

S J R

36

FISCAL NOTE

Revision Date: 3-16-89
Title: Requesting Congress to Reserve a
Highway Corridor for Lynn Canal Road

Agency Affected: DOT&PF
BRU:

Sponsor: Coghill
Requestor: Senate Transportation

Components:

EXPENDITURES/REVENUES: (THOUSANDS OF DOLLARS)

OPERATING	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL	0	0	0	0	0	0
CONTRACTURAL	0	0	0	0	0	0
SUPPLIES	0	0	0	0	0	0
EQUIPMENT	0	0	0	0	0	0
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	0	0	0	0	0	0

CAPITAL	0	0	0	0	0	0
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REVENUE	0	0	0	0	0	0
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FUNDING: (THOUSANDS OF DOLLARS)

GENERAL FUND	0	0	0	0	0	0
FEDERAL FUNDS	0	0	0	0	0	0
OTHER*	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS: (Attach a separate page if necessary)

SEE ATTACHED

Prepared by: R. T. Meketa, Chief of Planning
Division: Southeast Region, DOT&PF

Phone: 789-6264

Date: 4-7-89

Approved by Commissioner: Mark S. Hickey *MSH*
Agency: Department of Transportation and Public Facilities

Date: 4/10/89

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

- Fiscal note -

ANALYSIS - SJR 36

Senate Joint Resolution 36 (SJR 36) requests the Congress to reserve a two-mile wide highway corridor along the east side of Lynn Canal for the purpose of accommodating a future Juneau-Haines-Skagway road connection.

No detailed planning, environmental, or engineering studies have been completed that would allow the department to identify a specific preferred road alignment or other design criteria. Therefore, neither the location nor width of the needed corridor can be positively determined at this time.

There is no fiscal impact from the Resolve.

1 IN THE SENATE

BY COGHILL

2 SENATE JOINT RESOLUTION NO. 36

3 IN THE LEGISLATURE OF THE STATE OF ALASKA

4 SIXTEENTH LEGISLATURE - FIRST SESSION

5 Requesting the Congress to reserve a
6 highway corridor or setback along the
7 east shoreline of Lynn Canal.

8 BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF ALASKA:

9 WHEREAS, of all the continental states of the United States, Alaska's
10 capital, Juneau, is the only one that is not connected by highway to the
11 rest of the state, denying most Alaskans direct land access to the seat of
12 government; and

13 WHEREAS there is currently pending in the Alaska State Legislature
14 legislation that would authorize and appropriate money for the construction
15 of the Lynn Canal Highway Project, consisting of a highway and shuttle
16 ferry facilities, linking Juneau with Haines and Skagway; and

17 WHEREAS, in addition to improving direct land access to the seat of
18 government, the Lynn Canal Highway Project is important to the economies of
19 the communities of Lynn Canal because it would enhance diversity of the
20 economies of these communities; and

21 WHEREAS the proposed highway would pass through highly mineralized
22 areas that are currently being developed into operating mines; and

23 WHEREAS it is estimated that opening the Lynn Canal Highway would
24 precipitate a four-fold increase in visitor traffic between Juneau and the
25 communities of Upper Lynn Canal; and

26 WHEREAS completion of the Lynn Canal Highway Project would allow the
27 Alaska Marine Highway System to terminate its mainline ferries at Juneau
28 and thereby allow for improved ferry services to the remaining communities
29 served by ferry in Southeastern Alaska; and

1 WHEREAS the proposed Lynn Canal Highway Project would qualify for
2 federal matching funds for its construction; and

3 WHEREAS the proposed highway route of the Lynn Canal Highway Project
4 would pass almost entirely through federal and state lands, requiring
5 almost no purchase of private property; and

6 WHEREAS a federally-designated wilderness area has been proposed for
7 the headwaters of Barrens Bay that, if approved, would incorporate part of
8 the route of the Lynn Canal Highway Project; and

9 WHEREAS the proposed wilderness area would work an extreme hardship on
10 the developing hardrock mines in the area, as well as precluding potential
11 timber, fishery, tourism, and travel activities of the private sector; and

12 WHEREAS, at the time of withdrawal of lands for designation of wilder-
13 ness area within the Tongass National Forest known as the Endicott River
14 Wilderness area, Congress established a six-mile corridor or setback along
15 the west side of Lynn Canal for future economic and access needs; and

16 WHEREAS, because the Lynn Canal Highway Project proposes a highway on
17 the east side of Lynn Canal, the west side corridor is not appropriate for
18 the needs of the project; and

19 WHEREAS a similar corridor or setback along the east side of Lynn
20 Canal would assist development of the Lynn Canal Highway Project;

21 BE IT RESOLVED that the Alaska State Legislature asks the United
22 States Congress, in its deliberations relating to the Tongass National
23 Forest, to set aside a two-mile corridor or setback along the shoreline of
24 the east side of Lynn Canal, to be reserved specifically for a highway,
25 utility right-of-way, and related facilities, and to promote private sector
26 economic development activities.

27 COPIES of this resolution shall be sent to the Honorable George Bush,
28 President of the United States; the Honorable Dan Quayle, Vice-President of
29 the United States and President of the U.S. Senate; the Honorable Jim

1 Wright, Speaker of the U.S. House of Representatives; the Honorable George
2 J. Mitchell, Majority Leader of the U.S. Senate; the Honorable Samuel K.
3 Skinner, U.S. Secretary of Transportation; the Honorable Robert A.
4 Mosbacher, U.S. Secretary of Commerce; the Honorable Clayton K. Yeutter,
5 U.S. Secretary of Agriculture; and the Honorable Manuel Lujan, Jr., U.S.
6 Secretary of the Interior; and to the Honorable Ted Stevens and the Honor-
7 able Frank Murkowski, U.S. Senators, and the Honorable Don Young, U.S.
8 Representative, members of the Alaska delegation in Congress.

SENATE COMMITTEE REPORT

FIRST COMMITTEE OF REFERRAL

Date of 5-DAY NOTICE April 6, 1989
IN ACCORDANCE WITH UNIFORM RULE 23

FURTHER FIN

**FISCAL NOTE(S) MUST BE ATTACHED
IN ACCORDANCE WITH AS 24.08.035

DATE TURNED INTO OFFICE April 26, 1989

3/16/89
Mr. President:

TRSP Committee considered SJR 36

Congress to reserve a highway corridor or setback along the east shoreline of Lynn Canal

and recommended:

- replace with CS _____ same title
- attached amendment(s) and new title
- _____ letter of intent adopted
- do pass
- do not pass
- no recommendation
- individual recommendations
- further referral to _____

FISCAL NOTE(S) attached zero
 appropriation no FN attached

fiscal impact
 Gov. FN introduced w/ bill

MEMBERS SIGNING DO PASS

OTHER RECOMMENDATIONS

[Signature]

Fat Faint No Rec

Schunberg No Rec

[Signature]
Chairman signature and recommendation

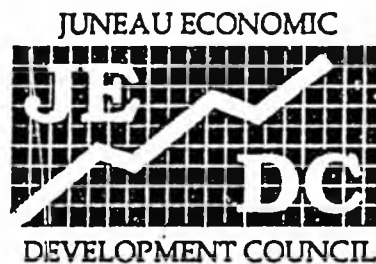
Committee backup attached

JUNEAU ROAD ACCESS IMPROVEMENTS

Prepared for:

Senator James Duncan

Prepared by:



March 8, 1989

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SECTION I

PURPOSE OF REPORT

In late September 1988, Juneau Senator James Duncan requested the assistance of the Juneau Economic Development Council in investigating the pursuit of improved road access to and from Juneau. Specifically, he requested the JEDC to attempt two tasks:

- o First, review recommended road development options proposed and studied to date and determine which is the most timely and cost effective to pursue from this point forward; and
- o Second, determine if there is any consensus within the community and region for that or any other road development option.

Senator Duncan indicated in his request that the JEDC study effort would have to proceed without monetary support. He further indicated that the study's findings and recommendations would be needed by his office no later than early March 1989 to allow him to propose and advance through the state legislature the allocation of resources necessary to initiate a sustained effort aimed at implementing the recommendations advanced by this report.

The study effort culminating in this report required the expenditure of approximately \$3,000 of JEDC funds in out-of-pocket expenses. In addition, the community of local civil engineers contributed the equivalent of approximately \$25,000 - \$30,000 of billable professional services to this effort.

SECTION II

METHODOLOGY

Access Options

Since 1921 a wide range of options have been proposed and studied for the development of improved road access to and from Juneau (see appendix A). While many were similar in scope or configuration, differences existed in the form of specific variations of routing, construction parameters and design.

To create some manageable parameters to this study effort, six options were identified around which the many variations could be identified. These options, however, were postulated as "generic" and the study fully recognizes that variations exist.

This generic approach made it possible to develop cost estimates whose value rested as much in their comparative value as providing target estimates around which specific design and construction could be initiated. The ability to compare one option to another was a critical demand of this study's design from the beginning. In spite of significant resources spent on various investigations in the past, this ability to reasonably compare one option to another based on a single set of standards and design parameters did not exist at the outset of this study.

The six generic access options identified for purposes of executing a comparative review and analysis are:

A. Taku River:

This option would require road construction to begin at road's end south of Juneau and proceed up the Taku River Valley, connecting to the existing road system in British Columbia south of the community of Atlin.

B. Juneau-Haines East:

This option would require road construction to begin at road's end just south of Berner's Bay and proceed northward along the Lynn Canal shoreline to a point almost due east of Haines. A shuttle ferry would link the road to Haines and a second shuttle would link Haines with Skagway.

C. Juneau-Haines-Skagway:

This option would differ from Option B by replacing the Haines/Skagway ferry link with a hard surface road.

D. Juneau-Haines West:

This option would require shuttle ferry service east-west across Lynn Canal from the current road's end to a point in the vicinity of William Henry Bay. Road surface would be constructed northward along the west shoreline of Lynn Canal with bridging to the existing road system on the Chilkat Peninsula, connecting at a point just north of the Haines airport. A shuttle ferry would provide access between Haines and Skagway.

E. Ferry Service:

This option would simply continue the existing ferry service between Juneau, Haines and Skagway in its present form. This option provides a baseline scenario against which to compare the other options studied.

F. High Speed Shuttle Ferry:

This last option would provide high speed shuttle ferry service between Juneau, Haines and Skagway utilizing two high speed vessels each capable of providing 2-3 round-trips per day within a 16-18 hour period. While this option is defined here as departing from a point near current road's end on the east side of Lynn Canal north of Juneau, the same scenario is possible operating out of the existing Auke Bay Ferry Terminal. A point of departure from the northern end of the existing road system only becomes critical when running time saved by the shorter distance is sufficient to provide increased frequency within the proposed 16-18 hour time period.

Construction Cost Estimates

Construction cost estimates were calculated based on the following base assumption.

First, Federal Secondary Highway standards were adopted for base design.

Second, a project study period of 25 years was established for purposes of calculating operation and maintenance costs for each option.

Third, revenues from shuttle and mainline ferry service were estimated across the same 25 year project study period and credited against ferry system operation and maintenance expenses in calculating total project costs.

All cost estimates were generated in terms of 1989 dollars. A 10% rate of return was built into the calculations across the 25 year project study period to keep cost estimates tied to 1989 dollar values.

Design and engineering services and contract administration costs were calculated at 10% and 12% respectively. Contract administration costs are normally calculated at a rate of 15%, however, given potential economy of scale savings, a reduced rate of 12% was used for calculations. In addition, a contingency factor of 5-10% was included in construction cost estimates. Normally, contingency, design services and contract administration are usually calculated at a combined rate of up to 40%. The combined rate of 30% used in this study effort represents minimum estimates.

Costs for the construction and maintenance of O&M facilities were included as project lengths were considered too excessive to service from existing facilities.

Customs facility costs were calculated for the Taku River option only, as they already exist on the road systems running north out of Haines and Skagway.

Avalanche shed costs were calculated based on the assumption that the respective options were to be kept open at all times.

Generating cost estimates for each of the proposed road options was a difficult task at best. The difficulty was compounded by the fact that several options did not have associated ground surveys and other field data normally available upon which to base detailed estimating. To offset some of this disadvantage, selected representatives from the volunteer engineering community who worked on this project, including a member of the JEDC board, visually surveyed the proposed routes by air. This reconnaissance provided significant verification for much of the judgement decisions made by the group during the course of their work.

Other Considerations

In addition to design, construction and operation and maintenance costs, other factors were evaluated across each option. These factors were assigned a value on a scale from 1 to 5, with 5 representing the most positive or highest benefit. These factors were then weighted to recognize that, in a comparative matrix, some were more significant than others. Maximum weighting was a multiplier of 30.

The only factor assigned a weighting value of 30 was that associated with environmental sensitivity. This factor could have been split into many more factors with a more specific focus as was done with the socio-economic

variables considered. To prevent socio-economic considerations from completely dominating this review of other considerations, environmental sensitivity was assigned a weighting factor which approximates the total weighting across the various socio-economic variables.

This study assumed that the significant environmental problems associated with each proposed road alternative could be mitigated. However, only a full EIS and design can verify that assumption.

For purposes of comparison, a final overall "relative factor" was calculated to compare the cumulative impact of these other factors from one option to the other. For purposes of establishing a baseline for comparison, the existing ferry system option was assigned an overall factor of 1. By dividing the total values of all factors considered for each option by the total generated for the existing ferry system option, the overall relative factor was determined.

Other factors considered include:

1. Environmental Sensitivity: (Weighted 30x)
A value of 5 (weighted 30x = 150) indicates minimum environmental sensitivity.
2. Geotechnical Complexities: (Weighted 3x)
A value of 5 (weighted 3x = 15) indicates minimum complexity in encountering weak/unstable/seismically-sensitive soils.
3. All-weather Reliability: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates minimal potential for route closures due to climatic conditions other than avalanches, e.g. high winds, heavy snowfall, icing, high water, etc.
4. Alternate Funding Potential: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates maximum potential for economic subsidy as a result of resource development or other funding, e.g. foreign participation, resource development such as mining/forest products/fisheries/tourism, and other one-time federal sources.
5. Regional Factors: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates maximum benefits enhancing the socio-economic and political integration of Juneau, Haines and Skagway.
6. Utility Joint Use Corridors: (Weighted 10x)
A value of 5 (weighted 10x = 50) indicates maximum potential use of the access option corridor for expansion of utilities, e.g. electrical distribution, pipelines, etc.
7. Travel/Distance Time Factor: (Weighted 10x)
A value of 5 (weighted 10x = 50) indicates

maximum benefits realized in reducing travel distance and travel time between major communities within the region and to other major highways serving the rest of the state, Canada and the lower 48 states.

8. Staged Construction Feasibility: (Weighted 10x)
A value of 5 (weighted 10x = 50) indicates maximum potential for realizing significant user benefits as a result of staged construction.
9. Induced Traffic: (Weighted 10x)
A value of 5 (weighted 10x = 50) indicates maximum potential for generating new and additional travel patterns to, from and within the region.
10. International Factors: (Weighted 3x)
A value of 5 (weighted 3x = 15) indicates maximum benefits to Juneau and the region enhancing the socio-economic and political relationships with Canada and, potentially, with Pacific Rim countries due to enhanced trade and visitation.
11. Socio-Economic Impact - Haines: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates maximum benefit to Haines socially and economically with the least amount of negative impacts.
12. Socio-Economic Impact - Skagway: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates maximum benefit to Skagway socially and economically with the least amount of negative impacts.
13. Socio-Economic Impact - Juneau: (Weighted 5x)
A value of 5 (weighted 5x = 25) indicates maximum benefit to Juneau socially and economically with the least amount of negative impacts.

The ratings assigned within each category for each option are subjective in nature. A more complete and objective approach would have necessitated a level of effort, at a minimum, normally expended for an environmental assessment. The approach adopted within this study is comparative in its structure. Ratings were assigned to delineate relative differences between options, thus, allowing a gross level of overall discrimination between them. The inherent limitations imposed by this comparative approach cannot be overemphasized.

A more complete iteration of the rationale driving the comparative ratings assigned for these "other considerations" can be found in Section VI of this report.

That section provides an option-by-option summary of both capital construction/O&M cost estimates and other factors considered.

Public input as well as specific interviews played a significant role in analyzing the comparative ratings assigned. This input process, however, was also limited by time and available resources.

As limited as this approach was in attempting to identify and consider non-construction/O&M cost estimates, the exercise was essential to satisfy the scope of this report. The most compelling reason for reviewing these other factors was that such considerations have rarely been included in previous studies, yet they shape construction decisions as strongly as construction cost estimates.

Given the generic description of each option adopted in this report, the reader is cautioned to review cost estimates as being more an expression of order of magnitude than detailed bidding cost estimates. This delineation of cost estimates to such an order of magnitude permits the general comparative analysis set out as an essential scoping demand of this study. However, actual cost estimates cannot be defended as falling within the +/- 10% range a full design could ascertain. Estimates most susceptible to falling outside of this range are those for facets of the proposed project other than actual road construction, e.g. tunnel construction, avalanche sheds, bridges, etc.

Lastly, construction cost estimates for road, bridges, avalanche sheds, tunnels, custom facilities, maintenance facilities and O&M were generated by Juneau-based civil engineers, currently or formerly employed in private practice or with the State of Alaska. Their time was donated to the study's effort.

Ferry system cost estimates were calculated by Alaska Marine Highway System staff.

Rating values assigned to each of the other considerations identified earlier in this section were made by JEDC staff after conducting public hearings in Juneau, Haines and Skagway and personal interviews with limited number of individuals and organizations. The Southeast Transportation Plan (1986) prepared for Alaska DOT/PF by Acres International Corporation was utilized for establishing comparative values across each option for specific variables, e.g. induced traffic and time/distance benefits. While the actual numbers proposed within this study are questionable due to insufficient data base and scoping, the values are useful in identifying comparative values across each option. Induced traffic study is a critical activity demanded in the next level of investigation of this overall project.

Yukon Territory

Carcross

ALTERNATIVES

- A Roadway from Thane to Atlin via Taku River Route
- B Road from Echo Cove to point opposite Chilkat Peninsula, Ferry to Haines and Skagway
- C Road from Echo Cove to point opposite Chilkat Peninsula, Shuttle Ferry to Haines, Road from Haines to Skagway
- D Ferry from Echo Cove to William Henry Bay, Road to Haines with Ferry to Skagway
- E Existing Ferry connect from Auke Bay to Haines and Skagway
- F High-Speed Shuttle Ferry from Echo Cove to Haines and Skagway

Alaska

Skagway

Haines

British Columbia

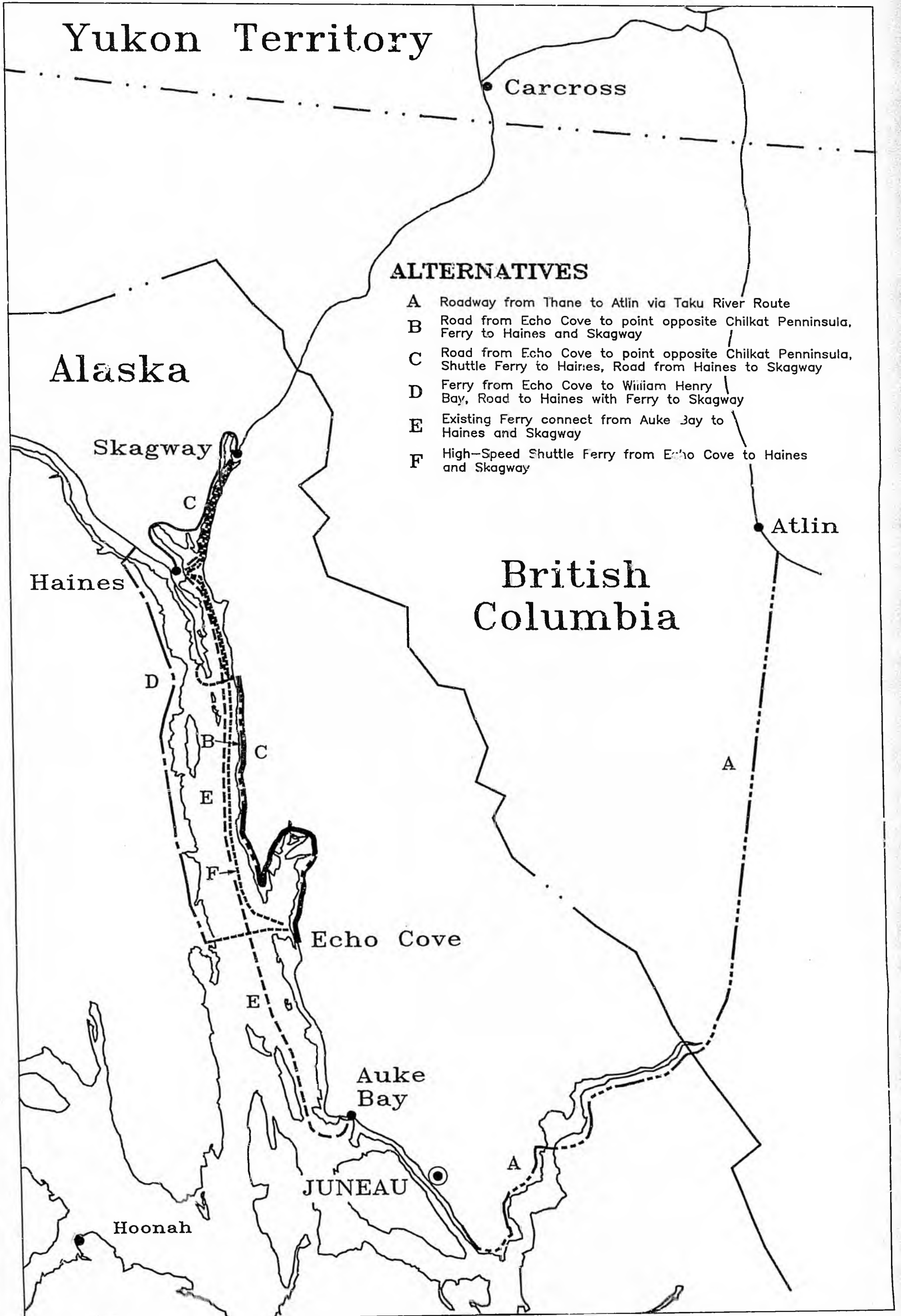
Atlin

Echo Cove

Auke Bay

JUNEAU

Hoonah



SECTION III

SUMMARY OF FINDINGS

Tables I and II provide in matrix form the summary of both sets of calculations and analyses generated by this study effort.

In reviewing capital construction/O&M costs and the consideration of other factors across the various options identified, several findings emerge:

1. When considering construction dollars alone, the least expensive option is associated with improving the marine transportation system in Lynn Canal by adding two high speed shuttle ferries to serve Juneau, Haines and Skagway.
2. Even when considering other factors (Table II), achieving greater access for Lynn Canal users ranks as high as road construction options for the Taku River Valley and the east side of Lynn Canal.
3. Initiation of high speed shuttle ferry service would provide the least amount of environmental disruption or impacts and the most benefits overall for the communities of Haines and Skagway. Juneau, too, will benefit significantly.
4. Road surface construction beyond Haines on either the east or west side becomes substantially more expensive and almost cost prohibitive.
5. Short of executing ground surveys, an Environmental Impact Statement and actual design needed to generate requests for construction bids within a range of +/- 10%, the Taku River, Juneau-Haines East and Juneau-Haines West are comparatively competitive. Of the two Lynn Canal options, the eastside route is lower in cost. The Taku River is especially competitive when considering that a significant portion of construction costs would likely have to be borne by the Canadian government.
6. More than 20% of the costs identified for the Taku River option are attributable to maintaining the existing ferry service in Lynn Canal.
7. Even operating the existing ferry system will cost almost as much as capitalizing and maintaining a high-speed shuttle ferry service within the same corridor.

8. While environmental sensitivity is a critical factor across all of the proposed road options, the westside option poses greater difficulty due to the shuttling across active fishing grounds and the particular sensitivity of eagle nesting and perching, especially along its northern reaches.
9. The westside option is also more vulnerable to the severe weather conditions in Lynn Canal because of the need to provide shuttle service across the Canal perpendicular to the prevailing winds and high sea conditions during storms.
10. Of the three competitive road options remaining after considering construction costs, the Taku River option and the eastside option along Lynn Canal as far north as the Chilkat Peninsula provide the best potential for shared corridor use by utilities.
11. Socio-economic impacts are the most beneficial for Juneau across all options and the least beneficial for Haines and Skagway with the Taku River option.

JEDC staff conducted a series of public hearings in Haines, Skagway and Juneau during February 1989 for the purpose of gaining input on public consensus for any of the proposed access options as well as for soliciting comments on the benefits and drawbacks of each option.

Except for the community of Skagway, there appears to be little consensus on which of the proposed options should be executed.

The Skagway City Council expressed during the public hearing conducted as part of a regular meeting of that body that they were on record opposing any road construction projects within the Lynn Canal. They expressed the concern that any such project would significantly weaken the economic foundation of the community. Public testimony at the same meeting reaffirmed this position in all cases.

The public hearing held in Haines drew approximately three dozen participants. The vast majority of those testifying took a similar position opposing any road construction up Lynn Canal. However, at a public meeting sponsored by the Haines Chamber of Commerce held almost two weeks later, approximately 30 individuals attended and the vast majority expressed their preference for road development up Lynn Canal but did not indicate a strong preference for either the east or west side.

The public demand for increased access to and from Juneau has little to do with the length of time it takes to travel from, for example, Juneau to Haines. Instead, demand is for the opportunity for greater frequency of travel and the most reasonable schedules possible.

Two public hearings held on consecutive nights in Juneau generated mixed preferences. The first hearing drew over two dozen participants with the majority expressing their desire for Lynn Canal road development. The second hearing drew similar numbers but testimony was fairly split between those supporting road construction and those preferring the maintenance or expansion of the existing ferry system. The second hearing offered more support for a Taku River option than the first hearing.

Individual comment, submitted by letter or by personal contact, was mixed but slightly favored no road construction.

The Juneau Branch of the Alaska Miners Association took a position at there January 27, 1989 meeting which was stated as follows:

"While the Juneau Branch of the Alaska Miners Association favors the concept of enhanced access to the State Capitol, it chooses at this time not to endorse any particular plan as the Branch feels the issue merits further study."

TABLE I

JUNEAU ACCESS ROAD
CAPITAL CONSTRUCTION / O & M
25 YEAR PROJECT LIFE

ACCESS OPTION	\$MILLIONS														
	Road Const. (1)	Bridge Const. (2)	Av'l'che Sheds (3)	O&M (1+2+3) (4)	Maint. Facil. (5)	Customs Facil. (6)	O&M (5+6) (7)	Ferry Term'ls (8)	Ferry Vessels (9)	O&M (8+9) (10)	Ferry Revenue (11)	PS&E @10% (12)	Cont'ct Admin. (13)	TOTALS W/O O&M (14)	TOTALS W/ O&M (15)
A) TAKU RIVER	109.6	20.5	3.0	5.0	2.5	4.0	1.0	0.0	29.5	72.4	-49.0	16.9	20.3	206.3	235.7
B) JUNEAU- HAINES EAST	78.0	12.7	15.8	5.4	2.5	0.0	0.0	2.5	18.6	75.1	-35.2	13.0	15.6	158.7	204.0
C) JUNEAU- SKAGWAY	230.0	28.8	32.0	8.5	2.5	0.0	0.0	2.5	4.7	30.1	-8.4	30.0	36.0	366.5	396.7
D) JUNEAU- HAINES WEST	84.8	26.2	8.0	5.4	2.5	0.0	0.0	3.6	17.5	74.6	-34.8	14.3	17.1	174.0	219.2
E) FERRY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.5	72.4	-49.0	0.0	0.0	29.5	52.9
F) FAST FERRY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	26.4	90.0	-50.2	2.9	3.4	34.9	74.7

NOTES
GENERAL

1. All figures represent 1989 dollars with 10% per annum dollar adjustment across 25 year project life.
2. O&M costs assume full 12 month/year use.
3. All cost categories (except PS&E and Admin) consider capital facilities only.
4. Ferry revenue represents cash income, therefore, displayed as a negative figure to offset ferry costs.
5. Contract Admin. estimated at 12% of all capital costs less O&M.
6. Maintenance facilities included as distances along each road alternative considered too great to allow use of existing facilities.
7. All ferry costs supplied by AMHS.

OPTION SPECIFIC

A. TAKU

1. Construction costs represent the entire length of the project. Canadian road mileage is approx. 2x the length of US miles; but construction costs are heavier on the US side, approx. \$80 million US/\$50 million Canadian.
2. Ferry costs are the same as maintaining the existing ferry system as this option would still demand a minimum of existing levels of service on Lynn Canal.

OPTION SPECIFIC CONT'D

B. JUNEAU-HAINES EAST

1. Ferry vessel costs include two shuttle vessels, the first linking road's end to the southern point on the Chilkat Peninsula, the second linking Haines and Skagway.

C. JUNEAU-SKAGWAY

1. Road construction costs are the same as Juneau-Haines East with additional costs estimated for road linking Haines and Skagway.
2. Tunnel costs included in road construction estimates.
3. Ferry costs include shuttle costs between east side and the Chilkat Peninsula.

D. JUNEAU-HAINES WEST

1. Ferry vessel costs include two shuttles, the first linking existing road's end to the west side on Lynn Canal, the second linking Haines and Skagway.
2. Ferry terminal costs represent additional terminal at existing road's end in vicinity of Echo Cove.

E. EXISTING FERRY

1. Ferry vessel costs represent existing vessel rehab and reconstruction only with no new vessels.
2. Costs estimated for existing levels of service.

F. HIGH SPEED SHUTTLE FERRY

1. Ferry costs include new high speed shuttle vessels only.

TABLE II
 JUNEAU ACCESS ROAD
 OTHER CONSIDERATIONS

ACCESS OPTION	Enviorn- mental Sensi- tivity 30x	Geo- tech Complex- ities 3x	All- Weather Reli- ability 5x	Alter- nate Funding Potent 5x	Region Factors 5x	Utility Joint Use Corridor 10x	Travel Distance Time Factor 10x	Staged Const. Feasib 10x	Induced Traffic 10x	Inter- national Factors 3x	Socio- Econ Impact Haines 5x	Socio- Econ Impact Skagway 5x	Socio- Econ Impact Juneau 5x	Total Values	Relative Factor
A) TAKU RIVER	60.0	9.0	20.0	25.0	15.0	50.0	30.0	30.0	30.0	15.0	5.0	5.0	25.0	319.0	1.2
B) JUNEAU- HAINES EAST	80.0	6.0	20.0	20.0	15.0	50.0	30.0	30.0	30.0	9.0	15.0	15.0	25.0	325.0	1.2
C) JUNEAU- SKAGWAY	60.0	6.0	15.0	20.0	15.0	50.0	50.0	30.0	50.0	15.0	20.0	20.0	25.0	375.0	1.4
D) JUNEAU- HAINES WEST	30.0	12.0	10.0	10.0	15.0	30.0	30.0	30.0	30.0	9.0	15.0	15.0	25.0	261.0	1.0
E) FERRY	150.0	15.0	25.0	5.0	15.0	0.0	10.0	0.0	10.0	6.0	10.0	10.0	10.0	266.0	1.0
F) FAST FERRY	120.0	15.0	20.0	5.0	20.0	0.0	20.0	20.0	20.0	9.0	20.0	20.0	20.0	309.0	1.2

NOTES

1. Rating scale of 1-5 with 5 representing least impact/
greatest benefit.
2. Ratings multiplied by weighting factor listed in
each column heading.
3. Relative factor calculated by dividing total value for
each option by total value calculated for ferry
option.

SECTION IV

CONCLUSIONS

The most cost effective and timely improvements to access between Juneau and the existing road network in Canada connecting the region to the rest of Alaska, Northwest Canada, and the lower 48 states can be achieved by enhancing the Alaska Marine Highway System. These improvements can be achieved by implementing a high speed shuttle ferry service augmented by mainline ferry service during peak demand periods, particularly the summer months.

The addition of the high speed shuttle ferry service would provide for higher frequency service and better scheduling of that service in Lynn Canal between Juneau, Haines and Skagway.

The implementation of high speed shuttle service can be initiated more quickly than any of the proposed road alternatives, thus generating greater benefits to more people sooner.

The development of a hard surface road north of Juneau would provide greater overall benefit to the region and provide a more stable and long-term improvement to the transportation and, concomitantly, to the socio-economic infrastructure of northern Southeast Alaska.

Road construction, however, is expensive and, while there is significant demand for its construction, that demand is divided across several alternatives.

The potential for the realization of this increased economic demand sufficient to justify moving a particular alternative to full design and construction, however, is already evident in the region. Mineral development on the east side of Lynn Canal is potentially just a few years from reality. Similar mineral development in northern British Columbia and the southern Yukon Territory is potentially as near.

The implementation of the U.S. Canada Free Trade Agreement is already beginning to lure increased northwest Canadian interest and participation in Pacific Rim trade. That trade demands greater access to deep water ports in northern Southeast Alaska and access to and between those ports. The U.S./Canada FTA is also generating growing interest and participation between U.S. and Canadian businesses within the region.

Even though the initial conclusion of this report is that the existing ferry system should be enhanced by adding high speed shuttle ferry service, this conclusion does not preclude the initiation of a sustained effort to advance the development and construction of improved road access to and from Juneau.

Three things are preventing road construction at this time. First, sufficient information to allow the selection of the best road alternative, i.e. up the east side of Lynn Canal with shuttle service to Haines and Skagway or up the Taku River Valley, will not be in hand until a full Environmental Impact Statement is executed across both scenarios.

Second, stronger economic demand is needed to convince some policymakers that the required appropriation is justified in terms of perceived and/or documented cost/benefit ratios. While this demand could materialize within the next few years, it is uncertain at this point in time.

Third, funding for new road construction is lacking statewide. Unless and until the state makes a commitment to the construction of new roads in an orderly and systematic way, local and regional economic opportunity will continue to be lost well into the 21st century.

Enhancing the existing ferry system with the addition of high speed shuttle ferries accomplishes three important goals. First, improved access with higher frequency and improved scheduling is realized as quickly as possible. Second, when economic demand matches the level of public demand to warrant expenditure of significant amounts of road construction funds, these high speed shuttle ferries can be reassigned to other legs on the AMHS which could benefit from higher frequency/better scheduled service.

Third, sufficient time is permitted to execute the necessary EIS and identify the preferred alternative for road construction as well as a funding source or sources to initiate road construction.

The initiation of a sustained effort to advance the development and construction of improved road access to and from Juneau requires the execution of several steps before actual design and construction can begin. A full Environmental Impact Statement must be prepared for the two options that emerge from this study as the most feasible for development: the east side of Lynn Canal between Juneau and Haines and the Taku River corridor.

This EIS effort demands the immediate allocation of resources to execute. However, even with prompt action, the effort will likely take two years due to the complexity of issues involved. Besides the traditional areas of investigation, the effort needs also to undertake a

thorough induced traffic demand study so that a clear cost/benefit comparison between the two options can be delineated.

Most importantly, a commitment to construct this and other new roads must be made by the State of Alaska and a plan identified for their funding. The most direct approach, and an idea not new to this report, would be to allocate up to 10% of the annual Aid to Federal Highway Funds received by the State of Alaska to a new road construction fund. While this would not amount to enough funds in any one year to undertake full construction of this or any other new road project, it would allow the funding of staged construction of priority projects. Staged construction results in full construction. Waiting for the identification of sufficient funds to construct a new road in its entirety almost guarantees no construction at all.

Lastly, discussions between the State of Alaska and the British Columbia and federal governments of Canada must be initiated immediately to define the thresholds of demand and funding participation necessary to execute joint new road construction. This is especially important in examining the Taku River option to allow a full comparative review with the east Lynn Canal corridor.

Major new road construction is a complicated and long-term commitment. If the State of Alaska waits until full demand is evident before initiating the initial steps necessary to realize a project (i.e. EIS, corridor identification, funding identification, Canadian participation, etc.) road construction is needlessly set back by several years. The resultant economic capture and socio-economic benefits are set back as well and some significant opportunities lost.

SECTION V

RECOMMENDATIONS

In summary, the following recommendations are advanced:

RECOMMENDATION I:

The State of Alaska, through the Department of Transportation and Public Facilities, specifically the Alaska Marine Highway System, should initiate the identification and allocation of resources to introduce high speed shuttle ferry service in Lynn Canal between Juneau, Haines and Skagway.

The actual implementation of this improved system should begin as soon as possible.

RECOMMENDATION II:

The State of Alaska should go on record with the commitment to improve hard surface access to and from Juneau, pending the results of detailed EIS and other investigations and negotiations with Canadian British Columbia and federal governments, either up the east side of Lynn Canal as far north as Haines or up the Taku River Valley.

This commitment should be to construct one of the two alternatives recommended in this report, thereby advancing the total process to its next logical step. Any action short of this will result in continued non-focused debate that will not lead to project delineation and construction.

This commitment will allow the use of federal matching funds to execute the required EIS and cost benefit analyses necessary to select the best of the two proposed alternatives.

RECOMMENDATION III:

The State of Alaska, through the Department of Transportation and Public Facilities, should allocate sufficient resources and execute a full Environmental Impact Statement of the two road access alternatives recommended in this report (Recommendation II).

This EIS effort should be initiated in FY90.

This EIS effort should include a cost benefit analysis of the two alternatives that includes a detailed comparison

of induced traffic generated by the two proposed alternatives.

RECOMMENDATION IV:

The State of Alaska, through the Office of the Governor, should initiate immediate discussions with the Canadian British Columbia and federal governments for the purpose of establishing demand thresholds and the protocol for the construction of joint road projects.

RECOMMENDATION V:

The State of Alaska should initiate a new road construction fund by allocating up to 10% of annual federal aid to highways appropriations to the State of Alaska for that purpose.

SECTION VI

ACCESS OPTION REVIEW

This section presents a review of each of the six generic access options reviewed by this study against the capital construction/O&M cost variables and other factors considered as displayed in Tables I and II in Section III of this report.

OPTION A: TAKU RIVER

o Capital Construction/O&M Costs

The Taku River option would begin at road's end near Thane and extend up the Taku River Valley, connecting to an existing road south of Atlin, B.C. Total new road length is approximately 120 miles. Approximately 44 miles lie on the U.S. side of the border and the remaining 76 miles extend from the border to the road's intersection south of Atlin.

Construction on the shorter U.S. portion of the road would be more expensive than the Canadian length due to more difficult terrain. Over 80% of the road on the Canadian side of the border would traverse relatively flat topography. Conversely, approximately 66% of the U.S. road length would traverse moderate to steep sloping terrain.

The proposed road would bridge the Taku drainage at a point below Grizzly Bar. This would avoid the leading edge of the Taku Glacier.

Bridging costs along the entire route mostly require spans of 80 feet or less, although lengths of 100 feet and greater are required in some places.

The construction of avalanche sheds are required in selected locations to enable the route to be used all year around. However, these avalanche control measures are less demanding than other options investigated along Lynn Canal.

A road maintenance facility would be required along the new road since its 120 mile length would be too difficult to maintain from existing facilities in Juneau and Atlin.

Construction of custom facilities are required at the border, similar to facilities at border crossings north of Haines and Skagway. This is the only option investigated with this requirement as the facilities already exist at the border crossings at the northern end of the Lynn Canal corridor.

A Taku Road would still demand Lynn Canal corridor access. As a result, at a minimum, existing ferry service between Juneau, Haines and Skagway would need to be

maintained. The resultant ferry costs attributed to this option are the same as those calculated in Option E (Existing Ferry Service) for maintaining the existing ferry system.

Since the ferry service would also generate revenue, this projected income has been included in the cost matrix as a negative number to offset the total O&M costs to the ferry system.

Road construction costs were calculated across the entire proposed 120 mile length, including the approximately 76 miles in Canada. Approximately \$50 million could be subtracted from the total cost estimates to represent the Alaska/U.S. portion of total project expenses. However, unless the Canadian government agrees to participate, the project would lead nowhere and, thus, not be competitive with other options studied on a cost/benefit basis. For this reason, total project costs are included.

o Other Considerations

The Taku River road project poses significant environmental mitigation challenges. While the areas of sensitivity are different in scope than those along the Lynn Canal coast, this sensitivity is of the same order of magnitude. The river valley hosts a large variety of flora and fauna. The area is active with hunting/recreation use. The relative isolation of this area is held by many to be critical for the long-term balance of the ecosystem.

The river's mouth emerges from and into critical fish habitat areas, compounded by management of returning salmon from both sides of the border.

In summary, road access would have to mitigate a range of significant environmental problems. This report assumes these problems can be solved, but only a thorough Environmental Impact Statement and design effort can verify this assumption.

Soil conditions and other geotechnical complexities are more favorable here than along the east side of Lynn Canal, but not as favorable as along Lynn Canal's west side.

While keeping the road open all year long would not be an easy task, all weather reliability is feasible with some avalanche shed management. The lack of long stretches of steep slopes and tunnels make twelve-month maintenance quite feasible.

Of all options considered in this report, the Taku option has the most potential for securing alternate funding, that is funding from sources other than the State of Alaska and federal highway assistance programs. Not only is there a potential for support from specific mining ventures, if and when their projects develop and the road

reaches design certainty, but Canadian government participation must be assumed.

This option provides no more or less, positive or negative, impact on the economic, political and social integration of northern SE Alaska than the other options considered in this study.

The Taku road option would provide excellent opportunities to power and other utility providers for shared corridor use. This availability of existing developed corridors with road access for construction and maintenance is critical to keep utility capitalization costs down. The Taku corridor would provide shared corridor use for the execution of some eventual form of shared power intertie with British Columbia.

Actual travel distance between Juneau and Whitehorse is only about 20 miles longer up the Taku River Valley than through Skagway. However, this option does not increase or benefit travel/distance benefits between Juneau, Haines and Skagway.

All road options investigated would provide opportunities for staged construction, ranging from mining access support, access to private property and greater access for hunting, fishing and recreational use.

All recent studies agree that the presence of a road north from Juneau would increase traffic flow to and from the community. How much induced traffic there would be is uncertain. Comparatively, the Taku option would significantly increase traffic from Juneau to Whitehorse and could attract significant traffic from that area into Juneau. However, this benefit is reduced by the fact that the route would not significantly alter traffic patterns along Lynn Canal.

The enhancement of trade and socio-economic relationships with British Columbia and Yukon Territory interests is strongest with the presence of an uninterrupted hard surface road running between Alaska and Canada. On the relative scale adopted by this report, the Taku option is rated the highest. Interruption of hard surface road by shuttle ferries as found in the other options reduces this capability somewhat.

Juneau would receive significant socio-economic benefit from this or any of the other hard surface road options considered in this report. However, the Taku River option would provide the least positive impact for Haines and Skagway than any of the other options investigated. The Taku option would not change travel patterns within the Lynn Canal corridor significantly.

OPTION B: JUNEAU-HAINES EAST

o Capital Construction/O&M Costs:

This option would begin at Echo Cove and proceed up the northwest shoreline to Lynn Canal. At this point the road would follow the shoreline of the Canal to a point approximately due east of the lower end of the Chilkat Peninsula. A shuttle ferry would connect the road's end with the existing road system running south from Haines. Transportation between Haines and Skagway would continue to be provided with ferry service.

Total new road construction is approximately 43 miles on the east side of Lynn Canal with an additional 3 miles of new road construction required on the southern tip of the Chilkat Peninsula.

Although these specific road points were identified for the purpose of calculating construction estimates, the actual location of the northern terminus of the proposed road could vary. The termination of road construction and construction of shuttle facilities to Haines depends on the delineation of several factors outside of the scope of this report. Location of a suitable site for the shuttle facilities on the east side of Lynn Canal and the concomitant facilities on the southern reaches of the Chilkat Peninsula could dictate a different road configuration than that proposed here. Environmental issues could dictate extension of the east side road north as far as the Katzehin River drainage with shuttle service direct to the existing ferry terminal in Haines. Variations in cost estimates allowing for these varying possibilities, however, did not yield significant variations in total cost estimates. The reader is cautioned, though, to review this option with the understanding that the exact configuration of the road's northern terminus and shuttling to Haines cannot be resolved until after a full EIS is prepared and full design scoped.

The steep slopes and avalanche areas along this proposed route drive road construction costs higher than the less demanding terrain in the Taku River Valley and along the west side of Lynn Canal. As a result costs for avalanche control to provide all year around access along the route are also significantly higher.

This option requires the least amount of bridge construction of all access options investigated. Most bridging involve spans of 80 feet or less.

The construction of maintenance facilities are required by this, and all other road options, as the length of the proposed road does not make it feasible to maintain it from existing facilities.

Ferry costs are based on estimates for a shuttle vessel

connecting the road's end to Haines and a separate vessel maintaining access service between Haines and Skagway.

Two ferry terminals would be required to provide shuttling between the road's end and the southern tip of the Chilkat Peninsula.

As with all other road options, ferry revenue is calculated and represented as a negative number within the cost matrix to offset ferry system O&M cost projections.

O Other Considerations:

Environmentally, the most sensitive areas within the scope of this option are in the vicinity of Echo Cove, the terminus of proposed road construction at or south of the Katzehin River drainage and the southern reaches of the Chilkat Peninsula. Echo Cove is a critical habitat area as well as an area actively enjoyed for recreation purposes. The isolation of this area from direct road access is considered by many to be critical to maintaining the balance of its ecosystem.

In addition the southern terminus of the Chilkat Peninsula represents the transition of the Lynn Canal water-based ecosystem with the mainland reaches of the Peninsula north. Even if shuttling was redirected from the Mud Bay area on the southern peninsula to the existing ferry terminal in Haines, shuttling from the vicinity of the Katzehin drainage poses its own significant environmental mitigation demands.

As indicated for each option, this report assumes that these environmental issues can be mitigated. However, only a detailed Environmental Impact Statement and full project design can verify this assumption.

The slopes along Lynn Canal pose the greatest potential for encountering geotechnical complexities in the form of weak, unstable and/or seismically-sensitive soils.

All weather reliability of this option is enhanced only with the investment of avalanche controls. The capitalization of these costs are significant, as represented in the cost matrix (Table I) and discussed above. With these efforts, though, maintaining year around traffic access is feasible.

Alternate funding is possible in the form of participation from mining interests along the eastern side of Lynn Canal. While these mining efforts are only in exploratory stages, there full development could be economically enhanced by road development. However, these same mining interests have made it clear that their participation would only be offered if their mines were to be developed and if the road project had matured past EIS stages into full design.

Regional integration of northern SE Alaska is

comparatively equal across all road options considered within this report.

The east side of Lynn Canal provides good potential for joint corridor use by utilities. Extension of power from Juneau to mining development on the northern side of Berner's Bay is economically feasible with the presence of a developed access corridor. Even extension of power from Juneau to Haines becomes economically feasible.

While this road option would enhance travel time between Juneau and Haines, the savings are mitigated by the wait for shuttle service to and from the Chilkat peninsula. Some additional benefits, however, are realized by reducing the reliance on scheduling of existing ferry service. Departures to and from Juneau and Haines would only be limited by the schedule of a high frequency shuttle ferry connecting Haines to the east side of Lynn Canal.

Staged construction would provide interim benefits, primarily access to mining development and increased recreational access.

While additional traffic would be generated between Juneau and points north with the construction of this option, the extent of this induced traffic appears to be inversely proportional to the number of road interruptions for shuttling by ferry. Any shuttling system provides the potential for some bottlenecking along the corridor. For this reason, ratings for this variable are moderate. However, the reader is cautioned to remember that a full determination of induced traffic necessitates a more detailed study than any executed to date.

Some increased benefit would be realized in increasing economic and social relationships with British Columbia and Yukon Territory with the construction of this option, but these benefits would not be as great as those derived from options A and C.

As with other road options, Juneau would derive significant benefits from the execution of this option. Haines and Skagway would benefit as well, but those benefits would be mitigated by potential negative impacts. Easier access to Juneau could significantly alter existing buying patterns within each community. Also, easier access could impact the nature of the tourist industry within each community. Because of the potential for these negative impacts, ratings for this variable for each community were moderate.

OPTION C: JUNEAU-HAINES-SKAGWAY

o Capital Construction/O&M Costs:

This option replaces the ferry connection between Haines and Skagway in Option B (Juneau-Haines-East) with a hard surface road link. While several options for construction of such a road were examined, the option selected for calculation of construction estimates extends existing road surface north from Haines along the west side of Chilkoot Inlet around the Lutak Inlet and up the west side of the Ferbee River drainage. The road is connected to Skagway with 2-3 miles of tunneling.

Cost estimates for the Juneau to Haines portion of this option are the same as those provided for Option B. The additional costs are those calculated for the Haines to Skagway link.

The most significant costs associated with this option are those for tunneling. These costs are difficult to determine without extensive ground survey and other field investigations. Tunneling costs are directly proportional to the character of rock encountered. Often this rock will require reinforcement. In addition, construction underground is more expensive than construction of the same surface above ground. Drainage, ventilation, hauling, etc. require more extraordinary construction measures than surface construction. Cost estimates for this option assumed average conditions possible for tunnel construction. Even using average scenarios, tunneling costs were estimated to reach \$50 million per mile. However, without detailed field investigation, these costs are very gross estimates.

Total new road miles to be constructed by this option add approximately 24 miles to those proposed for Option B. Of these, 16 miles traverse steep topography.

Bridging and avalanche shed construction add significantly to the costs for construction of this option.

Ferry costs are reduced significantly since the shuttle ferry from the east side of Lynn Canal to Haines is the only required ferry cost associated with this option. While ferry O&M costs decrease proportionately, so do projected revenues from the shuttle system.

While construction estimates are difficult for this option, the costs for constructing the Haines to Skagway road link drive overall costs well beyond those of any other option considered. These high construction costs, alone, make this option the least feasible of those investigated.

o Other Considerations:

The differences between this option and Option B are generated by the substitution of the hard road link between

Haines and Skagway for the ferry service. Ratings across factors other than construction/O&M costs considered in this report differ from those in Option B in three major areas.

First, increased benefit would be realized in calculating time/distance impacts. With the availability of road surface connection, travel time between Haines and Skagway would be enhanced with the elimination of reliance of scheduled service between the two communities. Departure times would be at the discretion of the traveler and would not require conformance with any scheduled service, no matter how frequent.

Second, this increase in traveler discretion would increase the amount of users traveling the corridor. Induced traffic benefits would equal those of the Taku option in relative numbers. Again, the reader is cautioned that actual induced traffic projections are not possible with existing data. However, existing data do suggest that with only one shuttle leg on the entire route, induced traffic would probably equal that of an access corridor that was all hard surface.

Third, road intertie between Haines and Skagway would generate the most benefit of the economies of the two communities. While each community would likely experience significant impacts, the connection of the two economies would create opportunities both individually and in tandem that are presently unavailable to each. Haines would be able to take greater advantage of potential opportunities with its Canadian neighbors. The availability of a hard surface loop to and from Whitehorse would likely greatly increase the amount of summer RV traffic through each community as well as expanded opportunity for destination packaging for visitor traffic flowing north from the Inside Passage.

While this option generates the most positive ratings across these factors other than construction costs, these greater benefits do not offset the proportionately higher costs for construction, operation and maintenance.

OPTION D: JUNEAU-HAINES WEST

o Capital Construction/O&M Costs:

This option would connect the east and west sides of Lynn Canal with shuttle service from the vicinity of Echo Cove on the east to the vicinity of William Henry Bay on the west. From this point new road would be constructed up the west side of Lynn Canal connecting to Haines by bridge across the Chilkat River over the McClellan Flats to a point on the existing road system just north of the Haines Airport.

Total new road construction is estimated at approximately 68 miles.

This option requires more bridge construction than options up the east side of Lynn Canal, with the significant increase associated with bridging the Chilkat River. Avalanche shed construction to enable twelve month open access is the least costly of the Lynn Canal options due to the less difficult terrain along the west side of the Canal.

As with other road options, a maintenance facility is required since service would not be feasible from existing facilities in Haines and Juneau.

Two ferry vessels would be required to service this option. The first is needed to provide shuttling from Echo Cove to William Henry Bay and the second is required to provide access between Haines and Skagway. Construction of ferry terminals would be required on both ends of the Echo Bay/William Henry Bay shuttle. These are the most expensive terminal costs estimated across the options explored due to specific requirements imposed by landfall demands in the area of William Henry Bay. As with other options, projected ferry revenues are included in the cost matrix (Table I) as a negative number to offset ferry costs for O&M.

o Other Considerations:

While all road construction options are significantly environmentally sensitive, the west side of Lynn Canal appears to be more sensitive than the others. Not only do the specific terminus points of the shuttle ferry in Echo Cove and William Henry Bay pose impact issues of magnitude, but the entire length of the proposed road system traverses an area with greater flora and fauna interaction than on the east side. Bird habitat is more abundant and eagle nesting is significant, especially on the northern end of the route. This difference is considered worth noting and calling attention to by assigning a rating associated with a higher environmental sensitivity.

Conversely, geotechnical complexities associated with unstable, weak and seismic-sensitive soils is the least

sensitive on the west side of Lynn Canal.

While all weather reliability of the road portion of this option is as good, if not better, than other options, the shuttling across a wide stretch of Lynn Canal perpendicular to prevailing winds makes this the most difficult option to keep open across the entire year. The shuttle system would no doubt experience proportionately more down time due to weather conditions than other options investigated.

Other than some private land holdings along this route, there is little other active economic interest that would yield significant potential for alternate funding of the project.

Some joint utility corridor use could feasibly be developed along this corridor, but its potential is not as high as for east side options. Traversing Lynn Canal is an extraordinary expense to assume to access the land corridor from that point north.

Shuttling frequency would provide greater incentive for travel along this option as is the case for east side options. Like other options requiring shuttle service, benefits are realized by increased frequency of access as opposed to any significant time saved enroute.

Benefits realized from staged construction are primarily two-fold. First, private property holdings would realize benefit from greater access and, second, greater recreational access to the west side of Lynn Canal could be provided.

As with east side options, construction of this option would increase traffic along the Lynn Canal corridor. However, this induced traffic would not reach levels typically associated with a full hard surface road with no ferry shuttle interruption because there would still be the need to rely on the scheduling of ferry service. As with other options discussed, detailed induced traffic studies need to be executed before this variable can be enumerated with any confidence. Relative to other options, however, benefits would accrue to this option sufficient to warrant a moderate rating.

In evaluating impacts on socio-economic impacts with Canada, this option rated the lowest due to the greatest vulnerability to weather closures and the longest shuttling times associated with any of the other road options.

This option rated evenly with Option B (Juneau-Haines West) with respect to socio-economic impacts to Haines, Skagway and Juneau for the same reasons discussed within that option.

OPTION E: EXISTING FERRY SYSTEM

o Capital Construction/O&M Costs:

This option serves as the base option against which the other options can be compared. Capital construction and O&M costs were calculated for the maintenance of the existing ferry system that presently serves the upper Lynn Canal, linking Juneau, Haines and Skagway.

The only capital costs are those in the three columns associated with the ferry system since no new road construction would be executed.

Ferry vessel costs are those calculated by the Alaska Marine Highway System needed to keep existing vessels operational across the 25 year period identified by the parameters of this study. The \$29.5 million dollars identified would not be used to purchase any new vessels but, rather, would be used for periodic repair and reconstruction of existing vessels to keep them operational.

As with other options, ferry revenue was calculated for the same 25 year period and included as a negative number in the cost matrix (Table I) to offset O&M costs.

This report does not propose that maintenance of the existing system with no additional carrying capacity would satisfy even minimum projected user demand on Lynn Canal over this time period.

The Southeast Alaska Transportation Plan, 1986, prepared for the Alaska Department of Transportation and Public Facilities, recommends the addition of high speed shuttle ferry service between Juneau, Haines and Skagway to the existing mainline vessel service now operating within the corridor. This option is reviewed in more detail and presented as the sixth option examined within this study.

Another variation on this option is the addition of a mainline vessel to service the entire system, including the provision of additional service in Lynn Canal. Capital construction costs for a Malispinia-class vessel is approximately \$59 million.

While other options have been proposed for improving existing ferry service, for purposes of maintaining consistency with previous studies, this study effort identified the high speed shuttle as the optimum alternative to examine for improved ferry access between Juneau, Haines and Skagway. The presentation of Option E, maintaining the existing ferry service, is presented to provide baseline costs against which to compare other options and is not intended to represent a viable alternative for improved access to and from Juneau.

o Other Considerations:

The analysis of the factors other than construction/O&M

costs for this option is intended to provide a similar baseline against which to compare other options.

Values displayed in Table II are ratings on a five-point scale which indicate the benefits of the existing system compared to no ferry system. Allowing for other options reviewed by this study to represent higher values on the five-point scale dictate minimum values for this option across the various categories. Again, the reader is cautioned to review the data presented in this report and summarized in Table II as relative values between the various option examined and not a presentation of absolute values for each alternative.

OPTION F: HIGH SPEED SHUTTLE FERRY

o Capital Construction/O&M Costs:

The high speed shuttle ferry option would require the construction of two new vessels which would provide daily round-trip service between Juneau, Haines and Skagway. The vessels would be large enough to accommodate approximately 40 vehicles and 200 passengers. Limited van capacity could be accommodated. Each vessel could operate at speeds more than twice that of existing vessels and each would be scheduled to provide 2-3 round-trips between Juneau, Haines and Skagway within a 16-18 hour time period, for a total of 4-6 round-trips per day.

High speed shuttle service could be initiated out of Echo Cove at the end of the current road on the east side of Lynn Canal or could be operated out of the existing facilities at Auke Bay.

Costs for a ferry terminal at Echo Cove were calculated and included for this option to allow for the execution of that alternative. The only immediate advantage for operating out of Echo Cove would be to save enough running time across the 16-18 day to complete another leg on the system.

O&M costs were calculated by AMHS to include augmentation of the high speed shuttle service with mainline vessels, primarily during peak demand in the summer. AMHS spread the capital costs for vessel repair and reconstruction across the entire system so that only a very small portion was allocated to the Lynn Canal corridor. As a result the \$26.4 million identified for capital vessel costs is primarily the cost identified for construction of the two high speed vessels.

As with all other options, ferry revenue has been estimated and displayed as a negative number to offset O&M costs for the ferry system.

Other Considerations:

The only environmentally sensitive facet of this option is the construction of a ferry terminal in Echo Cove. For this reason, the rating value assigned is lower than that for the baseline option of maintaining the existing system with no capital construction. Echo Cove is a sensitive habitat. Design and construction would have to be preceded by detailed studies of the area to make sure that construction would not cause any serious impact to the area. This study assumes that any such impacts can be mitigated but only a detailed study coupled with full design can verify that assumption.

Since the high speed shuttle vessels would be considerably smaller than existing mainline vessels, they would be more susceptible to down time caused by weather conditions in Lynn Canal. While not as reliable as the existing mainline vessels they would still provide greater reliability than the road links proposed in Options A-D.

The high speed shuttle ferry option can be implemented faster and at a lesser cost than the road options reviewed in this study. This significant increase in potential frequency for travel between Juneau, Haines and Skagway can be accomplished without altering the socio-economic base of either Haines or Skagway as road terminus communities. For these reasons, regional benefits were rated higher than other options.

Travel time and frequency of travel permitted by this option are less beneficial than for road options. However, the significant increase in frequency for travel is significantly greater than that offered by the existing ferry system. Rating values assigned within this category reflect that relationship between the proposed options.

Some limited benefit to users could be realized by adding a single high speed shuttle ferry vessel to the corridor. The benefits are primarily those associated with greater frequency of service created by the increased number of runs between the communities of Juneau, Haines and Skagway.

Induced traffic generated by this option could reach the same levels as the two proposed road-shuttle options if the system was able to provide a full six round-trips per 18 hour day. The greater all-weather reliability and the capability of some reservation scheduling would offset the risks of bottlenecking at a road shuttle point, especially during peak demand periods. However, this full 6 round-trips/day configuration is probably optimistic. For this reason, rating values for this category displayed in Table II show a slightly reduced benefit provided by this option for induced traffic.

While high speed shuttle service would offer less than full benefit impacts for Juneau when compared to road construction options, this service would provide significant benefit to Haines and Skagway. Each community would retain their socio-economic structure as a road terminus community and increases in the economic sectors associated with ferry traffic without altering the physical and social structure within the communities. The latter was a fear expressed by many residents of both communities during the public hearing process of this study effort.

APPENDIX A
CHRONOLOGY OF EVENTS
JUNEAU ROAD ACCESS
1921 - 1989

CHRONOLOGY OF EVENTS - JUNEAU ROAD ACCESS

PROVIDED BY SENATOR JIM DUNCAN, JANUARY 20, 1989

- 1921 TAKU VALLEY RECON. REPORT PREPARED FOR THE ALASKA ROAD COMMISSION - TIDEWATER TO THE CANADIAN BORDER.
- 1951-52 RECONNAISSANCE REPORT ON PROPOSED TAKU RIVER ROUTE AND PHOTO RECON. REPORT FOR THE BPR.
- 1954 DECEMBER - RECONNAISSANCE SURVEY OF THE TAKU ROUTE FOR THE ALASKA ROAD COMMISSION.
- 1963 TAKU GLACIER EVALUATION STUDY BY MAYNARD MILLER FOR THE ALASKA DEPT. HIGHWAYS AND BPR - INDICATED UNSTABLE SITUATION.
- 1964 NOVEMBER - RECONNAISSANCE REPORT FOR PROPOSED FOREST HIGHWAY DONE FOR THE U.S. FOREST SERVICE. ACCESS TO TIMBER AND THE GLACIER BAY NATIONAL MONUMENT THE GOAL.
- 1967 APRIL - RECONNAISSANCE REPORT ON THE CHILKAT RIVER CROSSING BY DOT/PF - TO PICK CROSSING LOCATION. ASSUMES A WEST SIDE ROUTE.
- 1970 STATE DEPT OF. HIGHWAYS DEVELOPS PLANS FOR CHILKAT RIVER CROSSING BUT FINDS RIGHT OF WAY PROBLEMS WITH INDIAN RESERVATION, ALSO ENVIRONMENTAL ISSUES ARISE.
- 1974 SEPTEMBER - LYNN CANAL ENVIRONMENTAL ASSESSMENT FOR THE ALASKA DEPARTMENT OF HIGHWAY.
- 1974 OCTOBER - ALASKA DEPARTMENT OF HIGHWAYS PREPARES A COST ESTIMATE ON THE JUNEAU TO SKAGWAY ROUTE.
- 1975 LYNN CANAL TRANSPORTATION CORRIDOR PUBLIC HEARING BROCHURE PREPARED BY THE DEPT. OF HIGHWAYS. CONCENTRATED PRIMARILY ON SURFACE TRANSPORTATION, TRANSPORTATION COSTS AND ENVIRONMENTAL ISSUES.

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JUNEAU ROAD ACCESS
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- 1979 SOUTHEAST TRANSPORTATION PLAN BY WILBUR SMITH & ASSOC. EXAMINES TAKU ROUTE AND ROUTES TO HAINES AND SKAGWAY.
- 1980 COST ESTIMATES PREPARED ON JUNEAU TO HAINES ROUTE BY DOT/PF
- 1981 JANUARY - JUNEAU TO HAINES LOCATION INVESTIGATION DONE BY R&M FOR THE SENATE TRANSPORTATION COMMITTEE.
- 1986 EVALUATION OF CORRIDOR ALTERNATIVES BY ACRES INTERNATIONAL FOR DOT/PF
- 1987 MARCH - GREATER JUNEAU CHAMBER OF COMMERCE, ECONOMIC DEVELOPMENT COMMITTEE PREPARES AN EVALUATION AND RECOMMENDATIONS STATING THE ACRES REPORT DID NOT INCLUDE IMPORTANT ECONOMIC FACTORS.
- 1987 MAY - SENATOR DUNCAN APPROPRIATES \$100,000 TO DETERMINE THE ECONOMIC FEASIBILITY OF ROAD ACCESS TO JUNEAU.
- 1988 MARCH - THE FEDERAL HIGHWAY ADMINISTRATION INDICATES THE NEXT STEP IN THE PROCESS SHOULD BE AN ENVIRONMENTAL IMPACT STATEMENT FOR A HIGHWAY CONNECTION BETWEEN JUNEAU, HAINES AND SKAGWAY. THE FHWA WOULD REQUIRE A COMMITMENT ON THE PART OF THE DEPARTMENT TO BUILD IN ORDER TO PROCEED.
- 1988 AUGUST - MAYNARD MILLER RELEASES INFORMATION STATING THE TAKU GLACIER WAS ADVANCING AT AN ACCELERATING RATE AND COULD DAM THE RIVER IN SIX TO 10 YEARS.
- 1988 SEPTEMBER 15 - MAYNARD MILLER RETRACTS HIS PREVIOUS STATEMENT SAYING AN ASSISTANT HAD CONFUSED FEET WITH METERS.
- 1988 SEPTEMBER - SENATOR DUNCAN ASKS DNR, FISH AND GAME AND THE U.S. GEOLOGICAL SURVEY TO DETERMINE WHETHER OR NOT THE INFORMATION ON THE GLACIAL PROBLEMS ON THE TAKU ROUTE WAS CORRECT.
- 1988 SEPTEMBER - SENATOR DUNCAN ASKS THE JUNEAU ECONOMIC DEVELOPMENT COUNCIL TO TAKE THE LEAD IN PULLING TOGETHER A COMMUNITY CONSENSUS ON A ROAD OPTION.

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JUNEAU ROAD ACCESS
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- 1988 NOVEMBER - SENATOR COGHILL ASKS FOR AND RECEIVES A \$6,000 GRANT FROM THE SENATE LEADERSHIP FUNDS FOR RED SWANSON.
- 1989 JANUARY 18 - SENATOR COGHILL INTRODUCES SB 124 AND SB 125 WHICH WOULD AUTHORIZE DOT/PF TO CONSTRUCT THE LYNN CANAL HIGHWAY PROJECT AND APPROPRIATE \$102.0 MILLION IN FEDERAL AND STATE FUNDS.
- 1989 DUE MARCH 1 TO SENATOR DUNCAN, A REPORT FROM THE JUNEAU ECONOMIC DEVELOPMENT COUNCIL EVALUATING ALTERNATIVE ACCESS ROUTES WITH SPECIFIC RECOMMENDATIONS AS TO LEGISLATIVE ACTION REQUIRED.