

REPORT OF THE
Board of Road Commissioners
for Alaska

1911



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U.S. Alaska Road Commission.

REPORT OF THE
Board of Road Commissioners
for Alaska ✓

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U.S. Alaska Road Commission

REPORT OF THE
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for Alaska

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1912

STATEMENT OF RECEIPTS AND DISBURSEMENTS.

This report covers vouchers received and placed in the account, including June 30, 1912:

By transfer from officers, Alaska fund.....	\$12,202.20
Received from the Treasurer United States:	
Appropriation "Military and post roads, bridges, and trails" (fact Mar. 3, 1911).....	150,000.00
Alaska fund.....	152,000.00
Total of vouchers.....	
Alaska fund.....	4.65
Special appropriation.....	1.23
Sales, property, Alaska fund.....	3,438.51
Total.....	317,646.59
Disbursed as per tabulated statement below.....	317,303.72
Balance, cash on hand.....	342.87

Expenditures in detail.

Route Nos.	Construction and maintenance of military and post roads, bridges, etc., Alaska.	Wagon roads, bridges, and trails, Alaska fund.	Total.
Offices.....	\$5,545.98	\$8,213.18	\$13,759.16
Route 2.....	6,479.32	12,740.81	19,220.13
Route 3.....	1,939.88	3,163.03	5,102.91
Route 4-A.....	1,680.77	237.19	1,917.96
Route 4-B, first section.....	14,597.88	4,227.55	18,825.43
Route 4-B, second section.....	160.37	17,568.23	17,728.60
Route 4-C.....	4,082.57	2,427.22	6,509.79
Route 4-D.....	2,350.60	8,507.71	10,858.31
Route 4-E.....	6,568.27	2,859.55	9,427.82
Route 4-F.....	2,408.47	2,216.79	4,625.26
Route 4-G.....	3,750.83	1,756.40	5,507.23
Route 4-H, first section.....	12,030.90	7,859.22	19,890.02
Route 4-H, second section.....	2,898.50	17,080.77	19,979.27
Route 4-I.....	6,601.65	7,015.22	13,616.87
Route 4-J.....	3,127.90	1,259.27	4,387.17
Route 4-K.....	5,031.19	5,328.41	11,259.60
Route 5.....	3,075.16	1,025.27	4,100.43
Route 6-A.....	1,324.48	3,649.02	4,973.50
Route 6-B.....	14,172.41	5,455.43	19,627.84
Route 7-A.....	697.52	8.00	705.52
Route 7-B.....	351.63	240.00	591.63
Route 7-C.....	486.09	8.00	494.09
Route 7-D.....	.32	494.14	494.45
Route 7-G.....	856.51	131.91	988.42
Route 7-I.....	971.85	5.50	977.35
Route 7-J.....	100.00	.50	100.50
Route 8.....	2,873.33	4,603.76	7,477.09
Route 10.....	3,862.07	831.32	4,693.39
Route 11-A.....		246.37	246.37
Route 11-B.....		246.38	246.38
Route 12.....	2,110.36	309.81	2,420.17
Route 13-A.....	1,567.35	1,944.84	3,512.19
Route 13-B.....	50.25	342.75	393.00
Route 13-C.....	33.00	193.02	226.02
Route 13-D.....		29.10	29.10
Route 13-E.....	24.50	4.81	29.31
Route 13-F.....	728.79	797.69	1,526.48
Route 13-H.....		51.50	51.50
Route 13-I.....	55.00	65.25	120.25
Route 13-J.....	126.54	570.85	697.35
Route 13-K.....		80.75	80.75
Route 14.....	39.50	68.99	108.49
Route 15.....	1,783.36	289.38	2,072.74
Route 16.....	585.21	200.00	785.21
Route 17.....		1.03	1.03
Route 17-A.....		275.00	275.00

Expenditures in detail—Continued.

Route Nos.	Construction and maintenance of military and post roads, bridges, etc., Alaska.	Wagon roads, bridges, and trails, Alaska fund.	Total.
Route 17-B.....		\$425.00	\$425.00
Route 18.....	\$59.50	1,560.45	1,619.95
Route 19.....	7,927.33	2,334.30	10,261.63
Route 20-A.....	835.87	1,853.79	2,789.66
Route 20-B.....	7,447.85	5,928.20	13,376.05
Route 20-C.....	312.41	3,511.71	3,824.12
Route 20-D.....		125.00	125.00
Route 21.....		166.09	166.09
Route 22.....	4,190.26	3,809.71	7,999.97
Route 23-A.....		1,798.96	1,798.96
Route 23-B.....		207.82	207.82
Route 24.....	117.99	317.39	435.38
Route 25-A.....	155.00		155.00
Route 25-D.....	262.00	145.00	407.00
Route 25-E.....	86.00	101.75	187.75
Route 25-F.....	398.78	164.50	563.28
Route 25-G.....	362.74	263.50	626.24
Route 25-H.....	123.88	451.25	575.13
Route 25, Tishou Ferry.....		342.63	342.63
Route 25, Sirock Ferry.....		121.20	121.20
Route 26.....	53.00	240.00	293.00
Route 27.....		47.00	47.00
Route 28.....	64.87	531.01	595.88
Route 29.....	299.25	.75	300.00
Route 31.....	100.00		100.00
Route 32-A.....	1,925.97	3,511.32	5,437.29
Route 32-B.....	4,497.63	2,362.75	6,860.38
Route 34.....	.03	604.44	604.47
Route 35.....	2,692.11	2,345.51	5,037.62
Route 36.....	1,652.79	40.00	1,692.79
Route 37.....		816.56	816.56
Klery Creek route.....		37.18	37.18
Staking and flagging trails.....	104.03	1,597.00	1,701.03
Kahiltna Bridge.....	4.35	4,346.53	4,350.88
Bull Creek Bridge.....		57.54	57.54
Nizina Bridge reconnaissance.....	86.60	240.55	327.15
Portland Canal reconnaissance.....	33.50	30.00	63.50
Kuskokwim reconnaissance.....		50.00	50.00
Total.....	150,001.23	167,302.49	317,303.72

Distribution of expenditures.

(Under classification required on Form E and E105, for executive office.)

I. Construction, repair, and maintenance, roads, etc.:	
Salaries, wages, and other compensation, personal service.....	\$195,414.02
Compensation for services other than personal—	
Transportation of persons.....	5,579.75
Subsistence of persons in traveling status.....	3,867.09
Subsistence of persons not in traveling status.....	1,128.00
Transportation of things.....	12,730.39
Subsistence and care of animals.....	8.00
Communication service (telegraph, telephone, and postage).....	241.83
Printing, etc.....	171.35
Furnishing electric lights.....	224.03
Other nonpersonal service (hire of horses and dogs).....	7,480.92
Materials for bridges, culverts, etc.....	9,977.52
Supplies—	
Stationery and drafting supplies.....	454.23
Fuel (coal and wood).....	388.50
Forage and other supplies for animals.....	14,720.75
Provisions.....	37,882.56
Miscellaneous supplies.....	55.80

U.S. AK Road Commission

"REPORT" OF THE
Board of Road Commissioners
for Alaska ✓

1913



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Route 10—Seward-Kenai Lake Road (14 miles).—In October, November, and December, 1912, a bridge was erected over Snow River. In the winter the ordinary light dog-team travel follows the railroad, but the use of that route for horse travel is practically impossible; and while that travel is not extensive, owing to the fact, noted above, that the road does not connect with route 24, it was considered necessary to place temporary bridges across Snow River for use during the winter of 1911-12. The difficulty of keeping these bridges in place (p. 14, annual report, 1912) made necessary the construction of a permanent bridge. Construction was commenced by Mr. Anton Eide, acting superintendent, October 24, and completed December 27, 1912. At the bridge site selected the river is in two channels at low-water stages. The bridge consists of: South approach, 60 feet of trestle on mudsill bents; south channel, one 89-foot Howe truss span and one 50-foot Kingpost truss span; between channels, 90-foot pile trestle; north channel, one 89-foot Howe truss span; north approach, 82-foot pile trestle. The total length is 462 feet. The trusses are of the usual wooden type, with iron tension web members. They are supported by pile bents protected by rock-filled crib piers.

The total cost of the bridge was \$4,871.10. This cost is considerably lower than usual for this type of construction, largely because of the excellent timber available and the low cost of transportation. Due credit, however, should be given Mr. Eide for economical field management.

Route 12—Mile 34 (A. N. R. R.)-Hope Road (40 miles).—No work has been done on this route since last report.

Route 19—Kern Creek-Knik Trail (60 miles).—Temporary staking last winter over the Crow Creek summit cost \$40.

Route 20A—Knik-Susitna Trail (approximately 35 miles).—This trail was completed on November 2, 1912. It conforms to the adopted standard for winter trails and provides a direct route from Knik to Susitna Station for winter travel. It is passable in summer, but can not be considered a good summer trail because of the swampy ground necessarily traversed. Communication between the terminals is maintained in summer chiefly by boats on Knik Arm, Cook Inlet, and the Susitna River. The cost of the construction of this trail averaged \$76.95 per mile. It was located and constructed by Mr. R. S. Giddings, foreman, who was in charge of all work on the divisions of route 20 during the past year.

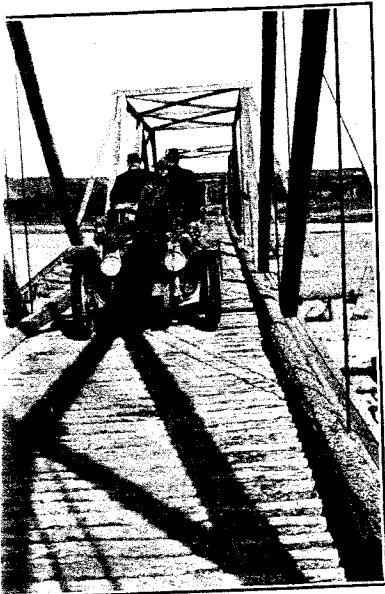
Route 20B—Susitna-Rainy Pass Trail (112 miles).—The work of the past year consisted of the location and construction of the remaining 48 miles between Susitna Station and the mouth of Happy River (p. 15, annual report, 1912). This work was completed in October, 1912. It conforms to the standards adopted for winter trails.

The construction of the previous year was improved by widening the clearing to bring it fully up to the standards adopted for its classification. The total cost of the work amounted to \$6,726.38, averaging \$79.16 per mile.

Route 20C—Rainy Pass-Tacotna Trail (127 miles).

Route 20B—Tacotna-Kaltag Trail (145 miles; 127 constructed).—No work was done on these routes during the period covered by this report.

PLATE 8.



TAZLINA BRIDGE.

Route 24—Mile 29 (A. N. R. R.)—Moose Pass Road (29.5 miles).—The work described in the last annual report (p. 16) was carried to completion in September of last year. Twelve miles were completed in September and November, 1912, at an average cost of \$977.80 per mile.

Route 32A—Tacotna-Flat Creek Trail (87 miles).—No work was undertaken on this route this year.

Route 35—Knik-Willow Creek Sled Road (34 miles).—The construction of this road was continued during the year. The nature of the construction, somewhat more elaborate than usually employed for this classification, is with a view to ultimate improvement to wagon road standards, as explained in the last annual report (p. 16). This year 13.5 miles were completed, at an average cost of \$613.80 per mile.

YUKON DISTRICT.

(Mr. JOHN ZUG, assistant engineer.)

In the Fairbanks region of this district the funds of the road tax created by act of Congress approved April 27, 1904, imposing a road tax of \$8 per person, were sufficient to enable some construction work to be done and to relieve the funds of the board of a considerable portion of the burden of repair and maintenance of the local road system. It is, therefore, in this district that the greatest effect of the removal of that tax will be felt. The law was repealed too late to affect greatly the period covered by this report, but at the present writing the requirements of the local roads of the Fairbanks mining district are making demands upon the meager funds of the board that it will be difficult, if not impossible, to meet.

The reports on the several routes of this district for 1912 covered the period September 1, 1911, to August 31, 1912. The following reports cover the period September 1, 1912, to July 31, 1913:

Route 4J—Richardson-Salchaket Road (30 miles).—No work was undertaken on this route during the period of this report. The work of maintenance, coupled with improvement, was undertaken in July of this year and is in progress at this writing.

Route 4K—Salchaket-Fairbanks Road (40 miles).—The bridge over Piledriver Slough (p. 17, Annual Report, 1912) was completed in September of that year at the contract price of \$4,250. The work of maintenance continued until October 16, 1912. It was combined with improvement and the costs of the two can not be separated. The work consisted of the usual repairs to ditches, culverts, and side-hill cuts and the replacement of small stringer bridges. These bridges were built under the project of a winter road originally adopted, and, being weakened by age, were considered too light for present traffic. They were replaced by substantial structures. A light-framed bent trestle across Telegraph Slough was also replaced by a stronger bridge of the same type. This work was completed over the section from Bylers to Salchaket, a distance of 20 miles. Its cost averaged \$429.28 per mile over that distance.

Route 5—Ester-Fort Gibbon Sled Road (148 miles¹).—The work of late fall of 1912 was entirely maintenance, consisting of repair-

¹ By a clerical error this route appeared 160 miles in length in the last annual report (p. 17).

ing bridges and removing slides from cuts to put the road in shape for travel during the winter. These repairs averaged \$26.05 per mile over the entire route.

In March, 1913, the stringer bridge over the Ohio Creek was repaired, at a total cost of \$125.

Route 7A—Summit-Clearj Road (11 miles).

Route 7B—Fox-Dome Road (13 miles).

Route 7C—Summit-Fairbanks Creek Road (11 miles).

Route 7D—Ester Creek Road (13 miles).

Route 7E—Vault Creek Road (2 miles).

Route 7F—Vault Creek-Treasure Creek Road (1.5 miles).

Route 7G—Fairbanks-Gilmore Road (13 miles).

Route 7H—Little Eldorado Creek Road (1.5 miles).

Route 7I—Gilmore-Summit Road (6 miles).—Since the last annual report to July 31 of this year only the most urgently necessary repairs have been made on these routes. Their condition is not first class and they should have a rather extensive overhauling as soon as the necessary funds can be allotted. The small bridges should be repaired and many of them should be replaced by uniform substantial structures. The total expenditure on each of the routes on which work has been done is given below:

7B.....	\$191.44
7C.....	237.68
7D.....	435.58
7G.....	291.08

Route 7J—Fairbanks-Chena Hot Springs Trail (64 miles).—The allotment of \$5,000 made last year (p. 18, annual report, 1912) was used in locating and constructing a shorter trail than that previously used between Fairbanks and the Hot Springs. The work was limited to standard winter-trail construction and is considerably less elaborate than that desired. In addition to the construction of the trail, a small bridge was constructed over the Little Chena River. The entire cost of the location and construction of this route averaged \$19.28 per mile.

Route 9—Rampart-Big Minook Road (6.5 miles road, 60 miles sled road).—No work has been done on this route since the close of the last annual report. The route is reported to be in fair condition.

Route 11—Eagle-Forty Mile Road (19.5 miles road and 60 miles sled road¹).—Only the most urgent repairs were made on this route in the fall of 1912. These repairs were confined to route 11A, Eagle-O'Brien Creek Road, and consisted chiefly of the removal of slides and the repair of stringer bridges and culverts.

The total cost of the work amounted to \$796.50, and averaged \$46.85 per mile for the distance worked over.

Route 15—Circle-Miller House Road (44 miles).—The extension of the road to Elmer Cabin (p. 19, annual report, 1912) was practically completed in the late fall of 1912. The work of the present season involves the maintenance of the Circle-Central House section and maintenance and some extension to the drainage system on the Central House-Elmer Cabin section. This latter work was commenced July 2 and was under way at the close of the period of this report.

¹ Length incorrectly printed in last annual report (p. 19).

ing bridges and removing slides from cuts to put the road in shape for travel during the winter. These repairs averaged \$26.05 per mile over the entire route.

In March, 1913, the stringer bridge over the Ohio Creek was repaired, at a total cost of \$125.

Route 7A—Summit-Cleary Road (11 miles).

Route 7B—Fox-Dome Road (13 miles).

Route 7C—Summit-Fairbanks Creek Road (11 miles).

Route 7D—Ester Creek Road (13 miles).

Route 7E—Vault Creek Road (2 miles).

Route 7F—Vault Creek-Treasure Creek Road (1.5 miles).

Route 7G—Fairbanks-Gilmore Road (13 miles).

Route 7H—Little Eldorado Creek Road (1.5 miles).

Route 7I—Gilmore-Summit Road (6 miles).—Since the last annual report to July 31 of this year only the most urgently necessary repairs have been made on these routes. Their condition is not first class and they should have a rather extensive overhauling as soon as the necessary funds can be allotted. The small bridges should be repaired and many of them should be replaced by uniform substantial structures. The total expenditure on each of the routes on which work has been done is given below:

7B.....	\$191.44
7C.....	237.68
7D.....	435.58
7G.....	291.05

Route 7J—Fairbanks-Chena Hot Springs Trail (6.4 miles).—The allotment of \$5,000 made last year (p. 18, annual report, 1912) was used in locating and constructing a shorter trail than that previously used between Fairbanks and the Hot Springs. The work was limited to standard winter-trail construction and is considerably less elaborate than that desired. In addition to the construction of the trail, a small bridge was constructed over the Little Chena River. The entire cost of the location and construction of this route averaged \$19.28 per mile.

Route 9—Rampart-Big Minook Road (6.5 miles road, 60 miles sled road).—No work has been done on this route since the close of the last annual report. The route is reported to be in fair condition.

Route 11—Eagle-Forty Mile Road (19.5 miles road and 60 miles sled road¹).—Only the most urgent repairs were made on this route in the fall of 1912. These repairs were confined to route 11A, Eagle-O'Brien Creek Road, and consisted chiefly of the removal of slides and the repair of stringer bridges and culverts.

The total cost of the work amounted to \$796.50, and averaged \$46.85 per mile for the distance worked over.

Route 15—Circle-Miller House Road (4.4 miles).—The extension of the road to Elmer Cabin (p. 19, annual report, 1912) was practically completed in the late fall of 1912. The work of the present season involves the maintenance of the Circle-Central House section and maintenance and some extension to the drainage system on the Central House-Elmer Cabin section. This latter work was commenced July 2 and was under way at the close of the period of this report.

¹ Length incorrectly printed in last annual report (p. 19).

The total cost of the work of last year, exclusive of the maintenance of the Circle-Central House section, was \$8,867.94, or about \$886.79 per mile.

The cost of the work of this year to July 31 amounted to approximately \$3,000. The detailed reports of the work have not yet been received.

A considerable portion of the funds allotted to this route this year will be required for maintenance work formerly covered by the road tax funds (p. 19, annual report, 1912).

Route 16—Chatanika-Birch Creek Sled Road (84 miles).—The maintenance and repair work on this route was undertaken and completed in the late fall of 1912. It consisted of the removal of slides and windfalls. The cost of this maintenance work averaged \$13.10 per mile over the entire route.

Route 17—Fort Gibbon-Kaltay Trail (approximately 250 miles).—The increased travel over the upper section of this route caused by the activities of the Ruby district warranted the board in making some improvements to that section. The work on the route was confined to the section about 25 miles long between Kokrines and Birches. The work accomplished included the clearing of windfalls, a short section of side-hill cutting, and the construction of a bridge over Moose Creek. This bridge is 112 feet long and contains a 46-foot King post truss, improvised from the materials available. The work was all done by Mr. S. R. Hudson, at a total cost of \$317.

Route 17A—Lewis Landing-Dishkaket Trail (approximately 10 miles).

Route 17B—Nulato-Dishkaket Trail (approximately 90 miles).—No work was undertaken on these routes during the period covered by this report.

Route 22—Hot Springs-Sullivan Creek Road (9 miles).—The route is largely corduroyed over very soft ground, and during the dry weather of June of this year a large part of the corduroy was badly damaged by fire. A large crew was in the field in July repairing the worst places in the road, which is reported as being nearly impassable. The detailed report of the operations of this crew has not been received at this office.

Route 23A—Chatanika-Beaver Trail (approximately 120 miles).—The work of the fall of 1912 was devoted to the completion of the section, about 20 miles in length, left unfinished the previous year. The route is now completed to the standard adopted for winter trails. The cost of the work averaged approximately \$95 per mile.

Route 23B—Beaver-Chandler Sled Road (75 miles).—Only the repairs most urgently needed to keep the route open for travel were made in the fall of 1912. The total cost of these repairs amounted \$2,036.05. The route is reported to be in very fair condition. Travel over it is very light, owing to the present inactivity of the Chandler mining district. It is not believed, however, that this inactivity will be permanent.

Route 30—Hot Springs Landing-Eureka Road (32 miles).—This section 2 miles in length from Hot Springs Landing to Hot Springs was included in this route this year for the first time. It was constructed by private individuals and has previously been maintained by the road-tax funds. It is in very poor condition at present.

In May of this year the bridge over Hot Springs Slough on the section of the route mentioned above was repaired. The total cost of the repairs amounted to \$1,003.48. No other work has been done on this route since the date of the last report.

Route 31—Salcha-Caribou Creek Sled Road (46 miles).—The work of the past year consisted of the necessary repairs to the small stringer bridges on the route made in the late fall of 1912. The total cost amounted to \$62.78. The route is in good condition.

Route 32B—Iditarod-Flat Creek Road (8 miles).—The work of the present year was carried on in June and July. It comprised repairs to the corduroy previously laid and the improvement of a branch 6 miles in length, from Summit to Discovery, Otter Creek. The total cost to the board amounted to \$1,339.04. A considerable amount of work was done on both routes, but particularly the branch above referred to, by the operators using the road. The exact amount and the cost of this work can not be obtained.

Route 33—Ruby-Long Creek Sled Road (30 miles).—The sled road referred to in the last annual report (p. 21) was completed in the late fall of 1912, and was extended 3 miles farther than previously contemplated. In June and July of this year an allotment was made for improving the character of this road to enable it, if possible, to accommodate summer traffic. The location and construction were undertaken with a view to ultimate completion to wagon-road standards and about 1 mile of this road could be classified properly as wagon road.

The location, including a small amount of clearing and the cost of a general reconnaissance of the district, amounted to approximately \$1,500.

The construction of the sled road averaged \$585.72 per mile in cost, and the mile of wagon road cost \$5,660.64.

Mr. L. S. Robe was in charge of the location and construction.

Route 43—Long Creek-Cripple City Trail (approximately 60 miles).—This route serves mail and passenger traffic to the Cripple City region. It was constructed in March of this year by the citizens of Ruby acting with the board. The total cost was \$1,000, of which \$500 was expended from funds of the board, the remainder being subscribed in Ruby and vicinity.

NOME DISTRICT.

[MR. DANIEL A. JONES, superintendent.]

The peculiarly unfavorable soil conditions prevailing and the absence of timber suitable for corduroy add both to the cost of original construction and to the cost of maintenance of the roads of this section. The tonnage developed on these roads is very large, compared to that of other districts in Alaska, owing to the extensive dredging operations undertaken here and to the absence of any local fuel supply for these dredges. For these reasons the district has, in the past, received larger allotments in proportion to its population and production than many of the other districts of Alaska, and the absence of the assistance of the road-tax fund to assist in the repair of the local systems will in the future doubtless call for still larger maintenance allotments. The immediate and

General repairs and maintenance on the about routes average \$17.35 per mile. This low cost is largely due to the fact that most of the repairs made during the present season are not included in this report.

Route 18—Kaltag-Solomon Trail (248 miles).—The work of the past year included the temporary staking of those portions of this route on which travel passes over the ice. In addition the permanent staking was repaired and a maintenance system adopted providing for the immediate replacement of stakes that are broken down. Agreements were entered into with several roadhouse men so that each assumes responsibility for the staking on a given section. The total cost of the work of last year averaged \$15.29 per mile.

Route 21—Unalaklik-St. Michael Trail (approximately 65 miles).—No work has been done on this route during the period of this report.

Route 25A—Cripple River Road (13.5 miles).

Route 25C—Nome-Wireless Road (0.25 mile).

Route 25D—Mouth of Center Creek Road (1.5 miles).

Route 25E—Submarine Pay Streak Road (1 mile).

Route 25F—Anvil-Glacier Road (3 miles).

Route 25G—Snake River Extension (3 miles).

Route 25H—Otter Creek Road (1.25 miles).

The cost of minor repairs to these trails during the period of this report averaged \$13.94 per mile. Repairs to and operation of Sinnerock Ferry cost \$160.49.

Route 26—Candle-Candle Creek Road (2.25 miles).—The work of the past year consisted of resurfacing 2.25 miles of road. The complete report of the cost of the work has not yet been received.

Route 27—Deering-Innuchuck Road (25 miles).—The allotment referred to in the last annual report (p. 25) was expended partly during the period properly covered by last year's report. The work accomplished consisted of resurfacing 1.5 miles of road and the construction of a relocated section 3 miles in length. The funds of the board were supplemented by the local road-tax funds. The total cost to the board amounted to approximately \$2,500.

Route 28—Dahl Creek-Candle Trail (140 miles).

Route 37—Topkok-Candle Trail (141 miles).—The work on these routes is included under flagging trails.

Route 41—Klery Creek Road (0.75 mile).—No work has been done on this route since last report.

Route 42—St. Michael-Kotlik Trail (approximately 70 miles).—The staking referred to in the last annual report has been completed by Mr. Frank Kameroff. The trail is now permanently staked but has not yet been inspected. The contract price is \$450, or \$6.43 per mile.

Flagging trails.—The usual temporary staking or flagging of routes of travel not otherwise permanently marked was included in the work of the past winter. The routes staked included portions of permanent routes that are located where permanent staking can not be accomplished and other routes whose locations vary from year to year, depending upon weather conditions, and which have never been taken up by the board. A total of 584 miles of temporary staking cost \$2,927.42, averaging \$5 per mile.

STATEMENT OF RECEIPTS AND DISBURSEMENTS.

This report covers vouchers received and placed in the account, including June 30, 1913:

Balance on hand July 1, 1912.....	\$342.87
Received from the Treasurer United States, appropriation "Military and post roads, bridges, and trails" (act Aug. 24, 1912).....	125,000.00
Alaska fund.....	228,000.00
Correction of vouchers:	
Alaska fund.....	32.26
Special appropriation.....	73
Sales property, Alaska fund.....	5,034.28
Total.....	358,410.14
Disbursed as per tabulated statement below.....	353,118.29
Balance cash on hand.....	5,291.85

Expenditures in detail.

Route No.	Construction and maintenance of military and post roads, bridges, etc., Alaska.	Wagon roads, bridges, and trails, Alaska fund.	Total.
Office.....	\$2,845.40	\$10,514.13	\$13,359.53
Route 2.....	4,890.51	6,641.75	11,532.26
Route 3.....	1,710.38	2,140.64	3,851.02
Route 4A.....	300.00	987.50	1,287.50
Route 4B (first section).....	9,401.21	2,198.79	11,600.00
Route 4B (second section).....		19,070.06	19,070.06
Route 4C.....	3,420.20	5,713.53	9,133.73
Route 4D.....	2,565.63	15,372.15	17,937.78
Route 4E.....	262.47	1,660.60	1,923.07
Route 4F.....	2,259.84	1,521.55	3,781.39
Route 4G.....	1,737.86	6,619.75	8,357.61
Route 4H (first section).....	5,025.71	7,064.29	12,090.00
Route 4H (second section).....		10,885.56	10,885.56
Route 4I.....	3,451.87	12,764.96	16,216.83
Route 4J.....	6,733.10	1,143.25	7,876.35
Route 4K.....	3,813.89	7,768.59	11,582.48
Route 5.....	2,212.08	1,560.20	3,772.28
Route 6A.....	5,522.65	7,142.60	12,665.25
Route 6B.....	1,355.66	5,448.48	6,804.14
Route 7A.....	66.50	545.00	611.50
Route 7B.....	3.00	15.00	18.00
Route 7C.....	147.50	358.00	505.50
Route 7D.....	321.00		321.00
Route 7E.....	294.75	340.00	634.75
Route 7F.....	111.00	329.80	440.80
Route 7G.....	770.69	4,074.30	4,844.99
Route 8.....	4,143.96	9,765.55	13,909.51
Route 9.....	1,501.86	98.23	1,600.09
Route 10.....	5,153.80	280.03	5,433.83
Route 11A.....	298.50	498.00	796.50
Route 12.....	123.37	752.14	875.51
Route 13A.....	6,644.32	5,700.03	12,344.35
Route 13B.....	14.00	114.48	128.48
Route 13C.....		34.75	34.75
Route 13D.....	211.26	2,936.17	3,147.43
Route 13E.....		38.44	38.44
Route 13F.....	14.00	56.00	70.00
Route 13G.....	129.33	171.67	301.00
Route 13H.....	28.00		28.00
Route 15.....	7,880.53	2,778.49	10,659.02
Route 16.....	901.94	205.50	1,107.44
Route 18.....		1,629.50	1,629.50
Route 19.....		58.50	58.50
Route 20A.....	2,413.30	278.21	2,691.51
Route 20B.....	5,224.12	1,502.26	6,726.38
Route 20D.....		100.00	100.00
Route 21.....		305.00	305.00
Route 22.....	4,619.85	2,731.48	7,351.33
Route 23A.....	30.01	1,835.89	1,865.90
Route 23B.....	562.12	1,473.93	2,036.05
Route 24.....	4,746.62	6,986.66	11,733.28
Route 25F.....	1.35	36.50	37.85
Route 25G.....		52.20	52.20
Route 25H.....	19.00	21.00	40.00
Route 25I.....		7.50	7.50
Route 25, Tishou Ferry.....		15.40	15.40
Route 25, Sinnerock Ferry.....	104.49	102.00	206.49

in detail—Continued.

	Construction and maintenance of military and post roads, bridges, etc., Alaska.	Wagon roads, bridges, and trails, Alaska fund.	Total.
		\$14.70	\$14.70
		229.10	229.10
	\$150.24	\$43.74	993.98
	1,113.95	2,237.75	3,351.79
		62.78	62.78
	968.00	5,305.00	6,273.00
		100.00	100.00
	7,063.39	1,225.19	8,288.58
	755.71	16,673.69	17,429.40
	5,677.23	4,227.95	9,905.18
	4,929.10	22.75	4,951.85
	34.08	2,434.36	2,468.44
		8.00	8.00
	247.63	2,407.45	2,655.08
		15.00	15.00
	72.77	5,116.50	5,189.27
		7.00	7.00
		14,740.61	14,740.61
	125,000.73	228,117.56	353,118.29

FUNCTION OF EXPENDITURES.

Maintenance, roads, etc.:	
compensation, personal service	\$216,847.74
other than personal—	
sons	2,771.98
in traveling status	1,238.79
not in traveling status	10,262.09
bags, freight, etc.	6,497.79
feed for animals	561.90
expense (telegraph, telephone, and post-)	
	452.50
	1,474.00
	230.92
light	21,085.73
service (hire of horses and dogs)	25,232.73
supplies	538.32
clothing	977.15
supplies	36.65
supplies for animals	15,816.37
equipment used:	31,995.36
other compensation, personal service	845.34
	326.32
	7.06
	46.81
equipment:	
camp equipment, wagons, harness,	12,168.57
ice boxes, and barns)	2,879.08
	824.49
	353,118.29

W. P. RICHARDSON,
Lieutenant Colonel of Infantry, *President.*
GLEN E. EDGERTON,
Lieutenant, Corps of Engineers, *Engineer Officer.*
L. A. KUNZIG,
Lieutenant, Thirtieth Infantry, *Disbursing Officer.*

REPORT OF THE Board of Road Commissioners for Alaska ✓

1914



WASHINGTON
GOVERNMENT PRINTING OFFICE
1914

8 REPORT OF BOARD OF ROAD COMMISSIONERS FOR ALASKA.

Route 39—Juneau-Sheep Creek Road (3 miles).—This road was completed at the end of the working season last year. Average unit costs for the work of the season after July 1 were as follows:

Clearing and grubbing.....	per acre..	\$143.10
Grading.....	per linear foot..	.90
Graveling.....	do.....	.102
Stringer bridges.....	do.....	3.00
4 by 4 foot box culverts.....	each.....	7.25

During the present season an average expenditure of \$575.64 per mile has been made. This heavy expenditure, while considered as maintenance, is partly in the nature of improvement, involving considerable increases in the depth of the road metal on the softer sections of the road. The average cost of gravel in place on this road during the present season is 79 cents per yard.

Route No. 40—Douglas-Gastineau Channel Road (2 miles).—The construction of this route was continued during the season of 1913, although the funds for its completion were not available. The average unit costs for the work were:

Clearing and grubbing.....	per acre..	\$120.27
Grading.....	per linear foot..	.857
Stringer bridges.....	do.....	2.63
Graveling.....	do.....	.173
Culverts.....	each.....	6.41

No work had been undertaken up to June 30 of this year, but construction work is now in progress. The funds available will not, however, permit the completion of the road this year.

Stikine River examination.—In response to a petition from Wrangell, an examination was made of a proposed trail from Wrangell up the Stikine River. This examination cost \$257.03.

Ketchikan-Charcoal Point examination.—At the request of the Governor of Alaska and in response to a petition from the citizens of Ketchikan, this route was examined, a project for a wagon road was prepared, and the location was made. The total cost amounted to \$100.85. At present there are no funds available for the work.

Skagway survey.—A wagon road location survey from Skagway to the Canadian boundary was made in May and June of this year. The road, if built, will form the Alaskan section of a road from Skagway, Alaska, to Whitehorse, Yukon territory. The total length of the road as located is 13.5 miles. The survey was made at a total expense, including preparation of maps, etc., of \$624.95, or \$46.29 per mile.

VALDEZ DISTRICT.

(Mr. J. H. INGRAM, superintendent.)

The season of 1914 has been very unfavorable to road work on account of extremely heavy rainfall throughout the district, not only damaging the road itself and adding to the difficulty and cost of making repairs, but also raising the rivers to extreme heights and causing washouts and more or less serious damage to several of the bridges.

The most serious loss suffered was the damage to the Nizina Bridge. In June of this year the bursting of a glacial reservoir, known as Skolai Lake, on the headwaters of the Nizina River, caused the highest stage of water in that river that has been known. The two northern piers of the Nizina Bridge were taken out and the two 150-foot



slides, and replacing bridges and culverts over 30 miles of the route. This work averaged \$76 per mile. No work was done on the remainder of the route.

Route 19—Kern Creek-Knik Trail (60 miles).—The Crow Creek summit and its approaches were staked during the winter at a cost of \$100. No other work has been done on this route since last report.

Route 20A—Knik-Susitna Trail (approximately 35 miles).

Route 20B—Susitna-Rainy Pass Trail (127 miles).

Route 20D—Tacotna-Kaltag Trail (145 miles; 127 constructed).

No work was done on these routes during the period of this report.

Route 24—Mile 29 A. N. R. R.—Moose Pass Sled Road (29.5 miles).—Repairs to this route were carried on in August, 1913. They consisted of the removal of windfalls and the slides in side hill cuts. Several short stretches of corduroy were laid with a view to improving the road for the summer travel which uses it. This corduroy was not covered because the route is not considered favorable for wagons, and the life of uncovered corduroy is considerably longer than that of covered corduroy, while the former is satisfactory for the traffic using this road.

There is a strong demand and a real need recognized by the board for the improvement of this road to wagon-road standards, but the present funds of the board will not permit the allotment necessary for the purpose.

Route 32A—Tacotna-Flat Creek Trail (87 miles).—No work was undertaken during the past year on this route.

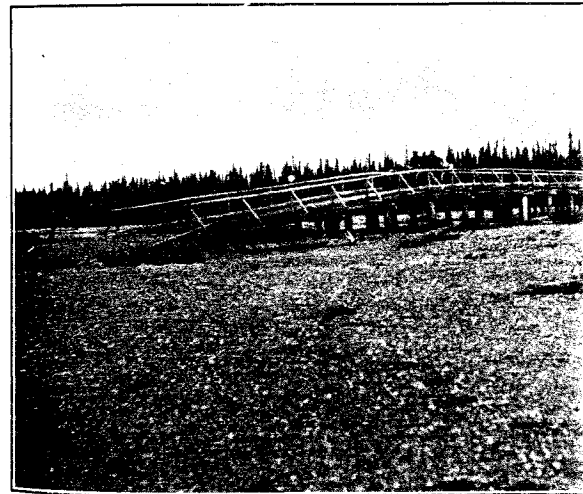
Route 35—Knik-Willow Creek Sled Road (34 miles).—During July of last year repairs were made over 7.5 miles of this route. The clearing was widened and a small amount of corduroy was laid. Clearing and grubbing averaged \$76.50 per acre and the corduroy 75 cents per linear foot.

Ninilchik examination.—In response to a request of residents of Ninilchik, an examination was made of a project for a bridge between the mainland and the sand spit where supplies are landed from the boats. As a result of this examination a project for a light suspension bridge was adopted, but the bridge has not yet been constructed. The total cost of the examination was \$45.

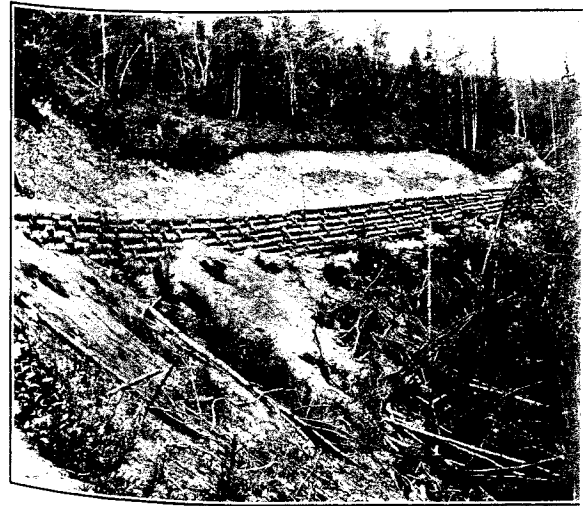
YUKON DISTRICT.

(Mr. JOHN ZUG, assistant engineer.)

Route 4J—Richardson-Salchacket Road (30 miles).—The work on this route during the latter part of the season of 1913 was chiefly the construction of a series of short pieces of road to replace sections destroyed by the Tanana River. The road is located upon the northern benches of the Tanana Valley, and could not have been located farther from the river without involving heavy work and greatly increased cost. The Tanana River is now following the north side of the valley and has cut out the original road in several places. These washouts have been replaced in each case by the shortest and cheapest new sections that could serve the traffic. The total expenditure on the route during August and July, 1913, amounted to \$4,611.97, almost all of which was devoted to this reconstruction work. Some general repairs to small culverts and bridges were carried on at the same time, but their cost was small and has not been segregated.



JARVIS CREEK BRIDGE.



CRIB WORK ALONG COPPER RIVER

Route 4K—Salchaket-Fairbanks Road (40 miles).—Minor repairs, chiefly the removal of small slides, between Salcha telegraph station and Salchaket (5 miles) on this road were made in August, 1913, at a total cost of \$116.75.

In September the corduroyed sections were damaged by forest fires which burned the ends of the corduroy so badly that portions of it had to be replaced. Most of this damage was inflicted between the 10 and 16 mile points from Fairbanks. Repairs to this corduroy and the regrading of the first 10 miles out of Fairbanks cost \$2,184.67.

In May, 1914, repairs to bridges and culverts between Fairbanks and Bylers, which had been discontinued in September on account of lack of funds, were recommenced and continued during June. These repairs averaged \$125 per mile over the section mentioned, 16 miles in length.

At the present writing the entire route is in bad condition, having been severely damaged by the July floods of the Tanana River. The road is located over the low valley of the Tanana, and the last 20 miles traverse an island between the pile driver and Chena sloughs and the main river. During the recent high water sections of the road were covered by backwater, which in some instances stood 3 feet deep on the road. Temporary repairs to the corduroy floated by this flood have been made, but complete repairs will require heavy expenditures, most of which will have to be postponed until next season.

Route 5—Ester-Fort Gibbon Sled Road (148 miles).—The repairs of the usual nature, removing slides and repairing small bridges, were made in the late fall of 1913. They averaged \$14.46 per mile over the entire route.

Route 7A—Summit-Cleary Road (11 miles).

Route 7B—Fox-Dome Road (13 miles).

Route 7C—Summit-Fairbanks Creek Road (11 miles).

Route 7D—Ester Creek Road (13 miles).

Route 7E—Vault Creek Road (2 miles).

Route 7F—Vault Creek-Treasure Creek Road (1.5 miles).

Route 7G—Fairbanks-Gilmore Road (13 miles).

Route 7H—Little Eldorado Creek Road (1.5 miles).

Route 7I—Gilmore-Summit Road (6 miles).

Route 7J—Fairbanks-Chena Hot Springs Trail (64 miles).

As noted in the last annual report (p. 24), the removal of the assistance of local road tax funds in the repair of local roads has had the greatest effect in this district. The board has endeavored to keep the roads in fair condition, and, with only that object in view, maintenance has been confined to the absolutely necessary repairs to the bridges and to the drainage and filling of mudholes after they developed. On route 7G most of the bridges have required reconstruction during the past year. It was desirable that this construction be undertaken systematically and standard bridges erected. However, this was not considered practicable with the funds that could be allotted to the route, and the cheapest bridge that could support the traffic was erected in each case. The expenditures on the routes upon which work was done were:

7A.....	\$451.40	7D.....	\$908.00
7B.....	364.88	7G.....	5,849.47
7C.....	121.00	7J.....	100.00

Route 9—Rampart-Big Minook Road (6.5 miles road, 60 miles sled road).—No work was undertaken on this route during the period covered by this report. Repairs to the wagon-road section were undertaken in July of this year.

Route 11—Eagle-Forty Mile Roads (19.5 miles road, 60 miles sled road).—Repairs on these routes were confined to section 11A, Eagle-O'Brien Creek Road. They consisted of repairs to bridges and the removal of slides, at a total cost of \$810.

Route 15—Circle-Elmer's Cabin Road (44 miles).—During August of 1913 maintenance and improvement of previously constructed road were carried on. In addition to the 10 miles constructed the previous year, the last 4 miles of the old road below Central House were included in this work. The repairs and improvement comprised widening, clearing, building new culverts, and completing the ditches, many of which could not be put down the first season on account of the frozen ground. The cost of the strictly repair work can not be separated from that of improvement. The cost of the work averaged \$245.75 per mile over the distance covered. Maintenance work for this year was carried on in July and August of this year, but the field reports have not been received at this office.

Route 16—Chatanika-Birch Creek Sled Road (84 miles).—Repairs to this route embraced removal of slides and minor repairs to small bridges. The cost of this work, together with inspection, averaged \$5.58 per mile over the entire route.

Route 17—Fort Gibbon-Kaltag Trail (approximately 250 miles).—In November and December the sections of this trail that follow the Yukon River were temporarily staked. The total cost of the staking was \$300.

Route 17A—Lewis Landing-Dishkaket Trail (approximately 108 miles).

Route 17B—Nulato-Dishkaket Trail (90 miles).

No work was undertaken on these routes during the period covered by this report.

Route 22—Hot Springs-Sullivan Creek Road (9 miles).—As noted in the annual report for last year (p. 26), this route was severely damaged by fires. It is largely corduroy of a very expensive character, owing to the unsuitable size of the timber near the road. Attempt was made to obtain positive evidence of the origin of a fire which was responsible for the greatest portion of the damage, but such evidence could not be obtained.

In August and September, 1913, repairs and improvements to the corduroy, except about 1 mile burned by the fire above mentioned, were undertaken and completed. The work cost approximately \$893.25 per mile over the distance covered. In July of this year a crew was put in the field for the purpose of rebuilding the section destroyed by fire. Approximately \$5,000 will be required for this work, together with the minor repairs required annually.

Route 23A—Chatanika-Beaver Trail (approximately 120 miles).

Route 23B—Beaver-Chandler Sled Road (75 miles).

No work was undertaken on these routes during the period of this report.

Route 30—Hot Springs Landing-Eureka Road (32 miles).—The Baker Creek Bridge was damaged in May of this year. It was repaired in July, but the field reports have not been received.



ACROSS SHAW CREEK

Route 31—Salchaket-Caribou Creek Sled Road (46 miles).—In the late fall of last year the small bridges damaged by freshets in the spring were repaired, at a total cost of \$250.65. The travel using the route is very light and the sole object of the expenditure was to keep the road passable.

Route 32B—Iditarod-Flat Creek Road (8 miles).—The only work on this route since July 31, 1913, was repair work of an urgent nature during the spring break-up. It embraced opening culverts, cleaning ditches, and filling mudholes. The total cost of the work was \$500. Owing to the existence of a tramway connecting the towns of Iditarod and Flat City, the board has not felt justified in making expenditures on this route sufficient to bring the road to a high standard when so many other urgent demands upon our funds are made each year. However, to protect the road from destruction an allotment of \$2,500 was made for the work of the present season.

Route 38—Ruby-Long Creek Sled Road (3 miles road, 27 miles sled road).—In July and August of last year the sled road was improved to wagon-road standards for approximately 3 miles from Ruby. Owing to the unfavorable soil conditions and the scarcity of material for good corduroy the cost of the work has been high. The road is on a long side hill with a northern—the most unfavorable—slope, and the construction required was almost entirely corduroy. The cost of the 3 miles of road averaged \$5,690 per mile.

In April the culverts on this road were thawed out to enable them to carry the spring snow water. The total cost was \$190.

Route 43—Long Creek-Cripple City Trail (approximately 70 miles).—The location of the Long Creek-Cripple City Trail, constructed last year (annual report 1913, p. 27), was changed to pass Poorman Creek, upon which a considerable amount of mining activity is developing. This change involved the construction of about 30 miles of new trail. Since the old construction will serve no traffic as long as Poorman is active, the additional mileage is not carried in the total mileage of trails.

The work on the Poorman Creek Trail was done in September and October, 1912. The total cost of the trail was \$2,089.79, or approximately \$69.66 per mile.

NOME DISTRICT.

(Mr. DANIEL A. JONES, superintendent.)

Route 8—Nome-Council Road (approximately 82 miles; 57 constructed).—The section of this country from Nome to Fort Davis was almost entirely destroyed by the storm of last October. After the storm the driftwood was cleared from the road for the purpose of making the route passable. The cost was \$193 per mile over the 3.5-mile section. ^{672.50}

The Cape Nome section was entirely destroyed by the storm above mentioned. Owing to the expensive character of the work, this section has not been replaced, and travel is forced to take an all but impossible route over Cape Nome. A survey to select the most suitable route for a new road was made in June of this year at a total cost of \$62.50.

On the Solomon East Fork section of this route 3.5 miles of new road were constructed to take the place of the old route, which fol-

lowed river bars and became impassable at high stages of the Solomon River. One mile of this work is corduroy construction and, like the remainder, is gravel surfaced. The total cost averaged \$697 per mile over the distance covered.

Ordinary maintenance on the Skookum Pass section cost \$73.70 per mile. The total length maintained was 3.5 miles.

Repairs to the Council corduroy section averaged \$209 per mile over 5 miles.

The cost of maintenance and operation of the Safety and Bonanza Ferries were approximately the same as last year. Complete reports of their costs have not yet been received in this office.

Route 13A—Nome-Bessie Road (3.3 miles).—The importance of this route and the heavy travel that it accommodates have been mentioned in previous reports. The maintenance of the route during the period of this report averaged \$572 per mile. This includes a fill of approximately 133 cubic yards across Dry Creek Flats, the cost of which can not be segregated from the maintenance operations.

Route 13B—Bessie-Banner Road (3.5 miles).—In June of this year cleaning ditches and repairs to culverts and to the gravel surfacing cost \$93.05.

Route 13C—Bessie-Little Creek Road (1.25 miles).—Two thousand feet of this road was given a light gravel surfacing. The material was obtained from mine tailings very conveniently located and was placed at an average cost of 11½ cents per linear foot of road.

Route 13D—Bessie-Dry Creek Road (1.25 miles).

Route 13E—Dry Creek-Newton Road (0.3 mile).

Route 13F—Nome-Osborne Road (6 miles).

Route 13G—Grass Gulch Road (1.75 miles).

Route 13H—Center Creek Road (1.5 miles).

Route 13I—Nome River Road (5 miles).

Route 13J—Wonder-Flat Creek Road (2 miles).

Route 13K—Bessie-Buster Road (7.6 miles).

General repairs were made to these routes during the period of this report. Only the absolutely necessary repairs to ditches, culverts, and surfacing were made. The total cost averaged \$501.21 per mile over the actual distances covered, about 7.5 miles. Most of this work was required on route 13F, and the high average cost is largely chargeable to the heavy traffic and the unfavorable soil conditions on that route.

A ferry was installed at the Seward Peninsula Railroad crossing of the Nome River. The railroad is no longer operated, but the track is used by freighters. The railroad bridge was taken out by the river, and since it was not to be replaced, the board installed a ferry at the bridge site. The ferry scow cost \$120 and the approaches \$79.75. This work is considered a part of route 13K, though not integrally a part of this route.

Route 18—Kaltag-Solomon Trail (248 miles).—During August, September, and October of last year extensive repairs and improvements were undertaken on this route. The work included permanent staking to replace stakes knocked down or destroyed and permanent staking over short relocations, made with a view to the general improvement of the route. In addition, 14 small, light bridges were built. These bridges are pole-stringer bridges, 8 feet wide, and

strong enough to carry dog teams—the only trail is expected to accommodate.

The permanent staking on this route is per mile to \$39.60 per mile, the wide variation being due to the difference in the cost of delivering the material in different sections. The staking averaged \$5.50 per mile over the distance (81.5 miles) staked.

The cost of the bridges varied from 60 cents per linear foot, being, like the staking, dependent on the ease or difficulty of obtaining the material. The cost averaged \$1.50 per foot for the 14 bridges, or 314 linear feet.

Route 21—Unalaklik-St. Michael Trail (10 miles).—The work on this route is carried under flag, and no permanent work having been done.

Route 25A—Cripple River Road (13.5 miles).

Route 25C—Nome-Wireless Road (0.25 mile).

Route 25D—Mouth of Center Creek Road (1.25 miles).

Route 25E—Submarine Pay Streak Road (1.25 miles).

Route 25F—Anvil-Glacier Road (3 miles).

Route 25G—Snake River Extension Road (1.25 miles).

Route 25H—Otter Creek Road (1.25 miles).

During the period of this report repairs were made on 6 miles of the above routes. They averaged \$1.50 per mile over the distance covered.

A new ferry was installed at Sinrock. The scow is 3½ by 10 by 28 feet, and will carry 20 tons. The cost of the scow was:

Labor	-----
Material	-----
Transportation of material, Nome to Sinrock	-----

Total-----

Route 26—Candle-Candle Creek Road (10 miles).—The work on this route during the past year was largely necessary to complete the route could not be completed because of the insufficiency of the general fund available. Two miles of new road were constructed and the remaining miles previously constructed were maintained. The cost of this season's operations amounted to \$3,874, which is very closely the cost of construction as the cost of the general fund is small. The latter has not been separately reported.

Route 27—Deering-Inmachuck Road (10 miles).—The work on this route covered approximately 1½ miles. The construction were undertaken and partially completed during the past year. The report. The total cost of the field operations for this route, as detailed in the report, however, has not yet been reported. The new construction is reconstruction completed and will not add to the total mileage. This is because of the very light nature of the work and the small maintenance allotments.

Route 28—Dahl Creek-Candle Trail (10 miles).—A footbridge was constructed on this route

me impassable at high stages of the Solo. his work is corduroy construction and, like surfaced. The total cost averaged \$697 per ered.

on the Skookum Pass section cost \$73.70 h maintained was 3.5 miles.

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le Creek Road (1.25 miles).—Two thousand en a light gravel surfacing. The material tailings very conveniently located and was of 11 $\frac{3}{4}$ cents per linear foot of road.

y Creek Road (1.25 miles).

k-Newton Road (0.3 mile).

borne Road (6 miles).

ch Road (1.75 miles).

reek Road (1.5 miles).

er Road (5 miles).

lat Creek Road (2 miles).

uster Road (7.6 miles).

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strong enough to carry dog teams—the only kind of travel that the trail is expected to accommodate.

The permanent staking on this route varied in cost from \$4.36 per mile to \$39.60 per mile, the wide variation being caused chiefly by the difference in the cost of delivering the stakes on the different sections. The staking averaged \$5.50 per mile over the entire distance (81.5 miles) staked.

The cost of the bridges varied from 60 cents per linear foot to \$2 per linear foot, being, like the staking, dependent upon the relative ease or difficulty of obtaining the material in each case. The bridges averaged \$1.50 per foot for the 14 bridges, with a total length of 314 linear feet.

Route 21—Unalaklik-St. Michael Trail (approximately 65 miles).—The work on this route is carried under flagging trails, no permanent work having been done.

Route 25A—Cripple River Road (13.5 miles).

Route 25C—Nome-Wireless Road (0.25 mile).

Route 25D—Mouth of Center Creek Road (1.5 miles).

Route 25E—Submarine Pay Streak Road (1 mile).

Route 25F—Anvil-Glacier Road (3 miles).

Route 25G—Snake River Extension Road (3 miles).

Route 25H—Otter Creek Road (1.25 miles).

During the period of this report repairs were required on about 6 miles of the above routes. They average \$58.72 per mile over the distance covered.

A new ferry was installed at Sinrock in May and June of this year. The scow is 3 $\frac{1}{2}$ by 10 by 28 feet, with 6-foot aprons at the ends. The cost of the scow was:

Labor-----	\$479.79
Material-----	251.51
Transportation of material, Nome to Sinrock-----	74.00
Total-----	805.30

Route 26—Candle-Candle Creek Road (4.25 miles).—Work was continued on this route during the past year, but the funds necessary to complete the route could not be allotted owing to the insufficiency of the general fund available for road work in Alaska. Two miles of new road were constructed, and the 2.25 miles previously constructed were maintained. The total field cost of the season's operations amounted to \$3,874.92, which represents very closely the cost of construction as the work of maintenance was small. The latter has not been separately reported.

Route 27—Deering-Inmachuck Road (25 miles).—Repairs on this route covered approximately 1 $\frac{1}{2}$ miles. Three miles of new construction were undertaken and partially completed at the close of the report. The total cost of the field operations amounted to \$2,877.78; the detailed report, however, has not yet reached this office. This new construction is reconstruction combined with short relocations and will not add to the total mileage. It is made necessary largely because of the very light nature of the original work and inadequate maintenance allotments.

Route 28—Dahl Creek-Candle Trail (140 miles).—A suspension footbridge was constructed on this route at the crossing of Taylor

Creek. The bridge is 4 feet wide and has a span of 160 feet. Its total cost was \$523.10. The staking on this route is carried under the head of flagging trails.

Route 37—Topkok-Candle Trail (141 miles).—The work on this route is carried under the head of flagging trails.

Route 41—Klery Creek Road (0.75 mile).—No work has been undertaken on this route since last report.

Route 42—St. Michael-Kotlik Trail (approximately 70 miles).—Approximately 30 miles of this route traverse the lakes and inlets along the Bering Sea coast or the sea ice itself. These portions were staked by Mr. Frank Kameroff in the fall of 1913 for use during the following winter. The total cost of the work was \$250. This is considered excessive, but was the cheapest arrangement that could be made at that time.

Flagging trails.—The work of the past winter included the usual temporary flagging with lath and streamers over those trails that are not permanently staked. Approximately 1,000 miles of trails were temporarily staked, at an average cost of \$5.65 per mile. The total of \$5,657.80 expended, however, includes items for inspection of permanently staked trails and some repairs thereto, the actual cost of which can not be accurately separated from the work belonging strictly to the classification of temporary staking.

VALDEZ DIKE.

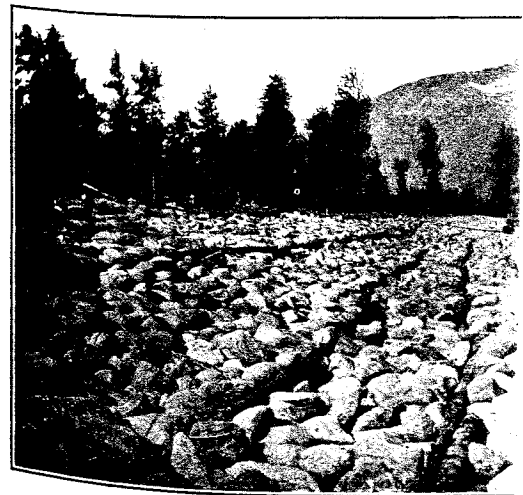
The duty of constructing a dike for the protection of the property of the United States in Valdez was added to the other duties of the board by the provisions of the act of Congress approved March 2, 1913. Although the funds for this work were not available until the beginning of the fiscal year 1914, the plans and estimates were completed and the location made in June and construction work was commenced July 1, 1913.

Roughly, the dike occupies three sides of an irregular quadrilateral, of which the shore line of the bay is the fourth side. The southern side is 3,314.4 feet in length, the eastern side is 1,685.3 feet in length and forms an angle of $91^{\circ} 12'$ with the southern side. The northern side is 2,400.3 feet in length and forms an angle of $39^{\circ} 42'$ with the eastern side. The total length is 7,400 feet, which is sufficient for the protection of all of the Government buildings as well as all of the other buildings in the town at the time the dike was completed.

The project adopted provided for an earth embankment of the typical section shown on the accompanying sketch protected by a brush fascine mattress on its exposed face. The material in the embankment was taken from the "river" side of the dike and is a mixture of sand, gravel, and earth in proportions varying in the different sections of the dike. Willows suitable for mattress construction are not found in any considerable quantity in this region, but the native alders, which cover large portions of the glacial moraine upon which Valdez is situated, offer a fairly satisfactory substitute. They are inferior to the willows in that they do not grow from cuttings, limiting the period of effective service from the mattress to the life of the brush of which it is composed, and in that they are crooked and large at the butts compared to willows of equal length, making the construction of the fascines somewhat difficult.



VALDEZ DIKE EMBANKMENT SHOWING F



VALDEZ DIKE, COMPLETED

REPORT OF THE
Board of Road Commissioners
for Alaska ✓

1915



WASHINGTON
GOVERNMENT PRINTING OFFICE
1915

VALDEZ DISTRICT.

(Mr. J. H. INGRAM, superintendent.)

The records of the district office were almost completely destroyed by the fire which destroyed the general office of the board at Valdez on July 15, 1915. It is therefore impossible to give detailed statements of all of the various classes of work done during the year. The unit costs of the work have not differed materially from similar costs reported in previous years. The total expenditure on each of the several routes is given in the report of the disbursing officer of the board.

A warehouse was constructed at Chitina for the storage of such portion of the tools, equipment, and supplies belonging to the Valdez district as can be more advantageously stored there than at Valdez. The building is a balloon-framed structure with corrugated iron siding and roof. A room 14 by 26 feet in dimensions was partitioned off and lined for office use, the attic space immediately above being available for sleeping quarters. The remainder of the building is without lining.

The main structure is 30 by 100 feet, with walls 12 feet high and one-third pitch roof. A shed on the north side, 48 feet wide, for the storage of vehicles, extends the full length of the building. A space 30 by 18 feet in this shed is inclosed and floored for use as a blacksmith shop.

Route 4A—Donnelly-Washburn Sled Road (55 miles).—The work of the year was devoted to minor repairs and to the construction of the temporary winter bridges on the Big Delta and Little Delta Rivers. These bridges were again constructed by Mr. J. E. Sullivan, at a contract price of \$2.50 per linear foot. The bridges on the Big Delta were removed by our crews in the spring of this year for the purpose of saving the material for use next winter.

Route 4B—Valdez-Ernestine Road (63 miles).—In the latter part of the season of 1914 approximately 100 feet of pile trestle bridges were constructed to replace embankment washed out by the Valdez glacier stream. The stream emerged from the glacier near its eastern side, and the first 2 miles of road were subjected to more or less serious attack during the entire summer. Similar conditions prevailed in the latter part of June of this year. Altogether three new bridges under 50 feet in length and a 100-foot extension of an old bridge were required during the year. These bridges were pile trestles of the usual type. The remainder of the work of the year on the first 3 miles was devoted to raising the grade and protecting it with brush. A considerable portion of this was emergency work in the protection of the road from attacks in unusual locations or of unexpected force.

Some additional work on the dike at mile 7 (see annual report, 1914, p. 9) was required in 1914; none has been required this year. A wing dam near the 8-mile point was built for the purpose of turning Lowe River to the opposite side of the valley and preventing continuous attacks on the road. This wing dam, about 500 feet long, was built of sandbags and brush. It was constructed in running water under considerable difficulty, but when completed proved substantial and effective.

The gravel slide at the foot of Keystone Canyon and the snowslide at the head of the same canyon were opened up in July of this year.

A washout on mile 12 required the construction of about 500 feet

1915

PLATE 3



OF ROAD NEAR GULKANA.

Route 12—Mile 34 A. N. R. R.-Hope Road (40 miles).—The work of the year on this route comprised the most urgently necessary maintenance work between mile 34 and Sunrise and the repair and improvement of the road between Sunrise and Hope. The removal of windfalls and small earth slides in the side-hill cuts on the mile 34-Sunrise section cost \$13.22 per mile. The work on the Sunrise-Hope section cost \$85.90 per mile.

Route 19—Kern Creek-Knik Trail (86 miles).—The work on this route during the year included the removal of windfalls and small earth slides in side-hill cuts. Forty miles of the route were covered by this work, at an average cost of \$23.24 per mile. The establishment of a winter mail service from Seward to Iditarod via this route, together with the activities of the Alaska engineering commission at Ship Creek, have added to the importance of the trail, and considerable improvements will be necessary during the coming year.

Route 20A—Knik-Susitna Trail (approximately 35 miles).

Route 20B—Susitna-Rainey Pass Trail (127 miles).

Route 20C—Rainey Pass-Tacotna Trail (130 miles).

Route 20D—Tacotna-Kaltag Trail (145 miles).

No work has been done on these routes during the year. Routes 20A, 20B, and 20C carry the mail referred to under route 19. Necessary repairs and improvements are planned for the late fall of this year.

Route 32A—Tacotna-Flat Creek Trail (87 miles).—No work was undertaken on this route during the year.

Route 35—Knik-Willow Creek Road (35 miles).—The work of the year was devoted to the repair and improvement of this route to wagon-road standards. It is now in fair condition for use during the entire season by horse-drawn vehicles and under favorable conditions has supported light automobile traffic.

The improvement included widening the clearing, ditching and grading, and the construction of pole culverts. A total of 635 feet of corduroy was placed over several sections not suitable for improvement by other methods. The total cost of the work averaged \$193.89 per mile. The cost of the corduroy laid averaged 62 cents per linear foot, and pole culverts cost \$5.25 each.

YUKON DISTRICT.

(Mr. JOHN ZUG, assistant engineer. Mr. R. J. SOMMERS, superintendent, since July 1, 1915.)

Route 4J—Richardson-Salchaket Road (30 miles).—During the latter part of the season of 1914 the chief work on this route was the construction of about 2 miles of new road between mileposts 301 and 303. This work was rendered necessary by the continued encroachment of the Tanana River, and owing to heavy rains during the summer and the flooded condition of the river the damage from this source was very severe in this locality and at other points adjacent to the river. During May and June of this year maintenance only has been carried on, and attention has been chiefly given to those portions of the road most in need of repairs. The total expenditure on this route was \$12,493.32, of which approximately two-thirds was used for new construction and one-third for maintenance, which covered the entire 30 miles. The average cost of maintenance was \$138.81 per mile.

Route 4K—Salchaket-Fairbanks Road (40 miles).—Most of the work on this route during the latter part of the working season of 1914 was done in August and September and embraced general maintenance and extensive repairs made necessary by heavy rains and high water in the Tanana River. Three sections of this route, aggregating nearly 5 miles in length, were flooded by an extremely high water in the river, and the greater portion of this was badly damaged by wash-outs. In addition to this a part of the road at Salchaket was destroyed, together with most of the local improvements at that place, requiring the construction of half a mile of new road and the reconstruction of the bridge and ferry towers at this point. In November repairs were made to two small bridges near Fairbanks, and in February, 1915, temporary repairs were made to three small truss bridges constructed in 1908. Two of these bridges were rebuilt entirely in June of this year and the third was repaired. General maintenance of the road was also carried on during May and June, embracing such repairs as were most urgently necessary. The expenditure during the fiscal year aggregated \$13,460.11, the greater portion of which was devoted to the repair of the sections between miles 330-335 and 355-360.

Route 5—Ester-Fort Gibbon Sled Road (148 miles).—Repair and maintenance where required covered the work done on this route. It embraced the clearing of slides, repair of small bridges, and grading the approaches to stream crossings not bridged. The work was done between October 4 and November 20, 1914, and the cost was \$1,636.21, an average of \$11 per mile.

Route 7A—Summit-Cleary Road (11 miles).

Route 7B—Fox-Olnes Road (13 miles).

Route 7C—Summit-Fairbanks Creek Road (11 miles).

Route 7D—Ester Creek Roads (13 miles).

Route 7E—Vault Creek Road (2 miles).

Route 7F—Vault Creek-Treasure Creek Road (1.5 miles).

Route 7G—Fairbanks-Gilmore Road (13 miles).

Route 7H—Little Eldorado Creek Road (1.5 miles).

Route 7I—Gilmore-Summit Road (6 miles).

Route 7J—Fairbanks-Chena Hot Springs Trail (64 miles).

Route 7K—Olnes-Livengood Sled Road (56 miles).

These routes embrace the local road system about Fairbanks. Route 7K is a new road to the Tolovana mining district, on which no construction work has yet been done; but preliminary examination has been made and location started. The greater part of the maintenance work during the year has been devoted to routes 7A, 7B, and 7C, which were most in need of it. Expenditures during the fiscal year have been as follows: 7A, \$2,808.84; 7B, \$783.88; 7C, \$40.50; 7D, \$188.08; 7G, \$1,737.80; 7I, \$132.83.

Route 9—Rampart-Eureka Road (6.5 miles road, 21.5 miles sled road).—Work done on this route covered maintenance of the 6.5 miles of wagon road. The work was done in July and August, 1914, and cost \$847.67.

Route 11—Eagle-Fortymile Road (19.5 miles road, 60 miles sled road).—Annual maintenance on the section from Eagle to O'Brien Creek was performed in August and September, 1914. The work consisted chiefly of repairs to bridges, clearing out slides, leveling up holes, and opening up drains. The expense of the work was \$981.86.

Route 38—Ruby-Long Cripple Trail (6 miles road, 24 miles sled road, 60 miles trail).—The work of the past season consisted of an extension of the wagon road previously constructed about 3 miles. The 6 miles now completed can be used to connect with the summer road in use over the ridge. Considerable work will still be necessary to complete the road the entire distance. A small amount of maintenance work was done in May, 1915, consisting of thawing out and opening up culverts and ditches. The total expenditure during the year was \$9,020.20.

NOME DISTRICT.

Mr. DANIEL A. JONES, superintendent,

Route 8—Nome-Council Road (approximately 82 miles, 57 completed).—The work of the year was devoted chiefly to continuing the repairs made necessary by the storm of the late fall of 1913. The section from Nome to Fort Davis, 3½ miles in length, was largely resurfaced with clay and gravel, and new bridges were constructed on Rocker, Peluk, Martin, and Bering Creeks. The cost of surfacing averaged 20 cents per linear foot. The cost of ditching with the road machine averaged 3 cents per linear foot. All of the repairs averaged \$964 per mile on the entire section. 3123.00

Additional instrumental work on the survey of the Cape Nome section (see annual report 1914, p. 19), cost \$100; no construction work was undertaken. The territorial road commissioner for the second judicial division contemplates the reconstruction of this section this year. 100.00

The cost of the operation of the Port Safety Ferry was \$599.85, of which \$99.85 was expended for the maintenance of the scow and cable. The cost of the operation of the Bonanza Ferry was \$462.40, of which \$87.40 was expended for the maintenance of the scow.

The work of the year on the Solomon East Fork section included the construction of 7,600 feet of brush corduroy and 6,000 feet of gravel surfacing. The work was confined to the section between Solomon and Shovel Creek, 7 miles in length, and its cost averaged \$726.70 per mile. No work was done on the East Fork-Fox River section of this route. 5035.90

Repairs to the Fox River-Council section, which is entirely corduroy, over extremely soft ground, cost \$89.66 per mile. This is less than the average annual cost for maintenance of work of this class.

Route 13A—Nome-Bessie Road (3.3 miles).—This route is considered one of the most important in the Territory, and in the tonnage carried it easily ranks first. Attention has been invited to this in previous reports. (See annual report 1911, p. 21.) The average freight movement over this road is conservatively estimated at 30 tons daily throughout the year. The summer freight rate has been reduced more than \$5 per ton since this road was constructed, and it is safe to say that this route is saving \$150 per day during the summer to the mining operators using it. The annual saving on summer freight is, therefore, between \$22,000 and \$25,000. Two caterpillar traction engines and several auto trucks of capacities as high as 4 tons are now using the road. One load of 25 tons hauled by a traction engine was observed. The work of the past year was devoted to