

SCR

25

**STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE**

REQUEST: 4-2-87

Bill Version: SCR 25
Publish Date: _____

Revision Date: _____
Title: Reconstruction of Bethel
Airport Road
Sponsor: Binkley
Requestor: Jones

Agency Affected: DOT&PF
BRU: Design & Construction
Maintenance and Operations
Components: _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES	-0-	-0-	-0-	17.5	17.5	17.5
TRAVEL						
CONTRACTUAL	-0-	-0-	-0-	25.0	25.0	25.0
SUPPLIES	-0-	-0-	-0-	7.5	7.5	7.5
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	50.0	50.0	50.0

CAPITAL	-0-	510.0	4,490.0	-0-	-0-	-0-
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REVENUE						
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FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	-0-	-0-	50.0	50.0	50.0
FEDERAL FUNDS	-0-	510.0	4,490.0	-0-	-0-	-0-
OTHER						
TOTAL	-0-	510.0	4,490.0	50.0	50.0	50.0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS : (Attach a separate page if necessary)

See attached analysis.

Prepared by: William R. Snell (Signed) Phone: 266-1440
Division: Regional Director, Central Region Date: _____

Approved by Commissioner: *W. L. X. H.* Date: 4/11/87
Agency: DOT&PF

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)
Senate Secretary

Fiscal Note
SCR 25

1. Background

The 4.3 mile long Bethel Airport Road has been on the Federal aid system since 1969 when the original construction took place. That project replaced a 4-wheel drive road and provided for the alignment and a gravel surface.

In 1970-1971 the road was paved. In 1972 the bridge at Brown's Slough was replaced. The last project in 1981-1982 was funded in Chapter 118 SLA 1980 for \$2.5 million. This project consisted of replacing culverts in thaw settlement areas, insulating underneath to protect the permafrost, and an asphalt overlay of the road to a 24' surface width.

In 1986 the City completed a \$287,000 shoulder widening project with the funding coming from a Transfer of Responsibility Agreement (TORA) with the Department.

2. Current Status

There are many pavement cracks and sections of the road are very uneven due to thawing and consolidation of the underlying silt permafrost. These problems are beyond Maintenance and Operation's ability to correct.

3. Reconstruction costs

The DOT&PF's earlier cost estimate to reconstruct this road was \$7,000,000 which would provide two 12 foot wide paved driving lanes as well as 8 foot wide shoulders. \$500,000 was estimated to design this project.

A close review of this project indicates that a lower cost federally funded project might be possible. This would be through the federal 3R (resurfacing, restoration, and rehabilitation) program; however, the department would have to receive a Federal Highway Administration (FHWA) waiver to reduce the roadway shoulders and pave the surface to two 12 foot driving lanes with 2 foot wide paved shoulders. A waiver might be justified by the presence of permafrost because the permafrost may thaw faster and in a larger area if shoulders were added.

Assuming the department developed a 3R project, the following would be provided:

- new pavement, 28 feet wide
- erosion control along the most critical slopes
- leveling with gravel as needed
- minor replacement of culverts

The total cost with a 3R project is estimated at \$5.0 million with \$510,000 of this being for preliminary engineering (PE). The PE money will allow the department to better define the geotechnical problems and propose a long term solution. With this information, we can then discuss with the FHWA the scope of the project and whether or not a 3R project is appropriate. It may be that a 3R project should be done on a periodic basis until the roadway stabilizes. Use of existing materials will be looked at during P.E. Depending on the condition, it may or may not be economical.

4. Maintenance Costs

The annual maintenance cost for this 4.3 mile section of road is approximately \$50,000. This is computed by multiplying the 8.6 lane miles by the estimated maintenance cost of \$5,800 per lane mile for this road.

SENATE COMMITTEE REPORT

FIRST COMMITTEE OF REFERRAL

Date of 5-DAY NOTICE
IN ACCORDANCE WITH UNIFORM RULE 23

FURTHER: FINANCE

**FISCAL NOTE(S) ATTACHED **
IN ACCORDANCE WITH AS 24.08.035
(see below)

4/1/87

DATE TURNED INTO OFFICE 1-28-88

Mr. President:

TRANSPORTATION

Committee considered SCR 25

expeditious redesign and reconstruction of the airport road in Bethel.

and recommended:

- replace with CS _____ same title
- attached amendment(s) and new title

do pass

do not pass

no recommendation

individual recommendations

further referral to _____

letter of intent adopted and attached

** Committee attached or adopted fiscal note(s) :
 zero fiscal impact

MEMBERS SIGNING DO PASS

OTHER RECOMMENDATIONS

Walt Hood

Tom Kelly

J. B. ...

L. ... (Do Pass)

Chairman signature and recommendation

Committee Backup Attached

TABLE 1
 FEDERAL AID HIGHWAY APPROPRIATIONS BY ELECTION DISTRICT FY 1984-1987
 (thousands of dollars)

DISTRICT NAME	HOUSE ELECTION DISTRICT	FY 84		FY 85		FY 86		FY 87	
		Approp.	% of total funds	Approp.	% of total funds	Approp.	% of total funds	Approp.	% of total funds
KETCHIK-WRANGL-PETRSBG	1	0.0	0.0%	7,222.0	10.1%	10,350.0	4.8%	5,800.0	2.3%
INSIDE PASSAGE	2	1,788.0	0.9%	4,500.0	6.3%	6,210.0	2.7%	13,804.0	5.5%
BARANOF-CHICHAGOF	3	0.0	0.0%	0.0	0.0%	900.0	0.4%	0.0	0.0%
JUNEAU	4	3,864.0	1.9%	2,852.0	4.0%	6,580.0	3.1%	135.0	0.1%
KENAI-COOK INLET	5	0.0	0.0%	0.0	0.0%	11,000.0	5.1%	300.0	0.1%
PRINCE WILLIAM SOUND	6	1,039.0	0.5%	3,036.0	4.2%	2,380.0	1.1%	5,550.0	2.4%
ANCHORAGE	7-15	119,958.0	59.7%	15,544.0	21.7%	74,432.0	34.5%	136,827.6	55.2%
HATANUSKA-SUSITNA	16	10,795.0	5.4%	368.0	0.5%	3,285.0	1.5%	3,985.0	3.5%
INTERIOR HIGHWAYS	17	33,397.0	16.6%	32,802.0	45.7%	36,690.0	17.0%	24,174.0	9.8%
FAIRBANKS	18-21	20,020.0	10.0%	5,402.0	7.5%	45,960.0	21.3%	46,967.0	19.0%
NORTH SLOPE-KOTZEBUE	22	0.0	0.0%	0.0	0.0%	13,000.0	6.0%	0.0	0.0%
NORTON SOUND	23	9,220.0	4.6%	0.0	0.0%	4,680.0	2.2%	4,931.0	2.0%
INTERIOR RIVERS	24	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
LOWER KUSKOKWIM	25	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
BRISTOL BAY-ALEUTIAN IS	26	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
KODIAK-EAST AK PENINSULA	27	900.0	0.4%	0.0	0.0%	0.0	0.0%	0.0	0.0%
TOTAL		200,981.0		71,734.0		215,467.0		247,823.6	

Prepared by the House Research Agency February 1987 (87-151;860506-01).

Senator Johne Binkley

Senate Finance Committee
P.O. Box V • Juneau, Alaska 99811 • (907) 465-4985



Finance Committee
Co-Chairman

M E M O R A N D U M

May 12, 1987

TO: SENATOR LLOYD JONES, CHAIRMAN
Senate Transportation Committee

FROM: SENATOR JOHN BINKLEY *Johne*

Subj: SCR25 Reconstruction of the Bethel Airport Road

The 4.3-mile long Bethel Airport Road has been on the Federal-Aid Highway system since 1969, when the original road construction took place. The \$3.5 Federal-Aid project included alignment and replacing the 4-wheel drive road with a gravel surface. In 1972, the Bridge at Brown's slough was replaced. In 1980, \$2.5 million in general funds were appropriated for major repairs, including an asphalt overlay of the road. In 1986, the City of Bethel completed a \$287,000 shoulder widening project through a Transfer of Responsibility Agreement (TORA) with the Department.

The road presently has numerous pavement cracks, and sections of the road are very uneven due to differential thawing and consolidation of the underlying silt permafrost. These problems are beyond the ability of the DOT&PF Maintenance and Operation to correct.

The Bethel Airport Road is the only major road in the Yukon-Kuskokwim delta. Bethel is the regional transportation center for 57 villages, encompassing an area of some 57,000 square miles (roughly the size of the State of Michigan). The population of the delta is approximately that of Juneau; however, because of the relatively low traffic volumes (1,420 Average Daily Traffic), the DOT&PF has stated that the Bethel Airport Road cannot compete on a statewide basis for federal funds.

Because the DOT&PF ranking criteria effectively precludes roads such as the Bethel Airport Road from receiving Federal-Aid funds regardless of need or condition, and because this road serves a population approximately that of Juneau, and because the DOT&PF has no plans to include these necessary repairs in its six-year plan, I am respectfully requesting that the Bethel Airport Road be given a priority by the Department for reconstruction.

STATE OF ALASKA

BILL SHEFFIELD, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

POUCH 2
JUNEAU, ALASKA 99811
PHONE: (907) 465-3900

OFFICE OF THE COMMISSIONER

February 23, 1987

The Honorable Lyman Hoffman
House of Representatives
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

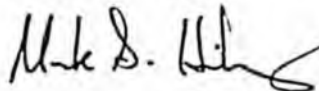
Dear Representative Hoffman:

The following information and attachments are transmitted in response to a request from your office staff to Bruce Freitag concerning the Bethel Airfield Road.

I believe the route in question was placed on the Federal-aid secondary system at statehood, but the earliest records for it in our office are attached. In 1972 the Department of Highways revised their accounting system and gave this route a "CDS Log" number of 080000.

If additional information is needed please let me know.

Sincerely,



Mark S. Hickey
Deputy Commissioner
Operations

Attachment

cc: Susan Fleischhauer, Legislative Liaison
Bruce Freitag, M&O Standards Engineer
Dean Redick, M&O Director, Central Region

- R.O.T. Information -

FACT SHEET

BETHEL ROAD
Airport to Brown's Slough

First Project: Original Construction, Grading, Drainage & Utilities

BEGAN: August 1969
COMPLETED: September 1970
DESIGNED BY: Department of Transportation and Public Facilities
(DOT&PF)
CONSTRUCTED BY: Studnek Construction
COST: \$2.2 million
FEDERAL AID

Second Project: Paved Surface

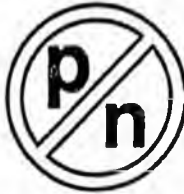
BEGAN: August 1971
COMPLETED: September 1972
DESIGNED BY: (DOT&PF)
CONSTRUCTED BY: Burgess Construction
COST: \$1.3 million
FEDERAL AID

Last State Project: Pavement Overlay, Insulating Underpermafrost, Culverts

BEGAN: August 1981
COMPLETED: September 1982
DESIGNED BY: (DOT&PF)
CONSTRUCTED BY: Knik Construction Company, Inc.
COST: \$2.5 million
State Funded Project

Local Project: City had Transfer of Responsibility Agreement (TORA) for
shoulder widening - completed in 1986. (\$287,000)

FEB 23 1987



Peratrovich, Nottingham & Drage, Inc.

Engineering Consultants

1506 West 36th Avenue • Suite 101 • Anchorage, Alaska 99503 • 907-561-1011

February 19, 1987

FN&D 87000AC

Representative Lyman Hoffman
Box V
Juneau, Alaska 99811

Re: Design, Construction and Maintenance of Roads on
Ice-Rich Soils

Dear Representative Hoffman:

It is well known that road construction over ice-rich soil without special precautions results in thawing of the frozen soil often with severe settlement. These settlements are known to cause some of the worst highway maintenance problems in Alaska.

Methods That Work

Much of what has been learned over the last two decades in Alaska about road construction is based on monitoring of viable types of existing roads. From this information engineers have developed many methods that can be used to assure good road performance with lower maintenance costs. Some of these methods include use of the following:

- * geotextiles - to segregate fine soil materials from structural fills, to bridge settlement zones and reduce differential settlement at roadway surface and to ensure insulation integrity in organic tundra overlay construction (i.e. Red Dog project).
- * synthetic plastic honeycomb reinforcing sections - similar to that used in the Shishmaref airport construction.
- * rigid insulation - between the embankment and natural ground to slow heat flow into frozen ground. The high strength closed cell rigid insulation provide the best performance.
- * thicker embankment fill - when cost effective as an insulating layer. Typically, 1 ft. of soil has the equivalent insulating value of 1 inch of rigid insulation.
- * culvert insulation - to slow thaw below culverts thus road settlement.
- * adequate shoulder widths - to protect and insulate the roadway edge from settlement due to ambient temperatures and drainage along the road.

- Engineering Report -

Representative Hoffman
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- * positive drainage - to minimize thermal degradation at culverts and along the shoulders.
- * heat pipes - to maintain frozen soil at site specific areas.
- * painted surfaces - painting or paving roadway surfaces with white materials to reflect infrared from the sun. A white surface will reflect heat and reduce the temperature in the fill thus reducing thaw in underlying soil. Black surfaces absorb I.R. energy and increase ground temperatures.

Many of these methods can be used to repair and stabilize existing roads or to improve performance and reduce maintenance.

Repair

Road upgrade costs depend on many factors: availability of local building materials and equipment, present condition of the road surface and foundation, soil type, drainage, adequate right-of-way, etc. However, the first step towards developing any upgrade plan would be to prepare a preliminary engineering status and upgrade report listing problems, their extent and obtaining an engineer's opinion on what is required to upgrade the road. These studies can generally be performed by reviewing available data and conducting a site visit.

Example

The Bethel Highway (FAS 208) is an example of improper construction over ice-rich soil. It was built to substandard width and does not use many of the methods now commonly used for roads of this type; it has narrow shoulders, does not use thermal protection for culverts and was constructed with improper base gradation and surfacing. Shoulders are important because they help prevent thawing below the roadway edge. And thermal protection of culverts is important because it protects against thaw under the roadway.

Repair and upgrade of this road to minimum State standards is expected to cost \$750,000 to \$1,000,000 per mile because some construction materials must be shipped to the site from outside Bethel. However, after a preliminary study, methods may be developed which could more fully utilize near site materials thus reducing costs.



Representative Hoffman
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If I may be of any further assistance please call.

Sincerely,

PERATROVICH, NOTTINGHAM & DRAGE, INC.



Alan B. Christopherson, P.E.
Senior Engineer

ABC/jk/L7

cc: Lori Nottingham





Bethel Fire Department

P. O. Box 388, Bethel, Alaska 99559
Phone: (907) 543-2131

March 25, 1987

Representative Hoffman
P.O. Box V
Juneau, Alaska 99811

Dear Lyman:

This letter is in reference to your request for fire department statistics relating to state highway use. Attached are ambulance statistics from 1985 and 1986.

Some of the terms used on the forms may be unfamiliar to you. Medivacs are those runs where a patient is picked up at the airport and delivered to the hospital. Transports are where the patient is loaded at the hospital and delivered to the airport. Bethel runs of course are local response to emergency incidents.

For both the fire and ambulance service the current condition of the state highway is a problem. Response time to all incidents is longer because of the road condition. With the large dips and bumps on the highway, to respond safely the crews must travel much slower than would normally be the case. The most serious problem though, is that when transporting injured persons to the hospital the condition of the road sometimes aggravates the injury or increases the level of pain. This problem is most evident in traumatic injuries such as broken limbs, injured backs, and pelvic injuries. During transportation of these patients the road condition causes them much additional pain. An added problem is that during situations where the crew is intensively involved in emergency action, the conditions of the roads sometimes makes adequate care difficult.

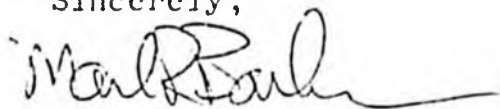
Hopefully the above will assist you in your project to repair the state highway. I am sorry that I took so long in returning

Bethel Fire Dept.

this to you; I hope I did not cause any inconvenience.

Please contact me if you have any further questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mark R. Barker", with a long horizontal flourish extending to the right.

Mark R. Barker
Fire Chief

MRB:lht



Bethel Fire Department

P. O. Box 388, Bethel, Alaska 995
Phone: (907) 543-21

--BETHEL FIRE DEPARTMENT AMBULANCE SERVICE--

1986

TOTAL RESPONSES.....	900
TOTAL PATIENTS CARRIED.....	740
NUMBER OF MEDIVACS.....	287
NUMBER OF TRANSPORTS.....	178
NUMBER OF BETHEL RUNS.....	324
NUMBER OF BETHEL RUNS, WITH OUT OF TOWN PATIENTS.....	111

--BILLING--

NUMBER OF PATIENTS BILLED.....	740
TOTAL AMOUNT OF BILLS SENT....	\$54,636.50
AMOUNT RECIEVED FROM:	
THIRD PARTY.....	\$9,326.12
MEDICAIDE.....	\$7,635.00
PHS.....	\$13,275.00

\$30,236.12

--- BETHEL FIRE DEPARTMENT AMBULANCE SERVICE---

1985

Total responses	---	943
Total patients carried	---	776
Number of Mediyacs	---	347
Number of Transports	---	172
Number of Bethel runs	---	257
Number of Bethel runs with out of town patients	---	104

--- Billing ---

Number of patients billed	---	776
Total amount of bills sent	---	\$58,106
Amount received from;		
third party	---	\$10,467
Medicaid	---	\$8,790
PHS	---	\$12,900

TOTAL RECEIVED --- \$32,157