lake. Fin- ished
\$1,950.00	11- 5-13	Colo. Bridge & Const. Co., Denver, Colo.	Between Acequia and Sedalia, over Sand Wash. Finished
.....		Manhart & Lowell, Castle Rock, Colo.	Between Castle Rock and Larkspur. Fin- ished
6,982.00	9-28-14	Pueblo Bridge Co., Pueblo, Colo.	At Gypsum, Colo. Finished
500.00	9-19-14	Oscar McCoy, Pagosa Springs	Up Wolf Creek. In progress, 2 bridges.
330.00			Finished
200.00			
444.00	9-14-14	Grant Shields, Pagosa Springs	Over Wolf Creek, at mouth. Finished
16,200.00	9-19-14	Pueblo Bridge Co., Pueblo, Colo.	Fountain Creek; Nevada St., Colorado Springs. In progress, foundations finished
13,200.00	1914	Pueblo Bridge Co., Pueblo, Colo.	Fountain Creek, at Buttes. Finished
4,586.00	6-00-13	Pueblo Bridge Co., Pueblo, Colo.	Squirrel Creek Bridge, near Peyton, Colo. Finished
6,700.00	10-00-12	Central Con. Co., Colorado Springs, Colo.	Monument Creek, near Pikeview. Fin- ished
1,975.00	1-00-14	Pueblo Bridge Co.	Fountain Creek, near Green Mountain Falls. Finished
\$5,200.00	1914	Midland Bridge Co., Denver, Colo.	Cattle Creek, in progress. Foundations finished
920.00	7-00-13	Pueblo Bridge Co., Pueblo, Colo.	Sand Creek. Finished
8,980.00	3-10-13	Pueblo Bridge Co., Pueblo, Colo.	Over Arkansas, near Florence. Finished (Plans filed after bridge was built)

CONTRACT WORK DURING

BRIDGES AND

COUNTY	State Road No.	Character of Work	Concrete, Cu. Yd.	Piling, Per Ft.	Length
Grand	47	Low steel truss, on tubular piers, 16' roadway			220 ft. 2-90' spans 2-piled app'ches
Gunnison	20	Low steel truss, 16' roadway			60' span
Jackson	50	Low steel truss, 16' roadway			70' span
Larimer	51	Steel truss, 12' roadway			50' 5" span 61' 3" span
		Extra concrete in old abutment, \$25.00 per cu. yd.			
	24	Reinforced Concrete—			
		Class B-Concrete of 1-2-4 Mixture	\$9.00		14' span
		Class C-Concrete of 1-3-6 Mixture	8.40		24' span
		Price per lb. for steel in place, \$0.03; per foot for 2" pipe railing in place, \$0.75; 16'			
Las Animas	26	Reinforced box culvert, 1-2-4; 1-2½-5; 1-3-6 mixture	\$9.55		8 0'
	26	Reinforced concrete bridges, 4 bridges	7.50		
	29	Reinforced concrete bridges and culverts, 1-2½-5 mixture	8.75		
	26	Reinforced concrete culverts, 2 of them 1-3-5 mixture	8.50		
Lincoln	32	Piled timber bridges, 16' roadway, 2 of them			36' 12' bents 64' 16' bents
Logan	9	Eye beam concrete bridges, 5 of them (angle iron railing)			2-14' spans 1-18' span 1-34' span 1-40' span
Mesa	11	Through steel truss			
Moffat	41	King & Queen truss, timber bridges			6-32' spans 6-16' spans 6-24' spans 4-12' spans

1913 AND 1914—Continued.

CULVERTS—Continued

Total Cost	Date	Contractor's Name	Remarks
\$5,493.00		Levy Const. Co., Denver, Colo.	Over Blue River. Finished. (Plans approved and returned to County Surveyor)
.....	1913	Pueblo Bridge Co., Pueblo, Colo.	Over Lake Fork of Gunnison to Sapinero. Finished
1,985.00	2-1-13	Midland Bridge Co., Kansas City, Mo.	Michigan Creek, north of Walden. Fin- ished
1,405.80	12-00-13		Big Thompson Creek, west of Loveland. Finished. Plans filed after bridge was built
.....	1913			Farmers' ditch. Finished
.....	1913		English ditch. Finished
roadway			
.....	7-26-13	Gaudio Bulgaroni, Trinidad, Colo.	Between Bowen and Suffield. Finished
.....	7-14-13	Antonio Lopresto, Aguilar, Colo.	Aguilar to North county line. Not to ex- ceed \$2,000. Finished
.....	6-2-13	Battista Enrietti	Finished
.....	8-15-14	Chas. Emerick, Trinidad, Colo.	Near Chicosa Arroya. Finished
\$1,275.00	10-15-13	W. A. Phipps, Flagler, Colo.	Seven Mile Creek and Barrow Guich. Fin- ished
4,221.80	1913	Robert Drake, Omaha, Neb.	Over Midland Ditch and Powell-Sterling No. 1 Ditch, Harmony No. 1 Ditch, Paw- nee Creek. All finished
2,497.00 } 9,998.00 }	2-5-13	J. J. Lumsden, Grand Jet., Colo.	Mouth Plateau Creek and over Plateau Creek, near Atwells. Finished
5,000.00	1-7-14	Levy Const. Co., Denver, Colo.	From Craig to west line of State. Finished

CONTRACT WORK DURING

BRIDGES AND

COUNTY	State		Concrete, Cu. Yd.	Piling, Per Ft.	Length
	Road	Character of Work			
Morgan....	24	Eye beam concrete..... (County supplied all material f. o. b. cars; 451 cu. yds. concrete; 136 piles; 49-18 eye beams; 420 ft. railing)			210 ft. 7-30' spans
Park.....	35	Eye beam concrete, 2 bridges, 16' roadway...			1-18' span 1-30' span
Pueblo.....	5	Reinforced concrete arch, 16' roadway.....			1-19' 4" span
	26	Eye beam concrete, 16' roadway.....			1-18' span
	26	Reinforced concrete arch, 16' roadway.....			1-20' span
	26	Steel girder, 16' roadway.....			1-40' span
Prowers.....	6	Steel span, 16' roadway.....			1-55' span
Rio Blanco.....	42	Steel low truss, 16' roadway.....			1-100' span
Sedgwick..	9	Eye beam concrete, 16' roadway (2 bridges).. (Extra concrete, \$8.00 per cu. yd.)			1-21' span 1-15' span

1913 AND 1914—Concluded.

CULVERTS—Concluded

Total Cost	Date	Contractor's Name	Remarks
\$2,409.00 for labor	4-8-14	F. H. Cowell, Denver, Colo.	At mouth of Bijou Creek. Finished
2,300.00	10-11-13	Levy Const. Co., Denver, Colo.	Over north fork of South Platte River, at Webster and Grant, Colo. Finished
2,456.00	5-5-13	Pueblo Bridge Co., Pueblo, Colo.	Dry Creek. Canon City road. Finished
1,880.00	7-7-13	Pueblo Bridge Co., Pueblo, Colo.	Walsenburg road. Finished
1,850.00	10-6-13	Pueblo Bridge Co., Pueblo, Colo.	Little Granero. Finished
1,900.00	10-6-13	Pueblo Bridge Co., Pueblo, Colo.	Greenhorn Creek. Finished
1,440.00	8-8-13	Lon Filoon, Lamar, Colo.	Buffalo Creek. Finished
4,600.00	1913	Patterson-Burghart Co., Denver, Colo.	White River. Finished
521.00	7-8-13	Standard Bridge Co., Omaha, Neb.	Finished
475.00			

REPORT OF STATE ROAD SUPERVISORS FOR BIENNIAL
PERIOD 1913 AND 1914.

Silverton, Colo., Jan. 8, 1915.

Hon. T. J. Ehrhart,
State Highway Commissioner,
Denver, Colorado.

Dear Sir: I hereby submit my report for the years 1913 and 1914. The road building in general for 1914 has not been as rushing nor active as it was in 1913, and the main reason is that the state had not the money on hand to apportion out to each county.

In Ouray County transferring part of the money for the Red Mountain road to the Dallas Divide road, they have built the two miles of the badly broken link between Ouray County and San Miguel County line; this completes the road between Ridgway and Telluride, a distance of 45 miles, while the new grade that has been started on Keystone Hill, six miles below Telluride, has been almost completed. This will reduce the grade from 10 to 12 per cent to 4 and 6 per cent. The entire 45 miles is in excellent condition.

When leaving Sawpit last Summer, and going to Norwood, down the San Miguel River, quite a large road camp was located. They were at work cutting off some very steep grades, and when this is done, San Miguel County will have a well built system of roads, that will reach as far as the county line towards Paradox Valley. The bridge work in this county, in particular the large ones, crossing the San Miguel River, and also the Dallas Divide river, are built out of No. 1 logs (yellow pine), the abutments are well protected from highwater, and the drainage in general has been well taken care of. Also the road from Vance Junction to the top of the divide at Lizzard Head was put in good travelable condition last year.

In Ouray County from the San Juan County line to Ouray, some very bad places have been rebuilt, and some very steep grades with heavy rock work must still be taken off. This will be very expensive on account of the quartzite formation, and by all means, nothing but machines should do this work, because there are several miles to be built.

From Ouray down to Montrose county line the road is in excellent condition, and a great deal of improvements have been made this year; roads have been widened and culverts put in wherever necessary. In Montrose county from the Ouray county line to Montrose, the road is in excellent condition. The Commissioners have taken great interest in keeping all the main lines up and well dragged after each hard rain; some heavy steel bridges have been put in across the large canals.



DELTA-HOTCHKISS ROAD, DELTA COUNTY—STATE PRIMARY ROAD NO. 46.

The road from Montrose over the Blue Mesa is in fine shape for a new roadbed. While in 1913 this road was constructed, the drainage had not been taken care of, but in 1914 this was attended to.

From Montrose to Delta, a distance of 22 miles, is in No. 1 condition, and I am pleased to state that all of the counties on the Western Slope have shown the greatest interest, not only in the building of roads, but also in the maintenance of the roads. The culvert and the bridge work in all of these counties has been carefully done, so the water is well taken care of, and from Delta to Hotchkiss, and from Hotchkiss to Fort Crawford, a distance of 70 miles, the road is in first-class condition, with many miles of new road built on this line.

From Fort Crawford over the Black Mesa to Sapinero, Gunnison county, great improvements were made. The snow conditions on the Black Mesa, and also on the Blue Mesa are not troublesome, and can be very easily taken care of, so these will be early and late routes.

From the Delta county line into Sapinero (in Gunnison county) some very good road building was done, and I believe some changes should be made for the betterment of the road, beside cutting off unnecessary road building. The road between Sapinero and Gunnison has been greatly improved by cutting off some very steep grades; also grading up the roads in the bottoms, from Gunnison to Monarch Pass. The entire distance has been overhauled and the entire road put in first-class condition; the grade going to the top of the pass has not been changed, but still has a grade of 10 per cent, for five miles straight, but this will be cut down to 4 and 5 per cent as soon as possible. The road to Pitkin has almost been entirely rebuilt, and heavy road work has been going on during this year to the Saguache county line, and is almost completed at this time.

Hinsdale county has the most willing people to build and construct roads if they only had the money. With what little money they had of their own, and the money received from the State, they had value received for every dollar they spent, and completed the through line from Sapinero to Lake City, and from Lake City up Slumgullon over Twin Pass to the Mineral county line. They are in need of help from the State, and I wish to recommend that all aid be given them that is possible. This will mend another link in the broken chain of roads.

In going from Delta to Grand Junction, a distance of fifty miles, great improvements have been made by Delta county as well as Mesa county. A splendid piece of road was built by Delta county volunteer labor, and a very bad deep gulch was cut off, and a four per cent grade put in place.

They have also surveyed the entire road to Mesa county, and the worst places on this line have been rebuilt. Mesa county has practically done the same in Mesa county from Grand Junction to the Utah line, a distance of 40 miles, and great road improve-

ments have been made in this entire distance. While the flood water in the low lands has given them a great deal of trouble, to a great extent they have overcome these difficulties by raising the roadbeds, and by leaving plenty of room for water where bridges and culverts had to be put in, have overcome this difficulty.

In leaving Grand Junction, going up the Grand River above Palisade, a grand piece of road can be seen here; the pride of Mesa county.

Leaving Grand River and going up Plateau Creek, a distance of 10 miles, a fine piece of road was constructed by convict labor, and going from here over the Mesa to Debeque, I found two large road camps at work, building entirely new roads, and cutting off a number of bridges, and selecting a far better location for the road. This will connect Grand Junction and Debeque, and Garfield county with a first-class road.

In leaving Debeque, going over Nigger Hill, from Nigger Hill through Grand Valley to Rifle, great improvements have been made. The road has been straightened out, and the old road bed in many places has been widened, and put in first-class condition. Drainage has been taken care of, and where light bridges were needed they were put in. From Rifle toward Meeker in Rio Blanco county, a 10 mile piece of new road was built, and is a credit to any county. Five miles below Rifle a very bad hill was cut off, and the grade reduced from 10 to 5 per cent. East of Rifle toward New Castle a number of very bad hills are cut off; this has been expensive work, and now that it is almost completed has made a most remarkable improvement over the old road. Some very bad places were cut off between New Castle and Glenwood Springs; the entire distance being rebuilt. This stretch of road contains some very heavy rock work. Part of this work was done by convict labor, and part by contract.

In leaving Glenwood Springs for Carbondale the road is in fine condition. From Carbondale to Aspen (Pitkin county) the road is in very good condition, being mostly in the valley, and easily taken care of. From Aspen to Independence Pass a contract was let in 1913, and the work carried on during the year 1914. The entire distance is 29 miles from Aspen to the Pass, and an entirely new road is being built. The work was carried on very satisfactorily during 1914, and at this time is nearing completion.

From Glenwood Springs, going up the canon to Shoshone, and from here to Dotsero, the road is in fair condition, but no new road was built in 1914. In places the grade has been raised so that there will be no more trouble with high water. Garfield county is not afraid to spend money for road building as long as they get value received.

From Dotsero to Eagle, and from Eagle to Wolcott, fine improvements have been made on this road, with a fine cement bridge put across the Eagle River, and another being built below

Wolcott. From Wolcott to Red Cliff the entire road has been put in excellent condition, and some heavy cliffs were taken down. From Red Cliff to the Tennessee Pass a splendid piece of road was built; part of the Denver & Rio Grande narrow gauge 4 per cent roadbed was widened out, and generally fixed up, and by doing this it has cut out the 12 to 15 per cent grades.

In Lake county from Tennessee Pass to Leadville almost the entire distance has been built; from Leadville to Twin Lakes an entire new road has been built. Eight miles below Leadville toward Twin Lakes the road had to be built across a very bad swamp. Good gravel beds were close at hand, and a grade put across four feet high and 16 feet wide; this naturally left the road high and dry. From this point to Twin Lakes, the road is A-No. 1, and very easy to maintain; the material being mostly sand and gravel; the entire distance from Tennessee Pass to Twin Lakes is well drained.

From Twin Lakes to Granite the road is surveyed and work has been started.

The road is good between Granite and Buena Vista, and from there to Salida. If this distance were completed, we would have a boulevard from Denver, Colorado Springs and Pueblo up the Arkansas River to Canon City, to Salida, Leadville and Glenwood Springs to Grand Junction.

In leaving Salida, going to Poncha Pass, the road is in a splendid condition; the road material on this line is the finest kind of gravel, and has the tendency to pack and leaves a very hard surface. From Poncha Pass to Saguache, a distance of from 35 to 40 miles, has been entirely rebuilt; also the road from Saguache over Cochetopa Pass to the Gunnison County line, is almost completed.

A contract for nine miles of road was let last spring by the Forestry Department over Cochetopa Pass, this being the last piece of road to be built across the reserve. From the reserve line to the Gunnison county line the road building is very light, and the road has been built most of the distance; this completes another line from Salida over Poncha Pass to Saguache, and over Cochetopa Pass to Gunnison, at the junction of Sapinero, and over the Blue Mesa to Montrose and Delta, or by way of the Black Mesa to Ft. Crawford and Hotchkiss to Delta, and from there to Grand Junction.

From Saguache to Monte Vista, or by way of Hooper to Alamosa, good substantial road work has been done for this entire distance of 40 miles. A large ditching machine has been used most of the way, with very good results. Also, another line has been built from Saguache to Del Norte, known as the "foot-hill" route. All these roads have been put in good condition.

Coming across the valley from La Veta Pass to Fort Garland, the road is the old narrow gauge roadbed, a 4 per cent grade. This has been repaired by the counties. From Fort Garland to Alamosa has been surveyed, and contract let for the worst places,

particularly where the deep sand and alkali bottoms are. From Alamosa to Conejos, a distance of 30 miles, has been graded up and ditched on both sides of the road; also from Alamosa to the Rio Grande county line, the road has been well graded during this year. From Alamosa county line to Monte Vista, a distance of 10 miles, from Monte Vista down the Gun Barrel route, some very boggy ground has been rebuilt, and put in good condition. From the Gun Barrel route up Alamosa Creek to the Pass-Me-By mine very little work was done this year, but from Monte Vista to Del Norte a good deal of grade work has been done, and some very heavy grade work was done between Del Norte and South Fork; also from South Fork to Mineral county line, and from there to Creede, a distance of 25 miles; also two steel bridges have been put in by Rio Grande county, one over South Fork, and the other across the Rio Grande River.

From Rio Grande county line to Creede, a distance of 20 miles, they have had a large road gang on during last year, and the road has been changed from the shady side of the gulch to the sunny side, and they are now contemplating putting in a heavy steel bridge across the Rio Grande River, 12 miles below Creede.

From Creede to the head of Antelope Park, a distance of 15 miles, has been almost entirely rebuilt, with the drainage well taken care of. From this point the road leads off to Lake City, but was not built on account of Hinsdale county not having money enough to rebuild this broken link of five miles.

Going back to South Fork, a new line has been located over Middle Fork to the head of Wolf Creek, and down Wolf Creek to the west fork of the San Juan River. A contract was let of three and one-half, and another of eight and a half miles to the same contractors, Logan and Lowell. Good, fast work has been experienced, and when these contracts are done, the road will be completed to the top of the range at Wolf Creek; and this will leave a broken link of 18 miles from the top of Wolf Creek to South Fork Station on the Rio Grande River. Whatever road building is done in the State, this is one of the most important pieces of road.

Six counties have been entirely cut off from all parts of the State. This means the entire southwest of Colorado, and the only connections that this section of the State has is a narrow gauge branch of the Denver & Rio Grande Railroad. While all the State roads in the six counties, from the West Fork of the San Juan river to Pagosa Springs, a distance of sixteen miles, and from Pagosa Springs to Durango, a distance of 63 miles; from Durango to Farmington, N. M., and Shiprock, a distance of eighty-five miles; from Durango to Mancos, and Mesa Verde Park, 30 miles; from Durango to San Juan county line, 15 miles; and from Mancos to Cortez up the Dolores River, a distance of 45 miles; also from Cortez to Shiprock, a distance of 50 miles, and from Cortez through McElmo Canon to the Utah county line, a



TENNESSEE PASS ROAD, NEAR BUENA VISTA, CHAFFEE COUNTY—STATE PRIMARY ROAD NO. 17.

distance of 40 miles; from Cortez to Monticello, a distance of 30 miles, a total mileage of 374 miles of first-class roads, besides from the mouth of McElmo Canon, Utah line, to Bluff City, Utah, a distance of 95 miles, the roads are in good travelable condition.

I have inspected every mile of these roads that I have mentioned, and when we look at the mileage of first-class State roads, the money that has been expended by all these counties, and the State, and then think that this mileage of first-class roads is still cut off from the entire State by one small broken link of 25 miles over a low pass.

The road between Durango (La Plata county) and San Juan county has also a broken link of 17 miles in San Juan county. Part of this ground is not very expensive road building, but part is very heavy rock work; also the road between Silverton and Red Mountain, Ouray county, has still a few miles of heavy grades of 15 to 20 per cent. If these were cut off the road between Silverton and Ouray, a distance of 25 miles, would be in fair travelable condition.

There is some very heavy rock work that will have to be done coming out of Ouray toward Silverton; also a half mile of rock work at Bear Creek Falls; another place that is known as "Mother Cline" slide, has some very steep grades, 15 and 18 per cent. These places will have to be cut out of solid rock and may prove quite expensive. If these places were put in this coming year, it would give the San Juan Basin another outlet, and connect up with the Western Slope.

Another broken link is at Rico, Dolores county. This will not be very expensive to build; the rock work would be in soft red sandstone, and from Rico to Lizard Head (top of range) will be all plow and scraper work. This will connect Rico, Telluride and Ridgway. All of my inspection work stopped the last of August, when I took charge of the construction on the Wolf Creek route.

In the year I visited 24 counties, some of them two and three times. I have not made less than 1,500 miles per month in automobile, and on horseback. I have found during my inspections that most of the counties through the mountains, put too many sharp curves; in building the new roads more cuts and fills should be made by all means.

I wish to thank all the County Commissioners in all of the counties I have visited for the kind and courteous treatment they have shown to me during the past two years.

Very truly yours,

LOUIS WYMAN,

State Road Supervisor.

Denver, Colo., December 31, 1914.

Hon. T. J. Ehrhart,
State Highway Commissioner,
Denver, Colorado.

Dear Sir: I beg to submit herewith report of work on the State Highways of which I had personal charge between the dates of June 20, 1913, and November 30, 1914. Also statement of other duties performed as one of your State Road Supervisors between June 20, 1913, and November 30, 1914.

On July 9, 1913, I arrived at Agate to take charge of the Anderson camp, at that time under Mr. Wyman's supervision. On July 10th, Mr. Wyman and myself looked over the road from Agate to Limon, and I decided to return over the road and put in the necessary drainage. I took charge of Anderson's road building organization on July 10, 1913, dispensed with his services on July 17th, and on July 26th returned to Agate and organized a force to complete the 8 miles of work.

By August 12, 1913, we had completed the work of repairing the 8 miles of road from Agate to the Arapahoe county line, and placed seven new culverts from 24 inches to 36 inches in diameter, and replaced 5-12 inch Ingot iron culverts, and 5-18 inch pipe 22 feet long, with larger pipes, regraded the entire road, and put in an 18 inch fill for three-fourths of a mile.

SUMMARY OF COST

(To this should be added the cost of the overhead charges, which in this case were small)

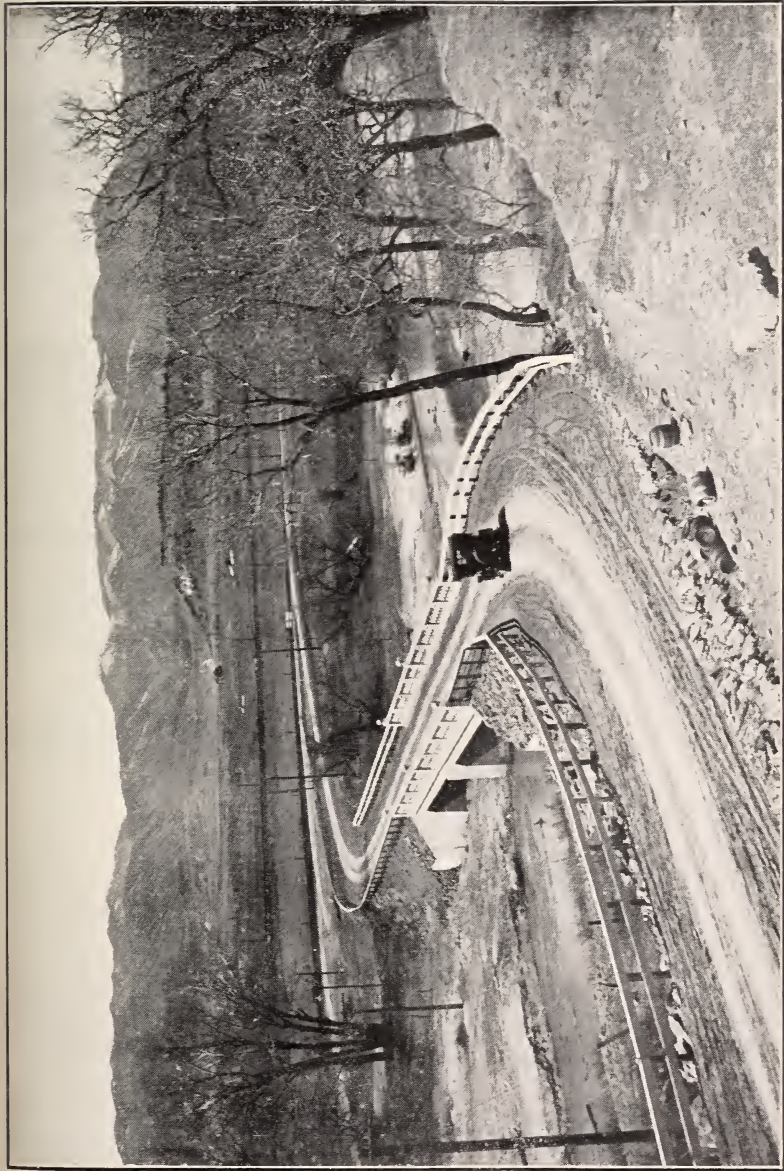
154' Ingot iron pipe, cost	\$461.92
Placing 17 culverts, labor	170.00
Grading and making fill	396.92
Total cost	\$1,028.84

On August 23, 1913, I commenced work finishing the road through Perry Park from Palmer Lake to Sedalia, that was constructed under the supervision of Mr. Blunt of Douglas county. This work was grader blade, with some slip and culvert work. There was about 23 miles of road that was finished at a cost of \$500.00.

Team and driver	\$0.50 per hour
Grader man	4.00 per day

The outfit consisted of 8 horses and two men on the grader, and two men and team on trap wagon, and slip scraper work. This work was completed on September 8th, 1913.

On September 15, 1913, the grading and graveling of 1.7 miles of road north of Larkspur toward Castle Rock was commenced, and was completed on October 31, 1913. The work was



COLORADO SPRINGS-DENVER ROAD, NEAR PIKEVIEW, EL PASO COUNTY—STATE PRIMARY ROAD
NO. 3, CONCRETE GIRDER BRIDGE, CONCRETE RAIL.

done by the local people at 50c per hour for men and team, and 25c per hour for single men and \$3.00 per day for foremen. One-half of this road was surfaced with gravel, and loam mixed, which was found along the roadside.

SUMMARY OF COST

4 Concrete culverts, 2.82 cu. yd. — \$9.00 per yd.....	\$ 250.40
1 Ingot iron culvert, 18" diameter.....	56.70
Cost of placing culvert and grading and graveling	1,187.52
	<hr/>
Total cost of 1.7 miles.....	\$1,494.62
Average cost per mile.....	\$79.19

Work was commenced on Acequia and Wollhurst road on November 1st, and completed on December 16, 1913. There were 1.4 miles graded, and 0.5 miles graveled.

SUMMARY OF COST

1 Concrete stock-run.....	\$ 342.52
1000' vitrified pipe culverts 15" and 18".....	376.50
Placing 22 culverts.....	132.00
Grading and graveling.....	980.07
	<hr/>
Total.....	\$1,831.09
Less 10 culverts on hand.....	93.75
	<hr/>
*Total cost 1.4 miles.....	\$1,737.34
Average cost per mile.....	1,240.95

On March 18, 1914, I went to Deertrail and repaired the Agate and Deertrail road, which was washed out, and placed 5 Ingot iron culverts at a cost of \$79.50. This work occupied my time from March 18th to March 25th, inclusive.

March 28th to April 2nd: Regraded Larkspur-Palmer Lake road. Six horses, two men and grader man, 9 miles of road, for \$94.05, at a cost of \$10.45. per mile.

Perry Park, regraded and repaired old road, April 3 to April 16th, inclusive, 6 days work, total \$89.75.

April 28th commenced the construction of 7.3 miles of road between Larkspur and Castle Rock; this work was completed September 8, 1914.

*To this total some additional expense for stock-run and overhead charges is to be added.

SUMMARY OF COST

Surveying.....	\$ 63 00
7 Concrete culverts, 4 concrete stock-runs, 4½ x 6½ x 20, 162.024 cu. yds. @ \$9.00.....	1,458 22
Reinforcement and rail.....	201 51
36 Vitrified pipe culverts, 10 x 24" in diameter.....	365 98
Placing same.....	221 40
14 ft. wooden bridge.....	121 34
Grading and graveling.....	6,511 24
<hr/>	
Total cost, 7.3 miles.....	\$8,942 69
Average cost per mile.....	1,225 02

On September 8, 1914, I commenced the building of a new road between Sedalia and the north county line of Douglas county.

By November 30, we had completed 4.7 miles of road from Sedalia toward the north county line. The prices paid for teams and labor were \$4.50 per day for man and team; \$2.25 per day for single men, and \$3.50 for foreman; \$3.50 for grader man and finisher. 2.5 miles of this road was graveled.

SUMMARY OF COST

Ingot iron culvert for Sedalia Street culverts, 12".....	\$ 214 15
Placing 5 culverts of same.....	30 75
685' vitrified pipe 12" to 24".....	301 05
Placing 21 culverts of same.....	129 15
4 Fresno scrapers and fixtures.....	109 76
Graveling, 1 mile 425 cu. yds. @ 44c yd.....	187 00
Grading entire road and graveling 1½ additional miles.....	4,322 87
<hr/>	
Total expenditure.....	\$5,294 75
Less value tools on hand.....	\$ 73 19
Grading and graveling on other road.....	170 75
Putting in crossing at Palmer Lake.....	53 00
96' of 12" Ingot iron.....	70 08
95' of vitrified pipe.....	52 18
<hr/>	
Total deducted.....	419 20
Average cost per mile.....	1,037 35
Total amount road repaired in Elbert County.....	8 miles
Roads repaired in Douglas County.....	32.0 miles
New roads constructed in Douglas County.....	15.1 miles
Other work done on Primary Roads Nos. 8 and 3 in Douglas County.....	11.2 miles
<hr/>	
Total new road completed.....	26.3 miles

All roads were built 28 feet from ditch to ditch with 24 feet traveled way, and all drainage was placed to enable the use of the entire width of the road, according to the plans and specifications of the State Highway Commission.

Tools on hand belonging to the State of Colorado.

- 6 fresnos and eveners
- 8 shovels, 1 pick.
- 2 plow shares.
- 1 drag.
- 4 Ingot iron culverts.
- 4 vitrified tile culverts.

INSPECTION TRIPS.

On July 1, 1913, I made a trip of inspection of the Golden and Lookout Mountain road, and found the work progressing nicely. They were using compressed air drills on the heavy work, and getting fair results. We walked over the entire route to the summit of the mountain, and the location of the road, both as to the grades and scenery effects is very good.

On July 2nd, I was over the Boulevard "F" road that was being improved, and found them working to a disadvantage on account of lack of proper tools; otherwise the work was progressing nicely, and they were making some much needed improvements.

On July 7th I was over the work in Douglas county, through Perry Park, and found Mr. Blunt using a steam tractor to pull a grader, which was impractical in such a country, as the curves and rough condition of the road made it impossible to get the engine where it was necessary, and left the road in very rough condition, and the expense of getting the coal and water for the engine, and the cost per day for the engine, made it more expensive than teams.

On August 16th, I looked over the situation, preparatory to smoothing the Perry Park road, and August 19th went to Palmer Lake and organized an outfit, and August 23rd commenced the work and completed the same on September 7th.

November 28th I inspected the Texas Creek-Cotopaxi road, and good progress was being made at that time, but the class of work was not up to the standard, and it was necessary to rebuild part of it, as the survey had not been followed as closely as it should. It was necessary to make a few changes in the grade and widen the fills, which we did with good results.

On November 29th I visited the convict camp above Parkdale, and found them doing some excellent work. The drainage was properly placed, and the general grade of the road was good.

On the same day I was over the new work being built below Florence, and found it nearing completion. This has been much more expensive than was expected, owing to the location of the bridge, which made it necessary to move a large amount of rock to get an approach to it.

February 28, 1914, I met with the members of the Town Board of Palmer Lake in regard to taking steps to get the Santa Fe Railroad Company to put in a crossing over their "Y" in Palmer Lake, as early as possible.

On February 28th the El Paso County Commissioners and myself went to Canon City by auto to meet the Fremont County Commissioners and make arrangements for the maintenance of the Colorado Springs and Canon City State Highway, and on the following day the Commissioners of both counties, and myself visited the convict camp above Parkdale, and found them doing good work.

On March 7th Mr. J. Bunten, County Surveyor and myself, went over the Cripple Creek road to look over the proposed improvements, and outline the work for the coming year, and on the following day Mr. Bunten and myself went over the new work between Texas Creek and Cotopaxi, and on to Salida, and decided on some changes, which were afterwards made.

On March 16th I was at Castle Rock, and saw the County Commissioners in regard to the maintenance of the State road through the county, and it was agreed that they would maintain it.

March 19th—Examined the flush bridges east of Deertrail, and found one of them had been washed around on the west end, and it would require a water-break to divert the water over the bridge, and that the gravel should be cleaned out under the slab, so that the water would cut the channel directly toward the bridge.

On May 11th, I was at Canon City, and attended the damage suit of Mr. Murray against Fremont County over the rights of way of the Parkdale and Texas Creek road.

On July 10th I went to Canon City and Mr. Bunten and myself went over the Canon City and Cripple Creek road that was being improved by Mr. Biddox, and we found the drainage that was being used entirely too small, and not enough turnouts, and no provisions made for drain ditches to carry the water to the culverts. A recent rain had washed away most of the work, as it consisted mostly of surfacing, and the road furnished a course for the water, and the surfacing was washed away.

On July 29, 1914, Mr. Burnett, County Commissioner of Chaffee County, and myself, made a trip over Poncha Pass, and found the road in good condition, except for the lack of drainage, and if it was properly drained, this would be a first-class road.

On the same day we went over the Monarch Pass, and considerable work had been done of a temporary nature, but the rains had washed it until little was left of the work, but where permanent work had been done, the water had done very little damage. This road could be built with reasonable expense, and make a good road. The material is good, and by changing it out of the creek bottom in places it would greatly minimize the cost of the upkeep.

On July 30th Mr. Dougherty of Buena Vista, representing the County Commissioners, and myself, went over the Trout Creek Pass road, and found it badly washed. All the bridges were washed out, and the road in an impassable condition. Mr. Capp, the Warden of the Reformatory, was working a crew of convicts on the lower end of the road, and the county was working a crew on the upper end, and every effort was being made to reopen the road.

On September 3rd and 4th Mr. W. A. Gillaspey, County Commissioner of Gunnison County, and myself made the trip from Gunnison to Montrose County line, over the Blue Mesa route, and found the road generally in very good condition, but close to the Montrose county line was a very bad mud hole, that was caused by seepage from the irrigation ditches on the Mesa above the road, which had caused a slide, and left the road in an impassable condition. We decided to have it fixed at once.

On September 13th I completed arrangements with the town Board of Palmer Lake to put in the crossing across the Santa Fe wye, and on September 26th I went to Palmer Lake with two 4-horse teams and two men, and the next day, with the assistance of the local people, we put in the crossing and opened it for travel.

On October 19th I was called to inspect the road from Cotopaxi to Texas Creek, and found some complications between the parties in charge, but the matter was arranged satisfactorily, and the work is progressing nicely, and on the following day I was over the road from Coaldale to Howard, and found the new concrete bridge across Hamilton Creek very badly constructed. It was located above the road line, and is too narrow, and the angling position makes the roadway still narrower.

On October 29th, in company with Mr. H. L. Kuykendall, I visited the road building camp near Broomfield, and found some very bad road on account of the recent rains, but they were crushing rock, and surfacing it, which is very essential on that road, owing to the character of the soil. Long rainy spells would make the road almost impassable.

On November 30th I saw Dr. McDaniels about the rights of way across his place in Douglas County, and found the property belonged to his wife, who was then in Chicago, and he took the matter up with her by mail.

Respectfully submitted,

W. R. ALLRED,
State Road Supervisor.

Fourth Biennial Report

OF THE

State Highway Commission

OF THE

State of Colorado

1916

T. J. EHRHART, Commissioner
J. E. MALONEY, Secretary-Engineer
ANNIE A. ROSS, Stenographer

ADVISORY BOARD:

J. M. KUYKENDALL, Chairman
District No. 1, Denver

LEONARD E. CURTIS
District No. 2, Colorado Springs

FREDERICK GOBLE
District No. 4, Silverton

FRED. J. RADFORD
District No. 3, Trinidad

L. BOYD WALBRIDGE
District No. 5, Meeker

To the Governor



Issued by order of the Commission
November, 1916

DENVER, COLORADO
EAMES BROS., STATE PRINTERS
1917

LETTER OF TRANSMITTAL

Denver, Colo., Dec. 1, 1916.

TO THE HONORABLE,
THE GOVERNOR AND THE LEGISLATURE
OF THE STATE OF COLORADO:

In compliance with Section 12, Chapter 88, of the Session Laws of 1913 (House Bill No. 254), we have the honor to submit herewith the biennial report of the State Highway Commission for the period, December 1, 1914, to November 30, 1916, inclusive.

(SEAL)

T. J. EHRHART,
State Highway Commissioner.

J. M. KUYKENDALL,
Chairman, State Highway Commission.

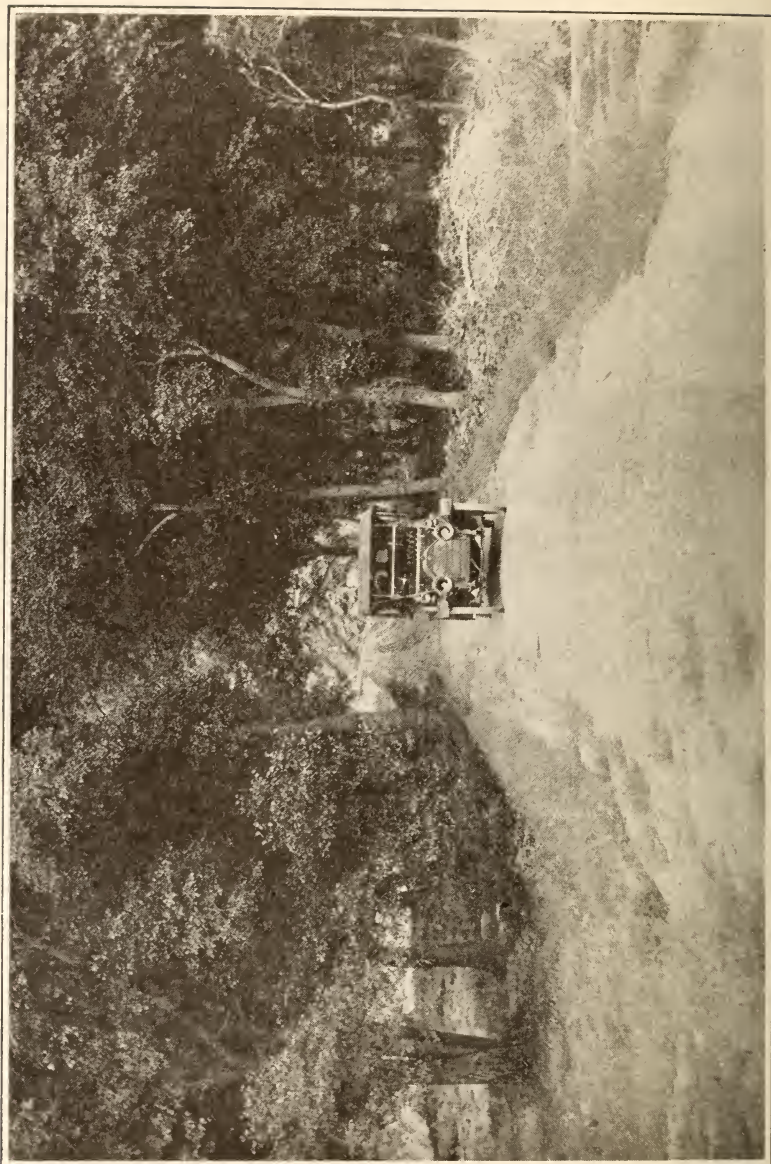
L. E. CURTIS,
FRED J. RADFORD,
FREDERICK GOBLE,
L. BOYD WALBRIDGE,
Members of Advisory Board.

J. E. MALONEY,
Secretary-Engineer.

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PARKDALE TO COTOPAXI, FREMONT COUNTY—STATE PRIMARY ROAD NO. 22.

Fourth Biennial Report

OF THE

State Highway Commission

OF THE

State of Colorado

1916

MEMBERSHIP OF COMMISSION DURING 1915 AND 1916

On January 18th, 1916, Mr. Frederick Goble was appointed by Governor Carlson to succeed Mr. Charles E. Herr, as member for District No. 4, for a term ending April 1, 1920, and

On April 3rd, 1916, Mr. Fred J. Radford was appointed by Governor Carlson to succeed Mr. Charles R. McLain, as member for District No. 3, for a term ending April 1, 1921;

The members of the Commission at this time being as follows:

Mr. Thomas J. Ehrhart, State Highway Commissioner.

Mr. John M. Kuykendall, Denver, Colo., District No. 1.

Mr. Leonard E. Curtis, Colorado Springs, Colo., District No. 2.

Mr. Fred J. Radford, Trinidad, Colo., District No. 3.

Mr. Frederick Goble, Silverton, Colo., District No. 4.

Mr. L. Boyd Walbridge, Meeker, Colo., District No. 5.

At a meeting held March 1-7, 1916, Mr. John M. Kuykendall was elected Chairman for the ensuing year, ending April 7, 1917; Mr. Leonard E. Curtis was elected Vice-Chairman for the ensuing year ending April 7, 1917; Mr. J. E. Maloney was elected Secretary for the ensuing year ending April 7, 1917; and Miss Annie A. Ross was appointed Stenographer.

MEETINGS

The Advisory Board, during 1915 and 1916, held thirteen meetings, regular and special, at the office of the State Highway Commission, Denver, Colo.

These meetings were held on the following dates, to-wit:

February 2, 1915.

March 2, 1915.

March 15, 1915.

April 27, 1915.

August 3, 1915.

September 15, 1915. Conference with Denver Mountain Park Commission.

November 2, 1915.

March 1 to 7, 1916.

March 21, 1916.

May 2, 1916.

August 2, 1916.

September 16, 1916.

November 11, 1916.

MILEAGE OF ROADS

At this time the total mileage of roads designated as State Roads of the Primary and Secondary Classes is as follows:

Primary	5,994.50
Secondary	1,088.99
Total State Roads.....	<u>7,083.49</u>

Total mileage of all highways in the state is approximately 40,067.

APPORTIONMENTS

Apportionments were made at the several meetings, as follows:

Year	Advisory Board District	Amount	Total
1915	No. 1	\$ 56,600.00	
	No. 2	20,250.00	
	No. 3	21,250.00	
	No. 4	30,000.00	
	No. 5	<u>29,150.00</u>	\$148,250.00
1916	No. 1	\$261,600.00	
	No. 2	104,750.00	
	No. 3	119,700.00	
	No. 4	189,700.00	
	No. 5	<u>94,200.00</u>	\$769,950.00

A total of \$918,200.00 state aid for 1915 and 1916. To avail themselves of this aid the counties of the state provided for raising by taxation or otherwise the following sums (by Advisory Board Districts):

Year	Dist. No. 1	Dist. No. 2	Dist. No. 3	Dist. No. 4	Dist. No. 5
1915	\$ 29,763.10	\$ 14,350.00	\$ 18,250.00	\$ 9,500.00	\$ 17,850.00
1916	<u>129,520.00</u>	<u>66,100.00</u>	<u>98,700.00</u>	<u>84,326.67</u>	<u>62,850.00</u>
	\$159,283.10	\$ 80,450.00	\$116,950.00	\$ 93,826.67	\$ 80,700.00

Total for the five districts of the state of \$531,209.77.

This is the total pledged by the counties to meet the State Aid Fund, but in a great many of the counties they have expended much more than this upon the state roads.

The total apportioned by the state plus the total pledged by the counties for 1915 and 1916 was \$1,449,409.77.

The total actually expended in 1915 and 1916 on state roads was \$2,042,765.81, and the total expended on all roads in these two years was \$4,075,500.59.

In addition to this there was reappportioned to the counties the balance of \$85,361.13 unexpended on November 30, 1914.

Of the state apportionments there remained on our books unexpended on November 30, 1916, \$196,290.38.

The expenditures for all salaries, traveling expenses, office fixtures and supplies for 1915 and 1916 was as follows:

1915	\$14,505.75
1916	14,916.57
Total	<u>\$29,422.32</u>

This amount is about 2% of the total state and county fund and about 3¼% of the state fund for 1915 and 1916.

At least one inspection trip was made by the members of the Board, the State Highway Commissioner, Engineer and Supervisors to every county in the state, and several trips were made to many of the counties.

MILEAGE TRAVELED

With the consent of the Auditing Board, in April, 1916, the old Cadillac automobile purchased for the use of the State Highway Commissioner in traveling about the state, was exchanged for a new machine at an additional cost of \$1,500.00.

The total cost of maintenance, storage, gasoline, oil, tires and tubes was as follows:

1915	\$ 896.75
1916	1,113.36
Total	<u>\$ 2,010.11</u>

During the two years a total of about 20,000 miles have been traveled, making the average cost per mile 10.05 cents for all expense, except first cost and depreciation.

There were 35,000 miles traveled by railroad, by the Commissioner, Engineer and Supervisors, at a cost for mileage books of:

1915	\$450.00
1916	465.00
Total	<u>\$915.00</u>

*NOTE.—Many bills for work during 1916 will be sent in during December by the County Clerks and the payments will have to be included in 1917 disbursements.

CAMPING SITES

The camping sites established throughout the state by the cities and towns have given great satisfaction to the tourists. The accommodations provided by the City of Denver in particular, have been used by thousands of automobile tourists, and they have carried away a very favorable opinion of the city and state.

ADVERTISING SIGNS

At the meeting of November 2, 1915, acting under authority of an Act of the General Assembly entitled, "An Act to Regulate Road Signs, approved April 9th, 1915;" the Advisory Board adopted rules governing the placing of signs on the state highways. These rules were sent to the counties of the state and the Commissioners were requested to see that they were enforced.

STANDARD SECTIONS FOR ROADS AND PLANS FOR BRIDGES

Much improvement is evident in the character of the road, bridge and culvert work, a continually increasing number of the counties bringing their work to conform to the standards suggested by this Commission.

ACCOUNTS

The accounts of this office during the past two years have been kept as recommended by the State Auditor, and the system has been satisfactory.

The counties have not a uniform system of keeping road accounts, but considerable progress is to be noted in this matter. Further improvement is desired so that detail costs may be obtained for each piece of work.

ROAD MAPS AND SURVEYS

Surveys and profiles are being obtained for most of the new work. In this connection I desire to call attention to the lack of space and adequate filing cases for our maps, which are valuable and should be filed so as to be readily accessible.

All counties which have not surveyed and recorded their roads properly are placed at a great disadvantage when any question as to the right of way comes up, and they have all been urged to make proper records of their roads.

TRAFFIC CENSUS REPORTS

Reports were received from fifteen counties and towns, covering many of the state highways, but we have not yet attained the desired end. Our efforts will be continued along this line so that we can get as nearly simultaneous records as possible for say June, July and August on our principal highways.

WAGON AND MOTOR VEHICLE TIRES

In the past few years a gradual change has been apparent in the method of hauling heavy loads over our roads. Motor trucks are being used in place of horse-drawn wagons, and the loads are being greatly increased. There is also to be noted the increasing use of our county and state roads by the large passenger stages and sightseeing cars. These vehicles, as well as the narrow-tired wagons, tend to destroy the road surfacing, and it would be well to consider the proposition to impose a license charge based upon the total load carried by the wheels, this license to be levied upon all vehicles.

These license collections to be distributed one-half to the state for maintenance of state roads and one-half to the counties for maintenance of the county roads, and to be used for no other purpose.

ENGINEERING AND INSPECTION

Plans, specifications and contracts have been prepared in this office, or examined and approved for bridges and culverts for the following counties: Adams, Arapahoe, Logan, Cheyenne, Kit Carson, Huerfano, Las Animas, Douglas, Crowley, Bent, El Paso, Otero, Pueblo, Prowers, Archuleta, Mineral, Rio Grande, Conejos, Gunnison, Eagle, Grand and Mesa.

Surveys, profiles, specifications and contracts were prepared or examined and approved for grading work in the following counties: Adams, Arapahoe, Jefferson, Larimer, Douglas, El Paso, Dolores, Archuleta, Rio Grande, Mineral, Hinsdale, La Plata, Ouray, San Juan, Garfield, Moffat, Wolf Creek Pass road and Pitkin Counties.

Also for surfacing in Adams, Jefferson, Larimer, Weld and Prowers Counties.

Foundations for many of the bridges were examined by our Engineer, and surveys for new locations or suggested changes in alignment were gone over with the county officials and approved or modified.

In the matter of surveys and locations for roads through the Forest Reserves, we have been assisted by the Engineers of that department.

In our office work we have answered inquiries from all parts of the United States, have kept the accounts with the 63 counties, examining statements of expenditures, and have issued 868 vouchers to the County Treasurers in payment for work done according to the apportionments. Minutes of all meetings were recorded and copies sent out. We sent to each county report blanks and traffic census blanks; prepared speeches and papers for good road meetings and conventions, and filed letters and catalogues.

CONVICT LABOR

In the past two years there have been five convict camps in operation in this state, most of the time on the construction of the state highways; part of the time upon county roads. These camps employ approximately 250 men from the State Penitentiary, and have been successfully worked under the terms of the "Lewis Law" and under the direction of the Warden, Mr. Thomas J. Tynan, and his Superintendents. These men are now working in the following counties:

In Larimer County on the Poudre Canon Road.

In Weld County on the Platte River Highway and County Roads.

In Garfield County on the Grand River Canon Road.

In Boulder County on the Boulder-Nederland Road.

In Pueblo County on the highway, Buelah to Rye.

The work accomplished has been very satisfactory and of great benefit to the state, also of benefit to the men, and these camps should be continued.

SUMMARY OF WORK ACCOMPLISHED IN 1915 AND 1916

In Advisory Board District No. 1: 705.85 miles of road graded, 155.37 miles of road surfaced, 31 bridges of all sizes, 246 culverts of all sizes.

In Advisory Board District No. 2: 752.75 miles of road graded, 56.25 miles of road surfaced, 27 bridges of all sizes, 446 culverts of all sizes.

In Advisory Board District No. 3: 552.20 miles of road graded, 187 miles of road surfaced, 59 bridges of all sizes, 431 culverts of all sizes.

In Advisory Board District No. 4: 1,147.47 miles of road graded, 13.99 miles of road surfaced, 103 bridges of all sizes, 763 culverts of all sizes.

In Advisory Board District No. 5: 621.37 miles of road graded, 20.75 miles of road surfaced, 55 bridges of all sizes, 410 culverts of all sizes.

This gives a total of 3,848.84 miles of state road worked upon during the past two years, at an average cost of \$304.64 per mile. This work includes the crowning, ditching and bringing to grade of this mileage of road. A great deal of this work was in the mountains and of a very heavy character.

There have been 433.36 miles of road surfaced with gravel, sand, shale, clay or adobe, at an average cost of \$466.27 per mile, and there were $1\frac{3}{4}$ miles of road concreted on the South Golden Road. The mile of concrete surfacing which has been under construction on the Morrison Road was completed.

There have been 275 bridges built at an average cost of \$965.26 per bridge. These bridges are of spans from 10 feet up; one bridge 612 feet 6 inches in length, was constructed at Sterling, Colo., over the Platte River.

There were 2,296 culverts placed, at an average cost of \$43.33 per culvert. The culverts ranged in size from 8 inches up to 10 feet.

There were 4,886.25 miles of road dragged, at an average cost of \$45.55 per mile per year for maintenance and repair. This includes dirt and gravel roads.

A brief outline of the work on the main roads of the state is as follows:

On the North and South Highway, running from Cheyenne, Wyoming, through Fort Collins, Loveland, Longmont, Denver, Littleton, Castle Rock, Palmer Lake, Monument, Colorado Springs, Pueblo, Walsenburg and Trinidad, to Raton, New Mexico. The road was graded, surfaced and has permanent bridges for 266 miles of the entire 326 miles within Colorado. Larimer, Boulder, Adams, Arapahoe, Douglas, El Paso and Pueblo Counties have this road surfaced. Huerfano has finished a fine concrete bridge over the Huerfano River and graded a part of their road, and Las Animas County has built a number of concrete culverts and bridges and surfaced a portion of the road. There remains about 60 miles to be surfaced.

River Road, Denver to Brighton, Greeley to Cheyenne. This road has been surfaced with gravel in Adams and Weld Counties during the past two years.

The road from Greeley to Fort Morgan, Brush, Sterling and Julesburg has been improved by surfacing and grading in the past two years.

There are six state roads to the east, which have all been improved by grading and surfacing. These East and West roads are connected by secondary North and South state roads on each of which the various counties have started some improvement.

Of these eastern connections, the road through Burlington to Limon and through Cheyenne Wells to Limon, branching at Limon to Denver and Colorado Springs, makes one of the very important eastern connections. This road has had a great deal of work done upon it by every county through which it passes, to-wit: Kit Carson, Lincoln, Elbert, Arapahoe, El Paso and Cheyenne. From Pueblo east the state road has been greatly improved by surfacing and the erection of concrete bridges.

In Boulder County work has continued on the Boulder-Nederland Road, and good progress has been made, considering the heavy work. Work was also in progress on the North and South Road and on the Boulder-Lyons Road to Estes Park.

On the Fall River Road contract was let for 4 miles, 2 miles of which have been completed. A survey was made of the entire line to Grand County through the co-operation of the Department of National Parks, Department of Interior.

The Convict Camp on the Poudre has been worked continuously and will be continued during the coming season.

The road up the Arkansas River from Canon City to Salida was opened to travel, and work started on the road from Texas Creek to Silver Cliff.

Considerable improvement in grading, bridges and surfacing was made on the Santa Fe Trail by Las Animas, Otero, Bent and Prowers Counties.

Park and Jefferson Counties have improved the Turkey Creek and South Platte Road by grading.

On Berthoud Pass the road has been graded and drained.

In Lake and Eagle Counties the Tennessee Pass road has been improved and considerable work done on the Twin Lakes-Aspen Road.

In Pitkin County work was continued on the Independence Pass Road and on the road down the river toward Carbondale.

The LaVeta Pass Road was improved on both sides by Huerfano and Costilla Counties.

To the northwest work has been in progress in Grand, Jackson, Routt, Moffat and Rio Blanco Counties.

Park and Summit have improved the road over Hoosier Pass.

Gunnison, Montrose and Delta Counties have worked upon the road from Monarch Pass over Black Mesa to Hotchkiss and over Blue Mesa to Montrose.

Montrose County has done a great deal of work on the road through Paradox Valley.

San Miguel has improved the road down the river from Telluride and Placerville.

Ouray has completed part of the improvement on the Ouray-Silverton Road near Ouray.

On the Silverton-Durango Road San Juan and La Plata Counties have both let contracts for a portion of the road, and the United States Forest Service has had a survey made between the two ends.

In Dolores County considerable work has been done on the Rico Road.

Montezuma County has greatly improved its roads from Durango and to the west and south.

The Wolf Creek Pass Road was finished and opened to travel this year; this road opened the southwestern section of our state to auto travel, making the Mesa Verde Park accessible to auto

tourists. This road is on the line of the "Spanish Trail" to the Southwest and is in Archuleta, Rio Grande and Mineral Counties. Archuleta has improved the road to Chama, New Mexico, also towards Wolf Creek Pass and to Durango.

Rio Grande, Mineral and Alamosa Counties have improved the Rio Grande River Road from Alamosa to Creede.

In Mesa County a great deal of work has been done on all the state roads.

Saguache County has graded most of the state roads and in conjunction with the Forest Service has completed the road over Cochetopa Pass into Gunnison County.

Hinsdale County has worked upon the road from Lake City to Gunnison and towards Creede.

The roads in Chaffee County show great improvement, work having been done upon the River Road and toward Monarch Pass.

In Conejos County work was done upon the road to the New Mexico line and up to the Conejos River.

Garfield County has greatly improved the road to Meeker and from Glenwood to Grand Valley and DeBeque. The work in the canon above Glenwood is progressing nicely, and we hope the Convict Camp will be maintained there until the completion of this important and heavy piece of work.

In Jefferson County, the state and county, in conjunction with the Mountain Park Commission of Denver, have improved the road to Morrison and up Bear Creek, and have completed $1\frac{3}{4}$ miles of the concrete road to Golden. The state and county have nearly completed the last piece of grading and have completed the surfacing of the road to Morrison; also the road up Turkey Creek; the North Golden Road was resurfaced for 5 miles, and the Guy Hill Road relocated for $1\frac{1}{2}$ miles with 6% grade.

Boulder, Jefferson and Gilpin Counties have started work on the Coal Creek Road towards Nederland.

During the past two years every county in the state, without an exception, has been busy with the improvement of its roads.

Attention is called to the fact that the total mileage of roads has increased nearly 25%. This is due to the opening of new roads by many counties along section lines for the accommodation of new settlers.

Our state road system has also increased by 20%, being now 7,083.49 miles, as against 5,842.45 miles two years ago.

GENERAL ROAD MAP OF STATE

A map is submitted herewith showing the system of State Primary and Secondary Roads, together with the boundaries of the Advisory Board Districts, and County lines.

GENERAL OUTLINE OF WORK PLANNED FOR 1917 AND 1918

1st. To complete the grading and surfacing of the Great North and South Highway, through Huerfano and Las Animas Counties.

2nd. The completion of the road from Durango to Silverton and to Ouray.

3rd. The completion of the Fall River and Poudre Roads to Grand Lake.

4th. The completion of the road from Boulder to Nederland, Central City and Idaho Springs.

5th. The further improvement of the road from the Kansas line through Limon to Denver and Colorado Springs.

6th. The improvement of the road from Tennessee Pass through Grand Junction to the Utah state line, and the continuation of the work in the Grand River Canon above Glenwood Springs.

7th. The improvement of the road over Monarch Pass.

8th. The further improvement of the Platte River Road to the Nebraska state line, and of the East and West connecting roads.

9th. The completion of the Independence Pass Road from Aspen to Twin Lakes.

10th. The further improvement of the road from Pueblo east to the Kansas state line, and the improvement of the eastern connection through Crowley and Kiowa Counties.

11th. The improvement of the road over Berthoud Pass to Wolcott, and to Grand Lake.

12th. The completion of the concrete road to Golden.

13th. The improvement of the road to Littleton.

14th. The completion of the road from Dolores to Rico and Placerville.

15th. The further improvement of the road from Craig to Meeker and Rifle; also to the Utah state line.

16th. The completion of the road to the Paradox Valley and to the Utah state line.

17th. The further improvement of the roads up Turkey and Bear Creeks and through Park County to Buena Vista.

18th. The completion of improvements on the Morrison Road.

19th. The improvement of the LaVeta Pass Road.

20th. The improvement of the La Junta-Trinidad Road and southeast from Trinidad to the state line.

21st. The improvement of the Black Mesa Road.

22nd. The improvement of the Blue Mesa Road.

23rd. The improvement of the road from Kremmling to Walden and over Rabbit Ear Pass.

The improvement of all connecting state roads is also to be continued. With the completion of these projects our state road system will be fairly well improved along the main lines.

FUTURE EXTENSIONS

It will be found desirable to keep extending the state road system until each section has a connection with the main roads. These extensions will probably continue until approximately 16,000 miles are included in the state system.

RECOMMENDATIONS

In order to properly prepare and look after this important work, it is absolutely necessary that this Commission have an increased expense account. Our total allowance for salaries and expenses should not be less than \$30,000.00 per annum.

Under the present law the appropriation of \$15,000.00 per annum for salaries and expense accounts is entirely inadequate for the conduct of this office on a basis of efficiency. The present salary list consists of:

Commissioner	\$3,000.00	per annum
Secretary-Engineer	2,100.00	per annum
Clerk and Stenographer.....	1,200.00	per annum
1 Supervisor	1,500.00	per annum
1 Supervisor	1,500.00	per annum
Total	\$9,300.00	per annum

leaving \$5,700.00 for traveling, office and Advisory Board expenses, which is insufficient to properly supply the office with the necessities and equipment, and pay the traveling expenses of the Commissioner, Engineer, Supervisors and Advisory Board.

This office ought to have the following employees and salaries:

Commissioner	\$ 4,200.00	per annum
Secretary-Engineer	3,000.00	per annum
Draftsman and Bookkeeper.....	1,500.00	per annum
Clerk and Stenographer.....	1,200.00	per annum
Stenographer	1,200.00	per annum
2 Field Engineers	1,800.00	per annum
2 Supervisors	1,500.00	per annum
Total	\$17,700.00	per annum

This would leave \$12,300.00 to take care of office expenses, Engineer's expenses, traveling expenses and Advisory Board expenses. These salaries and expenses would amount to less than 4% of the State Road Fund, and to but 2½% of the joint fund.

The Secretary of Agriculture, in administering the expenditure of the funds appropriated under the Federal Aid Road Act for the improvement of Post Roads, deducts from these funds be-

fore allotment to the different states 3% for office expenses, and allows, in the expenditure of these funds, not to exceed 10% for engineering and inspection, which means, altogether, an allowance of a sum approximately equal to 13% of the entire expenditure, as compared to my suggestion of appropriating an amount slightly less than 4% of the State Road Fund, and including a considerable portion of the field, engineering expense and supervision, which seems to be very reasonable and fair, and I am sure will tend to greater efficiency and satisfaction.

I have suggested an increase in the salary of the Commissioner for the reason that the duties require his entire time continuously all the year, and a large percentage of this time is spent in traveling about the state, visiting the county commissioners, inspecting actual road conditions and adjusting matters of difference.

The Secretary-Engineer's salary should be \$3,000.00 for the reason that every moment of his time is occupied, and that the varied duties of the office require a man of wide experience, peculiar fitness and technical engineering knowledge.

While the present State Highway Commission Act, through its administration, has brought about a great general improvement in road conditions all over the state, it could be greatly strengthened, and should be amended by the present Legislature along the following lines, and I make the following recommendations for your consideration:

The State Highway Commission should be given power and authority to make contracts and enter into agreements with the Boards of County Commissioners for the maintenance of state roads.

Plans and specifications for all bridges and culverts on both state and county roads, and the contracts therefor should be submitted to and approved by the State Highway Commissioner and his Engineer before a contract is entered into.

Counties having a valuation of eight million dollars or more, should be compelled to employ a County Engineer or General Road Overseer, to take entire charge of the county road system, who should be examined as to his qualifications, and approved by the State Highway Commission.

The State Highway Commission should be given the power to condemn rights of ways on state highways.

The State Highway Commission should be permitted to send a representative to national road conventions, and when they deem it necessary to permit the State Highway Commissioner or his Engineer to attend any important business meeting in connection with interstate roads in which Colorado is directly interested, and authorize the payment of the necessary expenses incurred in connection therewith.

The State Highway Commission should be authorized by law to enter into contracts and agreements with the Secretary of Agri-

culture, or his representatives, and the officers of the Forest Department, in order to expeditiously avail ourselves of the funds coming to the state under the Federal Aid Road Act.

The law should be amended so as to permit the State Highway Commission to assist in the improvement of state highways passing through towns having a population of less than 2,500.

There is a strong demand for a bond issue, with the purpose of more rapidly improving our road system. The time is, without doubt, near at hand when we will be compelled to seriously consider either a bond issue or an increase in our state road tax levy, and I believe some consideration should be given this matter during this session of the General Assembly.

A detailed statement of the finances and work of the department is submitted with the report of the Engineer.

In closing I desire to mention the death of the Hon. Charles P. Allen, Chairman of the first State Highway Commission, who died in Denver, December 18, 1916.

Mr. Allen was appointed in February, 1910, and served as Chairman until March, 1913, when the present Commission was appointed. He was very active and enthusiastic in this work and accomplished a great deal in a preliminary way with very little money.

Respectfully submitted,

T. J. EHRHART,
State Highway Commissioner.

Denver, Colo., Dec. 1, 1916.

Hon. T. J. Ehrhart,
State Highway Commissioner.

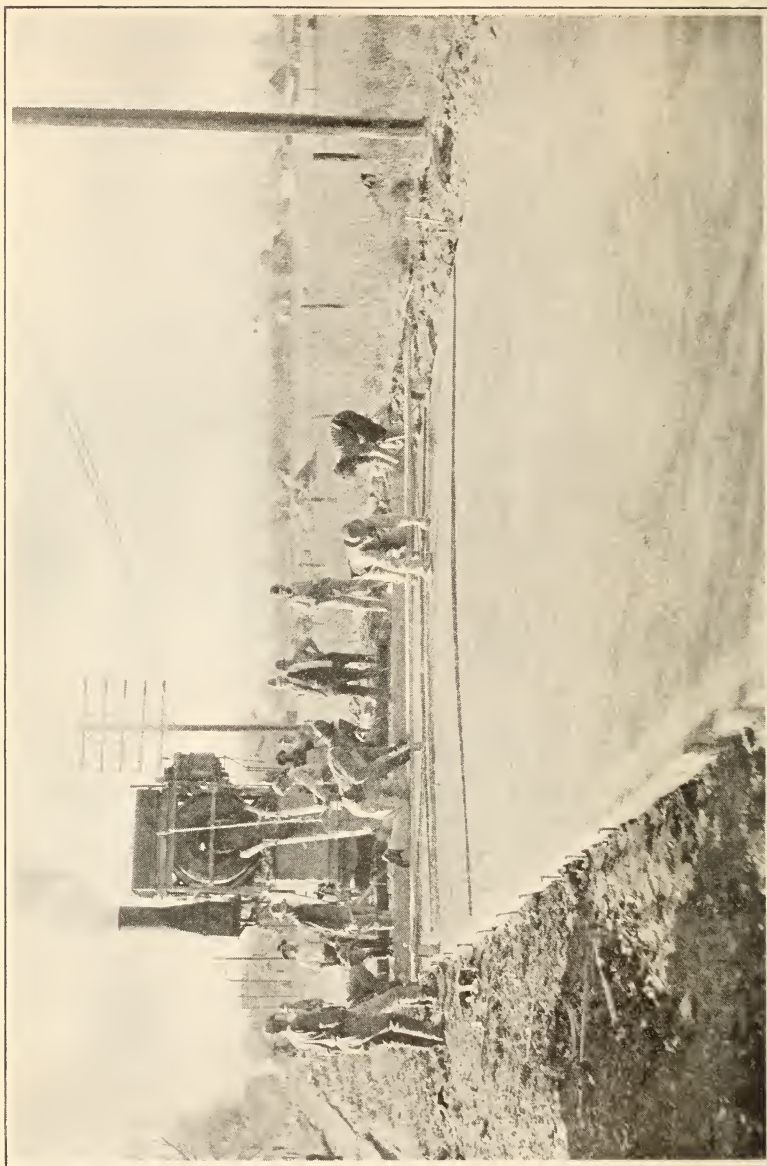
Dear Sir: I submit herewith the detail of the apportionments made by the State Highway Commission for the years 1915 and 1916, and of the amounts expended in payments to the counties of the state, as well as the detail for salaries and all expenses of this department.

TRAFFIC CENSUS

Our traffic census reports show returns from 13 counties and a condensed summary is appended. It is desirable to have this data cover all the important roads of the state for the same season, and the counties should be urged to assist in this matter.

TEST OF ROAD MATERIAL

We received results from the tests of basaltic rock from near Golden, and of paving brick from Trinidad which were sent to the Laboratory at the University of Boulder and tested for this department; we also received results of tests from the Office of Public Roads at Washington, for samples of slag, sand and andesite, and the results are appended.



EIGHTEEN-FOOT CONCRETE ROAD, DENVER TO GOLDEN—STATE PRIMARY ROAD NO. 62—GAFFY AND KEEFE, CONTRACTORS.

WIDE TIRES AND MOTOR TRAFFIC

Within the past two years it has become apparent that the question of weight on each wheel, not only upon horse-drawn vehicles, but upon motor trucks, should be considered. Freight and passenger trucks carry heavy loads, and the tendency is to keep increasing the loads. These trucks use the public highways and entail an extraordinary wear and tear upon the road whether it is of dirt, gravel top, or hard surface, and therefore an extra cost for the upkeep of the highway.

I desire also to call your attention to the destructive action of lugs on the driving wheels of traction engines.

Attention is called to the table of weight on tires and resistance to traction, published in the last biennial report.

BRIDGES

The improvement in the character of the bridges and culverts has continued, both in the sub and super-structures.

Some few bridges were washed out by floods during the past two years. They were all old wooden or combination wood structures that had served their purpose. All that were on the state highways have been replaced with first-class structures of steel and concrete, on good foundations.

Details of the contracts for bridges are given in Table No. 16C appended hereto.

GRADING

Thirty contracts, specifications and plans for grading were prepared, examined, modified or approved by this office for the counties, and details are shown in Table No. 16A. Most of this work is completed.

SURFACING

Specifications and contracts were prepared or examined for surfacing state highways with concrete, gravel, sand, shale or adobe for the following counties: Adams, Jefferson, Larimer, Weld and Prowers.

This surfacing is all finished, except on the road to Golden of which 1.75 miles of concreting was completed, when the weather conditions compelled the contractor to shut down for the winter.

SURVEYS AND MAPS

As this department had no appropriation to pay the salaries of a corps of Engineers, no surveys have been made direct from this office, but through the co-operation of the counties, U. S. Department of Agriculture, Office of Public Roads, Department of

National Parks, Department of Forestry, and by subscription from private parties surveys were made for many of the new road locations and for proposed changes. We have received and filed maps and profiles of many stretches of the state road system. There remain many more miles to be surveyed and properly recorded and the counties should be urged to complete their records in this respect.

A record has been started of each state highway, giving each culvert and bridge, also showing character of surfacing and other improvements. This record will be completed as rapidly as possible.

COST RECORDS

Many of the counties are still unable to detail their expenditures so as to give the cost for each of the particular classes of work. If it were possible to have a uniform system of books kept by each county it would be of great assistance to the county officials and to the state departments. Appended hereto I have inserted blanks, suggested for the records of the Road Overseers and County Clerks.

GENERAL

The work in various parts of the state has been visited, inspection trips being made to all the counties by some official of the department. The Arkansas River Road, and the Wolf Creek Pass Road have been completed and opened to travel. Bridge foundations were inspected for many of the counties, and the construction work gone over from time to time.

In the office work, accounts with the 63 counties were kept, miscellaneous correspondence answered, and circulars issued to each County Commissioner, giving the Rules and Regulations relating to Road Signs.

The following tables and maps are attached hereto:

No.

1. Cash receipts in State Road Fund for 1915 and 1916.
2. Balance of apportionment of state funds left on November 30, 1914.
3. Apportionments and payments of state funds on state roads for 1915 and 1916.
4. Balances on November 30, 1916.
5. Details of salaries and expenses for 1915 and 1916.
6. Details of expenditures on state roads, 1915 and 1916, and expenditures on county roads, 1915 and 1916.
7. Valuation, area, population, road mileage and road levy for the counties of the state.

8. Mileage and expenditure on each state highway.
9. Receipts from Forest Service Funds.
10. Expenditure by Forest Service of additional 10% fund on county and state roads of state for 1916.
11. Traffic census returns (condensed).
12. Results of tests of road materials.
13. Elevation of passes.
14. Replies from auto tourists, giving costs and comments on road conditions.
15. Camping sites.
16. Tables of contracts for 1915 and 1916.
 - (a) Grading.
 - (b) Surfacing.
 - (c) Bridges.
17. Forms for road reports.

Maps:

Map of the state highways of Colorado, 1916 (in pocket on cover).

Sketch of flush concrete crossings for creeks.

Respectfully yours,

J. E. MALONEY,
Secretary-Engineer.



GRAVEL ROAD, GREEBLEY TO CHEYENNE, SHOWING CONCRETE FLUSH CROSSINGS — STATE
STATE SECONDARY ROAD NO. 3.

TABLE NO. 1

CASH RECEIPTS FOR STATE ROAD FUND IN 1915 AND 1916

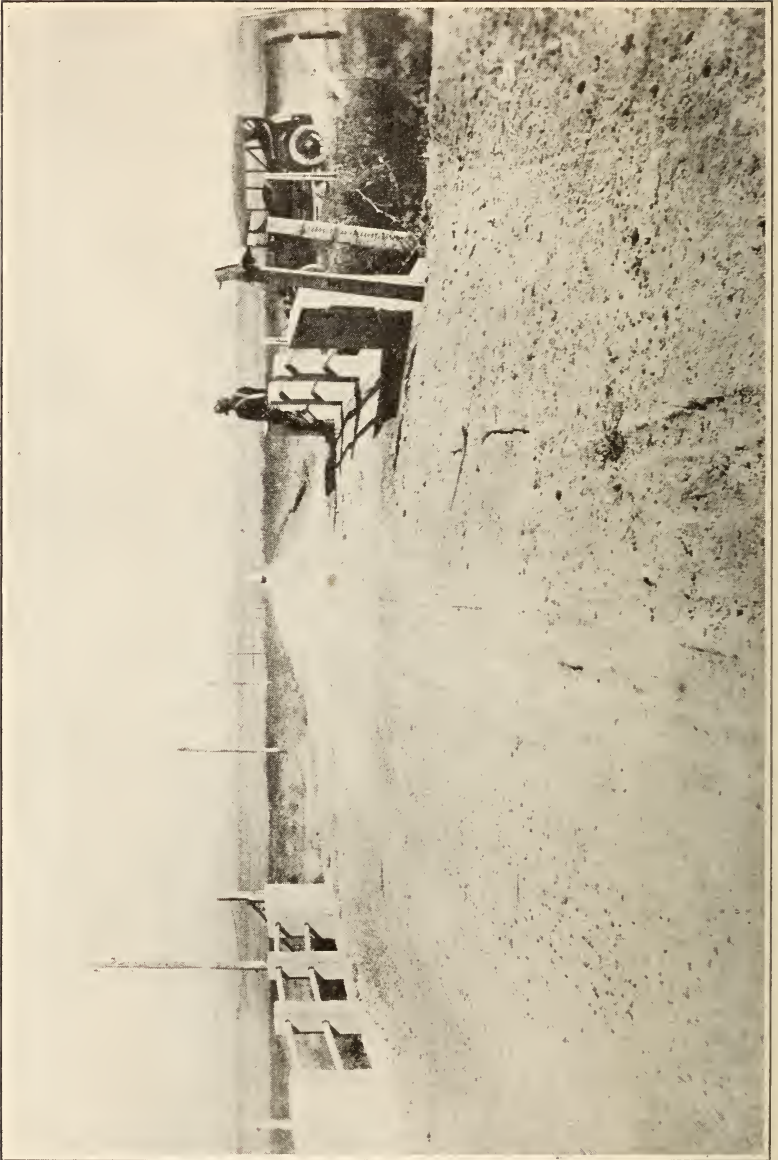
Cash balance carried over Nov. 30, 1914.....		\$ 21,465.56
Receipts, 1915:		
Motor Licenses	\$ 52,853.17	
Motor Fines	45.00	
Internal Improvement Fund, Permanent.....	118,000.00	
Internal Improvement Fund, Income.....	26,000.00	
	<hr/>	
Total, 1915		196,898.17
Receipts, 1916:		
Motor Licenses	\$ 90,560.43	
Motor Fines	5.00	
*Department National Parks, U. S.	2,500.00	
Miscellaneous Refunds	15.13	
Half Mill Levy, Road Tax.....	570,735.46	
Internal Improvement Fund, Permanent.....	38,108.81	
Internal Improvement Fund, Income.....	51,156.44	
	<hr/>	
Total, 1916		753,081.27
		<hr/>
Total Receipts for 1915 and 1916.....		\$971,445.00
**Total Expenditures, State Road Fund 1915 and 1916		835,730.41
		<hr/>
Cash Balance, Nov. 30, 1916.....		\$135,714.59

GENERAL STATEMENT OF EXPENDITURES IS AS FOLLOWS:

1915:		
Paid to Counties	\$198,091.39	
Salaries and Expenses	14,505.75	
	<hr/>	
Total		\$212,597.14
1916:		
Paid to Counties.....	\$607,627.95	
Emergency Road Work.....	576.25	
Salaries and Expenses.....	14,929.07	
	<hr/>	
Total		\$623,133.27
		<hr/>
Total for 1915 and 1916.....		\$835,730.41

*From Department of Interior for Fall River Road work.

**Many county bills for 1916 work were received too late to be included in this statement, and must appear in next year's account.



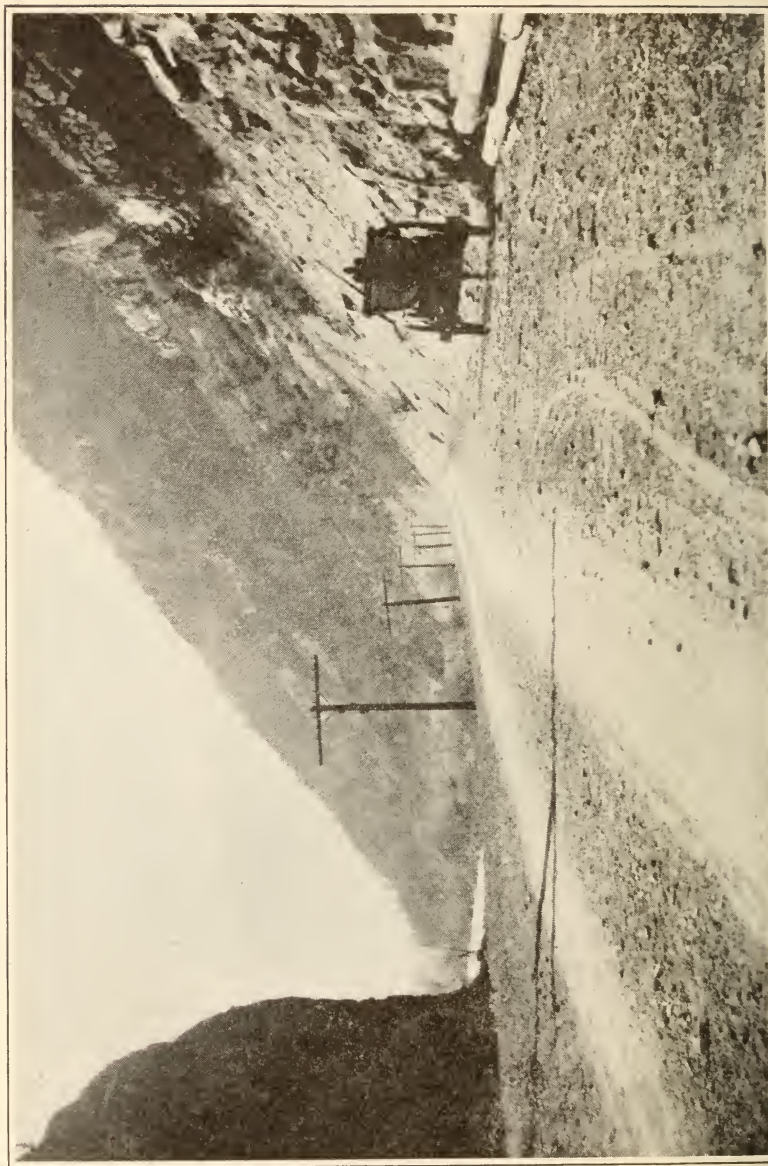
SHALE SURFACED ROAD IN PUEBLO COUNTY—STATE PRIMARY ROAD NO. 75.

TABLE NO. 2

BALANCE OF APPORTIONMENT LEFT TO CREDIT OF
COUNTIES NOVEMBER 30, 1914

Advisory Board

District	County	Amount	Total
No. 1	Adams	\$ 5,008.27	
	Arapahoe	1,628.18	
	Boulder	1,961.79	
	Clear Creek	.01	
	Gilpin	480.39	
	Jefferson	5,512.30	
	Logan	204.20	
	Morgan	1,175.61	
	Phillips	814.49	
	Washington	487.24	
	Weld	1,000.00	
			\$18,272.48
No. 2	Chaffee	\$ 171.75	
	Douglas	4,767.29	
	Elbert	611.74	
	Teller	4,228.25	
			9,779.03
No. 3	Baca	\$ 666.69	
	Custer	354.75	
	Crowley	1,415.61	
	Fremont	10,689.02	
	Huerfano	4,536.27	
	Kiowa	953.74	
	Otero	2,000.00	
			20,616.08
No. 4	Alamosa	\$ 2,020.56	
	Costilla	1,945.43	
	Conejos	609.86	
	Elwood Pass Road	21,357.59	
	Gunnison	145.25	
	Mineral	43.65	
	Ouray	1,181.67	
	San Miguel	138.25	
	San Juan	2,708.99	
	Saguache (overpaid)	\$.02	
			30,151.25
No. 5	Eagle	\$ 456.21	
	Grand	1,581.53	
	Moffat	2,600.00	
	Rio Blanco	1,397.06	
	Routt	507.49	
			6,542.29
			\$85,361.13



ROAD IN GRAND RIVER CANYON ABOVE GLEN WOOD SPRINGS—STATE PRIMARY ROAD NO. 11.
BUILT BY CONVICT LABOR.

TABLE NO. 3

APPORTIONMENTS AND PAYMENTS OF STATE FUNDS, ON STATE ROADS, FOR THE YEARS
1915 AND 1916

Arranged according to Advisory Board Districts

DISTRICT NO. 1

County	Apportioned for		Total 1915-1916	Payments for		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
Adams	\$ 9,750.00	\$ 17,100.00	\$ 26,850.00	\$ 13,202.07	\$ 13,507.04	\$ 26,709.11
Arapahoe	2,150.00	18,600.00	20,750.00	3,447.27	16,482.24	19,929.51
Boulder	3,500.00	29,300.00	32,800.00	5,461.79	28,647.38	34,109.17
Clear Creek	1,000.00	7,400.00	8,400.00	1,000.01	7,400.00	8,400.01
Gilpin	1,000.00	3,000.00	4,000.00	480.39	4,000.00	4,480.39
Jefferson	4,500.00	81,700.00	86,200.00	6,001.30	32,497.40	38,498.70
Larimer	*23,450.00	32,800.00	56,250.00	22,609.02	24,016.67	46,625.69
Logan	1,000.00	13,500.00	14,500.00	1,204.20	11,176.23	12,380.43
Morgan	1,500.00	7,900.00	9,400.00	2,675.61	7,900.00	10,575.61
Phillips	750.00	3,200.00	3,950.00	None	2,215.64	2,215.64
Sedgwick	1,000.00	3,200.00	4,200.00	774.67	2,504.50	3,279.17
Washington	750.00	5,100.00	5,805.00	968.89	2,441.11	3,410.00
Weld	5,000.00	33,200.00	38,200.00	5,881.99	22,623.04	28,505.03
Yuma	1,250.00	5,600.00	6,850.00	None	4,268.51	4,268.51
Total	\$ 56,600.00	\$ 261,600.00	\$ 318,200.00	\$ 63,707.21	\$ 179,679.76	\$ 243,386.97

*\$2,500.00 from Department of Interior, U. S. included.

Note: in all the Districts payments were made after Nov. 30, 1916, and will appear in report for 1917.

DISTRICT NO. 2

County	Apportioned for		Total 1915-1916	Payments for		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
Chaffee	\$ 1,000.00	\$ 8,700.00	\$ 9,700.00	\$ 1,175.75	\$ 8,700.00	\$ 9,875.75
Cheyenne	750.00	7,700.00	8,450.00	None	4,013.24	4,013.24
Douglas	7,000.00	13,150.00	20,150.00	10,944.65	10,536.20	21,480.85
Elbert	1,750.00	12,000.00	13,750.00	611.74	11,221.23	11,832.97
El Paso	5,000.00	30,900.00	35,900.00	5,000.00	30,900.00	35,900.00
Kit Carson	750.00	5,400.00	6,150.00	750.00	4,616.54	5,366.54
Lincoln	1,000.00	4,800.00	5,800.00	633.59	2,226.88	2,860.47
Lake	1,000.00	8,400.00	9,400.00	1,000.00	8,400.00	9,400.00
Park	1,000.00	6,000.00	7,000.00	None	None	None
Teller	1,000.00	7,700.00	8,700.00	3,652.50	None	3,652.50
Total	\$ 20,250.00	\$ 104,750.00	\$ 125,000.00	\$ 23,768.23	\$ 80,614.09	\$ 104,382.32

DISTRICT NO. 3

County	Apportioned for		Total 1915-1916	Payments for		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
Baca	\$ 750.00	\$ 1,400.00	\$ 2,150.00	\$ 276.23	\$ 590.21	\$ 866.44
Bent	1,000.00	4,900.00	5,900.00	629.30	3,553.15	4,182.45
Custer	500.00	1,100.00	1,600.00	226.74	594.62	821.36
Crowley	500.00	3,900.00	4,400.00	1,604.87	3,090.74	4,695.61
Fremont	10,000.00	28,200.00	38,200.00	20,689.02	27,672.52	48,361.54
Huerfano	1,000.00	8,100.00	9,100.00	4,536.27	8,707.20	13,243.47
Kiowa	750.00	3,600.00	4,350.00	870.82	3,226.79	4,097.61
Las Animas	1,000.00	19,000.00	20,000.00	1,000.00	16,902.82	17,902.82
Otero	750.00	11,900.00	12,650.00	2,750.00	10,907.18	13,657.18
Pueblo	1,000.00	28,200.00	29,200.00	1,000.00	28,200.00	29,200.00
Prowers	4,000.00	9,400.00	13,400.00	1,137.54	11,603.43	12,740.97
Total	\$ 21,250.00	\$ 119,700.00	\$ 140,950.00	\$ 34,720.79	\$ 115,048.66	\$ 149,769.45

DISTRICT NO. 4

County	Apportioned for		Total 1915-1916	Payments for		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
Archuleta	750.00	\$ 1,900.00	\$ 1,900.00	None	None	None
Alamosa	750.00	3,100.00	3,850.00	2,770.56	2,588.76	5,359.32
Costilla	750.00	2,400.00	2,400.00	1,945.43	2,400.00	4,345.43
Concejos	750.00	3,700.00	4,450.00	None	4,079.51	4,079.51
Dolores	750.00	5,100.00	5,850.00	None	7,613.36	7,613.36
Delta	750.00	10,800.00	11,550.00	None	25,467.19	67,324.78
Elwood Pass Road over Wolf Creek	20,500.00	29,000.00	49,500.00	41,857.59	7,600.00	8,745.25
Gunnison	1,000.00	9,600.00	10,600.00	1,145.25	2,101.92	2,601.92
Hinsdale	500.00	2,900.00	3,400.00	500.00	13,700.00	13,700.00
La Plata	1,500.00	13,700.00	24,900.00	1,500.00	23,400.00	24,900.00
Montrose	750.00	23,400.00	24,900.00	None	1,707.63	1,707.63
Montezuma	750.00	3,600.00	3,600.00	793.65	6,993.29	7,786.94
Mineral	750.00	8,200.00	8,950.00	1,931.67	9,880.00	11,811.67
Ouray	750.00	9,900.00	10,650.00	None	20,771.65	20,771.65
Rio Grande	1,000.00	22,500.00	22,500.00	1,138.25	4,525.33	5,663.58
San Miguel	1,000.00	6,000.00	7,000.00	2,057.25	8,474.17	10,531.42
San Juan	1,000.00	26,800.00	26,800.00	998.98	4,306.37	5,305.35
Saguache	1,000.00	7,100.00	8,100.00	None	None	None
Total	\$ 30,000.00	\$189,700.00	\$219,700.00	\$ 56,638.63	\$145,609.18	\$202,247.81

DISTRICT NO. 5

County	Apportioned for		Total 1915-1916	Payments for		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
Eagle	\$ 750.00	\$ 4,800.00	\$ 5,550.00	\$ 1,206.21	\$ 2,800.00	\$ 4,006.21
Grand	1,250.00	4,600.00	5,850.00	1,937.76	5,493.77	7,431.53
Garfield	4,000.00	29,400.00	33,400.00	3,997.74	29,402.26	33,400.00
Jackson	750.00	2,700.00	3,450.00	646.72	2,351.37	2,998.09
Mesa	2,000.00	14,500.00	16,500.00	2,000.00	11,236.91	13,236.91
Moffat	3,750.00	4,600.00	7,850.00	1,124.04	9,325.96	10,450.00
Pitkin	3,750.00	16,000.00	19,750.00	3,750.00	15,368.47	19,118.47
Rio Blanco	2,000.00	4,400.00	6,400.00	3,397.06	4,400.00	7,797.06
Routt	1,200.00	8,200.00	9,400.00	.....	6,297.52	6,297.52
Summit	1,200.00	5,000.00	6,200.00	1,200.00	.....	1,200.00
Total	\$ 20,150.00	\$ 94,200.00	\$114,350.00	\$ 19,259.53	\$ 86,676.26	\$105,935.79

SUMMARY

District	Apportioned		Total 1915-1916	Payments		Total 1915-1916
	Year 1915	Year 1916		Year 1915	Year 1916	
1	\$ 56,600.00	\$261,600.00	\$318,200.00	\$ 63,707.21	\$179,679.76	\$243,386.97
2	20,250.00	104,750.00	125,000.00	23,768.23	80,614.09	104,382.32
3	21,250.00	119,700.00	140,950.00	34,720.79	115,048.66	149,769.45
4	30,000.00	189,700.00	219,700.00	56,638.63	145,609.18	202,247.81
5	20,150.00	94,200.00	114,350.00	19,259.53	86,676.26	105,935.79
Total	\$148,250.00	\$769,950.00	\$918,200.00	\$198,094.39	\$607,627.95	\$805,722.34

Note: Attention is called to the balances shown in Table No. 2 which were carried over to the credit of the counties as shown; also to Table No. 4 which shows the balances remaining to the credit of the counties on Nov. 30, 1916.



ROAD UP CACHE LA POUDEE' FT. COLLINS TO GRAND LAKE—STATE PRIMARY ROAD NO. 50, CON-
VICT LABOR.

TABLE NO. 4

BALANCE OF APPORTIONMENT LEFT TO CREDIT OF
COUNTIES ON NOVEMBER 30, 1916

Advisory Board District	County	Amount	Total
No. 1	Adams	\$ 3,597.25	
	Arapahoe	2,448.67	
	Boulder	652.62	
	Clear Creek		
	Gilpin		
	Jefferson	53,213.60	
	Larimer	9,624.31	
	Logan	2,323.77	
	Morgan		
	Phillips	2,548.85	
	Sedgwick	920.83	
	Washington	2,927.24	
	Weld	10,694.97	
	Yuma	2,581.49	
			\$91,533.60
No. 2	Chaffee	\$	
	Cheyenne	4,436.76	
	Douglas	3,436.44	
	Elbert	2,528.77	
	El Paso		
	Kit Carson	783.46	
	Lincoln	2,939.53	
	Lake		
	Park	7,000.00	
	Teller	9,275.75	
			30,400.71
No. 3	Baca	\$ 1,950.25	
	Bent	1,717.55	
	Custer	1,133.89	
	Crowley	1,120.00	
	Fremont	527.48	
	Huerfano	392.80	
	Kiowa	1,206.13	
	Las Animas	2,097.18	
	Otero	992.82	
	Pueblo		
	Prowers	659.03	
			11,797.13
No. 4	Archuleta	\$ 1,900.00	
	Alamosa	511.24	
	Costilla		
	Conejos	5,059.86	
	Delta	3,936.64	
	Dolores	1,770.49	
	Elwood Pass Road	3,532.81	
	Gunnison	2,000.00	
	Hinsdale	798.08	
	La Plata		
Montezuma	1,892.37		

TABLE NO. 4—Continued

	Montrose		
	Mineral	1,206.71	
	Ouray	20.00	
	Rio Grande	1,728.35	
	San Miguel	1,474.69	
	Saguache	2,793.63	
	San Juan	18,977.57	
			<u>47,602.44</u>
No. 5	Eagle	\$ 2,000.00	
	Garfield		
	Grand		
	Jackson	451.91	
	Mesa	3,263.09	
	Moffat		
	Pitkin	631.53	
	Rio Blanco		
	Routt	3,609.97	
	Summit	5,000.00	
			<u>14,956.50</u>

SUMMARY

District No. 1	\$ 91,533.60
District No. 2	30,400.71
District No. 3	11,797.13
District No. 4	47,602.44
District No. 5	14,956.50
	<u>Total balance of apportionments unexpended Nov. 30, 1916.....</u>
	\$196,290.38



ROAD OVER WOLF CREEK PASS; DEL NORTE TO PAGOSA SPRINGS ON SPANISH TRAIL TO MESA VERDE PARK, SHOWING SWITCH-BACK—STATE PRIMARY ROAD NO. 15.

TABLE NO. 5

DETAILS OF SALARIES AND EXPENDITURES FOR
1915 AND 1916

Salaries:	Year 1915	Year 1916	Total for 1915-1916
Commissioner	\$ 3,000.00	\$ 3,000.00	\$ 6,000.00
Secretary-Engineer	2,100.00	2,100.00	4,200.00
Stenographer	1,200.00	1,200.00	2,400.00
Two Supervisors	3,000.00	1,707.00	4,707.00
Assistant Engineer	197.41	.....	197.41
Extra Stenographer	254.84	832.20	1,087.04
	<u>\$ 9,752.25</u>	<u>\$ 8,839.20</u>	<u>\$18,591.45</u>
Expenses:			
Advisory Board (5 members).....	\$ 577.68	\$ 941.76	\$ 1,519.44
Commissioner:			
R. R. Mileage.....		\$ 60.00	
Expenses	\$221.93	283.99	
	<u>221.93</u>	<u>343.99</u>	<u>565.92</u>
Secretary-Engineer:			
R. R. Mileage.....	\$250.00	\$180.00	
Expenses	215.95	105.80	
	<u>465.95</u>	<u>285.80</u>	<u>751.75</u>
Two Supervisors:			
R. R. Mileage.....	\$300.00	\$225.00	
Expenses	781.46	502.95	
	<u>1,081.46</u>	<u>727.95</u>	<u>1,809.41</u>
Automobile Expense	896.75	*2,613.36	3,510.11
	<u>\$ 3,243.77</u>	<u>\$ 4,912.86</u>	<u>\$ 8,156.63</u>
Office Expense:			
South Denver Tribune.....	\$	\$ 23.00	\$ 23.00
Chas. L. Patterson (file cases).....	.....	35.80	35.80
Denver Fire Clay Co. (screens).....	.....	11.20	11.20
Lallie Surveying Co. ....	.....	24.30	24.30
Mtn. States Tel. & Tel. Co.....	124.70	112.60	237.30
Western Union Tel. Co.....	22.16	14.77	36.93
Commercial Copying Co.....	97.85	120.59	218.44
Chicago Photo Finishing Co.....	47.40	50.40	97.80
Clason Map Co.	77.50	475.00	552.50
Colo. Blue Print Co.....	3.90	46.51	50.41
Henry R. May, Photos.....	20.00	.....	20.00
Wells-Fargo Exp. Co.....	.....	.60	.60
W. H. Kistler Stat. Co.....	130.69	73.16	203.85
Smith-Brooks Printing Co.....	674.63	.....	674.63
Hoeckel Blank Book Co.....	45.15	7.85	53.00
Underwood Typewriter Co.....	7.00	8.20	15.20
Remington Typewriter Co.....	9.00	30.78	39.78
L. C. Smith Typewriter Co.....	.....	8.00	8.00
Burroughs Adding Mch. Co.....	12.00	6.00	18.00
Denver Dry Goods Co.....	66.75	.....	66.75
Eames Bros. ....	.....	15.75	15.75
Postage	171.00	100.00	271.00
	<u>\$ 1,509.73</u>	<u>\$ 1,164.51</u>	<u>\$ 2,674.24</u>
Grand Total	\$14,505.75	\$14,916.57	\$29,422.32

In addition there was expended \$576.25 for Emergency Road Work.

*This includes \$1,500.00 for purchase of automobile.



BLUE MESA ROAD, GUNNISON, TO MONTROSE—STATE PRIMARY ROAD NO. 20

EXPENDITURES ON ALL STATE ROADS FOR THE YEAR 1915 BY STATE AND COUNTY

EXPENDITURES ON COUNTY ROADS BY THE COUNTIES

DISTRICT NO. 1

DISTRICT NO. 2

DISTRICT NO. 3

DISTRICT NO. 4

DISTRICT NO. 5

ALL ROADS Total expended on all Roads in 1915

Table with 18 columns: County, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915. Includes counties like Adams, Arapahoe, Boulder, Clear Creek, Gilpin, Jefferson, Larimer, Logan, Morgan, Phillips, Sedgewick, Washington, Weld, Yuma.

Average per mile, \$443.32.

Table with 18 columns: County, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915. Includes counties like Chaffee, Cheyenne, Douglas, Elbert, El Paso, Kit Carson, Lincoln, Lake, Park, Teller.

Average per mile, \$271.29.

Table with 18 columns: County, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915. Includes counties like Baca, Bent, Custer, Crowley, Fremont, Huerfano, Kiowa, Las Animas, Otero, Pueblo, Prowers.

Average per mile, \$266.50.

Table with 18 columns: County, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915. Includes counties like Archuleta, Alamosa, Castilla, Conejos, Delta, Dolores, Gunnison, Hinsdale, La Plata, Montezuma, Montrose, Mineral, Ouray, Rio Grande, San Miguel, Saguache, San Juan.

Average per mile, \$136.08.

Table with 18 columns: County, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915. Includes counties like Eagle, Garfield, Grand, Jackson, Mesa, Moffat, Pitkin, Rio Blanco, Routt, Summit.

Average per mile, \$290.10.

Summary table with 18 columns: District, Miles, Cost, No., Cost, No., Cost, Miles, Cost, Material, Miles, Cost, Miles, Cost, Total, Miles, Cost, Miles, Cost, No., Cost, Total, in 1915.

Average per mile, \$254.12 Average, \$860.00 Average, \$42.92 Average, per mile, \$575.51 Average per mile, \$42.25

Note: Figures in parentheses are estimated.

DEPARTMENT OF THE ARMY

No.	Name	1887		1888	
		Pay	Allowances	Pay	Allowances
1	John A. ...	1,200	100	1,200	100
2	James B. ...	1,500	150	1,500	150
3	William C. ...	1,800	200	1,800	200
4	George D. ...	2,100	250	2,100	250
5	Richard E. ...	2,400	300	2,400	300
6	Henry F. ...	2,700	350	2,700	350
7	John G. ...	3,000	400	3,000	400
8	Robert H. ...	3,300	450	3,300	450
9	Thomas I. ...	3,600	500	3,600	500
10	Charles J. ...	3,900	550	3,900	550
11	Edward K. ...	4,200	600	4,200	600
12	Frederick L. ...	4,500	650	4,500	650
13	William M. ...	4,800	700	4,800	700
14	George N. ...	5,100	750	5,100	750
15	Richard O. ...	5,400	800	5,400	800
16	Henry P. ...	5,700	850	5,700	850
17	John Q. ...	6,000	900	6,000	900
18	Robert R. ...	6,300	950	6,300	950
19	Thomas S. ...	6,600	1,000	6,600	1,000
20	Charles T. ...	6,900	1,050	6,900	1,050
21	Edward U. ...	7,200	1,100	7,200	1,100
22	Frederick V. ...	7,500	1,150	7,500	1,150
23	William W. ...	7,800	1,200	7,800	1,200
24	George X. ...	8,100	1,250	8,100	1,250
25	Richard Y. ...	8,400	1,300	8,400	1,300
26	Henry Z. ...	8,700	1,350	8,700	1,350
27	John A. ...	9,000	1,400	9,000	1,400
28	Robert B. ...	9,300	1,450	9,300	1,450
29	Thomas C. ...	9,600	1,500	9,600	1,500
30	Charles D. ...	9,900	1,550	9,900	1,550
31	Edward E. ...	10,200	1,600	10,200	1,600
32	Frederick F. ...	10,500	1,650	10,500	1,650
33	William G. ...	10,800	1,700	10,800	1,700
34	George H. ...	11,100	1,750	11,100	1,750
35	Richard I. ...	11,400	1,800	11,400	1,800
36	Henry J. ...	11,700	1,850	11,700	1,850
37	John K. ...	12,000	1,900	12,000	1,900
38	Robert L. ...	12,300	1,950	12,300	1,950
39	Thomas M. ...	12,600	2,000	12,600	2,000
40	Charles N. ...	12,900	2,050	12,900	2,050
41	Edward O. ...	13,200	2,100	13,200	2,100
42	Frederick P. ...	13,500	2,150	13,500	2,150
43	William Q. ...	13,800	2,200	13,800	2,200
44	George R. ...	14,100	2,250	14,100	2,250
45	Richard S. ...	14,400	2,300	14,400	2,300
46	Henry T. ...	14,700	2,350	14,700	2,350
47	John U. ...	15,000	2,400	15,000	2,400
48	Robert V. ...	15,300	2,450	15,300	2,450
49	Thomas W. ...	15,600	2,500	15,600	2,500
50	Charles X. ...	15,900	2,550	15,900	2,550
51	Edward Y. ...	16,200	2,600	16,200	2,600
52	Frederick Z. ...	16,500	2,650	16,500	2,650
53	William A. ...	16,800	2,700	16,800	2,700
54	George B. ...	17,100	2,750	17,100	2,750
55	Richard C. ...	17,400	2,800	17,400	2,800
56	Henry D. ...	17,700	2,850	17,700	2,850
57	John E. ...	18,000	2,900	18,000	2,900
58	Robert F. ...	18,300	2,950	18,300	2,950
59	Thomas G. ...	18,600	3,000	18,600	3,000
60	Charles H. ...	18,900	3,050	18,900	3,050
61	Edward I. ...	19,200	3,100	19,200	3,100
62	Frederick J. ...	19,500	3,150	19,500	3,150
63	William K. ...	19,800	3,200	19,800	3,200
64	George L. ...	20,100	3,250	20,100	3,250
65	Richard M. ...	20,400	3,300	20,400	3,300
66	Henry N. ...	20,700	3,350	20,700	3,350
67	John O. ...	21,000	3,400	21,000	3,400
68	Robert P. ...	21,300	3,450	21,300	3,450
69	Thomas Q. ...	21,600	3,500	21,600	3,500
70	Charles R. ...	21,900	3,550	21,900	3,550
71	Edward S. ...	22,200	3,600	22,200	3,600
72	Frederick T. ...	22,500	3,650	22,500	3,650
73	William U. ...	22,800	3,700	22,800	3,700
74	George V. ...	23,100	3,750	23,100	3,750
75	Richard W. ...	23,400	3,800	23,400	3,800
76	Henry X. ...	23,700	3,850	23,700	3,850
77	John Y. ...	24,000	3,900	24,000	3,900
78	Robert Z. ...	24,300	3,950	24,300	3,950
79	Thomas A. ...	24,600	4,000	24,600	4,000
80	Charles B. ...	24,900	4,050	24,900	4,050
81	Edward C. ...	25,200	4,100	25,200	4,100
82	Frederick D. ...	25,500	4,150	25,500	4,150
83	William E. ...	25,800	4,200	25,800	4,200
84	George F. ...	26,100	4,250	26,100	4,250
85	Richard G. ...	26,400	4,300	26,400	4,300
86	Henry H. ...	26,700	4,350	26,700	4,350
87	John I. ...	27,000	4,400	27,000	4,400
88	Robert J. ...	27,300	4,450	27,300	4,450
89	Thomas K. ...	27,600	4,500	27,600	4,500
90	Charles L. ...	27,900	4,550	27,900	4,550
91	Edward M. ...	28,200	4,600	28,200	4,600
92	Frederick N. ...	28,500	4,650	28,500	4,650
93	William O. ...	28,800	4,700	28,800	4,700
94	George P. ...	29,100	4,750	29,100	4,750
95	Richard Q. ...	29,400	4,800	29,400	4,800
96	Henry R. ...	29,700	4,850	29,700	4,850
97	John S. ...	30,000	4,900	30,000	4,900
98	Robert T. ...	30,300	4,950	30,300	4,950
99	Thomas U. ...	30,600	5,000	30,600	5,000
100	Charles V. ...	30,900	5,050	30,900	5,050

1888

1888

1888

EXPENDITURES ON ALL STATE ROADS FOR THE YEAR 1916 BY STATE AND COUNTY

EXPENDITURES ON COUNTY ROADS BY THE COUNTIES

Main data table with columns for County, Miles, Cost, No., and various road categories (Grading, Bridges, Culverts, Surfacing, Maintenance & Dragging, Administration & Engineering). Includes sub-sections for District No. 1, 2, 3, 4, and 5, and summary rows for Totals and Average per mile.

Note: Figures in parentheses are estimated.

Total expended on State Roads, 1915 and 1916, \$2,042,765.81

Total expended on State and County Roads, 1915 and 1916, \$4,075,500.59

TABLE NO. 7
 TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND
 ROAD LEVY FOR 1916

County	Valuation 1916	County Road Levy for		Miles		Miles State roads 1916	Area in Square Miles	Bonded In- debtedness	Pop- ulation, 1910
		1916	All roads 1916	All roads 1916	State roads 1916				
Adams	\$ 22,836,894	1.5	673	93.25	1,253	None	8,892		
Arapahoe	17,419,060	1.20	378	56.09	823	None	10,263		
Boulder	39,796,606	2.00	620	92.75	751	None	30,330		
Clear Creek	5,287,860	(2.00)	110	36.5	425	None	5,001		
*Denver	307,430,404	All in city limits	.....	.....	59	\$302,500	250,000
Gilpin	3,271,431	3.50	124	33.25	130	None	3,131		
Jefferson	22,299,940	(2.25)	634	126.2	858	None	14,231		
Larimer	36,968,343	2.73	1,500	207.50	2,937	31,000	35,270		
Logan	23,344,018	(2.00)	1,042	135.25	1,733	40,000	9,549		
Morgan	18,322,200	(2.9)	1,000	110.00	1,264	None	9,577		
Phillips	7,285,655	(0.70)	314	55.00	677	42,800	3,179		
Sedgwick	5,935,908	(2.10)	216	47.50	535	None	3,061		
Washington	12,640,797	(1.00)	1,760	128.75	1,074	15,500	6,002		
Weld	74,804,905	1.50	3,101	289.25	3,918	None	39,177		
Yuma	11,990,617	(1.00)	542	156.00	1,162	None	8,499		
Totals	\$609,634,638		12,014	1,567.29	17,599	\$431,800	436,162		

*Note—City and County of Denver.

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND
ROAD LEVY FOR 1916—Continued

DISTRICT NO. 2

County	Valuation		County Road Levy for		Miles		Miles		Area in Square Miles	Boned In- debtedness	Pop- ulation, 1910
	1916		1916		All Roads 1916	State Roads 1916					
Chaffee	\$ 11,285,708		(1.26)		325	99.50			1,224	\$255,000	7,322
Cheyenne	8,505,900		(0.50)		164	96.00			1,787	26,000	3,687
Douglas	10,871,230		(1.80)		516	140.80			889	15,000	3,192
Elbert	11,500,717		1.00		1,700	64.70			1,852	None	5,331
El Paso	65,936,960		(0.90)		2,000	219.30			2,134	None	43,321
Kit Carson	12,323,340		(0.90)		1,076	137.37			2,168	None	7,483
Lake	12,006,800		0.60		165	54.50			393	595,300	10,600
Lincoln	11,579,350		1.44		600	207.75			2,553	None	5,917
Park	8,841,065		1.5		376	191.50			2,084	None	2,492
Teller	15,352,880		(1.34)		186	72.50			551	None	14,351
Total	\$168,203,950				7,108	1,283.92			15,635	\$891,300	103,696

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND ROAD LEVY FOR 1916—Continued

DISTRICT NO. 3

County	Valuation	County Road Levy for 1916	Miles		Area in Square Miles	Boned In- debtcdness	Pop- ulation, 1910
	1916		All Roads 1916	State Roads 1916			
Baca	3,406,590	0.90	117	91.75	2,531	\$ 29,500	2,516
Bent	10,741,205	1.40	506	41.65	1,497	28,000	5,043
Crowley	9,028,563	1.20	346	33.50	805	Inc. in Otero Co.	
Custer	2,573,085	2.50	351	103.50	696	None	1,947
Fremont	17,840,490	2.12	460	135.0	1,478	None	18,181
Huerfano	12,397,646	0.90	575	126.0	1,537	31,000	13,320
Kiowa	8,507,890	0.55	460	97.0	1,780	.....	2,898
Las Animas	36,977,194	(1.00)	1,000	150.5	4,802	155,000	33,643
Otero	26,630,563	2.00	775	80.63	1,237	3,500	20,201
Prowers	16,807,975	1.70	805	173.75	1,602	15,500	9,520
Pueblo	61,329,837	(1.40)	1,890	161.25	2,447	350,000	52,223
Totals	\$206,241,038		7,285	1,194.53	20,412	\$612,500	159,492

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND
ROAD LEVY FOR 1916—Continued

DISTRICT NO. 4

County	Valuation 1916	County Road Levy for 1916	Miles		Area in Square Miles	Bonded In- debtedness (See Conejos Co.)	Pop- ulation, 1910
			All Roads 1916	State Roads 1916			
Alamosa	\$ 6,174,948	(1.50)	564	64.5	991	(See Conejos Co.)	Inc. in Conejos
Archuleta	4,277,373	3.10	208	102.00	1,209	\$ 28,000	3,302
Conejos	8,555,600	1.19	327	148.25	1,275	105,000	11,285
Costilla	5,261,002	2.45	126	65.25	887	26,000	5,498
Delta	14,892,410	(2.00)	875.5	122.5	1,201	71,700	13,688
Dolores	1,542,731	(2.40)	100	42.5	1,000	87,400	632
Gunnison	14,404,258	(2.30)	573	225.5	3,277	377,900	5,897
Hinsdale	909,139	(3.00)	225	60.0	1,003	144,700	646
La Plata	14,975,835	2.00	1,000	104.75	1,848	126,500	10,812
Mineral	1,413,580	2.00	98	80.0	880	17,000	1,239
Montezuma	5,685,457	3.00	500	102.25	2,113	27,000	5,029
Montrose	14,465,480	(3.10)	1,008.6	174.25	2,290	144,000	10,291
Ouray	5,216,451	(2.50)	202	58.75	557	230,000	3,514
Rio Grande	9,206,110	2.00	350	106.5	1,331	193,300	6,563
Saguache	11,420,441	2.80	1,575	150.5	2,767	None	4,160
San Juan	4,073,055	2.00	125	51.0	438	97,000	3,063
San Miguel	8,539,830	(4.00)	318.9	92.25	1,310	125,000	4,700
Totals	\$131,013,700		8,176	1,750.75	24,377	\$1,800,500	90,319

TABLE SHOWING VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND
ROAD LEVY FOR 1916—Concluded

DISTRICT NO. 5

County	Valuation	County Road Levy for		Miles		State Roads		Area in Square Miles	Bonded Indebtedness	Population, 1910
	1916	1916	All Roads	1916	1916	1916	1916			
Eagle	\$ 6,812,355	1.80	270	104.25	1,586	\$ 69,000	2,985			
Garfield	18,110,365	3.69	510	121.25	3,049	183,300	10,144			
Grand	4,801,650	2.00	386	196.75	1,873	None	1,862			
Jackson	4,955,720	1.50	305	134.00	1,400	None	1,013			
Mesa	26,536,803	(1.53)	2,200	135.75	3,309	50,000	22,197			
Moffat	4,815,310	3.80	550	184.50	4,740	None (Inc. in Routt)				
Pitkin	5,795,170	1.50	193	59.00	983	409,500	4,566			
Rio Blanco	5,113,205	2.70	400	123.00	3,249	25,000	2,332			
Routt	13,686,227	(2.69)	456	169.00	2,240	None	7,561			
Summit	5,977,147	3.00	214	59.50	603	.....	2,003		
Totals	\$ 96,603,952		5,484	1,287.00	23,032	\$ 736,800	54,663			

All figures in parentheses are approximate.

SUMMARY OF VALUATION, AREA, POPULATION, ROAD MILEAGE, INDEBTEDNESS AND ROAD
LEVY FOR 1916

Districts	Valuation 1916	County Road Levy for 1916	Miles		Area in Square Miles	Boned In- debtedness	Pop- ulation, 1910
			All Roads	State Roads			
District No. 1	\$ 609,634,638	.....	12,014	1,567.29	17,599	\$ 431,800	436,162
District No. 2	168,203,950	.....	7,108	1,283.92	15,635	891,300	103,696
District No. 3	206,241,038	.....	7,285	1,194.53	20,412	612,500	159,492
District No. 4	131,013,700	.....	8,176	1,750.75	24,377	1,800,500	90,319
District No. 5	96,603,952	.....	5,484	1,287.00	23,032	736,800	54,663
Totals	\$1,211,697,278	.....	40,067	7,083.49	101,055	\$4,472,900	*844,332

Note—Improved roads of all kinds, crowned and drained dirt roads, amount to about 8,000 miles.

*The population of the state at this time is close to 1,000,000.



ROAD UP BIG THOMPSON CANYON, LOVELAND TO ESTES PARK AND ROCKY MT. NATIONAL PARK—
STATE PRIMARY ROAD NO. 51.

TABLE NO. 8
STATE PRIMARY ROADS

ROAD NO. 1—Denver to Golden.		1915		1916		1915 and 1916	
County	Miles	County	State	County	State	Total	Total
Jefferson	9.75	3,999.99	2,000.00	2,726.15	4,500.00	7,226.15	13,226.14
Total	9.75	3,999.99	2,000.00	2,726.15	4,500.00	7,226.15	13,226.14
ROAD NO. 2—Denver to Ft. Collins—Boulder and north line of state.							
Adams	10.00	1,505.63	11,542.89	512.90	5,794.79	6,307.69	19,356.21
Boulder	35.25	8,607.43	5,714.06	7,757.44	6,764.35	14,251.79	28,843.28
Jefferson	1.00	539.00	539.00	.....	.....	.....	1,078.00
Larimer	52.50	7,839.24	2,833.14	8,012.04	5,879.67	6,691.71	17,364.09
Weld	6.00	.....	.....	.....	.....	.....	.....
Total	104.75	18,491.30	20,629.09	16,282.38	18,438.81	27,521.19	66,641.58
ROAD NO. 3—Denver to Colorado Springs.							
Arapahoe	7.50	604.20	604.20	1,235.11	6,175.17	7,410.28	8,618.68
Douglas	34.80	494.38	6,700.84	2,037.10	3,612.70	5,649.80	12,845.02
El Paso	24.75	1,772.61	1,522.61	6,949.79	6,179.16	13,128.95	16,424.17
Total	67.05	2,871.19	8,827.65	10,222.00	15,967.03	26,189.03	37,887.87
ROAD NO. 4—Colorado Springs to Pueblo.							
El Paso	26.80	.....	.....	1,245.62	4,670.64	5,916.26	5,916.26
Pueblo	17.50	.....	.....	681.75	516.00	1,197.78	1,197.78
Total	44.30	.....	.....	1,927.40	5,186.64	7,114.04	7,114.04

ROAD NO. 5—Pueblo to La Junta—Pueblo to Florence.

Fremont	7.00	.....	.....	.....	.....	.....	.....	.....	.....
Otero	30.25	.....	1,128.92	.....	10,935.16	.....	10,835.14	.....	21,870.30
Pueblo	56.50	.....	5,546.99	.....	980.33	.....	774.36	.....	1,754.69
Total	93.75	.....	5,546.99	.....	11,915.49	.....	11,709.50	.....	23,624.99

ROAD NO. 6—La Junta east to Kansas state line.

Bent	41.65	.....	629.31	.....	3,959.25	.....	3,553.15	.....	7,512.40
Otero	10.13	.....	7,162.93	.....	615.67	.....	615.67	.....	1,231.34
Prowers	47.25	.....	1,137.54	.....	6,417.79	.....	6,417.77	.....	12,835.56
Total	99.03	.....	8,929.78	.....	10,992.71	.....	10,588.59	.....	21,579.30

ROAD NO. 7—Denver to Ft. Morgan.

Adams	39.50	.....	1,149.19	.....	581.49	.....	941.56	.....	1,523.05
Arapahoe	6.50	.....	577.22	.....	610.08	.....	1,869.39	.....	2,479.47
Boulder	2.50	.....	.....	.....	.....	.....	.....	.....	.....
Morgan	31.00	.....	587.46	.....	4,406.53	.....	3,176.34	.....	7,582.87
Weld	54.00	.....	882.00	.....	351.49	.....	702.98	.....	1,054.47
Total	133.50	.....	3,195.87	.....	5,949.59	.....	6,690.27	.....	12,639.86

ROAD NO. 8—Sedalia to Palmer Lake—Castle Rock to Kiowa.

Douglas	40.00	.....	863.63	.....	5,232.07	.....	3,393.01	.....	5,966.65
Elbert	11.00	421.30	1,685.16	2,106.46
El Paso	1.25
Total	52.25	863.63	2,994.94	5,078.17	8,073.11

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13,305.18

STATE PRIMARY ROADS—Continued

ROAD NO. 9—Ft. Morgan to Nebraska state line via Sterling and Julesburg.

County	Miles	1915		Total	County	State	1916		Total	1915 and 1916
		County	State				State	County		
Logan	54.50	2,002.37	1,204.20	3,206.57	3,444.73	3,444.73	3,444.73	6,889.46	10,096.03	
Morgan	23.50	587.46	375.00	962.46	2,481.65	1,253.47	1,253.47	3,735.12	4,697.58	
Sedgwick	28.00	528.85	528.85	1,057.70	1,204.34	2,225.02	2,225.02	3,429.36	4,487.06	
Washington	9.50	300.39	425.15	725.54	509.08	746.10	746.10	1,255.18	1,980.72	
Total	115.50	3,419.07	2,533.20	5,952.27	7,639.80	7,669.32	7,669.32	15,309.12	21,261.39	

ROAD NO. 10—Leadville to Glenwood Springs.

Lake	10.25	720.72	720.72	1,441.44	1,766.33	4,199.96	4,199.96	5,966.29	7,407.73
Eagle	68.00	753.75	750.00	1,503.75	6,245.33	2,632.82	2,632.82	8,878.65	10,382.40
Garfield	14.25	355.14	355.14	710.28	10,613.33	21,266.09	21,266.09	31,879.42	32,589.70
Total	92.50	1,829.61	1,825.86	3,655.47	18,625.49	28,098.87	28,098.87	46,724.36	50,379.83

ROAD NO. 11—Glenwood Springs via Grand Junction to Utah state line.

Garfield	51.00	3,997.74	3,997.74	7,995.48	8,204.56	7,781.03	7,781.03	15,985.59	23,981.07
Mesa	83.75	12,712.51	1,828.45	3,099.96	7,422.14	7,422.14	7,422.14	14,844.28	17,944.24
Total	134.75	16,710.25	5,826.19	11,095.44	15,626.70	15,203.17	15,203.17	30,829.87	41,925.31

ROAD NO. 12—Grand Junction to Montrose.

Delta	27.00	744.22	228.51	972.73	2,100.02	2,374.85	2,374.85	4,474.87	4,474.87
Montrose	15.75	1,192.66	171.55	1,364.21	635.04	635.04	635.04	1,270.08	2,242.81
Mesa	24.50	1,936.88	400.06	2,336.94	1,425.90	1,425.90	1,425.90	2,851.80	4,216.01
Total	67.25	1,936.88	400.06	2,336.94	4,160.96	4,435.79	4,435.79	8,596.75	10,932.69

ROAD NO. 13—Montrose, via Durango, to New Mexico state line.

La Plata	50.00	.....	.....	10,341.96	6,428.10	16,770.06
Montrose	12.00	705.63	216.67	210.54	210.54	421.08
Ouray	39.75	542.77	.....	3,169.57	9,880.00	13,049.57
San Juan	36.00	2,057.25	2,957.25	4,114.50	8,474.17	14,805.90
Total	137.75	3,305.65	2,273.92	15,939.30	24,992.81	46,511.68

ROAD NO. 14—Durango, via Cortez, to Utah state line.

La Plata	23.50	.....	.....	2,093.89	4,815.59	6,909.48
Montezuma	57.25	5,458.66	.....	1,039.13	1,039.13	2,078.26
Total	80.75	5,458.66	.....	3,133.02	5,854.72	14,445.40

ROAD NO. 15—Durango to Alamosa, via Pagosa Springs, Wolf Creek Pass, Elwood Pass and Stunner.

Archuleta	48.00	.....	30,857.59	.....	8,310.60	39,168.19
Alamosa	6.75	45.33	31.22	81.07	81.08	162.16
Conejos	33.25	.....	.....	299.80	299.81	599.61
La Plata	31.25	.....	.....	1,555.34	2,466.29	4,021.63
Mineral	17.50	.....	.....	.....	.....	.....
Rio Grande	20.00	.....	.....	212.50	212.50	425.00
Total	156.75	45.33	30,888.81	2,148.71	11,370.28	44,453.14

ROAD NO. 16—Alamosa to New Mexico state line, via La Veta Pass to Walsenburg.

Huerfano	31.75	5,173.28	3,072.11	8,245.39	.....	8,245.39
Alamosa	22.75	2,780.02	1,394.85	4,174.87	585.12	1,170.25
Costilla	32.25	1,017.47	1,017.46	2,573.57	1,649.18	4,222.75
Conejos	29.00	.....	.....	2,081.86	2,081.87	4,163.73
Total	115.75	8,970.77	5,484.42	14,455.19	4,316.17	9,556.73

STATE PRIMARY ROADS—Continued

ROAD NO. 17—Salida to Leadville; to Poncha Pass.

County	Miles	1915		Total	County	State	1916		Total	1915 and 1916
		County	State				State	County		
Chaffee	61.75	3,717.91	601.16	3,719.07	2,596.68	4,130.66	4,130.66	6,727.34	10,446.41	
Lake	23.75	309.47	279.28	588.75	1,766.30	4,199.94	4,199.94	5,966.24	6,554.99	
Total	85.50	4,027.48	880.44	4,307.82	4,362.98	8,330.60	8,330.60	12,693.58	17,001.40	

ROAD NO. 18—Colorado Springs, via Ute Pass and Trout Creek, to Buena Vista.

Chaffee	14.00	1,513.00	244.64	1,757.64	487.35	323.69	323.69	811.04	2,568.68
El Paso	14.50	11,908.36	3,046.69	14,955.05	4,126.53	5,637.23	5,637.23	9,763.76	24,718.81
Park	62.50	.....	.....	.....	.....	.....	.....	.....	.....
Teller	21.50	7,936.24	2,504.04	10,440.28	.....	.....	.....	.....	10,440.28
Total	112.50	21,357.60	5,795.37	27,152.97	4,613.88	5,960.92	5,960.92	10,574.80	37,727.77

ROAD NO. 19—Brush, via Wray, to Nebraska state line.

Morgan	23.00	587.46	375.00	962.46	2,861.19	1,633.03	1,633.03	4,494.22	5,456.68
Washington	42.50	378.86	537.12	915.98	1,222.03	1,778.26	1,778.26	3,000.29	3,916.27
Yuma	43.50	540.25	450.00	990.25	2,027.03	2,217.94	2,217.94	4,244.97	5,235.22
Total	109.00	1,506.57	1,362.12	2,868.69	6,110.25	5,629.23	5,629.23	11,739.48	14,608.17

ROAD NO. 20—Gunnison, via Montrose and Paradox Valley, to Utah state line.

Gunnison	42.00	1,452.14	1,000.00	2,452.14	3,131.15	1,400.00	1,400.00	4,531.15	6,933.29
Montrose	115.00	2,896.99	892.60	1,179.59	19,403.95	13,918.88	13,918.88	33,322.83	34,502.49
Ouray	6.50	.....	.....	.....	.....	.....	.....	.....	.....
Total	163.50	4,349.13	1,892.60	3,631.73	22,533.10	15,318.88	15,318.88	37,853.98	41,485.78

ROAD NO. 21—Golden to Hot Sulphur Springs.

Clear Creek	24.50	1,653.07	1,000.01	2,653.08	10,464.36	7,200.00	17,664.36	20,317.44
Jefferson	17.80	900.00	900.00	1,800.00	155.14	775.74	930.88	2,730.88
Grand	33.75	.....	.....	.....	1,065.74	240.00	1,305.74	1,305.74
Total	76.05	2,553.07	1,900.01	4,453.08	11,685.24	8,215.74	18,595.24	24,354.06

ROAD NO. 22—Colorado Springs, via Canon City, to Salida,

Chaffee	5.00	668.33	108.07	776.40	1,237.64	1,704.06	2,941.70	3,718.10
El Paso	23.50	13,637.70	3,055.70	16,693.40	4,525.34	4,609.22	9,134.56	25,827.96
Fremont	86.00	13,123.75	22,247.52	35,371.27	7,451.50	23,201.40	30,652.90	66,024.17
Total	114.50	27,429.78	25,411.29	52,841.07	13,214.48	29,514.68	42,729.16	95,570.23

ROAD NO. 23—Sterling, via Haxtum and Holyoke, to Nebraska state line.

Logan	37.50	.....	.....	.....	7,731.50	7,731.50	15,463.00	15,463.00
Phillips	35.50	.....	.....	.....	638.49	1,276.99	1,915.48	1,915.48
Total	73.00	.....	.....	.....	8,369.99	9,008.49	17,378.48	17,378.48

ROAD NO. 24—Fort Morgan to Greeley and Loveland.

Larimer	7.00	.....	.....	.....	962.46	1,835.15	5,798.38	6,760.84
Morgan	27.50	587.46	375.00	962.46	3,963.23	1,835.15	5,798.38	6,760.84
Weid	48.00	7,163.40	3,074.00	10,237.40	5,673.17	11,346.30	17,019.47	27,256.87
Total	82.50	7,750.86	3,449.00	11,199.86	9,636.40	13,181.45	22,817.85	34,017.71

ROAD NO. 25—Glenwood Springs, via Independence Pass, to Twin Lakes and Road 17.

Lake	20.50	.....	.....	.....	.....	.....	.....	.....
Eagle	8.00	.....	.....	.....	.....	.....	.....	.....
Garfield	17.50	.....	.....	.....	.....	.....	.....	.....
Pitkin	38.00	1,316.67	1,583.33	2,900.00	1,983.48	15,368.47	17,336.95	20,236.95
Total	84.00	1,316.67	1,583.33	2,900.00	1,983.48	15,368.47	17,336.95	20,236.95



CONCRETE EYE-BEAM BRIDGE OVER SOUTH PLATTE RIVER,
NEAR STERLING; FOUR BRIDGES 612 FT. 6 IN. OF
OPENING—STATE PRIMARY ROAD NO. 23.

STATE PRIMARY ROADS—Continued

ROAD NO. 26—Pueblo, via Walsenburg and Trinidad, to New Mexico state line.

County	Miles	1915			Total	County	State	1916	Total	1915 and 1916
		County	State	Total						
Huerfano	34.75	2,465.59	1,464.14	3,929.73	8,710.92	8,707.20	8,707.20	17,418.12	21,347.85	
Las Animas	41.25	1,400.00	1,000.00	2,400.00	2,080.99	2,080.95	2,080.95	4,161.94	4,161.94	
Pueblo	32.75	1,400.00	1,000.00	2,400.00	22,658.42	19,593.54	19,593.54	42,251.96	44,651.96	
Total	108.75	3,865.59	2,464.14	6,329.73	33,450.33	30,381.69	30,381.69	63,832.02	70,161.75	

ROAD NO. 27—Denver, via Morrison and Evergreen, to Road 21.

Arapahoe	1.97	108.97	108.98	217.95	33.51	167.65	167.65	201.16	419.11
Jefferson	24.00	1,161.68	1,000.00	2,161.68	1,906.10	11,853.08	11,853.08	13,759.18	15,920.86
Total	25.97	1,270.65	1,108.98	2,379.63	1,939.61	12,020.73	12,020.73	13,960.34	16,339.97

ROAD NO. 28—Gunnison, east via Monarch Pass, to junction with No. 17.

Chaffee	18.75	1,347.47	217.88	1,565.35	1,615.72	2,540.99	2,540.99	4,156.71	5,722.06
Gunnison	41.00	.....	.....	.....	3,096.14	2,000.00	2,000.00	5,096.14	5,096.14
Saguache	9.50	.....	.....	.....	.....	.....	.....	.....	.....
Total	69.25	1,347.47	217.88	1,565.35	4,711.86	4,540.99	4,540.99	9,252.85	10,818.20

ROAD NO. 29—La Junta to Trinidad "Santa Fe Trail."

Las Animas	42.75	1,005.91	1,000.00	2,005.91	2,846.92	2,846.92	2,846.92	5,693.84	7,699.75
Otero	39.50	295.60	208.90	504.50	1,628.87	1,628.87	1,628.87	3,257.74	830.24
Total	82.25	1,301.51	1,208.51	2,510.41	3,009.79	3,009.79	3,009.79	6,019.58	8,529.99

ROAD NO. 30—Colorado Springs to Limon and to Kansas state line.

Elbert	25.00	919.26	611.74	1,531.00	1,780.91	6,314.74	8,095.65
El Paso	48.75	.....	.....	.....	1,317.71	1,314.11	2,631.82
Kit Carson	63.00	922.15	750.00	1,672.15	2,439.30	2,939.30	5,378.60
Lincoln	37.00	293.50	292.40	585.90	1,056.06	1,056.04	2,112.10
Total	173.75	2,134.91	1,654.14	3,789.05	6,593.48	11,624.19	18,218.17

ROAD NO. 31—Limon, via Deer Trail and Byers, to No. 7 near Bennett.

Adams	6.25	.....	.....	.....	.....	.....	.....
Arapahoe	23.50	318.14	318.12	636.26	710.76	3,553.82	4,264.58
Elbert	28.70	.....	.....	.....	925.55	4,121.37	5,046.92
Lincoln	2.00	.....	.....	.....	.....	.....	.....
Total	60.45	318.14	318.12	636.26	1,636.31	7,675.19	9,311.50

ROAD NO. 32—Limon, via Cheyenne Wells and Kansas state line.

Cheyenne	66.50	.....	.....	.....	1,969.55	3,939.09	5,908.64
Lincoln	42.50	340.21	340.19	680.40	413.41	413.41	826.82
Total	109.00	340.21	340.19	680.40	2,382.96	4,352.50	6,735.46

ROAD NO. 33—Fowler to Eads and Kansas state line.

Crowley	33.50	1,667.02	1,666.96	3,333.98	3,066.99	3,867.00	6,933.99
Kiowa	87.50	870.83	870.82	1,741.65	3,315.57	3,226.79	6,542.36
Otero .....	.75	.....	.....	.....	27.50	27.50	55.00
Total	121.75	2,537.85	2,537.78	5,075.63	6,410.06	7,121.29	13,531.35

ROAD NO. 34—Lamar to Springfield.

Baca	49.50	92.08	276.33	368.41	601.23	590.21	1,191.44
Prowers	31.25	.....	.....	.....	1,593.27	1,593.25	3,186.52
Total	80.75	92.08	276.33	368.41	2,194.50	2,183.46	4,377.96

STATE PRIMARY ROADS—Continued

ROAD NO. 35—Morrison, via Turkey Creek to Fairplay and to junction with No. 18 at Saltworks—Fairplay to Hartzel.

County	Miles	1915		1916		Total	1915 and 1916
		County	State	County	State		
Jefferson	24.50	1,027.68	500.00	1,773.49	3,054.36	4,827.85	6,355.53
Park	77.00	.....	.....	.....	.....	.....	.....
Total	101.50	1,027.68	500.00	1,773.49	3,054.36	4,827.85	6,355.53

ROAD NO. 36—Poncha Pass, via Saguache and Monte Vista to junction with No. 15.

Conejos	2.00	.....	.....	.....	.....	.....	.....
Gunnison	6.50	.....	.....	100.75	65.00	165.75	165.75
Rio Grande	24.00	.....	.....	657.02	657.01	1,314.03	1,314.03
Saguache	105.50	4,398.27	999.98	4,306.38	4,306.37	8,612.75	14,011.00
Total	138.00	4,398.27	999.98	5,064.15	5,028.38	10,092.53	15,490.78

ROAD NO. 37—Divide to Cripple Creek, Canon City, Westcliffe and Silver Cliff to Texas Creek.

Custer	34.00	226.75	226.74	453.49	594.62	1,189.24	1,642.73
Fremont	42.00	.....	.....	5,230.48	3,440.10	8,670.58	8,670.58
Teller	31.00	.....	.....	.....	.....	.....	.....
Total	107.00	226.75	226.74	453.49	4,034.72	9,859.82	10,313.31

ROAD NO. 38—Alamosa to Creede, Lake City, and Sapinero.

Alamosa	10.50	1,159.36	796.76	1,574.77	1,574.78	3,149.55	5,105.67
Gunnison	36.50	.....	.....	806.47	435.00	1,241.47	1,241.47
Hinsdale	35.00	622.22	500.00	270.38	2,101.92	2,372.30	3,494.52
Mineral	38.50	1,236.35	793.65	.....	8,200.00	11,256.31	13,286.31
Rio Grande	46.00	.....	.....	4,102.94	4,102.92	8,205.86	8,205.86
Total	166.50	3,017.93	2,090.41	5,108.34	16,414.62	26,225.49	31,333.83

ROAD NO. 39—Hot Sulphur Springs to Wolcott, via State Bridge.

Eagle	21.25	.....	167.17	167.17	334.34	334.34
Grand	39.25	1,081.42	949.95	2,031.37	4,306.97	7,473.84
Total	60.50	1,081.42	949.95	2,031.37	4,474.14	7,808.18

ROAD NO. 40—State Bridge to Steamboat Springs, branch Toponas to Kremmling.

Eagle	7.00	.....	.....	.....	.....	.....
Grand	17.50	.....	.....	.....	.....	.....
Routt	65.00	.....	1,690.96	1,690.96	3,381.92	3,381.92
Total	89.50	.....	1,690.96	1,690.96	3,381.92	3,381.92

ROAD NO. 41—Steamboat Springs to Utah line, via Craig.

Moffat	110.00	12.50	1,011.54	1,024.04	2,025.89	1,931.85	4,981.78
Routt	40.00	.....	.....	.....	2,899.07	2,899.07	5,798.14
Total	150.00	12.50	1,011.54	1,024.04	4,924.96	4,830.92	10,779.92

ROAD NO. 42—Rifle to Meeker, Craig, and to Wyoming state line; Meeker west to junction with No. 41.

Garfield	35.50	.....	.....	.....	.....	.....	.....
Moffat	70.50	1,529.95	1,338.46	2,868.41	4,656.76	6,168.15	13,693.32
Rio Blanco	123.00	2,896.89	3,397.06	6,293.95	4,411.68	4,400.00	8,811.68
Total	233.00	4,426.84	4,735.52	9,162.36	9,068.44	10,568.15	28,798.95

ROAD NO. 43—Granby to Rand and Walden; Walden, via Rabbit Ear Pass, to Sidney.

Grand	31.00	987.63	891.62	1,879.25	474.99	474.98	949.97	2,829.22
Jackson	78.00	.....	.....	.....	494.05	988.10	1,482.15	1,482.15
Routt	14.00	.....	.....	.....	3,300.43	1,707.49	5,007.92	5,007.92
Total	133.00	987.63	891.62	1,879.25	4,269.47	3,170.57	7,440.04	9,319.29

STATE PRIMARY ROADS—Continued

County	Miles	1915			County	Total	1916 State	Total	1915 and 1916
		County	State	Total					
ROAD NO. 44—Ridgway to Placerville and Naturita; Placerville to Telluride.									
Montrose	19.00	427.64	131.31	558.95	567.27	518.77	1,095.04	1,653.99	
Ouray	12.50	2,320.08	1,834.17	4,154.25	.....	.....	.....	4,154.25
San Miguel	55.25	5,565.05	1,138.25	6,703.30	2,252.67	4,525.33	6,778.00	13,481.30	
Total	86.75	8,312.77	3,103.73	11,416.50	2,828.94	5,044.10	7,873.04	19,289.54	
ROAD NO. 45—Dolores to Vance Junction; Norwood, via Disappointment, to Cortez.									
Dolores	42.50	.....	.....	.....	1,730.22	5,746.18	7,476.40	7,476.40
Montezuma	45.00	.....	.....	.....	668.51	668.51	1,337.02	1,337.02
San Miguel	37.00	.....	.....	.....	.....	.....	.....	.....
Total	124.50	.....	.....	.....	2,398.73	6,414.69	8,813.42	8,813.42
ROAD NO. 46—Delta, via Black Mesa, to Sapinero.									
Delta	48.00	.....	.....	.....	1,701.24	2,477.68	4,178.92	4,178.92
Gunnison	16.50	.....	.....	.....	.....	.....	.....	.....
Montrose	12.50	100.69	30.91	131.60	1,058.38	2,116.76	3,175.14	3,306.74	
Total	77.00	100.69	30.91	131.60	2,759.62	4,594.44	7,354.06	7,485.66	
ROAD NO. 47—Kremmling to Breckenridge and Fairplay.									
Park	13.00	.....	.....	.....	.....	.....	.....	.....
Grand	11.25	.....	.....	.....	.....	.....	.....	.....
Summit	59.50	8,461.64	1,200.00	9,661.64	8,270.32	4,303.19	12,573.51	22,235.15	
Total	83.75	8,461.64	1,200.00	9,661.64	8,270.32	4,303.19	12,573.51	22,235.15	

STATE PRIMARY ROADS—Continued

ROAD NO. 53—Colorado Springs east to junction with No. 32.

County	Miles	1915		Total	County	1916 State	Total	1915 and 1916
		County	State					
El Paso	42.00	.....	.....	.....	2,566.47	2,798.26	5,364.73	5,364.73
Lincoln	51.00	.....	.....	.....	.....	.....	.....	.....
Total	93.00	.....	.....	.....	2,566.47	2,798.26	5,364.73	5,364.73

ROAD NO. 54—Idaho Springs to Boulder, via Central City and Nederland.

Boulder	18.00	.....	8,000.00	11,594.64	8,999.97	7,832.12	16,832.09	28,426.73
Clear Creek	4.00	.....	.....	.....	3,860.47	3,595.62	7,456.09	7,456.09
Gilpin	17.25	.....	.....	.....	.....	.....	.....	.....
Total	39.25	.....	8,000.00	11,594.64	12,860.44	11,427.74	24,288.18	35,882.82

ROAD NO. 55—Trinidad to Clayton, N. M.

Las Animas	27.50	.....	.....	.....	8,752.98	8,752.96	17,505.94	17,505.94
Total	27.50	.....	.....	.....	8,752.98	8,752.96	17,505.94	17,505.94

ROAD NO. 56—Empire to Silver Plume.

Clear Creek	8.00	.....	.....	.....	.....	.....	.....	.....
Total	8.00	.....	.....	.....	.....	.....	.....	.....

ROAD NO. 57—From Road No. 40 Near Kremmling to Rabbit Ear Pass Road No. 43.

Grand	32.00	.....	.....	.....	.....	.....	.....	.....
Total	32.00	.....	.....	.....	.....	.....	.....	.....

Included in 43.

ROAD NO. 58—Golden to Central City via Guy Hill.

Gilpin	3.00	.....	.....	1,052.58	404.38	1,456.96
Jefferson	12.75	.....	.....	1,913.62	3,913.63	5,827.25
Total	21.75	.....	.....	2,966.20	4,318.01	7,284.21

ROAD NO. 59—From junction with No. 49 to junction with No. 7 at Hudson.

Adams	20.50	2,400.29	757.69	3,157.98	4,297.84	5,730.45
Weld	7.00	.....	.....	.....	.....	.....
Total	27.50	2,400.29	757.69	3,157.98	4,297.84	5,730.45

ROAD NO. 60—South Fork Station to junction with No. 15.

Mineral	14.50	.....	.....	.....	.....	.....
Rio Grande	6.00	.....	.....	2,884.43	14,272.16	17,156.59
Total	20.50	.....	.....	2,884.43	14,272.16	17,156.59

ROAD NO. 61—Fort Garland via San Luis to New Mexico state line.

Costilla	33.00	1,110.14	927.97	2,038.11	750.82	1,922.50
Total	33.00	1,110.14	927.97	2,038.11	750.82	1,922.50

ROAD NO. 62—Denver to Golden (Colfax Ave. west).

Jefferson	8.90	.....	.....	11,702.69	13,465.72	25,168.41
Total	8.90	.....	.....	11,702.69	13,465.72	25,168.41

ROAD NO. 63—Gunnison to junction with Road 64.

Gunnison	23.00	.....	.....	5,878.70	3,700.00	9,578.70
Total	23.00	.....	.....	5,878.70	3,700.00	9,578.70

STATE PRIMARY ROADS—Continued

ROAD NO. 64—Carbondale to Hotchkiss via Somerset.

County	Miles	1915			1916	
		County	State	Total	State	Total
Delta	18.50	.....	.....	197.67	391.34	589.01
Gunnison	60.00	.....	.....	.....	.....	.....
Garfield	3.00	.....	.....	.....	.....	.....
Pitkin	21.00	.....	.....	.....	.....	.....
Total	102.50	.....	.....	197.67	391.34	589.01

ROAD NO. 65—Plateau Creek via Collbran to junction No. 46.

Delta	29.00	.....	.....	1,184.76	2,369.48	3,554.24
Mesa	27.50	.....	.....	2,388.87	2,388.87	4,777.74
Total	56.50	.....	.....	3,573.63	4,758.35	8,331.98

ROAD NO. 66—Sterling to Fort Collins, via Eaton

Larimer	10.50	.....	.....	.....	.....	.....
Logan	25.25	.....	.....	.....	.....	.....
Weld	77.00	.....	.....	.....	.....	.....
Total	112.75	.....	.....	.....	.....	.....

ROAD NO. 67—Pagosa Springs to New Mexico state line and Chama.

Archuleta	37.00	.....	.....	1,345.43	1,345.43	2,690.86
Total	37.00	.....	.....	1,345.43	1,345.43	2,690.86

ROAD NO. 68—Del Norte to Saguache.

Rio Grande	7.50	.....	.....	.....	.....
Saguache	28.00	.....	.....	.....	.....
Total	35.50	.....	.....	.....	.....

ROAD NO. 69—Silver Cliff to Walsenburg.

Custer	21.50	.....	.....	.....	.....
Huerfano	43.00	.....	.....	.....	.....
Total	64.50	.....	.....	.....	.....

ROAD NO. 70—Trinidad to Stonewall and Walsenburg.

Huerfano	16.50	.....	.....	.....	9,573.36
Las Animas	39.00	.....	4,319.63	5,253.73	9,573.36
Total	55.50	.....	4,319.63	5,253.73	9,573.36

ROAD NO. 71—Antonito and Conejos to New Mexico state line via Cumbres Pass.

Conejos	33.50	.....	.....	.....	.....
Total	33.50	.....	.....	.....	.....

ROAD NO. 72—From Road No. 1, via Coal Creek, to Nederland.

Boulder	6.00	.....	336.90	1,347.58	1,684.48
Gilpin	7.00	.....	.....	.....	.....
Jefferson	21.00	.....	.....	.....	.....
Total	34.00	.....	336.90	1,347.58	1,684.48

Grand total5,994.50

STATE SECONDARY ROADS

ROAD 1s—Denver to Colorado Springs, via Cherry Creek.

County	1915			1916				
	Miles	County	State	Total	County	State	Total	1915 and 1916
Arapahoe	13.50	375.59	375.59	751.18	1,080.55	4,694.92	5,775.47	6,526.65
Douglas	33.00	.....	.....	.....	1,223.52	3,321.63	4,545.15	4,545.15
El Paso	11.75	625.00	375.00	1,000.00	1,532.62	2,151.38	3,684.00	4,684.00
Total	58.25	1,000.59	750.59	1,751.18	3,836.69	10,167.93	14,004.62	15,755.80

ROAD 2s—Holly south to south line of Colorado.

Baca	42.25	.....	.....	.....	.....	.....	.....	.....
Prowers	33.00	.....	.....	.....	2,251.29	2,251.29	4,502.58	4,502.58
Total	75.25	.....	.....	.....	2,251.29	2,251.29	4,502.58	4,502.58

ROAD 3s—Greeley north to Wyoming state line

Weld	46.00	483.20	207.36	690.56	1,595.21	3,190.38	4,785.59	5,476.15
Total	46.00	483.20	207.36	690.56	1,595.21	3,190.38	4,785.59	5,476.15

ROAD 4s—Antonito, via Conejos river, to junction with Road 15 near Stunner.

Conejos	50.50	.....	.....	.....	606.23	606.22	1,212.45	1,212.45
Total	50.50	.....	.....	.....	606.23	606.22	1,212.45	1,212.45

ROAD 5s—Yuma to Stratton.

Yuma	43.00	513.70	450.00	963.70	1,316.58	1,868.14	3,184.72	4,148.42
Kit Carson	19.12	.....	.....	.....	.....	.....	.....	.....
Total	62.12	513.70	450.00	963.70	1,316.58	1,868.14	3,184.72	4,148.42

ROAD 6s—Wray to Burlington, via Idalia.						
Yuma	42.50	354.17	350.00	704.17	1,279.25	1,513.92
Kit Carson	16.25	.....	.....	.....	.....	.....
Total	58.75	354.17	350.00	704.17	1,279.25	1,513.92
ROAD 7s—Pueblo to Silver Cliff, via Beulah.						
Custer	30.00	.....	.....	.....	.....	.....
Pueblo	30.00	.....	.....	.....	8,465.69	7,316.10
Total	60.00	.....	.....	.....	8,465.69	7,316.10
ROAD 8s—Pueblo to junction with Road 37, via Greenwood.						
Custer	18.00	.....	.....	.....	.....	.....
Pueblo	24.50	.....	.....	.....	.....	.....
Total	42.50	.....	.....	.....	.....	.....
ROAD 9s—Burlington to Cheyenne Wells.						
Cheyenne	19.50	.....	.....	.....	.....	.....
Kit Carson	19.00	.....	.....	.....	.....	.....
Total	38.50	.....	.....	.....	.....	.....
ROAD 10s—Alamosa via Mosca, Hooper, and Center to junction with Road No. 36.						
Alamosa	24.50	1,804.34	579.73	2,384.07	347.80	347.78
Rio Grande	3.00	.....	.....	.....	.....	.....
Saguache	7.50	.....	.....	.....	.....	.....
Total	35.00	1,804.34	579.73	2,384.07	347.80	347.78
					695.58	695.58
						3,497.34
					2,793.17	2,793.17
						3,497.34
					15,781.79	15,781.79
					15,781.79	15,781.79
					347.78	347.78
					3,079.65	3,079.65

STATE SECONDARY ROADS—Continued

	1915			1916			
	County	Miles	Total	County	State	Total	1915 and 1916
ROAD 11s—Boulder to Lyons and Estes Park.							
Boulder	17.50	.....	.....	4,594.56	4,013.28	8,607.84	8,607.84
Larimer	14.00	.....	.....	.....	.....	.....	.....
Total	31.50	.....	.....	4,594.56	4,013.28	8,607.84	8,607.84
ROAD 12s—Longmont to Lyons.							
Boulder	13.50	.....	.....	750.52	439.91	1,190.43	1,190.43
Total	13.50	.....	.....	750.52	439.91	1,190.43	1,190.43
ROAD 13s—See Primary Road No. 70.							
ROAD 14s—Berthoud to Twin Bridges, junction Road 51 (Glade Road).							
Larimer	14.00	.....	.....	.....	.....	.....	.....
Weld	15.75	.....	.....	1,271.37	2,542.73	3,814.10	3,814.10
Total	29.75	.....	.....	1,271.37	2,542.73	3,814.10	3,814.10
ROAD 15s—Jefferson to Lake George.							
Park	39.00	.....	.....	.....	.....	.....	.....
Total	39.00	.....	.....	.....	.....	.....	.....
ROAD 16s—Sedalia, via Jarr Canon and South Fork South Platte to Divide.							
Douglas	33.00	.....	.....	244.86	244.85	489.71	489.71
Teller	20.00	.....	.....	.....	.....	.....	.....
Total	53.00	.....	.....	244.86	244.85	489.71	489.71

ROAD 17s—Kit Carson to Eads.

Cheyenne	10.00	.....	.....	.....	111.22	111.22
Kiowa	9.50	.....	.....	.....	.....	.....
Total	19.50	.....	.....	.....	111.22	111.22

ROAD 18s—Hugo to Genoa; Hugo to Karvel.

Lincoln	35.50	.....	.....	.....	1,310.84	1,310.84
Total	35.50	.....	.....	.....	1,310.84	1,310.84

ROAD 19s—Flagler, via Akron, to junction Road 23.

Logan	18.00	.....	.....	.....	.....	.....
Washington	45.25	.....	.....	.....	944.20	944.20
Kit Carson	20.00	.....	.....	.....	6,189.28	6,189.28
Lincoln	1.50	.....	.....	.....	.....	.....
Total	84.75	.....	.....	.....	7,133.48	7,133.48

ROAD 20s—Limon to Gary.

Morgan	5.00	.....	.....	.....	.....	.....
Washington	30.00	.....	.....	.....	.....	.....
Lincoln	18.00	.....	.....	.....	38.90	38.90
Total	53.00	.....	.....	.....	38.90	38.90

ROAD 21s—Monument to Peyton.

El Paso	26.00	.....	.....	.....	1,481.63	1,481.63
Total	26.00	.....	.....	.....	1,481.63	1,481.63

STATE SECONDARY ROADS—Continued

ROAD 22s—Piedra to Arboles.		1915		1916		1915 and 1916	
County	Miles	County	State	County	State	Total	Total
Archuleta	17.00						
Total	17.00						
ROAD 23s—Petersburg, via Fort Logan, to junction Road 27.							
Arapahoe	3.12						
Jefferson	6.50						
Total	9.62						
ROAD 24s—Julesburg to Wray.							
Phillips	19.50			469.32	938.65	1,407.97	1,407.97
Sedgwick	19.50	245.83	245.82	176.37	279.48	455.85	947.50
Yuma	27.00						
Total	66.00	245.83	245.82	645.69	1,218.13	1,863.82	2,355.47
ROAD 25s—Granada south to Baca county line.							
Prowers	31.75						
Total	31.75			506.92	506.92	1,013.84	1,013.84
ROAD 26s—Carlton south to Baca county line.							
Prowers	30.50			834.20	834.20	1,668.40	1,668.40
Total	30.50			834.20	834.20	1,668.40	1,668.40

ROAD 27s—Arriba north to junction with Road 19s.

Washington	1.50	.....	.....	.....	.....
Lincoln	20.25	.....	82.55	82.55	165.10
Total	21.75	.....	82.55	82.55	165.10
				Grand total	1,088.99

SUMMARY OF STATE ROADS

Total miles of State Roads.....	5,994.50
Total miles of Secondary Roads.....	1,088.99
Total	7,083.49
State Roads: Miles surfaced.....	1,008.92
Miles improved.....	3,226.07
Total of improved roads.....	4,234.99



FALL RIVER ROAD, FROM ESTES PARK TO GRAND LAKE, LOOKING DOWN FALL RIVER TO ESTES
PARK, THROUGH ROCKY MOUNTAIN NATIONAL PARK—STATE PRIMARY ROAD NO. 51

TABLE NO. 9

FOREST SERVICE FUNDS

Twenty-five per cent of the receipts from Forest Reserves are turned over to the state by the National Government, and distributed pro rata, according to the acreage of forest reserve in each county. This money is divided by the County Commissioners between the School Fund and the Road Fund, but at least 5% must go to the schools. We have no information as to the exact division of this fund between the schools and roads, but probably 90% has gone into the improvement of the roads.

	1915	1916
Adams		
Arapahoe		
Archuleta	\$ 1,984.28	\$ 2,827.80
Alamosa		
Boulder	218.50	186.94
Baca		
Bent		
Clear Creek	593.33	761.33
Chaffee	1,209.33	1,323.23
Cheyenne		
Custer	346.34	391.75
Crowley		
Costilla	68.04	76.99
Conejos	1,747.78	1,824.39
Douglas	600.57	767.71
Dolores	1,901.50	2,085.39
Delta	1,318.18	1,314.98
El Paso	547.85	700.51
Elbert		
Eagle	3,655.97	3,483.00
Fremont	142.63	161.40
Gilpin	144.60	184.74
Gunnison	3,424.61	4,131.09
Grand	2,123.42	3,201.49
Garfield	2,907.36	2,981.20
Huerfano	253.87	287.25
Hinsdale	2,663.47	2,870.40
Jefferson	308.88	394.85
Jackson	2,240.28	2,198.54
Kit Carson		
Kiowa		
Larimer	945.55	711.65
Logan		
Lincoln		
Lake	411.63	483.84
Las Animas	59.03	66.76
La Plata	1,571.56	1,640.25
Morgan		
Montrose	1,672.32	1,438.17
Montezuma	1,436.64	1,577.67
Moffat	378.83	385.03
Mineral	3,160.66	3,569.95
Mesa	3,128.94	2,615.66
Otero		
Ouray	724.86	599.42
Phillips		

TABLE NO. 9—Continued

	1915	1916
Park	2,473.58	2,995.59
Pueblo	76.35	86.39
Prowers		
Pitkin	2,434.65	2,677.11
Rio Grande	1,499.91	1,579.73
Rio Blanco	1,834.85	1,901.70
Routt	3,129.45	3,193.49
Sedgwick		
San Miguel	1,090.67	1,175.94
San Juan	942.92	986.08
Saguache	2,765.41	2,915.25
Summit	780.20	880.00
Teller	297.80	380.40
Washington		
Weld		
Yuma		
Total	\$59,218.60	\$63,995.06



UTE PASS ROAD, COLORADO SPRINGS TO SOUTH PARK—STATE PRIMARY ROAD NO. 18.

TABLE NO. 10

FOREST SERVICE ADDITIONAL 10% FUND

In addition to the 25%, there is spent 10% of the receipts expended by the Forestry Department on roads through the Forest Reserves. During 1916 this fund was expended by the United States officials, on the projects as given in the table; all of these projects are on the county and state road systems.

(By courtesy of Mr. Smith Riley, District Forester.)

RECONNAISSANCE SURVEY

Project	Miles	Cost	Termini
Durango Silverton	42.0	\$ 250.51	Durango to Silverton
Cochetopa-Lake City	42.0	125.65	Cochetopa-Lake City
Monarch Pass	12.5	112.10	Maysville to Sargent
Independence Pass	44.0	104.81	Aspen to Twin Lakes
Creede-Silverton	75.0	157.39	Creede to Silverton
Antonito-Cumbres Pass.....	33.0	77.62	Antonito-Cumbres Pass
Rabbit Ear Pass	2.5	43.54	Bear River Valley to Muddy Pass
Bear Cr.-Roxborough Pk....	11.6	41.98	Bear Creek to Roxborough Park
<hr/> Total	<hr/> 262.6	<hr/> \$ 913.60	

LOCATION SURVEY

Project	Miles	Cost	Termini
Durango-Silverton	28.66	\$1,811.10	Durango-Silverton
Mt. Evans	21.97	1,520.12	Bergen Park to Mt. Evans
Monarch Pass	7.25	449.01	Maysville to Sargent
Independence Pass	6.19	804.03	Aspen-Twin Lakes
Sloss-Ruedi	4.42	400.80	Sloss to Ruedi
Bear Cr.-Fuller R. S.....	3.32	274.22	Bear Creek to Fuller Ranger Station
<hr/> Total	<hr/> 71.81	<hr/> \$5,259.28	

CONSTRUCTION

Project	Miles	Cost	Termini
Rabbit Ears Pass.....	2.2	\$5,501.72	Bear River Valley to Muddy Pass
Sedalia-Decker Springs.....	0.21	3,224.15	Jarre Canon to Sugar Creek
Monument-Nursery	0.23	1,016.73	Monument-Nursery
<hr/> Total	<hr/> 2.64	<hr/> \$9,742.60	

MAINTENANCE

Project	Miles	Cost	Termini
Cochetopa Pass	16.5	\$1,615.45	Saguache-Gunnison
Sedalia-Decker Springs.....	12.5	634.05	Jarre Canon-Sugar Creek
Monument-Nursery	1.67	57.90	Monument-Nursery
West Dolores	2.7	65.55	Coke Ovens-Dunton
Rabbit Ears Pass.....	16.5	1,432.39	Bear River Valley-Muddy Pass
Grand Mesa	5.0	82.50	Cedaredge-Collbran
Garfield Co.-Buzzard Cr.....	1.0	10.00	Collbran-Rife
Oro Fino	3.8	70.00	Durango-Oro Fino Mining Dis- trict
Total	54.67	\$3,967.84	

SUMMARY

Reconnaissance Survey	\$ 913.60
Location Survey 71.81 miles	5,259.28
Construction 2.64 miles	9,742.60
Maintenance 54.67 miles	3,967.84
Total for 1916.....	\$19,883.32

The total for 1915 is about the same as for 1916; the Forest Service uses this extra sum for work on the improvement of the roads through the Forest Reserves.

In addition to the sums given in Tables 9 and 10, the Forest Service will have available in 1917-18, about \$63,000.00 to use in the improvement of the roads in co-operation with the counties and state.



ROAD THROUGH COCHETOPA FOREST
RESERVE—STATE PRIMARY
ROAD NO. 36.



COCHETOPA PASS ROAD, IN FOREST RESERVE—STATE
PRIMARY ROAD NO. 36.

TABLE NO. 11

TRAFFIC CENSUS

These returns give some idea of the traffic on some of our state roads.

State Road	Location	Date	Observer	Weather	Road Conditions	Hours
49	Platteville, Weld Co.	Aug. 8, 1915 Sunday	S. F. Hunt	Rain	Good	6 A.M. to 8 P.M. 14 hrs.
	North of Sedalia, Douglas Co.	Apr. 1 to 30, 1915 23 days	Waggoner & Loraine	Rain 4 days	Fair	7 A.M. to 5 P.M. 10 hrs.
		May, 1915 14 days	"	Rain 5 days	Fair	"
8	South of Sedalia, Douglas Co.	May, 1915 11 days	Waggoner	Rain 1 day	Fair to Good	7:30 A.M. to 5 P.M. 9½ hrs.
		June, 1915 15 days	"	Rain 2 days	"	"
		July, 1915 11 days	"	Rain 2 days	"	"
		Aug., 1915 26 days	"	Rain 3 days	"	"
	South of Castle Rock	Sept., 1915 16 days	"	Good	"	"
3	Littleton, Arapahoe Co.	Aug. 15 to Sept. 4, 1915 12 days	Catherine Maloney	Fair	Fair	1:30 P.M. to 5 P.M. 3½ hrs.
		July 25 and 26, 1916 2 days	"	Good	Good	10 hrs.
51	Near Estes Park	July, 1915	C. B. Henderson			6 hrs.
	Larimer Co.	July 4, 1915	E. L. Stevens			6 hrs.
50 and Northwest	Virginia Dale	Jan. 1 to Aug. 6, 1915	Mr. Logan			

TABLE NO. 11
TRAFFIC CENSUS

It is hoped to obtain further information along this
line this next year.

VEHICLES										REMARKS
Autos	Motor Trucks	Motor- cycles	Bicycles	Six- Horse	Four- Horse	Two- Horse	One- Horse	Traction Engine		
171	7	9	12			19	68			Hard rain, Denver-Gree- ley Road
28	½	¾	1/5		¼	2½	1			Average per day
38	¼	2			1	3	2½			" " "
58	¼	4				6½	6½			" " "
104	1/5	4			1/5	5½	5			" " "
128	1	3				2½	2½			" " "
200	5/8	4½			¼	3½	3½			" " "
161	1	4½				2½	4½			" " "
153	1¾	16	22			58	19	1/12		Average per day (on Aug. 15 bridge at Wol- hurst out, replaced Aug. 20)
675	2	66	85			113	87			Average of 2 days, 1,018 per 10 hrs.
182										
360										One car a minute
2,107										Tie Siding and Larimer Road. Average about 10 per day

TRAFFIC CENSUS—Continued

State Road	Location	Date	Observer	Weather	Road Conditions	Hours
2	South of Ft. Collins	Aug., 1915	Adam Michie			
5	East of Florence, Fremont Co.	Aug. 15, 1915	Earl C. Bernard			8 hrs. 50 min.
8	Elizabeth, Elbert Co.	Aug. 11 to 17 6 days	W. C. Worteman	Clear	Rough	7 hrs. per day
32	Kit Carson, Cheyenne Co.	Aug. 9 to 14, 1915 5 days	David Mead	Bad	Fair	9 hrs.
	Cheyenne Wells	Aug. 14, 1915	Carl McCrumb	Rainy	Muddy	10 hrs.
19	Wray	Oct. 14-20 1915 6 days	Victor Willis			11 hrs.
	Yuma	Oct. 18-23, 1915 6 days	F. Boren	Fair	Good	11½ hrs.
Secondary 5-s	South of Yuma	Oct. 18-23 6 days	F. Boren	Fine	Good	11½ hrs.
Sec. 6s	South of Wray	Oct. 14-20 1915	Victor Willis			11 hrs.
Primary (	Lamar at Bridge, Prowers Co.	Aug. 11-14, 1915 2 days	Harry Hammond	Fair	Good	12 hrs.
	"	Ending Jan. 9, 1916 7 days	Co. Clerk, Prowers Co.			12 hrs.
	East of Lamar	Ending Jan. 15, 1916 7 days	"			12 hrs.
	East of Holly	Jan 10, 1916 7 days	"			12 hrs.

TRAFFIC CENSUS—Continued

VEHICLES									REMARKS
Autos	Motor Trucks	Motor-Cycles	Bicycles	Six-Horse	Four-Horse	Two-Horse	One-Horse	Traction Engines	
462									On an ordinary day
178		22	26			12	54	1	21 out-of-state cars
36	1/6	2 1/2	1/2			36	27	1/6	Average
6									9 out-of-state cars Average
37	2	4	6		2	32	16		21 foreign cars
104 1/3		1/6	5	3-horse 3	17	166	35		Average per day
36		1 1/6	5/6		2	31	19		" " "
29 1/3			1/3		16	63	24		" " " Also a total of 847 cat- tle
84		1/6	1 1/2	3-horse 23	36	164	19		Average
162	3	12	8			120	135	16	Saddle horse Average 87 foreign cars
162.7	2	5.6	5.6		21	139	93	16	Average 846 head stock
135.3		36	44		28 milk 26	91	86	41	545 head stock Average per day
78		4			4	169	40	19	" " "

TRAFFIC CENSUS—Continued

State Road	Location	Date	Observer	Weather	Road Conditions	Hours
	West of Holly	Jan. 10, 1916 7 days	"			12 hrs.
Secondary 2-s	South of Holly	Jan. 10, 1916 7 days	"			12 hrs.
Primary 34	South of Lamar	Jan. 10, 1916 7 days	Co. Clerk, Prowers Co.			12 hrs.
47	Robinson, Summit Co.	Aug. 7, 1915	W. H. Hampton	Wet spell	Good to Dillon, Bad to Leadville	
38	West of Creede	Aug. 1, 1915	W. T. Barnett	Clear	Good	8 hrs.
	East of Creede, Mineral Co.	July 15, 1915	"	Clear	Good	8 hrs.
42	Craig, Moffat Co.	Aug. 10, 1915	Craig Auto Co.			
11	West of Loma	June to Nov., 1915	J. H. Bertholf			
	West of Fruita	"	"		Census taken on 5 different dates and other observations show peak in Aug. on local, and aft. Sept. 1st for tourist travel	
	West of Grand Junction	"	"			
	West of Palisades	"	"			
	East of Palisades	"	"			
	Plateau Canon	"	"			

TRAFFIC CENSUS—Continued

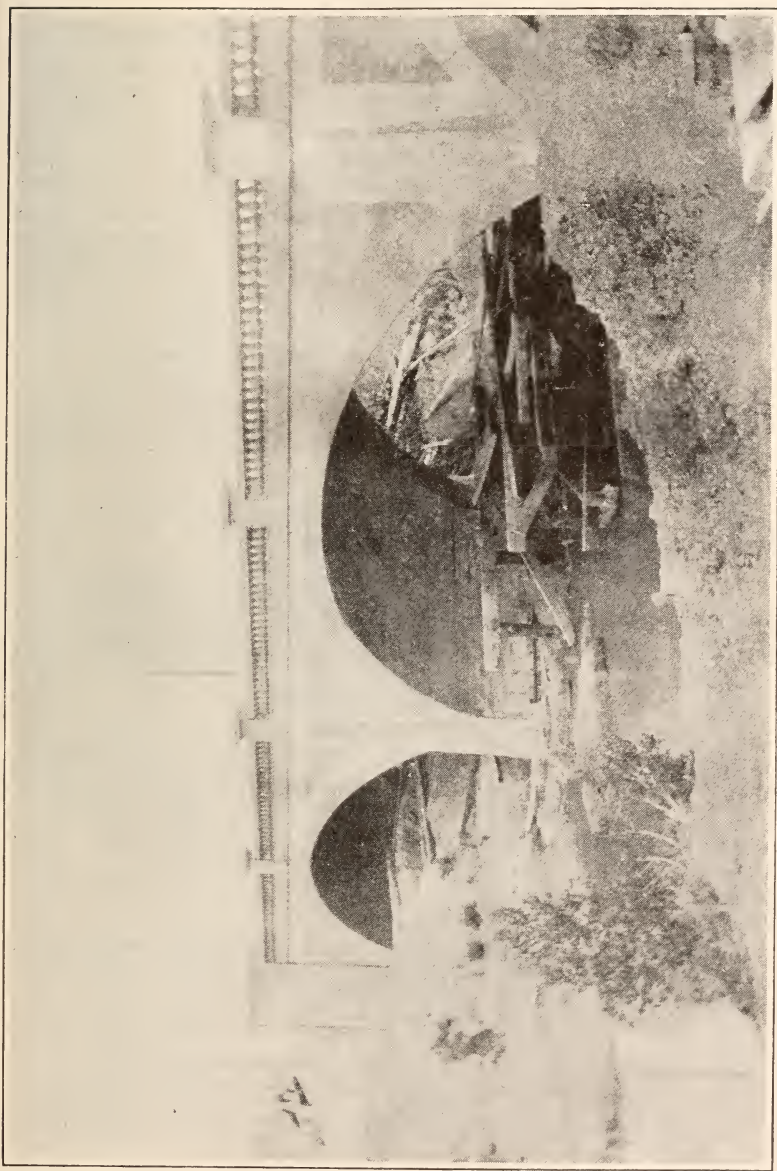
VEHICLES										REMARKS
Autos	Motor Trucks	Motor-Cycles	Bicycles	Six-Horse	Four-Horse	Two-Horse	One-Horse	Traction Engine		
63		1			1	53	44	4		Average per day
33		2		2/3	3.6	90	15	18		" " "
35		1.1	1.0	0.7	14	51	20	10		" " "
						6 or 8	10 to 12			Road over Fremont Pass bad (not a state road)
13						4	3			5 foreign cars
17		1				5	4			6 foreign cars
17 foreign cars, from Texas, Kansas, Nebraska, Arkansas, Missouri, Ohio, Iowa, Michigan, Pennsylvania and New York										
32		4	3		1	29	51		Foreign cars included	
							6			Average per day
42		4	6		1	51	109	6		" " "
152	2	12	23		2	59	133	66		" " "
136	2	20	28			44	171	6		" " "
52	3	4	7		1	48	69	5		" " "
48	5	5	1		2	35	27	5		" " "

TRAFFIC CENSUS—Continued

State Road	Location	Date	Observer	Weather	Road Conditions	Hours
12	West of DeBeque	June to Nov., 1915	J. H. Bertholf		Census taken on 5 different dates and other observations show peak in Aug. on local and aft. Sept. 1st for tourist travel	
	South of Grand Junction	"	"			
	South of Whitewater	"	"			
10	Canon above Glenwood Springs, Garfield Co.	July, 1915 11 days	Harry Pike	Various		10 hrs. each day
		August 31 days	"	"		
		Sept. 30 days	"	"		
		Oct. 8 days	"	"		

TRAFFIC CENSUS—Concluded

VEHICLES									
Autos	Motor Trucks	Motor-cycles	Bicycles	Six-Horse	Four-Horse	Two-Horse	One-Horse	Traction Engines	REMARKS
31	2	3	4		2	9	23	5	Average per day
57		8	25			63	110	1	" " "
33		2	2			40	34	1	" " "
26		1	½			24	Saddle 16	10	" " "
23		¾	¾			19	13	8	" " "
18		1/3	1/5			10	13	3	" " "
(Road block for 7 hours each day for 22 days)									
9						8	11	1½	" " "
(Road blocked for 8 hours each day for 6 days)									



REINFORCED CONCRETE BRIDGE OVER TIMPAS CREEK, OTERO COUNTY; TWO 56-FOOT AND ONE 60-FOOT OPENING—STATE PRIMARY ROAD NO. 5.

TABLE NO. 12

TESTS OF ROAD MATERIAL

It is desirable that as complete information as possible be obtained as to the characteristics of our road surfacing materials, and during the coming season, County Commissioners and Road Overseers, are urged to forward samples of all available road surfacing materials to this office. Fifty-pound samples should be sent.

During the past season tests have been made at the road material testing laboratory of the University of Colorado, at Boulder, Colo., of paving brick made at Trinidad, and of basaltic rock from vicinity of Golden. These tests are made by the Department of Civil Engineering.

MILO S. KETCHUM, C. E., Professor.

H. E. PHELPS, C.E., Assistant Professor.

Rock	Location		
Basaltic.....	Near Golden, Colo.		
Name of Test	Results	Rating U. S. Standard	Remarks
Specific gravity	2.7		
Wt. per cu. ft.....	168.4 lbs.		
Absorption	1.4 lbs. cu. ft	Low	
Per cent void.....	46.2		Stones ½ in. or less only
Abrasion	3.15% (Coefficient 12.7)	Medium Good	
Cementing value	67	Good	
Hardness	17	Hard	
Toughness	16	Medium	

Notes by Prof. H. E. Phelps: This rock "is therefore heavy, with a low absorption of water, hard, with a good cementing value, a medium good resistance to abrasion, and of medium toughness."

PAVING BRICK FROM TRINIDAD, COLO.

Absorption of water in 24 hours is 2.58%.

The rattler test on 10 brick gives 35.5% loss in 1,800 revolutions. "The absorption is well within ordinary specification limits. The rattler test gives an excessive loss. The brick, however, gave nearly uniform results, none of them breaking up into small pieces."

Notes by Prof. H. E. Phelps.

TESTS MADE BY U. S. DEPARTMENT OF AGRICULTURE, OFFICE OF
PUBLIC ROADS AND RURAL ENGINEERING

January 2, 1917.

"PEBBLES"

Report on sample No. 11165 of the road material from Boulder County, Colo., made at the request of E. S. Bice, City Engineer, Longmont, Colorado.

Material: Gravel.

Character: Sample consists essentially of large, rounded fragments of granite, with a large amount of coarse granite sand.

MECHANICAL ANALYSIS

Totals Retained on screens		Sample	Between Screens	Coarse Aggregate
2 -inch	9.2%	Over 2"	9.2%	
1½-inch	29.8%	2 "-1½"	20.6%	
1¼-inch	41.6%	1½"-1¼"	11.8%	
1 -inch	55.2%	1¼"-1 "	13.6%	
¾-inch	66.4%	1 "-¾"	13.2%	
½-inch	83.6%	¾"-½"	15.2%	
¼-inch	94.8%	½"-¼"	11.2%	
		Under ¼"	5.2%	
Total			100.0%	100.0%

Remarks: For interpretation of results of physical tests, see page 91.

REPORT ON SAMPLE NO. 11166

Material: Granite sand.

Character: Sample consists essentially of small angular fragments of granite with a large amount of coarse granite sand.

MECHANICAL ANALYSIS

Totals Retained on screens		Sample	Between Screens	Coarse Aggregate
½-inch	0.5%	¾"-½"	0.5%	22.7%
¼-inch	2.2%	½"-¼"	1.7%	77.3%
		Under ¼"	%	100.0%
				Fine Aggregate
10-mesh	23.3%	¼"-10	21.1%	21.6%
20-mesh	61.5%	10-20	38.2%	39.0%
30-mesh	83.9%	20-30	22.4%	22.9%
40-mesh	91.8%	30-40	7.9%	8.1%
50-mesh	95.2%	40-50	3.4%	3.5%
80-mesh	98.4%	50-80	3.2%	3.3%
100-mesh	99.0%	80-100	.6%	.6%
200-mesh	99.6%	100-200		.6%
200 and under	.4%	200 and under	.4%	.4%
			100.0%	100.0%

Remarks: Tensile strength, lbs. per sq. in. 1.3 mortar.

Age 7 days—Sand 11166, 243; Ottawa sand, 223.

Strength ratio—109.0%.

For interpretation of the results of physical tests, see page 91, as above.

Report on sample No. 11167, of road material from Denver County, Colo., made at the request of J. E. Maloney, Secretary-Engineer, State Highway Department, Denver, Colo.

Material: Granite sand.

Character: Sample consists essentially of angular fragments of granite with large amount of coarse and considerable fine granitic sand.

MECHANICAL ANALYSIS

Totals Retained on screens		Sample	Between Screens	Coarse Aggregate
1/4-inch	1.6%	1/2"- 1/4'	1.6%	100.0%
		Under 1/4"	%	
				100.0%
				Fine Aggregate
10-mesh	30.9%	1/4"-10	29.3%	29.8%
20-mesh	54.3%	10-20	23.4%	23.8%
30-mesh	69.5%	20-30	15.2%	15.4%
40-mesh	79.1%	30-40	9.6%	9.8%
50-mesh	85.8%	40-50	6.7%	6.8%
80-mesh	95.2%	50-80	9.4%	9.6%
100-mesh	97.4%	80-100	2.2%	2.2%
200-mesh	99.5%	100-200	2.1%	2.1%
		200 and under	.5%	.5%
			100.0%	100.0%

Remarks: Tensile strength lbs. per sq. in. 1.3 mortar.
 Age 7 days—Sand 11167, 293; Ottawa sand, 223.
 Strength ratio—131.4%.

Report on sample No. 11168, of road material from Jefferson County, Colo., made at the request of J. E. Maloney, Secretary-Engineer, State Highway Department, Denver, Colo.

Material: Augite andesite.

DETERMINATIONS

Specific gravity	2.72
Weight per cubic foot.....	169 pounds
Water absorbed per cubic foot.....	1.27 pounds
Per cent of wear.....	2.7
French coefficient of wear.....	14.8
Hardness	15.3
Toughness	17
Cementing value	96

DIVISION OF TESTS.

Mineral analysis of sample No. 11168, of rock from Jefferson County, Colo., made at the request of J. E. Maloney, Secretary-Engineer, State Highway Department, Denver, Colo.

Character of material: Volcanic rock.
 Name: Augite andesite.

ESSENTIAL MINERALS

Name	Composition	Per cent
Plagioclase—Silicate of Alumina, lime and soda.....		59.4
Augite—Silicate of Lime, magnesia, iron and alumina.....		26.5
Magnetite—Magnetic oxide of iron.....		7.8

ACCESSORY MINERALS

Biotite—Hydrous silicate of alumina, iron, magnesia and potash.....	0.7
Apatite—Phosphate of lime.....	0.7

SECONDARY MINERALS

Chlorite—Hydrous silicate of magnesia, iron and alumina.....	4.9
--	-----

Total 100.0

Remarks: Specimen is a dark gray, porphyritic rock, composed essentially of crystals of augite, plagioclase (labradorite) imbedded in a dense, fine-grained ground mass of chloritised augite, plagioclase and magnetite.

Date—January 2, 1916.

GLOBE NO. 1

December 30, 1916.

Report on sample No. 11169 of road material from Denver County, Colo., made at the request of.....

Material: Smelter slag.

DETERMINATIONS

Specific gravity	3.46
Weight per cubic foot.....	216 pounds
Water absorbed per cubic foot.....	.65 pounds
Per cent of wear.....	7.6
French coefficient of wear.....	5.3
Hardness	*
Toughness	*
Cementing value	6

Maximum, minimum and average results on all rock species tested up to date indicated are given in the accompanying table.

Remarks: *Sample contained no piece of sufficient size for drilling cores for this test.

Mineral analysis of sample No. 11169, of rock from Denver County, Colo., made at the request of

Character of material: Furnace product.

Name: Smelter slag.

ESSENTIAL MINERALS

Name	Composition	Per cent
Olivine—Silicate of magnesia and iron.....		
Glass—Silicate of iron.....		

ACCESSORY MINERALS

Troilite—Sulphide of iron.....

Remarks: Specimen is not suitable for quantitative analysis. It is a fine-grained, gray-black, porous slag, composed essentially of minute olivine crystals embedded in a dark brown glass base.

Date—December 30, 1916.

GRANT NO. 1

December 30, 1916.

Report on sample No. 11170, of road material from Denver County, Colo., made at the request of

Material: Smelter slag.

DETERMINATIONS

Specific gravity	3.48	
Weight per cubic foot.....	217	pounds
Water absorbed per cubic foot.....	.50	pounds
Per cent of wear	5.1	
French coefficient of wear.....	7.8	
Hardness	*	
Toughness	*	
Cementing value	7	

Maximum, minimum, and average results on all rock species tested up to date indicated are given in the accompanying table.

Remarks: *Sample contained no piece of sufficient size for drilling cores for this test.

DIVISION OF TESTS

Mineral analysis of sample No. 11170, of rock from Denver County, Colo., made at the request of

Character of material: Furnace product.

Name: Smelter slag.

ESSENTIAL MINERALS

Name	Composition	Per cent
Olivine—Silicate of magnesia and iron.....		50.4
Glass—Silicate of iron and sulphate of iron.....		49.6

Remarks: Specimen is a very dense, fine-grained, gray-black slag, composed essentially of olivine crystals embedded in a dark brown glass base.

Date—December 15, 1916.

GRANT NO. 2

December 30, 1916.

Report on sample No. 11171, of road material from Denver County, Colo., made at the request of

Material: Smelter slag.

DETERMINATIONS

Specific gravity	3.48	
Weight per cubic foot.....	217	pounds
Water absorbed per cubic foot.....	.86	pounds
Per cent of wear	4.6	
French coefficient of wear.....	8.7	
Hardness	17.3	
Toughness	15.0	
Cementing value	4.	

Maximum, minimum, and average results on all rock species tested up to date indicated are given in the accompanying table.

DIVISION OF TESTS

Mineral analysis of sample No. 11171, of rock from Denver County, Colo., made at the request of

Character of material: Furnace product.

Name: Smelter slag.

ESSENTIAL MINERALS

Name	Composition	Per cent
Olivine—Silicate of magnesia and iron.....		73.8
Magnetite—Magnetic oxide of iron.....		11.4
Troilite—Sulphide of iron.....		9.0

ACCESSORY MINERALS

Melillite—Silicate of alumina and lime.....		5.8
Total		100.0

Remarks: Specimen is a dense, fine-grained, gray-black slag, composed essentially of somewhat vitrified olivine, magnetite and troilite.

Date—December 30, 1916.

INTERPRETATION OF RESULTS OF PHYSICAL TESTS

By comparing the results of the tests shown in the foregoing tables with the requirements as shown in the following outline, a general idea of the value of this material for the various purposes indicated may be obtained.

GENERAL LIMITING TEST VALUES OF GRAVEL, SAND AND SAND CLAY, AND TOP-SOIL MIXTURES

GRAVEL.

(A) Gravel to be used in road construction to be composed of hard, durable fragments of rock, together with sand and clay or other binding material, with the proportions of the various sizes as noted below.

(1) For use in the base course of gravel roads.

All to pass a 2½-inch screen and to have at least 55 and not more than 75 per cent retained on a ½-inch screen.

At least 25 and not more than 75 per cent of the total coarse aggregate (material over ¼-inch in size) to be retained on a 1-inch screen.

At least 65 and not more than 85 per cent of the total fine aggregate (material under ¼-inch in size) to be retained on a 200-mesh sieve.

The cementing value of the material under ¼-inch to be at least 50.

(2) For use in the top course of gravel roads.

All to pass a 1½-inch screen and to have at least 55 and not more than 75 per cent retained on a ¾-inch screen.

At least 25 and not more than 75 per cent of the total coarse aggregate to be retained on a ¾-inch screen.

At least 65 per cent and not more than 85 per cent of the total fine aggregate to be retained on a 200-mesh sieve.

The cementing value of the material under ¼-inch to be at least 50.

(B) Gravel for use in Portland cement or bituminous concrete road construction to consist of sound, hard, durable particles of stone of the following sizes:

(3) For use as coarse aggregate in Portland cement or bituminous concrete roads.

All to pass a 1½-inch *screen and to be retained on a ¼-inch screen, and to have at least 25 and not more than 60 per cent retained on a ¾-inch screen.

SAND

Sand to be composed of sound, durable particles, and, if used as fine aggregate in Portland cement or bituminous concrete, or sheet asphalt construction, to be free from a coating of clay or loam.

(1) For use in sand-clay road construction (mixing method).

All to pass a ¼-inch sieve, to have at least 5 and not more than 50 per cent retained on a 20-mesh sieve, and at least 50 per cent retained on a 50-mesh sieve.

(2) For use as fine aggregate, cement concrete, first class.

All to pass a ¼-inch sieve, to have at least 20 and not more than 50 per cent retained on a 20-mesh sieve, at least 80 per cent retained on a 50-mesh sieve, and at least 97 per cent retained on a 200-mesh sieve.

To have a tensile strength ratio, when compared to standard Ottawa sand mortar briquets, of at least 100 per cent.

(3) For use as fine aggregate, cement concrete, second class.

All to pass a ¼-inch sieve, to have not more than 80 per cent retained on a 20-mesh sieve, and to have at least 50 per cent retained on a 50-mesh sieve, and at least 95 per cent retained on a 200-mesh sieve.

To have a tensile strength ratio, when compared to standard Ottawa sand mortar briquets, of at least 75 per cent.

(4) For use as fine aggregate, bituminous concrete.

All to pass ¼-inch sieve, to have from 40 to 60 per cent retained on a 40-mesh sieve, and at least 90 per cent retained on a 200-mesh sieve.

(5) For use in sheet asphalt construction.

All to pass a 10-mesh sieve, to have at least 20 and not more than 30 per cent retained on a 40-mesh sieve, at least 40 and not more than 50 per cent passing the 40 and retained on the 80-mesh sieve, and to have at least 25 and not more than 35 per cent passing the 80 and retained on the 200-mesh sieve.

SAND CLAY OR TOP SOIL (Natural Mixtures)

(1) For use in sand-clay or top-soil road construction.

To have not more than 10 per cent retained on a ¼-inch screen, at least 10 and not more than 50 per cent on a 20-mesh sieve, at least 30 and not more than 80 per cent on a 50-mesh sieve, at least 45 and not more than 85 per cent on an 80-mesh sieve, and at least 60 and not more than 90 per cent on a 200-mesh sieve.

To have a cementing value of at least 35.

INTERPRETATION OF RESULTS OF PHYSICAL TESTS

By comparing the results of the tests shown in the foregoing tables with the limits as shown in the following table, a general idea of the types of road construction for which this material is best suited may be obtained.

*When used in bituminous concrete construction, all to pass a 1¼-inch screen.

GENERAL LIMITING TEST VALUES FOR BROKEN STONE

Type of Construction	Traffic (1)	Fr. Coef. Wear	Limiting Values	
			Toughness	Hardness
Water-bound macadam, plain or with dust palliative treatment.	Light.....	5 to 8	5 to 9	10 to 17
	Moderate....	9 to 15	10 to 18	14 or over
	Heavy.....	16 or over	19 or over	17 or over
Macadam with bituminous carpet.	Light or			
	Moderate....	5 or over	5 or over	.....(4)
Bituminous macadam with seal coat.	Moderate to Heavy....	7 or over	10 or over	.....
Bituminous concrete.	Light to			
	Moderate....	7 or over	7 or over	.....(4)
	Moderate to Heavy....	10 or over	13 or over	.....
Binder course for sheet asphalt or Topeka type.	Any.....	7 or over	6 or over	.....(4)
Portland cement concrete.	Moderate to Heavy.....	(3)	8 or over	16 or over
Stone paving block (2).	Any.....	(3)	9 or over	16 or over
Broken stone foundations.	Any.....	3 or over	3 or over	8 or over
Cement concrete foundations.				

(1) Light traffic is assumed as less than 100 vehicles per day, moderate traffic between 100 and 250 vehicles, and heavy traffic over 250 vehicles per day.

(2) Crushing strength 20,000 lbs. or over per square inch.

(3) Limits for French coefficient of wear are not at present considered necessary for this type of construction.

(4) Numerous tests have shown that limits for hardness are unnecessary if the material possesses the required French coefficient of wear and toughness.

Cementing values should in all cases show over 25 if material is to be used in water-bound macadam construction.

Granites, gneisses, schists and sandstones should, not in general be used in the wearing course of water-bound macadam roads. Shales and slates should never be used in this connection. Cementing value tests have therefore been discontinued on these materials.

For further details and explanation of results of this table and also for tests on all materials to January 1, 1916, see U. S. Department of Agriculture Bulletin No. 370.

TABLE NO. 13

ELEVATION OF PASSES

(THIS TABLE IS COMPILED FROM THE BEST INFORMATION AT HAND,
AND IS BELIEVED TO BE CORRECT)

	Feet above sea level
Alpine Pass .....	.....
Alpine Tunnel	11,606
Argentine Pass	13,286
Boreas Pass	11,489
Breckenridge Pass	11,503
Berthoud Pass	11,306
Cochetopa Pass	10,032
East River Pass (Gunnison County).....	11,163
Elwood Pass	11,678
Fremont Pass	11,320
Gove Pass	9,570
Hoosier Pass	10,313
Hayden Pass	10,780
Hilltop Junction	9,839
Independence Pass	12,095
LaVeta Pass	9,378
Lake Creek Pass (Lake and Gunnison Counties).....	12,226
Mosquito Pass	13,188
Mosca Pass (Huerfano and Saguache Counties).....	9,713
Marshall Pass	10,950
Molas Lakes	10,488
Monarch Pass	11,650
Muddy Pass (Jackson and Grand Counties).....	8,772
Ohio Pass	10,033
Poncha Pass	8,945
Pearl Pass (between Pitkin and Gunnison Counties).....	12,715
Red Mountain	11,018
Rollins Pass	11,680
Sangre de Cristo Pass.....	9,454
Stony Pass	12,590
San Francisco Pass (Las Animas County).....	8,560
Tennessee Pass	10,276
Tarryall (Park County).....	12,466
Trout Creek (Park and Chaffee Counties).....	9,346
Weminuche Pass	10,628
Weston Pass	12,109
Willow Creek Pass.....	9,683
Yellow Jacket Pass (Rio Blanco County).....	7,493
Georgia Pass .....	.....
Webster Pass .....	.....
Loveland Pass .....	.....
Jones Pass .....	.....
Taylor Pass .....	.....
Cottonwood Pass .....	.....
Williams Pass .....	.....
Cumbres	10,003
Lulu Pass .....	.....
Buffalo Pass	10,650
Wolf Creek	10,850

TABLE NO. 14

TOURIST TRAVEL IN COLORADO

With the idea of securing some information at first hand relating to the automobile tourist travel through Colorado during 1916, the following letter was distributed in Denver, Colorado Springs and Pueblo:

"TO COLORADO AUTOMOBILE VISITORS:

Will you kindly reply to the following questions:

1. How long do you expect to remain in Colorado?
2. What car are you driving?
3. How many in party?
4. What does it cost your party per day?
5. What is your opinion of Colorado roads? Have you any complaint, criticism or suggestion?
6. Please give name and home address.

These questions are asked in the hope of betterment of road conditions, and to get a glimpse of ourselves from your point of view.

Very respectfully,

T. J. EHRHART,
State Highway Commissioner."

In response to which seventy-six (76) replies were received, from the following states:

Kansas, 18; Oklahoma, 13; Texas, 13; Nebraska, 7; Iowa, 5; Missouri, 4; California, 4; Utah, 2; Colorado, 2; Illinois, 1; South Dakota, 1; Ohio, 1; Indiana, 1; Pennsylvania, 1; Florida, 1; Washington, 1; unknown, 1.

From which the following table has been compiled:

Total number of states represented—16;
 Total number of cars—76;
 Total number of passengers—294;
 Average number per car—4;
 Average time spent in state—28.6 days;
 Average expenditure per person per day—\$3.30;
 Average expenditure per person during stay in state—\$94.38;
 Total amount expended in state—\$26,409.55.

From reports, it is conservatively estimated that the total number of cars visiting Colorado during 1916 was **26,500**. Based on the average number of persons per car as above, gives a total number of passengers of **106,000**.

Total amount expended in the state—\$10,004,280.

The comments on road conditions contained in 88% of the letters received were favorable, a few of which are quoted below.

"Roads very good. Will be there again some day."—Dr. and Mrs. A. E. Freeman, West Palm Beach, Florida.

"The best we have seen."—George M. Waddill, Amarillo, Texas.

"No criticism. Roads splendid."—J. C. Jackson, White Deer, Kansas.

"Fine. Everything lovely."—O. A. Kerns, Topeka, Kansas.

"We are very much pleased with road conditions in your state, and note many improvements since first driving over them in 1914."—C. M. Yocum, Forgan, Oklahoma.

"Good; best since we left California."—G. T. Kimble, San Jose, California.

"Fine."—W. S. Webb, Kansas City, Missouri.

"They are the best in three states that I traveled in."—J. C. Wise, Perry, Iowa.

"They are great. The best I know of, and the accommodations at City Park are a great treat to the travelers. It is also the best we have found."—Wm. Truitt, Fredonia, Kansas.

"Roads are perfect as to condition and well marked."—Mrs. Frances Dungan, Oregon, Missouri.

"The best I have ever driven over."—Geo. T. Pemberton, Hobart, Oklahoma.

"I think you are setting a very commendable example in road building. It is one of the best assets you have."—E. D. Carter, Perry, Iowa.

"Better than any state we have been in."—H. H. Wetzig, Junction City, Kansas.

"People of Colorado should be proud of their roads. The only suggestion—get more of them."—Colin McIntosh, Salt Lake City, Utah.

"No criticism; roads are very good. People along route very courteous and obliging."—J. C. Stafford, Ogden, Utah.

"Good."—A. W. Knowles, Soguel, California.

"I think you have the best roads I ever drove over. It is a pleasure to travel in Colorado."—W. E. Menaghten, Kansas City, Missouri.

"Our opinion of the Colorado roads is the best. I have no criticism as I know that such bad places as we found will in time be taken care of. The extremely dry weather made some of the roads a little bad that would no doubt have been good under other conditions."—W. M. Leonard, Lincoln, Nebraska.

"Very good."—V. Jelinek, 2610 Millard Avenue, Chicago, Illinois.

"They are being improved fast, and it is adding to tourist travel."—W. S. Lower, Republic, Kansas.

"Colorado roads are good. Have no complaints."—Ira Stewart, Clear Lake, Iowa.

"Generally good."—Dr. E. A. Archer, Pullman, Washington.

"Fine roads."—S. E. McAshan, 2415 Main Street, Houston, Texas.

"Roads very good. Will try and come again."—I. A. Wyatt and R. E. Simpson, Lamesa, Texas.

"Roads good. Enjoyed visit fine."—John France, 902 Atlantic Avenue, Long Beach, California.

"Colorado roads are the finest I ever saw anywhere. The only suggestion I would have is to keep on building them as you are."—R. J. King, Box 165, Quinlain, Oklahoma.

"Colorado roads are **fine**, none better."—D. A. Page, Allerton, Iowa.

"Fine. No room to kick."—C. Anderson, McCook, Nebraska.

"We Nebraskans think they are great."—A. H. Powell, 1845 Garfield Avenue, Lincoln, Nebraska.

"Fine roads and a beautiful country. Nothing like it beside California."—Mrs. E. F. Wendt, 1306 Edgemont Street, Los Angeles, California.

"Best roads of any of the Western States we were in, and we went as far west as Great Salt Lake."—Walter G. Lamade, 125 Ross Street, Williamsport, Pennsylvania.

"Continue as you are doing. The road between Pueblo and Colorado Springs is almost perfect, and much of it towards Denver."—P. H. Thornton, Wichita, Kansas.

"The evidences of road improvement in Colorado are on every hand."—F. A. Amsden, Wichita, Kansas.

"Roads **good**. Denver best town on map; Denver people best entertainers on earth."—B. T. Hoff, Balko, Oklahoma.

TABLE NO. 15

CAMPING SITES

For the accommodation of auto tourists camping sites in the following cities and towns have been provided:

City or Town	County	
Denver City.....	Denver.....	City Park
Holyoke.....	Phillips.....	See Mayor or Clerk
Brush.....	Morgan.....	City Park or See Clerk
Fort Morgan.....	Morgan.....	City Park or See Clerk
Greeley.....	Weld.....	Inland Grove Park
Castle Rock.....	Douglas.....	
Cheyenne Wells.....	Cheyenne.....	See Mayor
Colorado Springs.....	El Paso.....	Prospect Park
Pueblo.....	Pueblo.....	Fairmount Park
Salida.....	Chaffee.....	Old Race Track Grounds
Alamosa.....	Alamosa.....	See Mayor or Clerk
Pagosa Springs.....	Archuleta.....	See Town Clerk
Creede.....	Mineral.....	Along Rio Grande River
Lake City.....	Hinsdale.....	
Ouray.....	Ouray.....	See City Clerk
Cortez.....	Montezuma.....	See Mayor or Clerk
Montrose.....	Montrose.....	See Mayor or Clerk
Rifle.....	Garfield.....	See Mayor or Clerk
Steamboat Springs.....	Routt.....	See Mayor or Clerk

The National Forest Reserves are also open to campers under reasonable regulations, regarding campfires and pollution of streams.

TABLE 16A AND B

CONTRACT WORK DURING 1915 AND 1916
GRADING AND SURFACING

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Adams	2	Haul and spread gravel 4" center, 1" edge, 14' wide.....	\$ 0.50	\$ 674.19	1 $\frac{3}{8}$
Adams	2	Shipping gravel as per sample up to $\frac{3}{4}$ " size with 40% sand.....	0.25	815.36	.....
Adams	2	Crushing, hauling, and spreading pit gravel Road 16' wide, 5" center, and 3" at sides.	1.19	5,624.11	2 $\frac{1}{2}$
Adams	7	Hauling and spreading sand, road 15' wide, 3" deep.....	0.69 $\frac{1}{4}$	987.95	3
Adams	7	Grade and crown from Sand Creek to near Town of Watkins. Road 28 ft. between ditches.....	.....	526.19	7.517
Adams	2	Crush, haul, roll and spread all gravel	1.20	.....	2
Jefferson	1	Hauling, spreading and rolling 5 miles North Golden Road..... Two miles to be heavy sand or pea gravel, 2 miles..... 600 cu. yds. clay.....	..... 2.00 0.50	..... ..... .....	5
		Hauling gravel 3 miles from pit in Clear Cr., 3 miles.....	1.25	.....	.....

TABLE 16A AND B

CONTRACT WORK DURING 1915 AND 1916

GRADING AND SURFACING

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
.....	\$ 490.00	12-28-14	Pleasant DeSpain, Denver, Colo.	1 $\frac{3}{4}$ miles road from cars at \$0.50 per 2,800 lbs.
.....	.....	12-24-14	Platte River Sand & Gravel Co., Denver, Colo.	F. O. B. cars, Denver, at \$0.25 per 2,800 lbs.
.....	2,250.00	3- 9-15	Pleasant DeSpain	4 miles at \$1.19 per cu. yd. in place. County to furnish crusher.
2,400.00	329.00	6-17-15	J. A. Osner, Denver, Colo.	Aurora, 3 miles east, at \$0.69 $\frac{1}{4}$ per cu. yd. in place. In Adams and Arapahoe Counties,
.....	70.00	7-30-15	H. L. Kuykendall, Greeley, Colo.	5 furrows each side 10" deep to be graded to cen- ter. In Adams and Arap- ahoe Counties.
.....	.....	11-15-15	J. A. Osner, Denver, Colo.	Boulevard F from City North 2 miles.
.....	.....	7- 3-16	J. Fred Roberts, Denver, Colo.	600 cu. yds. sand per mile.
.....			
.....	.....			700 cu. yds. gravel per mile.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Jefferson	27	Grading earth	0.22	.....	.78
		Rock work, soft sandstone.....	0.95	.....	.....
		Loose rock	0.57	.....	.....
		Borrow excavation	0.20	.....	.....
Jefferson	27	Hauling and spreading sand and gravel, \$1.10 to \$1.25 per cu. yd. ....	.....	.....	.....
Jefferson	62	Grading .....	.39½	.....	.....
		Pavement, single course concrete, average 6¼" thick, 18' wide.....	1.14½ sq. yd.	.....	4.8
		Basalt stone concrete, abutments, wing and head walls.....	10.00	.....	.....
		Basalt stone concrete, floors.....	11.70	.....	.....
		Basalt stone concrete, posts and rail	12.50	.....	.....
		Gravel for shoulders.....	1.50	.....	.....
	
Jefferson	58	Rock and earth.....	.....	5,461.50	1.09
Larimer	2	Earth grading .....	.14	.....	2
		Hauling gravel, county to spread, per ton	0.372	.....	4
Larimer	51	Grading—Earth .....	.39½	.....	3
		Loose rock .....	.64	.....	.....
		Solid rock .....	.94½	.....	.....

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
1,891.00	.....	6-00-16	J. Fred Roberts,	Ditch and crown work, 10
6,944.00	.....		Denver, Colo.	cts. per lin. ft. for
2,951.00	.....			1,500 ft.
3,677.00	.....			12" corr. pipe in place at
				\$1.20 per ft.
				15" corr. pipe in place at
				\$1.43 per ft.
				24" corr. pipe in place at
				\$2.04 per ft.
				Concrete head walls, abut-
				ments and wings.
				437 cu. yds. at \$8.00 per cu.
				yd.
				Floors, 33.9 cu. yds. at
				\$11.00 per cu. yd.
				9,100 lbs. I beams at 5.3
				cts. per lb.; 176 ft. 2½"
				rail at \$2.26 per ft.
				3,620 ft. 4 wire fence at 7½
				cts. per ft., posts 16'
				apart.
.....	.....		J. Fred Roberts	5 miles Morrison Road. No
				written specifications or
				contract.
98.50	.....	5-13-16	Gaffy & Keefe	Corrugated pipe in place—
			Construction	10" diam. at 81½ cts. per
50,626			Co.,	lin. ft.
sq. yds.			Denver, Colo.	12" diam. at 92½ cts. per
70	.....			lin. ft.
31.40	.....			15" diam. at \$1.11 per
				lin. ft.
1.70	.....			18" diam. at \$1.287 per
1,252	.....			lin. ft.
				24" diam. at \$2.035 per
				lin. ft.
6,289	5,010.00	9-00-16	Jacobson & Seber-	
			son,	
			Boulder, Colo.	
9,200	.....	4- 7-16	J. A. Osner,	300 ft. overhaul at 1½ cts.
			Denver, Colo.	per cu. yd. per 100 ft.
5,000 tons	.....		
20,500	11,232.00	2-19-15	F. C. Dreher Con-	Culverts and bridges to be
9,000	.....		tracting Co.,	of timber and put in at
9,000	.....		Denver, Colo.	cost plus 15%.
				Clearing and grubbing,
				\$400.00 per mile.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Larimer	51	Grading—Earth excavation	.60		2
		Solid rock excavation	1.50		
Weld		Haul and dump gravel on road for 5 mi. E. from Larimer Co. line	1.37½		5
Douglas	3	Grading Ry. Crossing S. of Wolhurst to Cattle Run near Acequia	.1449		1.8
		4,734 lin. ft. of blade work at 0.95 cts. per lin. ft.			
El Paso	3	D. & R. G. Ry. Co. change of line near Fountain. Work done by Ry. Co.		3,500.00	.7
El Paso	18	Grading, change of location of highway parallel to Ry. track		4,268.29	.38
El Paso	18	Ute Pass		8,343.38	
Hinsdale	38	Grading, excavation, earth and rock, all culverts included; also 17 turnouts	\$	1,650.00	2.7
La Plata	13	Grading: Sec. 1, 15,000 ft. Durango-Silverton Road		5,440.00	2.84
		Earth and loose rock, 10,134 cu. yds.; rock fill, 194 cu. yds.; fill from borrow, 200 cu. yds., Sta. 0 to 94+50, ditch and crown work.			
		Grading Sec. 2		4,800.00	3.8

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
6,000 3,800	..... .....	8-18-16	The Hokasono Construction Co., Denver, Colo.	Clearing and grubbing, 11 acres at \$33.00 per acre. 5 log stringer bridge at \$510.00. Corrugated pipes 10", 12" and 15" in place at \$1.50 per ft.
.....	.....	11-24-15	Kuykendall Con- struction Co., Greeley, Colo.	County to provide man to spread gravel.
8,825	.....	3-27-16	Ed. Lindsay, Denver, Colo.	Extra work at cost plus 10%.
.....	5,000.00	7-22-16		3,700 ft. Total cost. \$8,- 139.00. State and County cost, \$3,500.00.
20,500	11,232.02	2-19-15		Midland Ry. Co.
.....	.....		Ripley & Leslie	
.....	\$6,111.00	8- 8-16	F. S. Williams, Lake City, Colo.	27 miles from Peniston ranch, southeasterly. Roadway not less than 12 ft. wide, 8 ft. to be in the solid.
Earth and loose rock				
10,134.00	1,915.00	July, '16	Logan & West, Durango, Colo.	2 bridges, 16-ft. spans. Ma- terial furnished by county.
Rock fill	.....	.....		Culverts and syphons to be of corrugated metal and furnished by county.
Borrow	.....	.....
200.00	.....	.....
.....	1,263.00	.....	W. A. O'Brien, Durango, Colo.	Contract not made, work being done by day work.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Ouray	13	Grading; Ouray toward Red Mt. from a point $\frac{1}{2}$ mile southerly from Ouray, 7,450 ft., Sta. 25+50 to Sta. 100.....		8,000.00	1.41
		Estimated 5,713 cu. yds. rock and 2,480 cu. yds. earth.			
San Juan		Grading from end of completed road between Silverton and Durango south for 15,250 ft. Grading to 14 ft. in width includes 1'-6" for ditch and 1 ft. deep; also clearing 40' wide. Contract changed Sept. 7th to roadway 16 ft. wide with turnouts 18 ft.		14,750.00	2.89
Garfield	42	Construction of highway, beginning about 14 miles north of Rifle, thence $4\frac{1}{2}$ miles in a northerly direction—			
		Earth excavation, free haul, 500 ft.	0.1989		4.5
		Rock excavation, free haul, 500 ft.	0.74		
		Borrow excavation, free haul, 500 ft.	0.1989		
		Clearing brush, 7 acres at \$7.50 per acre.			
		Clearing and grubbing, at \$7.50 per acre.			
		Extra work at cost plus 10%.			

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
.....	5,674.00	7- 5-16	B. H. Du Prow and A. A. Moule, Ouray, Colo.	Road to be 16 ft. wide, ditch 6" deep on inner side. 6 culverts to be installed furnished by county. Clearing included in grad- ing.
.....	5,104.00	7-29-16	The New Way Construction Co.	Bridges: 1 12-ft., 1 10-ft., 1 8-ft., 2 6-ft. and 10 4-ft.
.....	.....	9- 7-16	Silverton, Colo.	Timber, and placing all cor- rugated iron culverts. Also turnouts to be 16' in width for 30 ft. in length. First contract price \$8,765, and \$5,985.00 additional for change of contract, making total \$14,750.00.
21,053.00	.....	6- 8-16	A. Zeisemiss R. M. Squier, Rifle, Colo.	Corrugated Iron Pipe Cul- verts Hauling per Laying per 100 lbs. per ft.
584.00	.....	.....		Feet Size 100 lbs. per ft. 30 ft. +58 ft. 36" 25 cts. 10 cts. 38 ft. 30" 25 cts. 10 cts. 222 ft. 24" 25 cts. 10 cts. 136 ft. 18" 25 cts. 9 cts. 54 ft. 12" 25 cts. 9 cts. 2 miles moving and re- setting fences, 25 cts. per rod. 2 miles building new fences, 20 cts. per rod.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Garfield	11	Construction of 2,350 ft. of Lacy Hill—			
		Earth excavation, free haul, 500 ft., including loose rock.....	.50	.....	.44
		Rock excavation	1.00	.....	.....
		Borrow—Overhaul per 100 ft. at 2½ cts. per cu. yd.....	.50	.....	.....
		Clearing brush at \$12.00 per acre.			
		Clearing timber at \$50.00 per acre.			
		Per M. B. M., hauling and placing timber, \$45.00.			
Moffat	42	Construction, road and incidental structures, Sta. 758+74 to 1072—			
		Earth excavation .....	.25	.....	5.93
		Rock excavation	1.10	.....	.....
		Borrow for fills .....	.25	.....	.....
Pitkin	25	Construction of road below Aspen, Sta. 41 and 94		6,900.00	
		Including ditches and turnouts 16 ft. wide, 40 ft. long.			
Prowers	6	Grading and surfacing with gravel and shale at Holly, Morse, and Hardscrabble Ranch—Grading	\$ 0.15	\$.....	.504
		Grading .....	.18	.....	.89
		Surfacing with gravel—Graveling .....	.40	.....	.....
		Graveling .....	.44	.....	1.43
Prowers	5	Grading north of Holly.....	.16	.....	.....
		Surfacing with shale.....	.55	.....	.....
Prowers	2S	Grading from Holly south to Sta. 115 .....	.12	.....	2.18
		Surfacing from Holly south to Sta. 115 .....	.70	.....	.....

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
8,400.00	8-11-16	C. W. Fravert, Rifle, Colo., and Richard Prendergast, New Castle, Colo.	Concrete in place, 65 cu. yds. at \$10.00 per cu. yd. Steel reinforcement, 693 lbs. at 10 cts. per lb. 24" pipe, hauling and placing—Cement, 55 cts. per lin. ft.; iron, 25 cts. per lin. ft. 15" pipe, hauling and placing—Cement, 35 cts. per lin. ft.; iron, 20 cts. per lin. ft. Moving and resetting fences, 3 cts. per ft. Extra work at cost plus 10%.
12,652.00	6-26-16	Eugene Hunt,	Williams Fork on Axial-Craig Road to 300' S. of Stinking Gulch. Culverts 36"-50 ft., 24"-228 ft., 18"-46 ft., 12"-190 ft. Bridges, 3-10 ft., 2-20 ft., all 5 stringers and 1-32 ft. A frame truss.
72.12		
1,450.50		
.....	6,900.00	.....	Brown Bros., Aspen, Colo.	Sec. A, Sta. 94 to Sta. 78 = 4,337 ft., 16' wide. Sec. B, Sta. 78 to Sta. 41 = 8,723 ft., 13½' wide.
700.00	10-11-15	Filloon & Ford, Lamar, Colo.	Extra work at cost, plus 15%.
6,690.00		
975.00		
2,800.00		
1,000.00	10-11-15	Henry Massar, Carlton, Colo.	Extra work at cost, plus 15%.
975.00		
.....	8-8-16	M. U. Dewald, Holly, Colo.	Hauling, spreading and surfacing within 200 ft. at 20 cents per cu. yd. Extra work cost plus 20%.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Prowers	25S	Surfacing with lime stone shale, Sta. 0 to Sta. 105 and 60..... Haul, spread and smooth roadway 12 ft. wide.	.65	.....	2
Prowers	26S	Surfacing with adobe or shale, Sta. 38 to Sta. 138.....	.70	.....	1.9
Dolores	45	Grading, earth and rock excavation, 1,266 lin. ft. ....	.90	.....	.24
Dolores	45	Grading, earth and rock excavation, 766 lin. ft. ....	.90	.....	.24
Dolores	45	Grading, earth and rock excavation, 1,784 lin. ft.	1.25	.....	.....
Dolores	45	Grading, earth and rock.....	.90	3,462.75	.....
Elwood Pass or Wolf Creek Pass Road.....	15	Section 1, Sta. 0+25 to Sta. 30..... Section 2, Sta. 30 to Sta. 80..... Section 3, Sta. 80 to Sta. 130..... Section 4, Sta. 130 to Sta. 180..... Section 5, Sta. 180 to Sta. 250..... Section 6, Sta. 250 to Sta. 340..... Section 7, Sta. 340 to Sta. 443+17....	..... ..... ..... ..... ..... ..... .....	3,040.00 3,082.00 2,587.00 1,805.00 3,130.00 3,052.00 2,995.00	.56 .95 .95 .95 1.33 1.70 1.95
"	60	Excavation for 12,600 ft., Sta. 35 to 0, and 0 to 91..... Sta. 0 being near entrance to the box canon, road to be 12 ft. wide with 18 in. additional for ditch.	.....	8,150.00	2.39

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
3,500.00	.....	.....	Howard Brown, W. H. Hayden, R. H. Hayden, Nathan Meyden- hall, Granada, Colo.	Man and team, \$4.00 per 8 hrs. Man, \$2.00 per 8 hrs. Plus 15% for tools and supt.
3,100.00	.....	10- 3-16	Henry Masser, Carlton, Colo.	Man and team, \$4.00 per 8 hrs. Man, \$2.00 per 8 hrs. Plus 15% for tools and supt.
2,400.00	.....	6- 3-16	Harry E. Fry and Jas. K. Welsh, Rico, Colo.	
2,043.00	.....	8- 2-16		
2,229.00	.....	10- 1-16	Harry E. Fry, Rico, Colo.	Contract includes culvert at \$150.00.
585.00	.....	.....
.....	\$5,429.00	10- -14	Logan & Lovell, afterwards Logan & West.	To be 10' in the solid and an extra foot for ditch. Sta. 0+25 at the cliffs, Sta. 443+17 top of Wolf Cr. Pass.
.....	3,244.00	.....	
.....	2,723.00	.....	
.....	1,900.00	.....	
.....	2,353.00	.....		To be 8' in the solid and an extra foot for ditch.
.....	1,795.00	.....	
.....	1,536.00	.....		Includes earth loose and solid rock and clearing 40 ft. wide. Extra work at cost plus 10%. Culverts, bridges and turnouts ex- tra.
.....	3,410.00	6- 5-15	Carl J. Chapman, Monte Vista, Colo.	Up the South Fork Rio Grande river. Extra work at cost plus 10%. Bridges, culverts and clearing 40 ft. wide included in exca- vation. 1 bridge, 30' span, 14 cul- verts 2'x3'x1', 6" re- spruce.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

County	State Road No.	Character of Work	Unit Price per cu. yd.	Total Sum	Length Miles
Pass Road	15	Section 1, Sta. 53 to 103, 5,000 ft.		645.00	.95
		Section 2, Sta. 103 to 141+10, 3,810 ft.		515.00	.72
		Sta. 141+10=94+90 from 0 at the cliffs and is the W. side of Wolf Cr.			
"	15	Section 4, Sta. 94 to 40, 5,400 ft.....		1,590.00	1.02
		Section 5, Sta. 40 to 10, 3,000 ft.....		1,045.00	.57
		Section 6, Sta. 10 to 0+25, 1,025 ft.		800.00	.19
"	60	Excavation, including clearing 40 ft. wide; also bridges and culverts in Sec. 1, Sta. 91 to Sta. 160, Middle Fork of South Fork. Extra work cost plus 10%.....		5,950.00	1.30
"	15	Excavation, including clearing 40 ft. wide, bridges and culverts in Sec. 2, Sta. 160 to 559, on top of Pass. Extra work cost plus 10%		11,300.00	7.56
"	60	Excavation, including clearing 40 ft. wide, bridges and culverts in Sec. 1, Sta. 35 to 255, South Fork of Rio Grande River. Extra work at cost plus 10%.....		9,685.00	4.17
"	60	Excavation, including clearing 40 ft. wide, also bridges and culverts, in Sec. 2, Sta. 225 to 469+55, South Fork of Rio Grande River. Extra work at cost plus 10%.....		8,460.00	4.63

All culverts and bridges on Roads 15 and 60 to be of red spruce timber.

CONTRACT WORK DURING 1915 AND 1916—Continued

GRADING AND SURFACING—Continued

Total Cu. Yds.	Cost Per Mile	Date	Contractor's Name	Remarks
.....	679.00	.....	Logan & Lovell.	Excavation including clearing 40 ft. wide
.....	715.00	9-14-14		Road to be 18' wide, all earth. Culverts at cost plus 10%. Turnouts by force account.
.....	1,559.00	.....		Road to be 8' in the solid, loose and solid rock. Culverts at cost plus 10%.
.....	1,833.00	.....		Turnouts by force acct.
.....	4,210.00	.....	
.....	4,578.00	7-16-15	Carl J. Chapman, Monte Vista, Colo.	Roadway 12 ft. with 1'-6" additional for ditch. 1 45-ft. bridge and 1 35-ft. bridge, 2 6-ft. culverts and 9 smaller culverts. All to be 18-ft. roadway.
.....	1,500.00	7-16-15	Logan & West, Durango, Colo.	Roadway 12' with 1'-6" additional for ditch. 1 35-ft. bridge and 1 25-ft bridge, 3 20-ft., 1 8-ft., 6 6-ft. bridges, and 50 culverts. All to be 18-ft. roadway.
.....	2,321.00	12- 3-15	John E. Sheehan, Larkspur, Colo.	Roadway 12' with 1'-6" additional for ditch. 2 12-ft., 4 6-ft. bridges and 45 culverts.
.....	1,827.00	12- 3-15	Logan & West, Durango, Colo.	Roadway 12' with 1'-6" additional for ditches. 1 20-ft., 3 6-ft. bridges and 35 culverts.

TABLE 16C

CONTRACT WORK DURING 1915 AND 1916

BRIDGES AND CULVERTS

County	State Road No.	Character of Work	Concrete cu. yd.	Piling per ft.	Length
Adams	7	Steel Bridge over Toll Gate Cr. concrete floor			1-50 ft. span
Arapahoe	3	Steel Bridge over Sand Cr., concrete floor			1-60 ft. span
		Extra concrete in abutments and wings	16.00		
		Extra piles		0.51	
		Roadway 20 ft.			
Logan	23	Concrete I-beam Bridge over South Platte River			16-35 ft. spans 1-20 ft. span
		Roadway 20 ft.			612'-6" length
Cheyenne	32	Bridge over Big Sandy at Kit Carson			408 lin. ft.
		Concrete in piers, abutments and wings	11.25		17-24 ft. spans
		Timber for 2 spans at \$36.00 per M in place, 6,972 ft. B. M.			
		Piling for foundations in place, 14 piles		0.65	
		Extra work at cost plus 15%			
		Roadway 20 ft.			
El Paso	3	Reinforced Concrete Arch Bridge near Breed Station			1-40 ft. span
		Roadway 20 ft.			
	22	Nevada Ave. Bridge, 20 ft. road and 2-5 ft. walks			2-75 ft. spans
	18	Reinforced Concrete Bridge over Kettle Cr. Roadway 20 ft.			1-40 ft. span
Kit Carson	30	Concrete and I-beam Bridge over Republican River, Roadway 20 ft.			4-18 ft. spans
Bent	6	Luten Arch Bridge near Hasty			1-20 ft. span
Crowley	33	Concrete I-beam Bridge			1-26 ft. span

TABLE 16C

CONTRACT WORK DURING 1915 AND 1916
BRIDGES AND CULVERTS

Total Cost	Date	Contractor's Name	Remarks
\$ 3,900.00	5-8-16	The Levy Construction Co., Denver, Colo.	Low riveted truss, 20 ft. roadway, Adams and Arapahoe Counties. Finished
4,040.00	5-8-16	The Levy Construction Co., Denver, Colo.	Low Pratt truss, 20 ft. roadway. Finished.
.....			
.....			
27,730.00	1-4-16	The McDonald Construction Co., Denver, Colo.	East from Sterling Finished.
.....			
.....			
.....	7-19-16	The Levy Construction Co., Denver, Colo.	Removing timber from old bridge to new site, \$14.25 per M., 50,000 ft. B. M.; cutting old piles and placing same in bulkheads at new site, \$0.22 per lin. ft. Finishing bolts, nails, drift bolts, and spikes, \$80.00. Finished.
.....			
.....			
4,300.00	7-22-16	Pueblo Bridge Co.	Finished.
.....			
16,928.00	1-00-15	Pueblo Bridge Co.	Finished. Reinforced concrete arch.
6,415.00	1916	Pueblo Bridge Co.	14 mi. N. E. of Colo. Springs. Finished.
3,940.00	8-22-16	William Phipps, Flagler, Colo.	Near Flagler, Colo. Extra work at cost plus 12½%. In progress.
500.00	4-4-16	Pueblo Bridge Co., Pueblo, Colo.	Roadway 20 ft. Finished.
.....	1915		Roadway 20 ft. Finished.

CONTRACT WORK DURING 1915 AND 1916—Continued.

BRIDGES AND CULVERTS—Continued

County	State Road No.	Character of Work	Concrete cu. yd.	Piling per ft.	Length
Huerfano	26	Concrete Luten type Arch Bridge			2-75 ft. spans
		Extra concrete in foundations	18.00		
		Extra piling in foundations		0.60	
		Roadway 20 ft.			
Las Animas	55	Reinforced concrete Bridge over Frijole Creek			1-40 ft. span
		Extra concrete underground	10.00		
		Extra concrete above ground	9.00		
Las Animas	55	9 reinforced concrete Culverts between Frijole Hill and Garcia Station. County to furnish reinforcing steel	11.75		
Las Animas	55	3 reinforced concrete Culverts near where the San Francisco wagon road intersects Road No. 55	11.75		
Las Animas	55	Reinforced concrete slab, and several reinforced culverts between Hollenbeck farm and Rebyta school house			
Otero	5	Reinforced concrete Arch over Timpas Cr.			2-56 ft. spans
		Roadway 20 ft.			1-60 ft. span
Pueblo	26	Reinforced concrete Arch, Luten type, 20 ft. Roadway			1-25 ft. span
		Extra concrete in wall	12.50		
		Reinforced concrete Arch over South Creek			1-25 ft. span
Prowers	6	Reinforced concrete slab Bridge over Cheyenne Cr. east of Holly. Furnishing and driving piles		0.64	
		Concrete complete in place	12.75		
		Extra work at cost plus 15%.			

CONTRACT WORK DURING 1915 AND 1916—Continued.

BRIDGES AND CULVERTS—Continued

Total Cost	Date	Contractor's Name	Remarks
12,800.00	8-12-15	Pueblo Bridge Co., Pueblo, Colo.	12 miles from Walsenburg. Finished.
1,290.00	3-18-16	Battista Enririotta, Trinidad, Colo.	County to furnish all reinforcing steel. Finished.
.....	5-13-16	Albert E. Perry, Trinidad, Colo.	Proportions: Cement 1, sand 2½, stone 5, \$11.75 per cu. yd. in place. All extra concrete same price. Finished.
.....	7-13-16	Albert E. Perry, Trinidad, Colo.	Proportions: Cement 1, sand 2½, stone 5, \$11.75 per cu. yd. in place. County to furnish all reinforcing steel. Finished.
.....	7-22-16	Battista Enririotta, Trinidad, Colo.	Proportions: Cement 1, sand 2½, stone 5, \$11.50 per cu. yd. in place. County to furnish all reinforcing steel. Finished.
13,249.46	12-00-15	Washburn & Harris, Greeley, Colo.	Finished.
1,850.00	10-11-15	Pueblo Bridge Co., Pueblo, Colo.	Finished.
1,960.00			Finished.
.....	6-26-16	Smith & McDowell, Pueblo, Colo.	34 12-ft. spruce piles in all. Concrete in abutments, piers, and wings. Cement 1, sand 2½ and stone 5, 70 cu. yds. For floor slabs: Cement 1, sand 2½ and stone 4, 45 cu. yds. Finished.

CONTRACT WORK DURING 1915 AND 1916—Continued.

BRIDGES AND CULVERTS—Continued

County	State Road No.	Character of Work	Concrete Piling cu. yd per ft.	Length
Elwood Pass Road		Bridge over Wolf Creek. A frame truss timber Bridge with 5 stringers.....	.....	2-45 ft. spans
Gunnison	20	Steel Truss through Pratt. 110 ft. end to end, 16 ft. Roadway .....	.....	110 ft.
Eagle	10	Reinforced concrete Bridge, Luten type .....	.....	.....
Grand	43	Bridge over Grand River 3 miles N. E. from Granby.....	.....	1-90 ft. span
		Timber floor and stringers.....	.....	.....
Mesa	11	Bridge at Fullers on Plateau Cr. ....	.....	100 ft.
		Bridge at Masters on Plateau Cr. ....	.....	100 ft.
		Low truss steel Bridge.....	.....	.....

CONTRACT WORK DURING 1915 AND 1916—Continued.

BRIDGES AND CULVERTS—Continued

Total Cost	Date	Contractor's Name	Remarks
444.00	9-14-14	Grant Shields, Pagosa Springs, Colo.	State to furnish flooring and spikes. Finished.
3,566.00	9-30-16	Omaha Structural Steel Works, Omaha, Neb.	Bridge 20 ft. high. Timbers, joist and floor, 7 panels. In progress.
6,285.00	4-20-16	Pueblo Bridge Co., Pueblo, Colo.	Bridge over Eagle River at Wolcott. Finished.
3,354.00	8-20-15	The Levy Construction Co., Denver, Colo.	Bridge on metal tubes filled with cement. Low Pratt truss, 20 ft. roadway. Finished.
.....	8-12-16	Patterson-Burghardt Construction Co., Denver, Colo.	Timber floor and stringers. Steel for bridge, \$2,000.00 F. O. B. Fullers and \$2,000.00 F. O. B. Masters. County to supply abutments timbers, haul and erect. Finished.

TABLE NO. 17

FORMS

Form for Monthly Time-Books for Road Supervisors, Overseers
and Foremen

This Note to be printed on inside cover of each book:

Use one time-book for each supervisor, overseer or foreman for each month; and turn the book over to your county clerk each month, having all extensions made and all report blanks in the back of the book properly made.

These reports are intended:

First—To give the cost of the month's work and material, and also the location of the work done.

Second—To account for and give the location of all the tools, machinery, and material belonging to or in use by the county.

On all culverts or bridges the size or span should be given, and the kind of material, whether lumber, iron pipe, concrete, etc.

EXPLANATION.—At back of time-book four double pages are to be ruled, as per specimen below, for monthly report, being a summary of the several pieces of work for the month:

Report for month of..... Road Overseer District No....., of..... County.
....., 19....., of labor and material as follows:

Signed..... Road Overseer

Road No. and Location of Work	Material	Total Days Labor--Teams	Rate	Total Amount	Note if Work is Finished or Not
			\$		

Center of Page

5

—8 inches—

—5 inches—

—5 inches—

7 inches, about 40 lines—

At back of time-book, after the report pages as given, two double pages are to be ruled, as per specimen below, for the monthly reports of tools, machinery, and material on hand at the end of the month.

Road Overseer District No. of County.
 Report of Tools, Machinery and Material on hand this day of 191.....; and now in my care; also that which has been transferred during the past month.

Signed Road Overseer.

Name of Article, Tool or Machine	Number of Each	Condition	Present Location— Received From or Sent To

— 8 inches —

— 5 inches —

— 5 inches —

FORMS
Forms for Statements of Expenditures on State Roads to be
sent in every month by the County Clerk.
FORM FOR STATEMENTS OF EXPENDITURES ON STATE ROADS

STATE OF COLORADO, }
COUNTY OF } ss.

Date.....
I, county clerk and recorder in and for the County of, State of
Colorado, do hereby certify that the bills hereinafter listed is a true statement of the bills on file in this office, and are for material
furnished, and labor performed, on State Road No., located between.....
and.....

Primary or Secondary meeting of the board of county com-
missioners of County held on 191.....
That the bills have been audited and allowed at a.....

That warrants have been drawn and issued in full payment of the same, as follows:

Date	Warrant No.	Name (To Whom Paid) Person or Firm	Amount	(What For) Labor, Material or Contract	Amount
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IN WITNESS WHEREOF, I have hereunto set my hand and the seal of my office, at, Colorado,
this day of A. D. 191.....
County Clerk and Recorder.

(Seal)
NOTE: A separate statement must be made for each piece of work, on each road.

FORMS FOR ANNUAL STATEMENTS
ANNUAL REPORT OF TOTAL EXPENDITURES ON STATE PRIMARY AND SECONDARY ROADS
IN.....COUNTY, FOR YEAR ENDING NOVEMBER 30, 19.....

GRADING

(Should include all expenses, except surveys and engineering, bridges, culverts, maintenance, dragging, and surfacing; put these items under their proper headings.)

State Primary Road No.	from	to	Miles	Total Cost
	from	to	.....	\$.....
	from	to	.....	\$.....
	from	to	.....	\$.....
	from	to	.....	\$.....
	from	to	.....	\$.....
	from	to	.....	\$.....
	from	to	.....	\$.....

Total (If road is a secondary road, note same in first column.)

BRIDGES

(All Spans of Ten Feet and Over)

State Primary Road No.	Over Creek or River	Miles E. or W., N. or S. of	Nearest City or Town	Span in Feet	Width of Roadway	Kind of Bridge	Total Cost
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....
.....	\$.....

Total
Valuation of county.....
Tax levy for all county purposes.....
Tax levy for roads and bridges.....

(ANNUAL STATEMENT CONTINUED)
 CULVERTS
 (All Spans Under Ten Feet)
 (Cattle runs under this head)

State Primary Road No.	from	to	Size	Number	Kind	Total Cost
	from	to	.....	.....	.....	.....
	from	to	.....	.....	.....	.....
	from	to	.....	.....	.....	.....
	from	to	.....	.....	.....	.....
	from	to	.....	.....	.....	.....
	from	to	.....	.....	.....	.....
Total						.....

SURFACING
 (Of Gravel, Stone, Clay, Sand, Concrete, etc.)

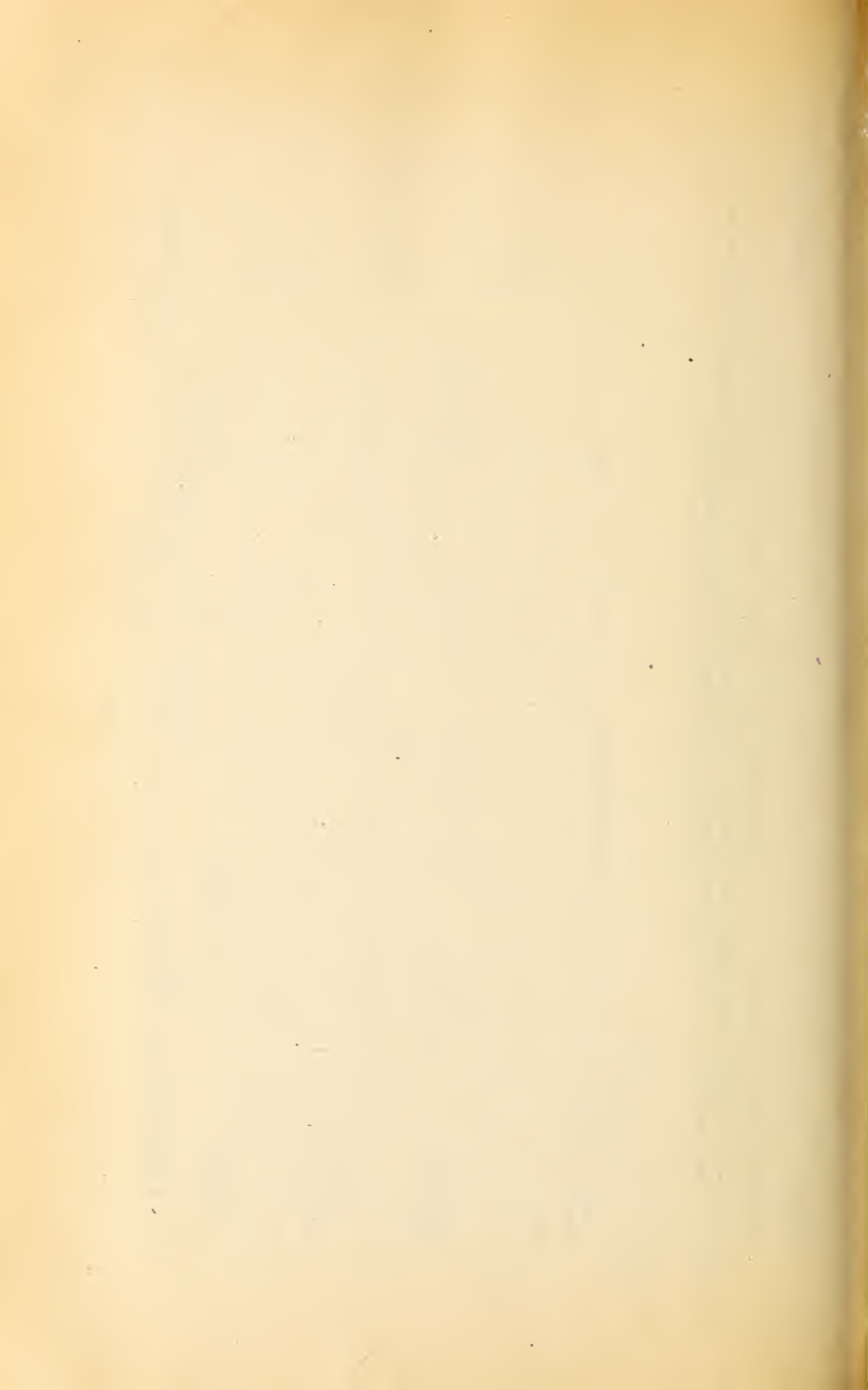
State Primary Road No.	from	to	Miles	Thickness	Width	Kind	Total Cost
	from	to	.....	.....	.....	.....	.....
	from	to	.....	.....	.....	.....	.....
	from	to	.....	.....	.....	.....	.....
	from	to	.....	.....	.....	.....	.....
	from	to	.....	.....	.....	.....	.....
	from	to	.....	.....	.....	.....	.....
Total							.....

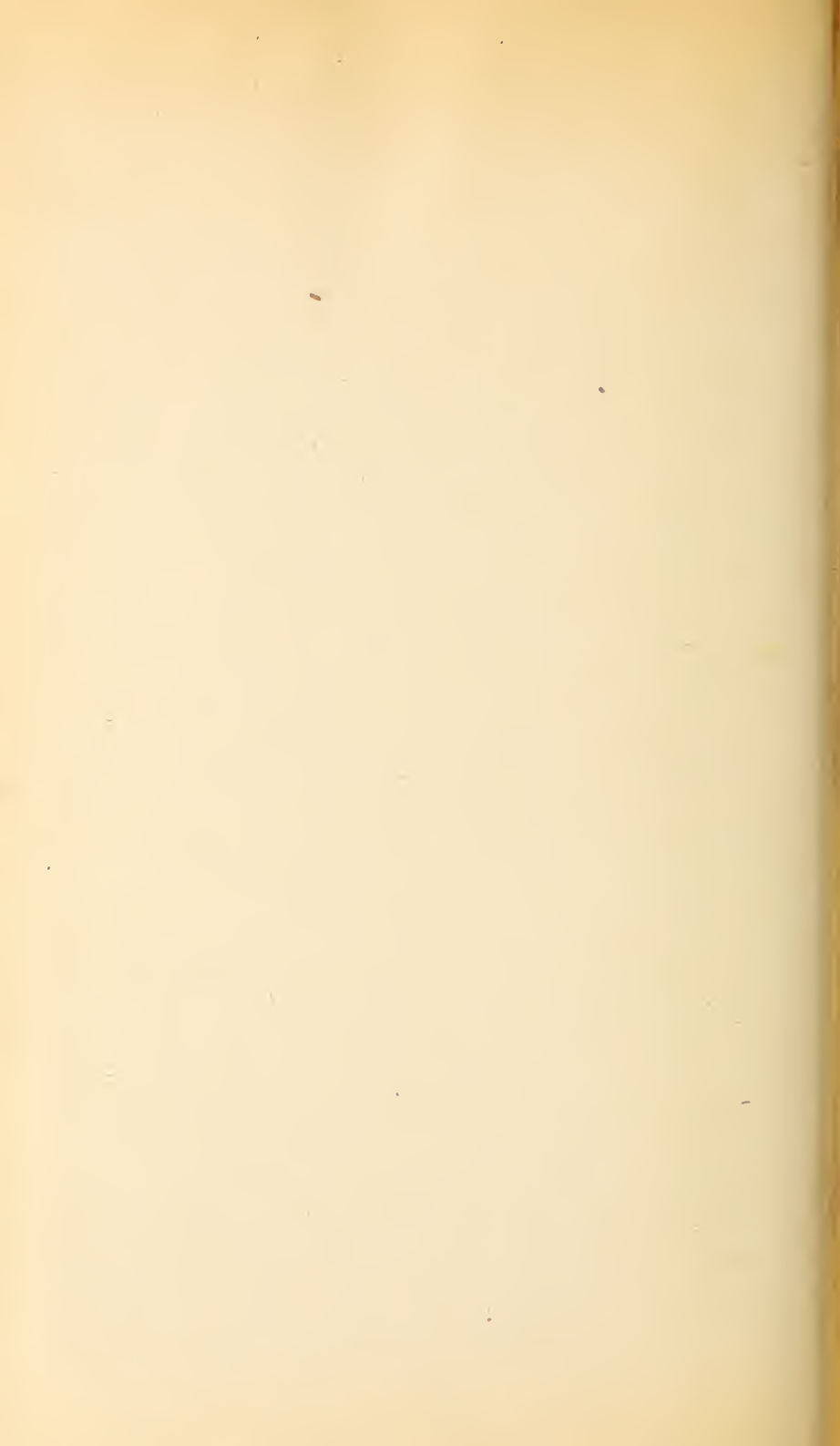
DRAGGING, MAINTENANCE AND REPAIRS

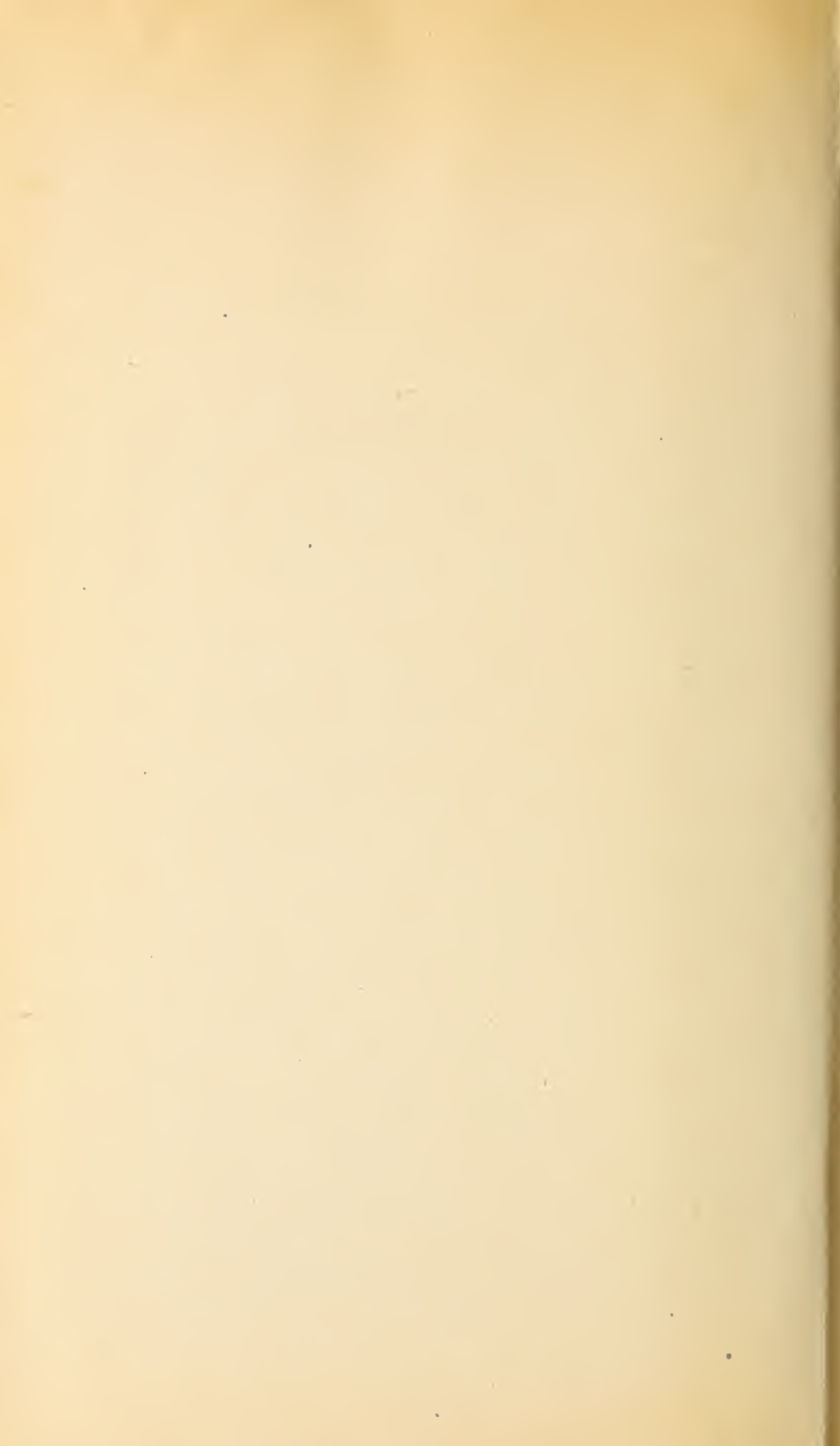
State Primary Road No.	from	to	Miles	Total Cost
	from	to	.....	.....
	from	to	.....	.....
	from	to	.....	.....
	from	to	.....	.....
	from	to	.....	.....
	from	to	.....	.....
Total				.....

ADMINISTRATION, SURVEYING AND ENGINEERING WORK

State Primary Road No.	from	to	Miles	Kind of Work	Total Cost
	from	to	.....	.....	.....
	from	to	.....	.....	.....
	from	to	.....	.....	.....
	from	to	.....	.....	.....
	from	to	.....	.....	.....
	from	to	.....	.....	.....
Total					.....
Grand total					.....











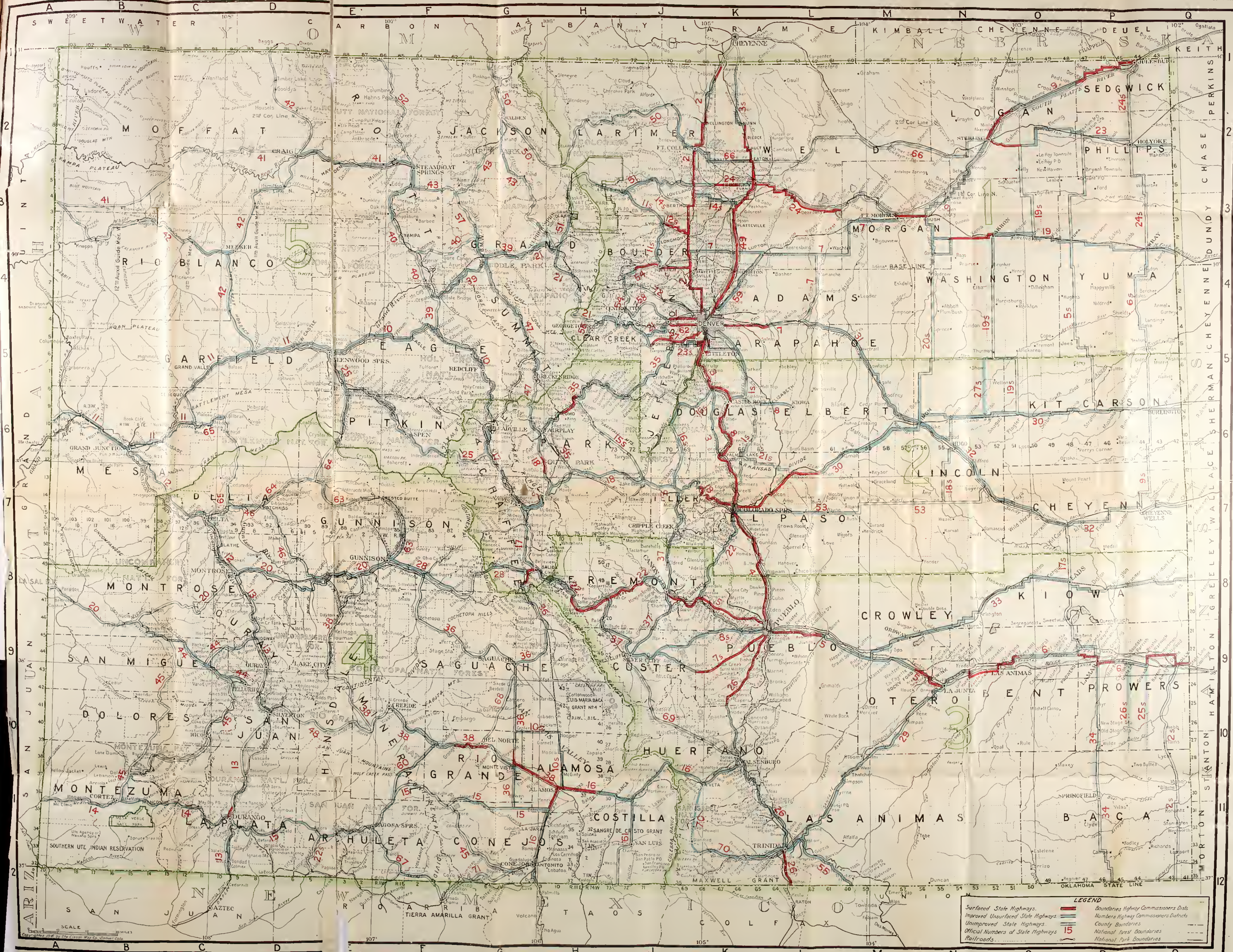
Map of the State Highways of Colorado

Issued August 1916 by the State Highway Commission of Colorado

T. J. EHRHART, COMMISSIONER.
J. E. MALONEY, SECRETARY
ENGINEER.

ADVISORY BOARD
J. M. KUYKENOALL, Chairman, District No. 1, Denver.
LEONARD E. CURTIS, District No. 2, Colorado Springs.
FRED D. RADFORD, District No. 3, Trinidad.
FREDERICK GOBLE, District No. 4, Silverton.
L. BOVO WALBRIDGE, District No. 5, Meeker.

SCALE 12 MILES = 1 INCH



LEGEND
Surfaced State Highways
Improved Unsurfaced State Highways
Unimproved State Highways
Official Numbers of State Highways
Boundaries Highway Commissioners Districts
Numbers Highway Commissioners Districts
County Boundaries
National Forest Boundaries
National Park Boundaries



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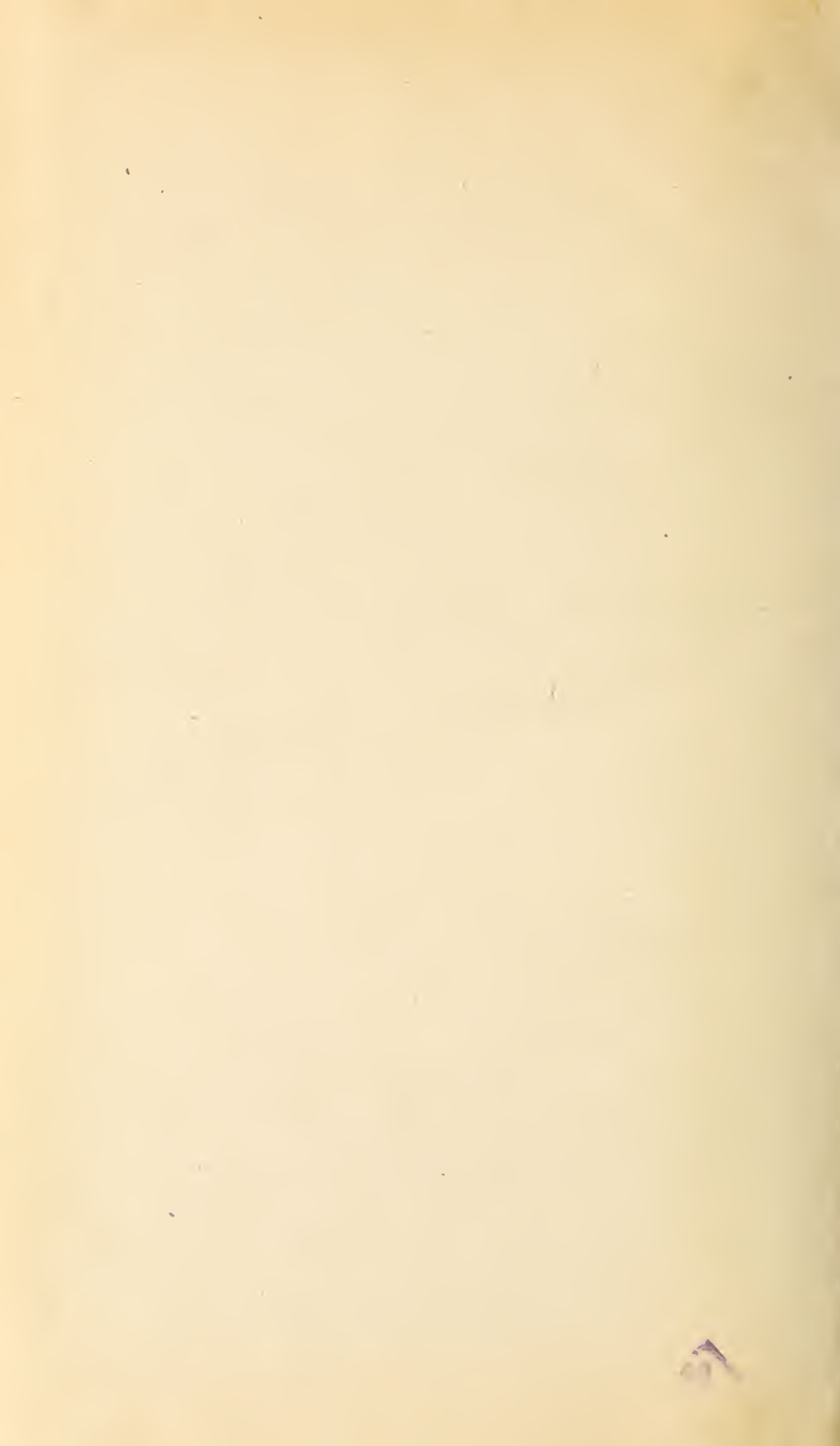


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1910-1915/16

report, 1910-1915/16.

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