APPENDIX A

ALTERNATIVE SCREENING REPORT
TECHNICAL REPORT

JUNEAU ACCESS IMPROVEMENTS
SUPPLEMENTAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT

STATE PROJECT NUMBER: 71100
FEDERAL PROJECT NUMBER: STP-000S (131)

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NOVEMBER 2003

1.0 INTRODUCTION

In 1997 the Alaska Department of Transportation and Public Facilities (DOT&PF) prepared a Draft Environmental Impact Statement (DEIS) that evaluated improved surface transportation within the Lynn Canal corridor. Reasonable alternatives analyzed in detail included:

- No Build
- East Lynn Canal Highway
- Marine Alternative with four options, two with ferry terminals at Auke Bay and two with ferry terminals in Berners Bay.

During 1998 and 1999, further analysis of the 1997 alternatives was conducted as well as analysis of additional proposals.

On January 24, 2000, then Governor Knowles announced the East Lynn Canal Highway as the State of Alaska's preferred alternative. Further work on the DEIS was suspended until December 2002, when newly elected Governor Murkowski ordered the completion of the EIS. A January 2003 re-evaluation of the DEIS by DOT&PF concluded that a Supplemental Draft Environmental Impact Statement (SDEIS) is required to update and augment the 1997 DEIS. A Notice of Intent (NOI) to prepare the SDEIS was published in the Federal Register on March 11, 2003.

The SDEIS and Final Environmental Impact Statement (FEIS) will update the 1997 DEIS by:

- Updating information for all 1997 DEIS alternatives
- Re-evaluating the range of reasonable alternatives
- Updating the socioeconomic data and projections
- Augmenting previous technical studies with new information utilizing improved analysis methods
- Insuring that the SDEIS and FEIS are in compliance with new laws and regulations that have been enacted since 1997

The purpose of this report is to document the screening process for determining the range of reasonable alternatives for analysis in the SDEIS.

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2.0 ALTERNATIVES SCREENED

The alternative screening list was derived from the following sources:

- The 1994 Reconnaissance Engineering Report (RER)
- The 1997 DEIS
- The 1999 DOT&PF Preferred Alternative Report (PAR)

Table 2-1 lists the name and origin of the alternative to be screened; Figures 1-21 illustrate each route. Each alternative is described below.

1994 Reconnaissance Engineering Report alternatives (not advanced in the 1997 DEIS):

1. East Lynn Canal Highway with bridge to Haines (Figure 1) – construct a highway from Echo Cove around Berners Bay to Skagway, and construct a suspension or floating bridge from Point Katz north of the Katzehin River, across Chilkoot Inlet to Battery Point.

2. Taku River Valley Highway (Figure 2) – construct a highway from the end of Thane Road northeast along the Taku Inlet, across the Alaska-Canada border, up the Taku River valley, and along the Sloko and Pike River valleys connecting to Canadian Highway 7 south of Atlin. Mainline ferry service would continue in Lynn Canal. (This alternative was discussed briefly in the DEIS but not advanced as reasonable.)

1997 DEIS alternatives not advanced as reasonable and therefore not studied in detail:

1. East Lynn Canal Rail (Figure 3) – construct a rail link between Echo Cove and Skagway, construct a ferry terminal at the Katzehin River area, and run a new shuttle ferry between the Katzehin terminal and Haines.

2. Goldbelt – Ferry Shuttle Service from Cascade Point (Figure 4) – The 1996 Goldbelt Master Plan for its Berners Bay holdings identified a development opportunity for construction of a highway from Echo Cove to Cascade Point, construction of a ferry terminal at Cascade Point, and operation of a private high speed ferry from Cascade Point to Haines and Skagway.

3. Haines/Skagway Intertie (Figure 5) – construct a highway from Echo Cove around Berners Bay to the Katzehin River area, construct a ferry terminal at Katzehin, and operate a ferry shuttle between the Katzehin terminal and Haines. A new highway would also be constructed from Haines to Skagway.

There are two potential routes for the Haines/Skagway Intertie:

-The first would extend Lutak Road around Lutak Inlet and up the Ferebee River valley. A tunnel would be constructed through the mountain near Burro Creek to Taiya Inlet where the highway would extend to Dyea Road in Skagway.

-The second option would extend Lutak Road around Lutak Inlet along the coast to Taiya Inlet and the highway would continue along the western shoreline to Dyea Road.

4. Alternative 3 West Lynn Canal Highway (Figure 6) – extend the Glacier Highway from Echo Cove to Sawmill Cove, construct ferry terminals at Sawmill Cove and William Henry Bay, and operate shuttle ferries between Sawmill Cove and William Henry Bay. A new highway would be constructed between William Henry Bay and Haines with a bridge across Chilkat Inlet to Haines

near Pyramid Island connecting into Mud Bay Road. A shuttle ferry would provide service to Skagway. Mainline ferry service would end at Auke Bay.

5. East Lynn Canal Highway with Berners Bay and Katzehin Terminals (Figure 7) – extend Glacier Highway from Echo Cove to Sawmill Cove, construct ferry terminals at Sawmill Cove and Slate Cove, and operate shuttle ferries between Sawmill Cove and Slate Cove. A highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed in the Katzehin River area and a shuttle ferry would operate between Katzehin and Haines. Mainline ferry service would end at Auke Bay. (Note: this alternative was evaluated in the PAR as Proposal 5A.)

1997 DEIS reasonable alternatives analyzed in detail:

1. Alternative 1 No Build/Transportation System Management – The 1997 No Build consisted of continuing the existing mainline service in Lynn Canal. This service could move an average of 87 vehicles a day. The No Build included the arrival of the M/V Kennicott and the possible deployment of the M/V Malaspina as a dayboat in Lynn Canal. (1997 DEIS No Build mainline service is the mainline ferry shown in Figures 9 and 10.)

2. Alternative 2 East Lynn Canal Highway (with Katzehin Terminal) (Figure 8) – construct a highway from Echo Cove around Berners Bay to Skagway, construct a ferry terminal at the Katzehin River area, and operate a shuttle between the Katzehin terminal and Haines. Mainline ferry service would end at Auke Bay.

3. Alternative 4, Option A Mainline Ferry Service with Shuttle Service from Auke Bay (Figure 9) – construct a 105-vehicle high speed catamaran to provide a supplement to mainline service. The high speed ferry would operate from Auke Bay, travelling between Juneau, Haines and Skagway in the summer, and Juneau to Haines in the winter. Mainline service would continue year round.

4. Alternative 4, Option B Mainline Ferry Service with Shuttle Service from Berners Bay (Figure 10) – extend Glacier Highway from Echo Cove to Sawmill Cove and construct a 105-vehicle high speed catamaran to provide supplemental summer service from Berners Bay. A new ferry terminal would be constructed at Sawmill Cove. The new ferry would travel from Berners Bay to Haines and Skagway in the summer, and between Auke Bay and Haines in the winter. Mainline service would continue year round.

5. Alternative 4, Option C Mainline Ferry Service ends at Auke Bay with Shuttle Service North from Auke Bay (Figure 11) – construct two 105-vehicle high speed catamarans to operate from Auke Bay, with service between Haines, Skagway and Juneau. A single high speed ferry would operate in the winter. Mainline ferry service in Lynn Canal would be discontinued.

6. Alternative 4, Option D Mainline Ferry Service ends at Auke Bay with Shuttle Service North from Berners Bay (Figure 12) – extend Glacier Highway from Echo Cove to Sawmill Cove and construct two high speed, 105-vehicle catamarans. A new ferry terminal would be constructed at Sawmill Cove and new fast ferries would operate from Sawmill Cove to Haines/Skagway in the summer. A single high speed ferry would operate from Auke Bay in the winter. Mainline ferry service in Lynn Canal would be discontinued.

1999 Preferred Alternative Report (potential alternatives proposed after release of the 1997 DEIS):

1. Proposal 5B East Lynn Canal Highway to Katzehin with Berners Bay Shuttle Ferry (Figure 13) – extend Glacier Highway from Echo Cove to Sawmill Cove, construct ferry terminals at Sawmill Cove and Slate Cove, and operate a shuttle ferry between Sawmill Cove and Slate Cove. A highway would be constructed between Slate Cove and the Katzehin area. A ferry terminal would be constructed in the Katzehin River area and a shuttle ferry would operate between Katzehin, Haines, and Skagway. Mainline ferry service would end at Auke Bay.

2. Proposal 5C East Lynn Canal Highway from Katzehin to Skagway (Figure 14) – extend Glacier Highway from Echo Cove to Sawmill Cove, construct ferry terminals at Sawmill Cove and Katzehin, and operate the Malaspina as a dayboat between Sawmill Cove and Katzehin. A second shuttle ferry would operate between Katzehin and Haines. A new highway would be constructed from Katzehin to Skagway. Mainline ferry service would end at Auke Bay.

3. Proposal 5D East Lynn Canal Highway to Katzehin (Figure 15) – construct a highway from Echo Cove around Berners Bay to a point north of the Katzehin River, construct a ferry terminal at Katzehin, and run a shuttle ferry to both Skagway and Haines. Mainline ferry service would end at Auke Bay.

Note: Although titled a report, the PAR is actually a printed version of a Power Point presentation prepared for then Governor Knowles, presenting DOT&PF's rationale behind its support for Alternative 2 as the State's Preferred Alternative. It includes an evaluation of the reasonable alternatives from the DEIS and other proposals made after 1997. The evaluation was an independent effort by a Rating Team composed of DOT&PF staff outside the Southeast Region and Federal Highway Administration (FHWA) Engineers and Planners.

2003 alternatives (identified from scoping comments and additional information):

1. Updated Alternative 1 No Build (Figure 16) – The No Build alternative now includes a minimum of three mainline vessel round trips per week through Lynn Canal year round. It also includes a shuttle vessel operating year round between Haines and Skagway (the Haines-Skagway vessel is to be determined by an independent Reconnaissance Study). The No Build alternative assumes the Fast Vehicle Ferry (FVF) Fairweather will operate between Juneau and Haines/Skagway approximately five days per week. This No Build alternative is based on the most likely Alaska Marine Highway System (AMHS) operations in the absence of any capital improvements specific to Lynn Canal, other than the Haines/Skagway shuttle, which DOT&PF is developing as an independent project.

2. Modified Alternative 2 East Lynn Canal Highway without Katzehin Terminal (Figure 17) – construct a highway from Echo Cove around Berners Bay to Skagway. The Haines-Skagway shuttle described in the No Build would be in operation, and would provide service to Haines, although a second shuttle could be required. Mainline ferry service would end at Auke Bay. No terminal would be constructed at Katzehin. (This consideration of dropping the Katzehin terminal is based on agency concern regarding the need for a terminal given the existing one in Skagway, and public concern over the weather conditions at Katzehin.)

3. Modified Alternative 4, Option A FVF Service from Auke Bay (Figure 18) – construct one or more FVFs to operate from Auke Bay to Haines/Skagway. This alternative assumes a minimum of two mainline vessel round trips per week year round, and continuation of the Haines-Skagway shuttle identified in the No Build.

4. Modified Alternative 4, Option B FVF Service from Berners Bay (Figure 19) – extend Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay, and construct a new ferry terminal at Sawmill Cove. New FVF(s) would run from Sawmill Cove to Haines/Skagway in the

summer and from Auke Bay in the winter. This alternative includes a minimum of two mainline vessel round trips per week year round, and continuation of the Haines-Skagway shuttle identified in the No Build.

5. Modified Alternative 4, Option C Dayboat Service from Auke Bay (Figure 20) – construct one or more displacement speed dayboats to operate year round from Auke Bay to Haines and Skagway. A minimum of two mainline vessel round trips per week would continue year round. The Haines-Skagway shuttle identified in the No Build would continue to provide service between those communities.

6. Modified Alternative 4, Option D Dayboat Service from Berners Bay (Figure 21) – extend Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay, and construct a new terminal at Sawmill Cove. New dayboat(s) would operate to Haines and Skagway from Sawmill Cove in the summer and from Auke Bay in the winter. A minimum of two mainline vessel round trips per week would continue year round. The Haines-Skagway shuttle identified in the No Build would operate as planned.

Note: The Marine Options have been modified in response to 1997 and 2003 comments requesting an updated range of marine ferry options, based on recent experience in Lynn Canal and trends within the AMHS. Traffic projections and recommendations of the new Marine Segments Report will determine the size of the vessels for Options A-D. More information on the reasons for the changes is presented in section 4.2 of the screening results.

Table 2-1. Juneau Access Alternative Origins

Alternative	Origin
East Lynn Canal Highway with Bridge to Haines (Fig. 1)	1994 Reconnaissance Engineering Report
Taku River Valley Highway (Fig. 2)	1994 Reconnaissance Engineering Report
East Lynn Canal Rail (Fig. 3)	1997 DEIS
Goldbelt Ferry Shuttle Service from Cascade Point (Fig. 4)	1997 DEIS
Haines/Skagway Intertie (Fig. 5)	1997 DEIS
Updated Alternative 1 No Build (Figure 16)	1997 DEIS with 2003 update
Alternative 2 East Lynn Canal Highway (with Katzehin Terminal) (Fig. 8)	1997 DEIS
Modified Alternative 2 East Lynn Canal Highway without Katzehin Terminal (Fig. 17)	2003 DOT&PF analysis & DEIS comments
Proposal 5A East Lynn Canal Highway with Berners Bay and Katzehin Terminals (Fig. 7)	1999 Preferred Alternative Report (Alternative 2 East Lynn Canal Highway with Berners and Katzehin Ferry Terminals in 1997 DEIS)
Proposal 5B East Lynn Canal Highway to Katzehin with Berners Bay Shuttle (Fig. 13)	1999 Preferred Alternative Report
Proposal 5C East Lynn Canal Highway from Katzehin to Skagway (Fig. 14)	1999 Preferred Alternative Report
Proposal 5D East Lynn Canal Highway to Katzehin (Fig. 15)	1999 Preferred Alternative Report [aka East Lynn Canal to Katzehin River Ferry Terminal in 1994 RER]
Alternative 3 West Lynn Canal Highway (Fig. 6)	1994 Reconnaissance Engineering Report & 1997 DEIS
Alternative 4 Option A Mainline Ferry Service with Shuttle Service from Auke Bay (Fig. 9)	1997 DEIS
Alternative 4 Option B Mainline Ferry Service with Shuttle Service from Berners Bay (Fig. 10)	1997 DEIS
Alternative 4 Option C Mainline Ferry Service ends at Auke Bay, Shuttle Service from Auke Bay (Fig. 11)	1997 DEIS
Alternative 4 Option D Mainline Ferry Service ends at Auke Bay, Shuttle Service from Berners Bay (Fig. 12)	1997 DEIS
Modified Alternative 4 Option A FVF Service from Auke Bay (Fig. 18)	1997 DEIS comments & 2003 scoping
Modified Alternative 4 Option B FVF Service from Berners Bay (Fig. 19)	1997 DEIS comments & 2003 scoping
Modified Alternative 4 Option C Day Boat Service from Auke Bay (Fig. 20)	1997 DEIS comments & 2003 scoping
Modified Alternative 4 Option D Day Boat Service from Berners Bay (Fig. 21)	1997 DEIS comments & 2003 scoping

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3.0 SCREENING METHODS and CRITERIA

Qualitative and quantitative information for the screening process was obtained from the following sources:

- The 1994 Reconnaissance Engineering Report (RER)
- The 1997 DEIS
- The 1999 Preferred Alternative Report (PAR)
- The January 2003 Re-evaluation
- An analysis of 1997 and 2003 public/agency comments
- 2003 Alaska Marine Highways Ferry Schedule
- Lynn Canal and Northern Panhandle Ferry Operations and Service Study (McDowell Group 2001)

Criterion I - Cost/Technical Feasibility and Common Sense: The Council on Environmental Quality (CEQ) publication *NEPA's Forty Most Asked Questions,* stresses that common sense should be used when determining reasonable alternatives. This guidance states that reasonable alternatives are those that are "practical or feasible from the technical and economic standpoint and using common sense". Using professional judgment and cost data from previous analyses, the alternatives can be screened to determine if they would be economically and/or technically feasible, or go against common sense.

Criterion II - Appropriateness and Unnecessary Variations: The CEQ guidance also points out that where a very large or infinite number of possible reasonable alternatives exist, "a reasonable number of examples that cover the full spectrum of alternatives" is an appropriate range to be included in the EIS.

Criterion III - Purpose and Need: Reasonable alternatives should meet the purpose and need of the project. *The purpose of this project is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will: 1) provide the capacity to meet the transportation demand in the corridor, 2) provide flexibility and improve opportunity for travel, 3) reduce travel time between the communities, 4) reduce state costs for transportation in the corridor, 5) reduce user costs for transportation in the corridor.* This statement has five different but related elements. For some alternatives, meeting one element may come at the expense of not meeting another. To be reasonable an alternative must at least partially meet a majority (three or more) of the elements. The specific criteria used to evaluate reasonableness with regard to Purpose and Need elements for alternatives were as follows:

- Element 1 - Meet Future Capacity Needs. An alternative should provide sufficient capacity to meet the projected traffic demand for that mode.
- Element 2 - Provide Flexibility and Opportunity for Travel. An alternative should potentially provide for more round trips per day from Juneau to Haines and Skagway than the Alternative 1 No Build.
- Element 3 – Reduce Travel Time. An alternative should have a quicker one-way travel time from Juneau to Haines/Skagway than the No Build time.
- Element 4 - Reduce State Annual Costs for Transportation in Lynn Canal. An alternative should have estimated annual maintenance and operations (M&O) costs that are less than the1997 No Build M&O cost estimate.
- Element 5 – Reduce User Cost. An alternative should have a lower one-way travel cost from Juneau to Haines/Skagway than the current No Build cost.

Criterion IV - Environmental Factors. This screening process uses information on specific Social Environment, Physical Environment, and Biological Environment impacts to determine if an alternative has an impact so great that it should not be considered reasonable.

A tiered approach was used for the screening analysis. Alternatives were screened one criterion at a time. If an alternative satisfied the screening criterion for a given tier, then it was carried forward for consideration under the next criterion of screening. If an alternative did not satisfy the screening criterion for a tier, it was dropped from further consideration.

4.0 SCREENING RESULTS

The tiered screening results are presented for each screening criterion. Only alternatives that were dropped in a screening tier are discussed under each screening criterion subsection.

4.1 Criterion I – Cost/Technical Feasibility and Common Sense Screening

Taku River Valley Highway (Figure 2). In 1993, the British Columbia (BC) Minister of Transportation was contacted regarding Canada's interest in the Taku alternative. At that time, BC indicated it did not support pursuit of this alternative. In 2003, the BC Minister of Transportation was once again contacted to determine if BC was still opposed to this alternative. The October 2, 2003 response indicated BC is not interested in the Taku route. (The 2003 correspondence is in Attachment A) Clearly an alternative that involves construction in and access to a foreign country, that does not have the support of that government, is not a reasonable alternative to evaluate fully. Although the nature of this alternative is such that it is marginal with regard to meeting the purpose and need of the project, it is dropped from further consideration because it fails the common sense test without support from the BC government.

Goldbelt – Ferry Shuttle Service from Cascade Point (Figure 4). A Goldbelt road from Echo Cove to Cascade Point, construction of a ferry terminal, and operation of a ferry service between Cascade Point and Haines/Skagway is a private action that cannot be compelled by the State of Alaska. Although Goldbelt is no longer pursuing a private vehicle ferry to Skagway, even if such a ferry was in operation, it would not remove the need for public transportation. (The State does not rule out the possibility of running a public ferry from Cascade Point, if Goldbelt proceeds with a terminal there and the State selects an alternative requiring a ferry terminal in Berners Bay.) A potential private enterprise is not a reasonable alternative and is dropped from further consideration.

Haines/Skagway Intertie (Figure 5). The Haines/Skagway Intertie was dropped from the 1997 DEIS range of reasonable alternatives based on cost and Section 4(f) issues. While this argument is still valid when viewed as a Juneau Access alternative, a more basic issue is involved. The purpose and need statement for Juneau Access makes clear that the goal is to improve transportation to and from Juneau. An alternative that has a very costly road component connecting Haines and Skagway, while forcing all Juneau traffic on a ferry, is primarily an independent Haines-Skagway project. DOT&PF has identified improved access between Haines and Skagway as an independent need, and is pursuing this as an independent project, currently in the reconnaissance stage. At this time indications are that this will result in a dedicated Haines-Skagway shuttle that will be in place before any Juneau Access alternative is constructed. Therefore this alternative is being dropped from further consideration, and a Haines-Skagway shuttle is being included in the Updated No Build.

East Lynn Canal Highway with Bridge to Haines (Figure 1). This alternative (as proposed in 1994) would require a 11,150 foot bridge to cross the Chilkoot Inlet between the Katzehin River

and Battery Point. (Battery Point is located in Chilkat State Park, so very likely 4(f) constraints would require a longer length.) Water depths, span lengths, and the need to accommodate large vessels (including cruise ships) dictate a high clearance suspension bridge or a floating structure with an opening span. Construction costs associated with a structure of this magnitude were estimated to be approximately $190 million in the 1994 RER. Much more detailed estimates for the Gravina Access project, when applied to this distance (ignoring the much greater depth) indicate a cost close to $250 million. This additional cost would be prohibitive, approximately doubling the cost of any East Lynn Canal Highway alternative. On the basis of cost this alternative is dropped from further consideration.

East Lynn Canal Rail (Figure 3). An East Lynn Canal Rail alternative was partially analyzed in the 1997 DEIS. DOT&PF compared a typical segment of road and corresponding railroad construction costs, and determined that the more than double costs, along with limited ability to meet purpose and need, made this alternative unreasonable. The analysis for a rail link was updated to reflect 2003 costs and standards. (See Updated Railroad Analysis in Attachment B) The conclusion of the updated analysis is the same; construction costs would be more than 2.5 times higher for a railroad when compared to a road. This alternative is dropped from further consideration due to the representative costs confirmed by the updated railroad analysis.

4.2 Criterion II – Appropriateness & Unnecessary Variations Screening

Proposal 5B East Lynn Canal Highway to Katzehin with Berners Bay Shuttle Ferry (Figure 13). This proposal is essentially a combination of ferry components from two other PAR proposals – Proposal 5A, which has a shuttle across Berners Bay, and Proposal 5D which has a terminal at Katzehin with shuttles to both Haines and Skagway. Proposal 5B was evaluated in the PAR in response to concerns raised about impacts of a road through Berners Bay and concerns about favoring Skagway at the perceived expense of Haines with a road link to Skagway. In any comparison between surface transportation modes, there are endless possible combinations of ferry and road links. The Marine Options 4B and 4D are an attempt to improve ferry service by taking advantage of an existing road with a short extension to reduce the ferry run. Proposal 5D would reduce capital costs by eliminating the most expensive road link. The CEQ guidance with regard to limiting the range to alternatives that cover the full spectrum is relevant here; the full spectrum of alternatives is covered without this unnecessary variation. Also, an alternative that forces all traffic onto two or more ferries arguably fails the common sense question, "Why not just keep traffic on a single ferry?" All impacts of this alternative (other than combined delay and sequencing problems) will be evaluated in the analysis of the "parent" alternatives. Therefore this alternative is dropped from further consideration.

Proposal 5C East Lynn Canal Highway from Katzehin to Skagway (Figure 14). This alternative also combines pieces of other alternatives, in this case combining the short highway extension and ferry run of Alternative 4D with a highway link from Alternative 2. This alternative was proposed in 1999 specifically as a way of improving service with the M/V Malaspina, which began daily service in Lynn Canal in 1998. The Malaspina was a very costly dayboat because the length of the route necessitated two crews. Route planners were investigating ways to get two round trips per day from this double crew. The PAR rated this alternative lower than the No Build because of its marginal service improvements relative to its high capital and operating costs. This proposal is no longer appropriate, as the Malaspina is not operating as a dayboat in Lynn Canal. Conventional speed dayboat operation, with and without a road extension from Echo Cove, is now a part of the Marine Alternative (Options 4C and 4D). From the standpoint of being a combination of ferry and highway links, it is an unnecessary variation of existing alternatives.

Original Marine Alternative 4, Options A-D (Figures 9, 10, 11, and 12). The original marine options in the 1997 DEIS were attempts to design alternatives to improve service in Lynn Canal based on concepts and marine technology prevalent in the mid-1990's. All four options were based on an existing design, the Wavepiercer catamaran, capable of carrying 105 vehicles. The differences between options were summer starting point, and supplemental versus replacement service. The later difference is primarily an operations issue (typically AMHS operational changes occur at the discretion of the AMHS from season to season and are not a federal action subject to NEPA). Because the number of vessels required for Lynn Canal service is dependent on whether or not mainliners continue in the corridor, this potential change in operation was captured in two marine options.

Based on 1997 DEIS comments, 2003 scoping comments, and AMHS experience and direction over the past seven years, the marine options have been modified. The new options retain the different potential summer supplemental service locations (Auke Bay versus Berners Bay) but drop the issue of mainliner service level in favor of analyzing high speed ferries in relation to conventional speed port-to-port dayboats. This reflects several recent developments. Both AMHS and the Inter-Island Ferry Authority (IFA) now have experience operating dayboats (single shift crewed boats operating point to point and returning to the same port every night), and there is increased interest in the public in this type of operation. AMHS also experimented with turning some mainliners around in Juneau in hopes of moving through corridor traffic onto another vessel, with poor result. For this reason and scheduling concerns, it is most likely there will always be some mainline service in Lynn Canal absent a road link.

Another reason to update these options is that AMHS has designed and is constructing two fast vehicle ferries much different than the 105-vehicle ferry analyzed in the 1997 DEIS. It may be that the smaller AMHS design currently under construction is better suited for Lynn Canal service. The actual size vessel for each new marine option will be determined by the information in a new Marine Segments Report. Vessel selection will be made based on meeting marine traffic projections while minimizing operational cost.

As with road alternative alignment changes that occur to reduce impacts or take advantage of new information, the new marine Options A-D replace the original options. On the basis of common sense and the need to avoid minor and no longer relevant variations, the original Options A-D are being dropped.

4.3 Criterion III – Purpose & Need Screening

The remaining nine build alternatives were screened to determine if they satisfied purpose and need elements. Information regarding the extent to which each alternative meets individual elements of the purpose and need comes primarily from the 1997 DEIS, with additional information where indicated. Updated No Build information is given first for comparison purposes.

Updated Alternative 1 No Build (Figure 16):

1. The projected capacity is approximately 206 vehicles per day during the summer (93 in winter). This is based on five days of twice daily FVF Fairweather summer service with four mainliners per week. Winter service would be two days of once daily FVF Fairweather service with three mainliners per week.
2. The projected opportunity to travel is 14 trips per week in summer (five in winter).
3. The projected travel time in summer is the weighted average time to Haines of 4.3 hours and 5.1 hours to Skagway. (Travel time is from required arrival at the terminal to departing

the vessel at the destination: 3.25 hrs. FVF to Haines, 7 hrs. mainliner; 3.5 hrs. FVF to Skagway, 9 hrs. mainliner. Weighting is based on 10 FVF trips per week, 4 mainliner per week.)

4. Projected State maintenance and operations cost for the Updated No Build will be determined by the analysis in the Updated Marine Segments Report. For screening purposes the DEIS No Build estimate of $8.4 million (excluding revenue) can be used, as this is conservative given the inflation of the past six years and the additional costs of supplemental FVF service.

5. The current one-way fare for a family of four and a 15-19 foot vehicle is $142 to Haines and $194 to Skagway (2 adults and 2 children under 12).

Alternative 2 East Lynn Canal Highway (with Katzehin Terminal) (Figure 8). This alternative meets all five elements. A two-lane road has capacity well above the projected average daily traffic (ADT) peak of 2123 vehicles per day. The shuttle ferry to Haines would be operated to accommodate the projected traffic to Haines. Flexibility and opportunity for travel would be increased. Travel times would be reduced: approximately two hours to Skagway and three hours to Haines. Estimated State maintenance and operation cost in 1997 was $4.3 million. User costs would be very low; no toll is proposed to Skagway; and the fare to Haines would be considerably lower than the No Build, given the short distance.

2003 Modified Alternative 2 East Lynn Canal Highway without a Katzehin Terminal (Figure 17). This alternative meets the purpose and need elements similarly to Alternative 2, with the following difference. Travel times to Haines would be approximately 3.5 hours, given the increased length of the ferry run from Skagway to Haines (15 miles versus 7 miles from Katzehin). Opportunity to travel would be somewhat less as well, as the longer ferry run means less round trips per day in a given time period.

Proposal 5A East Lynn Canal Highway with Berners Bay and Katzehin Terminals (Figure 7). This variation of the East Lynn Canal Highway is limited by the capacity constraint of the shuttle system at Berners Bay. The PAR estimated 12 round trips per day with two 50-vehicle shuttles, for a daily capacity of 1200 vehicles. Although this is approximately half of the predicted average daily traffic (ADT) for the highway, it is a considerable increase over the No Build. The shuttle "bottleneck" causes similar limitations in the number of trips per day (12) and the travel time (3 hrs. versus 2 hrs. to Skagway). The cost of operating the additional shuttle system raises the annual operating cost of this alternative to approximately $11 million, failing to meet Element 4. User fees would be less than the No Build, based upon the shorter ferry lengths. This alternative was considered in the 1997 DEIS but not advanced as reasonable due to the high capital and operation cost of the additional shuttles. However this alternative was ranked high in the PAR, partially meets four of the five purpose and need elements, and addresses a scoping concern.

Proposal 5D East Lynn Canal Highway to Katzehin (Figure 15). This proposal of constructing the East Lynn Canal Highway as far as the Katzehin delta would provide a capacity of approximately 1200 vehicles a day (two 50 vehicle boats making six round trips each), failing to meet the projected highway ADT of 2123. Operating more shuttle trips between Katzehin, Haines and Skagway could provide greater capacity, but this would drive up the estimated State operating cost of $8.2 million. Opportunity to travel would be increased to 12 round trips per day, and travel times would be reduced to three hours to Haines and 3.3 hours to Skagway. User fees would be reduced, based on the shorter ferry distances. This alternative was originally proposed as a way of reducing capital costs by avoiding construction in some of the most difficult terrain. The proposal has public interest in terms of improving service in Lynn

Canal while not favoring Skagway with a road link. This proposal meets in part four of the five elements.

Alternative 3 West Lynn Canal Highway (Figure 6). This alternative would provide a summer capacity of approximately 1500 vehicles per day. Although this is 70 percent of the projected peak ADT for the East Lynn Canal Highway, it meets the projected demand for this system (1484 ADT-July, 2025). The ferry system crossing Lynn Canal would provide 10 crossings a day in summer with two boats. Travel time to Haines would be just under three hours, with time to Skagway just over four hours, assuming no wait time. State operating costs were estimated in 1996 to be $16.6 million per year, almost double the No Build estimate. User costs would be reduced, based upon the shorter ferry links (10 miles from Berners Bay to William Henry Bay, 15 miles from Haines to Skagway). This alternative was originally considered reasonable after scoping in 1994, but determined to not be reasonable in 1996 after detailed study. User benefit analysis indicated this alternative would have only marginal benefit, and the alternative seemed to be an undesirable combination of ferry runs and road links, in terms of both capital and operating costs. Although there was little controversy associated with dropping this alternative in 1996 and little interest expressed in the 1997 DEIS comments, both resource agencies and the public expressed interest in this alternative during 2003 scoping. Although this alternative has a high operating cost, it meets the four remaining elements.

Modified Alternative 4, Marine Options A-D (Figures 18 – 21): Alternative 4 was originally called the AMHS alternative in the 1994 RER. It was called the All Marine Alternative in 1997, although it included options that involved a five-mile road extension. For the purpose of determining ability to meet the five elements of the project purpose and need, the modified options can be evaluated together, discussing differences where necessary.

Project planners acknowledge that demand for options that are primarily ferry runs is different from highway demand. The longer trip time, limited number of available trips, and cost of the ferry fare all serve to reduce demand. While it is possible to design a ferry system in Lynn Canal that meets the all highway route demand, it would be very expensive for the State to operate, and would not attract the full level of demand, even if it was free, which is not practicable. In practice, it is very unlikely that large improvements in service, in terms of capacity, travel time, and opportunity to travel, can be made while achieving reductions in operating costs. Consequently, the 1997 DEIS marine options had capacity levels approximately one third of the projected unrestricted highway ADT. Nevertheless, the annual operating costs were very high. Public comments asserted that the operating costs were high because the single vessel studied was too large.

The modified marine options all look at ways to provide faster and/or more frequent service with greater capacity while minimizing the operating costs. Various combinations of the following will be used to reduce travel times: faster boats, shorter summer routes, and port-to-port operations (travel to one port then return to origin). More travel opportunity (minimum two trips per day) will be provided by faster boats making more trips or more small vessels. Capacity will be increased over the No Build (to meet the calculated “marine demand”) by providing more dedicated Lynn Canal vessels and/or trips. The lowest cost system for each proposed option (high speed versus conventional speed vessels, Auke Bay versus Berners Bay summer departure) will be identified in the new Marine Segments Report. Each option will therefore partially meet full road demand but fully meet the reduced ferry demand capacity, reduce travel time, and provide greater flexibility and improve opportunity to travel. The difference between options will be the extent of travel time reduction, the number of trip options, and operating cost. Since all options will at least partially meet three of the five elements, all four Modified Marine Options are reasonable with regard to purpose and need.

All of the nine build alternatives screened are reasonable with respect to purpose and need.

4.4 Criterion IV - Environmental Factors Screening

The remaining alternatives were qualitatively screened to determine if there are specific social, physical, or biological environment impacts so great as to render an alternative unreasonable. The results are discussed below.

Social Environment

1. Cultural Resources: Based on information to date, no alternative would result in an Adverse Effect on a property eligible for the National Register of Historic Places. All alternatives with road links have eligible properties within their Areas of Potential Effect, but field investigation and informal coordination with the State Historic Preservation Officer supports the determination that no effect would be adverse.
2. Section 4(f): This section of the Transportation Act mandates that no land can be acquired from a park, recreation area, wildlife refuge or historic property for transportation purposes unless there is no feasible and prudent alternative. DOT&PF has identified several properties potentially protected by 4(f) and has adjusted alignments to avoid these properties. Further investigation into potential 4(f) properties is ongoing.

Physical Environment

1. Wilderness: No alternative would pass through a Congressionally designated Wilderness. Alternative 3 would pass approximately one mile east of the Endicott River Wilderness. Alternative 2 and similar east side alternatives would cross through land Congressionally designated as LUD II. These lands are to be managed as wilderness, with no roads other than State designated essential corridors. In 1994 Governor Hickel designated a road through Berners Bay as a State transportation need. A similar designation would be made by the current administration if the final preferred alternative passes through LUD II land.
2. Wild and Scenic Rivers: There are two designated Wild and Scenic Rivers within the study area, the Katzehin and the Antler. The limits of both designated reaches are upstream of proposed east side alternative limits.

Biological Environment

1. Bald Eagles: Bald eagle nests on the east and west sides of Lynn Canal were remapped in July and August of 2003. Alignments for east and west side alternatives have been adjusted so that no nest trees would be taken, and where feasible to avoid nest trees by 330 feet. Areas with nest trees within 330 feet of the project limits would be constructed outside the nesting season, or would utilize monitoring if deemed appropriate by the U.S. Fish and Wildlife Service.
2. Threatened and Endangered (T&E) Species: No alternative would have an adverse effect on a T&E species. Alternative 2 and other East Lynn Canal Highway alternatives would involve construction close to Gran Point and Met Point Steller sea lion haulouts. Previous consultation with National Marine Fisheries Service resulted in their concurrence that the project would not likely adversely affect Steller sea lions, providing certain mitigation measures are followed.
3. Special Aquatic Sites: No mud flats or eel grass beds would be impacted by any alternative, based on recent intertidal and subtidal surveys. Both east and west highway alternatives would impact a small amount (less than 6 acres) of estuarine wetlands. The majority of wetlands impacted are palustrine forested wetlands. While the total wetland acreage for the

east Lynn Canal alternatives is substantial (52 acres in DEIS), none of the wetlands impacted are rare or regionally unique, and none are known to support threatened or endangered species.

All of the nine build alternatives are reasonable based on the environmental screening factors. Table 4-1 provides a list of the reasonable alternatives to be evaluated in the SDEIS and their number and letter designations. A complete description of the Reasonable Alternatives, reflecting the updated No build, follows the Table.

Table 4-1. Juneau Access Improvements SDEIS Reasonable Alternatives

Screening Alternative	SDEIS Alternative Designation
Updated Alternative 1 No Build (Fig. 16)	Alternative 1 No Build
Alternative 2 East Lynn Canal Highway (with Katzehin Terminal) (Fig. 8)	Alternative 2
Proposal 5A East Lynn Canal Highway with Berners Bay and Katzehin Terminals (Fig. 7)	Alternative 2A
Proposal 5D East Lynn Canal Highway to Katzehin (Fig. 15)	Alternative 2B
2003 Modified Alternative 2 East Lynn Canal Highway without Katzehin Terminal (Fig. 17)	Alternative 2C
Alternative 3 West Lynn Canal Highway (Fig. 6)	Alternative 3
Modified Alternative 4 Option A FVF from Auke Bay (Fig. 18)	Alternative 4A
Modified Alternative 4 Option B FVF from Berners Bay (Fig. 19)	Alternative 4B
Modified Alternative 4 Option C Dayboat from Auke Bay (Fig. 20)	Alternative 4C
Modified Alternative 4 Option D Dayboat from Berners Bay (Fig. 21)	Alternative 4D

JUNEAU ACCESS IMPROVEMENTS SDEIS REASONABLE ALTERNATIVES

Alternative 1. – No Build

The No Build Alternative includes a minimum of three mainline vessel round trips per week through Lynn Canal year round. It also includes a dayboat shuttle operating year round between Haines and Skagway. (Actual Haines-Skagway vessel to be determined by an independent Reconnaissance Study.) The No Build alternative is based on the FVF Fairweather operating between Juneau and Haines/Skagway five days per week in summer, two days per week in winter. (Note: in this situation “No build” means no capital improvements designed specifically for Lynn Canal, other than the Haines/Skagway shuttle, which has independent utility and does not preclude or favor any of the build alternatives.)

Alternative 2. – East Lynn Canal Highway with Katzehin Terminal

This alternative would construct the East Lynn Canal Highway from Echo Cove to Skagway with a shuttle ferry from Katzehin Delta to Haines. The shuttle ferry would be the vessel identified in the No Build Alternative. Mainline ferry service would end at Auke Bay.

Alternative 2A. – East Lynn Canal Highway with Berners Bay Shuttle

This alternative is the same as Alternative 2 (East Lynn Canal Highway from Echo Cove to Skagway) with the exception that shuttle ferries would cross Berners Bay from Sawmill Cove to Slate Cove rather than constructing a highway around the Bay. A shuttle ferry would operate from Katzehin Delta to Haines. As in Alternative 2, the Katzehin to Haines shuttle ferry would be the vessel identified in the No Build Alternative. Mainline ferry service would end at Auke Bay.

Alternative 2B. - East Lynn Canal Highway to Katzehin, shuttles to Haines and Skagway

This alternative would construct the East Lynn Canal Highway from Echo Cove to the Katzehin Delta, with shuttle ferries providing service from Katzehin to both Haines and Skagway. Shuttle service from Katzehin would include the Haines-Skagway shuttle identified in the No Build Alternative. Mainline ferry service would end at Auke Bay.

Alternative 2C. – East Lynn Canal Highway with shuttle to Haines from Skagway

This alternative would construct the East Lynn Canal Highway from Echo Cove to Skagway with shuttle ferry service from Haines to Skagway. This alternative deletes the Katzehin ferry terminal; service to and from Haines would be via Skagway using the vessel identified in the No Build Alternative. Mainline ferry service would end at Auke Bay.

Alternative 3. – West Lynn Canal Highway

This alternative would extend Glacier Highway to Sawmill Cove; shuttle ferries (to be determined from a new Marine Segments Report) from Sawmill Cove would run to William Henry Bay. A highway would be constructed from William Henry Bay to Haines via Pyramid Island, connecting to Mud Bay Road. The Haines-Skagway shuttle identified in the No Build Alternative would provide service to and from Skagway. Mainline ferry service would end at Auke Bay.

Alternative 4. – Marine Options

The four marine options would all provide supplemental ferry service in Lynn Canal. These options are based on a minimum of two mainline vessel round trips per week, year round, and continuation of the Haines-Skagway shuttle identified in the No Build Alternative. All options would require construction of a new double stern berth at Auke Bay.

Alternative 4A. – FVF Service from Auke Bay

This option would construct one or more FVFs to provide daily summer service from Auke Bay to Haines and to Skagway.

Alternative 4B. – FVF Service from Berners Bay

This option would extend Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay. A ferry terminal would be constructed at Sawmill Cove. One or more FVFs would be constructed to provide daily service from Sawmill Cove to Haines and to Skagway in the summer and from Auke Bay to Haines and to Skagway in the winter.

Alternative 4C. - Dayboat Service from Auke Bay

This option would construct one or more dayboats to provide daily summer service from Auke Bay to Haines and to Skagway.

Alternative 4D. - Dayboat Service from Berners Bay
This option would extend Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay. A ferry terminal would be constructed at Sawmill Cove. One or more dayboats would be constructed to provide daily service from Sawmill Cove to Haines and to Skagway in the summer and from Auke Bay to Haines and to Skagway in the winter.

FVF = Fast Vehicle Ferry, approximately 32 knot speed, 12 hour crew.
Dayboat = Approximately 16 knot speed, 12 hour crew
Mainline = Approximately 90 vehicle capacity, 24 hour operation, two full crews

Note: The size of each vessel and the number of vessels required to meet the winter and summer traffic projections will be determined by Marine Segments Report.

Attachment A
Taku River Valley Highway Correspondence

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STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
OFFICE OF THE COMMISSIONER

FRANK H. MURKOWSKI, GOVERNOR

3132 CHANNEL DRIVE
JUNEAU, ALASKA 99801-7898

TEXT: (907) 465-3652
FAX: (907) 586-8365
PHONE: (907) 465-3900

August 4, 2003

The Honorable Judith Reid
Minister of Transportation
Province of British Columbia
PO Box 9055 Stn Prov Govt
Victoria BC V8W 9E2
CANADA

Dear Minister Reid:

Governor Murkowski has ordered the resumption of the Juneau Access Improvement Environmental Impact Statement. This project began in 1992 and is a study to consider various alternatives to improve surface access to Juneau, the state's capital, and a community not accessible by road. The environmental process involves re-assessing alternatives that were originally considered in 1992. One of these original alternatives was a road from Juneau through the Taku River Valley to Atlin. This alternative would require 50 miles of new roadway in Alaska from Juneau to the Alaska/British Columbia border and 82 miles of new roadway in British Columbia from the border to Atlin.

In May of 1993, Department of Transportation and Public Facilities (DOT&PF) then Commissioner Campbell requested permission to perform surveys within British Columbia to study the Taku River alternative. On June 16, 1993 Minister Charbonneau indicated that "British Columbia does not support an access through the Taku River drainage." Subsequently the draft Environmental Impact Statement released in 1997 did not evaluate the Taku River route as a reasonable alternative.

In order to update all alternatives considered in the original study, the State of Alaska needs to know whether British Columbia is still opposed to an access route in the Taku River corridor.

Please find enclosed the pertinent 1993 letters mentioned above. Thank you for your attention to this matter and we look forward to your prompt attention to this matter.

Sincerely,

Mike Barton
Mike Barton
Commissioner

Enclosures

cc: Jack Phelps, Special Staff Assistant, Office of the Governor

25A-T34LH

BRITISH COLUMBIA

OCT 0 2 2003

Reference: 116278

Mike Barton, Commissioner
Department of Transportation and Public Facilities
3132 Channel Drive
Juneau AK 99801-7898
USA

Dear Mr. Barton:

Re: Access to Juneau

I am writing in response to your letter of August 4, 2003, regarding your state's study of ways to improve surface access to Juneau and British Columbia's plans in the Taku River corridor. My Deputy Minister, Dan Doyle, and I were glad to have the chance to meet with you during our July trip to Alaska.

The government of British Columbia has no plans to build a public road from Atlin Valley to the border. While it would be possible for us to build a road at some time in the future, it would be very challenging to get the necessary environmental approvals. A private road for mining may be constructed in the near future, but it will be restricted to mine traffic because of the area's environmental sensitivity.

I hope this information proves useful for your study.

Sincerely,

Judith Reid

Judith Reid
Minister

RECEIVED
OCT 15 2003
DOT & PF Commissioner

Ministry of Transportation

Office of the Minister

Mailing Address:
Parliament Buildings
ria BC V8V 1X4

Attachment B
Updated Railroad Analysis

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INTRODUCTION

During the 1994 scoping process for the Juneau Access Improvements Draft Environmental Impact Statement (DEIS), some commenters suggested that a railroad alternative should be evaluated. As a result, an analysis that compared design criteria and costs of a railroad versus a highway for a typical segment of the East Lynn Canal Highway alternative was included in the 1997 DEIS. The analysis used an 8.4 mile segment of east Lynn Canal coastline starting at Comet (just north of Sherman Creek).

As part of the Juneau Access Improvements supplemental draft Environmental Impact Statement (SDEIS), URS has prepared an update to the 1997 DEIS railroad cost analysis. The analysis uses updated design criteria and current unit pricing for estimating costs.

DESIGN CRITERIA

The 1997 railroad cost analysis was based on a rail system that would accommodate passengers and freight, as well as the transport of private and commercial vehicles through the use of flat bed rail cars. The Alaska Railroad Corporation (ARRC) was contacted in 1994 to identify applicable railroad design criteria for the analysis. ARRC was contacted again in 2003 to confirm that the railroad design criteria used in the 1997 analysis was still applicable. Based on 2003 discussions with the staff at the ARRC, a design speed of 40 mph has been used for the railroad for the current analysis because ARRC still considers this to be a desirable speed for operation in mountainous terrain. The criteria used in the current analysis are for a standard gauge railroad.

The highway design criteria used in the 1997 cost analysis were developed during the Juneau Access Improvements Reconnaissance Study for a two-lane road with a design speed of 40 miles per hour. The criteria were based on American Association of State Highway and Transportation Officials (AASHTO) requirements, Alaska Department of Transportation and Public Facilities (DOT&PF) standards, predicted traffic, and terrain characteristics. Updated highway design criteria have been furnished by DOT&PF for the 2003 costs analysis.

Table 1 provides a comparison of 1997 and 2003 design criteria used for the railroad and highway costs comparison.

TABLE I
DESIGN CRITERIA

Criteria	Highway		Railroad*	
	1997	***2003***	***1997***	***2003***
Design Speed	40 MPH	40 MPH	40 MPH	40 MPH
Minimum Clear Zone	4 feet	12 feet	9 feet	9 feet
Minimum Tunnel Clearances	16.5' Vertical	30.0' Horizontal 16.5' Vertical	18' Horizontal 23' Vertical	18' Horizontal 23' Vertical
Maximum Side Slopes	2:1	1 ½:1	2:1	2:1
Maximum Horizontal Curve	11.25°	10.75°	8°	6°
Maximum Vertical Grade	10%	10%	2%	2%
Min. Vertical Curve "k" value[1] Crest Curve Sag Curve	 18.5 18.5	 44 64	 152.5 305	 152.5 305

[1] "k" value represents length divided by the algebraic difference in vertical grades of slopes.

* Railroad design criteria provided by the Alaska Railroad Corporation.

METHODOLOGY

This cost update was based on the 1997 methodology. The following is taken from the 1997 railroad cost analysis technical memorandum.

> "Based on the design criteria, obtained from ARRC, a typical section and rail alignment were prepared. In preparing the alignment for the rail alternative an attempt was made to keep it as close to that of the highway alternative as was possible. This was because the highway route was selected to be close to the coastline where the terrain is generally less severe compared to a more inland route. Another goal was to minimize the number and length of tunnels that may be necessary. Lastly, the alignment was selected to maintain the lowest capital cost possible by minimizing the amount of excavation and embankment construction. It should be noted that the alignments were selected so that embankment fill did not encroach significantly into the waters of Lynn Canal.
>
> Bridges are located where terrain conditions (usually associated with streams) indicated that it would be impractical to build embankments. Shorter crossings can be accommodated with culverts. Tunnels for rail must provide 18 feet lateral and 23 feet vertical clearance per ARRC criteria. Excess rock excavation will be crushed and used for ballast to minimize borrow requirements."

A single or multiple span concrete Bulb-tee girder type structure was assumed for the highway analysis. A Cooper E-9 structure utilizing twin steel girders with a timber deck was assumed for the railroad analysis.

RESULTS

Current unit costs for construction were provided by DOT&PF for this analysis. Table 2 represents the estimated costs associated with earthwork, bridges, and tunnels; and estimated project/engineering costs. The intent is to develop a first stage cost comparison to determine the practicality of constructing a railroad in the corridor. Construction costs associated with highway surfacing, installation of ties and rails, rolling stock acquisition, and maintenance and operations costs were not included in the 1997 or 2003 cost analysis.

The highway segment did not require a tunnel in the 1997 analysis (reference the 1997 Railroad Analysis Technical Memorandum), The same highway alignment was analyzed in 2003, therefore, there is no tunnel associated with the highway cost estimate. The highway required more square feet of bridge than the railroad in the 1997 and 2003 analyses because highway bridges are wider than railroad bridges.

The results of the 2003 analysis indicate that the initial cost for construction of a railroad in this area is more than two and a half times as high as that of the highway alternative. The 1997 analysis had the same result.

TABLE 2
COMPARISON OF CONSTRUCTION REQUIREMENTS AND COSTS

Item	Unit of Measure	Highway			Railroad		
		Quantity	Unit Price	Cost ($1,000)	Quantity	Unit Price	Cost ($1,000)
Unclassified Excavation	Cubic Yard	660,780	$5.00*	3,304	519,000	$5.00	2,595
Rock Excavation	Cubit Yard	440,520	$8.00*	3,524	346,000	$8.00	2,766
Tunnels	Linear Foot	0	N/A	0	4,430	$4,860	21,530
Bridges	Square Feet	34,390	$125.00	4,299	17,440	$100.00	1,744
Subtotal				**$11,127**			**$28,635**
Project Engineering	% of Subtotal	4%		445	4%		1,145
Construction Engineering	% of Subtotal	5%		556	5%		1,432
Subtotal				**$12,128**			**$31,212**
Contingencies	% of Subtotal	10%		1,213	10%		3,121
Total Cost				**$13,341**			**$34,333**

* Unit cost to embank any of the excavation will be an additional $2.00/cubic yard.

CONCLUSIONS

URS completed an updated cost analysis to determine if a railroad would be a viable alternative compared to a highway. The 1997 highway and railroad alignments were used for this update (8.4 mile segment near Comet along the east side of the Lynn Canal).

The following conclusions were made:

- The estimated cost to construct the railroad alignment for the segment analyzed is approximately 2.5 times higher than the comparable segment of highway. The primary difference is attributed to the additional tunnel construction required for the railroad alignment.
- Construction costs associated with installation of ties and rails or rolling stock acquisition were not included in this analysis. Pavement and guardrail costs were not included in the highway estimate. Railroad terminal facilities presently exist in Skagway. However, there are none at either Juneau or Echo Cove (the current end of the road system north of Juneau). If the additional rail and terminal construction costs and highway construction costs would have been included as part of this analysis, a greater disparity between the railroad and highway costs would be exhibited.

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Figures

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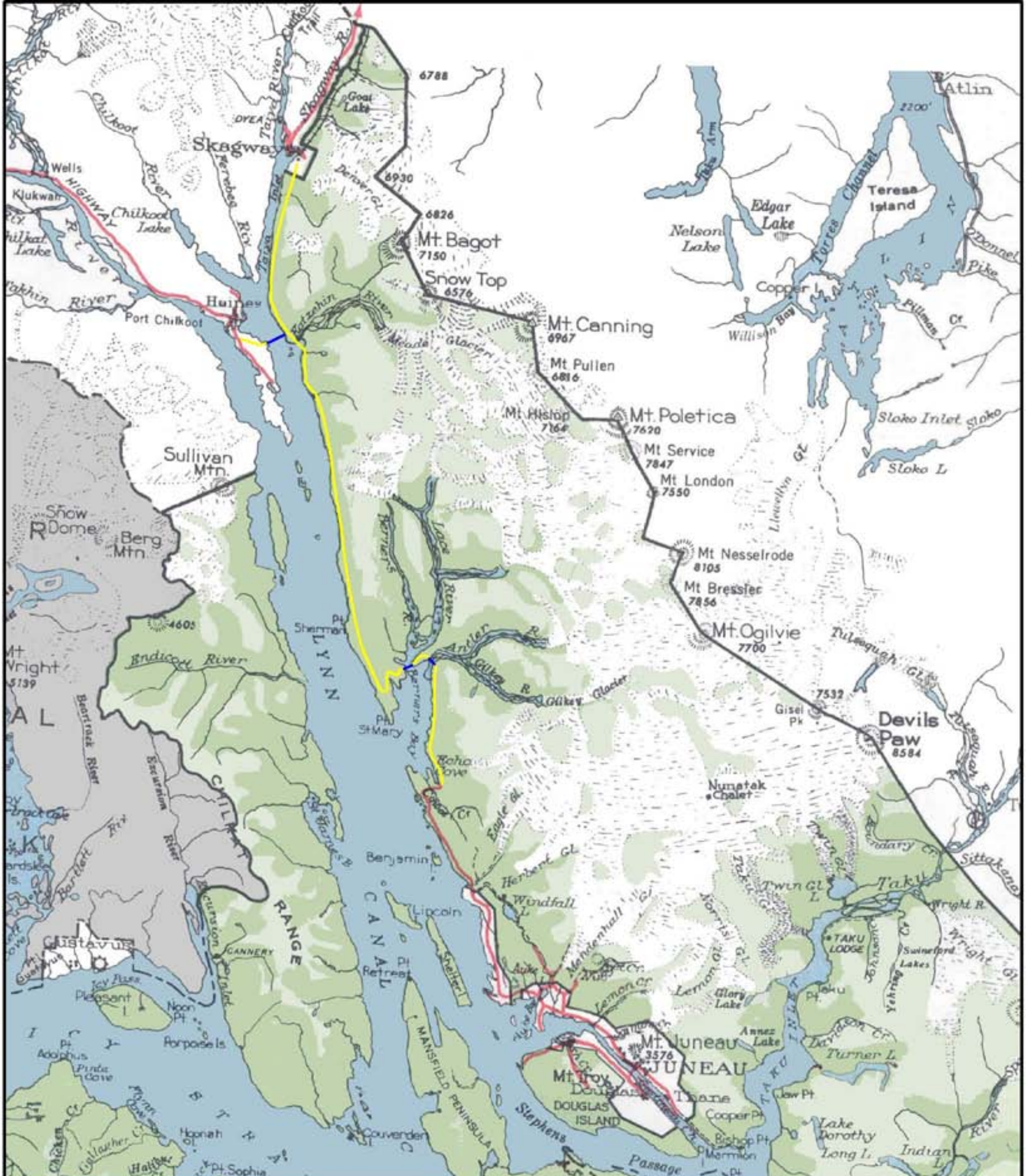

LEGEND

NEW HIGHWAY
NEW BRIDGE

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APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

EAST LYNN CANAL HIGHWAY WITH BRIDGE TO HAINES

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN	**FIGURE 1**
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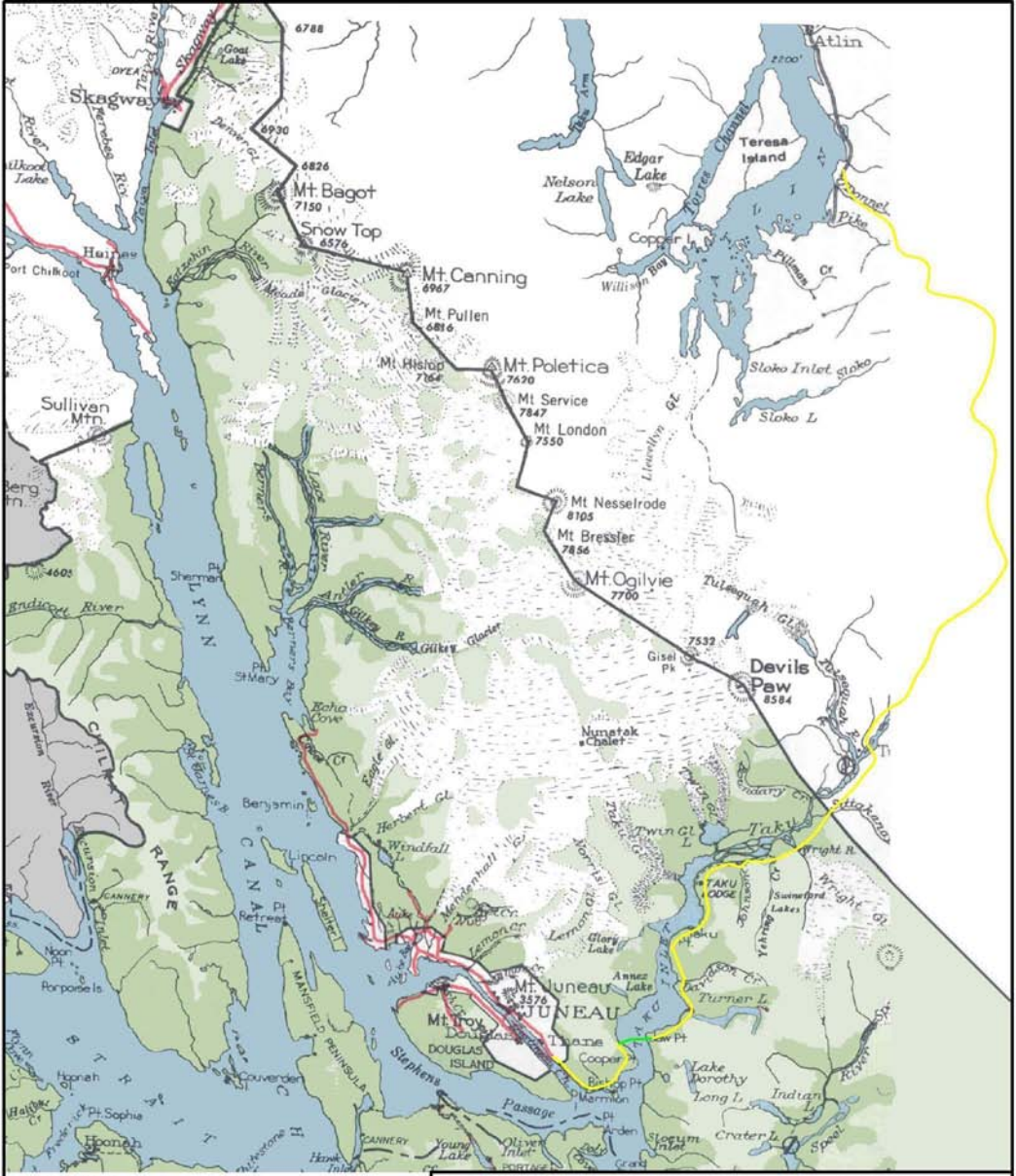

LEGEND

- NEW HIGHWAY
- FERRY

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APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

TAKU RIVER VALLEY HIGHWAY

JUNEAU, ALASKA

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FIGURE 2

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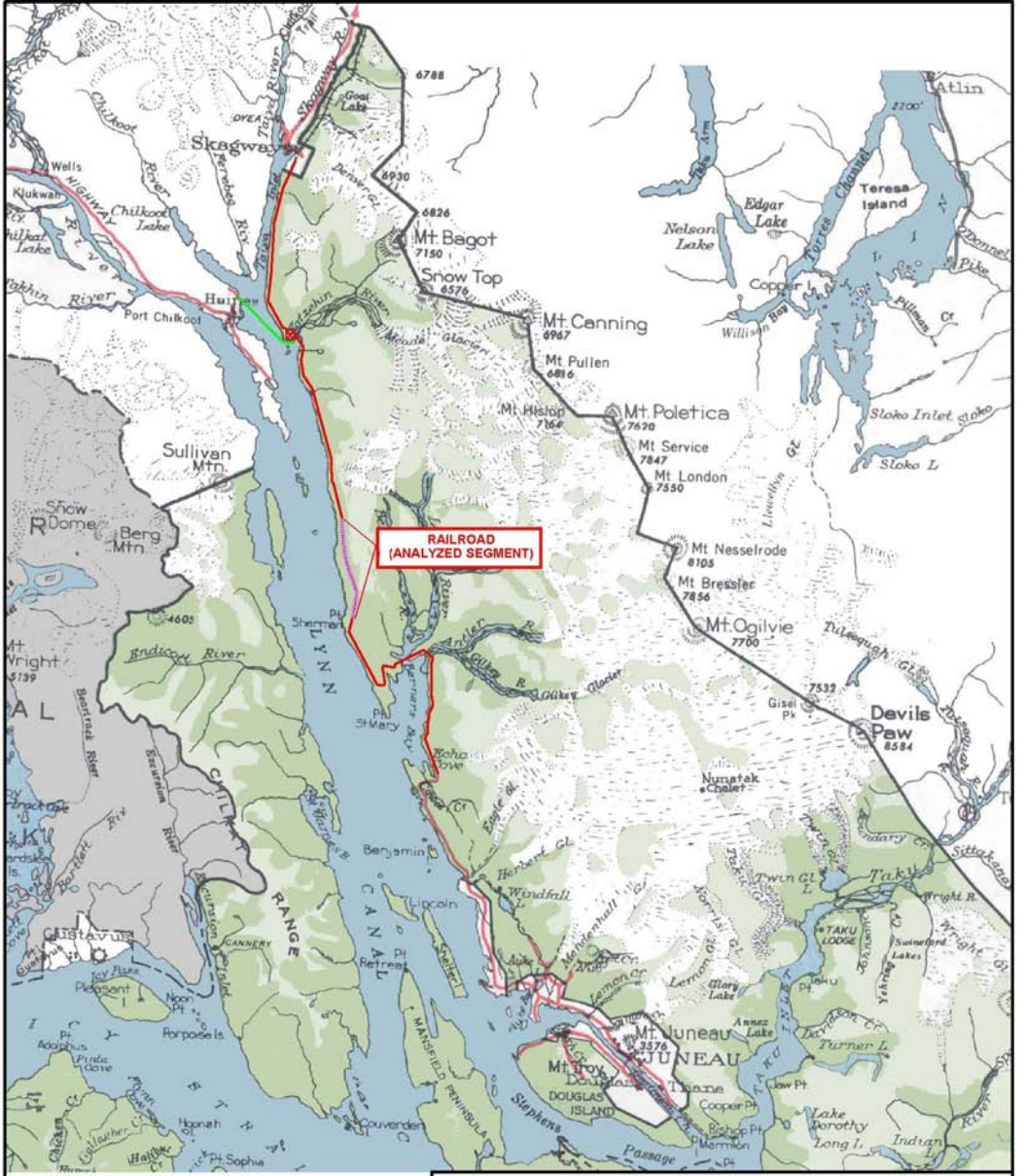

LEGEND

- RAILROAD (ANALYZED SEGMENT)
- NEW FERRY TERMINAL
- FERRY SHUTTLE
- RAILROAD

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APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

EAST LYNN CANAL RAIL

JUNEAU, ALASKA

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FIGURE 3

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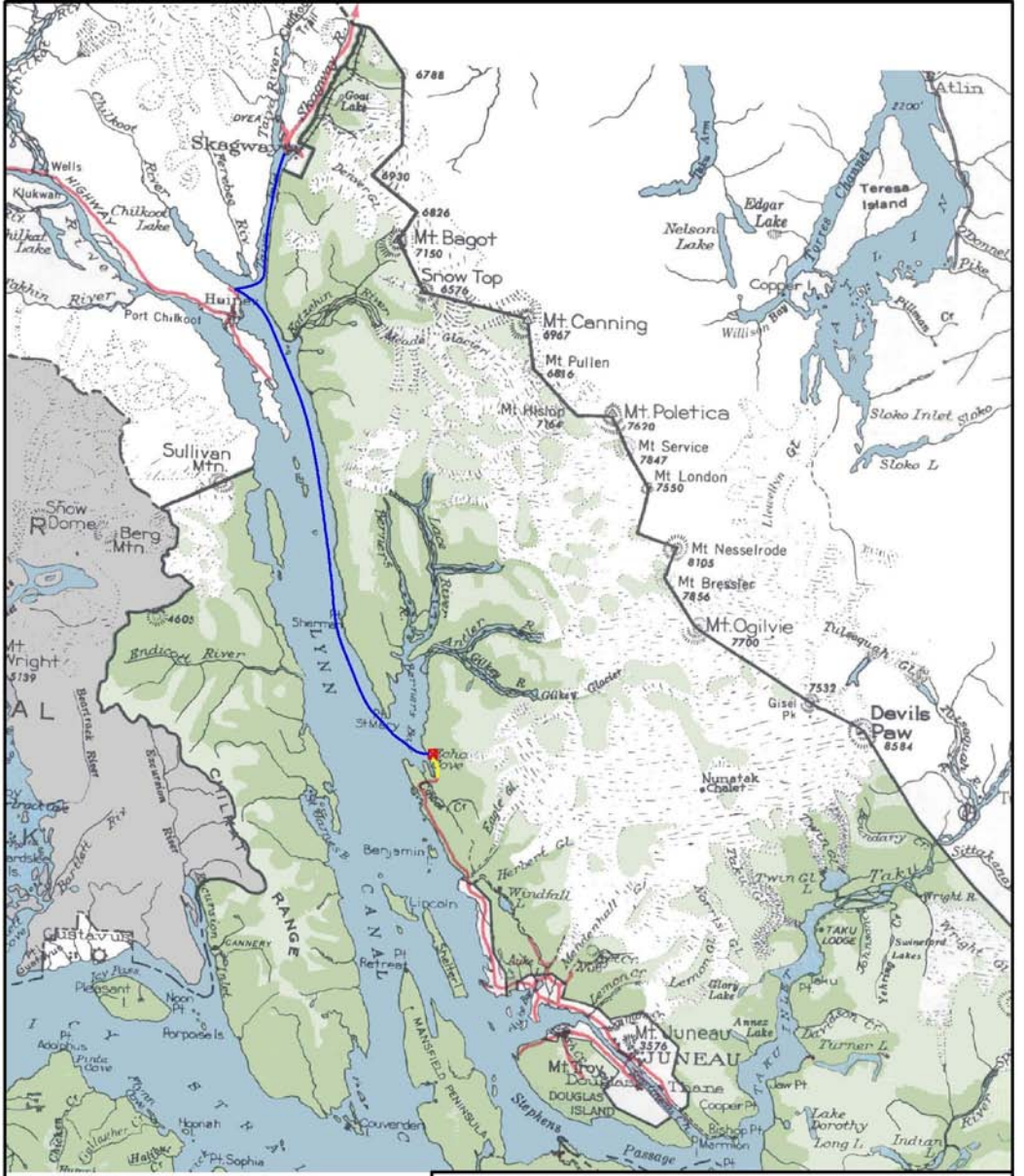

LEGEND

- GOLDBELT FERRY
- NEW HIGHWAY
- NEW FERRY TERMINAL

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APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

GOLDBELT FERRY SHUTTLE SERVICE FROM CASCADE POINT

JUNEAU, ALASKA

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FIGURE 4

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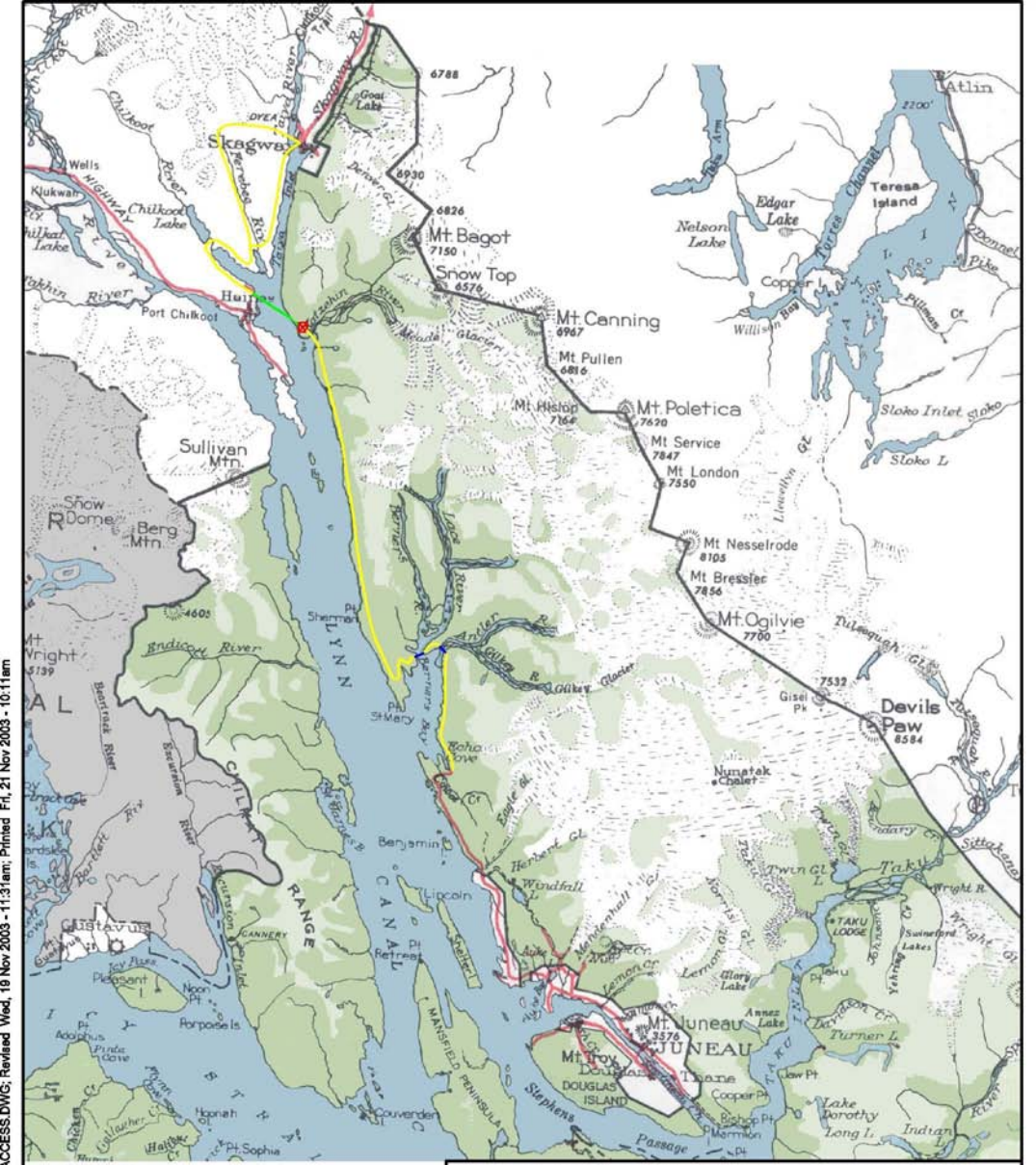

LEGEND

- NEW HIGHWAY
- NEW BRIDGE
- NEW FERRY TERMINAL
- FERRY SHUTTLE

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APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

HAINES/SKAGWAY INTERTIE

JUNEAU, ALASKA

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FIGURE 5

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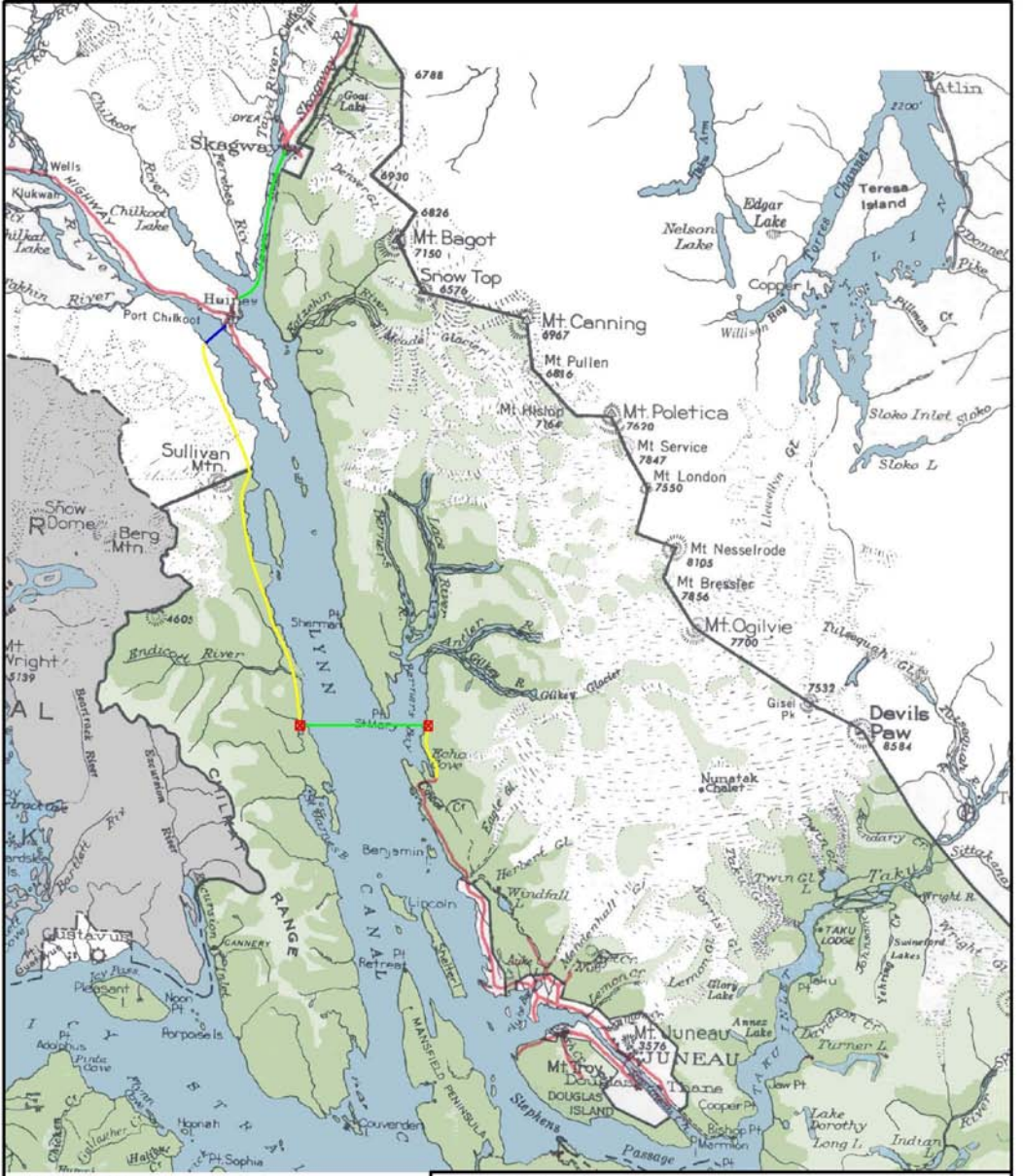

LEGEND

- NEW HIGHWAY
- NEW BRIDGE
- NEW FERRY TERMINAL
- FERRY SHUTTLE

N

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0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

ALTERNATIVE 3

WEST LYNN CANAL HIGHWAY

JUNEAU, ALASKA

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FIGURE 6

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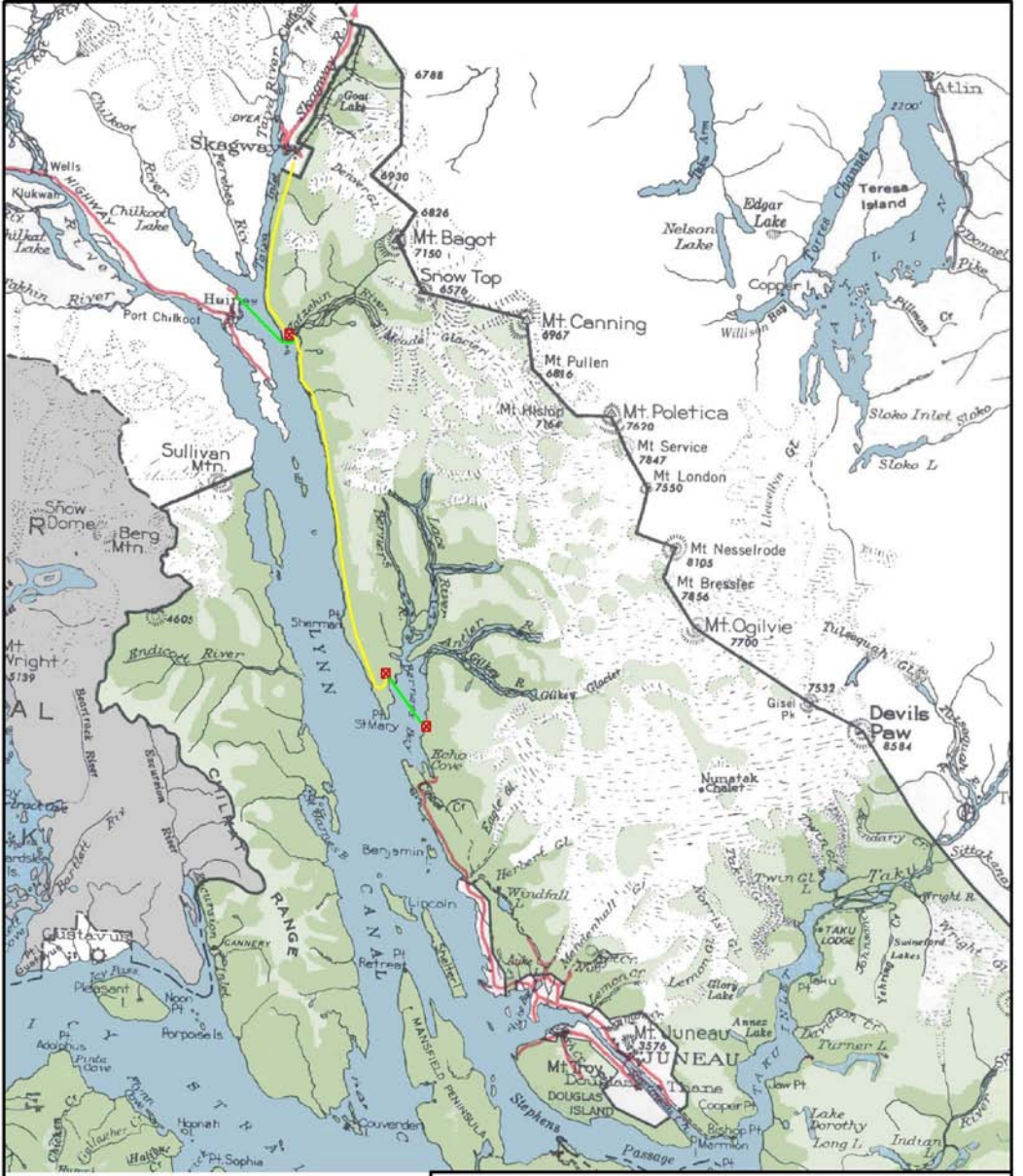

LEGEND

- NEW HIGHWAY
- NEW FERRY TERMINAL
- FERRY SHUTTLE

N

W — E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

PROPOSAL 5A, EAST LYNN CANAL HIGHWAY WITH BERNERS BAY AND KATZEHIN FERRY TERMINALS

JUNEAU, ALASKA

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FIGURE 7

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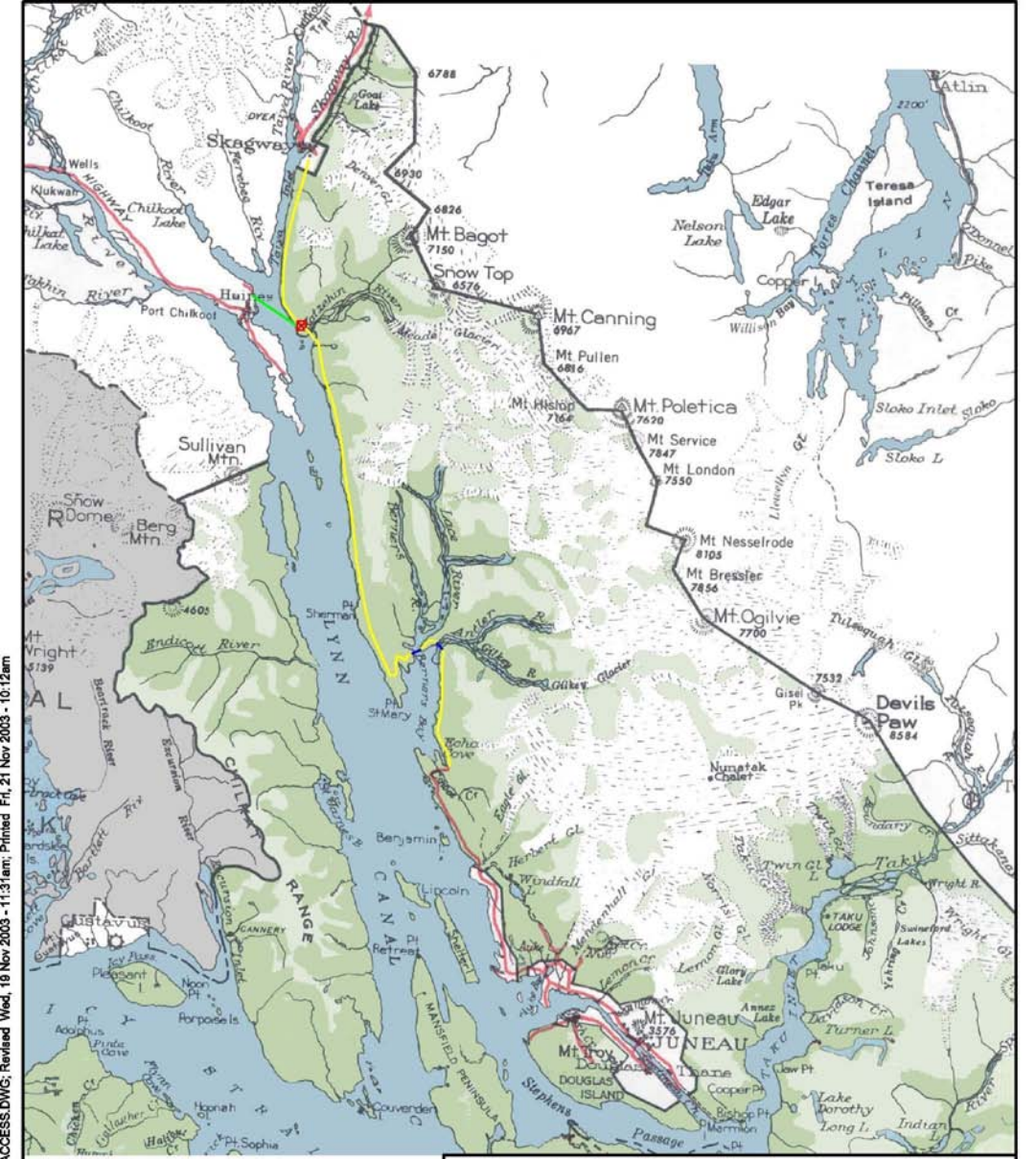


LEGEND

- NEW HIGHWAY
- NEW BRIDGE
- NEW FERRY TERMINAL
- FERRY SHUTTLE

N

W — E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

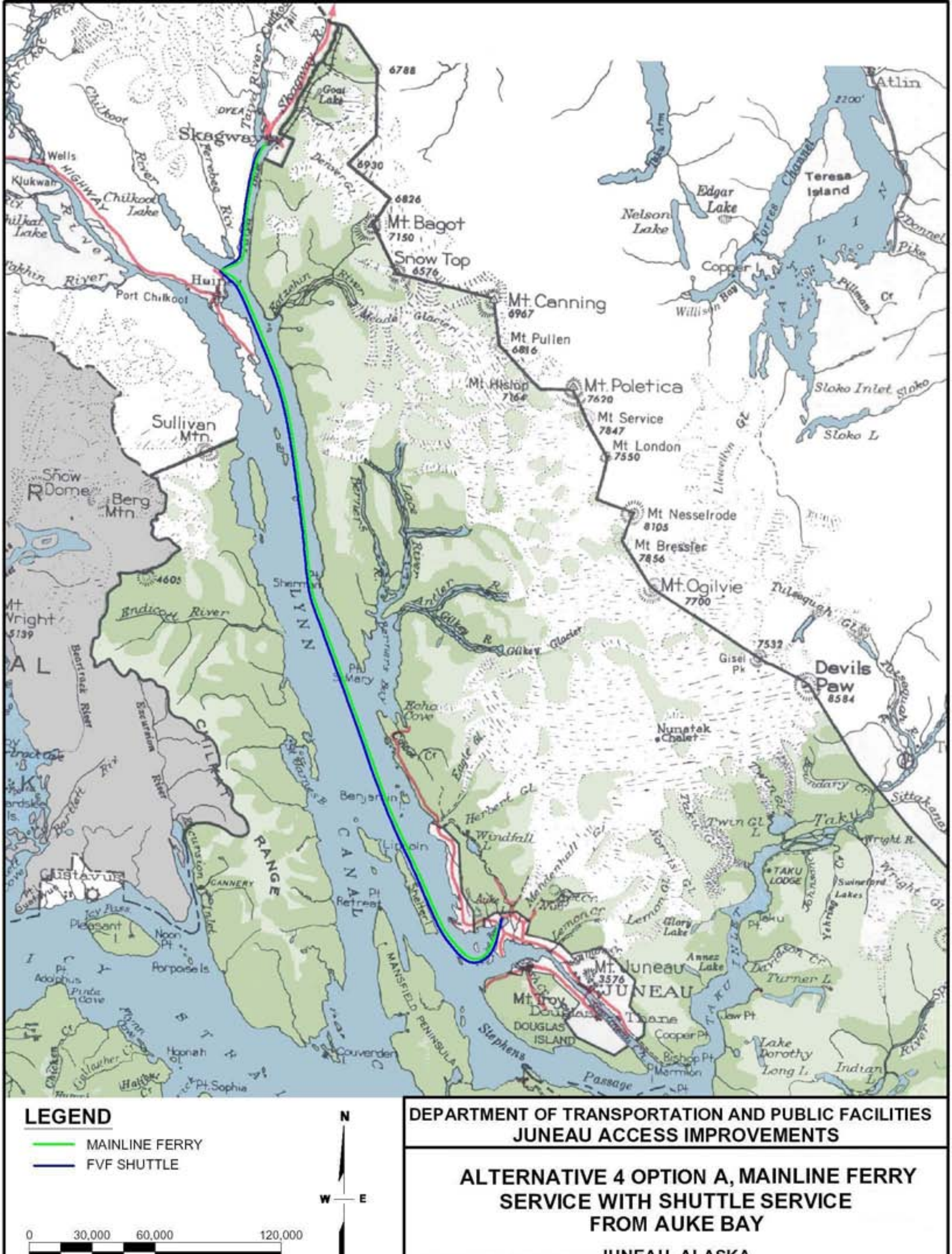
ALTERNATIVE 2, EAST LYNN CANAL HIGHWAY WITH KATZEHIN FERRY TERMINAL

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 8

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:12am



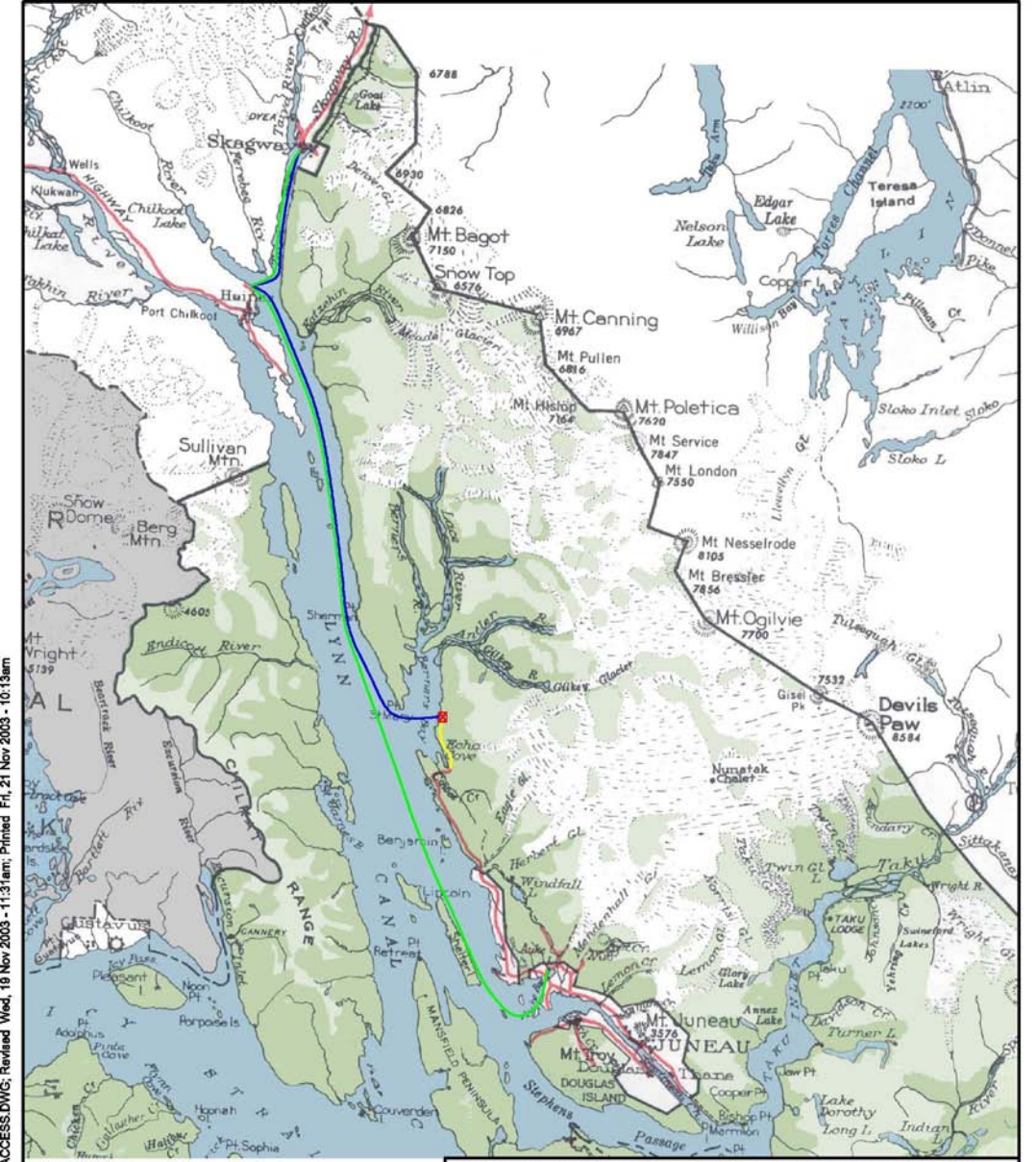
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

ALTERNATIVE 4 OPTION A, MAINLINE FERRY SERVICE WITH SHUTTLE SERVICE FROM AUKE BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN	FIGURE 9
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG	

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:12am



LEGEND

- MAINLINE FERRY
- FVF SHUTTLE
- NEW FERRY TERMINAL
- NEW HIGHWAY

N
W E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

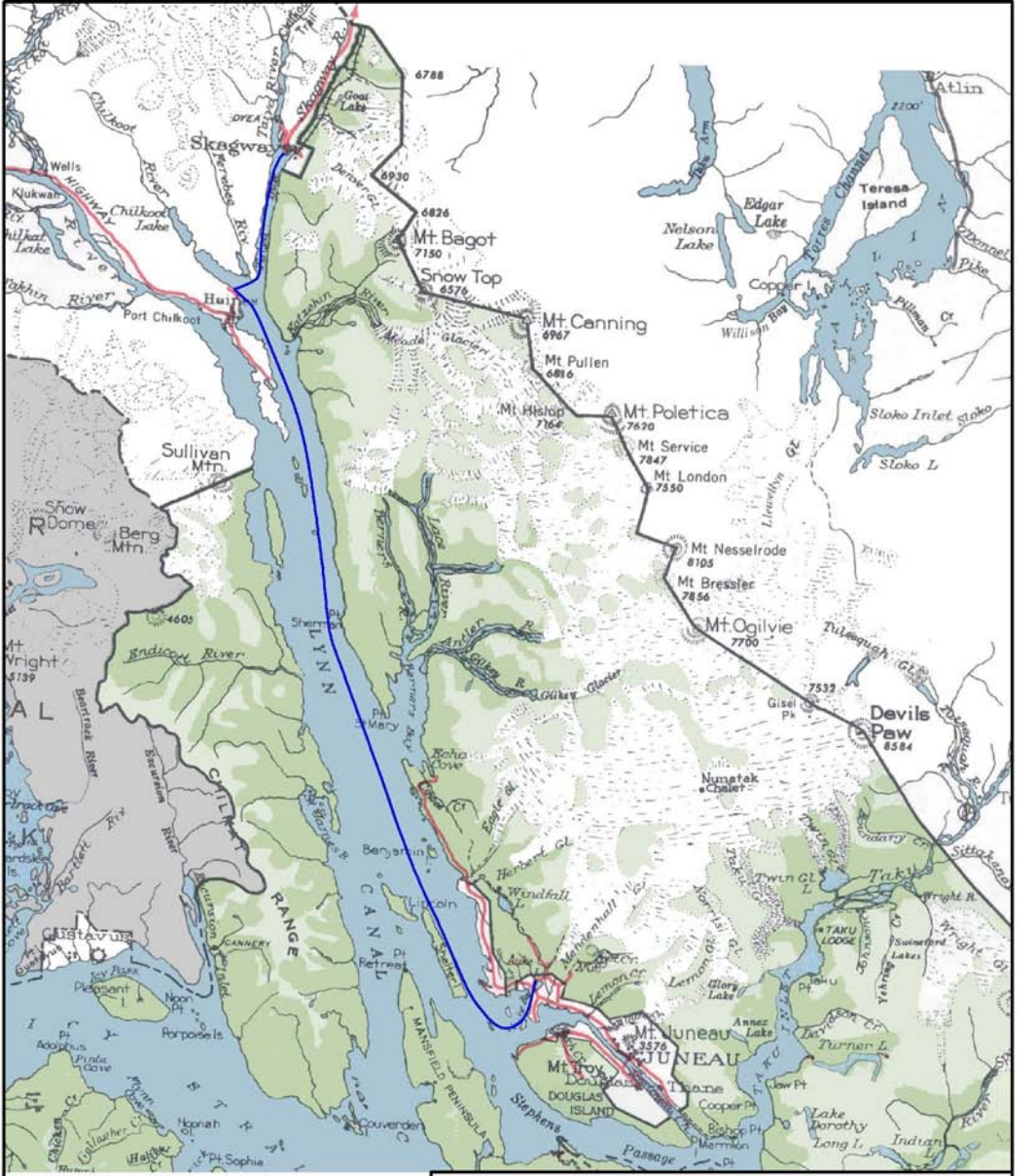
ALTERNATIVE 4 OPTION B, MAINLINE FERRY SERVICE WITH SHUTTLE SERVICE FROM BERNERS BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 10

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:13am



LEGEND

FVF SHUTTLE

N

W E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

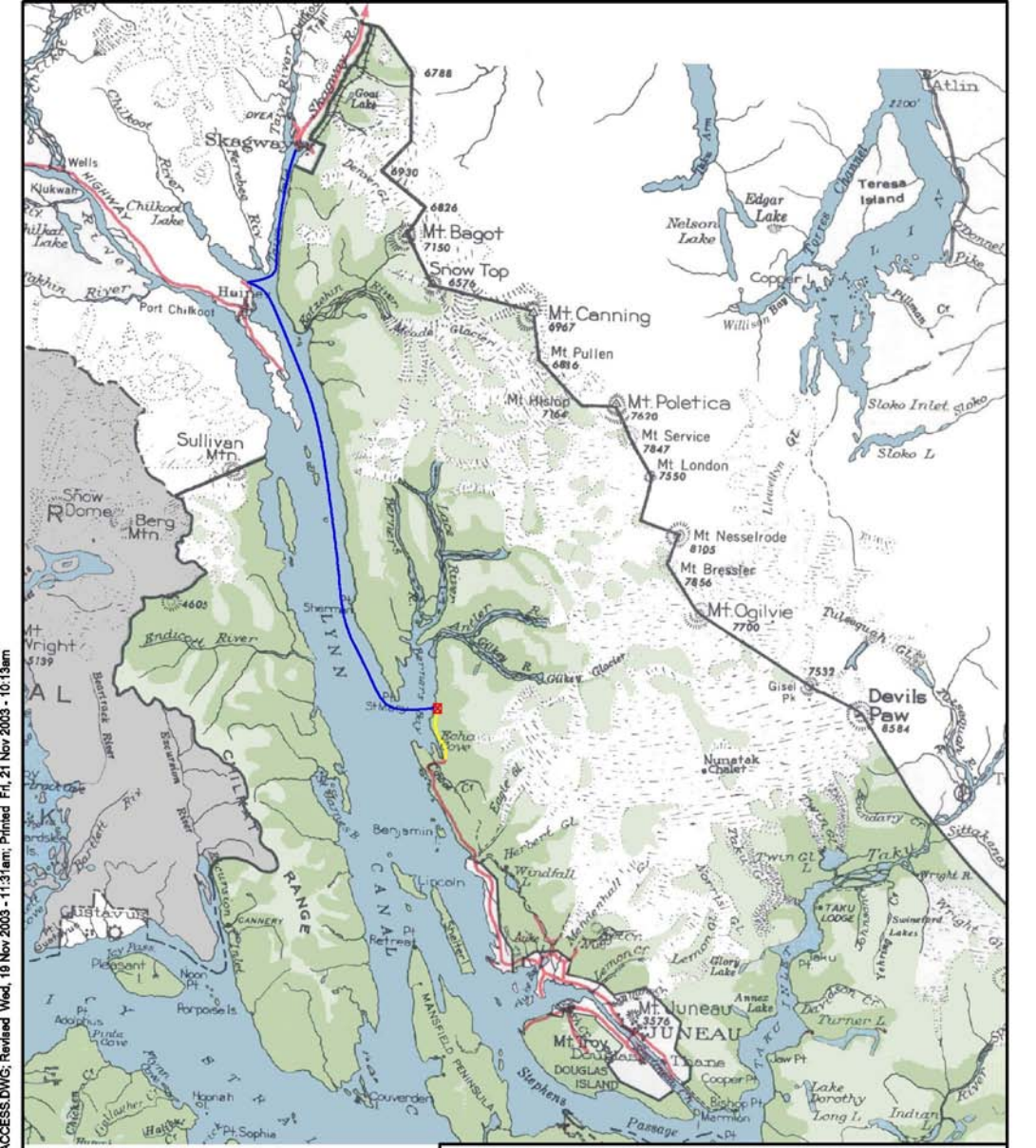
ALTERNATIVE 4 OPTION C, MAINLINE FERRY SERVICE ENDS AT AUKE BAY WITH SHUTTLE SERVICE NORTH FROM AUKE BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 11

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:13am



LEGEND

- NEW HIGHWAY
- FVF SHUTTLE
- NEW FERRY TERMINAL

N
W E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

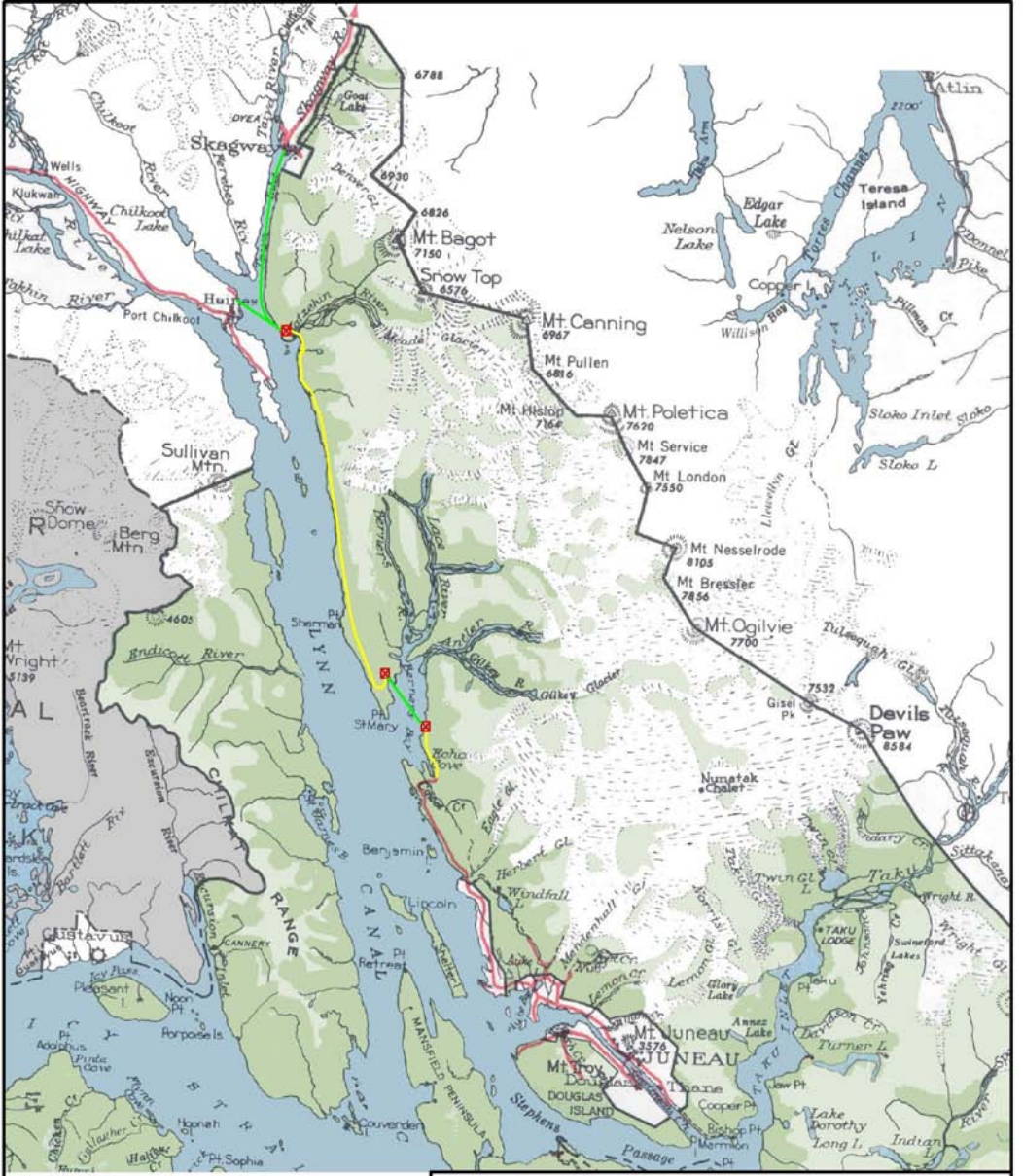
ALTERNATIVE 4 OPTION D, MAINLINE FERRY SERVICE ENDS AT AUKE BAY WITH SHUTTLE SERVICE NORTH FROM BERNERS BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 12

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:13am



LEGEND

- NEW HIGHWAY
- NEW FERRY TERMINAL
- FERRY SHUTTLE

N
W E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

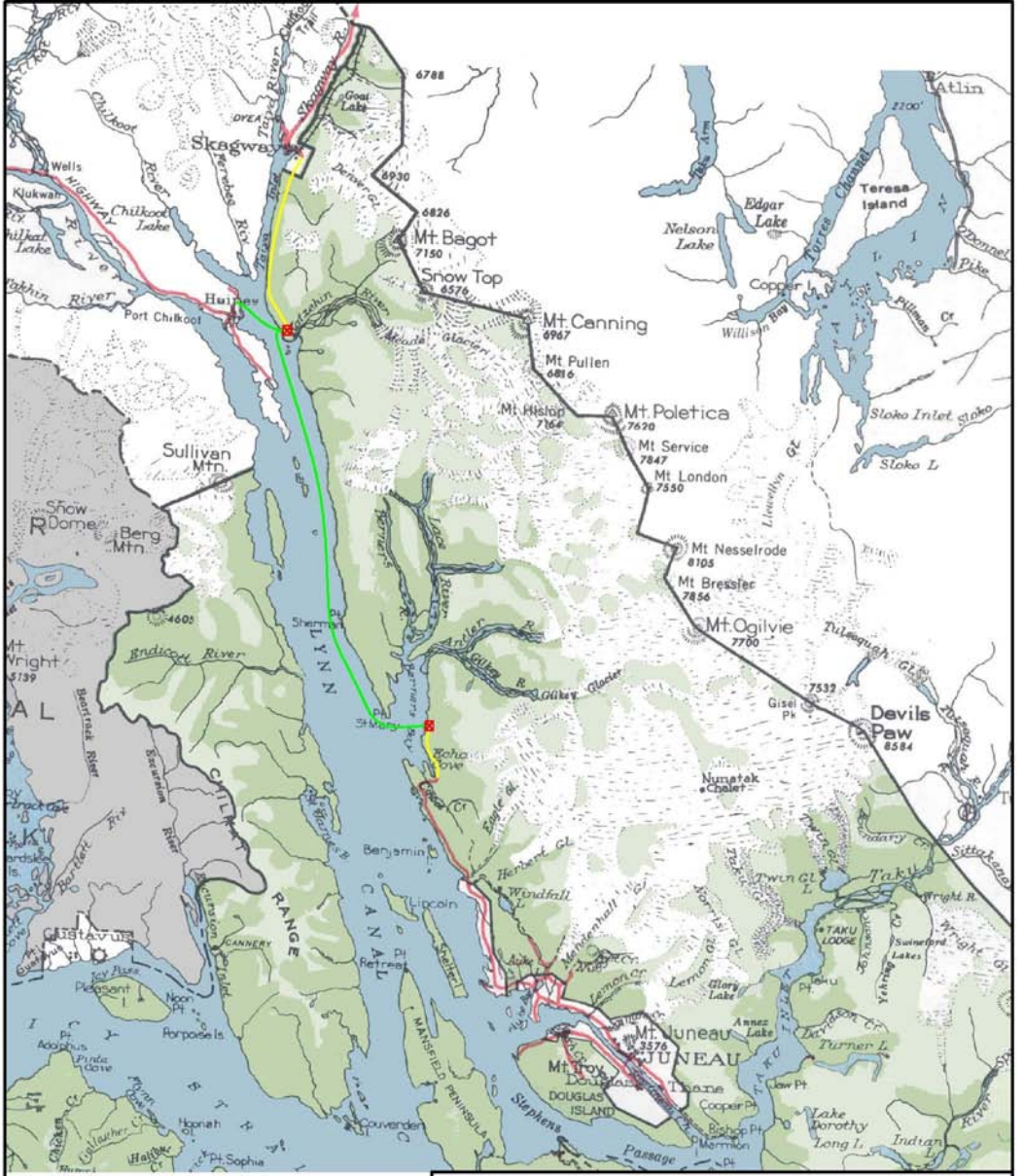
PROPOSAL 5B, EAST LYNN CANAL HIGHWAY TO KATZEHIN WITH BERNERS BAY SHUTTLE FERRY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 13

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:13am



LEGEND

- NEW HIGHWAY
- NEW FERRY TERMINAL
- FERRY SHUTTLE

N
W — E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

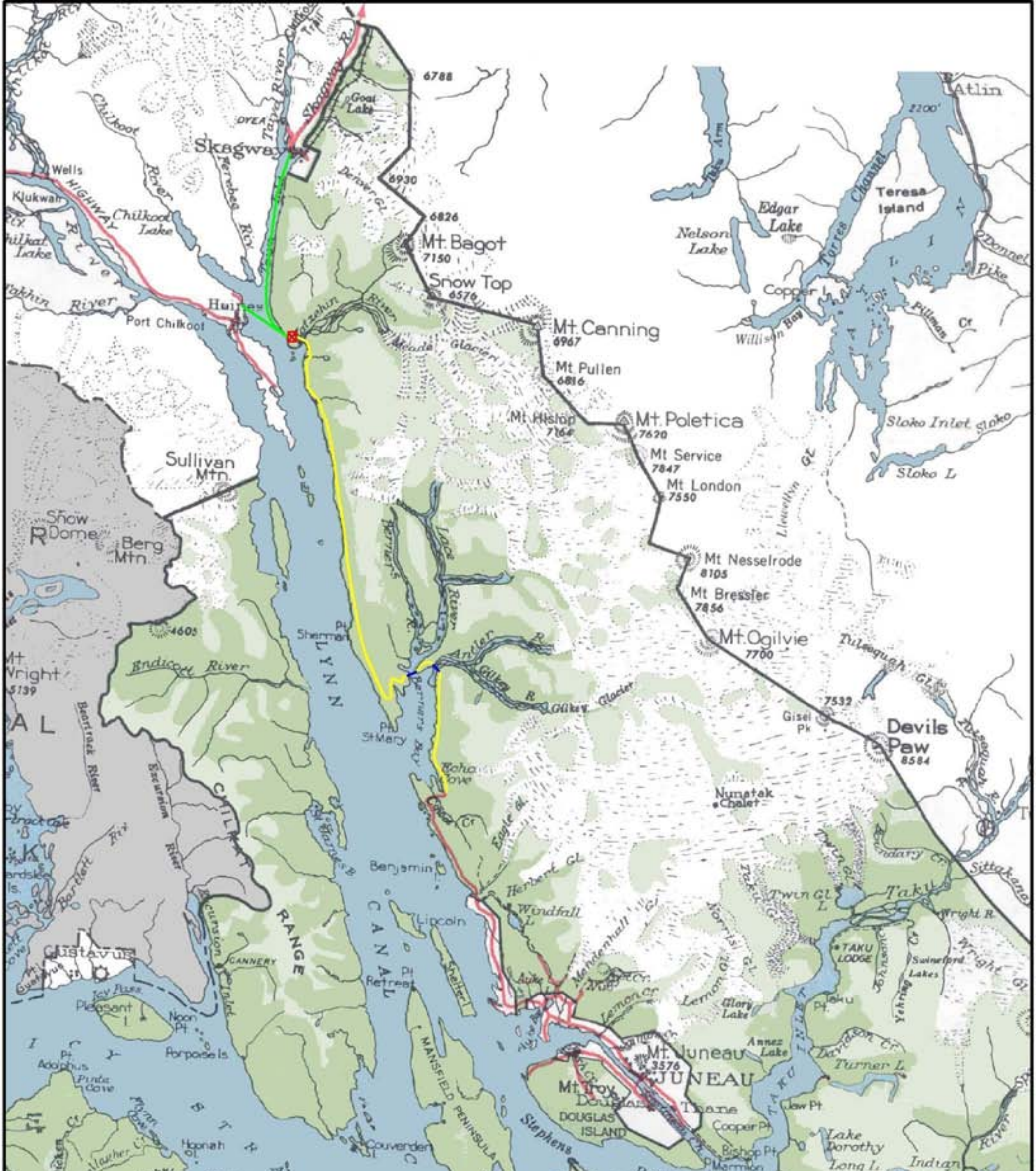
PROPOSAL 5C, EAST LYNN CANAL HIGHWAY FROM KATZEHIN TO SKAGWAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 14

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:14am



LEGEND

- NEW HIGHWAY
- NEW BRIDGE
- NEW FERRY TERMINAL
- FERRY SHUTTLE

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

N

W E

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

PROPOSAL 5D, EAST LYNN CANAL HIGHWAY TO KATZEHIN

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN	**FIGURE 15**
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG	

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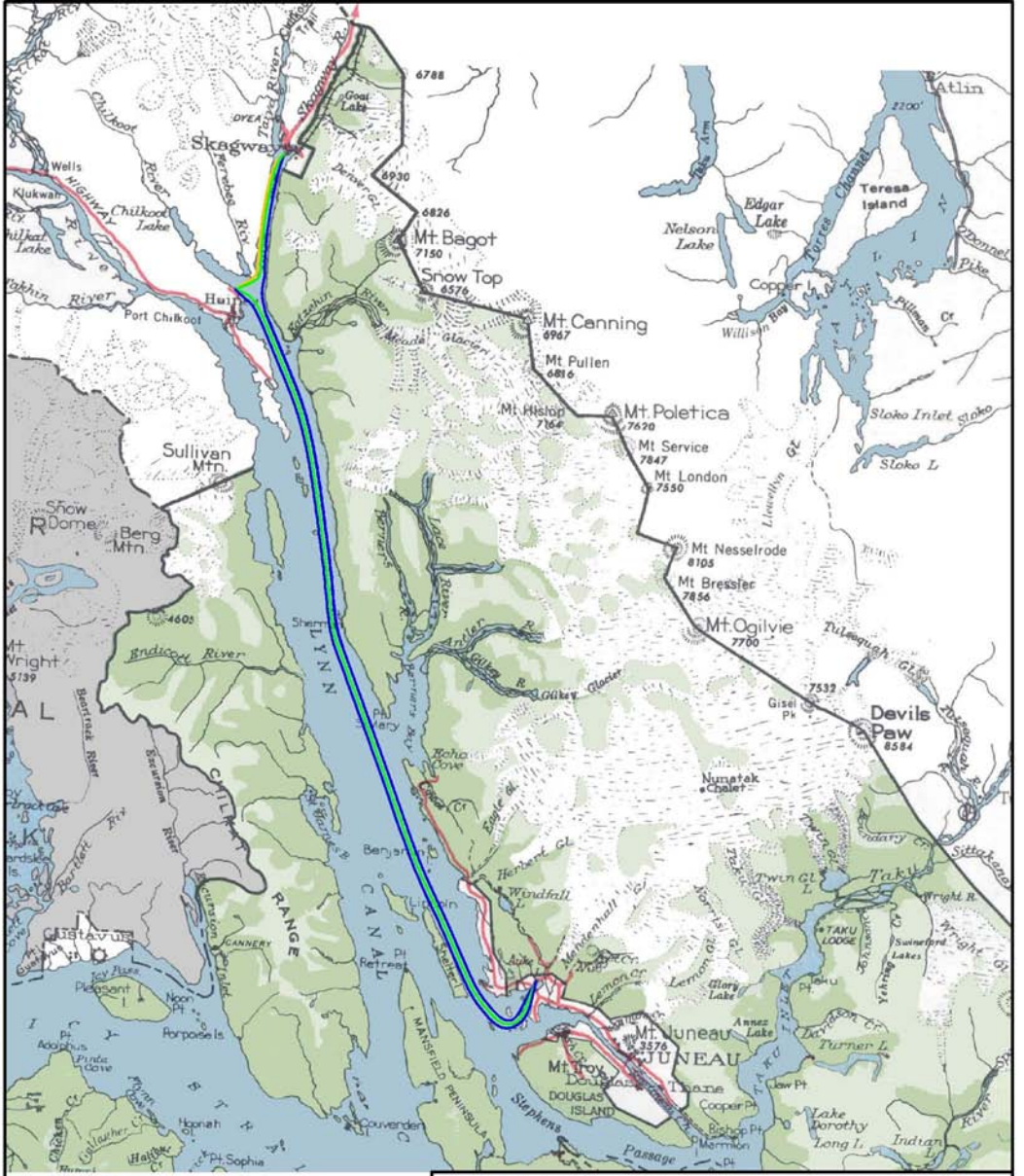


LEGEND

- Hns/Skg SHUTTLE (Year Round)
- MAINLINE FERRY (Year Round)
- FVF SHUTTLE (Year Round)

N

W — E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

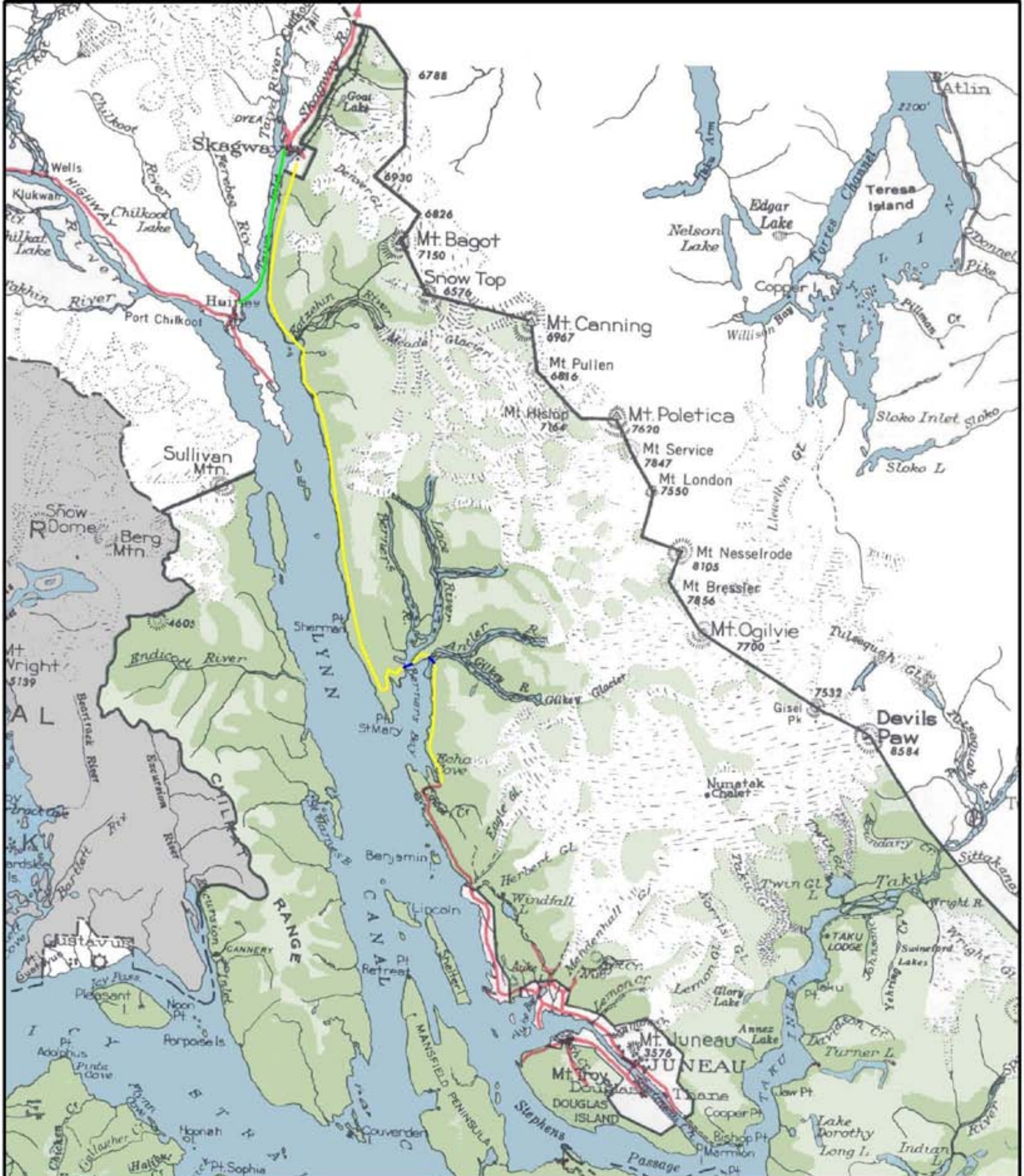
UPDATED ALTERNATIVE 1 NO BUILD

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 16

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:14am



LEGEND

- NEW HIGHWAY
- NEW BRIDGE
- FERRY SHUTTLE

N / W / E

0 | 30,000 | 60,000 | 120,000

APPROXIMATE SCALE IN FEET

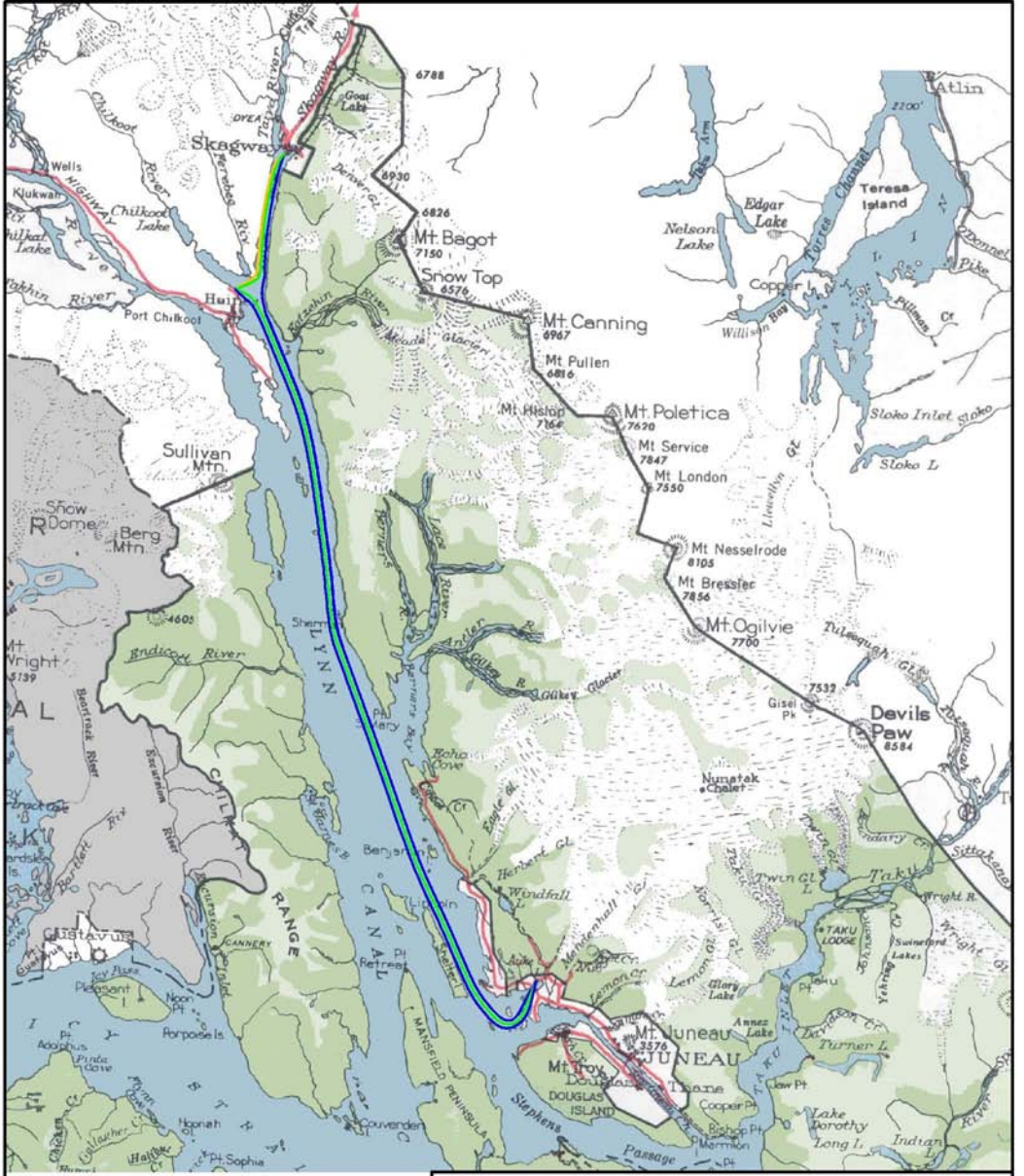
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

ALTERNATIVE 2,
2003 MODIFIED EAST LYNN CANAL HIGHWAY
WITHOUT KATZEHIN FERRY TERMINAL

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN	**FIGURE 17**
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG	

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:15am



LEGEND

Hns/Skg SHUTTLE (Year Round)

MAINLINE FERRY (Year Round)

FVF SHUTTLE (Year Round)

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

N

W E

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

JUNEAU ACCESS IMPROVEMENTS

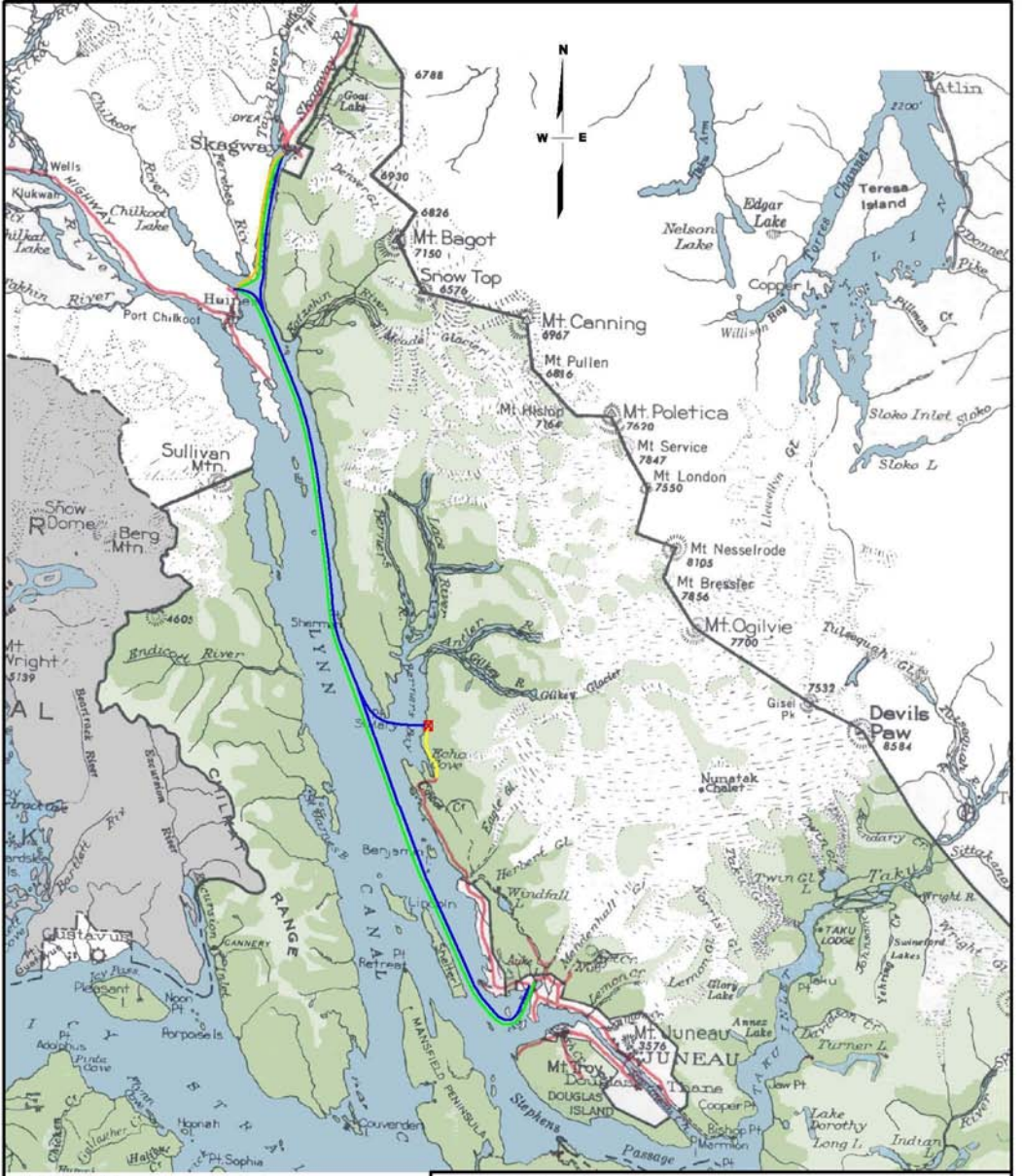
MODIFIED ALTERNATIVE 4 OPTION A, FVF FERRY SERVICE FROM AUKE BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 18

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:15am



LEGEND

- NEW HIGHWAY
- FVF SHUTTLE (BB/Hns/Skg; Winter-Auke Bay/Hns/Skg)
- MAINLINE FERRY (Year Round)
- Hns/Skg SHUTTLE (Year Round)
- NEW TERMINAL

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

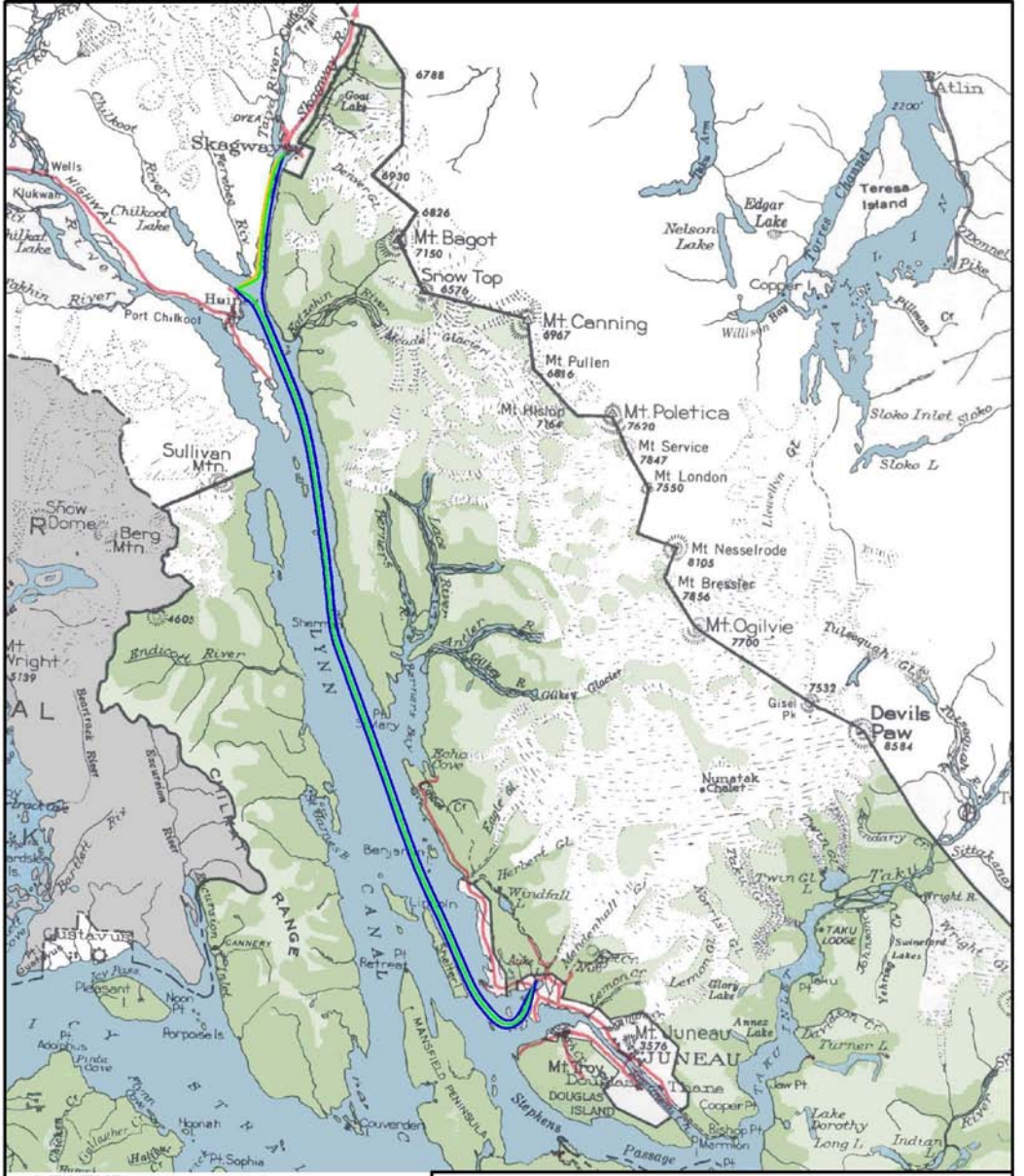
MODIFIED ALTERNATIVE 4 OPTION B, FVF SERVICE FROM BERNERS BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 19

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:16am



LEGEND

- Hns/Skg SHUTTLE (Year Round)
- DAYBOAT SHUTTLE (Year Round)
- MAINLINE FERRY (Year Round)

N
W E

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

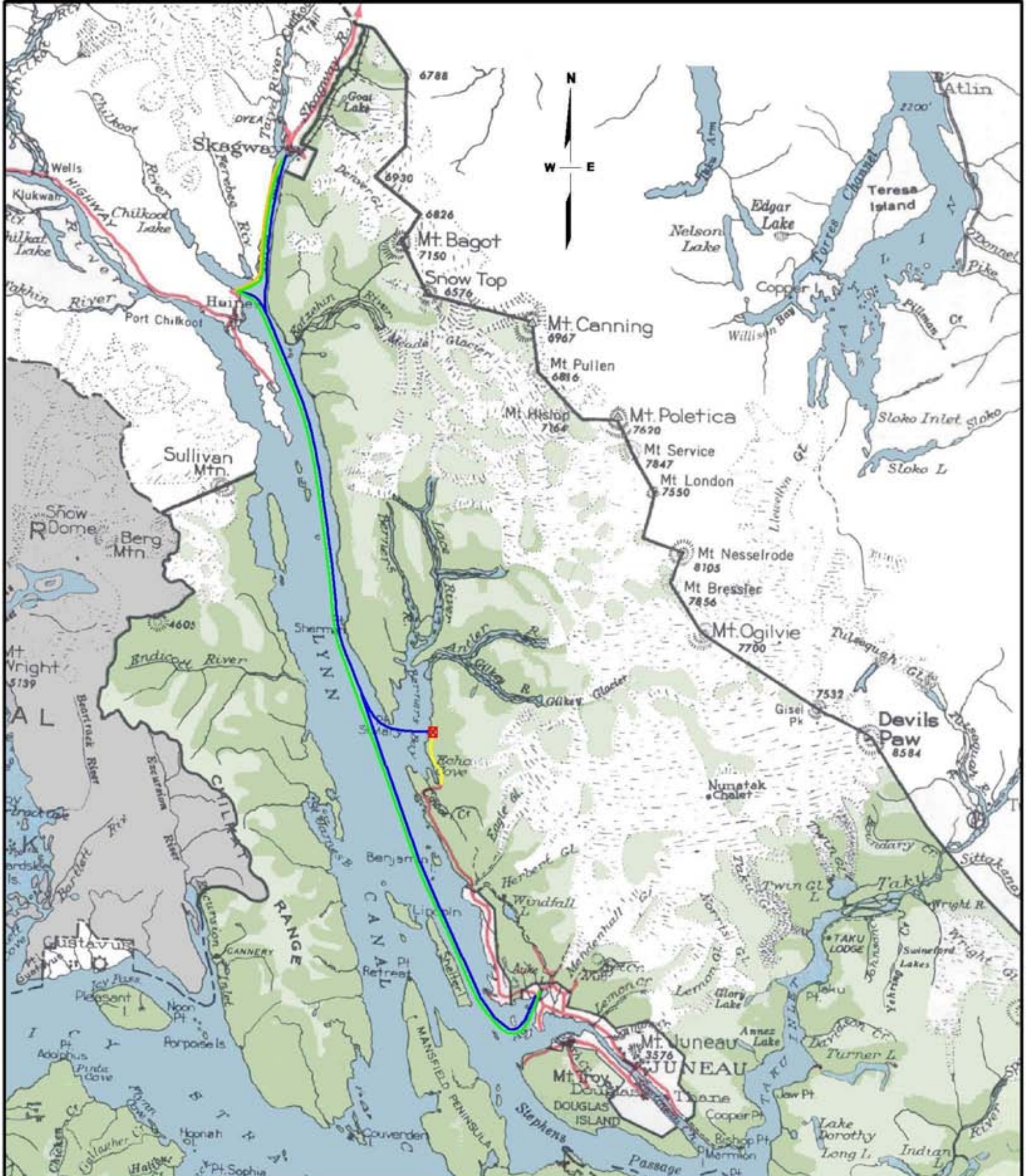
MODIFIED ALTERNATIVE 4 OPTION C, DAYBOAT SERVICE FROM AUKE BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG

FIGURE 20

G:\PROJECTS\26219591\JUNEAU ACCESS.DWG; Revised Wed, 19 Nov 2003 - 11:31am; Printed Fri, 21 Nov 2003 - 10:16am



LEGEND

- NEW HIGHWAY
- DAYBOAT SHUTTLE (BB/Hns/Skg; Winter-Auke Bay/Hns/Skg)
- MAINLINE FERRY (Year Round)
- Hns/Skg SHUTTLE (Year Round)
- NEW FERRY TERMINAL

0 30,000 60,000 120,000

APPROXIMATE SCALE IN FEET

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
JUNEAU ACCESS IMPROVEMENTS

MODIFIED ALTERNATIVE 4 OPTION D, DAYBOAT SERVICE FROM BERNERS BAY

JUNEAU, ALASKA

JOB NO: 26219591	DRAWN: ARN	**FIGURE 21**
DATE: 11/7/03	FILE: JUNEAU ACCESS.DWG	