JUNEAU ACCESS IMPROVEMENTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

STATE PROJECT NUMBER: 71100
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Juneau Access Improvements Project
Juneau, Alaska
City and Borough of Juneau

Final Environmental Impact Statement

Submitted Pursuant to 42 U.S.C. 4332 (2)(C)
By the
U.S. Department of Transportation
Federal Highway Administration
And
State of Alaska
Department of Transportation and Public Facilities

This action complies with Executive Order 11988, Floodplain Management, Executive Order 11990, Protection of Wetlands, and Executive Order 12898, Environmental Justice

Cooperating Agencies

National Marine Fisheries Service
U.S. Coast Guard
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Forest Service

1/18/06
Date of Approval

Patrick J. Kemp, P.E. for DOT&PF

1/18/06
Date of Approval

David Miller for FHWA

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The Juneau Access Improvements Project would improve public access to and from Juneau in Lynn Canal. Six build alternatives are evaluated, along with the No Action Alternative. Alternatives include a combination of highway and ferry routes and improved ferry service in Lynn Canal.

FHWA will issue a Record of Decision (ROD) no sooner than 30 days after publication of the notice of availability of this Final EIS in the Federal Register. The ROD will present the basis for the decision as specified in 40 CFR 1505.2 and summarize any mitigation measures that will be incorporated in the project. Comments on this Final EIS should be sent to:

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SUMMARY

Introduction

The purpose of an Environmental Impact Statement (EIS) is to satisfy the requirements of the National Environmental Policy Act (NEPA),[1] which requires preparation of an EIS for any proposed project that:

- Is not categorically excluded
- Is a major federal action (i.e., requires a permit, regulatory decision, or funding from a federal agency)
- May have a significant effect on the quality of the human environment

NEPA mandates that the EIS determine, characterize, analyze, and document the project's environmental impacts, as well as specify possible mitigation of adverse impacts.

An essential element of the NEPA process is interactive public participation, whereby a Draft EIS is published and comments are solicited from the general public and interested parties (including governmental entities, regulatory agencies, and Native organizations). These comments may range from simple statements of support or opposition to complex technical discussions of such issues as project alternatives, study methods, determination and characterization of impacts, and mitigation recommendations. The Final EIS documents and responds to all comments.

The Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA) issued a Draft EIS for the Juneau Access Improvements Project in June 1997. Following review and consideration of the public and agency comments received on the Draft EIS, Governor Knowles announced in 2000 that Alternative 2, the East Lynn Canal Highway with Katzehin Terminal, was the preferred alternative for the proposed project, but his administration did not actively pursue completion of the EIS. Work accelerated on the project in 2002 when Governor Murkowski directed that the EIS be completed.

Because more than three years had passed since release of the Draft EIS, the adequacy of the environmental document was reevaluated in December 2002. DOT&PF determined, and FHWA concurred, that there were sufficient changes in project alternatives and potential environmental impacts to warrant preparation of a supplemental draft EIS. The Supplemental Draft EIS, released in January 2005, included pertinent information from the 1997 Draft EIS as well as the additional material required. Following circulation of the Supplemental Draft EIS to the public and interested government agencies, and consideration of comments received on the document, DOT&PF and FHWA have prepared a Final EIS.

The basis of this Final EIS is the Supplemental Draft EIS text in its entirety, with changes made as appropriate throughout the document. These changes reflect selection of a new preferred alternative, modifications to alternatives, dropping alternatives that are no longer reasonable, updated information on the affected environment, changes in the assessment of impacts, development of mitigation measures for the preferred alternative, the results of ongoing agency coordination, comments received on the Supplemental Draft EIS, and responses to those comments. Initial construction costs have been updated to 2005 dollars. Except where noted, all other monetary values are in 2004 dollars in keeping with the original analysis. Important

[1] National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, U.S. Code 4321-4347, January 1, 1970, as amended).

changes are highlighted for easy identification by the reader. Three new appendices including addenda to the Supplemental Draft EIS Technical Report appendices and a *Response to Comments Report* are appended to this Final EIS. The Supplemental Draft EIS appendices have not been reprinted, but can be viewed on compact disk (CD), at local libraries, and on the project website (www.dot.alaska.gov/juneauaccess).

Proposed Action

DOT&PF proposes to improve surface transportation to and from Juneau within Lynn Canal. Juneau is the largest community on the North American continent not connected to the continental highway system. Because of its location and lack of highway access, all freight, vehicle, and passenger movement to and from Juneau is by air or sea. The only public surface transportation available to and from Juneau is the Alaska Marine Highway System (AMHS), a state-owned ferry system that provides transportation to many of Southeast Alaska's coastal communities. AMHS service from Juneau connects to the continental highway system in Prince Rupert, British Columbia (B.C.), and Bellingham, Washington to the south, and in Haines and Skagway to the north. The AMHS is the National Highway System link to Juneau, Haines, and Skagway.

The Juneau Access Improvements Project is included in the Statewide Transportation Improvement Program (STIP) for 2004-2006. This federally required document was approved by the FHWA and Federal Transit Administration in October 2003 and last amended in January 2005. The project is consistent with the DOT&PF 2004 Southeast Alaska Transportation Plan (SATP)[2]. The SATP is an approved element of the Alaska Statewide Transportation Plan and was prepared in accordance with 23 United States Code (USC), Alaska Statute (AS) 44.42.050, and other related federal and state regulations.

Project Purpose and Need

The purpose of and need for the Juneau Access Improvements Project is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will:

- Provide the capacity to meet transportation demand in the corridor
- Provide flexibility and improve opportunity to travel
- Reduce travel times between Lynn Canal communities
- Reduce state costs for transportation in the corridor
- Reduce user costs for transportation in the corridor

Chapter 1 contains detailed information on the need for the proposed Juneau Access Improvements Project.

Alternatives Evaluated in the Final Environmental Impact Statement

Following are brief descriptions of the reasonable alternatives evaluated in the Final EIS. Chapter 2 includes more detailed descriptions of each alternative.

[2] See information on page S-6 regarding consistency with the SATP for all project alternatives.

No Action Alternative

The No Action Alternative includes a continuation of mainline AMHS service in Lynn Canal as well as the operation of the fast vehicle ferry (FVF) motor vessel *(M/V) Fairweather* between Auke Bay and Haines and Auke Bay and Skagway. Shuttle service would operate between Haines and Skagway, provided by the *M/V Aurora*.

Alternative 2B (Preferred): East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

Alternative 2B would construct a 50.8-mile two-lane highway from the end of Glacier Highway at Echo Cove around Berners Bay and along the eastern coast of Lynn Canal to a point north of the Katzehin River delta. Shuttle ferry service to both Skagway and Haines would be provided from a new terminal at Katzehin. The Haines to Skagway shuttle service would continue to operate, with two new shuttle ferries and the *M/V Aurora* forming a three-vessel system. Mainline AMHS service would end at Auke Bay and the *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 3: West Lynn Canal Highway

Alternative 3 would extend Glacier Highway with a two-lane highway 5.2 miles from Echo Cove to Sawmill Cove. Ferry terminals would be constructed at Sawmill Cove and William Henry Bay, and shuttle ferries would operate between the two terminals. A 38.9-mile two-lane highway would be constructed from William Henry Bay to Haines with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road. The *M/V Aurora* would continue to operate as a shuttle between Haines and Skagway. Mainline ferry service would end at Auke Bay, and the *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 4: Marine Alternatives

The four marine alternatives described below would construct new shuttle ferries to operate in addition to continued mainline service in Lynn Canal. All of the alternatives would include a minimum of two mainline vessel round-trips per week, year-round, and continuation of the Haines/Skagway shuttle service provided by the *M/V Aurora*. The *M/V Fairweather* would no longer operate in Lynn Canal. All of these alternatives would require construction of new berths at Auke Bay.

- **Alternative 4A: FVF Shuttle Service from Auke Bay** – Alternative 4A would construct two FVFs to provide daily service from Auke Bay to Haines and to Skagway.
- **Alternative 4B: FVF Shuttle Service from Berners Bay** – Alternative 4B would extend Glacier Highway with a two-lane highway 5.2 miles from Echo Cove to Sawmill Cove where a new ferry terminal would be constructed. Two 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: Conventional Monohull Shuttle Service from Auke Bay** – Alternative 4C would construct two conventional monohull vessels to provide daily summer service from Auke Bay to Haines and to Skagway. In winter, a single shuttle would alternate between running one day to Haines and one day to Skagway.
- **Alternative 4D: Conventional Monohull Shuttle Service from Berners Bay** – This option would extend Glacier Highway 5.2 miles with a two-lane highway from Echo Cove to Sawmill Cove where a ferry terminal would be constructed. Two conventional

monohull vessels would be constructed to provide daily service from Sawmill Cove to Haines and to Skagway in the summer and alternating day service from Auke Bay to Haines and to Skagway in the winter.

Alternatives Eliminated from Further Consideration

A variety of potential alternatives for the proposed project were identified by the DOT&PF project team, resource agencies, and the public over the course of preliminary engineering studies and environmental review of the project, including the public review of the 1997 Draft EIS. The alternatives listed below were eliminated from further consideration in the Supplemental Draft EIS because they were not technically or financially feasible, they were not practical, they were similar to other alternatives carried through the environmental analysis, and/or they did not meet the purpose of and need for the proposed project.

- A new highway from the south end of Thane Road to Atlin, B.C., on an alignment through the Taku River Valley.
- A new highway from the north end of Glacier Highway to the Katzehin River delta with shuttle ferry service between Katzehin and Haines, and a new highway linking Haines and Skagway between the end of the road in Lutak Inlet and Dyea Road in Skagway.
- A new highway from the north end of Glacier Highway to Skagway with a bridge at the Katzehin River delta to Haines.
- A new highway from the north end of Glacier Highway to Sawmill Cove and a new highway from Katzehin to Skagway with shuttle ferry service between Sawmill Cove and Katzehin and Katzehin and Haines.
- A new highway from Echo Cove to Sawmill Cove with shuttle ferry service to Slate Cove, a new highway from Slate Cove to Katzehin, and shuttle ferries to Haines and Skagway.

The alternatives listed below were eliminated from consideration in the Final EIS because FHWA has determined these alternatives would require use of land in the Skagway and White Pass District National Historic Landmark that are protected under Section 4(f) of the Department of Transportation Act of 1966. Based on the original alternative screening criteria, FHWA and DOT&PF determined that alternatives with a Section 4(f) impact in the National Historic Landmark are not reasonable.

- A new highway from the north end of Glacier Highway around Berners Bay and along the eastern coast of Lynn Canal and Taiya Inlet to Skagway with a new ferry terminal north of the Katzehin River delta for shuttle service to Haines (Alternative 2).
- A new highway with two road segments, one from the north end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay and one from Slate Cove to Skagway along the eastern coast of Lynn Canal and Taiya Inlet, linked by new ferry terminals at Slate and Sawmill coves that provide shuttle services (Alternative 2A).
- A new highway from the north end of Glacier Highway around Berners Bay and along the eastern coast of Lynn Canal and Taiya Inlet to Skagway with shuttle service between Haines and Skagway provided from existing terminals (Alternative 2C).

Additional discussion of the reasons for eliminating these alternatives from further consideration is provided in Chapter 2.

Environmental Consequences

A comparison of the environmental consequences of the alternatives carried forward in the Final EIS is provided below. Table S-1, provided at the end of this section, summarizes many of the beneficial and adverse impacts of these alternatives.

Transportation –The total unconstrained demand in the Lynn Canal corridor is estimated to exceed 930 annual average daily traffic (ADT) (1,640 summer ADT) by 2038. This is the demand that would exist if there were no constraint to travel other than ownership of a vehicle and the cost of fuel for that vehicle. None of the reasonable alternatives would generate this level of demand, and therefore they would not have the capacity to meet this latent demand. All of the alternatives place constraints on travel in terms of increased cost and travel time because of ferry links. These increased constraints limit demand. The actual summer 2038 travel demand under the No Action Alternative is projected to be 230 ADT but capacity would be 167 vehicles. Alternative 2B is projected to generate the greatest travel demand of any of the reasonable alternatives with a summer ADT of 1,190 in 2038. Alternative 2B would have summer capacity in 2038 of 1,276 vehicles per day. Alternative 3 is projected to have a summer demand of 940 ADT in 2038 with a summer capacity of 1,006 vehicles per day. Marine alternatives would generate a lower demand and therefore have lower planned capacity. Alternatives 4A and 4C are projected to have a summer demand of 390 and 260 ADT, respectively, in 2038. The summer capacity of Alternative 4A would be 452 vehicles per day, while the summer capacity of Alternative 4C would be 303 vehicles per day. Alternatives 4B and 4D are projected to have a summer demand of 470 and 350 ADT, respectively, in 2038. Alternative 4B would have a summer capacity of 511 vehicles per day. Alternative 4D would have a summer capacity 411 vehicles per day.

All of the build alternatives would increase travel flexibility and opportunity in the Lynn Canal corridor. In summer Alternative 2B would provide eight ferry round-trips to Haines and six to Skagway. Alternative 3 would provide 12 summer round-trips to Haines and 6 round-trips to Skagway. In the summer, Alternatives 4A through 4D would increase the number of ferry trips between Juneau and Haines or Skagway relative to the No Action Alternative but would provide less travel opportunity than the highway alternatives, as shown in Table S-1.

Assuming an average speed on the highway of 45 miles per hour (mph) and no wait time at a terminal, Alternative 2B would have the shortest travel times between Auke Bay and Haines or Skagway at 2.5 and 3 hours, respectively, among all of the project alternatives. Alternatives with longer or additional ferry runs would have longer travel times. For Alternative 3, travel times from Auke Bay to Haines or Skagway would be 2.9 and 4.2 hours, respectively. Travel times for all of the marine alternatives except Alternative 4B would be somewhat longer than travel on the *M/V Fairweather* under the No Action Alternative, due to the slightly longer loading times for larger ferries. Alternative 4B consists of a fast vehicle ferry traveling from Sawmill Cove in the summer, and has the same travel time as the *M/V Fairweather* in the No Action Alternative.

Alternative 2B would have the lowest maintenance and operating cost of all alternatives: approximately $9.2 million versus $10.2 million for the No Action Alternative. As ferry links or longer ferry runs are added to the alternatives, annual operating costs would increase, with all of the marine alternatives (Alternative 4A through 4D) having higher annual operating costs than the highway alternatives and the No Action Alternative. None of the build alternatives would reduce net state cost over a 35-year period (approximately 5 years of construction and 30 years of operation) when taking into consideration construction and refurbishment costs, operating costs, and revenues. The net cost to the state of the No Action Alternative over the 35-year period would be about $61 million. Alternative 3 would have the lowest net cost to the state of all build alternatives over this 35-year period ($86 million), followed by Alternative 2B ($88 million). Alternative 4A would have the highest net cost to the state of any of the build alternatives over the 35-year period ($98 million). All of the build alternatives would carry more vehicles than the No Action Alternative. Alternatives 2B, 3, 4B, and 4D would cost the state less than the No Action Alternative on a per vehicle basis, with Alternative 2B having the lowest cost per vehicle at $15.

The overall lower net cost to the state of the No Action Alternative would be the direct result of higher out-of-pocket costs for travelers. The out-of-pocket costs for a family of four in a 19-foot vehicle would be $237 one way between Juneau and Skagway and $180 one way between Juneau and Haines under the No Action Alternative[3]. All of the highway alternatives considered for the project would have out-of-pocket travel costs that are less than half of the out-of-pocket costs of the No Action Alternative. Alternative 2B would have the lowest out-of-pocket cost for travelers of all project alternatives. A trip would cost approximately $51 between Juneau and Skagway and $34 between Juneau and Haines under Alternative 2B. Alternative 3 is estimated to have out-of-pocket costs of $85 between Juneau and Skagway and $45 between Juneau and Haines. The out-of-pocket travel costs for Alternatives 4A and 4C would be similar to the No Action Alternative, while Alternatives 4B and 4D would reduce summer out-of-pocket travel costs by roughly 30 to 40 percent relative to the No Action Alternative.

One economic measure of an alternative is its net present value[4]. Net present value is the total of the user benefits minus the net costs of an alternative over and above the net cost of the No Action Alternative for a given period of time. The 35-year net present value of Alternative 2B is approximately $70 million. Other build alternatives have a net present value less than half of that of Alternative 2B. Three of the marine alternatives (Alternatives 4A through 4C) would have higher total project costs than the user benefits they would provide, resulting in a negative net present value (see Table S-1).

The 2004 SATP calls for construction of a highway from Juneau to Skagway on the east side of Lynn Canal with a shuttle from Katzehin to Haines. Alternative 2B is partially consistent with the SATP, containing all of the elements of the plan except a highway from Katzehin to Skagway. Alternative 3 is not consistent with the plan because it does not include a highway on the east side of Lynn Canal or shuttle ferry service between Katzehin and Haines. Alternatives 4A and 4C improve on the existing ferry service in Lynn Canal but contain no elements of the SATP, and are therefore inconsistent with the plan. Alternatives 4B and 4D would extend the Glacier Highway 5.2 miles; however, they would primarily improve on the existing ferry service in Lynn Canal and are therefore inconsistent with the SATP.

Socioeconomics – Improved access in Lynn Canal would facilitate the movement of goods and people through and to the northern Southeast Alaska region. This would create closer links between the economies of Juneau, Haines, Skagway, and Whitehorse.

In the near-term, improved access to Juneau is not expected to result in new major economic development in Alaska. Instead, improved access to Juneau would redistribute within the state some of the economic benefits received from one of Alaska's primary industries, the visitor industry. Independent visitors (i.e., non-cruise ship visitors) could shift their travel patterns, perhaps spending more time and money in Southeast Alaska, particularly in Juneau. Improved

3 This cost is for travel on a conventional monohull ferry in 2004. Travel on a fast vehicle ferry would cost 10 percent more.

4 See *User Benefit Analysis*, Appendix E, for more information on economic analysis of alternatives.

access would have beneficial effects on other segments of the region's economy by reducing travel costs for residents and reducing shipping costs for some industries.

Population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by improved access. Of the three major communities in the Lynn Canal corridor, Juneau would experience the most population growth due to improved access, though that growth would not be large.

Alternative 2B is projected to cause the greatest influx of independent visitors to Lynn Canal of all the build alternatives. Therefore, it would create the largest economic benefits to the region. All of the other build alternatives would result in less independent visitor travel with a corresponding reduction in visitor spending. Alternative 3 would provide the largest economic benefit to Haines of all the build alternatives and essentially no economic benefit to Skagway. Alternatives 4A, 4B, and 4D would have a small benefit to the region economy. Because Alternative 4C is similar to the No Action Alternative in regard to travel opportunity and flexibility and out-of-pocket travel costs, it would provide no economic benefits to Lynn Canal communities.

Visual Resources – The steep topography along much of the east side of Lynn Canal results in the alignment for Alternative 2B being close to the shore at many locations. It would be visible from many points in Berners Bay and Lynn Canal, introducing man-made forms into the natural landscape. Alternative 2B would have no visual impacts to Taiya Inlet. From the highway there would be many panoramic views of Lynn Canal with the rugged, snow-capped Chilkat Range in the background.

Because topography is not as steep on the west side of Lynn Canal, most views of Alternative 3 from the canal between William Henry Bay and Haines would be masked by vegetation except where the highway crosses the Endicott River, Sullivan River, the Davidson Glacier outwash plain, and the Chilkat River/Inlet. At those locations, Alternative 3 would introduce man-made forms into the natural landscape from views in Lynn Canal, Chilkat River, Chilkat Inlet, and Haines. The ferry terminals for this alternative would also be visible from views in Berners Bay and William Henry Bay.

Alternatives 4A through 4D would primarily involve improved ferry transportation in Lynn Canal. They would have lesser visual impacts from views in Lynn Canal than the highway alternatives considered for the project. Because Alternatives 4B and 4D would extend Glacier Highway to a new Sawmill Cove Ferry Terminal, these alternatives would introduce man-made forms to the natural landscape of Berners Bay.

Subsistence – Alternatives 2B and Alternative 3 would provide access to areas for subsistence harvest activities that previously were accessible only by boat or aircraft. This access could increase competition for subsistence resources from recreational hunting and fishing. Alternatives 4A through 4D would not improve access in Lynn Canal enough to impact subsistence activities.

Cultural Resources – The FHWA has determined that none of the build alternatives would have an adverse effect on properties eligible for the National Register of Historic Places.

Geology – The proposed alignment for Alternative 2B crosses 36 avalanche paths. Because the terrain is not as steep on the west side of Lynn Canal, the Alternative 3 alignment crosses only 17 avalanche paths. With appropriate hazard reduction and operational risk management, such as raised embankments and catchment areas, avalanche forecasting, warnings, temporary highway closures, and release of unstable snow with explosives during highway closures, the risk of avalanche-associated accidents along any of the highway alternatives would be reduced to the generally accepted standard in North America for safe operation of a highway in avalanche-prone areas.

Wetlands – Alternative 2B would result in the loss of 70 acres of wetlands. All but approximately 1 acre of the wetlands impacted by the highway alignment would be forested wetlands that provide hydrologic control functions, sediment retention functions, and wildlife habitat. The largest area of wetland loss, 56 acres, would occur between Slate Creek and Sherman Point north of Berners Bay. A total of 19.7 acres of forested wetlands, and 0.7 acre of palustrine scrub-shrub wetlands would be impacted in Berners Bay watersheds.

Alternative 3 would result in the loss of 26 acres of wetlands. Approximately 90 percent of the wetlands impacted by the highway alignment would be forested wetlands that provide hydrologic control functions, sediment retention functions, and wildlife habitat.

Alternatives 4A and 4C would not impact wetlands. Alternatives 4B and 4D would result in the loss of 1.9 acres of wetlands between Echo Cove and Sawmill Cove.

Marine and Freshwater Habitats (including Essential Fish Habitat) – A total of 36.4 acres of intertidal and subtidal marine habitat would be filled or dredged for construction of the highway and Katzehin Ferry Terminal under Alternative 2B. For all build alternatives, all anadromous fish streams would be crossed with bridges. Piers for the bridges over the Lace, Antler, and Katzehin rivers (Alternative 2B) would be placed at least 130 feet apart and would not impede fish movement in these rivers. Under Alternative 3, the Sullivan, Endicott, and Chilkat rivers would be crossed in a similar manner.

Alternative 3 would result in impacts to 12.9 acres of intertidal and subtidal habitat, primarily from construction of ferry terminals at Sawmill Cove and William Henry Bay. Alternatives 4A through 4D would cause disturbance to less than an acre of subtidal habitat at the existing Auke Bay Ferry Terminal. Alternatives 4B and 4D would also result in impacts to approximately 3 acres of marine habitat from construction of a ferry terminal at Sawmill Cove.

None of these impacts would be large enough to measurably affect fish and invertebrate populations in Lynn Canal. Conservation measures identified by DOT&PF and the National Marine Fisheries Service (NMFS) would be included in the design and construction of the selected alternative to further minimize impacts to intertidal and subtidal habitat (essential fish habitat).

Terrestrial Habitat – Alternative 2B would result in the loss of approximately 428 acres of terrestrial habitat including 286 acres of old-growth forest, 128 acres of other forest, and 13 acres of shrub land. The loss from each vegetation type represents less than 1 percent of that type in the project study area. The loss of this vegetation would not adversely affect any rare or unique community types or any listed threatened or endangered or U.S. Forest Service (USFS) sensitive plant species but could affect two plant species considered rare by the Alaska National Heritage Program.

Approximately 68 acres of old-growth forest that would be lost under Alternative 2B are in old-growth reserves established by the USFS to protect this habitat. Implementation of Alternative 2B would require adjustment of the boundaries of these reserves to meet the USFS old-growth reserve system criteria.

Alternative 3 would result in the loss of approximately 395 acres of terrestrial habitat including 286 acres of old-growth forest, 95 acres of other forest, and 14 acres of shrub and muskeg. The loss from each vegetation type represents less than 1 percent of that type in the project study area. The loss of this vegetation would not adversely affect any rare or unique community types or any listed threatened or endangered species, USFS sensitive plant species, or plant species considered rare by the Alaska National Heritage Program.

Alternatives 4A and 4C would impact no terrestrial habitat. Alternatives 4B and 4D would result in the loss of 25 acres of old-growth forest and 2 acres of open meadow and shrub-scrub.

Wildlife – The direct loss of wetland and terrestrial habitat from the build alternatives that include a highway (Alternatives 2B, 3, 4B, and 4D) would have a small effect on wildlife because that loss would be a small (less than 1 percent) part of the habitat available in the project study area. However, habitat fragmentation caused by the presence of a highway, mortality from vehicle collisions, and the indirect impact of improved access by hunters and trappers resulting from Alternatives 2B and 3 would have a larger impact on wildlife, particularly terrestrial mammals.

Currently, most of the habitat in the project area is roadless and undeveloped. A highway on the east side of Lynn Canal would be constructed close to the coastline, resulting in a potential barrier between upland habitats and important marine fringe along the east side of Lynn Canal that would fragment habitat of animals that tend to avoid roads. Based on habitat capability modeling conducted for the 1997 Draft EIS, Alternative 2B could reduce brown bear habitat capability in the potentially impacted areas by up to 26 percent. Alternative 2B would also increase the potential for mortality from vehicle collisions to the small moose population in Berners Bay. To reduce habitat fragmentation impacts, wildlife underpasses would be constructed at anadromous streams and other known high-use wildlife corridors.

Alternative 3 would have similar but smaller impacts to wildlife than Alternative 2B. For example, this alternative could reduce the brown bear habitat capability in the potentially impacted areas by up to 21 percent. Alternatives 4A and 4C would have no impacts to terrestrial wildlife, while impacts from Alternatives 4B and 4D would be small because they would involve the construction of only about 2.5 miles of new road and the upgrade of 2.5 miles of existing road through terrestrial habitats.

Bald Eagle – The highway for Alternative 2B would be located within 0.5 mile of 92 bald eagle nests and within 330 feet of 49 of these nests. Alternative 3 would be within 0.5 mile of 50 bald eagle nests, and within 330 feet of 24 of these nests. The highway for Alternatives 4B and 4D would be located within 0.5 mile of 10 bald eagle nests between Echo Cove and Sawmill Cove, none of these nests are within 330 feet of the alignment.

Construction along the alignments of Alternatives 2B and 3 would be staged; therefore, construction would not occur along the entire alignment in any one season. In addition, not all eagle nests are actively used each year. Construction would be timed to avoid nest tree areas during the nest occupation period, and to avoid active nests during the rearing season. In specific locations, monitors may be used to allow construction during these periods if agreed to by U.S. Fish and Wildlife Service (USFWS).

A highway on the east or west side of Lynn Canal would involve a persistent source of noise that may result in the relocation of individual eagle pairs to alternate nest trees within their nesting territory. Individual eagle pairs may even abandon their nesting territory and associated hunting perches altogether, especially during the summer months, when traffic volumes are predicted to peak. Because food availability has been identified as a key factor that influences breeding success, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the shoreline of Lynn Canal for breeding. As a result, a highway on either side of Lynn Canal is not likely to adversely affect the overall population of bald eagles in the Lynn Canal area.

Threatened and Endangered Species – There are two species in the project study area that are protected under the Endangered Species Act: the Steller sea lion (eastern population classified as threatened, western population classified as endangered) and the humpback whale (classified as endangered). There are two principal haulouts along the proposed alignment for Alternative 2B that are used on an annual basis by Steller sea lions: Gran Point and Met Point. Gran Point is designated a Critical Habitat Area by NMFS. Met Point is also an important haulout for this species. Highway design elements have been incorporated into Alternative 2B that are intended to prevent motorists from leaving the highway corridor and approaching these haulouts. DOT&PF would monitor the effectiveness of these design elements after highway construction and make additional changes, if necessary, to keep people away from these haulouts. The project would include no new boat launch facilities in Lynn Canal. DOT&PF would monitor construction activities within 3,000 feet of the Gran Point and Met Point haulouts to ensure that sea lions were not disturbed. No construction would take place within 1,000 feet of the haulouts when they are being used by sea lions unless authorized by NMFS. Based on these mitigation measures, the FHWA has determined that Alternative 2B is not likely to adversely affect Steller sea lions or adversely modify critical habitat. NMFS has concurred with this determination.

All of the build alternatives would increase ferry traffic in one or more areas of the Lynn Canal region. This increase in traffic would not be high enough to substantially increase the risk of collisions with humpback whales. Pile driving for construction of ferry terminals under Alternatives 2B, 3, 4B, and 4D could disturb humpback whales in the area. Monitors would be used during pile driving to ensure that this activity does not occur when humpback whales are within 660 feet of the construction area. FHWA has determined that the build alternatives are not likely to adversely affect humpback whales. NMFS has concurred that Alternative 2B is not likely to adversely affect humpback whales.

Identification of the Preferred Alternative

The 1997 Draft EIS for the Juneau Access Improvements Project did not identify a preferred alternative for the State of Alaska. After the comment period ended in December 1997, DOT&PF analyzed the comments, developed a list of the substantive issues, and identified the additional information that was necessary to address the substantive comments. In late March 1999, a review team composed of FHWA and non-Southeast Region DOT&PF engineers and planners evaluated the information developed for the project and rated the alternatives based on the purpose and need elements. Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, was rated the highest of all alternatives and proposals. This rating was based on the assessment that Alternative 2 would meet corridor traffic demand, provide the greatest flexibility and opportunity to travel, result in the greatest reduction in travel time, have the lowest operating cost, and result in the lowest user cost for the traveler.

In January 2000, Governor Knowles declared Alternative 2 the state’s preferred alternative. At the same time, Governor Knowles stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued. In February 2000, the DOT&PF Commissioner confirmed the state’s selection of Alternative 2 as the preferred alternative to FHWA, along with a plan to continue obtaining specific data that would be crucial to restarting the EIS at a later date.

In December 2002, newly elected Governor Murkowski directed DOT&PF to aggressively pursue completion of the Juneau Access Improvements Project EIS. In February 2003, the DOT&PF Commissioner, after reviewing the Draft EIS and the reevaluation that called for a Supplemental Draft EIS, stated that Alternative 2 continued to be the state's preferred alternative. After careful scrutiny of all the studies prepared for the Supplemental Draft EIS, DOT&PF continued to prefer Alternative 2 because of its ability to best meet the purpose of and need for the proposed project, and identified it as the preliminary preferred alternative in the Supplemental Draft EIS.

FHWA and DOT&PF carefully considered all comments submitted during the Supplemental Draft EIS review period. On August 10, 2005, DOT&PF announced that it was changing its preferred alternative to 2B, based on the fact that Alternatives 2, 2A, and 2C would require land within the Skagway and White Pass District National Historic Landmark that is protected under Section 4(f) of the Transportation Act. Of the remaining reasonable alternatives, 2B best meets the purpose and need, particularly in regard to providing capacity to meet demand, reducing user costs, and reducing state costs per vehicle.

Mitigation Plan

The following discussion of proposed mitigation for the preferred alternative, Alternative 2B, is divided into four sections: Final Design and Construction, Pre- and Post-Construction Monitoring, Maintenance and Operations, and Compensatory Mitigation.

Final Design and Construction

A key consideration in mitigation is avoidance. Over the past decade to the present, DOT&PF has made many design changes, including highway alignment and ferry terminal layout changes, to avoid or reduce impacts to habitat, including anadromous streams, wetlands, bald eagle nest trees, sea lion haulouts, and marine waters. For example, the highway alignment across the Lace and Antler rivers has been moved upstream as far as possible in response to a conservation recommendation by NMFS made during the review of the Supplemental Draft EIS. During final engineering design of Alternative 2B, DOT&PF will investigate additional measures to reduce potential impacts, including further small alignment changes, changes in the footprint of the roadway, and ways to reduce the amount of material sidecast into subtidal areas. Within wetlands and other sensitive areas, the roadway will be designed with a low-profile embankment to limit embankment heights and side slopes so that the fill footprint is minimized. Culverts will be installed in appropriate locations to maintain natural flow patterns for surface water. Roadway swales will be designed to keep surface water within the natural drainage basins. The breakwater for the Katzehin Ferry Terminal will be designed with gaps or culverts to allow fish passage.

All anadromous fish streams will be crossed by bridges. Anadromous fish streams that can be crossed with 130-foot or shorter bridges will not include any structure or fill in the stream channel. Anadromous fish streams that require pier supports will have the minimum possible piers using at least 130-foot spacing, placed to reduce impact to the streams. Bridges across streams will also be designed to function as wildlife underpasses where practicable. The Lace and Antler rivers will both have 50-foot bridge extensions on each side. At the Katzehin River, an additional 100-foot section will be added to the north side of the bridge. These bridge extensions will also reduce impacts to riparian wetlands. Additional wildlife underpasses will be located at the two identified major brown bear migration corridors on the isthmus between the Antler and Lace rivers. The Jualin Mine Tram and the Comet/Bear/Kensington Railroad will also be bridged to avoid impacts to these historic properties.

The roadway within 3,000 feet of Gran Point and Met Point will be designed to include through-cuts[5] and walls to avoid lines of sight between the haulouts and the highway and to discourage human disturbance of sea lions. Prior to beginning construction, NMFS will review and approve final detailed construction plans in these zones, including planned vegetation removal and blasting requirements. This review will include an on-site tour of the area by NMFS. As large of a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts. To further protect marine mammals from human disturbance, no boat launches or other boat access points will be included in the project or constructed at a later date. No tidelands permits for boat launches or other boat access will be granted to adjacent landowners unless NMFS concurs that the activities are not likely to adversely effect sea lions.

The highway alignment will be located as far from the existing USFS cabin in Berners Bay as the topography allows with a minimum of 100 feet from mapped use-areas. A handicap-accessible trail will be designed and constructed from the highway parking area to the cabin. To mitigate impacts to remote use areas, DOT&PF will also construct another wilderness cabin in Berners Bay at a location determined in coordination with the USFS. A visitor facility with restrooms will be included in the design of the maintenance facility at Comet. Construction workers transported to the site for work purposes will be prohibited from hunting or trapping on-site before or after their work shift. Any construction workers located at a construction camp would be prohibited from hunting from the construction camp.

Construction Procedures – DOT&PF and the contractor will both file Notices of Intent to use the National Pollution Discharge Elimination System (NPDES) General Permit for stormwater discharge during construction. The construction contractor will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) that describes the best management practices (BMPs) to be used to avoid water quality impacts. This plan will be made available to Alaska Department of Environmental Conservation (ADEC) for review and comment and approved by DOT&PF before being included in project construction plans. The SWPPP will include procedures for locating and installing silt fences and sediment basins and installation of temporary erosion controls such as mulching and hydroseeding. As required by the General Permit, DOT&PF and the contractor would monitor stormwater discharge from the project and adjust the SWPPP as necessary and maintain records of inspections and any SWPPP changes.

The construction contractor will provide plans for DOT&PF approval for any construction camps. These plans will include procedures to avoid water quality impacts from wastewater discharges and stormwater runoff from the camps. They will also include procedures for handling food, trash, and other potential wildlife attractants. Construction camps, staging sites, borrow pits, and waste areas will be located in upland areas and stabilized during and after use to avoid water quality impacts.

Known archaeological and historical resources in the vicinity of the project will be identified on the construction plans provided to the contractor. Cultural resources within the project limits will be flagged in the field to ensure that equipment operators do not inadvertently damage these

[5] Through-cuts are areas where the highway is built lower than the surrounding ground on both sides by excavating down to the desired elevation without removing either cut slope.

resources. Before and after photographs will be provided to the State Historic Preservation Officer (SHPO) for crossings of the Jualin Tram and the Kensington/Comet/Bear Railroad.

Before clearing takes place, DOT&PF will conduct surveys of wolf dens, amphibian breeding ponds, and bald eagle, trumpeter swan, and Queen Charlotte goshawk nests in appropriate habitats. Clearing will be avoided to the extent practicable at the sites of active wolf dens, trumpeter swan nests, Queen Charlotte goshawk nests, and amphibian ponds. Construction in the vicinity of bald eagle nests will be coordinated with the USFWS to develop earth moving and blasting plans and to assess the need for nest monitoring during construction. During construction, DOT&PF and USFWS will assess the sufficiency of natural screening between the highway and any eagle nests below the elevation of the road within 330 feet of the edge of the roadway. During construction, DOT&PF and USFWS will evaluate the need to provide support to any nest tree or tree in the vicinity of the nest tree against windthrow.

Staking will be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area. No grubbing will be done outside of the fill footprint and only the minimum clearing required for safety will be done beyond the toe of slope. During construction, slope limits in wetland areas will be separately identified to ensure that workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.

Only clean mineral soil or rock excavated from construction limits or immediately adjacent to the highway will be used for the highway and Katzehin ferry terminal embankments. No soil will be imported to the project site. Any soil within the project boundaries identified as containing invasive species will not be transported to other areas of the project. Construction equipment will be steam cleaned prior to use on the project to reduce the potential for introducing invasive species.

Rock will be used to stabilize the toes of slopes at ponds and stream crossings. Grass seed will be placed on all slopes containing soil. To the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. To protect the integrity of the natural plant communities, plant species indigenous to the area will be used for vegetating road slopes, except that non-invasive annual grasses may be used to provide initial soil cover. Only seed mixtures certified for purity will be used to seed exposed soils. In moose habitat areas, low-growing grasses and fertilizer will be used to avoid establishment of shrubs that would encourage moose to browse near the highway.

To the extent practicable, beach access points will be chosen to take advantage of existing landings, previously disturbed sites, or locations of planned fill. Additional necessary access points identified during construction will be sited to minimize impacts to habitat and will be restored to pre-existing condition after project completion. No temporary barge landings will be constructed within 3,000 feet of the Gran Point and Met Point haulouts.

Pile driving at the Katzehin ferry terminal and the Antler, Lace, and Katzehin rivers will be done with vibratory hammers to the extent possible. If vibratory hammers cannot be used, NMFS will be provided with an explanation of why they cannot be used before alternative measures are implemented. During construction, helicopters will not operate within 3,000 feet of the Gran Point and Met Point haulouts when occupied by sea lions.

Construction Timing and Monitoring – In-water work for fill placement, dredging, or pile driving will be timed to avoid impacts to spawning and migrating fish species. In-water work at the Antler, Lace, and Katzehin rivers will not occur between March 15 and June 15 to protect out-migrating salmonids and spawning eulachon.

No construction will occur within 330 feet of an eagle nest, and no blasting will occur within 0.5 mile of an eagle nest, during the March 1 to May 31 nest selection period unless agreed to by USFWS. If a nest is active, no construction or blasting will occur within these distances until after August 31, unless the USFWS approves a plan to avoid impacts while operations continue.

No construction will occur in April or May within one mile of identified harbor seal haulouts. Monitoring for marine mammals will be conducted during pile driving at the Katzehin Ferry Terminal and for the Katzehin, Antler, and Lace river bridges. Pile driving will be halted if any marine mammals come within 660 feet (200 meters) of the activity.

No construction will occur within 3,000 feet of Gran or Met Point before a monitoring and construction plan is submitted for review to NMFS. The review will include an on-site tour. Construction at Gran Point will not occur until NMFS reviews the results of construction and monitoring at Met Point. Construction within 1,000 feet of Met Point or 3,000 feet of Gran Point will occur during periods when sea lions are absent, unless authorized by NMFS. Trained observers will be employed to ensure that no sea lions are present during work within 1,000 feet of the haulouts. Monitoring will occur during construction within 3,000 feet of the Gran Point and Met Point haulouts to ensure noise levels above background (45 average-weighted decibels [dBA]) or vibration levels above 0.05 inches per second (ips) occur at the haulouts when they are occupied.

If goat monitoring identifies areas where pregnant nannies congregate in late winter or early spring, DOT&PF will coordinate with Alaska Department of Fish and Game (ADF&G) to avoid construction from January through April in those areas to the extent feasible.

In the event that a previously unknown cultural resource is discovered during construction, work in the area will cease. DOT&PF will contact the SHPO and develop an approved plan before proceeding.

Pre- and Post-Construction Monitoring

To facilitate game management after construction of the highway, DOT&PF will fund bear, moose, goat, and wolverine surveys to determine population characteristics. The goat study will be of 4-year duration, and brown bear, moose, and wolverine study of 3-year duration. The brown bear study will include recommendations for a long term monitoring study to determine the effectiveness of wildlife underpasses for this species. DOT&PF will continue to fund aerial surveys of bald eagles for a period of five years following project construction. Also, video monitoring at the Gran Point haulout and aerial and ground monitoring at the Met Point haulout will continue for a period of five years following construction. Annual reports on the Steller sea lion monitoring during and after construction will be provided to NMFS and a final report will be provided to NMFS following completion of the monitoring period.

Maintenance and Operations

Shuttle ferries will have wastewater holding tanks that will discharge to wastewater treatment facilities or wastewater will be treated onboard before discharge. DOT&PF will maintain public restrooms at the Comet maintenance facility. The restrooms at the Katzehin Ferry Terminal will be available to highway users as well as ferry travelers. DOT&PF will also maintain constructed pullouts including collection of refuse from containers supplied at those pullouts. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the Gran Point and Met Point haulouts and will not be conducted within 1,000 feet of the haulouts when occupied. After the highway is open, no tidelands permits for boat launches or other boat access will be granted to adjacent landowners unless NMFS concurs that the activities are not likely to adversely effect sea lions.

Compensatory Mitigation

As discussed in Section 4.3, Alternative 2B will result in the loss of 70 acres of wetlands and 32 acres of unvegetated intertidal and shallow subtidal habitat. The wetlands affected by the project consist of 69.1 acres of palustrine forested, 0.7 acre of palustrine scrub-shrub, and 0.2 acre of estuarine emergent wetlands.

The eastern side of Lynn Canal where Alternative 2B is located is largely undeveloped and does not contain substantial areas of degraded wetland, intertidal, or subtidal habitat. Therefore, it is not practicable to mitigate project impacts on wetlands and marine habitats by restoring similar degraded habitat within the project area. For this reason, DOT&PF proposes to provide a combination of on-site out-of-kind mitigation and in-lieu fee compensation to mitigate project impacts on wetlands and other waters of the U.S.

As discussed in Section 3.3.1.3, the forested wetlands that would be impacted by Alternative 2B generally have a moderate to low wildlife habitat function. The principal function of this wetland type is groundwater discharge and lateral flow and nutrient transport/export. It is the most common wetland habitat on the east side of Lynn Canal (about 60 percent of total wetlands), covering about 6,720 acres (Table 3-4). Scrub-shrub wetlands also provide moderate to low wildlife habitat function. Their principal function is sediment retention, groundwater recharge and discharge, and lateral flow. This wetland type covers about 2,133 acres on the east side of Lynn Canal and is the second most common wetland habitat type (about 19 percent) in the region (Table 3-4). To mitigate impacts to forested and scrub-shrub wetlands, DOT&PF would construct a wildlife underpass at the identified bear corridor a the northwest part of the peninsula between the Lace and Antler rivers.

Mitigation for impacts to estuarine wetlands and intertidal and subtidal habitats would be in-lieu fee compensation. Intertidal and shallow subtidal habitats affected by Alternative 2B have been assigned a value of $24,000 per acre. These essential fish habitat areas impacted by Alternative 2B provide low to moderate foraging habitat for juvenile and adult fish and marine invertebrates.

Estuarine emergent wetlands have been assigned the highest value of $60,000 per acre. The estuarine emergent wetland that will be impacted by Alternative 2B has high wetland function ratings for wildlife habitat, riparian support, regional ecological diversity, and ecological replacement cost. This type of essential fish habitat is relatively limited on the east side of Lynn Canal, representing only about 5 percent of all the wetlands in the region and covering a total of about 574 acres (Table 3-4).

Based on these acreages and values, DOT&PF will provide a total of $780,000 in-lieu fee compensation for impacts to wetlands and other waters of the U.S. This payment will be used to purchase parcels containing high value wetlands and intertidal habitat in the project vicinity threatened by development or to fund habitat restoration/enhancement projects in the project vicinity. Currently available parcels and projects are being investigated. If no parcels or projects have been agreed to before construction starts, the money would be deposited with a non-governmental land trust with stipulations that the funds be used as described above. See Section 5.12 for more information on compensatory mitigation for impacts to waters of the U.S.

Areas of Controversy

Providing highway access to Juneau is a contentious issue in northern Southeast Alaska. In October 2000, Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road. A September 2002 motion by the City and Borough of Juneau Assembly supporting "completion of the EIS for the identified preferred alternative for the road into Juneau …" passed by a 5 to 4 vote. In 1999, a survey conducted for the City of Skagway indicated that 49 percent of Skagway residents oppose a road while 46 percent were in favor of a road. In April 2003, the City Council of Skagway passed a resolution supporting improved ferry service and opposing a road connection by a 4 to 1 vote. In January 2003, the Haines Borough Assembly voted unanimously to request that a road to Haines (as opposed to a road to just Skagway) be included in the EIS. In April 2004, the Haines Borough Assembly adopted a resolution requesting that the state and federal government focus on enhancing marine transportation within the region. In an October 2004 advisory ballot, Skagway residents voted 62 to 38 percent in favor of improved ferry service over a road.

Telephone surveys of Haines, Skagway, and Juneau households conducted for the Supplemental Draft EIS confirm that residents are divided in their opinions on the value of highway access. Aspects of this controversy include:

- Potential reduction in AMHS service to other Alaskan coastal communities because of the loss of revenue that would result from discontinuing AMHS mainline service in Lynn Canal
- High initial construction costs of a highway in Lynn Canal
- Aesthetic and biological impacts in Berners Bay
- Impacts to the economies of Haines and Skagway
- Impacts to the perceived quality of life in Juneau, Haines, and Skagway

Numerous letters, editorials, and opinion pieces in Haines, Juneau, Skagway, and Anchorage newspapers over the past two years have expressed support for or opposition to a highway in the Lynn Canal corridor. Comments submitted during the review period for the Supplemental Draft EIS that expressed a preference were approximately 60 percent in support of a highway, with 40 percent preferring a marine alternative. During the Supplemental Draft EIS review period both branches of the Alaska Legislature submitted resolutions in support of Alternative 2, the East Lynn Canal Highway with Katzehin Terminal.

Issues raised by the public and agencies during 2003 scoping were outlined in Chapter 7 of the Supplemental Draft EIS. Resource agency comments and DOT&PF responses are presented in Chapter 7 of this Final EIS. Public comments on the Supplemental Draft EIS and DOT&PF responses are presented in Appendix Y of this Final EIS.

Related Actions and Projects

In addition to the Juneau Access Improvements Project, there are two major actions being pursued by private parties in the Lynn Canal region. These actions are independent of the Juneau Access Improvements Project, but are related to the project because they could affect some of the same areas and resources. The two actions and their relationship to the Juneau Access Improvements Project are described below.

Coeur Alaska, Inc. (Coeur Alaska), a mining company based in Idaho, acquired the Kensington and Jualin mines north of Berners Bay in the 1990s and received all permits required to begin construction and operations following publication of the *1997 Kensington Gold Project Final Supplemental Environmental Impact Statement* and issuance of a USFS Record of Decision. In an effort to increase efficiency and reduce disturbance in the area, Coeur Alaska submitted an amended Plan of Operations, which became the basis of the current *2004 Kensington Gold Project Final Supplemental Environmental Impact Statement* and USFS Record of Decision. Coeur Alaska received the necessary permits in 2005 and construction of the new mine began in August of that year[6].

The preferred alternative for the Juneau Access Improvements Project would intersect an existing unpaved road that runs from the shore at Slate Cove to the Jualin Mine. This is a public road that is being upgraded by the State of Alaska and Coeur Alaska as part of Coeur Alaska's approved plan to reopen the Kensington Mine. State funding for the Jualin Road upgrade is from the Industrial Roads Program. If Coeur Alaska and DOT&PF develop a cooperative use agreement for the dock at Slate Cove, DOT&PF could use the dock in two ways: to provide interim ferry shuttle service during construction of an East Lynn Canal highway north of Slate Cove, and to provide temporary winter ferry service during extended closures of an East Lynn Canal highway for avalanche control.

Goldbelt Inc. (Goldbelt), a local Native corporation organized under the Alaska Native Claims Settlement Act, owns land at Cascade Point, three miles north of the end of the Glacier Highway in the City and Borough of Juneau. Goldbelt has prepared a management plan for these landholdings that includes development on 10 percent of Goldbelt land at Echo Cove, including a commercial development site at Cascade Point (road, dock development, and service station).

In 1996, Goldbelt prepared the Echo Cove Master Plan and an EIS was distributed for a proposed gravel access road from Echo Cove to Cascade Point in Berners Bay. The USFS completed a Record of Decision in 1998. Goldbelt received easements to cross USFS land, USFS special-use permits, and a U.S. Army Corps of Engineers (USACE) Section 404 permit for construction of the road. Construction began in May 2005. The alignment of this road and the highway segment for the Juneau Access Improvements Project are similar. The road without surfacing is scheduled to be completed by January 2006. Because Goldbelt's Cascade Point Road was built first, DOT&PF would use that alignment and widen the road to meet the state's highway standards.

The State of Alaska funded construction of the Cascade Point Road as part of the Industrial Roads Program. Also known as the Roads to Resources Program, these state funds are used to foster industrial development. In this case the goal is to assist Goldbelt to develop its land at Cascade Point.

In July 2005, Goldbelt received a permit for a terminal at Cascade Point to be used in part to shuttle mine workers[7]. On June 22 and 23, 2005, the AMHS Director was reported in the *Juneau Empire* to be interested in running AMHS ferries in Lynn Canal from the Cascade Point terminal. On July 8, 2005, the Commissioner of DOT&PF in a letter to FHWA clarified that the state may investigate creating a temporary ferry terminal at Cascade Point with state funds if there are delays in construction of the Juneau Access Improvements Project preferred alternative (see letter in Chapter 7, Public and Agency Coordination).

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6 On November 22, 2005, the USACE suspended Coeur Alaska's permit for further evaluation.

7 On November 22, 2005, the USACE suspended Goldbelt's permit for further evaluation.

Federal Actions Necessary

Depending on the build alternative selected for the Juneau Access Improvements Project, the following federal permits and approvals may be required.

- USFS special use permit for project facilities in the Tongass National Forest
- USACE Section 404 (Clean Water Act) permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit (Rivers and Harbors Act) for dredge, fill, and structures placed below mean high water
- U.S. Coast Guard, Section 9 permits (Rivers and Harbors Act) for bridges over navigable waters
- U.S. Environmental Protection Agency (EPA) NPDES General Permit for stormwater discharge during construction

Unresolved Issues

Compensatory mitigation for impacts to wetlands and other waters of the U.S., including essential fish habitat, has been discussed with resource agencies and there is general consensus regarding the state's proposal. The Final EIS contains detailed information on compensatory mitigation for the preferred alternative. Further details on mitigation will be finalized for the selected alternative during the permitting process.

NMFS, ADF&G, and EPA do not concur with FHWA's assessment of impacts of a ferry terminal in Berners Bay associated with Alternatives 3, 4B, and 4D. This disagreement involves projected direct impacts to Pacific herring spawning habitat and indirect impacts to Steller sea lions and humpback whales. If one of these three alternatives is selected for the proposed project, further consultation would be necessary.

EIS Availability

The Final EIS is available free of charge on CD for viewing electronically or in printed format. The document is also available for viewing on the project website at http://www.dot.state.ak.us/juneauaccess/. Bound versions of the document are available upon request. Bound versions of the document and all appendices are available for public review at the following locations:

Juneau Public Library
292 Marine Way
Juneau, Alaska

Mendenhall Valley Public Library
Mendenhall Mall
Juneau, Alaska

Douglas Library
1016 3rd Street
Douglas, Alaska

Haines Public Library
111 Third Avenue South
Haines, Alaska

Skagway Public Library
769 State Street
Skagway, Alaska

DOT&PF Southeast Region
6860 Glacier Highway
Juneau, Alaska

For information on obtaining a CD or bound version of the Final EIS, contact Deborah Holman at DOT&PF at (907) 465-1828, or visit the project web site at http://www.dot.state.ak.us/juneauaccess/.

Table S-1
Summary of Estimated Beneficial and Adverse Impacts of Proposed Project Alternatives[8]

Factors	Alternatives						
	No Action	2B	3	4A	4B	4C	4D
Cost Factors							
Initial Capital Costs ($ million)	0	$258	$268	$131	$142	$111	$103
30-Year Life Cycle Costs[1] ($ million)	$267	$352	$375	$495	$482	$326	$313
Annual Maintenance and Operations Costs ($millions)	$10.2	$9.0	$9.2	$16.6	$15.5	$11.6	$11.3
Net Present Value[2] ($ millions)	0	$70	$32	-$56	-$23	-$57	$3
Purpose and Need Factors							
Projected Summer Capacity to Skagway (vehicles per day)	71	636	408	223	227	149	203
Projected Summer Capacity to Haines (vehicles per day)	96	544	1,008	229	284	154	208
Summer Travel Time – Auke Bay to Skagway[3] (hours)	3.8/9.1	3.0	4.2	4.1/9.1	3.8/9.1	6.3/9.1	5.3/9.1
Summer Travel Time – Auke Bay to Haines[3] (hours)	3.5/7.1	2.5	2.9	3.8/7.1	3.5/7.1	6.0/7.1	5.0/7.1
Number of Ferry Round-trips/Week – Auke Bay to Skagway (Summer)	7	42	42	16	16	9	16
Number of Ferry Round-trips/Week – Auke Bay to Haines (Summer)	8	56	84	16	30	9	16
Net State Cost Over 35-Year Analysis Period ($millions)	$61	$88	$86	$98	$94	$78	$70
Net State Cost per vehicle	$45	$15	$18	$46	$37	$51	$36
Total / Out-of-Pocket User Costs – Juneau/Skagway[4]	$237 / $237	$77 / $51	$111 / $85	$261 / $261	$174 / $163	$237 / $237	$160 / $149
Total / Out-of-Pocket User Costs – Juneau/Haines[4]	$180 / $180	$60 / $34	$70 / $45	$198 / $198	$124 / $113	$180 / $180	114 / $103
Employment and Population Impacts							
Juneau							
New Local Employment (2038)	0	200	70	45	90	0	30
Population Increase (2038)	0	300	100	70	140	0	45
Skagway							
New Local Employment (2038)	0	55	0	10	15	0	0
Population Increase (2038)	0	70	0	10	20	0	0

[8] Initial capital costs (those costs required to design and construct the alternative) have been updated to 2005 dollars. All other costs remain in 2004 dollars as expressed in the Supplemental Draft EIS and appendices.

Table S-1 (continued)
Summary of Estimated Beneficial and Adverse Impacts of Proposed Project Alternatives

Factors	Alternatives						
	No Action	2B	3	4A	4B	4C	4D
Haines							
New Local Employment (2038)	0	65	155	15	30	0	15
Population Increase (2038)	0	98	230	25	50	0	25
Natural Resources Impacts							
Number Of River/Stream Crossings	0	46	32	0	5	0	5
Number Of Anadromous Streams Crossed	0	9	11	0	1	0	1
Terrestrial Habitat Losses[5] (acres)	0	428	395	0	27	0	27
Wetland Habitat Losses (acres)	0	70.0	26.4	0	1.9	0	1.9
Essential Fish Habitat Impacted[6]	0	36.4	12.9	0	3.2	0	3.2
Eagle Nests Within 330 Feet	0	49	24	0	0	0	0
Total Eagle Nests Within 0.5 Mile	0	92	50	0	10	0	10
Estimated Percent Reduction in Brown Bear Habitat Capability	0	26	21	0	4	0	4
Estimated Percent Reduction in Black Bear Habitat Capability	0	6	2	0	1	0	1
Estimated Percent Reduction in Marten Habitat Capability	0	32	30	0	7	0	7
Estimated Percent Reduction in Mountain Goat Habitat Capability	0	0.4	1	0	0.1	0	0.1

Notes: [1]Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period discounted to 2004 dollars. See *User Benefit Analysis Technical Report* (Appendix E) for a detailed explanation of life-cycle cost analysis.
[2]Net present value is the sum of the user benefits minus net incremental project costs. User benefits are the reduction in user costs, which consist of travel time, AMHS fares, vehicle costs, and accident costs. See *User Benefit Analysis Technical Report* (Appendix E).
[3]The first number is based on travel on a shuttle ferry and the second number is the mainline ferry travel time.
[4]Total/Out-of-pocket cost for a family of four traveling in a 19-foot vehicle. No Action cost is on a mainline ferry; FVF would be 10 percent higher. All other costs are based on the use of shuttle ferries.
[5]Includes wetlands.
[6]Includes impact from dredging (Alternative 2B, 4.4 acres; Alternative 3, 4B and 4D, 1.3 acres)

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

Section	Title	Page

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

LIST OF TABLES (continued)

LIST OF FIGURES

LIST OF FIGURES (continued)

APPENDICES LIST

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
A	
AAAQS	Alaska Ambient Air Quality Standard
AAC	Alaska Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADT	average daily traffic
AHI	Avalanche Hazard Index
AMHS	Alaska Marine Highway System
AML	Alaska Marine Lines
AMSA	Area Meriting Special Attention
ANILCA	Alaska National Interest Lands Conservation Act
APE	Area of Potential Effect
AS	Alaska Statute
ASTM	American Society for Testing and Materials
AWQS	Alaska Water Quality Standards
B	
BBHMD	Berners Bay Historic Mining District
B.C.	British Columbia
BF	board feet
BMP	Best Management Practice
C	
CAR	Comment Analysis Report
CBJ	City and Borough of Juneau
CD	compact disk
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
Coeur Alaska	Coeur Alaska, Inc.
cy	cubic yards
D	
dB	decibel
dBA	average-weighted decibels
DHHS	U.S. Department of Health and Human Services
DOL&WD	(Alaska) Department of Labor and Workforce Development
DOT&PF	(Alaska) Department of Transportation and Public Facilities
E	
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	(United States) Environmental Protection Agency
ESA	Endangered Species Act

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
F	
°F	degrees Fahrenheit
FBD	Ferry Boat Discretionary
FC	fecal coliform
FCRPA	Federal Cave Resources Protection Act
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FVF	Fast Vehicle Ferry
FY	fiscal year
G	
g	gravity
GF	General Fund
GIS	Geographic Information System
Goldbelt	Goldbelt, Inc.
GPS	Global Positioning System
H	
HBCP	Haines Borough Comprehensive Plan
HCI	Habitat Capability Index
HCMP	Haines Coastal Management Plan
HOV	high-occupancy vehicle
I	
IFA	Inter-Island Ferry Authority
IRA	Indian Reorganization Act
ips	inches per second
ISA	Initial Site Assessment
K	
KLGO	Klondike Gold Rush National Historic Park
L	
L_{eq}	Equivalent Sound Level
$L_{eq(h)}$	Equivalent Sound Level hourly
LUD	Land Use Designation
M	
M&O	maintenance and operations
$\mu g/m^3$	microgram(s) per cubic meter
MIS	management indicator species
MMPA	Marine Mammal Protection Act
MOA	Municipality of Anchorage
mpg	miles per gallon
mph	miles per hour
M/V	Motor Vessel

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
N	
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHP	National Historical Park
NHS	National Highway System
NLUR	Northern Land Use Research, Inc.
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	(United States Department of the Interior), National Park Service
NRHP	National Register of Historic Places
NWCA	NorthWest CruiseShip Association
NWI	National Wetlands Inventory
O	
O_3	ozone
OCRM	Office of Ocean and Coastal Resource Management
OHMP	(Alaska Department of Natural Resources) Office of Habitat Management and Permitting
ORV	off-road vehicle
P	
PAR	Preferred Alternative Report
$PM_{2.5}$	particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns
PM_{10}	particulate matter with an aerodynamic diameter of less than or equal to 10 microns
ppm	parts per million
R	
RARE II	Roadless Area Review and Evaluation
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RV	recreational vehicle
S	
SATP	Southeast Alaska Transportation Plan
SCMP	Skagway Coastal Management Plan
SEARHC	Southeast Alaska Regional Health Consortium
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SOC	statement of concern
STIP	Statewide Transportation Improvement Program
SWPPP	Storm Water Pollution Prevention Plan

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
T	
TLMP	Tongass National Forest Land and Resource Management Plan
TSM	Transportation System Management
TSS	total suspended solids
TTRA	Tongass Timber Reform Act
U	
URS	URS Corporation
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	
VCU	value comparison unit
VQO	Visual Quality Objective
W	
WET	Wetland Evaluation Technique
WP&YR	White Pass and Yukon Route

1.0 PURPOSE AND NEED

1.1 Introduction

This document is a Final Environmental Impact Statement (Final EIS) for the Juneau Access Improvements Project. Currently, access to Juneau, the Alaska state capital, is only possible by air and water. The Alaska Department of Transportation and Public Facilities (DOT&PF) proposes to improve surface transportation to and from Juneau within the Lynn Canal corridor. Figure 1-1 identifies the project vicinity and area.

Federal funds administered by the Federal Highway Administration (FHWA) would be used for design and construction of the selected project alternative. In accordance with Section 2 of the National Environmental Policy Act (NEPA) (42 United States Code [USC] § 4332), the FHWA must consider the environmental impacts of this action. DOT&PF and the FHWA issued a Draft Environmental Impact Statement (Draft EIS) for the project in June 1997. In 1998 and 1999, DOT&PF analyzed comments submitted regarding the Draft EIS and conducted additional studies related to the project. In January 2000, then-Governor Knowles declared Alternative 2, the East Lynn Canal Highway, the state's preferred alternative. At the same time, he stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued. In 2002, Governor Murkowski directed that the EIS be completed.

Because more than three years had passed since release of the Draft EIS, the adequacy of the environmental document was reevaluated. DOT&PF determined, and FHWA concurred, that there were sufficient changes in project alternatives and potential environmental impacts to warrant preparation of a Supplemental Draft Environmental Impact Statement (Supplemental Draft EIS). A Supplemental Draft EIS was released in January 2005. The Supplemental Draft EIS and this Final EIS have been prepared in accordance with the Council on Environmental Quality regulations for implementation of the NEPA of 1969 (Title 40, Code of Federal Regulations [CFR], Part 1502.9) and FHWA regulations (23 CFR 771.130).

A substantial amount of the information on the affected environmental and potential environmental consequences of project alternatives presented in the 1997 Draft EIS remains valid. To assist the reviewer, that information was carried forward in the Supplemental Draft EIS and Final EIS, as appropriate.

The basis of this Final EIS is the Supplemental Draft EIS text in its entirety, with changes made as appropriate throughout the document. These changes reflect selection of a new preferred alternative, modifications to alternatives, dropping alternatives that are no longer reasonable, updated information on the affected environment, changes in the assessment of impacts, development of mitigation measures for the preferred alternative, the results of ongoing coordination, comments received on the Supplemental Draft EIS, and responses to those comments. Important changes are highlighted for easy identification by the reader. Three new appendices including addenda to the Supplemental Draft EIS Technical Report appendices and a *Responses to Comments Report* are appended to this Final EIS. The Supplemental Draft EIS appendices have not been reprinted, but can be viewed on compact disk (CD), at local libraries and on the project website (http://www.dot.alaska.gov/juneauaccess).

Initial construction costs have been updated to 2005 dollars to reflect actual current funding requirements. Except where noted, all other monetary values are in 2004 dollars in keeping with the original analysis. The environmental analysis provides a comparison of the No Action Alternative and build alternatives. This comparison identifies the relative difference among alternatives regardless of the year of analysis.

The Juneau Access Improvements Project is included in the Statewide Transportation Improvement Program (STIP) for 2004 to 2006. This federally required document was approved by the FHWA and the Federal Transit Administration on October 31, 2003. The project is consistent with the Department's 2004 Southeast Alaska Transportation Plan (SATP). The SATP is an approved element of the Alaska Statewide Transportation Plan and was prepared in accordance with Title 23 USC, Alaska Statute (AS) 44.42.050, and other related federal and state regulations.

1.2 Project History

Juneau, with a population slightly over 30,000, is the largest community on the North American continent not connected to the continental highway system. The only public surface transportation available is the Alaska Marine Highway System (AMHS), a state-owned ferry system that provides transportation to many of Alaska's southeast coastal communities. AMHS service from Juneau connects to the continental highway system in Prince Rupert, British Columbia (B.C.), and Bellingham, Washington, to the south, and in Haines and Skagway to the north. The most commonly used access route to the continental highway system is northbound.

1.2.1 Marine Access

Between the mid-1890s and early 1960s, the two main companies providing surface transportation to Juneau were the Alaska Steamship Company and the Canadian Pacific Line. The motor vessel *(M/V) Chilkat*, owned and operated by the Territory of Alaska, began providing seasonal service between Juneau, Haines, and Skagway in the 1950s.

In 1960, following statehood, Alaska voters narrowly approved a $23 million bond proposal to create the AMHS. The issue was controversial because Alaska's four distinct population centers greatly differed in their views. Southeast region residents, who stood to benefit the most, approved the proposal almost ten to one, southcentral area residents voted against the bond by a margin of four to one, and Central and Northwest area residents were almost evenly split.

The bonds were used to construct the *M/V Malaspina*, *M/V Taku*, and *M/V Matanuska* for Southeast Alaska service and the *M/V Tustumena* for southwest Alaska service. Service in Southeast Alaska began in 1963, operating only between the larger communities. Lynn Canal service consisted of three round-trip voyages each week between downtown Juneau, Haines, and Skagway. AMHS and private barge services have been the primary surface transportation providers in Lynn Canal since the 1960s.

In the 1970s, the *M/V Columbia*, *M/V LeConte*, and *M/V Aurora* were added to the fleet. The Lynn Canal corridor gained more service with the addition of the *M/V Columbia,* and the smaller *M/V LeConte* and *M/V Aurora* were dedicated to linking the smaller communities south of Lynn Canal. During this period, the Auke Bay Ferry Terminal was constructed, which reduced the time required to travel from Juneau to Haines and Skagway by about two hours.

In the late 1990s, service in Lynn Canal was supplemented by the *M/V Kennicott* and daily summer shuttle service by the *M/V Malaspina*. The *M/V Malaspina* would overnight in Juneau, travel to Haines and Skagway, and return through Haines to Juneau, usually a 14- to 16-hour voyage.

Prior to 2004 all of the vessels in the AMHS fleet operated continuously on a 24-hour basis throughout the year except for maintenance and lay-up periods. Crews generally worked 6 hours on, 6 hours off, for 1- or 2-week periods. Larger vessels of the AMHS that travel the length of the system from Bellingham or Prince Rupert in the south to Haines and Skagway in the north are called mainliners. Smaller vessels that provide service to smaller communities not on the mainline routes are referred to as community link vessels. The mainline routes are part of the National Highway System (NHS).

The latest major change to service in Lynn Canal was implementation of the state's first fast vehicle ferry (FVF), the *M/V Fairweather*, in the summer of 2004 to replace the summer shuttle ferry service. The *M/V Fairweather* has less vehicular capacity than the larger monohulled vessels, but with its increased speed can make two daily trips between the three Lynn Canal communities.

The *M/V Fairweather* operates on a 12-hour schedule, traveling to a single community and then returning to Juneau before heading for another port. A separate crew performs maintenance nightly in Juneau.

1.2.2 Highway Access

The first road linking a Lynn Canal community with the continental highway system was the Haines Cutoff Highway. During World War II the United States (U.S.) Army constructed the Alaska Highway between Dawson Creek, B.C., and Fairbanks, Alaska. The 150-mile highway spur from Haines Junction to tidewater in Haines was an essential transportation corridor, providing support for construction of the Alaska Highway and adding another route to provide supplies and equipment to western Alaska for the war effort.

The construction of the Klondike Highway in the late 1970s provided another link to the continental highway system. The highway was strongly supported by Skagway residents and city officials, the Skagway Chamber of Commerce, the U.S. Department of the Interior, National Park Service (NPS), and the governments of Yukon Territory and B.C. The support was based on the need for economic development, tidewater access for mining ventures, access to Whitehorse, and access to historical areas along White Pass. The Klondike Highway parallels the White Pass and Yukon Route (WP&YR) Railroad that was constructed in the late 1890s to improve access to interior mining areas.

Providing highway access to Juneau has been an issue for many years. Because of geographical conditions, only two corridors are available for a highway or rail connection to the continental highway system from Juneau: Lynn Canal and the Taku River Valley.

Construction of the Alaska Highway in 1942 made a direct connection from Juneau to the continental highway system more feasible. The Bureau of Public Roads performed preliminary reconnaissance work in the Taku River Valley during the 1950s. With enactment of statehood in 1959, Alaska became responsible for an inadequate highway transportation system and could not afford to invest in expansion efforts without first repairing the existing infrastructure. This situation was further exacerbated by the 1964 earthquake, which damaged many transportation facilities in the state.

In the 1960s, after many of the state-inherited roads were upgraded, the focus on improving access to Juneau centered on constructing a highway south from Haines along the west side of Lynn Canal. The highway would terminate at a ferry terminal facility, where shuttle ferries would cross Lynn Canal to Berners Bay. Reconnaissance engineering was completed and the state was within months of initiating construction on the first phase when the project was halted and an environmental assessment prepared in compliance with the recently enacted NEPA legislation. The environmental assessment was completed in the early 1970s, but the state chose to delay construction of the highway after passage in 1974 of a statewide ballot measure to move the capital to the southcentral region of the state.

On completion in 1979, the Klondike Highway provided another possible alternative to link Juneau to the continental highway system: via a highway along the east side of Lynn Canal. The 1975 Lynn Canal Transportation Corridor Economic Analysis identified a roadway between Juneau and Skagway as the best alternative to improve surface transportation in terms of total economic costs, citing low annual expenses and shortest travel times. The 1980 SATP recommended the Lynn Canal Highway for further investigation and evaluation. The 1986 SATP recommended acquiring high speed ferries to operate in Lynn Canal, while monitoring demand to determine if a road link was warranted.

In 1994, work on the Juneau Access Improvements Project EIS began. In 1997, a Draft EIS was released; however, a decision was not made regarding a preferred alternative until 2000. Therefore the 1999 SATP only referenced the Draft EIS and the upcoming decision. In 2000, then Governor Knowles announced Alternative 2, East Lynn Canal Highway with Katzehin Terminal, was the preferred alternative, but his administration did not actively pursue completion of the EIS. The 2001 addendum to the 1999 SATP reflected this situation, identifying the road as the preferred alternative while addressing interim improvements. In 2002, Governor Murkowski directed that the EIS be completed. The 2004 SATP calls for construction of a road between Juneau and Skagway.

Providing highway access to Juneau is a contentious issue in northern Southeast Alaska. In October 2000, Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road. A September 2002 motion by the City and Borough of Juneau (CBJ) Assembly supporting "completion of the EIS for the identified preferred alternative for the road into Juneau …" passed by a five to four vote. In 1999 a survey conducted for the City of Skagway indicated that 49 percent of Skagway residents opposed a road while 46 percent were in favor of a road. In April 2003, the City Council of Skagway passed a resolution supporting improved ferry service and opposing a road connection by a four to one vote. In January 2003, the Haines Borough Assembly voted unanimously to request that a road to Haines (as opposed to a road to just Skagway) be included in the EIS. In April 2004, the Haines Borough Assembly passed another resolution requesting that the state and federal government focus on enhancing marine transportation within the region. In an October 2004 advisory ballot question regarding transportation in Lynn Canal, 62 percent of Skagway voters chose improved ferry service over a road. Telephone surveys of Haines, Skagway, and Juneau households conducted for the Supplemental Draft EIS confirm that residents are divided in their opinions on the value of highway access. For further information, refer to the *Household Survey Report*, Appendix I.

Numerous letters, editorials, and opinion pieces in Haines, Juneau, Skagway, and Anchorage newspapers over the past two years have expressed support for or opposition to a highway in the Lynn Canal corridor. Comments submitted during the review period for the Supplemental Draft EIS that expressed a preference were approximately 60 percent in support of a highway, with 40 percent preferring a marine alternative. During the Supplemental Draft EIS review period both branches of the Alaska Legislature submitted resolutions in support of Alternative 2, the East Lynn Canal Highway with Katzehin Terminal.

1.2.3 Existing Transportation Network

Haines and Skagway, at the north end of Lynn Canal, are linked by road to the continental highway system via the Alaska Highway. The Haines Highway connects Haines with the Alaska

Highway at Haines Junction, Yukon Territory. The Klondike Highway links Skagway to the Alaska Highway near Whitehorse, Yukon Territory.

The existing road system in Juneau currently extends 40 miles to the north where Glacier Highway terminates at the public boat ramp in Echo Cove. No surface transportation facilities extend beyond Echo Cove. Goldbelt, Inc. (Goldbelt) a local corporation organized under the Alaska Native Claims Settlement Act (ANILCA), owns land at Cascade Point, three miles north of the end of the road, and has the necessary permits to extend the road. The State of Alaska funded construction (but not surfacing) of this extension as part of the Industrial Roads Program. Also known as the Roads to Resources program, these state funds are used to foster industrial development. In this case the goal was to assist Goldbelt and its partner Coeur Alaska, Inc. (Coeur Alaska), the mining company developing the Kensington Gold Project, with their plans to develop a marine facility at Cascade Point (USFS, 1997a). The State of Alaska is also using Industrial Roads Program funding to upgrade the road from Slate Cove to Jualin Mine. Because the road to Echo Cove does not connect to another community, the National Highway designation of Glacier Highway ends at the Auke Bay Ferry Terminal. Due to Juneau's location and lack of highway access, all freight, vehicle, and passenger movement is by air or sea.

Sections of Glacier Highway are identified in the STIP for improvement in the near future, independent of the Juneau Access Improvements Project. Improvements from Tee Harbor (5 miles north of Auke Bay) to Bessie Creek (7 miles south of Echo Cove) are needed based on the condition of the highway and current traffic. DOT&PF began rehabilitating and widening the 7 miles from Tee Harbor to Amalga Harbor Road in the spring of 2005. The remaining 8 miles to Bessie Creek would be rehabilitated and widened as funding becomes available. Resealing of the section from Bessie Creek to Echo Cove was completed in the summer of 2005.

1.2.4 Aircraft Service

Aircraft access to Juneau is provided by commercial jet aircraft primarily from Seattle and Anchorage. The nearest other communities with regular jet service are Petersburg (98 miles south), Sitka (76 miles southwest), Yakutat (163 miles northwest), and Whitehorse (165 miles north). Commuter aircraft serve Haines, Skagway, and other communities that have neither the demand nor the facilities for jet aircraft service. Three companies offer regularly scheduled commuter service in Lynn Canal. These companies offer approximately 11 round-trips daily in the summer, with reduced service in the winter.

Because of the relatively short travel times and schedule frequency, business travelers generally prefer air travel to the ferry system. Air service in the Lynn Canal corridor plays an important role in transporting passengers, freight, and mail; however, travel is often constrained by fog, high winds, or snowstorms and can be delayed up to several days in the fall, winter, and spring.

1.2.5 AMHS Service

The AMHS is the only public transportation that carries passengers and vehicles in Lynn Canal. Statewide, the ferry system serves 31 ports in Alaska with a combined population of about 87,000, or 14 percent of Alaska's population. The system also has a port in Prince Rupert, B.C., and in Bellingham, Washington.

Seven of the eight state ferries operating in Southeast Alaska serve Lynn Canal. Five are mainline vessels with full accommodations that can carry between 69 and 134 vehicles at one time. The feeder vessel *M/V LeConte* can transport 34 vehicles, and the *M/V Fairweather* can transport 35 vehicles. About one-third of all vehicular traffic on the statewide ferry system travels through Lynn Canal, and 70 percent of all travel through Lynn Canal embarks or disembarks in Juneau.

In the summer of 2003, the Lynn Canal corridor was served by two mainline ferries originating from Bellingham, two mainline ferries originating from Prince Rupert, the feeder vessel *M/V Aurora*, and a Juneau-based shuttle service provided by the *M/V Taku* operating three days per week. The times of arrival and departure for many of the mainline ferries in Juneau, Haines, and Skagway varied each trip due to tidal restrictions, differing ports of call, and other factors.

In the summer of 2004 and 2005, weekly ferry service in Lynn Canal included mainline ferries from Bellingham and Prince Rupert, an occasional feeder vessel, and shuttle service five days per week by the *M/V Fairweather* to Haines and four days per week to Skagway. The *M/V Fairweather* vessel is based in Juneau and made a round-trip to Haines in the morning on Monday, Tuesday, Thursday, Friday, and Saturday and a round-trip to Skagway in the afternoon on Tuesday, Thursday, Friday, and Saturday.

1.2.6 Private Vessel Service

Private companies provide passenger-only service between Lynn Canal communities. This service is seasonal from mid May to mid September. Multiple daily trips are scheduled between Haines and Skagway as well as twice-weekly service between Haines and Juneau.

Juneau receives three barge shipments per week from the Puget Sound area, with one barge shipment continuing north to Haines and Skagway.

1.3 AMHS Service History in Lynn Canal

In 2004, AHMS transported approximately 27,000 vehicles and 97,000 passengers through Lynn Canal. Average daily traffic (ADT) is an important planning tool used to evaluate traffic levels on transportation facilities. It is a measure of average daily bi-directional traffic, that is, the number of vehicles passing a given point in either direction. Annual ADT is calculated by dividing annual traffic volumes by 365 days per year.

For AMHS service in Lynn Canal, annual ADT has two distinct counting locations: any point between Juneau and Haines and any point between Haines and Skagway. The annual ADT in Lynn Canal between Juneau and Haines, which includes traffic between Juneau and Skagway, is 81 vehicles. This equates to about 40 vehicles traveling to or through Haines and about 40 vehicles traveling to or through Juneau. Table 1-1 summarizes the Lynn Canal annual ADT and passenger traffic from 1988 to 2004.

Table 1-1
Lynn Canal Annual ADT 1988 to 2004 Juneau to Haines Traffic Volumes

Year	Round-trips	Traffic Volumes for Year (Vehicles)	Annual Average Daily Traffic	Passenger Traffic
1988	266	29,513	81	117,045
1989	240	28,871	79	115,742
1990	256	30,734	84	123,610
1991	290	32,605	89	131,865
1992	283	31,044	85	131,234
1993	245	30,098	82	122,271
1994	262	29,322	80	120,360
1995	270	30,349	83	118,857
1996	270	30,998	85	115,946
1997	287	29,158	80	107,040
1998	285	28,083	77	103,512
1999	298	30,131	83	112,531
2000	308	28,889	79	106,875
2001	285	26,662	73	93,645
2002	324	29,202	80	104,913
2003	325	27,967	77	96,517
2004	388	26,971	74	97,285
Average	287	29,447	81	112,897

Source: *AMHS*, *Annual Traffic Volume Reports,* 1998-2004 (DOT&PF, 2005a).

About 60 percent of all ferry traffic in Lynn Canal occurs between May and September. AMHS adjusts for the downturn in volume during the off-season by reducing the number of weekly round-trips from about ten in the summer to about four in the winter.

Since 1998, the AMHS has utilized a dedicated Lynn Canal summer shuttle ferry to provide same-time departures and arrivals at each port. The *M/V Fairweather* provided this service in 2004 and 2005 with a round-trip voyage from Juneau to Haines five days per week and a round-trip voyage from Juneau to Skagway four days per week. The *M/V Fairweather* does not operate between Haines and Skagway during the summer. All other vessels that provide service in Lynn Canal communities will have scheduled but varied arrival and departure times.

The route distance from Auke Bay Ferry Terminal in Juneau to Lutak Inlet in Haines is 78 miles. It takes an average of 4.5 hours for a mainline vessel and 2.3 hours for a FVF to transit this distance. The distance from Auke Bay to Skagway is 93 miles and requires an average transit time for a mainline vessel, including an intermediate stop in Haines, of 6.5 hours. The FVF takes 2.5 hours to transit from Auke Bay to Skagway with no intermediate stop in Haines. The required 2-hour check-in time and off-loading time add to total travel time for both the mainline ferry and the FVF.

1.4 Purpose and Need Statement

The purpose of and need for the Juneau Access Improvements Project is to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will:

- Provide the capacity to meet transportation demand in the corridor
- Provide flexibility and improve opportunity for travel
- Reduce travel times between the communities
- Reduce state costs for transportation in the corridor
- Reduce user costs for transportation in the corridor

The project Purpose and Need Statement has been subdivided into these five elements for clarity and to help evaluate the ability of project alternatives to meet or approach the overall goal of improving surface transportation to and from Juneau in the Lynn Canal corridor.

The five elements of the project Purpose and Need Statement are interrelated. Convenience and opportunity for travel are important factors in transportation demand, as are travel times and user costs. Transportation improvements to provide increased capacity and opportunity in Lynn Canal affect state and traveler costs. Traveler cost and travel time have a strong effect on demand. Generally, the more expensive the trip and the longer the travel time, the less the actual demand (as opposed to latent demand). Also, reductions in travel time and/or user cost generally increase state cost.

1.4.1 Transportation Demand

The first element of the Purpose and Need Statement is to *provide the capacity to meet transportation demand in the corridor*.

The Lynn Canal corridor is the largest bottleneck in Alaska's surface transportation system. DOT&PF estimates that the demand to travel through the corridor is over six times greater than the number of vehicles currently transported by AMHS. Indications of unmet demand in Lynn Canal include traffic growth and volume comparisons, telephone surveys, and the traffic forecast analyses.

1.4.1.1 Traffic Growth and Volume Comparisons

A clear indication that AMHS service is not meeting demand in Lynn Canal is the lack of traffic growth in Lynn Canal compared to the population growth in the state as a whole and in the three communities. A second indicator is the comparison of the traffic growth within transportation corridors adjacent to Lynn Canal to traffic growth in Lynn Canal. Table 1-2 presents both of these comparisons.

As shown in Table 1-2, the population of the three Lynn Canal communities grew 25 percent from 1988 to 2002, almost 2 percent annually. Traffic on adjacent corridors increased at a rate of 1 to 2 percent annually. Over the same period, there was no increase in vehicular volumes in Lynn Canal. In fact, in 2003 and 2004, both vehicle and passenger volumes decreased.

Table 1-2
Population and Transportation Growth

Population Growth	Percent Increase from 1988 to 2002
State of Alaska	20
City and Borough of Juneau	26
Haines Borough	21
City of Skagway	20
Transportation Growth	**Percent Increase from 1988 to 2002**
Haines Highway Border Station	13
Klondike Highway Border Station	14
Alaska Highway at Champagne (between Haines Junction and Whitehorse)	28
Alaska Highway near Beaver Creek	21
AMHS Lynn Canal Service (passengers or vehicles)	0

Source: Population growth from Alaska Department of Labor & Workforce Development, Research and Analysis Section, Demographics Unit statistics. Transportation growth from DOT&PF Annual Traffic Maps 1998-2002 (2003a) and Yukon Highways and Public Works 2002 Yukon Traffic Count Summary (2003).

In addition to no growth, a 15-year annual ADT of 81 in Lynn Canal is extremely low for access to a community with a population of 30,000. Table 1-3 compares AMHS annual ADT for Lynn Canal with the annual ADT of adjacent transportation corridors and the annual ADT of three other highways in Alaska that terminate at a tidewater community. These three communities, Seward, Valdez, and the Kenai Peninsula, all have populations smaller than Juneau.

Table 1-3
Corridor Annual Traffic Volumes and Annual ADT

Corridor	Annual Traffic Volume[1] (Vehicles)	Annual Average Daily Traffic
Alaska Highway between Haines and Whitehorse near Champagne	451,000	1,236
Glacier Highway in Juneau near Tee Harbor	627,000	1,734
Glacier Highway end of road in Echo Cove	78,000	213
Egan Drive in Juneau near McDonalds	9,790,000	26,817
Haines Highway at Haines Airport	381,000	1,045
Dyea Road in Skagway near end of road	74,000	204
Lutak Road in Haines near end of road	103,000	282
North Douglas Highway in Juneau past launch ramp	142,000	388
Klondike Highway at Skagway River Bridge	548,000	1,501
Sterling Highway west of Seward Highway Junction [2]	562,000	1,540
Richardson Highway between Glenallen–Valdez [2]	381,000	1,044
Seward Highway south of Sterling Highway Junction [2]	1,007,000	2,760
AMHS Lynn Canal between Juneau–Haines	30,000	81

Note: [1] Annual traffic volumes are rounded.
[2] Highways that terminate at a tidewater community.

Source: DOT&PF, 2003a and Yukon Highways and Public Works, 2003.

Table 1-3 shows that the lightly traveled Dyea Road in Skagway has traffic volumes 2.5 times greater than the traffic transported by AMHS. Dyea Road is a low-volume rural road used principally by local residents and summer tourists. The AMHS is the NHS route between Juneau and Haines, the principal surface transportation route for everyone traveling between these two communities. The low annual ADT on this NHS route compared to the annual ADT on rural roads indicates that AMHS is not meeting the travel demand in Lynn Canal.

> Note: The capacity and demand analyses in this document focus on vehicles. On inter-city surface routes, the primary responsibility of the state is to provide a transportation facility and not the transportation itself. Because of the nature of the AMHS, the facilities to move vehicles also accommodate walk-on passengers. However, this is a secondary function that is not provided on other highways in the state.

1.4.1.2 Telephone Surveys

In 1994 and 2003, DOT&PF contracted with an independent consultant to conduct telephone surveys of households in Juneau, Haines, Skagway, and Whitehorse (2003 survey only) regarding transportation needs, travel patterns, access preferences, and predicted travel frequencies. The surveys indicated that travelers in each community would make more trips through the Lynn Canal corridor if travel were faster, less costly, and more convenient.

The 1994 survey (Appendix C of the 1997 Draft EIS) responses indicated the following:

- More than 60 percent of households surveyed in all three communities felt that improving transportation was important to their own households.
- More than 75 percent of households in each community felt that improving transportation was important to their respective cities.

The 2003 (Appendix I) survey responses indicated the following:

- The majority of households, over 70 percent in all three communities, felt that improving transportation to and from Juneau was important.

1.4.1.3 Traffic Forecast Analysis

The traffic forecast analysis used the types of travel, origin/destination information, regional growth, and other methods and modeling to determine transportation demand in the Lynn Canal corridor for 2008 through 2038. A summary of the traffic forecast methodology is provided in Section 4.1.5. Further detail on the forecast is provided in Appendix C, *Traffic Forecast Report*.

The traffic forecast estimated that travel demand is over six times greater (500 vehicles per day) than what AMHS currently accommodates (15-year annual ADT of 81 vehicles per day).

The analysis also indicated that traffic demand would grow at an annual rate of about 2 percent in the Lynn Canal corridor between 2008 and 2038. At this rate, traffic demand would exceed 900 annual ADT in 2038, more than 11 times the current annual ADT.

1.4.2 Flexibility and Opportunity for Travel

The second element of the Purpose and Need Statement is to *provide flexibility and improve opportunity for travel* in Lynn Canal.

The opportunity to travel is restricted in Lynn Canal under the current ferry system. As Table 1-1 in Section 1.3 indicates, there have been an average of about 278 round-trip voyages each year between Juneau and Skagway with intermediate stops in Haines. AMHS provides more service in the summer season, May to September, than in October to April, the winter season. There are usually nine round-trip voyages per week to Haines and eight round-trip voyages per week to Skagway during the summer peak season and four round-trip voyages per week to both communities during the off-season.

During the summer season, a traveler has a choice of one or two sailings per day. In the winter, a traveler has a choice of approximately four sailings per week. Ferries typically sail below vehicular capacity during winter, but in summer they are at times unable to accommodate all reserved space and standby traffic.

Some restrictions to flexibility and opportunity to travel are as follows:

- Travelers must make reservations for vehicles in advance; travel during peak summer season periods can require making reservations within days of the summer ferry schedule release in the preceding December.
- Changing reservations can be problematic and can include cancellation charges if made within 14 days of a reservation.
- Travelers must plan trips to coincide with ferry schedule departures and arrivals.
- A 1- to 2-hour check-in time is required.
- Trips can be delayed by unforeseen events, including vessel mechanical problems, inclement weather, and last-minute requests to serve an additional port south of Juneau.
- Reservation changes are limited to regular business hours.
- Border crossings are restricted at night but ferry schedules do not always coincide with the operating hours of the U.S. Customs stations, inconveniencing travelers going beyond Haines and Skagway.
- When ferries do not have vehicle space available, travelers may register at the ticket counter 2 hours before sailing for standby vehicle space; however, there is no guarantee of boarding.

The listed restrictions to opportunity and flexibility to travel combined with long travel times inhibit residents of Juneau from using alternate airports such as Whitehorse Airport to travel to locations outside Southeast Alaska. These restrictions also contribute to the perception held by many Alaska residents that the capital is isolated from the rest of the state. Capital move proponents often cite this as a reason to relocate the state's capital.

The 1994 and 2003 household surveys included several questions on flexibility and convenience. The following information was identified in the 1994 survey:

- Households in all three communities reported having problems with ferry reservations (44 percent in Juneau, 53 percent in Haines, and 33 percent in Skagway).
- 55 percent of households in Haines, 34 percent of households in Juneau, and 40 percent of households in Skagway said that they have been unable to travel in Lynn Canal due to scheduling or reservations problems.
- 47 percent of Juneau households, 62 percent of Haines households, and 44 percent of Skagway households said that obtaining car space on the ferries was a problem.

The following information was identified in the 2003 survey:

- A strong majority of residents would travel more frequently in Lynn Canal if transportation were improved (72 percent in Juneau, 79 percent in Haines, and 70 percent in Skagway).
- Whitehorse households would make as many as three trips per year to Juneau with a highway connection, compared to the current average of once per year. Haines residents would take an average of eight trips to Juneau with a highway connection, and Skagway residents would take an average of 12 trips to Juneau with a highway connection.
- With a highway connection, Juneau households would increase their trips to Haines from the current two per year to four per year and would travel three times per year to Skagway, compared to the current once per year.

1.4.3 Travel Time

The third element of the Purpose and Need Statement is to *reduce travel time between the communities* in Lynn Canal. Table 1-4 lists AMHS travel times between Auke Bay and Haines and Auke Bay and Skagway.

Table 1-4
AMHS Travel Time

Route	Vessel Type	Check-in Time (hours)[1]	In-Transit (hours)	Unload Time (hours)	Total Travel Time (hours)
Auke Bay – Haines	Mainliner	2.0	4.5	0.6	7.1
	FVF	1.0[2]	2.3	0.2	3.5
Auke Bay – Skagway	Mainliner	2.0	6.5	0.6	9.1
	FVF	1.0[2]	2.5	0.2	3.8

Notes: [1]Check-in time is the time that a vehicle must arrive at the dock prior to departure and includes loading.
[2]Check-in time for the FVF used in this document is one hour. Vehicles must have completed check-in an hour before departure to avoid losing a reservation. Therefore, AMHS recommends two hours.

Source: 2004 AMHS Summer Schedule and *Marine Segments Technical Report* (Appendix B).

Travel time between the communities by ferry is significantly longer than travel times would be by highway, the most prevalent method of surface transportation outside the Lynn Canal corridor. If a direct highway connection existed, driving from Auke Bay to Haines at a speed of 40 to 50 miles per hour (mph) would take about 1.5 to 2 hours. Traveling by highway from Auke Bay to Skagway at a speed of 40 to 50 mph would take between 2 and 2.5 hours.

1.4.4 State Costs for Transportation System

The fourth element of the Purpose and Need Statement is to *reduce state costs for transportation in the corridor*.

To maintain and operate the ferry system, AMHS depends on vessel-generated revenues (e.g., fares, restaurant income, staterooms) and state funds appropriated annually by the legislature. Statewide, the system required about $90 million to operate in 2004 and generated about $46 million in revenues, as shown in Table 1-5. The fiscal year (FY) 2006 projected cost to operate the system is $101 million due to increases for marketing and experimental increased winter service using vessels normally layed up during the winter.

Table 1-5
AMHS Statewide Expenditures and Revenues

Fiscal Year (FY)	Expenditures in $Millions	Revenues in $Millions (Percent of Total)	State General Fund in $Millions (Percent of Total)
FY01	$81.7	$37.6 (46%)	$44.1 (54%)
FY02	$79.6	$39.5 (50%)	$40.1 (50%)
FY03	$85.6	$41.2 (48%)	$44.4 (52%)
FY04	$89.5	$44.7 (50%)	$44.8 (50%)

Source: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038 (DOT&PF, 2004a).
Lynn Canal Corridor Revenue and Expenditures 2003 and 2004 (DOT&PF, 2005c).

The cost to operate the AMHS is high in comparison to the cost to operate and maintain Alaska's highways. For comparison, the AMHS provides about 21.3 million vehicle miles of travel at a state cost of about $40 million each year, or $1.87 per vehicle mile. On state-owned highways, about two billion miles are driven each year. The maintenance budget for state-owned highways is about $70 million per year, which equates to approximately $0.035 per vehicle mile. Revenues from gas tax receipts and licensing/registration fees are about $65 million, some of which reduces the overall state cost for highway maintenance.

Because the cost of providing AMHS service is high and a large portion of the state's population does not use the system, state funding has become increasingly more difficult to obtain.

Travelers in the Lynn Canal corridor account for about 15 percent of the total AMHS revenues. Over fiscal years 2001 through 2004, the cost to operate AMHS in Lynn Canal averaged $11.2 million per year (Table 1-6). This cost included maintenance and operation of the vessels and administrative costs, such as selling tickets, scheduling, and operating the terminals. Revenues from fiscal years 2001 through 2004 from passenger and vehicle tickets and on-ship services averaged $6.0 million. As a result, the state general fund contribution has averaged $5.2 million to provide surface transportation in Lynn Canal.

Table 1-6
AMHS Lynn Canal Corridor Expenditures and Revenues

Fiscal Year (FY)	Expenditures in $Millions	Revenues in $Millions (Percent of Total)	State General Fund in $Millions (Percent of Total)
FY01	$10.4	$5.5 (53%)	$4.9 (47%)
FY02	$11.5	$6.4 (56%)	$5.1 (44%)
FY03	$11.3	$6.2 (55%)	$5.1 (45%)
FY04	$11.7	$6.0 (51%)	$5.7 (49%)

Source: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038 (DOT&PF, 2004a).
Lynn Canal Corridor Revenue and Expenditures 2003 and 2004 (DOT&PF, 2005c).

In comparison to statewide operations, AMHS provides about 2.5 million vehicle miles of travel in Lynn Canal at an average annual cost to the state of $5.2 million, or $2.08 per vehicle mile.

As shown in Table 1-6, AMHS service in Lynn Canal recovers a slightly higher percentage of expenditures than the system-wide average; nevertheless, it requires a state general fund contribution of over $5 million annually to carry an average of 81 vehicles per day.

1.4.5 User Costs

The fifth element of the Purpose and Need Statement is to *reduce user costs for transportation in the corridor.*

The fares for passage in Lynn Canal on the AMHS are substantially higher than those for other surface transportation modes. A typical family of four in a 19-foot vehicle[9] traveling one way from Juneau to Skagway paid $237 on a mainline vessel and $261 on an FVF in 2004. The fare between Juneau and Haines for the same family was $180 on a mainline ferry and $198 on an FVF. In comparison, if direct highway links existed the total 2004 cost to a vehicle owner would be about $40 from Juneau to Skagway and $35 from Juneau to Haines. The 2004 out-of-pocket cost to a vehicle owner would be about $9 from Juneau to Skagway and $8 from Juneau to Haines[10].

Table 1-7 summarizes the projected cost per mile in Lynn Canal for a typical family traveling on a mainliner, FVF, and an equivalent-length highway.

Table 1-7
Projected Family of Four Cost per Mile in Lynn Canal by Mode

Route	Conventional Vessel [1]	FVF[1]	Highway[2]
Auke Bay – Haines	$2.31	$2.54	$0.44
Auke Bay – Skagway	$2.55	$2.80	$0.44

Notes: [1] Uses distances of 93 miles (Auke Bay–Skagway) and 78 miles (Auke Bay–Haines). The FVF and conventional vessel costs per mile are based on 2004 AMHS published fares, not including the 10 percent fuel charge.
[2] Based on total vehicle cost for an SUV (AASHTO, 2003). Cost includes fuel, oil, tires, maintenance, insurance, license, registration, depreciation, and financing.

As shown in Table 1-7, the cost per mile for a family of four traveling on the AMHS in Lynn Canal is five to six times higher than the cost to make an equivalent-length trip by highway.

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[9] Twenty-one feet is the average vehicle size transported on the AMHS including motorcycles, campers, trucks, and recreation vehicles. For a family vehicle the 15- to 19-foot category is used. This medium vehicle size category includes station wagons, minivans, most pickups, and many sedans. The family-of-four passenger costs are based on two adults, one child over 12, and one child 2 through 12.

[10] Assumes fuel cost at $2 per gallon and 19.7 miles per gallon (EPA fleet mix average).

2.0 PROJECT ALTERNATIVES

This chapter describes the reasonable alternatives evaluated in this Final EIS and provides information on the screening process used to select these alternatives. The chapter is divided into five sections: Alternative Screening, Alternatives Determined Not Reasonable, Reasonable Alternatives, Selection of the Preferred Alternative, and Funding Considerations.

2.1 Alternative Screening

Alternatives were screened in fall 2003 after the Supplemental Draft EIS scoping process. The alternative screening process used specific criteria to evaluate alternatives and determine the range of reasonable alternatives. The list of alternatives to be screened was derived from the following Juneau Access Improvements Project documents:

- The 1994 Reconnaissance Engineering Report (DOT&PF, 1994)
- The 1997 Draft EIS (DOT&PF, 1997a)
- The 1999 DOT&PF Preferred Alternative Report (PAR) (DOT&PF, 1999)

Alternatives were screened using four criteria.

- Criterion I – Cost/Technical Feasibility and Common Sense. Using professional judgment and cost data from previous analyses, the alternatives were screened to determine if they would be economically and/or technically feasible or go against common sense.
- Criterion II – Appropriateness and Unnecessary Variations. Alternatives were screened to determine if certain variations were unnecessary to consider a full spectrum of alternatives.
- Criterion III – Purpose and Need. To be reasonable, an alternative must at least partially meet a majority (three or more) of the five Purpose and Need elements. Alternatives were screened with regard to the Purpose and Need elements 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 provide for more round-trips per day from Juneau to Haines and Skagway than the No Action Alternative.
  - Element 3 – Reduce Travel Time. An alternative should have a quicker one-way travel time from Juneau to Haines/Skagway than the travel time of the No Action Alternative.
  - 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 the 1997 M&O estimated costs for the No Build Alternative. (The 2004 No Action Alternative M&O cost estimates were unknown at the time of this screening.)
  - Element 5 – Reduce User Cost. An alternative should have a lower one-way travel cost from Juneau to Haines/Skagway than the current cost under the No Action Alternative. (The No Action Alternative costs were estimated from the Summer 2003 AMHS ferry schedule.)

- Criterion IV – Environmental Factors. This screening process used information regarding 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. These environmental impact factors included cultural resources, lands protected by Section 4(f) of the Transportation Act, Congressionally designated wilderness, Wild and Scenic Rivers, bald eagle nest trees, threatened and endangered species, and special aquatic sites.

  Note: The strongest test of capacity/demand is the degree to which an alternative provides capacity to meet the total demand (including latent demand) in the corridor. However, it is not reasonable to design the marine segment of an alternative to meet the total demand when it is clear that actual demand is affected (reduced) by user cost and time delay associated with that mode. Designing for full demand even though it is not expected would unrealistically drive up the costs of the alternative. Therefore, each alternative was designed to meet the projected 30-year average daily summer travel demand for the limiting marine segment of the alternative.

A detailed discussion of the 2003 screening process and figures depicting the screened alternatives presented in the Supplemental Draft EIS can be found in the *Alternative Screening Report* (Appendix A).

2.2 Alternatives Determined Not Reasonable

2.2.1 Taku River Valley Highway

This alternative would construct a 118-mile-long highway from the end of Thane Road in Juneau, northeast along the Taku Inlet, across the Alaska-Canada border, up the Taku River Valley, along the Sloko and Pike River Valleys, and connecting to Canadian Highway 7 south of Atlin, B.C. (Figure 2-1). Under this alternative, mainline ferry service would continue in Lynn Canal.

In 1993, the B.C. Minister of Transportation was contacted regarding Canada's interest in the Taku River Valley Highway. At that time, B.C. indicated it did not support pursuit of this alternative.

In 2003, the B.C. Minister of Transportation was once again contacted to determine if B.C. was still opposed to this alternative. The October 2, 2003, response indicated that B.C. is not interested in the Taku River Valley Highway. An alternative that involves construction in, and access to, a province of a foreign country that does not have the support of the government of that province fails the common sense test and is not a reasonable alternative. This alternative also does not directly address the Purpose and Need Statement of improved transportation to and from Juneau in Lynn Canal. The alternative was dropped from further consideration.

2.2.2 Goldbelt – Ferry Shuttle Service from Cascade Point

The *Echo Cove Master Plan* (Goldbelt, 1996) identified a development opportunity to construct a highway from the end of Glacier Highway at Echo Cove to Cascade Point. A ferry terminal would be constructed at Cascade Point, and a private high-speed ferry would operate from Cascade Point to Haines/Skagway. This alternative would be a private-sector action that could not be compelled by the State of Alaska in terms of assuring its construction, continuation, or level of service. Therefore, the state could not rely on it as a long-term transportation solution on this NHS route. Goldbelt is no longer pursuing the development of a private vehicle ferry to

Haines and Skagway. Potential development of private ferry service in Lynn Canal is not a reasonable alternative.

2.2.3 Haines/Skagway Intertie

This alternative would construct a highway from the end of Glacier Highway at Echo Cove around Berners Bay to Katz Point north of the Katzehin River delta. A ferry terminal would be constructed at Katzehin, and a shuttle ferry would operate between Katzehin and the Lutak Ferry Terminal in Haines. A new highway would be constructed between the end of the road in Lutak Inlet and Dyea Road in Skagway.

The purpose and need for the Juneau Access Improvements Project is to improve transportation to and from Juneau in Lynn Canal. An alternative that has a very costly road component connecting Haines and Skagway, while requiring all Juneau traffic to travel to Haines by ferry, is primarily a Haines/Skagway access project. DOT&PF has identified improved access between Haines and Skagway as an independent need and is pursuing this as an independent action. In the 2004 *Haines/Skagway Access Reconnaissance Report*, DOT&PF has determined that a shuttle ferry is the appropriate Haines/Skagway connection for the near future (DOT&PF, 2004b). The 2004 SATP identifies the *M/V Aurora* as available for Haines/Skagway service as early as 2005 (DOT&PF, 2004c). However, it remained in Prince William Sound in 2005 and is scheduled to operate there in 2006. Current AMHS planning is for the *M/V Aurora* to begin Haines/Skagway service in 2007. Therefore, Haines/Skagway service is included in the updated No Action Alternative and modified as necessary in each build alternative.

> Note: The Haines/Skagway Intertie was not included in the 1997 Draft EIS range of reasonable alternatives based on cost and issues relating to Section 4(f) of the Transportation Act (49 USC Section 303) protecting certain public lands, including parks. Although these are important concerns, they affect the consideration of a potential Haines/Skagway Highway, which is independent of the Juneau Access Improvements Project.

2.2.4 East Lynn Canal Highway with Bridge to Haines

This alternative would construct a highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway. An approximately 7,000-foot-long bridge would be constructed from the north end of the Katzehin River delta across Chilkat Inlet to Battery Point, south of Haines. (Because Battery Point is located in Chilkat State Park, Section 4(f) constraints could require an even longer length bridge.)

Water depths, bridge span lengths, and the need to accommodate large-vessel passage (including cruise ships) at this location 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 in the Reconnaissance Engineering Report to be approximately $190 million. More detailed estimates for recent bridge projects, when applied to this distance (ignoring the much greater depth), indicate a cost of 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 was dropped from further consideration.

2.2.5 East Lynn Canal Rail

This alternative would construct a railroad connection from the end of Glacier Highway at Echo Cove to Skagway. A ferry terminal would be constructed near Katz Point north of the Katzehin

River delta, and a new shuttle ferry would run between Katzehin and the Lutak Ferry Terminal in Haines.

An East Lynn Canal Rail alternative was partially analyzed in the 1997 Draft EIS. At that time, DOT&PF compared a typical segment of road and the corresponding railroad construction costs and determined that the East Lynn Canal Rail alternative more than doubled the highway comparison costs and had limited ability to meet the Purpose and Need elements. Therefore, this alternative was considered to be unreasonable in the 1997 Draft EIS.

In 2003, the analysis for a railroad connection was updated to reflect 2003 costs and standards. The conclusion of the updated analysis was the same; construction costs were more than 2.5 times higher for a railroad than for a highway. Therefore, the East Lynn Canal Rail alternative was again considered unreasonable and dropped from further consideration.

2.2.6 East Lynn Canal Highway to Katzehin with Berners Bay Shuttle Ferry (PAR Proposal 5B)

This proposal would extend Glacier Highway from Echo Cove to Sawmill Cove, construct ferry terminals at Sawmill Cove and Slate Cove, and operate shuttle ferries between the two ferry terminals. A highway would be constructed between Slate Cove and Katz Point north of the Katzehin River delta. A ferry terminal would be constructed at the end of the highway, and shuttle ferries would operate between the Katzehin, Lutak, and Skagway Ferry Terminals. Mainline ferry service would end at Auke Bay in Juneau.

This proposal is essentially a combination of ferry components from two other 1999 PAR proposals:

- Proposal 5A (now designated as Alternative 2A), which proposed shuttle service across Berners Bay
- Proposal 5D (now designated as Alternative 2B) which proposed 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. The alternative was rated relatively low in the PAR because of its combination of high construction cost and high operating cost, as well as comparatively long travel times and high user fees. It was determined to be unreasonable during 2003 screening as an unnecessary variation that also did not pass the common sense test because it required all travelers to take two ferries separated by a highway link. With Alternative 2A determined not reasonable in 2005 due to Section 4(f) impacts, the Berners Bay shuttle concept is no longer part of any reasonable alternative. Sufficient analysis has occurred on Alternative 2A for DOT&PF and cooperating agencies to determine that the use of shuttles in Berners Bay is not a reasonable way of reducing project impacts in the Berners Bay area. Therefore, the alternative remains not reasonable.

2.2.7 East Lynn Canal Highway from Katzehin to Skagway (PAR Proposal 5C)

This proposal would extend the Glacier Highway from Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at Sawmill Cove and Katzehin, and the *M/V Malaspina* would operate as a dayboat between the two ferry terminals. A second shuttle ferry would operate between the Katzehin and Lutak ferry terminals. Mainline ferry service would end at Auke Bay. A new highway would then be constructed from Katzehin to Skagway.

This alternative was proposed in 1999 specifically as a way of improving service with the *M/V Malaspina*. The *M/V Malaspina* was costly to operate on this route because the length of the route necessitated two crews. AMHS planners were investigating ways to get two round-trips per day from this double crew. The PAR rated this alternative lower than the 1997 No Build Alternative because of its marginal service improvements relative to its high capital and operating costs. This proposal is no longer appropriate, as the *M/V Malaspina* is being replaced with a FVF to serve Lynn Canal.

This proposal is also a combination of other alternatives, in this case combining the highway extension and ferry route of Alternative 4D with a highway link from Alternative 2. Conventional vessel operation, with and without a highway extension from Echo Cove, is a part of Marine Alternatives 4C and 4D. An additional combination of ferry and highway links is an unnecessary variation on existing alternatives and was dropped from further consideration.

2.2.8 Original Marine Alternative 4, Options A through D

The original marine options in the 1997 Draft EIS were based on improving service in Lynn Canal with the marine technology prevalent in the mid-1990s. All four options utilized the same vessel, the high-speed Wavepiercer catamaran, capable of carrying 105 vehicles. The differences between options were summer starting points (Auke Bay versus Berners Bay) and additional versus supplemental service. The latter 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 the NEPA. However, because the number of vessels required for Lynn Canal service is dependent on whether mainliners continue in the corridor, this potential change in operation was captured in two marine options in the 1997 Draft EIS.

Based on 1997 Draft EIS comments, 2003 scoping comments, and AMHS experience and direction over the past seven years, the original marine options have been modified. The new marine alternatives retain the different potential summer supplemental service locations (Auke Bay versus Berners Bay), but drop the issue of mainline service level in favor of analyzing high-speed shuttle ferries versus conventional-speed shuttles. This approach reflects several recent developments:

- Both AMHS and the Inter-Island Ferry Authority (IFA) now have experience operating dayboats (vessels operating point to point and returning to the same port every night rather than 24-hour operation), and there is increased public interest in this type of operation.
- AMHS experimented with turning some mainliners around in Juneau in hopes of moving through-corridor traffic onto another vessel, with poor results. For this reason and due to scheduling concerns, it is likely that as long as there are mainline ferries there will always be some mainline service in Lynn Canal absent a highway connection.
- Another reason to modify the 1997 marine options is that AMHS has designed and constructed two FVFs that are much different than the 105-vehicle ferry analyzed in the 1997 Draft EIS. AMHS planners believe smaller fast ferries, designed specifically for Southeast situations, are more appropriate.

The actual size of the vessel(s) for each new marine option, including those with high-speed ferry service, was determined by a new analysis in the *Marine Segments Technical Report* (Appendix B). Vessel selection was based on meeting marine traffic projections, providing reasonable frequency, and minimizing operational cost.

As with the highway alternative alignment adjustments that occur to reduce impacts or utilize new information, new Alternatives 4A through 4D replace the original marine options from the 1997 Draft EIS. The original marine options are variations that are no longer relevant, and therefore were dropped from further consideration.

2.2.9 Alternatives Determined Not Reasonable After Publication of the Supplemental Draft EIS

The following alternatives were evaluated as reasonable in the Supplemental Draft EIS but were dropped from consideration in the Final EIS after FHWA determined they would take Section 4(f) protected lands within the Skagway and White Pass District National Historic Landmark (NHL) (see Chapter 6.0 for more information on the Section 4(f) applicability determination). The original alternative screening criteria included Section 4(f) impacts because DOT&PF and FHWA recognized that, given the project purpose and need and the existence of reasonable alternatives without 4(f) impacts, a 4(f) impact could render an alternative unconstructable. Based on the Section 4(f) applicability determination these alternatives were determined to be not reasonable at this time.

East Lynn Canal Highway with Katzehin Terminal (Supplemental Draft EIS Alternative 2). This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway (Figure 2-2). A ferry terminal would be constructed north of the Katzehin River delta, and operation of the Haines/Skagway shuttle would change to shuttle service between Katzehin and the Lutak Ferry Terminal in Haines. Mainline ferry service would end at Auke Bay in Juneau, and the existing Haines/Skagway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

East Lynn Canal Highway with Berners Bay Shuttle (Supplemental Draft EIS Alternative 2A). This alternative would construct a 5.2-mile highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay (Figure 2-3). A ferry terminal would be constructed at both Sawmill Cove and Slate Cove, with shuttle ferries operating between them. A 52.9-mile highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed at Katzehin, and the Haines/Skagway shuttle would operate between the Katzehin and Lutak ferry terminals. Mainline ferry service would end at Auke Bay, and the Haines to Skagway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway, the shuttle ferry service across Berners Bay, and the shuttle ferry service from Katzehin to Haines would become the NHS routes in Lynn Canal.

East Lynn Canal Highway with Shuttle to Haines from Skagway (Supplemental Draft EIS Alternative 2C). This alternative would construct a 68.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway (Figure 2-4). A Haines/Skagway shuttle would continue to provide service to Haines. Mainline ferry service would end at Auke Bay, and no new terminals would be constructed. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Skagway and the shuttle ferry service from Skagway to Haines would become the NHS routes in Lynn Canal.

2.3 Reasonable Alternatives

All the remaining alternatives at least partially meet a majority of the Purpose and Need elements screening criteria, pass the cost, common sense, and appropriateness tests, and have no known environmental impacts that would render them unreasonable alternatives. In compliance with NEPA requirements, a No Action Alternative is included in the range of alternatives to be evaluated.

All reasonable build alternatives, as defined, include at least one ferry link, because Haines and Skagway are on opposite sides of inland waters. The parameters of the marine segment(s) control the capacity and flexibility provided by the alternative, and have a large effect on travel time and costs. Capacity needs to be based on demand, but demand is affected by the type of service, and varies throughout the year. In order to best meet the purpose and need elements while not inflating cost, the marine segments have been designed to meet the projected average summer demand (not peak) for each alternative while providing greater trip frequency than the No Action Alternative. Larger vessels, more vessels, and longer operating schedules could provide greater capacity and flexibility, but at a greater cost. In order to address capacity and cost equitably, ferry service for each alternative is based on the projected 2038 average summer daily traffic for its marine segment(s). To provide reasonable frequency of service with the least cost to the state, summer ferry service is generally provided for 14 to 16 hours each day, with less frequent service in the winter. For the projected 2038 average summer daily traffic, see the *2004 Traffic Forecast* (Appendix C). See the *Marine Segments Technical Report* (Appendix B) for more details on potential crewing for ferry segments of alternatives.

Table 2-1 lists the reasonable alternatives and their numeric designations.

Table 2-1
Reasonable Alternatives Evaluated in the Final EIS

Alternative Title	Numeric Designation
No Action Alternative	Alternative 1
East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway	Alternative 2B
West Lynn Canal Highway	Alternative 3
Fast Vehicle Ferry Shuttle Service from Auke Bay	Alternative 4A
Fast Vehicle Ferry Shuttle Service from Berners Bay	Alternative 4B
Conventional Monohull Shuttle Service from Auke Bay	Alternative 4C
Conventional Monohull Shuttle Service from Berners Bay	Alternative 4D

The following description of reasonable alternatives includes information on key parameters for the project purpose and need: capacity, travel time, travel frequency, and cost (design, construction, maintenance, operation, and life-cycle[11]). Travel times for ferry segments are from terminal-to-terminal. All travel times from Juneau to Haines and Skagway presented in this discussion were calculated from Auke Bay in order to provide a consistent measure of travel time for each alternative.

The alternative descriptions and cost estimates include all construction required for implementation of the alternatives. No improvements to connecting facilities would be required, although construction and operation of a build alternative could accelerate the scheduling of improvements to adjacent facilities. Initial construction costs have been updated based on August 2005 estimates. All maintenance, operation, and life-cycle costs are expressed in 2004 dollars.

[11] Life-cycle costs are the total construction, refurbishment, and maintenance costs for a 5-year construction period (evaluated as 2004 to 2008) and a 30-year operation period (evaluated as 2008 to 2038) discounted to 2004 dollars. See Section 4.1.5 for an explanation of life-cycle cost analysis.

2.3.1 Alternative 1 – No Action

The No Action Alternative includes a continuation of mainline[12] service in Lynn Canal as well as the operation of the fast ferry *M/V Fairweather* between Auke Bay and Haines and Auke Bay and Skagway (Figure 2-5). The *M/V Aurora* would provide shuttle service between Haines and Skagway, beginning as early as 2007[13]. The *M/V Fairweather* would travel at approximately 32 knots (37 mph), and the *M/V Aurora* would travel at approximately 15 knots (17 mph), which is similar to the speed of the other AMHS conventional monohull vessels. This alternative is based on the most likely AMHS operations in the absence of any capital improvements specific to Lynn Canal other than possible terminal modifications for the Haines/Skagway shuttle, which DOT&PF would develop as an independent project. Ferry terminal modifications to accommodate the *M/V Fairweather* have already been made at Auke Bay.

The No Action Alternative is an updated version of the 1997 Draft EIS Alternative 1, titled No Build/Transportation System Management. Alternative 1 originally used the term No Build rather than No Action to help clarify that the AMHS has and would continue to implement new actions in the Lynn Canal corridor. An example of an expected AMHS addition to Lynn Canal is the use of the *M/V Aurora* as a shuttle ferry between Haines and Skagway.

Transportation System Management (TSM) refers to activities that maximize the efficiency of an existing system with little or no new construction. It is generally applicable to transportation systems in urban areas and typically involves options such as fringe parking, ride sharing, designating high-occupancy vehicle (HOV) lanes, and traffic signal timing optimization. Reassigning vessels to Lynn Canal could be reviewed as a form of TSM, but unlike more typical TSM measures, this would be at the expense of service elsewhere. For this reason, there is no TSM alternative in the Supplemental Draft EIS range of alternatives and the term TSM is not included in the Alternative 1 title.

New actions that AMHS may implement in the Lynn Canal corridor include deploying different vessels (including new ones added to the system as a whole) and changing schedules, but do not include implementing a build alternative specific to the Juneau Access Improvements Project. Therefore, under the No Action Alternative the AMHS would continue to be the NHS route from Juneau to Haines and Skagway. The No Action Alternative would not involve any of the actions described in the build alternatives (Alternative 2B through 4D) evaluated in this Final EIS.

> Note: The No Action Alternative is a projection of future Lynn Canal service based on the most recent SATP. It is not a continuation of past or current service levels. As such, capacity, frequency, and cost are somewhat different from past and current service. Current service is a reduction in capacity from pre-fast vehicle ferry service. The No Action Alternative is a reduction below the current level of service due to reduced mainliner frequency in Lynn Canal. Mainliner frequency would be reduced because of projected reduction in the number of mainliners operating in the AMHS. The 2004 SATP envisions two mainliners operating out of Bellingham and one mainliner operating out of Prince Rupert to Whittier. The Bellingham ferries would each make a trip through Lynn Canal once a week. In order to maintain a minimum level of Lynn Canal service, a Prince Rupert-based ferry would average one trip in Lynn Canal per week. The $10.2

[12] Mainline service consists of larger vessels that travel the length of the system from Bellingham or Prince Rupert in the south to Haines and Skagway in the north.

[13] The 2004 Southeast Transportation Plan identified the *M/V Aurora* as available for the Haines/Skagway shuttle service in 2005. However, it remained in Prince William Sound in 2005 and is scheduled to operate there in 2006. Current AMHS planning is for the *M/V Aurora* to begin Haines/Skagway service in 2007.

million operation estimate for the No Action Alternative in 2008 is therefore less than the $11.7 million expended in 2004.

Capacity – Alternative 1 traffic capacity would be determined by the combination of mainline and FVF sailings. Mainline vessel capacity ranges from 80 to 134 vehicles one way, with an estimated three round-trips per week year-round traveling Juneau / Haines / Skagway / Haines / Juneau. The *M/V Fairweather* has a one-way capacity of 35 vehicles. In the summer, it would make five weekly trips to Haines and four to Skagway. In the winter, this would be reduced to two trips per week to each community. This configuration of AMHS ferries in Lynn Canal would accommodate the daily traffic volumes presented in Table 2-2, with mainliner capacity apportioned 60 percent to Haines and 40 percent to Skagway, based on historical usage.

Table 2-2
Daily Traffic Capacity for Alternative 1

Alternative 1 – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	96
Winter	66
To/From Skagway	
Summer	71
Winter	51

Travel Time – The one-way trip times for Alternative 1 are shown in Table 2-3. These times include check-in (including loading), transit, and unloading. Check-in time covers the time the AMHS requires for vehicles to be present at the dock prior to loading. No delay time is included.

Table 2-3
Travel Time for Alternative 1

Alternative 1 – Travel Time (hours)		
Route	**Mainliner**	**Fairweather**
Auke Bay – Haines	7.1	3.5
Auke Bay – Skagway	9.1	3.8

Travel Frequency – The opportunity to travel between Auke Bay and Haines or Skagway would depend on the frequency of both mainline and FVF *(M/V Fairweather)* service. The travel frequency for Alternative 1 in terms of round-trips is provided in Table 2-4.

Table 2-4
Travel Frequency for Alternative 1

Alternative 1 – Travel Frequency		
Auke Bay – Haines	**Average Round-Trips per Day**	**Round-Trips per Week**
Summer	1.1	8
Winter	0.7	5
Auke Bay – Skagway	-	-
Summer	1	7
Winter	0.7	5

Cost – The No Action Alternative has no initial construction costs. The annual M&O costs would be $10.2 million: $4.9 million for mainline service, $3.4 million for FVF service, and $1.9 million for Haines/Skagway shuttle service provided by the *M/V Aurora*. The estimated 30-year life-cycle cost is $267 million.

2.3.2 Alternative 2B (Preferred) – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

This alternative would construct a 50.8-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Katzehin, construct a ferry terminal at the end of the new highway, and run shuttle ferries to both Skagway and Haines from the Katzehin Ferry Terminal (Figure 2-6). The highway would have a 30-foot pavement width, with two 11-foot-wide vehicle lanes and 4-foot shoulders (Figure 2-7). The minimum design speed would be 40 mph[14]. The design would meet American Association of State Highway and Transportation Officials (AASHTO) standards for a rural arterial except for the 4-foot shoulder width, which would be an exception to the 6-foot AASHTO recommended shoulder width (see the addendum to the *Technical Alignment Report* (in Appendix W) for further information).

The Haines to Skagway shuttle service would continue to operate, two new shuttle ferries would be constructed, and the *M/V Aurora* would be part of the three-vessel shuttle system. Mainline ferry service would end at Auke Bay in Juneau. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Katzehin and the shuttle ferry service from Katzehin to Haines and Skagway would become the NHS routes in Lynn Canal.

> Note: This alternative was originally proposed in the PAR as a way of reducing capital costs by avoiding construction in some of the most difficult terrain. The alternative has public interest in terms of improving service in Lynn Canal while not favoring Skagway over Haines with a direct road link. The alternative partially met four of the five 2003 Purpose and Need elements as defined for screening and was therefore included in the range of reasonable alternatives in the Supplemental Draft EIS and this Final EIS.

Capacity – The capacity of this alternative would depend on the shuttle system at Katzehin. Summer service would consist of three vessels and would include the *M/V Aurora* as a Katzehin/Haines shuttle ferry with a 34-vehicle capacity, a Katzehin/Skagway shuttle ferry with a 53-vehicle capacity, and a Haines/Skagway shuttle with a 16-vehicle capacity. During the

[14] The minimum design speed is not the average travel speed on the highway. Many sections of the highway would meet substantially higher standards and therefore would be posted at 50 mph. It is expected that the average speed on the highway would be 45 mph taking into account the curves requiring a reduction to 40 mph.

winter, no direct Haines/Skagway shuttle would operate; this service would be provided via the Katzehin Ferry Terminal by the other two shuttle systems. The daily traffic volumes that would be accommodated by Alternative 2B are provided in Table 2-5.

Table 2-5
Daily Traffic Capacity for Alternative 2B

Alternative 2B – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	544
Winter	408
To/From Skagway	
Summer	636
Winter	424

The 30-year summer traffic projection to Haines under Alternative 2B exceeds the vehicle capacity of an *M/V Aurora*-class vessel on a two-shift operating schedule. The *Marine Segments Technical Report* (Appendix B) includes the optimum vessel for the 2038 projected traffic. As traffic demand approaches capacity (estimated at year 2028), AMHS may choose to replace the existing vessel with the optimum vessel or add another vessel. The alternative is analyzed in the EIS based on replacement with the optimum vessel in the year that the projected demand exceeds the capacity of an *M/V Aurora*-class vessel. For more details see the *Marine Segments Technical Report*.

Travel Time – The one-way trip times for Alternative 2B are provided in Table 2-6. These times include ferry loading, transit time, and unloading, but no delay is included. The travel times for the shuttle ferries to and from Katzehin and between Haines and Skagway do not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis.

Table 2-6
Travel Time for Alternative 2B

Alternative 2B – Travel Time (hours)	
Route	**Travel Time (hours)**
Auke Bay – Haines	2.5
Auke Bay – Skagway	3.0

Travel Frequency – Under Alternative 2B, flexibility and opportunity for travel is a function of the frequency of shuttle ferry service from the Katzehin Ferry Terminal. During the summer, all three shuttles would operate 15 hours per day. During the winter, the ferry to Haines would operate approximately 11 hours a day, and the Skagway ferry would operate about 10 hours per day. Winter travel would also be limited by road closures for avalanche control; however, one or more ferries would be available to shuttle vehicles and passengers in Lynn Canal on days when the highway is closed. Trip frequency for Alternative 2B is provided in Table 2-7.

Table 2-7
Travel Frequency for Alternative 2B

Alternative 2B – Travel Frequency		
Auke Bay – Haines	**Round-Trips per Day**	**Round-Trips per Week**
Summer	8	56
Winter	6	42
Auke Bay – Skagway	-	-
Summer	6	42
Winter	4	28

Cost – The 2005 initial design and construction cost estimate for Alternative 2B is $258 million. Highway construction costs would be $189 million, vessel acquisition costs would be $53 million, and the Katzehin Ferry Terminal would cost $16 million. Annual M&O costs are estimated to be $9 million: $1.3 million for the highway and $7.7 million for the shuttle ferries. The estimated 30-year life-cycle cost is $352 million.

Alignment – Alternative 2B would begin at the end of Glacier Highway just north of the Echo Cove boat ramp and would follow the same alignment as the Cascade Point Road as far as Cascade Creek. From there on, the highway would generally follow the shoreline to north of the Katzehin River except at a few locations where topography would allow the highway to be located well inland from the shore. Wherever possible, the highway alignment is positioned above the high tide line to minimize marine impacts as well as reduce visual impacts.

2.3.2.1 Echo Cove to Antler River

Along the east shore of Berners Bay the highway would generally be located inland from the shore to avoid disturbing trees with eagle nests and filling beach areas. Up to Cascade Creek, the highway location would utilize the Cascade Point Road, widening and making grade improvements as necessary. The highway would avoid the U.S. Forest Service (USFS) Berners Bay cabin by passing approximately 400 feet uphill of the cabin site. Beyond the cabin, highway construction would involve short stretches of exposed rock cuts, with some cuts up to 200 feet in height.

2.3.2.2 Head of Berners Bay

The Antler, Gilkey, Lace, and Berners rivers form the large delta at the head of Berners Bay. The bridge over the Antler River would be 2,600 feet in length, and the bridge over the Lace River would be 2,750 feet in length. Both bridges would be constructed with enough clearance to permit airboats, the largest craft currently navigating these rivers, to pass under them.

The highway through this part of Berners Bay would be set back from the shore to avoid the intertidal habitat at the head of the bay, minimize impacts on wetlands, and reduce the length of the river crossings. This portion of the alignment is a refinement of the 1997 Draft EIS alignment and was designed to further reduce impacts to wetland and upland habitats.

2.3.2.3 Lace River to Comet Landing

The highway from the west side of the Lace River to the beach near Independence Lake would cross a combination of heavily wooded uplands and forested wetlands. From Slate Cove to

Point Sherman the highway would move inland to cross Point Saint Mary peninsula and avoid trees containing eagle nests near the shore. This segment would require fill hauled from other sections, as few rock cuts would be required. A combination maintenance station and rest stop would be located at Comet Landing at the existing Kensington mine facilities. Coeur Alaska is moving its mine operations to the Jualin Mine area and has agreed to negotiate the use of its Comet facility.

> Note: The highway west of the Lace River would intersect the existing unpaved road that runs from Slate Cove to the Jualin Mine. This is a public road that is being upgraded as part of Coeur Alaska's Kensington Mine Project. Two "T" intersections would be created, separated by a short road segment in common. The lower traffic volume Jualin Road would have stop signs at both intersections. Coeur Alaska plans to build a deepwater floating dock at Slate Cove. If DOT&PF and Coeur Alaska develop a cooperative agreement on the use of the Slate Cove dock, DOT&PF could use the dock in two ways: to provide interim ferry shuttle service during construction of a highway north of Slate Cove and to provide temporary winter ferry service during extended road closures for avalanche control.

2.3.2.4 Independence Lake to Katzehin River

North of Comet Landing, the highway would be located close to the shore to avoid the trees with eagle nests on the hillsides, to mitigate avalanche zones, and to pass under steep cliffs. At avalanche zones with relatively high hazard indices, including north of Independence Lake and south of Yeldagalga Creek, the highway would be constructed on intertidal areas. At all locations where highway construction would be near or below the high-tide line, riprap slope protection would be constructed. Rock cut areas would generate excess material, some of which would be sidecast into Lynn Canal at steep drop-offs.

Near Met Point and Gran Point the highway would be located further uphill to avoid the sea lion haulouts at these areas. The highway would be notched below existing ground level to maintain a natural screen between the haulouts and the roadway. Where this is not possible, screening structures would be constructed.

2.3.2.5 Katzehin River Area

The highway approach to the Katzehin River would be located close to the shore to avoid the steep cliffs above the high-tide line. Riprap slope protection would be used to protect the highway from erosion. The bridge across the Katzehin River would be 2,500 feet long and set high enough to allow airboats to pass underneath. The highway would pass behind the intertidal flats north of the Katzehin River to the location of the proposed Katzehin Ferry Terminal. This location would provide some southern wave protection, have access to deep water, and have suitable depths for a terminal area and breakwater. Rubble-mound breakwaters would be sited to the north and south of a dredged mooring basin to provide protection from the predominate northerly and southerly waves. Dredged material would be incorporated into the fill for terminal parking.

A more detailed description of the current alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the addendum to the *Technical Alignment Report* (in Appendix W).

2.3.3 Alternative 3 – West Lynn Canal Highway

This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at Sawmill Cove in Berners Bay and William Henry Bay on the west shore of Lynn Canal, and shuttle ferries would operate between the terminals. A new 38.9-mile highway would be constructed between William Henry Bay and Haines with a bridge across the Chilkat River/Inlet connecting into Mud Bay Road (Figure 2-8). The highway design features for this alternative would be the same as those described for Alternative 2B in terms of design speed and typical section.

The *M/V Aurora* would operate as a shuttle between Haines and Skagway, but mainline ferry service would end at Auke Bay in Juneau. The *M/V Fairweather* would be redeployed on other AMHS routes. The highway from Auke Bay to Sawmill Cove, the shuttle ferry between Sawmill Cove and William Henry Bay, the highway from William Henry Bay to Haines, and the shuttle ferry from Haines to Skagway would become the NHS routes in Lynn Canal.

> Note: This alternative was originally considered reasonable after scoping in 1994, but after detailed study was determined to be unreasonable in 1996. A user benefit analysis indicated that this alternative would have only marginal benefits. Although there was little controversy associated with dropping this alternative in 1996 and little interest expressed in this alternative in the 1997 Draft EIS comments, both resource agencies and the public expressed interest in this alternative during 2003 scoping. This alternative met four of the five Purpose and Need elements as defined during screening, and was therefore included in the range of reasonable alternatives in the Supplemental Draft EIS and this Final EIS.

Capacity – Under Alternative 3, traffic capacity would be determined by the parameters of the two shuttle ferry systems. The Sawmill Cove/William Henry Bay shuttle ferries would have a 42-vehicle capacity, with two vessels operating in the summer and one in the winter. The Haines/Skagway shuttle *(M/V Aurora)* would have a 34-vehicle capacity. The daily traffic volumes that would be accommodated by Alternative 3 are provided in Table 2-8.

Table 2-8
Daily Traffic Capacity for Alternative 3

Alternative 3 – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	1,008
Winter	336
To/From Skagway	
Summer	408
Winter	272

The 30-year summer traffic projection to Haines under Alternative 3 exceeds the vehicle capacity of an *M/V Aurora*-class vessel on a two-shift operating schedule. The *Marine Segments Technical Report* (Appendix B) includes the optimum vessel for the 2038 projected traffic. As traffic demand approaches capacity (estimated at year 2030), AMHS may choose to replace the existing vessel with the optimum vessel or add another vessel. The alternative is analyzed in the EIS based on replacement with the optimum vessel in the year that the projected demand exceeds the capacity of an *M/V Aurora*-class vessel. For more details see the *Marine Segments Technical Report*.

Travel Time – The one-way trip times for Alternative 3 are provided in Table 2-9. These times include ferry loading, transit time, and unloading, but no delay is included. The travel times for the shuttle ferries between Sawmill Cove and William Henry Bay and Haines and Skagway do not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis.

Table 2-9
Travel Time for Alternative 3

Alternative 3 – Travel Time	
Route	**Travel Time (hours)**
Auke Bay – Haines	2.9
Auke Bay – Skagway	4.3

Travel Frequency – Under Alternative 3, flexibility and opportunity to travel would be determined by the shuttle ferry systems. The two Sawmill Cove/William Henry Bay shuttles would operate 17 hours per day in summer, and a single shuttle would operate 9 hours per day in winter. The Haines/Skagway shuttle would operate 15 hours per day in summer and 10 hours per day in winter. Winter travel would also be limited by road closures for avalanche control. The estimated trip frequency for Alternative 3 is provided in Table 2-10.

Table 2-10
Travel Frequency for Alternative 3

Alternative 3 – Travel Frequency		
Auke Bay – Haines	**Round-Trips per Day**	**Round-Trips per Week**
Summer	12	84
Winter	4	28
Auke Bay – Skagway	-	-
Summer	6	42
Winter	4	28

Cost – The 2005 initial design and construction cost estimate for Alternative 3 is $268 million. Highway costs would be $175 million, vessel acquisition costs would be $65 million, and terminal costs would be $28 million. Annual M&O costs are estimated to be $9.2 million: $1.2 million for highways and $8 million for the shuttle ferry systems. The estimated 30-year life-cycle cost is $375 million.

Alignment – The West Lynn Canal Highway would follow the west shoreline of Lynn Canal and the Chilkat Inlet, from William Henry Bay to Pyramid Harbor. Wherever possible, the highway would be located sufficiently inland to avoid impacts to the beach fringe and to reduce visual effects. The terrain is generally conducive to this, but at some locations a combination of trees with eagle nests, avalanche zones, steep terrain, caves, and/or other geological features would force the highway to be located close to the beach, and in a few locations highway fill would be placed below the high-tide line.

2.3.3.1 Echo Cove to Sawmill Cove

Alternative 3 would begin at the end of Glacier Highway at Echo Cove and continue north for 5.2 miles to the Sawmill Cove Ferry Terminal at Berners Bay. The ferry terminal would be a twin-berth facility used to overnight two shuttles. Dredging would be required in Sawmill Cove to provide adequate depth for shuttle mooring and turning, and some intertidal fill would be required.

2.3.3.2 William Henry Bay

A ferry terminal would be constructed at William Henry Bay for shuttle ferry service across Lynn Canal. The William Henry Bay Ferry Terminal would be somewhat protected from southeast winds but exposed to severe northerly storms; therefore, vessels would return to the Sawmill Cove Ferry Terminal to overnight. At William Henry Bay Ferry Terminal, a pile-supported access trestle would be required to reach adequate water depths for vessel berthing. A single berth is proposed with a transfer bridge accessed by a pile-supported dock structure. No dredging would be required, but fill would be placed in the intertidal area.

2.3.3.3 Endicott River Area

The highway from the William Henry Bay Ferry Terminal to the Endicott River area would be located on a wide bench above the beach for most of the segment. The highway would descend off the bench onto a 1,100-foot-long bridge across the Endicott River. The bridge elevation would be set to provide sufficient clearance for airboats. An elevated fill would be placed across the brush-covered gravels that form the Endicott River alluvial fan. From the Endicott River crossing to the Sullivan River crossing, wide, timber-covered benches are frequent, but at two locations the highway would drop onto the beach to avoid trees with eagle nests, important geological features, and stretches of steep terrain. Riprap armor would be placed at these locations to protect the highway fill from wave erosion.

2.3.3.4 Sullivan River Area

In the area of the Sullivan River, the highway would cross a wide plateau to the south of the river before dropping down to the river floodplain. A 600-foot-long bridge over the Sullivan River would be built on a gradual uphill grade to the north bank of the river. The bridge would be set high enough to allow airboats to pass underneath. From the Sullivan River north to the Glacier River the highway would be located several hundred feet inland from the shore, except at two locations where it would be located just inside the beach fringe to avoid steep cliffs. The high avalanche hazard zones opposite the middle of Sullivan Island would be mitigated by a combination of bridges and elevated fills with large culverts.

2.3.3.5 Glacier River Area

A 400-foot-long bridge would cross the Glacier River. The highway north of the Glacier River would be built on an elevated fill through brush and timber covering the Davidson Glacier alluvial fan. The highway would have a series of curves to miss most of the many small ponds and wetlands in this low-lying area. A 400-foot-long bridge would cross the unnamed outlet of Davidson Glacier Lake.

2.3.3.6 Davidson Glacier to Pyramid Harbor

The highway would continue north from the Davidson Glacier area on heavily timbered benches immediately above the beach cliffs. Construction on these benches would consist primarily of rock cuts with some downhill fills. A 428-foot-long bridge would cross Ludaseska Creek, and a 300-foot-long bridge would cross the glacial stream at Anchorage Point. At Anchorage Point, the construction would shift to fills placed on the alluvial fan of a glacial stream. Elevated fills would be used to mitigate the high avalanche hazard zone south of Pyramid Harbor, with large-diameter culverts providing the necessary drainage.

2.3.3.7 Chilkat River Area

The 2.0-mile Chilkat River crossing would extend from Green Point to Mud Bay Road. The bridge abutment on the west side would start approximately 500 feet from the shore of Chilkat River to avoid placing fill on the Dalton Trail, which starts at Pyramid Harbor and heads north along the Chilkat River. The highway in this area would consist of 6,350- and 2,850-foot long bridges separated by a 2,000-foot-long causeway in the middle of the inlet. The causeway would be placed to the northwest of Pyramid Island to avoid trees with eagle nests on the island. The causeway would be in the intertidal zone in an area of glacial silt deposition. Both bridges would be set at an elevation that would allow airboats and other small open boats, the only vessels currently navigating past Pyramid Island, to pass underneath.

The east abutment of the Chilkat River/Inlet crossing would be located above the high-tide line on the Chilkat Peninsula. From the bridge abutment the highway would continue on a short fill section to connect with Mud Bay Road in a standard tee-shaped intersection.

A more detailed description of the alignment, the ferry terminal layouts, and the design criteria for this alternative can be found in the *Technical Alignment Report* (Appendix D).

2.3.4 Alternatives 4A through 4D – Marine Options

All four marine alternatives would include continued mainline ferry service in Lynn Canal, and the AMHS would continue to be the NHS route from Juneau to Haines and Skagway. These alternatives are based on a minimum of two mainline vessel trips per week, year-round[15], and Haines/Skagway shuttle service provided by the *M/V Aurora.* The *M/V Fairweather* would no longer operate in Lynn Canal. It would be redeployed to other AMHS routes. All of these alternatives would require construction of new berths at Auke Bay. Vessel sizes and a potential schedule for each alternative are identified in the *2004 Marine Segments Technical Report* (Appendix B) and are based in part on traffic volumes in the *2004 Traffic Forecast* (Appendix C).

All of the marine options provide faster and/or more frequent service with greater capacity than the No Action Alternative while minimizing operating costs. Various combinations of the following are proposed to reduce travel times: faster boats, shorter summer routes, and port-to-port operations (travel to one port then return to origin). Crew shifts with minimal overtime would reduce operating costs. These marine alternatives partially met three or more of the five Purpose and Need elements as defined for screening and therefore were included in the range of reasonable alternatives in the Supplemental Draft EIS and this Final EIS.

> Note: Alternative 4 was originally identified as the AMHS Alternative in the 1994 Reconnaissance Engineering Report. It was designated as the All Marine Alternative in

[15] The two Bellingham mainline ferries identified in the 2004 SATP would continue to make one trip each week in Lynn Canal but the Prince Rupert/Whittier vessel would not operate in Lynn Canal due to the increased capacity and trip frequency provided by Alternative 4 shuttles.

the 1997 Draft EIS even though it included two options with a 5-mile road extension. As described in Section 2.2.8, the original marine alternative options have been modified to reflect recent AMHS experience and planning.

2.3.5 Alternative 4A – FVF Shuttle Service from Auke Bay

This alternative would construct two fast aluminum catamaran ferries with a minimum speed of 30 knots (34 mph) to provide daily summer service from Auke Bay to Haines and to Skagway (Figure 2-9). Mainline service from Auke Bay to Haines/Skagway would continue, with two weekly trips estimated for both summer and winter service. The Haines/Skagway shuttle service would continue, but the *M/V Fairweather* would no longer operate in Lynn Canal.

Capacity – Alternative 4A would have two high-speed ferries, each with a 50-vehicle capacity, providing service to Haines and Skagway. Mainline capacity in Lynn Canal would average 90 vehicles per vessel. Daily mainline capacity has been distributed as 55 percent to Haines and 45 percent to Skagway based on the projected traffic demand ratio in the *2004 Traffic Forecast Report* (Appendix C). The daily traffic volumes that would be accommodated by Alternative 4A are provided in Table 2-11.

Table 2-11
Daily Traffic Capacity for Alternative 4A

Alternative 4A – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	229
Winter	129
To/From Skagway	
Summer	223
Winter	123

Travel Time – The one-way trip times for Alternative 4A are provided in Table 2-12. These times include check-in, transit time, and ferry loading and unloading, but no delay time is included.

Table 2-12
Travel Time for Alternative 4A

Alternative 4A – Travel Time (hours)		
Route	**Mainline**	**Fast Ferry**
Auke Bay – Haines	7.1	3.8
Auke Bay – Skagway	9.1	4.1

Travel Frequency – Under Alternative 4A, the opportunity to travel between Auke Bay and Haines or Auke Bay and Skagway would be determined by the combined frequency of mainliners and fast shuttles. The trip frequency based on two shuttles operating in summer and one in winter is provided in Table 2-13.

Table 2-13
Travel Frequency for Alternative 4A

Alternative 4A – Travel Frequency		
Auke Bay – Haines or Skagway	**Average Round-Trips per Day**	**Round-Trips per Week**
Summer	2.3	16
Winter	1.3	9

Cost – The 2005 initial design and construction cost estimate for Alternative 4A is $131 million. Vessel acquisition cost would be $119 million, and terminal construction cost at Auke Bay would be $12 million. Estimated annual M&O costs would be $16.6 million: $3.5 million for mainline service, $11.2 million for Lynn Canal shuttle service, and $1.9 million for the Haines/Skagway shuttle. The estimated 30-year life-cycle cost is $495 million.

Design Details – The only construction for this alternative, other than for new vessels, would be the reconstruction of the west end of the Auke Bay Ferry Terminal to create new berths. Terminal layout details for the Auke Bay modifications can be found in the *Technical Alignment Report Addendum* in Appendix W.

2.3.6 Alternative 4B – FVF Shuttle Service from Berners Bay

This alternative would extend Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay using the same design standards described in Alternative 2B (Figures 2-10 and 2-11). A ferry terminal would be constructed at Sawmill Cove in Berners Bay. This alternative would utilize two high-speed aluminum catamaran ferries with a minimum speed of 30 knots (34 mph) to provide service from Sawmill Cove to Haines/Skagway in the summer and from Auke Bay to Haines and to Skagway in the winter. Mainline service from Auke Bay to Haines/Skagway would average two trips per week year-round. The Haines/Skagway shuttle service would continue, but the *M/V Fairweather* would no longer operate in Lynn Canal.

Capacity – Mainline capacity would average 90 vehicles per vessel. The new ferry serving Haines in the summer would have a 32-vehicle capacity, and the new Skagway ferry would have a 51-vehicle capacity. In the winter, the 32-vehicle ferry would make two trips a day from Auke Bay: one to Haines and one to Skagway. This combination of vessels would be able to accommodate the daily traffic volumes listed in Table 2-14, with mainliner capacity split 55 percent and 45 percent between Haines and Skagway, respectively.

Table 2-14
Daily Traffic Capacity for Alternative 4B

Alternative 4B – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	284
Winter	93
To/From Skagway	
Summer	227
Winter	87

Travel Time – Times shown in Table 2-15 are for a one-way trip in summer and include driving time from Auke Bay to Sawmill Cove, check in, ferry loading, transit, and unloading, but do not include delay time. Mainline travel time and winter FVF shuttle travel time from Auke Bay would be the same as in Alternative 4A.

Table 2-15
Travel Time for Alternative 4B

Alternative 4B – Travel Time (hours)		
Route	**Mainline**	**Shuttle**
Auke Bay – Haines	7.1	3.5
Auke Bay – Skagway	9.1	3.8

Travel Frequency – Under Alternative 4B, the opportunity to travel between Auke Bay and Haines or Skagway would be determined by the combined frequency of mainliners and dedicated shuttles, in both summer and winter. Two shuttles would operate in summer from Sawmill Cove Ferry Terminal; the shorter distance between terminals allows for more trips per day. The Haines-bound vessel would make four trips per day, and the Skagway-bound vessel would make two trips per day. In winter a single shuttle vessel would make two trips a day from Auke Bay: one to Haines and one to Skagway. This schedule would result in the travel frequency provided in Table 2-16.

Table 2-16
Travel Frequency for Alternative 4B

Alternative 4B –Travel Frequency		
Auke Bay – Haines	**Average Round-Trips per Day**	**Round-Trips per Week**
Summer	4.3	30
Winter	1.3	9
Auke Bay – Skagway	-	-
Summer	2.3	16
Winter	1.3	9

Cost – The 2005 initial design and construction cost estimate for Alternative 4B is $142 million: $6 million for highway design and construction, $27 million for terminal design and construction at Auke Bay and Sawmill Cove, and $109 million for vessel acquisition. Annual M&O costs would be $15.5 million: $3.5 million for mainline service, $10.1 million for Lynn Canal shuttle service, $1.9 million for the Haines/Skagway shuttle, and $19,000 for highway maintenance. The estimated 30-year life-cycle cost is $482 million.

Alignment – Alternative 4B would begin at the end of the existing Glacier Highway just north of the Echo Cove boat launch. It would follow the same alignment as described for Alternative 3 from Echo Cove north to the Sawmill Cove Ferry Terminal. The terminal would be a double-berth facility with two support floats and twin steel transfer bridges. Dredging would be required to provide adequate depth.

A detailed description of the alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *Technical Alignment Report* (Appendix D).

2.3.7 Alternative 4C – Conventional Monohull Shuttle Service from Auke Bay

This alternative would construct two conventional monohull shuttle ferries to operate from Auke Bay to Haines/Skagway (Figure 2-9). These shuttles would operate at approximately the same speed as mainline vessels, with a minimum speed of 15 knots (17 mph) but would be dedicated dayboats that would run from Auke Bay to Haines or Skagway and then return. Mainline service from Auke Bay would continue at an average of two trips per week throughout the year. The Haines/Skagway shuttle service would continue but the *M/V Fairweather* would no longer operate in Lynn Canal.

Capacity – Each of the two shuttle ferries would have a capacity of 63 vehicles. In the summer they would make one trip per day, with one vessel making a round-trip to Haines and the other making a round-trip to Skagway. In winter a single vessel would operate, alternating between a round-trip to Haines one day and to Skagway the next. Alternative 4C would accommodate the traffic volumes provided in Table 2-17, including mainline capacity split of 55 percent to Haines and 45 percent to Skagway.

Table 2-17
Daily Traffic Capacity for Alternative 4C

Alternative 4C – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	154
Winter	92
To/From Skagway	
Summer	149
Winter	86

Travel Time – The one-way trip times for Alternative 4C are provided in Table 2-18. These times include check-in, ferry loading and unloading, and transit time, but no delay time is included.

Table 2-18
Travel Time for Alternative 4C

Alternative 4C – Travel Time (hours)		
Route	**Mainline**	**Shuttle**
Auke Bay – Haines	7.1	6.0
Auke Bay – Skagway	9.1	6.3

Travel Frequency – Under Alternative 4C, the opportunity to travel between Auke Bay and Haines/Skagway would be determined by the frequency of both mainline vessels and dedicated dayboat shuttles. The two shuttles would each make one trip per day during the summer in addition to the twice per week mainline trips. In winter, a single shuttle would alternate daily trips to Haines and Skagway; mainline service would continue at two times per week (travelers could still reach either town on alternate days by using the Haines-Skagway shuttle). Trip frequency for Alternative 4C is provided in Table 2-19.

Table 2-19
Travel Frequency for Alternative 4C

Alternative 4C – Travel Frequency		
Auke Bay – Haines	**Average Round-Trips per Day**	**Round-Trips per Week**
Summer	1.3	9
Winter	0.8	5.5
Auke Bay – Skagway	-	-
Summer	1.3	9
Winter	0.8	5.5

Cost – The 2005 initial design and construction cost estimate for this alternative is $111 million. Vessel acquisition would cost $99 million, and terminal construction cost at Auke Bay would be $12 million. Annual M&O costs would be $11.6 million: $3.5 million for mainline service, $6.2 million for Lynn Canal shuttle service, and $1.9 million for the Haines/Skagway shuttle. The estimated 30-year life-cycle cost is $326 million.

Design Details – The only construction required for this alternative, other than new vessels, would be the reconstruction of the west end of the Auke Bay Ferry Terminal to create new berths. The terminal layout details for the Auke Bay modifications can be found in the *Technical Alignment Report Addendum* in Appendix W.

2.3.8 Alternative 4D – Conventional Monohull Shuttle Service from Berners Bay

This alternative would extend Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay using the same design standards described for Alternative 2B. A twin-berth ferry terminal would be constructed in Sawmill Cove. Two conventional monohull shuttle ferries with a minimum speed of 15 knots (17 mph) would run from the Sawmill Cove Ferry Terminal in summer: one to Haines and one to Skagway (Figures 2-10 and 2-11). In winter, only one of these shuttle ferries would operate, departing from the Auke Bay Ferry Terminal. Mainline service would continue at an average of two round-trips per week in Lynn Canal year-round. The Haines/Skagway shuttle service would continue but the *M/V Fairweather* would no longer operate in Lynn Canal.

Capacity – Each of the shuttle ferries in this alternative would have a capacity of 45 vehicles. In the summer, each ferry would make two trips per day, with one dedicated to Haines and the other to Skagway. In winter, a single vessel would operate from Auke Bay, alternating between a round-trip to Haines one day and a round-trip to Skagway the next day. The daily traffic volumes that would be accommodated by Alternative 4D, including mainline capacity (mainline capacity split of 55 percent to Haines and 45 percent to Skagway) are provided in Table 2-20.

Table 2-20
Daily Traffic Capacity for Alternative 4D

Alternative 4D – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	208
Winter	74
To/From Skagway	
Summer	203
Winter	68

Travel Time – The one-way travel times in summer are provided in Table 2-21. These times include driving time from Auke Bay to Sawmill Cove Ferry Terminal, check-in, loading, transit time, and unloading. No delay time is included. Mainliner travel time and winter shuttle travel time from Auke Bay would be the same as in Alternative 4C.

Table 2-21
Travel Time for Alternative 4D

Alternative 4D – Travel Time (hours)		
Route	**Mainline**	**Shuttle**
Auke Bay – Haines	7.1	5.0
Auke Bay – Skagway	9.1	5.3

Travel Frequency – Under Alternative 4D, the opportunity to travel between Auke Bay and Haines or Skagway would be determined by the frequency of both mainline vessels departing from Auke Bay and shuttles departing from the Sawmill Cove Ferry Terminal. The two shuttles based in Sawmill Cove would each make two trips a day during the summer in addition to the twice per week mainline vessel trips from Auke Bay. In winter, a single shuttle would operate from Auke Bay, alternating daily trips to Haines and Skagway in addition to the twice-weekly mainline vessel trips to each destination (travelers could still reach either town on alternate days by using the Haines-Skagway shuttle). Trip frequency is provided in Table 2-22.

Table 2-22
Travel Frequency for Alternative 4D

Alternative 4D – Travel Frequency		
Auke Bay – Haines	**Average Round-Trips per Day**	**Round-Trips per Week**
Summer	2.3	16
Winter	0.8	5.5
Auke Bay – Skagway	-	-
Summer	2.3	16
Winter	0.8	5.5

Cost – The 2005 initial design and construction cost estimate for Alternative 4D is $103 million. Road construction would cost $6 million, vessel acquisition would cost $70 million, and terminal construction at Auke Bay and Sawmill Cove would cost $27 million. Annual M&O costs would be $11.3 million: $3.5 million for mainline service, $5.9 million for Lynn Canal shuttle service, $1.9 million for the Haines/Skagway shuttle, and $19,000 for highway maintenance. The estimated 30-year life-cycle cost is $313 million.

Alignment – The alignment and terminal details for Alternative 4D are identical to those of Alternative 4B. Road construction would begin at the end of Glacier Highway just north of the Echo Cove boat launch. The alignment would follow the same alignment as Alternative 3 to the Sawmill Cove Ferry Terminal. The terminal would be a double-berth facility with two support floats and twin steel transfer bridges. Dredging would be required to provide adequate depth.

A detailed description of the alignment, the ferry terminal layout, and the design criteria for this alternative can be found in the *Technical Alignment Report* (Appendix D).

Table 2-23 provides a summary of the key characteristics of each alternative.

2.4 Identification of the Preferred Alternative

The 1997 Draft EIS did not identify a preferred alternative for the State of Alaska. After the comment period ended in December 1997, DOT&PF analyzed the comments, developed a list of the substantive issues, and identified the additional information that was necessary to address the substantive comments. In March 1999, a report was prepared by an independent marine consultant to verify the costs and benefits of the marine option alternatives (Glosten, 1999). At the same time, a summary document was prepared with information on substantive issues, traffic capacity, travel time, trip frequency, capital costs, M&O costs, and user costs for the five build alternatives from the Draft EIS and four additional proposals based on Draft EIS comments.

In late March 1999, a review team composed of FHWA and non-Southeast Region DOT&PF engineers and planners evaluated the information in the summary document and rated the alternatives based on the Purpose and Need elements. Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, was rated the highest of all alternatives and proposals.

In April 1999, the summary document and the results of the review team's rating were combined in a presentation entitled DOT&PF Preferred Alternative Report. The PAR was given to Governor Knowles and contained DOT&PF's recommendation that the state identify Alternative 2 as the preferred alternative. This recommendation was based on the assessment that Alternative 2 would meet corridor traffic demand, provide the greatest flexibility and opportunity to travel, result in the greatest reduction in travel time, have the lowest operating cost, and result in the lowest user cost for the traveler.

In January 2000, Governor Knowles declared Alternative 2, the East Lynn Canal Highway, the state's preferred alternative. At the same time, Governor Knowles stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued. In February 2000, the DOT&PF Commissioner confirmed the state's selection of Alternative 2 as the preferred alternative to FHWA, along with a plan to continue obtaining specific data that would be crucial to completing the EIS at a later date.

Table 2-23
Alternatives Data Summary

	Alt 1	Alt 2B	Alt 3	Alt 4A	Alt 4B	Alt 4C	Alt 4D
Projected Summer Capacity (vehicles per day)							
To Skagway	71	636	408	223	227	149	203
To Haines	96	544	1,008	229	284	154	208
Summer Travel Time (check-in/loading/unloading)							
Auke Bay to Skagway[1]	3.8 / 9.1	3.0	4.2	4.1 / 9.1	3.8 / 9.1	6.3 / 9.1	5.3 / 9.1
Auke Bay to Haines[1]	3.5 / 7.1	2.5	2.9	3.8 / 7.1	3.5 / 7.1	6.0 / 7.1	5.0 / 7.1
Travel Opportunity (number of ferry round-trips per week)							
Auke Bay to Skagway – Summer	7	42	42	16	16	9	16
Auke Bay to Haines - Summer	8	56	84	16	30	9	16
Initial Capital Costs (Preliminary Design, Final Design and Construction) $Millions in 2005							
Final Design and Highway Construction[2]	$0	$189	$175	$0	$6	$0	$6
Total Marine Vessel Acquisition[2]	$0	$53	$65	$119	$109	$99	$70
Ferry Terminal [2]	$0	$16	$28	$12	$27	$12	$27
Preliminary Design Including EIS	$15	$15	$15	$15	$15	$15	$15
Total Initial Capital Cost	**$15**	**$273**	**$283**	**$146**	**$157**	**$126**	**$118**
Annual Maintenance and Operations Costs							
Highway M&O [2] ($Thousands)	$0	$1,296	$1,244	$0	$19	$0	$19
Marine M&O [3] ($Thousands)	$10,185	$7,710	$7,992	$16,655	$15,535	$11,658	$11,291
Total ($Thousands)	**$10,185**	**$9,006**	**$9,236**	**$16,655**	**$15,554**	**$11,658**	**$11,310**
30 Year Life Cycle Costs[4] ($Millions)	**$267**	**$352**	**$375**	**$495**	**$482**	**$326**	**$313**

Notes: [1]Travel Time - Shuttle / Mainliner
[2]*Technical Alignment Report* (Appendix D) and *Technical Alignment Report Addendum* (Appendix W)
[3]*Marine Segments Report* (Appendix B), Lynn Canal Revenues and Expenditures 2001-2002 and Projected Capital Cost 2001-2038 (DOT&PF, 2004a)
[4] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period discounted to 2004 dollars. See *User Benefit Analysis Technical Report* (Appendix E) for a detailed explanation of life-cycle cost analysis.

In December 2002, newly elected Governor Murkowski directed DOT&PF to aggressively pursue completion of the Juneau Access Improvements Project EIS. In February 2003, the DOT&PF Commissioner, after reviewing the Draft EIS and the reevaluation that called for a supplemental Draft EIS, stated that Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, continued to be the state's preferred alternative.

The Supplemental Draft EIS identified Alternative 2 as the State's preferred alternative, based on its ability to meet the Purpose and Need elements. After the Supplemental Draft EIS comment period ended, all comments were evaluated and considered. Based in part on comments from the NPS with regard to the contributing status of natural areas within the Skagway and White Pass District NHL, FHWA determined that these areas were protected by Section 4(f) of the Transportation Act. Alternatives that would require the use of Section 4(f) protected lands within the NHL were determined to be not reasonable, in accordance with the original alternative screening criteria.

On August 10, 2005, the Commissioner of DOT&PF announced the State had changed its preferred alternative, citing the NPS position and the resultant FHWA Section 4(f) applicability determination. The preferred alternative identified in this Final EIS is Alternative 2B, East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway.

In addition to avoiding impacts to the Skagway and White Pass District NHL, Alternative 2B would avoid impacts to other resources in the Taiya Inlet area. No land would be required from the City of Skagway-owned Dewey Lakes Parcel. Alternative 2B would impact 201 fewer acres of terrestrial habitat than Alternative 2, the previous preferred alternative. Twelve fewer streams would be crossed and 15 fewer eagle nests would be in the vicinity of the highway. The estimated 4.4 million cubic yards (cy) of excess rock that would be sidecast into Taiya Inlet under Alternative 2 would be avoided.

After considering all factors, including beneficial and adverse impacts, agency and public comments, and the natural, social, and economic environments, DOT&PF believes Alternative 2B is the reasonable alternative that would best achieve the project's purpose.

Alternative 2B would come closest to meeting the overall demand to travel in Lynn Canal at the lowest cost per vehicle. It would provide the greatest increase in flexibility and opportunity to travel in the corridor, while reducing travel time. Alternative 2B would make the largest reduction in user costs, lowering costs approximately 80 percent.

Alternative 2B would provide the greatest economic benefit in terms of increased visitor spending and new employment while balancing the somewhat competing interests of Haines and Skagway. DOT&PF has also considered that Alternative 2B would have the greatest adverse impact on the terrestrial environment, but as indicated by both the U.S. Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) it would have less adverse impacts on the aquatic environment than any build alternatives other than Alternatives 4A and 4C. All practicable measures to reduce these impacts have been incorporated into the alternative, including alignment changes and special construction features. Mitigation is proposed for unavoidable impacts to the extent feasible.

2.5 Funding Considerations

The 1997 Draft EIS identified several potential funding sources for construction and operation of build alternatives, as funding was an issue of concern raised during development of the Draft EIS. Capital funding sources included the state's excess apportionment funds, supplemental federal allocations (congressional earmarks), revenue bonds, programmed and reallocated federal highway funds (from the NHS section of the STIP), public lands highway funds, ferry boat discretionary funds, state matching funds, and private funds. M&O funds included ferry system fares, highway tolls, and the state general fund, including the state motor fuel tax and licensing/registration fees.

All of the funding sources mentioned in the Draft EIS were also stated in the Supplemental Draft EIS as under consideration as potential funding sources for a build alternative, if selected, with the exception of highway tolls. No tolls are proposed for the highway segments of build alternatives. M&O for new highway segments would be funded out of the state general fund, as with all existing highways in Alaska (vehicles driven on highway segments would pay state fuel tax and therefore would generate state revenue; fuel used by state ferries is exempt from this tax). Fares on marine links, along with state general funds, would fund M&O for those links. No tolls are included in the economic analysis of the alternatives; the projected fares used in the analysis are based on a combination of projected costs and reasonable rates based on past practice.

Current planning for funding construction of the preferred alternative is based on a combination of a project specific congressional earmark, funding from applicable categories in the State's Federal Aid Highway Program, and specific State of Alaska General Fund (GF) allocations (as opposed to GF match for federal funds). Currently the following funding sources have been identified for the three project components:

Highway construction ($189 million required):

- 2005 GF appropriation $5 million
- Safe, Accountable, Flexible and Efficient Transportation Equity Act – a Legacy for Users project specific earmark[16] ($5 million in 2006) $14.5 million
- 2006-10 NHS funding[16] $15 million
- 2007-10 Section 218 funding[17] $57 million
- 2008-10 Section 144 bridge funding[18] $45 million
- 2006-09 GF appropriation separate from state match for federal funds ($45 million in 2006; $10 million 2008-09) $52.5 million

Ferry terminal construction ($16 million required):

- 2008-10 Section 218 funding $16 million

New Vessel Construction ($53 million required):

- 2008-10 Section 218 funding $38 million
- 2010 Ferry Boat Discretionary (FBD) funding[19] $15 million

The preferred alternative would be designed and constructed in stages. Funding projected to be available in 2006 totals $55 million. This funding would be sufficient to construct two stages of the project, anticipated to be from Echo Cove to the southeast bank of the Antler River and from the northwest bank of the Lace River to approximately two miles north of Independence Lake. Other stages would be constructed over the next five years as the designs are finalized and funds become available.

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[16] These federal fund categories provide a federal share of 91 percent; therefore, 9 percent of the amount shown will come from a GF match.

[17] 23 USC 218, as amended by SAFETEA-LU, established a category of federal funds that was originally designated for the reconstruction of highways in Canada that connect the Southeast panhandle to the rest of Alaska. Currently, they may also be used for reconstruction of the Haines Highway, for the AMHS, and roads to ferry terminals. The federal share is 100 percent.

[18] 23 USC 144 established a category of federal funds that may be used for bridge work including construction of bridges that will replace ferries that were in existence on January 1, 1984. Federal share is 91 percent; therefore, 9 percent of the amount shown will come from a GF match.

[19] FBD funds are federal funds allocated for construction or improvement of ferries or ferry terminals on the NHS. The federal share is 80 percent; therefore, 20 percent of the amount shown will come from a GF match.

The first construction project would use $5 million appropriated by the Legislature for the purpose of extending Glacier Highway. This appropriation was made prior to identification of the preferred alternative but is consistent with all build alternatives other than 4A and 4C. The appropriation is also consistent with the construction phasing deemed best by DOT&PF in terms of both immediate constructability and best utility to be gained from a highway segment within the preferred alternative.

3.0 AFFECTED ENVIRONMENT

3.1 Social and Economic Environment

3.1.1 Land Use

DOT&PF prepared a *Land Use and Coastal Zone Technical Report* in 1995 (revised in 1997) in support of the 1997 Draft EIS (DOT&PF, 1995 and 1997b). The 1997 report was updated to include changes in land management and land use since 1997 (*Land Use and Coastal Management Technical Report*, Appendix F). Documents reviewed for this update included district coastal management programs and enforceable policies of the district programs and the Alaska Coastal Management Program (ACMP); the current *Tongass National Forest Land and Resource Management Plan* (TLMP) and related documents (USFS, 1997b); the most recent community (Juneau, Haines, and Skagway) comprehensive plans and other local government planning documents; State of Alaska land, park, preserve and forest management plans; and current state and federal legislation. Privately produced planning documents for entities such as Goldbelt Incorporated, a Native corporation owning land north of Echo Cove, and Coeur Alaska, a mining company owning land and holding mineral claims on the northwest side of Berners Bay, were also reviewed, as were state fish and wildlife management plans and reports. Additional contacts were made with federal, state, and local officials and private parties to update planning, land management, and land use information. Finally, information from 2003 traffic projections and socioeconomic analyses and a 2003 public survey was incorporated into the description of the affected environment and analysis of potential impacts.

The project area includes federal, state, local, and private lands. Most of the lands are within the Tongass National Forest and are managed by the USFS. The Klondike Gold Rush National Historical Park (NHP) in Skagway is administered by the NPS.

A majority of the state lands in the project area are within the Haines State Forest along West Lynn Canal and are managed by the Alaska Department of Natural Resources (ADNR) Division of Forestry. Local government lands are managed by the CBJ, Haines Borough, and the City of Skagway. Private lands include Native corporation holdings, Native allotments, private commercial, and private residential properties. The principal change in land use in the project study area since preparation of the 1997 Draft EIS is that the City of Haines and the Borough of Haines have consolidated.

Figures 3-1 and 3-2 depict land ownership and coastal management district locations on the northern and southern ends of Lynn Canal, respectively. Primary landowners and managers in the study area are described further in the following subsections.

3.1.1.1 United States Forest Service

Information in the 1997 Draft EIS was taken from the TLMP of 1979, as amended in 1986 and amended again in 1991 by the Tongass Timber Reform Act (TTRA) of 1990. Information for the Final EIS has been taken from the 1997 revision of the plan and the 2003 Supplemental EIS of the plan.

Most of the lands in the study area are in the Tongass National Forest and are therefore managed by the USFS. Management direction for these lands is set forth in the most current version of the TLMP (USFS, 1997b). The TLMP guides natural resource decision making in the Tongass National Forest by establishing management standards and guidelines for a variety of activities, based on land use designations (LUDs). Figure 3-3 identifies LUDs within the study area.

Two main LUD categories were established in the TLMP: Non-Development (which maintains old-growth forest habitat) and Development. Each LUD category describes the purpose and objectives of management for each area of the Tongass National Forest and establishes specific constraints for the various uses. Within the Non-Development LUD category are two groups: Wilderness and National Monument, and Mostly Natural. The Development LUD category also consists of two groups: Moderate Development and Intensive Development. Each of these four groups consists of subcategories of LUD designations, which are described below. (Note that not all of these LUDs occur in the Lynn Canal corridor.)

- Wilderness and National Monument
  - Wilderness – Preserve essentially unmodified areas to provide opportunities for solitude and primitive recreation. Limit motorized access.
  - Wilderness National Monument – Manage monuments to provide opportunities for solitude and primitive recreation. Limit motorized access.
  - Non-Wilderness National Monument – Facilitate the development of mineral resources in a manner compatible with the National Monument purposes.
- Mostly Natural
  - **LUD II** – Maintain the wildland characteristics of these Congressionally designated roadless areas; permit fish and wildlife improvements and primitive recreation facilities; and permit roads for access for transportation needs identified by the state.
  - **Old-Growth Habitat** – Maintain old-growth forests in a natural or near-natural condition for wildlife and fish habitat.
  - **Research Natural Areas** – Manage areas for research and education and/or to maintain natural diversity of National Forest System lands.
  - **Remote Recreation** – Provide for recreation in remote natural settings outside Wilderness, where opportunities for solitude and self-reliance are high.
  - **Semi-Remote Recreation** – Provide for recreation and tourism in natural-appearing settings, where opportunities for solitude and self-reliance are moderate to high.
  - **Municipal Watersheds** – Manage municipal watersheds to meet state water quality standards for domestic water supply.
  - **Special Interest Areas –** Preserve areas with unique archaeological, historical, scenic, geological, botanical, or zoological values.
  - **Wild, Scenic, and Recreational Rivers** – Maintain and enhance the outstandingly remarkable values of river segments, which qualify a river to be classified as a Wild, Scenic, or Recreational River.
- Moderate Development
  - **Modified Landscapes –** Provide for natural-appearing landscapes while allowing timber harvest and a mix of resource activities, including mineral development.
  - **Scenic Viewsheds** – Maintain scenic quality in areas viewed from popular land and marine travel routes and recreation areas, while permitting timber harvest.
  - **Experimental Forest** – Provide opportunities for forest practices research and demonstration.
- Intensive Development

- **Timber Production** – Manage the area for industrial wood production. Promote conditions favorable for timber resources and for maximum long-term timber production.
- **Minerals** – Encourage mineral exploration and development of areas with high mineral potential.
- **Transportation and Utility Systems** – Emphasize existing and potential major public transportation and utility systems. Until constructed, manage according to the other land use designation indicated.

Note: In awareness and anticipation of the Juneau Access Improvements Project, the TLMP designated the two possible road corridors as Intensive Development – Transportation and Utility Systems.

LUDs on East Side of Lynn Canal – Much of the area around the east side of Berners Bay is designated LUD II and Semi-Remote Recreation. The northwest side of Berners Bay has two areas designated Old-Growth Habitat, located both east and west of Slate Cove; an additional area of Old-Growth Habitat occurs about midway between Comet and Met Point. (These Old-Growth Habitat LUDs were enlarged as part of the 2004 USFS Kensington Gold Project Record of Decision (ROD) (USFS, 2004). Figure 3-3 includes the new Old-Growth Habitat LUDs boundaries.) The Katzehin River is proposed as a Wild River; however, the lower two miles of the river adjacent to Lynn Canal are not proposed Wild in recognition of the potential for a future transportation corridor in this area. Also, there is an unpaved landing strip approximately 0.25 mile north of the river mouth.

Portions of land along East Lynn Canal extending north from Echo Cove to approximately 4 miles north of Met Point are Tongass National Forest lands designated as Scenic Viewshed (Echo Cove area only) and Modified Landscape; the Modified Landscape lands include some areas of mineral development activity. From approximately 4 miles north of Met Point to north of the City of Skagway, USFS lands are designated Semi-Remote Recreation. The Modified Landscape and Old-Growth Habitat designations west of Berners Bay are overlaid with a Mineral designation.

The congressionally designated LUD II permits roads only for access for authorized uses, for transportation needs identified by the state, or for vital linkages. In 1994, the state sent a letter to the USFS identifying a highway along the east side of Lynn Canal between Juneau and Skagway as a state transportation need (Hickel, 1994). The USFS included the highway alignment as a transportation corridor in the 1997 TLMP.

LUDs on West Side of Lynn Canal – From William Henry Bay north to nearly the Sullivan River, most of the USFS lands are designated Semi-Remote Recreation. The Endicott River Wilderness Area, which lies inland west and northwest of William Henry Bay, is not affected by the project. The lower 2.5 miles of the Endicott River, where the Alternative 3 highway would be located, is outside of the designated Wilderness Area. The area downstream of the Wilderness Area contains an unpaved airstrip approximately 1 mile north of the river mouth. The land on either side of Alternative 3 in this area is a Scenic Viewshed LUD.

LUDs in the Development category in the West Lynn Canal study area include Scenic Viewshed along the western shore surrounding William Henry Bay and adjoining the lower 3 miles of the Endicott River. USFS lands are designated as Modified Landscape from approximately the Sullivan River to the area of Sullivan Mountain at the boundary with the Haines State Forest. The Modified Landscape designation west of Sullivan Island is partially overlaid with a Mineral designation.

The USFS identified a transportation corridor on the west side of Lynn Canal during preparation of the 1997 TLMP. That corridor was included in the adopted 1997 TLMP.

Roadless Areas as a Resource – Inventoried roadless areas on federal lands are a resource potentially available for future designation as wilderness under the Wilderness Act of 1964. Roadless areas are categorized as inventoried roadless or small unroaded areas (smaller areas were identified but not included in the inventory). Definitions of these two areas follow (USFS, 2003).

- **Inventoried roadless area**: "Undeveloped areas typically exceeding 5,000 acres that met the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning."

  Roadless areas exclude buffer zones by all existing roads and harvest units, as all areas within 1,200 feet of an existing road and 600 feet of an existing harvest unit are considered developed areas.

- **Unroaded area**: "Any area, without the presence of a classified road, of a size and configuration sufficient to protect the inherent characteristics associated with its roadless condition. Unroaded areas do not overlap with inventoried roadless areas." There are two categories of unroaded areas: (1) 1,000 to 5,000 acres in size, and (2) less than 1,000 acres.

Figure 3-4 is a map of the inventoried roadless areas in the project area.

After evaluating roadless areas for wilderness recommendations[20], the USFS determined that it would not be necessary to recommend additional designated wilderness on the Tongass National Forest for several reasons: (1) almost 40 percent of the Tongass is currently designated as Wilderness, National Monument, or other Non-Development land use designations; (2) most of the remaining Tongass is managed to remain in a largely untouched, wildland state or to assure long-term sustainability; and (3) effects to communities' economies. Approximately 92 percent of the Tongass is either wilderness (35 percent) or inventoried roadless area (57 percent). The USFS goal is to indefinitely manage most of the Tongass as undeveloped, and manage most of the non-designated wilderness lands as wild and roadless (USFS, 2003). The inventoried roadless areas and unroaded areas in the Tongass National Forest are managed according to the current 1997 TLMP, as supplemented by the February 2003 Supplemental EIS, according to the management prescriptions for the land use designation they are in.

Alternatives 2B, 3, 4B, and 4D are in Roadless Area 301 (Juneau–Skagway Icefield). Alternative 3 is also in Roadless Areas 303 (Sullivan) and 304 (Chilkat). Following are brief descriptions of these inventoried roadless areas (USFS, 2003).

[20] The 1979 TLMP recommended 10 areas for wilderness which, with minor changes, were made part of the National Wilderness Preservation System in 1980 by ANILCA. In 1990 the TTRA designated five new wilderness areas on the forest and enlarged one wilderness and 12 legislated LUD areas to retain their roadless and wildland character. The TLMP was amended in February 1991 to incorporate the TTRA changes, with a TLMP Revision and ROD issued in 1997. After appeals, the Final EIS and ROD for the 1997 TLMP were issued in 1999. However, the Court determined that the 1997 TLMP should have considered making wilderness recommendations for the National Wilderness Preservation System. The USFS prepared a Supplemental EIS in 2003 to evaluate roadless areas for wilderness recommendations. Congressionally designated LUD II areas are included in the roadless assessment.

Roadless Area 301 - Juneau-Skagway Icefield – This roadless area extends from the Juneau vicinity to Skagway on the east side of Lynn Canal, with the south boundary at the shoreline abutting Area 305 near Cascade Point. Access to Area 301 is by boat and aircraft, and by hiking trails off the Juneau road system.

Area 301 encompasses 1,201,474 acres with 159 miles of shoreline bordering tide water. There are approximately 129,669 acres mapped as forestland, of which 60,528 acres (47 percent) are productive old-growth forest.

Area 301 is generally unmodified and natural. It provides a very high opportunity for solitude and primitive recreation. The primary Recreation Opportunity Spectrum (ROS) class is Primitive, covering 90 percent of Area 301. The Wilderness Attribute Rating System of Area 301 is 25 out of 28 possible points for wilderness characteristics (natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities).

Area 301 is managed under nine LUDs: Modified Landscape, Minerals, Transportation and Utility Systems, Remote Recreation, Semi-Remote Recreation, LUD II, Wild River, Research Natural Area, and Old-Growth Habitat. The Minerals LUD is secondary, overlaying the other land uses. The Transportation and Utility Systems LUD is also secondary, with land in this LUD managed for the other land uses it overlays until a transportation or utility is constructed in the LUD. The Development LUD, Modified Landscape, covers 2 percent of the roadless area, with the remaining 98 percent managed as Non-Development LUDs.

Roadless Area 303 - Sullivan – This roadless area encompasses federal land from the Endicott River Wilderness boundary to the north boundary of the Tongass National Forest. There is a usable airstrip adjacent to the area on an alluvial fan along Lynn Canal. The shoreline is flat and accessible at two river mouths from Lynn Canal.

Area 303 covers 66,143 acres, including 30 miles of shoreline on the west side of Lynn Canal. It also contains three small unroaded areas less than 1,000 acres in the Sullivan River delta area at the shoreline. There are 17,135 acres of forestland in Area 303, of which 75 percent is productive old-growth forest. The productive old-growth includes 5,693 acres of high volume, coarse canopy old-growth.

Area 303 is managed under five LUDs: Modified Landscape, Scenic Viewshed, Minerals, Transportation and Utility Systems, and Semi-Remote Recreation. The Minerals and Transportation and Utility System LUDs are secondary, overlaying the other land uses. The Development LUDs, Modified Landscape and Scenic Viewshed, cover 22 percent of Area 303. The remaining 78 percent is designated as a Non-Development LUD, Semi-Remote Recreation.

Area 303's overall natural integrity is high and its appearance is primarily natural. There is a very high opportunity for solitude and an outstanding opportunity for primitive recreation. The primary ROS classes in Area 303 are Primitive and Semi-Primitive Non-Motorized, which cover 54 and 38 percent, respectively, of the roadless area. Along the shoreline of Lynn Canal there is an increased probability of seeing or hearing others, including small planes, ferries, small boats, or cruise ships. The Wilderness Attribute Rating System of Area 303 is 26 out of 28 possible points for its natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

Roadless Area 304 - Chilkat-West Lynn Canal – Roadless Area 304 encompasses federal land from the south end of the Chilkat Peninsula north to Endicott River, and is bordered on the east by Lynn Canal. Areas 303 and 304 are separated by a previously harvested timber unit which is considered a development area. Access to Area 304 is possible via boat and floatplane. There are no places suitable for landing wheeled airplanes, and access into the interior is by foot or helicopter.

Area 304 covers 198,109 acres, of which 58 percent is productive old-growth forest. This old-growth forest includes 23,789 acres of high volume, coarse canopy old-growth forest.

The area is managed under five LUDs: Scenic Viewshed, Timber Production, Transportation and Utility Systems, Semi-Remote Recreation, and Old-Growth Habitat. The Transportation and Utility Systems LUD is secondary, overlaying the other land uses. The Development LUDs, Timber Production and Scenic Viewshed, cover 23 percent of Area 304. The remaining 77 percent is designated as Non-Development LUDs (Semi-Remote Recreation and Old-Growth Habitat).

Roadless Area 304 is largely unmodified and maintains its natural integrity and apparent naturalness very well. There is a very high opportunity for solitude and an outstanding opportunity for primitive recreation. The primary ROS classes for Area 304 are Primitive and Semi-Primitive Non-Motorized, which cover 48 and 44 percent, respectively, of the roadless area. Along the shoreline of Lynn Canal there is an increased potential for seeing or hearing others, including small planes, ferries, small boats, or cruise ships. The Wilderness Attribute Rating System for Area 304 is 25 out of 28 possible points for its natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

3.1.1.2 State of Alaska

The State of Alaska owns and manages several state parks, marine parks, and a state forest in the project vicinity. The state also owns and manages most of the tidelands, submerged lands, and navigable waters along Lynn Canal. Specific management guidelines for these lands are set forth in various land management plans. University of Alaska lands and Mental Health Trust lands also lie within the study area.

The state owns the following parcels within the study area (Figures 3-1 and 3-2):

- Point Bridget State Park
- State-owned parcel southeast of Skagway in the area of Devil's Punchbowl
- State-owned parcel north of Skagway in the Twin Dewey Peaks area
- Sullivan Island State Marine Park
- Haines State Forest
- Pyramid Island
- Some parcels of shoreline along Mud Bay Road
- Chilkat State Park

In addition, ADNR owns and manages submerged lands and tidelands throughout the study area, unless conveyed to another entity. Parcels of land owned by other state entities exist within the study area and within alternative corridors. These lands, owned by the Alaska Mental Health Trust and the University of Alaska, are managed to produce revenue for their agencies.

3.1.1.3 Local Government

City and Borough of Juneau – Approximately 3,281 square miles of land are located within CBJ boundaries, including tidelands and submerged lands. The stated policy of the

Comprehensive Plan 1995 Update (CBJ, 1996) is to participate as actively as possible in the preparation, review, and approval of any transportation or utility corridor plans or routes undertaken by the state or federal government. The CBJ depends on air and marine transportation because no roads connect the area with other regions of the state and Canada. Strong local support exists for increasing ferry service in Southeast Alaska; improving and expanding air, marine, and highway transportation systems; and participating in studies of road transportation links between Juneau, Southeast Alaska, and Canada. These would expand Juneau's role as a regional center.

Haines Borough – The City of Haines and the third-class Haines Borough consolidated in 2002 to become the Haines Borough, a Home Rule Borough with the same boundaries as the former Haines Borough. The Haines Borough is located on the east and west shores of the Lynn Canal. The borough extends to the Canadian border. The area encompasses 2,344 square miles of land and 382 square miles of water (Alaska Department of Community and Economic Development, 2004).

The Haines Borough adopted an April 2004 Comprehensive Plan to reflect the consolidation (Haines Borough, 2004). This plan expresses a concern about a Lynn Canal road link to Juneau. The *Haines Coastal Management Plan* (HCMP) (City of Haines, 2000) was revised on November 20, 2002, to include newly annexed areas. The HCMP applies to all lands and waters within the original and annexed city limits. The annexed areas are immediately west of the central urban area in Haines and south of the original city limits. The annexed areas encompass a portion of Deshu Isthmus, including the Chilkat landfall of the West Lynn Canal Highway Alternative 3 route. Areas outside of the former City of Haines limits are governed by the state coastal boundary and the statewide ACMP standards.

City of Skagway – The City of Skagway is a first-class city encompassing a land area of 443 square miles. The southern and western boundaries of Skagway are adjacent to the northern and eastern borders of the Haines Borough. The city's northern and eastern boundaries abut the U.S./Canada border.

Land use within the City of Skagway is guided by *City of Skagway Comprehensive Plan* policies (City of Skagway, 1999), *Skagway Coastal Management Plan* (SCMP) (City of Skagway, 1991) policies, and zoning ordinance regulations. The SCMP focuses primarily on the downtown area, including the current AMHS terminal area, and notes that continued development in ferry service and scheduling is desirable, including development of fast shuttle ferries (City of Skagway, 1991). The waterfront/port area is designated in the SCMP as an Area Meriting Special Attention (AMSA)[21], which means that the city will manage land uses in this area to prioritize transportation and waterfront industrial and commercial development. The waterfront port AMSA and the Skagway River AMSA are shown in Figure 3-5.

City-owned land in the study area includes a parcel surrounding Lower Dewey Lake that was conveyed from the state in 1995.

3.1.1.4 Private Lands

The area of Berners Bay was traditionally used by the Auk Tlingit. The land north of Point St. Mary on the east side of Lynn Canal was traditionally used by the Chilkat Tlingit, as was much of the west side of Lynn Canal. Most of this land is now managed by the USFS and the State of Alaska. Sealaska, the regional Native corporation for Southeast Alaska, owns a parcel of land north of Sawmill Cove. Goldbelt, a Native corporation based in Juneau, owns 1,382 acres in the

[21] AMSAs are specific areas designated under the ACMP that are sensitive to change or alteration and possess unique physical, cultural, or biological characteristics.

study area surrounding Echo Cove. In 1996, Goldbelt prepared the Echo Cove Master Plan and the USFS circulated an EIS for a proposed access road from Echo Cove to Cascade Point in Berners Bay. The USFS completed a ROD in 1998. Goldbelt received a USFS special-use permit and a U.S. Army Corps of Engineers (USACE) Section 404 permit for the road. Construction began in 2005 with funding from the State of Alaska Industrial Roads Program.

One Native allotment application lies along the proposed alignment of Alternative 2B; seven certified allotments and allotment applications lie near the proposed alignment of Alternative 3. The Central Council Tlingit and Haida Indian Tribes of Alaska administer Native land allotments for the Bureau of Indian Affairs.

Other private lands are clustered at several locations throughout the study area (Figures 3-1 and 3-2) and include mines and patented mining claims (Kensington Gold Project) and private homesteads.

3.1.1.5 Land and Resource Uses

Current land and resource uses in the study area include commercial/industrial, recreational, residential, and public. Commercial/industrial uses include timber harvest, mineral exploration, commercial fishing, commercial guiding and outfitting, and commercial charter fishing. Recreational uses include sport and personal use fishing, hunting, boating, camping, wildlife viewing, and other recreational activities.

Timber Harvest – Some USFS lands and Haines State Forest lands are potentially available for timber harvest. Because no changes in timber harvesting have taken place since 1997 and no timber harvests are proposed in any of the 5- or 10-year plans for lands within the study area, the following description of timber harvest from the 1997 Draft EIS is still relevant:

> Throughout Lynn Canal, timbered areas are limited to the shorelines and the major river valleys. Historically, commercial timber harvest has been an important industry in Southeast Alaska but it has been in decline for several years.

Haines currently supports a small sawmill, which is mainly used to cut cedar for locally produced hot tubs.

Mineral Development – The study area lies within a large mineral region known as the Juneau Mining District. The district has been a highly productive mineral area since 1869, producing large quantities of gold, silver, and lead. The proposed routes for Alternatives 2B and Alternative 3 run through this area of mineral occurrences, prospects, claims, and historic and current mines. The Juneau Mining District consists of five geographical subareas: Haines-Klukwan-Porcupine, Glacier Bay, West Lynn Canal, Juneau Gold Belt, and Coast Range. Portions of each subarea except Glacier Bay are within the Juneau Access Improvements Project study area.

The Kensington Gold Project is located just north of Berners Bay within CBJ boundaries and the Tongass National Forest. Coeur Alaska, Inc., the managing company for the Kensington Gold Project, acquired the Jualin gold prospect in 2001. Coeur Alaska recently received the state and federal permits for mine operation and began construction in August 2005[22]. Mine operation could begin in 2006 or 2007. The Kensington Gold Project has an expected life of 10 years, although additional ore discovery could extend the operating life of the mine. The monitoring and reclamation phase following mine closure is expected to last five years (Coeur Alaska, 2004).

[22] On November 22, 2005, the USACE suspended Coeur Alaska's permit for further evaluation.

Commercial Fishing – Commercial fishing has historically been an important element of the economy of Southeast Alaska. Although market and other considerations have reduced profits in the salmon industry, commercial fishing continues to be a valuable contributor to the Juneau economic and employment base and an important sector of the Haines economy. Commercial fishing has not been substantial in the Skagway economy. Only three Skagway residents hold commercial fishing licenses. Salmon, halibut and other groundfish, and shellfish (crab and shrimp) are the targeted species for Lynn Canal commercial fishing.

Lynn Canal supports commercial salmon drift gill net and troll fisheries. Berners Bay and the Chilkat River and lakes system are productive fish-rearing areas that contribute to these fisheries. To a lesser degree, the study area also supports halibut and groundfish longline fisheries and crab and shrimp pot fisheries.

Recreation, Sport Fishing, and Hunting – The Lynn Canal area has high recreational value and annually attracts thousands of Alaskans and visitors from all over the world. Because most of the study area lies within the Tongass National Forest, recreation in the region is affected by USFS management decisions. The 1997 Draft EIS included the following description of recreation, which is still pertinent:

> Recreation in Lynn Canal is primarily water-based because of limited access. Boating is both a recreational activity and a means of transportation for other recreational pursuits, such as camping, hunting, hiking and kayaking. Berners Bay is a popular recreation area, which is accessible from a public boat launch at Echo Cove. Tent and recreational vehicle camping occur in urban outskirt areas and in developed campgrounds. A public recreation cabin, managed by the [USFS], is located [8 miles] north of Echo Cove.
>
> Hiking occurs primarily on trails built and maintained by federal, state, and local government agencies and a few private, nonprofit groups. These trail systems are generally in road accessible areas within and around the communities of Juneau, Haines, and Skagway.
>
> Wildlife viewing is an important recreation activity for residents and visitors, especially viewing marine mammals, such as seals, sea lions, porpoises, and whales. Gran Point, located south of the Katzehin River, is the site of a Steller sea lion haulout, a popular viewing location. Seabirds and ducks are abundant in the area. Terrestrial mammals such as brown bears, black bears, and mountain goats can also be seen.
>
> Sport fishing is extremely popular. Surveys have found that boating and sport fishing have higher participation rates in Southeast than in any other region of Alaska.
>
> Hunting is a relatively minor activity in Lynn Canal. The most productive valleys for wildlife are around Haines and Skagway, Berners Bay, William Henry Bay, Katzehin River and the Endicott Wilderness Area. Species harvested include brown bear, black bear, wolf, moose, Sitka black-tailed deer, mountain goat, waterfowl, ptarmigan, and grouse.

Other recreational activities in the study area include flightseeing, eagle viewing at the Alaska Chilkat Bald Eagle Preserve, wildlife viewing, camping, hiking, kayaking, canoeing, and jet and air boating. Marine and freshwater sport fishing is extremely popular in Lynn Canal. Shellfish, including red and blue king, Tanner, and Dungeness crab, and shrimp are also harvested for sport.

3.1.1.6 Parks and Recreation Facilities

Many municipal, state, and federal parks and public recreation areas are located within the study area. The City of Skagway has two public parks: Pullen Creek Shoreline Park and Molly Walsh Park (Figure 3-6). State parks include Point Bridget State Park, Sullivan Island State Marine Park, Chilkat State Park, Chilkoot Lake State Recreation Site, Portage Cove State Recreation Site, and Chilkat Islands State Marine Park (Figures 3-1 and 3-2). The NPS manages the Klondike Gold Rush National Historical Park in the Skagway area (Figure 3-6). The USFS has a public use recreation cabin in Berners Bay (Figure 3-2) and a day use area at Sturgill's Landing south of Skagway (Figure 3-5).

The Lower Dewey Lake area is a popular hiking/picnicking destination and trail hub and is owned by the City of Skagway (Figure 3-6). The area has many trails connecting to Sturgill's Landing, Icy Lake, Upper Reid Falls, Upper Dewey Lake, and Devil's Punchbowl. On October 7, 2004, the City of Skagway adopted an ordinance creating the Dewey Lakes Recreation Area Management Plan. This ordinance sets forth allowable and prohibited activities in this management area.

No land purchased with grants under Section 6(f) of the Land and Water Conservation Fund Act would be impacted by any alternative.

3.1.1.7 Residential, Commercial, Industrial, and Public Facilities

City and Borough of Juneau – From the Auke Bay Ferry Terminal north to the end of the highway at Echo Cove, Glacier Highway is an arterial highway designed to accommodate traffic at steady speeds. The land use designations in the CBJ Comprehensive Plan vary from Rural Dispersed Residential, General Commercial, Resource Development, and Waterfront Commercial to Recreation Resource Area around Berners Bay (CBJ, 1996). Land use surrounding Echo Cove, including the mouth of Sawmill Creek, is designated for Resource Development. The CBJ has designated the Goldbelt land near Echo Cove as New Growth (CBJ, 1996). Goldbelt has completed a master plan for Goldbelt lands in the area.

Haines Borough – Active management within the Haines Borough boundaries takes place only within the former City of Haines boundaries (now called the Townsite Planning Zone) and in former City of Haines Coastal Management AMSAs. All other areas of the Borough fall under the general use zoning district, until zoned otherwise. Traffic from a West Lynn Canal Highway that would be directed onto Mud Bay Road would be within the Development Zoning District of Mud Bay/Tlingit & Haida and includes single-family residential, multifamily residential, recreation, and public institution land uses (City of Haines, 2000).

City of Skagway – The City of Skagway has constructed a $4 million project to move the existing seawall 50 feet into the harbor and add new uplands for pedestrian access, additional boat harbor parking, and a city park. The focus of the project is to better manage existing pedestrian, vehicle, and train traffic in the area. The area is within the waterfront zoning district, and it is zoned Waterfront Industrial. Future land use for this area, as established in the "Skagway Future Growth Plan" (City of Skagway, 1999), is also industrial. Current land use is a mixture of water-related commercial and industrial activities, pedestrian paths and amenities, shops and restaurants, small boat harbor uses, a staging area for the city transfer bridge, and the Pullen Creek picnic area. The Lower Dewey Lake area is zoned Residential-Conservation and allows for low-density residential development, natural resource development, conservation-dispersed recreation, seasonal recreational lodges and cabins, and other facilities.

3.1.1.8 Coastal Zone Management

Provisions of 15 CFR 930 require the preparation of a consistency statement to ensure that proposed federal actions and projects requiring federal or state permits that could potentially affect the coastal zone are consistent with the ACMP and approved local coastal zone management programs. The agency with federal consistency review authority for projects with the potential to affect coastal resources or coastal uses in Alaska is the ADNR.

Development activities, such as the construction of a highway or ferry terminal that affects any coastal use or resource that requires federal or state authorization, must be consistent with the ACMP, including statewide standards and the enforceable policies of local coastal district plans. Lands owned or managed by the federal government are excluded from the coastal zone. However, all uses and activities on excluded federal lands that affect the coastal area must be consistent with ACMP policies and provisions of Section 307 of the Coastal Zone Management Act of 1972, as amended.

The ACMP identifies uses of state concern, including "facilities serving statewide or interregional transportation and communication needs" (AS 46.40.210[8]). The Juneau, Skagway, and Haines coastal management programs all adopt this or a similar definition of uses of state concern. All proposed project alternatives are considered a "use of state concern" and, as such, may not be arbitrarily or unreasonably restricted by local coastal management districts. The Federal Coastal Zone Management Act regulations (15 CFR 923) direct state coastal programs to assure that district policies do not unreasonably restrict or exclude uses of regional benefit.

Three coastal districts are within the area traversed by the proposed project alternatives: CBJ, City of Skagway, and City of Haines within the Haines Borough (Figures 3-1 and 3-2). Each community has an approved district coastal management plan containing enforceable policies that apply to activities within their coastal area boundaries. These local enforceable policies were incorporated into the ACMP at the time of program approval or amendment. In addition, the SCMP includes four approved AMSAs; however, none would be affected by project alternatives (Figure 3-5). No AMSAs within the CBJ would be affected by the project. Any of the proposed project alternatives selected for construction must comply with the statewide standards of the ACMP under Title 6, Chapter 80 of the Alaska Administrative Code (AAC) and coastal district coastal management plans.

Key subject areas of the ACMP that are applicable to the type of activities potentially associated with the Juneau Access Improvements Project are:

- Coastal Development
- Geophysical Hazard Areas
- Recreation
- Transportation and Utilities
- Timber Harvest and Processing
- Mining and Mineral Processing
- Subsistence
- Habitats
- Air, Land, and Water Quality
- Historic, Prehistoric, and Archaeological Resources

For further information on land use see *Land Use and Coastal Management Technical Report* (Appendix F) and the addendum to that report in Appendix W.

3.1.2 Visual Resources

Landscapes within Lynn Canal are predominantly natural and undisturbed, and contain a wide range of visual resources. The area is characterized by steep mountainous terrain topped with rugged peaks, sheer rock faces, glaciers, and icefields. The upper elevations along the canal range from approximately 5,000 to 7,000 feet. The moderate to steep slopes along Lynn Canal are largely covered by undisturbed, dense coniferous forest. Rivers or braided streams, wetlands, or glaciers (e.g., Davidson Glacier) occasionally break through the forested landscape, creating spectacular and visually diverse landscapes. In some areas, the rocky coastline of the canal is visible, which provides a distinct contrast to the dramatic mountains and icefields in the background. Within Lynn Canal, several low-elevation islands (e.g., Sullivan Island and Chilkat Islands) have been rounded by the extreme erosional forces found in the canal valley.

Weather conditions of Lynn Canal also play an important role in the visual character of the area. During frequent periods of low clouds and rain, most, if not all, of the spectacular scenery surrounding the canal becomes invisible or severely obscured. Conversely, on bright, clear days, the views are unforgettable and unparalleled within the region. The contrasting colors, shapes, and textures of the surrounding environment visible on these days further highlight the extraordinary visual quality of the area.

The 1997 Draft EIS included the following description of visual resources. Because there has been little change in the area, this information is still relevant.

> Important landscape resources on the east side of the Lynn Canal include: Berners Bay and Lions Head Mountain; the Kakuhan Range north of Comet; a Steller sea lion haulout at Gran Point; the Katzehin River delta and valley area; and the eastern shore of Taiya Inlet. On the west side, the major landscape areas are the Chilkat Mountain Range along William Henry Bay, the Endicott River, Sullivan Island, the narrow drainage valleys west of Sullivan Island, and the Davidson Glacier area. The Forest Service has rated many of these areas as visual variety Class A to denote distinctiveness. This rating is often associated with avalanche chutes, braided streams, steep slopes with rock outcrops, glaciers, and scenic shoreline features.
>
> Most of the viewers are cruise ship and ferry tourists, local travelers, and recreational users. The view perspectives are from the air and waters of Lynn Canal. The entire coastline of Lynn Canal is considered an area of high visual sensitivity.
>
> The Forest Service has established Visual Quality Objectives (VQOs) for each of the LUDs in the TLMP. These VQOs are categorized as follows (from most protective to least): retention, partial retention, modification, and maximum modification.

The Retention VQO provides for land management activities that are not visually evident. Management activities should only repeat the form, line, color, and texture found in the existing landscape.

The VQO for Partial Retention provides for management activities that remain visually subordinate to the characteristics of the existing landscape. These management activities may change visual qualities of the landscape but do not create man-made features that visually dominate the landscape.

Under the Modification VQO, land management activities can visually dominate the original characteristics of the landscape. However, facilities should borrow from naturally established form, line, color, and texture to blend with the natural landscape. For transportation projects, rock quarries should be designed and located to minimize the apparent visual size and dominance of the activity.

The VQO for Maximum Modification allows management activities of vegetative and landform alteration to dominate the landscape. When viewed in the background, the visual characteristics of these activities should blend with the surrounding landscape.

As mentioned in Section 3.1.1.1, a transportation utility corridor has been designated on both the east and west sides of Lynn Canal. If a highway is constructed on either corridor, the corridor would become a Transportation and Utility Systems LUD. The VQO for this LUD is Modification.

The VQO for much of the study area is Partial Retention, but large areas also have a VQO of retention. Retention areas include the head of Berners Bay, Comet area, Katzehin River valley, William Henry Bay shoreline, several valley mouths on the west side of Lynn Canal, the east shore of Sullivan Island, and the east shore of Taiya Inlet. The Endicott River Wilderness Area has a VQO of Retention.

The USFS Juneau Ranger District staff helped develop the methodology used in the analysis, which incorporated the steps outlined below. This methodology is consistent with the visual impact assessment performed for the 1997 Draft EIS and allows the visual effects of project alternatives to be compared to the VQOs of the TLMP, since most of the land traversed by highway alternatives is within the Tongass National Forest.

Classification of Existing Landscapes – Landscapes within the viewshed (or visual sphere of influence) of project alternatives were inventoried by variety class and existing visual condition. These are qualitative measures of a landscape's inherent scenic value (variety class) and the level of noticeable human-made visual change in the natural landscape setting (existing visual condition). In addition, the following analyses were conducted to predict the magnitude of impact and to compare the level of impact within the Tongass National Forest with USFS VQOs.

- **Visual Absorption Capability Analysis** – The visual absorption capability analysis characterizes landscapes in terms of their ability to accept human alteration without loss of landscape character or scenic condition. Visual absorption capability levels were integrated with variety class and visibility factors to estimate potential visual impacts of highway alternatives on sensitive viewers and visual quality.
- **Consistency Analysis** – Changes to the visual resource resulting from project alternatives were compared to TLMP VQOs and ACMP districts' visual resource policies.

For additional information on the visual resource assessment methodology, see the *Visual Resources Technical Report* (Appendix G).

Existing travel routes and use areas in Lynn Canal and along the east and west shoreline were inventoried and considered in the visual resources assessment. Landscape units consisting of areas with similar scenic qualities (i.e., variety class) were grouped together to facilitate the discussion of the inventory and assessment results. In clear weather, each area is typically seen from Lynn Canal as a whole unit, combining views of the water, shoreline, mountainsides, and rock features at higher elevations in the overall setting. The major landscape units on the east and west sides of Lynn Canal used for this analysis and the characteristics of those units are described in the following subsections.

3.1.2.1 East Lynn Canal

Berners Bay – This bay is almost 3 miles wide and opens to Lynn Canal on its western side. It has distinctive enclosing mountainsides and a varied coastline, ranging from rocky shore to extensive wetlands at the mouths of the Lace and Antler rivers that flow into the bay. Federal lands have a VQO of Retention, and the USFS manages the eastern shoreline of Berners Bay as a scenic viewshed.

Point St. Mary to Eldred Rock – Lynn Canal ranges from 5 to 8 miles wide in this area. Slopes along the shoreline are moderate on both sides of the canal and have uniform forest cover. Federal lands have a VQO of Retention and Partial Retention.

Eldred Rock to Mount Villard – This area encompasses the Chilkoot Inlet corridor and is about 2 to 3 miles wide. The low hills of the Chilkat Peninsula and islands form the western side, and precipitous mountainsides, interrupted only by the 1-mile-wide mouth of the Katzehin River valley, form the eastern side. Federal lands in this area have several VQOs. Most of the area is classified as Partial Retention with a small area north of Eldred Rock classified as Modification. Views that include the mouth of the Katzehin River and the area east of Anyaka Island are classified Retention. The area at about midslope of Sinclair Mountain is classified Maximum Modification.

Mount Villard to Skagway – This area encompasses a linear narrow marine corridor about 1 mile wide with uniformly steep mountains on both sides. These mountains offer distinctive views of cascading streams, talus slopes, and colorful rock formations. The steep topography flanking the narrow Taiya Inlet tends to funnel views up and down the inlet.

The USFS has established a VQO of Partial Retention for forested lands under its management in this area. This VQO recommends that facilities remain visually subordinate to the natural landscape. From Kasidaya Creek south to Mount Villard, federal lands have a VQO of Retention. In the USFS Retention VQO, facilities should not be visually evident.

3.1.2.2 West Lynn Canal

William Henry Bay to Sullivan Island – This area encompasses William Henry Bay north through the straits west of Sullivan Island. The straits are 1 to 2 miles wide with steep mountainsides to the west. This area encompasses the mouth of the Endicott River with the Endicott River Wilderness Area further upstream. The topography north and south of the river delta is relatively rugged and mountainous with closed terrain. Visible glacier fields are rare. Federal lands have a VQO of Retention and Partial Retention primarily at the mouths of the Endicott and Sullivan rivers.

Sullivan Island to Chilkat – This area encompasses the Chilkat Inlet corridor. It is approximately 3 miles wide and includes views of the forested Chilkat Peninsula and islands to the east and the rugged mountainsides and glaciers of the Chilkat Range to the west. There are no USFS lands in this area; therefore, there are no federal VQOs.

3.1.3 Historical and Archaeological Resources

Section 106 of the National Historic Preservation Act, as amended (16 USC 470f), requires federal agencies with jurisdiction over a project (including federal assistance to state projects) to identify and evaluate affected historic properties, assess the project's effect upon them, and afford the Advisory Council on Historic Preservation the opportunity to comment on the project if there would be an adverse effect on an historic property. Historic properties are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 USC 470w[5]).

A literature review completed in 1994 as part of the initial scoping process for the Juneau Access Improvements Project identified several previous archaeological studies in Lynn Canal. These studies identified a number of known and reported prehistoric and historic sites along both the eastern and western shores of Lynn Canal that could be affected by project alternatives. Archaeological inventories were undertaken in 1994 and 2003 to confirm the existence of reported sites, locate previously undiscovered sites, and evaluate the significance of these properties. The archaeological research in both years was guided by a research design previously adapted by the Alaska Region of the USFS. An Area of Potential Effect (APE) of approximately 164 feet on both sides of the alternative alignment centerlines including potential terminal locations (a 328-foot-wide corridor) was assessed for cultural resources. Areas with a high potential for past human occupancy (e.g., river and stream mouths, shoreline benches below 100 feet in elevation, and areas of less than 25 percent slope) were surveyed on the ground. Areas with a low potential for past human occupancy received a reconnaissance-level survey using shoreline observations from a boat and a review of aerial photography. The State Historic Preservation Officer (SHPO) was consulted and concurred that the APE and field methodology were applicable for the cultural resource inventories conducted for the proposed project.

Additional archaeological fieldwork was performed during the fall of 2003 and spring of 2004, to more accurately locate previously discovered sites and to evaluate new areas potentially affected by revised alternative highway alignments and potential ferry terminal sites. In September 2003, formal tribal consultation letters were sent to 11 area tribes and Native organizations, with follow-up phone calls and face-to-face meetings when requested. No potential traditional cultural properties were identified within the Juneau Access Improvements Project APE. The results of all investigations and FHWA determinations of eligibility and effect were communicated to these same tribes and organizations in August 2004 (see correspondence section of Chapter 7.0 of the Supplemental Draft EIS). No additional comments were received from tribes and Native organizations at that time.

In 1994 and 1995, formal determinations of National Register of Historic Places (NRHP) eligibility were prepared for sites within the APE, and determinations were made of the potential effect of the project on historic properties eligible for the NRHP. Additional properties in the project area were determined eligible by the USFS in 2004. Formal determinations of NRHP eligibility were also prepared by FHWA for three additional sites within the project study area in 2004.

The APE on the east side of Lynn Canal crosses three historic mining districts eligible for the NRHP: the Berners Bay, Jualin, and Comet/Bear/Kensington historic mining districts (Figure 3-7). The APE passes near a fourth district, the Ivanhoe/Horrible Historic Mining District. The Berners Bay Historic Mining District encompasses the material remains of historic mining activities that took place in the Juneau Mining District from the 1870s to 1944 and contain sufficient integrity to convey that significance. The Berners Bay Historic Mining District includes three smaller districts. Many of the material remains are located in these three smaller historic mining districts.

The contributing elements of the Jualin Historic Mining District are linked with the history of the Jualin Mine operations. The identified elements consist of the Jualin Mine Wharf, Lower Jualin Mine Camp, Upper Jualin Mine Camp, and Jualin Mine Tram. Only one contributing element from this district, the Jualin Mine Tram, is located in the APE for Alternative 2B.

The Comet/Bear/Kensington Historic Mining District includes mining properties that are connected in several ways, including common claim ownership and shared use of mining structures. Identified contributing elements to this district are the Comet/Bear/Kensington Millsite, Comet/Bear/Kensington Railroad, Comet Mine, Comet Mine Tram, Bear Mine, and Kensington Mine. Only one contributing element from this district, the Comet/Bear/Kensington Railroad, is located in the APE for Alternative 2B.

The Ivanhoe/Horrible Historic Mining District reflects the connections between two stamp mills, three tramways, and two mines that were developed through changing claim ownership. Contributing elements to this district are the Mellon Millsite, Portland Millsite, and Lynn Canal Company Horrible Mine Tram. The District has two separate areas. The APE passes between these two areas but no part of either area is within the APE of any alternative.

The Dayebas Creek Sawmill site consists of a shipway, two areas of mill-related debris, and a penstock running parallel to Dayebas Creek. This sawmill embodies patterns of features, such as its location, a pelton wheel, and other associated objects, that were common to late nineteenth and early twentieth century sawmills along Lynn Canal. Although the site possesses little structural integrity, it does have potential as a historical archaeological site to provide information on the character and development of the area's sawmills; therefore, it is eligible for listing in the NRHP (Ballard, 1994; Bittner, 1995). This site is not in the project's APE.

The Skagway Hydroelectric Complex District located at Lower Dewey Lake is another NRHP-eligible historic district on the east side of Lynn Canal. Contributing elements of the district include the Lower Dewey Lake Dam, the reservoir, pipelines, power plant, hoist building, and tramway. None of the elements are in the project's APE.

The Lower Dewey Lake Trail begins at a bridge across Pullen Creek and runs east/southeast toward Lower Dewey Lake. The Lower Dewey Lake Trail (Figure 3-6) is an historic route from the trailhead to the junction where the trail splits into the Upper Dewey Lake Trail, the Sturgill's Landing Trail, and the Lower Dewey Lake Circuit Trail. The eligible portion of the trail ends near the northern end of Lower Dewey Lake at the junction point. The trail is outside the project's APE. The trail is visible in a 1903 photograph of Skagway, and older rockwork supports some of the switchbacks.

The Skagway and White Pass District NHL extends from the Skagway harbor to the Canadian border at White Pass summit. This NHL includes the historic Skagway townsite, which has 152 contributing buildings; a log cabin and wharf built in 1897; the WP&YR Railroad built between 1898 and 1900; and cliffside painting east of the White Pass Dock, known as the Ships Registry, dating back to 1918. The NHL is not within the project's APE.

The Klondike Gold Rush NHP was established in 1976 to commemorate the gold rush of 1897 to 1898. The park is listed in the NRHP and includes 14 blocks of downtown Skagway, also designated by the City of Skagway as the Skagway Historic District. The Klondike Gold Rush NHP is not within the APE of any of the project alternatives.

On the west side of Lynn Canal, the only NRHP-eligible site within the APE of the proposed project is the Dalton Trail (Figure 3-1). The 305-mile Dalton Trail was built in 1896 and was the longest of three access routes from Lynn Canal to the Klondike goldfields. The trail began at Pyramid Harbor and stretched to B.C. and the Yukon Territory. The part of the trail crossing Green Point north of Pyramid Harbor is within the APE for Alternative 3.

On September 29, 2004, FHWA submitted determinations of eligibility for historic properties within the APE and requested concurrence by the SHPO. On October 19, 2004, the SHPO concurred with the FHWA determinations of eligibility but recommended a different width for the Dalton Trail (see correspondence in Chapter 7 of Supplemental Draft EIS).

3.1.4 Socioeconomic Resources

3.1.4.1 Juneau

Based on the 2000 Census (U.S. Census Bureau, 2000), approximately 31,000 people reside in the CBJ. The population of Juneau has increased by 128 percent since 1970. This is an average annual rate of growth of 2.9 percent. The 1990s had a much slower pace of growth than previous decades, with population increasing about 16 percent from 1990 to 2000, an average annual growth rate of 1.2 percent.

According to the 2000 Census, approximately 76 percent of Juneau's population is white, and 15 percent is Alaska Native or American Indian. The remaining population consists of 6 percent Asian, 1 percent African American, and 2 percent of a variety of other races (U.S. Census Bureau, 2000).

The 2000 Census counted 11,543 households in Juneau, with an average household size of 2.66 persons. Among these households, 15.5 percent had incomes less than $25,000 in 1999, and 6 percent of all individuals living in Juneau had incomes below the poverty line. More than 60 percent of the CBJ households had incomes of over $50,000, with almost 38 percent earning $75,000 or more. Median household income was $62,034, and per capita income was $26,719 (U.S. Census Bureau, 2000).

According to the Alaska Department of Labor and Workforce Development (DOL&WD), annual average employment in Juneau reached 17,331 jobs in 2002. Since 1980, employment in the CBJ has grown almost 60 percent, increasing at an average annual rate of 2.2 percent. Juneau's payroll totaled $598 million in 2002. In inflation-adjusted "real" dollars, total annual payroll in Juneau has increased by approximately 33 percent since 1980.

Juneau is the capital of Alaska. Government is Juneau's most important source of employment, accounting for 43 percent of total employment and 53 percent of the total annual wage and hour earnings. State government alone accounts for 26 percent of employment, and local government makes up another 12 percent. Service-providing industries account for 48 percent of total employment in the CBJ but only 35 percent of the earnings. Goods-producing industries make up the balance of employment (9 percent) and earnings (12 percent) (DOL&WD, 2002). Many of the state and federal government jobs in Juneau are there because it is the state capital. There have been several capital move efforts and ballot initiatives over the past three decades. Relocating the capital to a location other than Juneau would decrease the number of government jobs as well as related service industry jobs.

The leisure and hospitality industry is a new classification under the North American Industry Classification System for recording industry employment. It accounts for 10 percent of the service jobs in the CBJ. This industry has average monthly employment of 1,766 workers in Juneau, which peaked at 2,091 workers in June 2002. Leisure and hospitality positions are mostly seasonal, lower-paying jobs, comprising only 4 percent of total earnings in the CBJ.

The tourism industry has been Juneau's fastest-growing industry, primarily from cruise ship visits. Juneau cruise passenger volume has more than doubled in the last decade, reaching almost 770,000 visitors in 2003 (Cruise Line Agencies of Alaska, 2003). Continued moderate growth, likely between 3 and 4 percent, is forecast for the cruise market over the next decade. Cruise growth is expected to slow to an average of about 1 to 2 percent 10 to 20 years into the future.

The Juneau Convention and Visitors Bureau estimates that between 100,000 and 150,000 visitors arrive annually by non-cruise modes of travel. In general, the non-cruise ship, independent visitor market has been flat in Alaska over the last several years; however, some growth in Juneau's visitor industry has occurred. For example, employment in hotels increased by about 125 jobs between 1994 and 2001. Current employment in Juneau's visitor industry is estimated at about 1,650 jobs with total annual payroll of approximately $30 million.

Over the past few years, the Alaska independent visitor market overall has apparently declined. Based on Alaska Visitors Statistics Program data, Alaska independent, pleasure-related visitor traffic (not including cruise ship passengers) declined from 300,000 visitors in 1993 to about 275,000 visitors in 2001. The number of visitors arriving by highway has declined steadily, as has the number of visitors arriving by ferry. Over the long term, the state's commitment to marketing, perceived safety of overseas travel, exchange rates, demographic shifts, and other factors will determine how many independent visitors travel to Alaska.

Juneau's visitor market includes a relatively small number of recreational vehicle (RV) travelers. According to AMHS data, a total of 900 RVs disembarked in Juneau in 2002, including Juneau residents owning RVs. That represents about 14 percent of total RV traffic on the AMHS. Juneau's capacity to serve RVs is limited but adequate to meet current demand. It includes 82 parking sites at private parks, plus up to 63 sites at the Mendenhall Campground.

The Greens Creek Mine is Juneau's largest private sector employer. The mine employs 260 workers and has a projected life of about 10 more years. Greens Creek employees live in Juneau and commute to the mine on a daily basis.

The seafood industry in Juneau includes commercial fishing and seafood processing. According to Commercial Fisheries Entry Commission 2002 data, 286 Juneau-based commercial fishermen fished 510 permits and harvested 18.4 million pounds of fish with an estimated gross income of more than $14 million. Based on 2001 data, the seafood processing sector in Juneau employed 65 workers among four different employers. According to Alaska Department of Fish and Game (ADF&G) data, nine Juneau processors produced 7.3 million pounds of seafood with a wholesale value of $19.5 million.

Retail trade employment in the CBJ for 2002 averaged 1,942 workers who earned a total annual payroll of $44 million. In general, retail employment has been trending downward in Juneau. Over the long term, the retail industry will track with changes in local basic industry employment and population and with growth in the visitor industry.

Bartlett Regional Hospital, the Juneau Public Health Center, and the Southeast Alaska Regional Health Consortium (SEARHC) Clinic provide medical services in Juneau. Private medical practices are available in the area as well as long-term care facilities; physical therapy services; alcohol treatment programs; and services for victims of domestic violence, AIDS patients, and terminally ill patients. The health services industry in the CBJ provides health care to residents of outlying communities as well as the Juneau resident population. The health care and social assistance industry had average annual employment of 1,497 jobs in 2002, representing about 9 percent of the employment in the area and $40 million in annual payroll.

Juneau's transportation sector generated employment for 730 workers and a total payroll of $23 million in 2002. With limited access options, the transportation industry in Juneau is a critical component of the economy. This sector will continue to grow according to the demands of the local population and growth in the visitor industry.

Most of Juneau's basic goods and materials are shipped into the city by barge. The Port of Juneau had in-bound freight traffic of 222,000 tons in 2001 (U.S. Army, 2001). The majority of this freight (56 percent) was petroleum products, primarily gasoline and other fuels. Manufactured equipment, machinery, and products (almost 20 percent) along with food and farm products (12.6 percent) also made up a significant portion of the waterborne freight into Juneau.

There were 12,369 housing units in the CBJ in 2001, with 321 vacancies (CBJ, 2001a). Single-family homes comprise 43 percent of Juneau's housing inventory, and multifamily homes and condominiums/townhouses make up another 30 percent.

Population projections for the year 2035 are for an additional 11,800 residents to live in Juneau. If the average household size is 2.5 people, 4,700 housing units would be required in the area to satisfy this population growth.

The CBJ had revenues of $157 million in 2002 (CBJ, 2002). The majority of revenues collected by the CBJ are derived from taxes and State of Alaska sources. Local taxes include real property, sales, bed, liquor, and tobacco taxes.

The Juneau School District enrolled 5,543 students during the 2002 to 2003 academic year. The school district has typically offered education from kindergarten through twelfth grade, including vocational education programs and a number of alternative learning programs.

Local public safety services consist of 39 volunteers and 32 paid staff for fire and emergency response. The Juneau Police Department has 47 sworn officers and 40 civilian staff. The headquarters for the Alaska State Troopers is located in Juneau, with three uniformed troopers and five fish and wildlife protection officers.

3.1.4.2 Haines

The City of Haines and the Haines Borough consolidated in 2002 and together comprised 2,360 residents (DOL&WD, 2002). The population of Haines has grown at an average annual rate of 1.6 percent since 1980. However, the local population declined over the previous three years, from 2,475 in 1999 to 2,360 in 2002. Average annual population growth from 1992 through 2002 was 0.6 percent.

Klukwan is a Native village with 150 residents located approximately 20 miles northwest of Haines west of the Haines Highway. It is not part of the Haines Borough and is not incorporated as a municipality. It is governed by an Indian Reorganization Act (IRA) Council.

According to the 2000 Census, approximately 83 percent of the Haines population is white and 15 percent is Alaska Native or American Indian. The remaining population consists of 1 percent Asian and 1 percent of a variety of other races (U.S. Census Bureau, 2000).

The 2000 Census counted 985 households in Haines, with an average household size of approximately 2.38 persons (U.S. Census Bureau, 2000). Among those households, more than 30 percent had incomes of less than $25,000 in 1999, and 11 percent of all Haines residents had incomes below the poverty line. A total of 41 percent of Haines households had incomes of over $50,000, with almost 21 percent earning $75,000 or more. Median household income was $40,772, and per capita income was $22,090 (U.S. Census Bureau, 2000).

In 2002, the Haines economy produced an annual average of 893 jobs and $23.5 million in wages. Employment grew by 56 percent from 1980 to 2002. This is an annual average growth rate of 2.1 percent.

Total Haines earnings in 2002 dollars decreased by almost 24 percent, from $30.7 million to $23.5 million, between 1990 and 2002. The average annual rate of decline for total earnings was approximately 2 percent during this 12-year period.

Some of the drop in employment and earnings in 2001 to 2002 may have been due to Royal Caribbean Cruise Lines dropping Haines as a port of call. Cruise traffic dropped from 195,466 visitors in 2000 to less than 20,000 visitors in 2003 (Cruise Line Agencies of Alaska, 2003).

In terms of employment, the largest sector in the Haines economy is local government, with 145 jobs and $4.1 million in annual payroll in 2002. Retail trade accounted for 118 jobs with $750,000 in payroll, and the transportation sector had average annual employment of 115 jobs with $1.6 million in payroll. The construction sector had average employment of 62 jobs with $2.4 million in payroll. Leisure and hospitality jobs peaked at 365 in August of 2002, while offering 189 average annual jobs with annual payroll of $2.8 million.

The visitor industry directly or indirectly accounted for the annual equivalent of approximately 300 jobs in Haines in 2001. These jobs stem from local spending by visitors to the community, including cruise ship passengers, visitors traveling to and through Haines by ferry or highway, and visitors traveling by air or ferry to participate in special activities (e.g., attend the fair, take guided hunts, or view eagles).

The long-term outlook for cruise traffic to Haines is uncertain. Haines is likely to remain a secondary port of call. It lacks the tour and excursion opportunities needed to be popular with passengers and cruise lines. Cruise traffic will probably continue to be erratic as lines add or drop the port, depending on availability of other ports of call.

Haines' non-cruise independent visitor traffic has been declining. In 1992, ferry traffic included 45,300 disembarking passengers and 15,100 vehicles. In 2002, disembarking traffic totaled 36,900 passengers and 13,400 vehicles. This reflects an overall decline in the AMHS visitor market in recent years.

According to Commercial Fisheries Entry Commission preliminary data, 81 Haines-based commercial fishermen fished 120 permits in 2002 and harvested 5.3 million pounds of fish with an estimated gross income of $2 million. Though outside the local area, the Haines economy includes the Excursion Inlet fish processing plant. In 2002, this plant employed a peak workforce of 200 people. The plant was closed and sold in 2003, and the scale of future operations and employment is uncertain.

The transportation industry in Haines accounted for an average of 115 jobs in 2002, with peak employment of 200 workers (DOL&WD, 2002). Payroll totaled approximately $1.6 million. Most of these jobs are in air (55 jobs) and water (28 jobs) transportation activities.

As mentioned, employment in Haines's retail trade sector in 2002 averaged 118 jobs with $750,000 in total annual payroll. The retail sector in Haines is particularly dependent on non-resident spending. This is reflected in the seasonal increase in retail employment. In 2002, retail employment peaked at 161 jobs in August, compared to October employment of 89.

To a significant degree, Haines' retailers compete against Juneau stores. Based on data from the 1994 *Juneau Access Household Survey*, Haines households spent an average of $3,500 in Juneau, including $1,000 on groceries (McDowell Group, Inc., 1994). Leakage (the term for when local consumers purchase goods and services from outside of their community) from the Haines economy has likely increased since then because of improved ferry service to Juneau.

Medical services are provided by two facilities, the Haines Medical Clinic and the Klukwan Medical Clinic. Most routine and emergency health care services are provided locally; however, evacuation to Juneau is required for general anesthesia procedures. The peak in summer population spurred by the visitor industry causes a corresponding increase in demand for local health care services.

In 2002, health care generated average employment of 60 jobs and annual payroll of $2 million. The SEARHC accounts for about half of this employment and is one of Haines's largest employers.

The 2000 Census counted 1,419 housing units in Haines, of which 991 were occupied. Vacant housing units numbered 428 (30 percent), but 301 were classified as seasonal, recreational, or occasional-use units (U.S. Census Bureau, 2000).

The City and Borough of Haines had revenues of $10.5 million in 2002. Local taxes included real property, sales, bed, and tour taxes.

While the Haines population has been relatively stable, school district enrollment has been declining since 1997, with 331 enrolled students in 2003. The school district has typically offered education from kindergarten through twelfth grade.

Local public safety services consist of volunteer fire and emergency response staff. The Haines Police Department has five full-time uniformed officers. There is one Alaska State Trooper stationed in the Borough.

3.1.4.3 Skagway

Approximately 841 people resided in Skagway in 2002 (DOL&WD, 2002). Skagway's population has not changed significantly over the past 20 years, growing only 0.3 percent. However, the community experiences a significant influx of seasonal workers employed in the visitor industry. One estimate placed Skagway's summer population at about 1,700 residents in 1999 (City of Skagway, 2000).

According to the 2000 Census, approximately 92 percent of the population is white. The remaining population consists of 5 percent Alaska Native or American Indian, 2 percent Asian, and 2 percent of a variety of other races (U.S. Census Bureau, 2000).

The 2000 Census counted 398 households in Skagway, with an average household size of approximately 2.11 persons (U.S. Census Bureau, 2000). Among these households, approximately 17 percent had incomes of less than $25,000 in 1999, and 3.7 percent of Skagway residents had incomes below the poverty line. Just under half (49.5 percent) of the households had incomes of over $50,000, and 26 percent of the households earned $75,000 or more. Median household income was $49,375, and per capita income was $27,700 (U.S. Census Bureau, 2000).

The visitor industry is, by far, Skagway's most important industry. In 2003, Skagway had almost 630,000 cruise ship visitors and another 160,000 visitors arriving by other modes of transportation, based on information from the Skagway Convention and Visitors Bureau. Historically, Skagway has also been an important transshipment center, with freight, fuel, and ore concentrates moving over its dock.

Cruise ship traffic to Skagway is expected to increase along with regional growth in the industry. Skagway is a very popular stop among cruise ship passengers and is profitable in terms of tour and excursion sales commissions for the cruise lines. Infrastructure-related limitations (e.g., dock space) may result in Skagway cruise traffic growing at a slower rate than predicted for the region overall. Regional cruise traffic growth of 3 to 4 percent annually is predicted for the next 10 years.

Non-cruise independent visitor travel to Skagway includes travelers arriving by ferry, air taxi, and highway. In 2002, approximately 130,000 independent travelers arrived in Skagway by these routes. This represents a decline over recent years. In 1998, approximately 147,000 independent travelers visited Skagway.

The visitor industry-dominated transportation industry employed 193 workers in Skagway in 2002, about 26 percent of the total employment for the area, and these workers accounted for nearly 33 percent of the total earnings for the year. Transportation workers are primarily employed with the WP&YR Railroad. The railroad was originally built to supply goods to interior gold mining camps. Today, the railroad connects Skagway with Fraser, B.C., during the summer months. This trip is one of the most popular visitor excursions in Alaska.

The port of Skagway serves several important functions in the City's economy. In addition to serving the cruise ship industry, it is an important freight terminal. Skagway marine freight traffic totaled 84,000 tons in 2001, primarily gasoline and other fuels (almost 75 percent). According to Alaska Marine Lines, 43 percent of Skagway general freight continues on to the Yukon.

The retail trade industry in Skagway employed an average of 146 workers in 2002. As indicated, many of these positions were seasonal.

The 2000 Census counted 502 housing units in Skagway, of which 401 were occupied. Vacant housing units numbered 101 (20 percent), but 47 were classified as seasonal, recreational, or occasional-use units. Skagway is reported to have extreme shortages of housing during the peak summer season.

The City of Skagway had revenues of $6.5 million in 2002. More than 63 percent of the revenues were generated from sales and real property taxes. Skagway also has a bed tax.

The Skagway School District enrolled 117 students during the 2002 to 2003 academic year. Enrollment has varied but has generally declined over the past 10 years. Education has been offered from the pre-elementary through twelfth-grade levels at a single school.

Outpatient medical services are provided by the Dahl Memorial Clinic, which employs two physician's assistants on a year-round basis. General practitioners and specialists visit the community periodically. Emergency medical patients are generally evacuated to Juneau.

Local public safety services consist of four paid staff and 10 to 15 year-round volunteers for fire and emergency response. During the summer cruise ship season, the number of volunteers grows to approximately 40. The Skagway Police Department has a police chief, three sworn officers, and two civilian staff. Two seasonal officers are added during the summer months. The U.S. Customs and Immigration has an office in Skagway, and the U.S. Park Service also has law enforcement officers on staff. No Alaska State Troopers are located in Skagway.

Additional economic and social information about the Lynn Canal vicinity is provided in the *Socioeconomic Effects Technical Report* and the *Household Survey Report* (Appendices H and I, respectively) and the addendum to the *Socioeconomic Effects Technical Report* in Appendix W.

3.1.5 Environmental Justice

Executive Order (EO) 12898 (February 11, 1994) was created to prevent federally assisted projects from adversely affecting the environment and human health of minority and/or low-income communities at a disproportionately high rate.

Data used to assess environmental justice considerations were obtained from the U.S. Census Bureau (U.S. Census Bureau, 2000). Ethnicity and income status for Juneau, Haines, Skagway, and Klukwan were examined and compared to state and national data to determine the minority and low-income status of these communities. The overall populations of Juneau and Haines are about 75 and 80 percent white, respectively. The statewide and national average is approximately 70 and 75 percent white, respectively. Approximately 92 percent of the Skagway population is white. The community of Klukwan, located approximately 20 miles northwest of Haines, has a higher percentage (90 percent) minority population than the other three communities in Lynn Canal. This is substantially higher than either the statewide or national average for minority populations. The statewide and national median household incomes are $51,571 and $41,994, respectively. At $62,034, the CBJ has a higher median household income than the statewide and national averages. Skagway's median household income is similar to the statewide average at $49,375, and Haines' median household income is similar to the nationwide average at $40,772. The community of Klukwan has a lower median household income than the statewide and national averages, at $30,714. Table 3-1 summarizes race and income for Juneau, Haines, Skagway, and Klukwan by Census Tract[23] and Block Group[24] from the 2000 Census (U.S. Census Bureau, 2000).

3.1.5.1 Poverty Guidelines

The U.S. Department of Health and Human Services (DHHS) poverty guidelines are illustrated in Table 3-2. The guidelines from 2000 are used in this study to match the available Census data on income. The average household size in Juneau, Haines, and Skagway in 2000 was 2.66, 2.38, and 2.11, respectively. The poverty guideline for a family of two in Alaska was $14,060 in 2000, while the poverty guideline for a family of three was $17,690. Poverty guidelines for the lower 48 states and Hawaii are presented in Table 3-2 to provide a comparison to Alaska guidelines. The DHHS poverty guidelines are a simplified version of the Census Bureau statistical poverty thresholds used to prepare its statistical estimates of the number of persons and families in poverty. The DHHS poverty guidelines (unlike the Census Bureau poverty thresholds) are designated by the year in which they are issued; the 2000 DHHS poverty guidelines are therefore roughly equal to the Census Bureau poverty thresholds in 1999.

[23] A **census tract** is a small, relatively permanent statistical subdivision of a municipality delineated by a local committee of census data users for the purpose of presenting data. Census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time of establishment, and average about 4,000 inhabitants.

[24] A **census block group** is a subdivision of a census tract (or, prior to 2000, a block numbering area). A block group is the smallest geographic unit for which the Census Bureau tabulates sample data. The block groups consist of all the blocks within a census tract with the same beginning number. For the study area, the block group populations range from about 600 persons to 2,800 persons. For more detailed information or to find out the exact locations of the census block groups, visit the U.S. Census web page at http://factfinder.census.gov/servlet/BasicFactsServlet.

Table 3-1
Key Demographic and Economic Data

Area	Percent Minority or Mixed Race	Median Household Income in 1999
United States	25	$41,994
Alaska	31	$51,571
Juneau City and Borough	25	$62,034
Census Tract 1 Total	**12**	**$78,875**
Block Group 1, Census Tract 1	9	$82,795
Block Group 2, Census Tract 1	13	$66,597
Block Group 3, Census Tract 1	15	$83,420
Block Group 4, Census Tract 1	10	$92,409
Census Tract 2 Total	**24**	**$70,167**
Block Group 1, Census Tract 2	19	$78,514
Block Group 2, Census Tract 2	18	$61,667
Block Group 3, Census Tract 2	28	$67,188
Block Group 4, Census Tract 2	17	$86,039
Block Group 5, Census Tract 2	35	$46,813
Census Tract 3 Total	**28**	**$56,603**
Block Group 1, Census Tract 3	30	$60,143
Block Group 2, Census Tract 3	26	$46,583
Block Group 3, Census Tract 3	34	$41,000
Block Group 4, Census Tract 3	20	$70,761
Census Tract 4 Total	**41**	**$53,622**
Block Group 1, Census Tract 4	56	$38,750
Block Group 2, Census Tract 4	36	$57,250
Block Group 3, Census Tract 4	53	$56,458
Block Group 4, Census Tract 4	20	$70,893
Census Tract 5 Total	**21**	**$53,622**
Block Group 1, Census Tract 5	9	$81,143
Block Group 2, Census Tract 5	25	$46,336
Block Group 3, Census Tract 5	26	$40,938
Block Group 4, Census Tract 5	13	$65,739
Census Tract 6 Total	**23**	**$60,729**
Block Group 1, Census Tract 6	17	$79,482
Block Group 2, Census Tract 6	29	$62,443
Block Group 3, Census Tract 6	22	$51,618
Haines Borough	17	$40,772
Census Tract 1 Total	**17**	**$40,772**
Block Group 1, Census Tract 1	8	$42,115
Block Group 2, Census Tract 1	21	$49,333
Block Group 3, Census Tract 1	20	$31,513
Skagway– Hoonah – Angoon Census Area	42	$40,879
Census Tract 1 Total	**8**	**$49,375**
Block Group 1, Census Tract 1	8	$49,375
Census Tract 2 Total	**90**	**$30,714**
Block Group 1, Census Tract 2 (Klukwan)	90	$30,714

Note: Neighborhoods that could be indirectly impacted by project alternatives through an increase in traffic and related noise on existing highways are highlighted.

Source: U.S. Census Bureau, Census 2000

Table 3-2
2000 Health and Human Services Poverty Guidelines

Size of Family Unit	48 Contiguous States and D.C. ($)	Alaska ($)	Hawaii ($)
1	8,350	10,430	9,590
2	11,250	14,060	12,930
3	14,150	17,690	16,270
4	17,050	21,320	19,610
5	19,950	24,950	22,950
6	22,850	28,580	26,290
7	25,750	32,210	29,630
8	28,650	35,840	32,970

Source: Federal Register, Vol. 65, No. 31, February 15, 2000, pp. 7555-7557

3.1.6 Subsistence

The 1997 Draft EIS contained the following description of subsistence:

> The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) requires that subsistence hunting and gathering uses be addressed for all projects on federal lands in Alaska. Subsistence is defined in ANILCA as the "customary and traditional use by rural Alaska residents of wild renewable resources for direct personal or family consumption as food, shelter, clothing, tools, or transportation." Subsistence issues are addressed within Section 810 of ANILCA. As a result, subsistence evaluations are commonly called Section 810 evaluations.

Subsistence in Alaska is dually managed by the state and the federal governments. Until late 1989, the state managed statewide subsistence harvests on federal land. Under ANILCA, the federal government began managing subsistence hunting, trapping, and fishing on Alaska's federal public lands in 1990.

Both the state and federal governments have their own legislation and enforceable regulations. The ADF&G Division of Subsistence provides a database and analysis of fishing and hunting patterns to support the implementation of the law by the Board of Fisheries and Board of Game. The Federal Subsistence Management Program's lead agency, the U.S. Fish and Wildlife Service (USFWS), manages hunting of most species of terrestrial mammals, grouse, ptarmigan, fish (except halibut), and shellfish. Residents of rural areas may harvest fish and wildlife under federal subsistence regulations, if a recognized, consistent, and traditional subsistence use of that species exists. Since statehood in 1959, ADF&G has managed all sport, subsistence, and personal use salmon harvesting under regulations set by the Alaska Board of Fisheries. Subsistence regulations have been in place for state residents since 1961. The personal use category was adopted for non-rural communities beginning in 1982. In the mid-1980s, the state designated some historic fisheries and hunts that did not meet the required subsistence criteria or fit the definition of commercial or recreational uses as personal use. Personal use harvests receive no priority and are sometimes open only at times of a non-allocated surplus of a resource. Personal use harvests are open only to Alaska residents, and a resident sportfish license is required to participate (United Fishermen of Alaska, 2004).

Since 1990, salmon harvest under subsistence regulations has been authorized by the Board of Fisheries in discrete areas of Lynn Canal. Salmon are harvested in other areas of the Lynn Canal region under personal use regulations (ADF&G, 1994). In the study area, customary and traditional use areas for salmon, Dolly Varden, smelt, and steelhead identified by the Alaska Board of Fisheries include the Chilkat, Chilkoot, and Lutak inlets, the Chilkat River and its tributaries, and Chilkat Lake (Figures 3-8 through 3-10). Customary and traditional use areas for shellfish, bottom fish, and herring identified by the Alaska Board of Fisheries include almost all of upper Lynn Canal and its inlets to just south of the southern end of Sullivan Island (ADF&G, 1991) (Figures 3-8 through 3-10).

No new subsistence surveys have been conducted since the Tongass Resource Use Cooperative Survey in 1988, which was referenced in the 1997 Draft EIS. Information included in the 1997 Draft EIS is still relevant. Federally recognized subsistence use of lands within the study area includes the residents of Klukwan, Haines, and Skagway. Currently available information was collected for deer, salmon, non-salmon finfish, marine invertebrates, and marine mammals. No mapped, specific land-use information exists for other species in the study area. For a complete discussion of subsistence in the study area, refer to the *Land Use and Coastal Management Technical Report* (Appendix F) and its addendum in Appendix W.

3.1.6.1 Haines

Subsistence resource use categories in Haines consist of salmon, non-salmon finfish, marine invertebrates, marine mammals, black bear, brown bear, mountain goats, moose, and Sitka black-tailed deer. Deer are scarce in the upper Lynn Canal region. Hunting takes place on the south end of Sullivan Island, portions of Lincoln and Shelter islands, and the south shore of St. James Bay. Hunting also occurs in the lower Lynn Canal region and on Chichagof and Admiralty islands. Fishing occurs primarily in the Chilkoot River; Chilkoot Lake; the lower Chilkat River; Lutak, Chilkoot, and Chilkat inlets; and St. James Bay. Most invertebrate harvests in upper Lynn Canal areas close to Haines involve crab or shrimp harvest. Clams and cockles are harvested in more distant areas (St. James Bay and the inlets of Icy Strait). Trade with residents of other communities for locally unavailable marine invertebrates is common. Harbor seals have been the only marine mammals hunted by Haines residents for subsistence purposes.

The 1997 Draft EIS contained the following information on subsistence use in Haines:

> Haines was originally the site of a Chilkoot Tlingit seasonal camp near the mouth of the Chilkat River. Subsistence activities were surveyed in 1983 and 1987 and by telephone as part of the proposed project. The 1987 survey found 93 percent of the households used subsistence resources and 83 percent of households participated in subsistence harvests.

> Subsistence harvesters focus on river, upland, and marine environments. Salmon were harvested from the Chilkat River and from marine areas of upper Lynn Canal. Trout and eulachon were harvested from rivers and marine finfish were harvested from saltwater areas. Local roads and rivers were used to reach moose, mountain goat, bear, some fish, berry picking, and wood cutting harvest areas.

3.1.6.2 Juneau

Juneau has a relatively large native community and personal use of fish and wildlife is common, but the CBJ is not designated under ANILCA as a subsistence area.

3.1.6.3 Klukwan

Klukwan is a Tlingit community located near the confluence of the Chilkat, Klehini, and Tsirku rivers approximately 20 miles northwest of Haines. Subsistence is important economically and culturally to Klukwan residents, who continue to use the study area for these purposes. The people of Klukwan harvest salmon, non-salmon finfish (e.g., eulachon, trout, char, and halibut), black bear, brown bear, moose, mountain goat, marine mammals (harbor seals), and Sitka black-tailed deer. Deer are scarce in the Chilkat Valley and other mainland areas in the northern Lynn Canal area. Sitka black-tailed deer hunting occurs on portions of Lincoln, Shelter, Benjamin, and Sullivan islands. There is some moose harvest as well. Residents of Klukwan generally fish for sockeye, pink, and chum salmon in designated subsistence harvest areas near their community. Non-salmon harvest for Klukwan residents takes place in all waters of Chilkat River for eulachon, Chilkoot and Lutak inlets for halibut, and Lynn Canal from Point St. Mary (entrance to Berners Bay) to Seduction Point, including waters around Sullivan Island and in William Henry Bay, for halibut (ADF&G, 1994).

The 1997 Draft EIS contained the following information on subsistence use in Klukwan:

> Subsistence fishing activities were surveyed in 1983 and 1987. The findings were similar, although the estimate of total pounds harvested was almost 22 percent higher in the 1987 survey. The survey found that 100 percent of Klukwan households used subsistence resources and 95 percent of households participated in the harvest of those resources.
>
> Resource harvest for Klukwan is strongly focused on riverine and inland environments for most of the resources harvested. Chinook salmon, sockeye salmon, chum salmon, and eulachon were the primary species harvested in the Chilkat River system. In addition, chinook and the other salmon, and bottomfish, were harvested in the marine environment by rod and reel. Harbor seals were the primary marine mammals harvested. Moose, mountain goat, and bear were harvested along the local roads and rivers. Deer hunting was conducted along Lynn Canal by boat.

3.1.6.4 Skagway

As with Klukwan and Haines, relatively little deer hunting occurs in the vicinity of Skagway because of the scarcity of deer in the upper Lynn Canal area. Skagway residents hunt black bear, brown bear, moose, and mountain goat. Most Skagway residents fish Taiya Inlet and Burro Creek for chinook, coho, and pink salmon. The primary non-salmon finfish species harvested is halibut. Skagway residents fish for trout in creeks and lakes near the community. Invertebrate harvesting by Skagway residents is common along the beaches and in the bays and coves near town. In areas close to the community, including Dyea, Nahku Bay, and Taiya Inlet, residents harvest shrimp and crab. Skagway lacks good clam beaches; therefore, crab is more heavily harvested by Skagway residents (ADF&G, 1994). Harbor seals have been the only marine mammals hunted by Skagway residents for subsistence purposes.

The 1997 Draft EIS contained the following information on subsistence use in Skagway:

> The 1987 survey found that 96 percent of households used subsistence resources and 68 percent of household participated in harvest activities.
>
> Resource harvest focused near the community for marine fish species and invertebrates and inland for mountain goats. [Residents] primarily harvest salmon and other species with rod and reel from Taiya Inlet. Trout and char and eulachon were harvested from local rivers.

3.1.7 Transportation

The existing transportation network in Lynn Canal is described in Sections 1.2 and 1.3. As stated in those sections, access to Juneau is only possible by air and water. Juneau is the largest community on the North American continent not connected to the continental highway system.

Commercial jet aircraft provide access to Juneau. Commuter aircraft serve Haines, Skagway, and other communities that do not have the demand or facilities for jet aircraft service.

The AMHS is the only form of public transportation that carries passengers and vehicles in Lynn Canal. As of the summer of 2004, the Lynn Canal corridor is served by two mainline ferries originating from Bellingham, two mainline ferries originating from Prince Rupert, an occasional feeder vessel, and shuttle service by the *M/V Fairweather*, Alaska's first fast vehicle ferry, five days per week to Haines and four days per week to Skagway. This vessel is based in Juneau; during the summer of 2004 and 2005 it made a round-trip to Haines in the morning on Monday, Tuesday, Thursday, Friday, and Saturday and a round-trip to Skagway in the afternoon on Tuesday, Thursday, Friday, and Saturday.

Private ferry companies provide passenger-only service between Lynn Canal communities. This service is seasonal from mid-May to Mid-September. Multiple daily trips are scheduled between Haines and Skagway, as well as twice-weekly service between Haines and Juneau.

Pedestrians and bicyclists are also served by the AMHS. The 2004 passenger-to-vehicle ratio in Lynn Canal was 3.6. Assuming the actual number of passengers traveling with cars was closer to the highway average of 2.2, as many as 38,000 people may have been walk-on passengers on AMHS ferries in Lynn Canal in 2004.

The 1997 Draft EIS reports the following:

> At least ten rivers in the project area would be considered navigable by federal standards. These include the Antler, Gilkey, Lace, Berners, and Katzehin rivers on the east side and the Endicott, Sullivan, 'Unnamed' (north of Sullivan Island), North Glacier, and Chilkat rivers on the west side. Navigability needs will influence design parameters and construction methods for major bridges. The U.S. Coast Guard has jurisdiction for bridges over navigable rivers.

Coordination with the U.S. Coast Guard has established that the largest vessels using these rivers are air boats with a maximum height above the water of 12 feet.

3.2 Physical Environment

3.2.1 Geology

A geotechnical and geologic study was prepared in February 1994 by Shannon & Wilson, Inc. for inclusion in the 1997 Draft EIS *Juneau Access Improvement Reconnaissance Engineering Report.* Because geologic changes are not rapid occurrences, a new study was not prepared for the Final EIS. However, limestone features (termed karst) are located along the proposed alignment of the West Lynn Canal Highway alternative (Alternative 3), and a new study was completed in 2003 to further delineate and assess these features.

The 1997 Draft EIS included the following description of geology in the study area:

> Lynn Canal, Chilkat Inlet, Chilkoot Inlet, Taiya Inlet, and Berners Bay are all typical fjords occupying glacially sculpted valleys in the Southeast's coast mountains. These mountains rise steeply from the water to elevations greater than 2,000 meters (6,561 feet) and the valley sides dive steeply into the water reaching depths in excess of 300 meters (984 feet). Rock outcrops are pervasive in the steep areas.
>
> Glacially fed streams and rivers flow into the fjords from both sides, as well as from the heads of the valleys. Large amounts of sediment have been deposited as deltas where these streams and rivers enter salt water. A generally high water table and generally low soil density in the delta areas, combined with the large tide range and possibility of earthquakes, increases the potential for liquefaction and sloughing along the face of the deltas.

3.2.1.1 Geologic Features

Physiographic and Tectonic Setting – The northern part of Southeast Alaska is underlain by a complex heterogeneous assemblage of rocks, including sedimentary, volcanic, metamorphic, and intrusive rocks of Paleozoic, Mesozoic, and Tertiary age. These rocks were emplaced in the southeastern Alaska archipelago during a series of subductions and accretions by tectonic plates obliquely colliding with the ancient continental margin of western North America during Jurassic to early Tertiary time (Gehrels and Berg, 1992 and 1994). Plate tectonic activity since the late Paleozoic has resulted in northwesterly trending curved bands of folded sedimentary, volcanic, and metamorphic rocks. Granitic batholiths, emplaced during the Cretaceous times, are widespread and form the backbone of the Coast Range. Tectonic activity during the Tertiary age resulted in major northwest-trending fault zones.

Major contours in the region, such as fjords and river valleys, are likely controlled by major faults or fault zones (Lemke, 1974). The Chatham Strait/Lynn Canal/Chilkoot River fault system, which bisects the study area along Lynn Canal, trends northwest and apparently continues for over 300 miles, connecting with the Denali fault of interior Alaska (Miller, 1972).

While the faults are thought to control the orientation of features in the area, the fjords and U-shaped river valleys that characterize the region are the result of glaciation. These features were carved by glaciers that have been active since the Pleistocene. The weight of the ice, which at times has reached a thickness of about 5,000 feet, has caused the surrounding land mass to sink below its original level. Upon deglaciation, gradual rebound of the depressed ground has resulted in the emergence of marine deposits and has also caused uplifted rock faces to be exposed to the effects of shoreline erosion. This erosion forms benches or terraces at the lower elevations of the U-shaped valley walls.

Bedrock – Rock types encountered in the study area include deep to shallow marine sedimentary rocks, volcanics and their metamorphosed equivalents, and granite intrusive rocks. The proposed road corridors along both the east and west sides of Lynn Canal are roughly parallel or oblique to the rock units. Bedrock is visible along wave-cut shorelines, forms knolls and cliffs in the lower slopes, and occurs as bare or muskeg-covered slopes above the timberline on higher mountain slopes. In offshore areas and river drainages, the bedrock surface is often deeply buried beneath unconsolidated soils that are glacial or alluvial in origin.

Karst – The term "karst" is used to describe an area of limestone or carbonate rock in which the landforms are mostly soluble in origin and drainage is underground through enlarged fissures and conduits (Drew, 1999). Karst develops when acidic waters, enriched in humic and carbonic acids from natural soil decomposition, drain onto carbonate rocks, causing limestone to dissolve. The most favorable climatic environment for karst development occurs in alpine and cold temperate regions with high precipitation and runoff rates (Ford and Williams, 1994). These conditions are generally optimal in Southeast Alaska, creating one of the most actively developing karst regions in the world. The presence of muskegs and forested wetlands ensures that acidic water is generated, which results in aggressive solution activity where water drains onto carbonate rock. Through this chemical weathering process, surface and subsurface features such as interconnected channels are developed. These areas can collapse when limestone dissolved by water percolating downward, combined with removal of cavity roofs from below, weakens the span of surface bedrock or soil.

The Federal Cave Resources Protection Act (FCRPA) of 1988 (16 USC 4301-4310) requires protection of significant caves on federal lands. As described above, karst is a three-dimensional terrain developed on and within soluble, carbonate bedrock in which caves develop. Although the stated intent of FCRPA is to protect cave resources and not karst resources, the USFS recognizes that caves with associated features and resources are an integral part of the karst landscape, and that karst must therefore be managed as an ecological unit to ensure protection of cave resources.

Previous mapping studies (DOT&PF, 1994; Dames & Moore, 1994; NLUR, 1994) indicated that carbonate rock and karst landscape exists on the western side of Lynn Canal in the area between Sullivan Island and William Henry Bay. Carbonate rock is not known to underlie East Lynn Canal. A karst assessment was conducted in summer 2003 to determine the extent of karst development along the Alternative 3 route (West Lynn Canal) and to evaluate whether the location and design of the highway would be protective of karst resources based on vulnerability criteria and land use objectives established by the USFS for the Tongass National Forest.

A preliminary karst survey of the project area on the west side of Lynn Canal was performed in 1994. This survey was based primarily on literature and aerial photograph review and did not include a field survey (Dames & Moore, 1994). An archaeological team investigating the route of Alternative 3 in 1994 documented a number of shoreline karst features during a ship-based survey (NLUR, 1994); however, a systematic karst survey of the project area was not conducted during these investigations.

A karst field survey was conducted for the project in 2003. The protocol for the survey was developed in coordination with and approved by the USFS. The survey corridor was 300 feet wide (150 feet on either side of a preliminary road centerline) and was expanded to 500 feet wide in areas where high-vulnerability karst was encountered.

Pertinent karst vulnerability rating criteria from TLMP and a Tongass Plan Implementation Team Clarification Paper were used to rate karst features encountered in the field. The criteria are as follows:

- **High Vulnerability** – Areas containing a high density of karst features and areas exhibiting openness to the subsurface. These areas are underlain by carbonate bedrock that is well drained internally.
- **Moderate Vulnerability** – Areas underlain by carbonate bedrock that is well drained internally. Areas often occur on knobs and ridges and on the dip-slope of carbonate bedding planes. The surface tends to be irregular and undulating and often open. The primary characteristic used to differentiate between moderate- and high-vulnerability karst is the degree of openness of the system.
- **Low Vulnerability** – Areas underlain by carbonate bedrock that are most commonly internally drained, but surface streams may be present. Generally, these areas have been greatly modified by glaciation and have a covering of glacial till or mineral soil.

The following paragraphs summarize the types of karstland encountered along the West Lynn Canal project area based on the vulnerability criteria category. Figure 3-11 identifies their locations.

High-Vulnerability Areas – Linear strips of high-vulnerability karst were mapped along coastal cliffs in several areas where the Alternative 3 highway alignment comes close to shoreline and where caves or other potential karst features were observed in the cliffs. Similar features were also occasionally observed along inland cliffs along what may be raised wave-cut terraces. A number of the coastal caves observed have previously been mapped and named in the vicinity of Glacier Grotto (Allred and Allred, 1995; Dames & Moore, 1994; Love, 1999). Most of these caves lie outside of the eastern edge of the study corridor.

Many of the shoreline cliff features do not appear to be solutional in origin; rather, most appear to have been formed by cavitation and littoral erosion accompanied by block failure. Cavitation occurs as air is forced into joints or small solution cavities within the rock, and the hydraulic force of the water and pneumatic pressure of the trapped air interact to cause corrosion. The abrasive effects of cobbles and sand cause littoral erosion and undercutting of cliff exposures. Block failure along fracture planes enlarges the developing cavities. Although solutional connectivity appeared to be lacking in most of these features, the littoral caves were considered high-vulnerability areas nonetheless, because they met the FCRPA definition of a significant cave (36 CFR 290).

Low- to Moderate-Vulnerability Areas – Much of the karst encountered in the project area was of low to moderate vulnerability typical of other low-elevation karstland around Southeast Alaska. Areas underlain by carbonate-bearing bedrock, which is otherwise dominated by non-carbonates (e.g., schist with minor marble interbeds or limestone-bearing conglomerates), were given a low-vulnerability rating. Within the alignment, these areas were characterized by shallow undulating terrain, thick glacial deposits, and rare bedrock exposures along benches and gentle slopes. Exposed limestone cliffs, ridges, and rock overhangs were characterized as moderately vulnerable if open fractures were observed that appeared to be soil-filled at shallow depths. Limestone cliffs and ridges with closed fractures were characterized as low vulnerability, as were lower slopes at the base of cliffs where covered by a thick section of colluvium or talus deposits.

No- to Low-Vulnerability Areas – Areas with underlying non-carbonate bedrock, such as volcanics and schist, were considered to have no karst vulnerability. Non-carbonate bedrock underlies more than 70 percent of the West Lynn corridor. The landscape over these rocks typically exhibits little to no karst characteristics.

Karst Resources on Alternative Alignments – No identified significant caves or other important karst features are within the current alignment of any alternative. Where significant caves or other important karst features were identified, DOT&PF moved the alignment to avoid them.

3.2.1.2 Geologic Hazards

It is important to recognize the potential for geologic hazards within areas considered for the project alternatives. Geologic hazards in the study area include avalanches, earthquakes, tsunamis, outburst floods, and landslides.

Avalanches – The most common geologic hazard within the study area is avalanches. The avalanche information presented in the 1997 Draft EIS has been updated. Steep slopes, heavy snowfall and precipitation, high winds, and a climate influenced by both maritime and continental systems contribute to this hazard. The proposed road alignments along both the east and west sides of Lynn Canal traverse areas that exhibit considerable evidence of ongoing avalanche activity. These areas are marked by a lack of timber in the avalanche chutes and, in some areas, by large accumulations of snow at the base of the chutes in the spring and well into the summer. The paths are described as small, medium, large, and very large based on starting height, amount of snow, and avalanche frequency. Occasionally, subpaths run off from the main path. Figure 3-12 shows the location of the avalanche paths. The *Snow Avalanche Report* (Appendix J) provides more detailed information on the snow avalanche paths mapped and rated along each side of Lynn Canal.

East Lynn Canal Alignment – The average annual snowfall for the East Lynn Canal, as a whole, is 147 inches. This high level of snowfall contributes to 74 avalanche paths, including subpaths, on the east side of Lynn Canal. Of the paths identified, 11 are considered large or very large based on their high elevation starting zones and their tendency to produce frequent large avalanches. Runout from avalanche events in some of these paths would reach the highway only once in several decades, whereas, in the absence of mitigation efforts, runout from events at other locations could cross the highway more than once in an average winter.

Field observations have identified four avalanche paths from Echo Cove to a location three miles past Independence Lake. One is near Sawmill Cove in Berners Bay and three are north of Independence Lake. The first path north of Independence Lake is the widest on the alignment and is a frequent producer of large avalanches.

The area north of these paths to the Katzehin River, a distance of 21 miles, contains 36 avalanche paths. They are found in three clusters of multiple paths that include large and very large paths. The first cluster is located opposite Eldred Rock, the second group is south of Yeldagalga Creek, and the third group is north of Yeldagalga Creek.

From the Katzehin River north to Skagway there are 34 avalanche paths. These include a cluster of small but steep paths near Dayebas Creek and three large, narrow, high-elevation paths located approximately two miles north of the creek that produce frequent slides. The remaining paths are narrow, steep paths that generally reach saltwater. North of the Katzehin River, near the proposed Katzehin Ferry Terminal, is a large avalanche chute.

West Lynn Canal Alignment – Average annual snowfall for the West Lynn Canal area is 120 inches. The highway alignment of Alternative 3 on the west side of Lynn Canal is near 19 avalanche paths, including subpaths. Of the paths identified, 11 are considered large or very large.

Some of these avalanche paths occur in clusters. The first cluster consists of two paths, located between William Henry Bay and the Endicott River, which are considered medium in size. The second cluster of three paths is located approximately three miles north of Sullivan River to the northern tip of Sullivan Island, which are rated as large to very large. The third cluster consists of three paths located in the area just north of Glacier Point to Pyramid Harbor. These paths are also rated as large to very large.

See the *Snow Avalanche Report* (Appendix J) and its addendum in Appendix W for further details on avalanche potential in the project area.

Earthquakes – Large earthquakes have occurred on the strike-slip faults associated with the Queen Charlotte/Fairweather fault system (Hanson and Combellick, 1998). This system, located along the outer coast of Southeast Alaska approximately 75 miles west of the study area, produces lateral motion parallel to the fault line. Within the last century, four earthquakes with magnitudes greater than 7.0 have occurred along the Queen Charlotte/Fairweather fault system (Hanson and Combellick, 1998). In addition to these well-recorded historic shocks on the main plate boundary, significant seismicity follows the southern end of the Denali fault system and has produced historic earthquakes of up to at least 6.4 in magnitude. The interior Alaska portion of the Denali fault was responsible for the 7.9 magnitude earthquake in November 2002. The Denali fault trends southeast beneath Lynn Canal and appears to join the Chatham Strait fault system, which continues south past the Juneau area. Little historic seismicity is associated directly with the Chatham Strait segments of this fault system. The Alaska Earthquake Information Center lists only 11 events of magnitude 4 or greater along this fault system within a radius of 35 miles of Haines. The strongest event had a magnitude of 6.9 with its epicenter 24 miles southwest of Haines.

Landslides – Landslides occur less frequently than snow avalanches. Most landslides are caused by the combined effects of geologic characteristics and soil types. Earthquakes are also a triggering mechanism for landslides in Southeast Alaska. Avalanche paths are also prone to slides during the summer months due to the lack of vegetative cover and the channel-like nature of avalanche chutes.

The 1997 Draft EIS identified five landslides in the vicinity of the East Lynn Canal alignment and two along the West Lynn Canal alignment. An additional slide occurred in 2001 on the east side of Lynn Canal north of Independence Lake. Figure 3-12 identifies the locations of the slides. The eight identified slides are all rock slides created when large rock fractures at the top of a steep slope released rock and the falling rock caused the poorly attached, vegetated slope below to slide. Little soil movement was involved because in these areas there is almost no soil between the vegetation layer and the underlying rock.

Outburst Floods – Glacial lake outbursts can result in flooding, the scale of which can be many times greater than the anticipated maximum flood event for a given basin. The proposed highway alignments on both the west and east sides of Lynn Canal cross rivers that drain glaciers and thus have the potential for outburst flooding.

The 1997 Draft EIS presented the following information about glacial outburst floods:

> Meade Glacier, located at the head of the Katzehin River, creates a glacially dammed lake which discharges annually, usually in late August. Glacial outburst floods also occur occasionally on the Gilkey/Antler River system in Berners Bay.

The Chilkat and Endicott rivers on the west side of the canal also have the potential for glacial outburst flooding from large glaciers at their headwaters.

Glacial Advance – The 1997 Draft EIS contained the following information about glacial advance:

> Numerous glaciers are located in the mountains around Lynn Canal. None of the glaciers in the project area pose a hazard.

3.2.2 Hydrology and Water Quality

Lynn Canal, Chilkat Inlet, Chilkoot Inlet, Taiya Inlet, and Berners Bay are all typical fjords occupying glacially sculpted valleys in the coast mountains. The landscape is intensely glaciated and the mountains are heavily forested. The study area contains rugged topography with moderate to steep forested slopes, broken by raised benches and bare rock cliff bands. Drainage patterns are characterized by steep, deeply incised, first-order streams, which feed into wide, braided rivers in the base of glacially carved valleys. The wide valley bottoms are relatively flat due to infilling with unconsolidated sediments.

3.2.2.1 Climate

Lynn Canal has a maritime climate with temperatures in the range of 45 to 65 degrees Fahrenheit (°F) in the summer and 18° to 37°F in the winter. The north end of Lynn Canal around Haines and Skagway lies within a climatic transition zone that receives less precipitation than Juneau. Annual precipitation in the area ranges from 54 inches in Haines to 92 inches in the Endicott River Wilderness Area. Storms and rain showers occur throughout most of the year; however, precipitation is heavier and more frequent from November to January. The *Snow Avalanche Report* (Appendix J) estimates average snowfall for East Lynn Canal at 147 inches per year or approximately 12 feet per year, and for West Lynn Canal at 120 inches per year or approximately 10 feet per year. Melting snows and spring rains contribute large amounts of water to rivers and creeks within the study area.

3.2.2.2 Freshwater Environment

Glacially fed streams and rivers flow into the fjords from both sides, as well as from the heads of the valleys. Large amounts of sediment have been deposited as deltas where these streams and rivers enter saltwater. A generally high water table and generally low soil density in the delta areas, combined with the large tidal range and the possibility of earthquakes, increases the potential for liquefaction and sloughing along the face of deltas.

The 1997 Draft EIS included the following description of water quality:

> Most streams in the project area originate in undeveloped alpine areas and are clear and low in dissolved solids. The larger rivers generally originate from glaciers and characteristically carry large silty glacial plumes into Lynn Canal off Berners Bay and the Katzehin delta. Overall, water quality in the project area is high except during periods of heavy runoff when plumes of silt can be seen at the mouth of most streams.

During winter and periods of low flow, streams generally carry less silt. During spring melt, streams carry higher silt loads.

There are 64 streams/rivers along the east side of Lynn Canal. The Antler/Gilkey river basin, Lace/Berners river basin, and the Katzehin River basin drain watershed areas that are each larger than 100 square miles. All of these watersheds include large glacial areas. These larger basins include areas behind the coastal ridge at high elevation. Several intermediate-sized drainages (between 5 and 20 square miles in area) also have relatively large areas covered by glaciers. The majority of streams are relatively small, draining steep watersheds of less than 5 square miles, and are confined to the seaward coastal ridge along Lynn Canal.

Freshwater resources on the west side of Lynn Canal in the project area include 28 streams/rivers, four of which drain major watersheds with basin areas greater than 20 square miles. Only one of these watersheds, Endicott River, drains an area greater than 100 square miles. All of these basins have relatively large glacial areas, except the Endicott River. The watersheds along this alignment all drain into Lynn Canal and are generally less steep than on the east side of the Canal. The terminus of Davidson Glacier is near the base of a watershed and occupies nearly the entire valley of the Glacier River. The larger drainages along this route all have deltas (alluvial fans) that have formed where the streams enter Lynn Canal.

3.2.2.3 Groundwater

Detailed hydrogeological information has not been obtained for the study area; however, general geologic considerations and base flow data/observations provide sufficient information to understand the groundwater regime. Groundwater along the roadway alignments occurs within the bedrock, shallow soils, glacial till sediments overlying bedrock, and alluvial deposits within floodplains. No groundwater wells are known to exist within the proposed alternative project alignments.

Due to the low bulk permeabilities and associated low yield, groundwater storage within bedrock formations generally does not constitute significant aquifers. One exception to this condition occurs in fractured and faulted zones, where permeability and storage are higher due to large fracture porosity. Groundwater seepage tends to be seasonal with large fluctuations. Shallow soils and glacial till found in the area would also be expected to yield low quantities of groundwater because of low permeability and storage potential. Levels of groundwater in these materials are very seasonal and do not provide significant base flow to streams and rivers.

Alluvial and glacial outwash associated with floodplains of larger streams and rivers in the area can be expected to have notable groundwater year-round. At the valley walls, groundwater levels are controlled by the water level in nearby surface waters, which are recharged by precipitation and snow melt. Relatively shallow groundwater levels are expected within the glacio-fluvial deposits in the alluvial valleys. Within these larger streams, including tributaries downgradient of the valley wall slope break, base flows are sustained by groundwater seepage.

3.2.2.4 Marine Environment

Lynn Canal and Chatham Strait, with a combined length of about 235 miles, comprise the longest and straightest fjord-like inlet in North America. Lynn Canal is the narrow, northern segment of this inlet, extending northward some 90 miles from its junction with Icy Strait, west of Juneau, between steep mountains where it splits into Chilkat and Chilkoot inlets at its north end. Marine access to the communities at the head of Lynn Canal is provided through Chilkoot Inlet and its northeasterly extension as Taiya Inlet.

The physical setting and oceanographic environment of Lynn Canal suggest that it is a fjord-type estuary. Pritchard (1967) defined an estuary as "…a semi-enclosed body of water which has a free connection with the open sea and within which fresh water is measurably diluted with sea water." Estuary settings range from coastal plain to steep-sided fjords such as Lynn Canal, but all have the common feature of serving as a mixing region for freshwater and saltwater. Density differences between freshwater and saltwater can drive circulation and hence influence mixing and flushing in estuaries. The net circulation depends on the amount and timing of freshwater and saltwater input as well as other influences such as winds, tides, topography, and continental shelf oceanic properties and processes. These influences can combine in various ways such that distinctly different circulations develop in otherwise similar estuaries.

Fjords are deep, narrow, and steep-sided estuaries that are peculiar to glacially carved coastlines and have hydrodynamic characteristics that distinguish them from shallower embayments. Most fjords have at least one moraine or bedrock sill that affects, if not controls, hydraulic communication with the adjacent ocean. Several major rivers and numerous streams discharge into the northernmost reaches of Lynn Canal, further supporting its classification as a fjord-type estuary and a presumption of estuarine circulation within it.

Studies of fjords show that deep or bottom water ranges from well oxygenated to poorly oxygenated. Because the bottom water in fjords that have sills at their entrances are not always oxygen deficient, there must be times when the deep waters undergo renewal and become oxygenated. The movement of water along the bottom and tidally driven mixing are probably the most effective mechanisms for increasing the oxygen content of the water. Details regarding typical oceanographic conditions in Lynn Canal are provided in the *Hydrology and Water Quality Technical Report* (Appendix K).

Tides in Lynn Canal vary during the year, with the maximum recorded level in the Juneau area being 23.8 feet. Available data show that the highest tide in the study area is 22.5 feet above mean lower low water at Chilkat Inlet near Pyramid Island. The more normal tidal range is 14 to 16 feet (DOT&PF, 1994).

3.2.3 Floodplains

EO 11988 (May 24, 1977), Floodplain Management, addresses the use of floodplains by federal agencies. The objective is to avoid to the extent possible the long- and short-term adverse impacts associated with occupancy and modification of floodplains.

The following information about floodplains that was included in the 1997 Draft EIS is still relevant to the proposed project:

> The Federal Emergency Management Agency has not mapped floodplains in the project area. There is little information available about past floods. A floodplain analysis was conducted for this project. There are nine large rivers that potentially have extensive 100-year floodplains. From south to north, on the east side of Lynn Canal, these include the Gilkey, Antler, Lace, Berners and Katzehin rivers, and some of their tributaries. The west side includes the Endicott, Sullivan, 'Unnamed' (north of Sullivan Island), and North Glacier rivers, in addition to Chilkat Inlet at the mouth of the Chilkat River.
>
> The smaller, coastal streams have steep banks or channels that allow considerable overflows during floods. Although these channels carry floodwaters, they are not considered floodplains. Floodplains, which occur downstream in less steep areas, typically have braided channels, and can cover wide areas of up to several square miles. Seasonal flooding often causes changes in the channels.
>
> Available data show that the highest tide in the project area is [22.5 feet] above mean lower low water at Chilkat Inlet near Pyramid Island. The coastal floodplain is in the area affected by tides. Tidal fluctuation and stormwaves dominate coastal floodplains. In addition, tides will affect velocity and flow dynamics within the tidal zone.

3.2.4 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968, as amended, was established to recognize and preserve certain rivers in a free-flowing state to better manage the development of river resources.

There are no designated Wild and Scenic Rivers in the project study area. Two rivers within the Lynn Canal corridor have been recommended by the USFS for designation: the Gilkey and the Katzehin rivers (Figure 1-1), both located on the east side of Lynn Canal. The Gilkey River joins with the Antler River, and the Antler River subsequently empties into Berners Bay. The lower 2 miles of the Katzehin River have been excluded from recommendation because this 2-mile segment is a designated transportation corridor.

Four additional rivers within the canal corridor are on the USFS list of potential Wild and Scenic Rivers but have not been recommended for designation: the Antler, Berners, Endicott, and Lace rivers. The Antler, Berners, and Lace rivers were not recommended because they are in a congressionally designated LUD II area that provides protection the USFS considers adequate. The Endicott River was not recommended because a majority of the river lies within the Endicott River Wilderness Area, and such a designation already serves to protect the river's values.

The Sullivan River has not been evaluated by the USFS with regard to eligibility as a Wild and Scenic and/or Recreation River. The USFS has indicated that the lower reach of the Sullivan River is not eligible due to past development activities.

3.2.5 Air Quality

According to the air quality report prepared for the 1997 Draft EIS (DOT&PF, 1994a), ambient air quality is good and carbon monoxide (CO) levels are well below maximum allowable levels. This section describes applicable air quality standards, attainment status, and ambient air quality relevant to the project area.

3.2.5.1 Air Quality Standards and Relevant Pollutants

Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual pollutants degrade the atmosphere by reducing visibility, damaging property, reducing vegetation productivity, or adversely affecting human and animal health.

Air quality is regulated at the federal level under the Clean Air Act of 1970 and the Final Conformity Rule (40 CFR, Parts 51 and 93). The Clean Air Act authorizes the EPA to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that pose a risk to public health. These primary standards represent the air quality levels, with an adequate safety margin, that are required to protect public health. EPA has established standards for seven criteria pollutants: CO, ozone (O_3), particulate matter with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and airborne lead. The Alaska Ambient Air Quality Standards (AAAQS) mirror the federal standards for most of the pollutants. Table 3-3 shows the federal air quality standards for selected pollutants. Alaska has adopted the federal standards as state standards.

The federal standards require each state to submit a State Implementation Plan (SIP) detailing strategies for attaining the standards. Air quality is regulated at the state level under the AAAQS promulgated in Title 18, Chapter 50, of the AAC.

In addition to the NAAQS, EPA has developed Prevention of Significant Deterioration standards that limit the incremental increase in air pollutant concentrations above the specified Prevention of Significant Deterioration standards. The study area is within the Southeast Alaska Intrastate Air Quality Control Region, where baseline dates have been set for sulfur and nitrogen dioxides, and incremental increases of these two pollutants must be below the levels set by EPA.

3.2.5.2 Attainment Status of Study Area

The geographic region where the project is located has been designated an air quality attainment area or unclassifiable. This means that the project is in an area where the region meets the ambient air quality standard for each pollutant or there are insufficient data to make a determination. Therefore, the SIP does not contain any control measures, and conformity procedures do not apply to this project. A conformity determination is not required per 40 CFR 51.

Regions where monitored values of any pollutant exceed the NAAQS are formally designated by EPA as non-attainment areas. Both federal and state regulations require the preparation of strategies by which non-attainment areas can meet attainment for each pollutant where the NAAQS are exceeded. Documentation of this strategy and planning is then included in the SIP.

The nearest non-attainment area to the project is the Mendenhall Valley in Juneau (18 AAC 50.015). The Mendenhall Valley is approximately 40 miles south of the southern extent of potential highway construction. The existing Glacier Highway connects the Mendenhall Valley to the project area. The Mendenhall Valley area is designated as a non-attainment area for airborne particulate matter (PM_{10}). Air quality is impaired primarily during the winter when stable air masses and low winds trap particulate matter in the valley (particulate matter is generated by wood smoke and dust from unpaved roads). No other criteria pollutants are above NAAQS for the Mendenhall Valley. On March 24, 1994, EPA approved the Mendenhall Valley PM_{10} attainment plan. The plan strategy for improving air quality in the Mendenhall Valley focuses on control of wood smoke emissions and fugitive dust sources (e.g., glacial silt and dust from unpaved roads) during the winter months. There have been no non-attainment violations since the plan has been in effect.

3.2.5.3 Ambient Air Quality in the Study Area

Weather and topography influence air pollution concentrations. Hydrocarbon and NO_2 emissions from automotive sources, when exposed to sunlight, are a major component of photochemical smog. Still air and temperature inversions that result in heavy fog can result in high CO concentrations, if there are sufficient pollutant sources in the area. The potential for dispersion of airborne pollutants at the study area is determined by the stability class, or measure of atmospheric turbulence.

Table 3-3
National Ambient Air Quality Standards

Pollutant	Averaging Period	Primary	Secondary
Carbon Monoxide (CO)	1 hour	35 ppm ($40{,}000\ \mu g/m^3$)	Not Applicable
	8 hours	9 ppm ($10{,}000\ \mu g/m^3$)	
Lead (Pb)	3 months	$1.5\ \mu g/m^3$	Same as Primary Standard
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm ($100\ \mu g/m^3$)	Same as Primary Standard
Ozone (O_3)	1 hour	0.12 ppm ($235\ \mu g/m^3$)	Same as Primary Standard
	8 hours [1]	0.08 ppm ($157\ \mu g/m^3$)	
Respirable Particulate Matter (PM_{10})	24 hours	$150\ \mu g/m^3$	Same as Primary Standard
	Annual	$50\ \mu g/m^3$	
Fine Particulate Matter ($PM_{2.5}$) [1]	24 hours	$65\ \mu g/m^3$	Same as Primary Standard
	Annual	$15\ \mu g/m^3$	
Sulfur Dioxide (SO_2)	3 hours	Not Applicable	0.5 ppm ($1{,}300\ \mu g/m^3$)
	24 hours	0.14 ppm ($365\ \mu g/m^3$)	Not Applicable
	Annual	0.03 ppm ($80\ \mu g/m^3$)	

Notes: $\mu g/m^3$ = micrograms per cubic meter ppm = parts per million
Standards from 40 CFR 50.8 and 18 AAC 50.010. Alaska standard for ammonia is not included in this table.
[1] No corresponding Alaska standard exists for $PM_{2.5}$ or 8-hour O_3 (Register 168, 18 AAC 50.010).

Stability classes are divided into six categories, designated "A" through "F," with the greatest pollutant dispersion occurring for "A." The study area distribution of stability classes is expected to be similar to that found in all of Southeast Alaska. Stability class "A" occurs infrequently due to the lack of strong solar insulation. Stability class "D" occurs most frequently (55 percent of the time). The moderately high frequency of stable atmosphere classes ("E" and "F") occur 40 percent of the time. This indicates that the potential exists for elevated air pollution within the study area due to temperature inversions (USFS, 1992). Air modeling for the project assumed a conservative air dispersion stability class of "F" (little to no wind).

Air quality analyses must account for ambient concentrations of pollutants. With the exception of Anchorage, Fairbanks, and Juneau, Alaska does not have a statewide air toxics emission inventory (Alaska Department of Environmental Conservation [ADEC], 2004). The ambient air quality CO impact is rated insignificant for the study area, and no air quality sampling was completed to determine baseline conditions. Minimal to no development has occurred within the study area, except at the ends of the study area near Haines and Skagway. Air quality within the study area is estimated to be very good due to the absence of air pollution sources. Therefore, background levels of CO, O_3, sulfur oxides (SO_X), and nitrogen oxides (NO_x) are estimated to be low. This determination is further supported by data accumulated for the EIS for the Kensington Gold Project, which is within the project area, showing that background concentrations of air pollutants were significantly below NAAQS (USFS, 1997a). On rare occasions, elevated PM_{10} concentrations may exist in the study area when wood smoke or smoke from fires is carried south from the Yukon via northerly winds (USFS, 1992).

ADEC collected $PM_{2.5}$ measurements in 2004 and 2005 in Skagway. These data are not published but they have been included in the EPA air quality database for Alaska. Most of the measurements were less than 10 micrograms per cubic meter (µg/m^3) for the 24-hour average concentration. This is substantially below the NAAQS 24-hour standard of 65 µg/m^3. On two occasions, $PM_{2.5}$ concentrations were elevated over typical conditions due to smoke from fires. On August 16, 2005, the 24-hour $PM_{2.5}$ concentration was recorded at 44 µg/m^3. This was attributed to smoke from an interior wildfire. On June 20, 2004, the 24-hour $PM_{2.5}$ concentration was recorded at 32.5 µg/m^3. This was attributed to a barge fire offshore of Haines. Even these high $PM_{2.5}$ concentrations were substantially below the NAAQS.

3.2.6 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Response to noise can vary according to type and characteristic of the noise source, the distance between the noise source and receptor, the sensitivity of the receptor, and the time of day.

The perception of noise is dependent on land use and receptors. Most of the land adjacent to the proposed alternatives is undeveloped. Most of this land is multi-use including dispersed recreation, subsistence, and personal use hunting. Within and near the communities of Juneau, Haines, and Skagway, the presence and density of noise-sensitive receptors increases. Residential development, motels and hotels, recreation areas, parks, schools, churches, and hospitals are present in these urban areas.

Levels of noise are measured in units called decibels (dB). Since the human ear cannot perceive all pitches or frequencies equally well, measured sound levels are adjusted or weighted to correspond to human hearing. This adjusted unit is known as the "A-weighted" decibel. All references to noise in this report refer to A-weighted decibel levels or dBA.

Very few noises are constant; most fluctuate in decibel level over short periods of time. One way of describing fluctuating noise is to present the sound level over a specific time period as if it had been steady and unchanging. In this approach, a descriptor called the equivalent sound level, L_{eq}, is computed. L_{eq} is the constant sound level that, for a given situation and time period, conveys the same sound energy as the actual time-varying sound. The L_{eq} during the peak-hour traffic period is often used to determine necessary noise mitigation measures from roadway noise, and is used in describing noise in this report.

The FHWA specifies noise abatement criteria (NAC) (codified in 23 CFR 772) for noise-sensitive human land uses. Noise abatement must be considered when the predicted future peak-noise-hour from highway traffic on new construction approaches or exceeds the NAC, or when a substantial increase occurs. DOT&PF Noise Abatement Policy (March 1996) has defined approaching the NAC as being within 2 dBA of the NAC. For example, Activity Category B land uses such as residences, schools, and hospitals, peak-noise-hour external levels of 65 dBA L_{eq} are considered to approach the NAC of 67 dBA. DOT&PF has also defined an increase in external peak-noise-hour of 10 dBA L_{eq} or more as a substantial increase in noise regardless of the peak hour L_{eq}. The following NAC apply to noise-sensitive land uses.

- **Activity Category A** – Exterior L_{eq} (hourly [h]), dBA 57: Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. (There are no Activity Category A land uses in the project study area.)
- **Activity Category B** – Exterior $L_{eq(h)}$, dBA 67: Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals (e.g., homes adjacent to new highway construction and the USFS cabin in Berners Bay).
- **Activity Category C** – Exterior $L_{eq(h)}$, dBA 72: Developed lands, properties, or activities not included in Categories A or B above (e.g., Juneau International Airport).
- **Activity Category D** – Undeveloped lands (e.g., undeveloped urban land in Juneau, Haines, or Skagway).
- **Activity Category E** – Interior $L_{eq(h)}$, dBA 52: Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums (e.g., the interior of homes and hotels and motels in Juneau, Haines, or Skagway).

In accordance with 23 CFR 772.11a, primary consideration is given to exterior areas in determining and abating traffic noise impacts. Noise abatement is usually considered only where frequent human use occurs and a lowered noise level would be of benefit to people. Exterior noise levels take precedence in the evaluation and mitigation of traffic noise because protection of exterior areas from noise typically achieves protection of interior spaces as well.

There are cases where exterior areas of Activity Category B land uses, such as residences, that would be affected by traffic noise do not receive “frequent human use” or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents a noise impact on exterior activities. For example, in a home situated close to a roadway (e.g., 20 to 40 feet), the residents may not use the outdoor area adjacent to the road for more than coming into and out of the house, and concentrate their outdoor activities to a back yard shielded from the road by the house. In these cases, 23 CFR 772.11b indicates that the interior NAC (Activity Category E criterion) should be used as the basis of determining noise impacts. The NAC categories and sound levels are also useful in evaluating noise impacts that occur as an indirect effect of a proposed project. FHWA regulations do not require consideration of noise abatement for these types of impacts.

A new noise analysis was conducted for the 2005 Supplemental Draft EIS. Since most of the highway portions of the alternatives cross undeveloped lands where there are no noise sensitive receptors, much of the analysis was undertaken in an effort to disclose any indirect noise impacts associated with the predicted increases in traffic on the existing road systems of Juneau, Haines, and Skagway. Short- and long-term sound level measurement data were collected for this study. Short-term noise measurements have durations of less than one hour. Long-term measurements have durations of at least 24 hours.

For purposes of evaluating direct highway traffic noise effects, no noise sensitive receptors were evaluated in the vicinity of Juneau for any of the Build Alternatives other than the campground at Echo Cove where a short-term noise measurement was taken (ST-17). This is due to the fact that all of the proposed new highway sections of the Build Alternatives would begin north of Echo Cove. The short-term noise measurement at Echo Cove campground, the only identified sensitive receptor in the area, was 43 dBA.

Short-term measurements were collected at and near the USFS cabin at the head of Berners Bay. Alternative 2B would pass within about 500 feet of this cabin. Meteorological conditions were mostly favorable when data were collected from September 10 to 16, 2003. Measurements were 49 dBA at the beach to the west of the cabin and 52 dBA at the cabin. The higher levels at the cabin were attributable to a nearby stream and rain falling through the trees. Noise in Berners Bay includes intermittent sounds from helicopters, small airplanes, and small boats including airboats, with the greatest frequency occurring in the summer.

No sensitive receptors were evaluated in Haines for direct noise impacts because the new highway segment associated with Alternative 3 would not be located in the vicinity of any receptors. Public comments on the 1997 Draft EIS expressed concerns that noise from a highway on the east side of Lynn Canal would result in noise impacts on the Chilkat Peninsula in the vicinity of Chilkat State Park. On September 10, 2003, a long-term sound measurement was collected near a residence at the end of Mud Bay Road (LT-2) overlooking Chilkoot Inlet and opposite the southern end of the Katzehin River delta. Two short-term sound measurements were also taken near this location. The sound sources included vehicular traffic, boats, birds, distant aircraft, and rain. Measured sound levels ranged from a low of about 34 dBA to a high of 55 dBA.

Long-term sound measurements were recorded in Skagway on September 12 and 13, 2003. One sound level meter was positioned in the backyard of a residence on 22nd Avenue and State Street facing 23rd Avenue and State Street (LT-3). Noted sound sources were vehicular traffic, railroad activity, aircraft, rustling leaves, and distant lawn maintenance activities and ship horns. A second monitoring station was located at a residence on Broadway and 12th Avenue (LT-4). Noted sound sources were traffic, rustling leaves, railroad activities, and aircraft. At LT-3, ambient noise ranged from about 60 to 65 dBA between 11 a.m. and 5 p.m., dropping steadily after that time to a low of about 46 dBA between midnight and 5 a.m. Noise rapidly increased to 55 to 60 dBA shortly after 5 a.m. and remained at that level until 11 a.m. Ambient noise followed the same trend at LT-4 except it was typically about 5 dBA lower than at LT-3. Peaks that occurred simultaneously at both sites were likely attributable to passing trains or aircraft. Two short-term measurements were collected at midblock on 22nd Avenue between Main Street and State Street. These measurements recorded noise levels of 56 and 57 dBA.

Long-term and short-term sound measurements were collected in Juneau, Haines, and Skagway where increased traffic on local roads resulting from project alternatives could result in indirect noise effects to sensitive receptors. In Juneau, the Glacier Highway from downtown to

Auke Bay is densely developed. Some residential noise receptors either abut the highway or have a direct line of sight to the highway without benefit of intervening structures. From Auke Bay to Echo Cove, development density decreases and sensitive land use is mostly residential. The Eagle Beach State Campground and a camping area at Echo Cove are located adjacent to the highway.

On September 14 and 15, 2003, long-term sound level measurements were collected in Juneau. One sound level meter was positioned at a residence adjacent to Glacier Highway between Auke Bay and Lena Cove. Noted sound sources were vehicular and helicopter traffic, birds, and rain. A second meter was placed at a residence adjacent to the Glacier Highway south of Auke Bay. The noted sound source was vehicular traffic. The measured noise levels at this location were above the NAC thresholds of 67 dBA. The higher noise levels were associated with greater traffic volumes that included heavy trucks and buses that do not regularly travel north of the ferry terminal at Auke Bay. Both locations had sound level measurements that were dominated by traffic noise, with peak traffic noise occurring between 5:00 p.m. and 6:00 p.m.

Seven short-term measurements were collected on the Juneau road system including side yards at homes along Glacier Highway and at Bear Lair Cabin, Adlersheim Wilderness Lodge near Yankee Cove. Measurements varied from 45 dBA at the Bear Lair Cabin to 70 dBA at 4150 Glacier Highway overlooking Egan Drive near downtown.

Downtown Haines is mostly commercial with some residences, motels, schools, and a public library. Residences are scattered from the end of Mud Bay Road north to Haines and to the Lutak Ferry Terminal. Residences abut the existing roadway where the proposed West Lynn Canal Highway would intersect Mud Bay Road.

On September 10, 2003, a long-term sound measurement was collected in Haines adjacent to Lutak Road. The sound sources included vehicular traffic, boats, birds, distant aircraft, and rain. Measured sound levels ranged from about 40 to 50 dBA.

Six short-term measurements were collected at five locations in Haines. Those locations included a residence near the Alternative 3 crossing of the Chilkat River/Inlet, the camping area at Portage Cove State Recreation Site, downtown Haines between Soap Suds Alley and Portage Street, and the Haines School on 3rd Avenue adjacent to the playground. Noise levels varied from 43 dBA at the Portage Cove State Recreation Site to 57 dBA at Haines School located downtown.

Five short-term measurements were collected at four locations in downtown Skagway, including the front yards of residences at Spring Street and 10th Avenue and Main Street between 15th and 17th avenues, mid-block on 22nd Avenue between Main and State streets, Historic Moore Homestead, and Pullen Creek Shoreline Park. Recorded levels varied from 44 to 57 dBA, except for one peak measurement of 70 dBA caused by a barking dog in close proximity to the meter.

Additional information on noise can be obtained in the *Noise Analysis Technical Report* (Appendix L).

3.2.7 Hazardous Materials

A new Initial Site Assessment (ISA) was prepared in 2003 for the project area to determine the potential for encountering hazardous materials during construction of any alternative. The objective of the ISA process is to evaluate, based on readily available information, whether hazardous materials or petroleum products are likely to be present along the project corridor or are likely to exist in the future due to on-site or nearby activities or problems. Hazardous materials include soil and groundwater contamination due to leaking underground storage tanks, aboveground storage tanks, pesticides, and other chemical discharges.

The ISA was prepared in general accordance with the corridor screening requirements as defined by AASHTO Hazardous Waste Guide for Project Development (AASHTO, 1990) and FHWA guidance documents on hazardous materials (FHWA, 1988 and 1997).

Known and potential hazardous material sites in the project area were identified through review of federal and state databases, agency interviews, aerial photography, and site reconnaissance. Minimum search distances and the types of databases required for review were based on American Society for Testing and Materials (ASTM) standard E2247-02.

Based on the site visits, agency interviews, and federal and state database review, 29 sites were identified in the vicinity of the original Supplemental Draft EIS alternatives on the east side of Lynn Canal and three were identified in the vicinity of the West Lynn Canal alternative (Figure 3-13). Sites were given a hazard rating of high, medium, or low. A high hazard rating was given to sites where commercial quantities of fuel or hazardous materials were used or stored at the site and there is a high potential for soil or groundwater contamination. A medium hazard rating was given to sites where commercial quantities of fuel or hazardous materials were used or stored at the site but further investigation would be needed to determine if there is soil or groundwater contamination. A low hazard rating was given to sites where only small quantities of fuel or hazardous materials were used or stored at the site and there is no existing evidence of spills or if there was a spill it was remediated to the satisfaction of regulatory agencies. No hazardous waste treatment, storage, or disposal sites exist within the project corridor. Contaminants of concern at the identified sites were predominantly petroleum hydrocarbons (e.g., fuel oil, gasoline, or diesel fuel).

Two EPA Comprehensive Environmental Response, Compensation, and Liability Act-listed sites are located in Skagway. Both the Skagway/Nahku Ore Terminal and WP&YR Railroad Yard sites had documented lead and zinc soil and marine sediment contamination from former ore management and transport activities associated with the railroad and dock facilities in Skagway. Cleanup actions at these sites have removed most of the lead and zinc contamination in surface soils within Skagway. The WP&YR Railroad maintenance yard also has known volatile organic compound contamination in soil and groundwater from former railroad maintenance activities at the railroad yard.

The Kensington beach facility, which has a medium hazard rating, is located about 150 feet from the alignment for Alternative 2B at Comet. This facility contains three 20,000-gallon above ground diesel fuel storage tanks. There have been no reported spills from these tanks (ADEC, 2003a and 2003b).

The AT&T Alascom Sullivan River Microwave Repeater Station is located 1 mile north of the Sullivan River and within 600 feet of the centerline for the Alternative 3 alignment. This station has a medium hazard rating because commercial quantities of diesel fuel are stored there in tanks. These tanks have leaked in the past but the spilled fuel has been cleaned up to the satisfaction of ADEC (ADEC, 2003a). For specific information on the ISA findings, ISA methodology, and identified hazardous materials sites, refer to the *Initial Site Assessment Technical Report* (Appendix M).

3.3 Biological Environment

3.3.1 Wetlands

Waters of the U.S., including wetlands, are regulated by the USACE under the authority of the Clean Water Act. Wetlands are defined in the following excerpt from the federal Clean Water Act:

> [Wetlands are] … those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

The Lynn Canal study area contains 13,710 acres of wetlands and aquatic beds (e.g., lily ponds). The USFWS National Wetlands Inventory (NWI) has mapped wetlands in the region. The inventory has grouped wetlands into general wetland classes or complexes. The predominant wetlands in the project area consist of palustrine forested and scrub-shrub wetlands (and combinations) with an area of 10,562 acres, and palustrine emergent and palustrine emergent and emergent/scrub-shrub wetlands with an area of 2,152 acres. The combination of these classes of wetlands comprise about 93 percent of all wetlands in the project study area.

The least common wetlands in the study area consist of 966 acres of estuarine emergent wetlands and 30 acres of palustrine aquatic bed/open water. These wetlands comprise 7.1 and 0.2 percent, respectively, of all wetlands in the project area.

In the study area, the largest wetland areas occur on the east side of Lynn Canal at the northern end of Berners Bay and on lowlands between Slate Cove and Sherman Point (Figures 3-14 through 3-18). At the north end of Berners Bay, the Antler and Berners rivers and their tributaries support an extensive area of palustrine scrub-shrub, palustrine emergent, estuarine flooded and emergent, riverine flooded, and palustrine forested wetlands. Forested wetlands cover large areas between Slate Cove and Sherman Point with patches of emergent and scrub-shrub wetlands in depressions and areas of groundwater discharge. On the west side of Lynn Canal, the most extensive wetlands in the study area are present in the Endicott River and Sullivan River areas (Figures 3-16 through 3-18). The Davidson Glacier outwash plain supports a large number of relatively small wetlands and water bodies that have formed in the alluvial material including emergent wetlands, ponds with emergent or floating vegetation, and open water habitats.

The 1997 Draft EIS identified wetlands using existing USFWS NWI maps with some additional wetland field determinations performed in specific areas in accordance with methods presented in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). The NWI groups wetlands into classes or complexes.

The alternatives evaluated in the 1997 Draft EIS have been modified and new alternatives are being evaluated. Agency comments on the 1997 Draft EIS, as well as 2003 scoping comments for the Supplemental Draft EIS, indicated that further analysis was needed for the proposed project. For these reasons, a new wetlands analysis was conducted in 2003. This analysis focuses on wetlands in the immediate vicinity of the alignment for project alternatives.

The 2003 wetland analysis was based on new fieldwork and wetland delineations that were conducted in 2003. The following scope and methods for the 2003 wetlands assessment were agreed to by the USACE, USFS, NMFS, USFWS, EPA, and ADNR Office of Habitat Management and Permitting (OHMP).

- **Methodology** – Wetlands were assessed as individual wetlands rather than complexes. Wetlands identified in the field were mapped and photographed. Soil profiles and site hydrology were evaluated and NWI classification was verified. A field data sheet was prepared for each wetland using the USACE 1987 methodology. A wetland functional assessment data form was also completed for each wetland based on the modified Adamus method used in a recent Juneau International Airport wetlands assessment (SWCA Environmental Consultants, 2002).
- **Fieldwork Locations** – Field surveys were conducted at individual wetlands that the proposed alignments or ferry terminals would impact in the following areas: Berners Bay, Katzehin River, William Henry Bay, Endicott River, Sullivan River, Davidson Glacier area, and Pyramid Island. Existing data were reviewed for background information on the project areas prior to the 2003 field investigation to assist in the delineation and evaluation of wetlands. The NWI maps and aerial photography were used to prioritize field survey site locations where additional investigations were needed. Areas that appeared to have extensive wetland coverage, high value wetlands, or questionable coverage were given the highest priority. In these priority areas, NWI wetlands within 300 feet of an alternative alignment were field checked and evaluated for functions and values. All proposed ferry terminal sites were evaluated for wetland and/or marine impacts.

Field methods for verifying wetland classification and boundaries were based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetlands hydrology, as outlined in the USACE Wetlands Delineation Manual. Information on general site hydrology was interpreted from aerial photographs. On-site observations of wetland hydrology included the following criteria: inundated or saturated soils, landscape position, oxidized or reduced root channels, or sediment and debris deposits from previous flooding. Qualitative field notes of functions and values were recorded on a modified version of the Juneau Airport EIS Wetland Functional Assessment Data Form.

The combination of field notes, aerial photography interpretation, and global positioning system (GPS) coordinates were used to develop wetland maps of the project area. Delineations of wetlands not recorded on the ground are primarily based on NWI delineations and aerial photography interpretation. Of the 116 wetland areas potentially impacted by project alternatives, 51 were field checked. This represents approximately 67 percent of the wetland acreage potentially impacted.

3.3.1.1 Wetland Classifications

The classification of wetlands in the project area follows the NWI Classification System and includes both freshwater and saltwater-influenced wetlands. Palustrine wetlands are nontidal wetlands with vegetation either dominated by persistent emergent vegetation ("emergent"), shrubs ("scrub-shrub"), or trees ("forested"), or by water bodies that lack such vegetation and have relatively shallow water ("aquatic bed/open water"). Estuarine emergent wetlands, or salt marsh communities, consist of salt-tolerant vegetation in areas that are subject to tidal inundation and extend to the seaward limit of emergent vegetation and/or upstream where the ocean-derived salts measure less than 0.5 percent during low-flow periods. Figures 3-15 through 3-18 identify the locations of these wetlands within the project area.

Palustrine Emergent Wetlands – Palustrine emergent wetlands within the project area primarily occur in association with groundwater seeps (marshes or fens), muskeg or bog environments, and areas that are flooded to the extent that tree and shrub growth is inhibited. Sedges (*Carex* spp.) are typically the dominant species, with cottongrass (*Eriophorum* spp.) and water horsetail (*Equisetum fluviatile*) also found. These areas have a low shrub component of

Labrador tea (*Ledum groenlandicum*), bog blueberry (*Vaccinium uliginosum*), or cloudberry (*Rubus chamaemorus*). Emergent wetlands are often components of larger wetlands complexes of scrub-shrub and forested wetlands and aquatic bed/open water features.

Palustrine Scrub-Shrub Wetlands – Scrub-shrub wetlands are dominated by shrubs and/or trees that are less than 20 feet tall. These wetlands are typically associated with muskegs and floodplains along rivers and streams. In the project area, scrub-shrub wetlands are dominated by either deciduous species such as Sitka alder (*Alnus sitchensis*), thinleaf alder (*Alnus tenuifolia*), and willow (*Salix* spp.) along rivers and streams. In muskeg environments, the common species include shore pine (*Pinus contorta*), mountain hemlock, and western hemlock (*Tsuga mertensiana*). Smaller shrubs in these communities include Labrador tea, deer cabbage (*Fauria crista-galli*), Alaska blueberry (*Vaccinium alaskaensis*), bog blueberry, and cloudberry.

Palustrine Forested Wetlands – Forested wetlands are dominated by trees taller than 20 feet and typically consist of layers of trees, shrubs, and herbaceous vegetation. Tree species found in the forested wetlands within the project area include mountain hemlock, western hemlock, and Sitka spruce (*Picea sitchensis*). The shrub understory consists of rusty menziesia (*Menziesia ferruginea*), tall blueberry (*Vaccinium ovalifolia*), and Alaska blueberry. The ground cover species layer is dominated by Canada bunchberry (*Cornus canadensis*), skunk cabbage (*Lysichiton americanum*), spleenwort-leaf gold thread, Alaska goldthread (*Coptis asplenifolia, C. trifolia*), and false lily-of-the-valley (*Maianthimum dilatatum*). Broad-leaved forested wetlands are found along river floodplains and are dominated by black cottonwood (*Populus balsamifera*) with typical understory species of willow and alder. Forested wetlands, mostly of the needle-leaved evergreen subclass, occupy the greatest area of wetland land cover within the project area.

Palustrine Aquatic Bed/Open Water – Palustrine aquatic bed wetlands are permanently flooded areas that contain vegetation that grows on or below the surface of the water for most of the growing season (Cowardin et al., 1979). These communities are considered “vegetated shallow” under the Clean Water Act. Dominant vegetation in aquatic bed wetlands of the project area consists of floating-leaf pondweed (*Potomageton natans*), northern burreed (*Sparganium hyperboreum*), and yellow pond lily (*Nuphar polysepalum*). Palustrine aquatic bed habitats are relatively scarce in the project area.

Estuarine Emergent Wetlands – Estuarine emergent wetlands, also called salt marshes, are found within the intertidal zone and are present in the project area. These areas vary in species composition depending on exposure to saltwater. Vegetation of upper beach areas consists of beach rye (*Leymus arenarius*), silverweed (*Argentina anserina*), beach pea (*Lathyrus japonicus*), and Lyngbye’s sedge (*Carex lyngbyei*); the substrate is mostly gravel and sand. Salt-tolerant forbs, such as seaside arrowgrass (*Triglochin maritimum*) and seaside plantain (*Plantago maritima*), occupy the areas irregularly exposed to salt water. Areas more frequently inundated support salt-tolerant alkali grass (*Puccinella* spp.), sea milkwort (*Glaux maritima*), and salt brush (*Atriplex alaskana*).

Marine Areas – Unvegetated intertidal flats, beach bars, and rocky shores are also included in the NWI and are classified as estuarine wetlands. They do not meet the USACE definition of wetlands and are therefore classified as other waters of the U.S. Rocky shores are the most extensive intertidal habitats in the project area and occur along extensive areas on both sides of Lynn Canal. Beach bars are found on active beaches with unconsolidated substrate. Descriptions of potentially impacted marine sites, including subtidal areas, are presented in the *Essential Fish Habitat (EFH) Assessment* (Appendix N).

3.3.1.2 Distribution Within the Project Area

The East Lynn Canal wetlands are bounded by the Juneau icefields to the east, the Lynn Canal marine waters to the west, Skagway to the north, and the northern extent of the Glacier Highway to the south. Approximately 11,259 acres of wetlands lie within the eastern side of the study area. Palustrine forested wetlands make up over half of the wetlands in this area (Table 3-4).

The greatest amount of wetland coverage extends from Slate Cove on the north side of Berners Bay to Sherman Point, where forested wetlands dominate with smaller amounts of muskegs or emergent wetlands. The most extensive areas of estuarine emergent wetlands in this region occur at the head of Berners Bay, at the mouths of the Antler and Berners/Lace rivers, and on the Katzehin outwash plain. Unvegetated intertidal flats are also associated with these rivers and glacial outwash plains. Unvegetated rocky shorelines are extensive along the coast especially in the northern portions of East Lynn Canal between Sherman Point and Skagway.

Table 3-4
Project Area Wetlands by Type

Wetland Type	Acres (Percent of Total)		
	East Lynn Canal	West Lynn Canal	Total Project Area
Estuarine Emergent	574 (5.1%)	392 (16.0%)	966 (7.1%)
Palustrine Emergent	1,812 (16.1%)	340 (13.9%)	2,152 (15.7%)
Palustrine Forested	6,720 (59.7%)	1,039 (42.4%)	7,759 (56.6%)
Palustrine Scrub-shrub	2,133 (18.9%)	670 (27.3%)	2,803 (20.4%)
Palustrine Aquatic Bed	20 (0.2%)	10 (0.4%)	30 (0.2%)
Total Wetlands	**11,259**	**2,451**	**13,710**

The West Lynn Canal wetlands are bounded by the Lynn Canal marine waters to the east, the Chilkat Range in the northwest, and the eastern boundary of the Endicott River Wilderness Area to the southwest. The northern extent of the highway at Mud Bay Road in Haines acts as the northern boundary, and William Henry Bay is the southern boundary. Approximately 2,451 acres of wetlands lie within the western side of the study area.

Forested wetlands are the dominant wetland type, similar to the East Lynn Canal wetlands (Table 3-4). These wetlands are most extensive on Sullivan Island and in the Endicott and Sullivan River areas. The Davidson Glacier outwash plain is different from other sections of this coastline in that it has numerous small, wet depressions that support a diverse range of emergent wetlands, aquatic beds, and open water habitats. Estuarine emergent wetlands are primarily found at the mouths of small rivers and the outer fringes of the glacial outwash plains and river deltas. Intertidal rocky shores occur along most of the coastline between the major rivers and outwash plains. Unvegetated intertidal flats occupy the outer fringes of most outwash plains and deltas.

3.3.1.3 Wetlands Functions

Wetlands functions are “the physical, chemical, and biological processes or attributes that contribute to the self-maintenance of wetland ecosystems” (ASTM International, 1999). Wetlands also provide many benefits to society, depending upon the wetland types and their location, including both consumptive and non-consumptive uses. Values assigned to specific wetlands are generally estimates, sometimes subjective, of the importance of wetland functions to people, fish, wildlife, water quality, etc. Values often include social values. The discussion of values of wetlands will specify the degree of importance as well as the entity for which the function is important.

A modified version of the Adamus Resource Assessment, Inc., Wetland Evaluation Technique (WET) (Adamus, 1987; SWCA Environmental Consultants, 2002) was used to evaluate the wetlands in the project area. The Interagency Working Group of the Juneau Airport EIS revised this primarily freshwater assessment methodology to consider coastal wetlands (SWCA Environmental Consultants, 2002). During 2003 scoping, resource agencies determined that this would be an appropriate method for the Juneau Access Improvements Project. All wetlands affected by the project were rated from high to low for each of the following functions:

- Groundwater recharge
- Groundwater discharge/lateral flow
- Surface hydrologic control
- Sediment/toxicants retention
- Nutrient transformation and export
- Riparian support
- Disturbance of sensitive wildlife habitat
- Regional ecological diversity
- Erosion sensitivity
- Ecological replacement cost
- Downstream/coastal beneficiary sites

There are intermittent palustrine forested wetlands along the east shore of Berners Bay from Echo Cove to the Antler River that are apparently fed by groundwater seeps from the hillside. These wetlands have a moderate to low wildlife habitat function; they provide forage and cover for several species such as deer, brown bear, black bear, marten, goat (in winter), and many species of birds, as does the surrounding upland forest. Their principal function is groundwater discharge and lateral flow and nutrient transformation/export.

The estuarine emergent wetland at the head of Berners Bay has high wetland function ratings for wildlife habitat, riparian support, regional ecological diversity, and ecological replacement cost. This rating is based on the documented use of the area by wildlife and because the wetland type is limited in distribution in Berners Bay and likely receives substantial use by wildlife. Riparian support is also important to fish.

There is a broad band of palustrine forested wetlands at lower elevations between Slate Cove and Sherman Point. Large patches of emergent and scrub-shrub muskeg wetlands occupy the lowest elevations in this area with expanses of seasonally flooded emergent wetlands in low lands west of Slate Cove. While the forested wetlands have a moderate to low wildlife habitat function, the scrub-shrub muskeg provides blueberry foraging areas for bears as well as nesting and rearing habitat for songbirds in the summer. The principal function of these wetlands is sediment retention, groundwater recharge and discharge, and lateral flow.

The Katzehin River delta supports estuarine emergent wetland. These wetlands receive floodwaters and are rated high as wildlife habitat. The estuarine emergent wetland area is extensive in the Katzehin River outwash plain and a valuable habitat for wildlife. At the location of the proposed Katzehin Ferry Terminal, the intertidal rocky shore is rated high for fish and wildlife habitat. The rocky shore habitat north of the Katzehin River is extensive along the shoreline and a valuable habitat for fish and wildlife.

On the west side of Lynn Canal, between the Endicott River and the Davidson Glacier outwash plain, forested wetlands are the predominant wetlands. This area supports relatively large trees and is rated high for groundwater discharge, nutrient transformation, and wildlife habitat.

The Glacier River bisects the Davidson Glacier outwash plain, and the area supports a number of unique wetlands. Wetland types include emergent wetlands, ponds with floating vegetation, and open water habitats. They are generally rated high for groundwater functions, surface hydrologic control, and nutrient transformation and export. The groundwater and nutrient transformation and export functions are important to fish. The surface hydrological control is important for fish and wildlife, as it controls flooding and erosion.

Detailed wetland maps and additional information on wetland function ratings are provided in the *Wetlands Technical Report* (Appendix O) and in its addendum in Appendix W.

3.3.2 Marine and Freshwater Habitat (Including Essential Fish Habitat)

Lynn Canal is a long and deep fjord-like estuarine inlet surrounded by rugged glaciated mountains with deep V-shaped and U-shaped valleys. Many of the bays in the project area have narrow margins of hilly moraines, with small flat-bottomed valleys at their heads. Most slopes throughout the project area are steep. Elevation ranges from sea level to over 4,000 feet. The marine and freshwater habitats in Lynn Canal support a variety of animal and fish species.

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to assess the effects of their projects on EFH for commercial fish stocks in all life stages and associated habitats. This Act also calls for direct action to stop or reverse the continued loss of fish habitats. The Act requires consultation between NMFS, the Fishery Management Councils, and federal agencies to protect, conserve, and enhance EFH. Federal agencies are required to determine if their actions have a potential adverse effect on EFH and if so, they must prepare an EFH assessment. The Act defines EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Act considers *fish* to include finfish, mollusks, crustaceans, and other forms of marine life except marine mammals and birds. The Act defines *waters* as "aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish, where appropriate"; *substrate* as "sediment, hard bottom, structures underlying the waters, and associated biological communities"; and *necessary* as "the habitat required to support a sustainable fishery and a healthy ecosystem." In considering an *adverse effect* to EFH, Subpart J, Section 600.810 of the Act defines an adverse effect to EFH as "any impact, which reduces the quality and/or quantity of EFH."

This section provides a description of EFH in the project study area. The section also describes habitat for shellfish, prey species, and resident fish that are not commercial fish stocks covered by the Magnuson-Stevens Fishery Conservation and Management Act.

3.3.2.1 Marine Habitat in Lynn Canal

Marine habitats considered for evaluation in this Final EIS include intertidal and subtidal zones in Lynn Canal that would potentially be affected by fill placement and/or sidecasting from construction of a road or new ferry terminal, and offshore waters that would potentially be affected by ferry traffic. The marine habitats in Lynn Canal support many species of both resident and transient marine mammals, terrestrial mammals (river otter), seabirds, fish, marine invertebrates, and vegetation, all of which are discussed in detail in subsequent sections of this Final EIS.

Lynn Canal provides an essential migratory corridor for all five species of Pacific salmon (*Oncorhynchus* spp.), which includes all estuarine and marine areas used by the fish. Marine habitat in Lynn Canal exists for such marine fish as sablefish (*Anoploma fimbria*) (estuarine waters), sculpin (Cottidea) (intertidal and subtidal sites), Pacific herring (*Clupea pallasii*) (kelp and eelgrass for spawning), skate (Rajiidae) (Berners Bay subtidal areas), and forage fish (prey species; estuarine and marine waters) such as eulachon (*Thaleichthys pacificus*) (Berners Bay and surrounding rivers for spawning), sand lance (*Ammodytes hexapterus*), and capelin (*Mallotus villosus*) (Berners Bay for spawning).

Field surveys were conducted in 2003 to obtain information on intertidal and subtidal habitat composition in Lynn Canal. Fieldwork and assessment methodologies were developed in consultation with the USACE, USFS, NMFS, USFWS, EPA, ADNR (OHMP and ACMP), and FHWA in 2003. Based on preliminary consultation with NMFS, DOT&PF determined that the proposed project alternatives may adversely affect the following EFH fish species including specific life stages, and prey species:

- Pink salmon (*Oncorhynchus gorbuscha*), chum salmon (*O. keta*), sockeye salmon (*O. nerka*), coho salmon (*O. kisutch*), and Chinook salmon (*O. tshawytscha*) – eggs, fry smolt, and spawning adults
- Sablefish and other rockfish (*Sebastes* spp.) – adults; other life stages unknown
- Sculpin – eggs, juveniles, and adults
- Skate – adults; other life stages unknown
- Pacific herring – eggs, juveniles, and adults
- Forage fish (eulachon], capelin, and sand lance) – eggs, juveniles, and adults

Thirty-one subtidal areas were surveyed using the Seabed Imaging and Mapping System, which consists of a video camera that is towed just above the seabed and a video recording system that links GPS fixed locations to the imagery. Figure 3-19 shows the 14 general locations where these 31 subtidal surveys were conducted. Video data were classified for geological and biological features, providing a classification record for every two seconds of imagery.

Surveys of 49 intertidal sites were conducted during low tide from August 26 to 29, 2003. Forty-one of these sites were identified by DOT&PF as possible fill locations for highway construction. Four sites were investigated as representative of typical locations where, due to the steep terrain, rock from blasting would fall directly through the intertidal zone (uncontrolled sidecasting) or the locations would be used for intentionally controlled sidecasting. The remaining four sites are situated at potential ferry terminal locations.

Intertidal Habitat – The nearshore coast or intertidal zones surveyed in Lynn Canal consist mainly of sediment beaches (boulder, cobble, gravel, sand, and/or mud), bedrock cliffs, and vertical rock faces. There are also a few tidally influenced sloughs and estuarine wetland habitats. Some sites consist of one shoreline classification, while others are a combination of two or more classifications. Characteristics of the zonation and types of organisms observed can differ greatly among locations and depend upon many variables including wave exposure and slope of the beach.

The sediment beaches that exhibit a low slope angle tend to have vegetation and low to medium wave exposure. Sediment beaches tend to support a higher diversity of species than shorelines with a higher angle or harsher wave action. Species observed at these high-angle sites form conspicuous bands or belts of varying widths (zonation).

Bedrock cliffs or vertical face shorelines can likely support prey species for many marine and anadromous species known to inhabit the study area. Due to their morphology, these sites are not important for the spawning, breeding, or growth to maturity for these fish species.

The nearshore waters of the intertidal zone are used by forage fish species (e.g., eulachon and capelin) for consumption of intertidal prey; some anadromous fish for consumption of prey as well as spawning and/or rearing; marine birds for feeding and/or nesting; and river otters, harbor seals, and Steller sea lions for feeding and haulouts. The project vicinity contains the following intertidal habitat areas:

- **Sawmill Cove** – Vegetation coverage was linked to gravel presence. The rocky points at the north and south headlands of the cove are covered with dense *Fucus* (rockweed) to about the zero foot tidal elevation. In the lower intertidal zone, rockweed is interspersed with two kinds of large-bladed kelp (*Lamanaria saccharina* and *Agarum clathratum*). Foliose red and green algae and filamentous green algae are also present in the intertidal zone. Intertidal fauna was composed of barnacles, mussels, and anemones. Siphons of many mollusks were observed during a field survey.
- **Slate Cove** – No intertidal vegetation or fauna were observed.
- **Katzehin Ferry Terminal Area** – The intertidal area is a boulder-cobble-pebble dominant zone. Vegetation observed included stalked kelps in one location, foliose green algae, filamentous red algae, and rockweed.
- **Taiya Inlet** – Typical zonation was observed on the rocky cliffs and bedrock outcrops in Taiya Inlet and on the boulder beaches north of the Katzehin River.
- **William Henry Bay** – The intertidal area has gravel with boulders and cobbles along the western shore and mostly pebbles to the south. Intertidal vegetation observed included bladed kelps, coralline red algae, rockweed, filamentous red algae, and foliose red algae. Intertidal fauna observed included barnacles, blue mussels, sea cucumbers, and green urchins.

Subtidal Habitat – Subtidal areas are the areas extending below the intertidal zone along the seabed toward the offshore region. The substrate in the subtidal areas surveyed in Lynn Canal consists of boulders, cobbles, gravel sediments, and mud. Fish, invertebrates, and vegetation are present in the subtidal area; the concentrations of these species depend on the type of substrate. Offshore regions consist predominantly of mud and sand with a minimum of vegetation, but observable populations of burrowing mollusks and fish occur. The subtidal areas nearer to the shore consist of a mixture of sandy and rocky substrates, with boulders and cobbles more concentrated toward the shore. The rocky substrates support a higher diversity of sessile fauna (e.g., cup corals and sea anemones) as well as mobile species (e.g., crabs and urchins) and algae (e.g., kelps and coralline reds). Areas where subtidal habitat surveys were conducted are noted on Figure 3-19. Site-specific observations are presented below.

- **Sawmill Cove** – A 500-by-1,600-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 100 feet. The seabed is composed almost exclusively of clastic sediment (muds, sand, and gravels) with occasional large cobble. Gravel content is highest in the intertidal zone and drops off rapidly in the offshore where sands and muds predominate. Rockweed was interspersed with large-bladed kelp. One species of this kelp (*Laminaria saccharina*) was sparse but persistent and evenly distributed throughout the site. No eelgrass, floating kelp, or giant kelp were noted at the site. Subtidal fauna included sea whips (*Halipterus* sp.), one location of orange sea pens, and one location with a bivalve and brozoan complex concentration. Mobile species were also recorded including yellowfin sole, rock sole, gunnels, snake pickleback, sculpin, sand lance, and a large school of young Pacific herring.

- **Slate Cove** – A 980-by-2,600-foot area was surveyed from the intertidal zone (at approximately +6 foot tidal elevation) to a depth of 125 feet. The site has a highly uniform seabed consisting of mud. A few boulders and cobbles were observed. No sea grasses or kelps were noted. Subtidal fauna was sparse with a few unidentified fish, a few flatfish, and one anemone observed.

- **Representative East Lynn Canal Shoreline Between Comet and Katzehin River** – Surveys were conducted at three locations along the east coast of Lynn Canal between Comet and the Katzehin River. The surveys were conducted from the intertidal zone (from approximately +10 to -4 feet tidal elevation) to depths from 100 to 128 feet. This section of shoreline is very steep and has substrate with varying amounts of bedrock, sediment veneer over bedrock, and boulder-cobble-gravel sediments. Shell fragments were noted throughout the survey areas. Coralline red algae were common at all three survey areas, whereas bladed kelps, fucus, filamentous red algae, and foliose red algae were uncommon. Bryozoan complexes dominated the deeper areas of all three areas. Unidentified fish were common at two of the areas, and anemones, sea whips, and mottled stars were uncommon at all three areas. Green urchins were common in the intertidal zone at two survey areas and uncommon at the other. Barnacles and mussels were noted but uncommon.

- **Katzehin Ferry Terminal Area** – A 660-by-2,600-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 85 feet. The subtidal seabed is composed of a muddy zone. No vegetation was observed. Subtidal fauna was sparse with a few unidentified fish, a few flatfish, and a single anemone.

- **Taiya Inlet** – Two types of subtidal habitat were surveyed in the Taiya Inlet as representative of habitat potentially impacted by rock sidecasting. The first type represents a scenario where rock would land on an underwater outcrop (or ledge) of rock. The second represents a scenario where rock would fall into marine water with steep-sided shores. A survey area north of the Katzehin River where underwater bedrock outcrops were observed in deeper water represents the underwater outcrop scenario. The survey was conducted from the intertidal zone (from +6.5 foot tidal elevation) to a depth of 125 feet. Intertidal substrate was mostly boulder-cobble with offshore substrate mostly gravelly mud/sand. Shell fragments were sparsely distributed with higher concentrations associated with bedrock areas. Vegetation cover was restricted to the intertidal area and dominated by bladed kelps and coralline red algae. At depths greater than 50 feet, mussels, shrimp, and unidentified urchins were common. Green sea urchins, crab, snails, unidentified fish, and flatfish were noted but uncommon.

  Five steep-sided sites were surveyed in the Taiya Inlet. The surveys were conducted from the intertidal zone (0 foot tidal elevation to +11.5 foot tidal elevation) to depths from 100 to 148 feet. The shoreline was steep with variable substrate. Bedrock dominated the intertidal and shallow subtidal areas. Subtidal areas had rock with sediment veneers over bedrock. Shell fragments were common (30 to 50 percent coverage). Vegetation was observed in the shallow subtidal areas and primarily consisted of coralline algae, foliose green algae, fucus, filamentous red algae, and bladed kelp. Vegetation covers were typically low (e.g., one site had 25 percent coverage). Barnacles and mussels were common in the intertidal area, and shrimp were common in the subtidal areas. Sea urchins, anemones, bryozoan complexes, and fish were observed but were not common.

- **William Henry Bay** – A 1,300-by-3,000-foot area was surveyed from the intertidal zone (at approximately +10 foot tidal elevation) to a depth of 70 feet. Fines rapidly increased in the offshore direction, with sands and muds extending to the 30 to 50 foot depth and muds predominate in deeper water. Vegetation was restricted to depths of less than 50 feet. Subtidal vegetation observed included minimal amounts of bladed kelp and filamentous red algae. Subtidal fauna observed included sea cucumbers; orange sea pens, which were common on the northern end of the survey area (33- to 65-foot depth); sea whips; anemones, which were common at depths greater than 33 feet; mottled sea stars, which were common between three and 20 feet; 18 crabs; and flatfish, which were common and had 44 individuals observed at depths greater than 23 feet throughout the survey area.

For further information on the marine environment in the study area, see the *EFH Assessment* (Appendix N) and its addendum in Appendix W.

3.3.2.2 Freshwater Habitat in Lynn Canal

Freshwater habitat in the study area consists of mountain lakes and side streams that were formed mainly by glacier melt. Most of the streams drain directly into Lynn Canal. The mixture of steep and gentle terrain along Lynn Canal produces a variety of stream types and habitat for freshwater and anadromous fish species. Mountain lakes provide habitat for some mammals and amphibians.

Approximately 90 streams are within the proposed project area, and about 28 percent of these streams (13 on the east and 11 on the west side of the canal) are known to support anadromous fish species (ADF&G, 2003). Freshwater lake habitat in the area consists of high mountain lakes, which are usually surrounded by a variety of riparian vegetation.

Freshwater stream habitat in Lynn Canal consists of drainages within the deep V-shaped and U-shaped valleys that dominate the area. The river-carved V-shaped valleys lack the outwash region or floodplain characteristics of the more gently sloped U-shaped valleys, where many side channels and sloughs are usually located. Spawning habitat in the V-shaped valley streams is limited to the intertidal zone, and rearing habitat in these streams is usually limited to the main channel. Both of these features may restrict the variety of species able to use the area. The large, glacial, braided river systems contained within U-shaped valleys provide a greater potential for anadromous habitat located outside of the main channel. Side channels branch out into adjacent muskegs and floodplain areas associated with the river, providing varied and extensive rearing and spawning habitat within the river system, which promotes anadromous species diversity. Necessary characteristics of habitat required to support anadromous fish species include ample spawning and rearing habitat. Depending on the species, one or both of these habitat types can be the limiting factor in the successful reproduction of the species.

Anadromous fish habitat has been identified along the east side of Lynn Canal within Berners Bay (the Berners, Gilkey, Lace, and Antler rivers); at Sherman, Sawmill, Johnson, Slate, and Sweeney creeks; and the Katzehin River (Figure 3-19). Three unnamed anadromous streams also occur on the east side of Lynn Canal. The Katzehin, Lace, and Antler rivers are large glacial river systems in U-shaped valleys. Many of these anadromous streams also support resident fish populations. There are several smaller streams with the potential to support resident fish; the remaining streams along the east side of the canal provide poor fish habitat and/or have steep waterfalls.

Anadromous fish habitat exists within rivers contained in floodplains and U-shaped valleys along the west side of Lynn Canal. Anadromous streams found in William Henry Bay are the

Beardslee River and William Henry Creek. Other anadromous streams are the Endicott, Sullivan, and Chilkat rivers; Sullivan Creek; and six unnamed streams. As on the east side of Lynn Canal, many of the anadromous fish streams also support resident fish populations. Several smaller streams have the potential to support resident fish; the remaining streams along the west side of the canal provide poor fish habitat.

See the *Anadromous and Resident Fish Streams Technical Report* (Appendix P) and its addendum in Appendix W for additional information on stream habitat in the project area.

3.3.3 Terrestrial Habitat

The landscape in Lynn Canal is intensely glaciated, and the mountains are primarily densely forested with a typically undisturbed coniferous closed canopy system, interrupted in a few areas by river valleys and glacial outwash plains. The study area contains rugged topography with moderate to steep forested slopes, interrupted by raised benches, bare rock cliffs, and steep avalanche chutes.

Terrestrial habitat in the Lynn Canal study area consists mostly of coastal coniferous rainforest, which occurs throughout the study area and is characterized by an overstory dominated by western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), and some scattered mountain hemlock (*T. mertensiana*), Alaska or yellow cedar (*Chamaecyparis nootkatensis*), and red alder (*Alnus oregona*). The TLMP refers to this climax stage of the spruce/hemlock or hemlock forest habitat as old-growth forest. Large trees, decaying logs, lush undergrowth, and multiple canopy layers characterize old-growth forest habitat. There is a total of approximately 150,749 acres of old-growth forest in the study area, with 76,279 acres along East Lynn Canal and 74,470 acres along West Lynn Canal (USFS, 1997b). Old-growth forest typically extends from sea level to an elevation of approximately 2,500 feet, with subalpine and alpine habitats at higher elevations. In the typical Sitka spruce/western hemlock forest, the understory consists of shrubs such as Sitka alders (*A. crispa*), rusty menziesia (*Menziesia ferruginea*), blueberry (*Vaccinium ovalifolium and V. alaskensis*), red huckleberry (*V. parvifoloium*), salmonberry (*Rubus spectabilis*), shield ferns (*Dryopteris dilitata*), devils club (*Echinopanax horridum)*, and yellow skunk cabbage (*Lysichiton americanum*).

Deciduous forest or mixed deciduous/needleleaf forest communities are found in limited areas, primarily in association with floodplains of larger rivers. The dominant tree species in these areas are the black cottonwood (*Populus balsamifera*) with a shrub layer of Sitka alder (*A. crispa*), thinleaf alder (*A. tenuifolia*), and willow (*Salix* spp.).

Interspersed within the forest are open, poorly drained areas, including muskeg and bog communities. These wetland communities are discussed in Section 3.3.1 and described in the *Wetlands Technical Report* (Appendix O).

Shrub communities in the study area consist of open dwarf tree complexes, tall shrub communities, and low shrub communities. Dwarf tree communities are primarily dominated by mountain hemlock (*T. mertensiana*), smaller amounts of shore pine (*Pinus contorta*), and an understory of blueberry (*Vaccinium* spp.) shrubs. Tall shrub communities are found on steep slopes, along stream banks, and in floodplains. Dominant species on steep terrain typically include Sitka alder (*A. crispa*). A mixture of willow (*Salix* spp.), alder (*Alnus* spp.), and cottonwood (*Populus* spp.) is typically found near stream banks and floodplains of rivers such as the Antler River on the east side of Lynn Canal and the Endicott River on the west side of Lynn Canal. Low shrub communities are typically found in poorly drained bog habitat and are dominated by ericaceous shrubs such as Labrador tea (*Ledum groenlandicum*), crowberry (*Empetrum nigrum*), leatherleaf (*Chamaedaphne decumbens*), and deer cabbage (*Fauria crista-galli*).

The subalpine and alpine areas, with steep slopes and limited soil, support low shrub and dwarf shrub communities of blueberry (*Vaccinium* spp.), Aleutian heather (*Phyllodoce aleutica*), Arctic willow (*Salix arctica*), salmonberry (*R. spectabilis*), and a variety of grasses, wildflowers, ferns, and mosses. At elevations above the alpine vegetation, glaciers and snowfields dominate.

Herbaceous communities are typically found at lower elevations and consist of sedge/grass/forb meadow communities on outwash plains, wet meadow communities in poorly drained wetlands areas with emergent grasses, sedges (*Carex* spp.*)*, and cottongrasses (*Eriophorum* spp.). Herbaceous salt marsh communities occur in tidally influenced areas, typically at the mouth of rivers, streams, or along outwash plains, and are dominated by salt-tolerant species such as sea beach lyme-grass (*Elymus mollis*), beach lovage (*Ligusticum scoticum)*, seaside plantain (*Plantago maritima*), and seaside arrowgrass (*Triglochin maritimum*).

Surveys for plants listed as threatened, endangered, or proposed under the Endangered Species Act, and plants on the USFS Alaska Region Sensitive Species List were conducted in the summer of 2004 along portions of the alternative alignments where they would be likely to occur. None of these species were found in the surveys.

Three species of plants listed as rare by the Alaska Natural Heritage Program were identified during field surveys conducted in 2004 (URS, 2005). Paper birch (*Betula payprifera*) was found at seven locations on the east side of Lynn Canal and near William Henry Bay on the west side. Wild blue lettuce (*Lactuca biennis*) was found at two locations on the east side and near Cant Point on the west side. A small population of *Scheuchzeria palustris* was identified north of Sawmill Cove.

Three non-native plant species were found north of the Katzehin River. Two of these species, creeping buttercup (*Ranunculus repens*) and butter and eggs (*Linaria vulgaris*) are considered invasive.

The lands on both sides of Lynn Canal in the vicinity of project alternatives contain a few contiguous areas of high volume old-growth forest, as well as intermittent small areas of high and low volume old-growth forest. The TLMP contains a conservation strategy to maintain a forest-wide system of old-growth forest habitat, identifying a forest-wide system of large, medium, and small old-growth reserves. According to the criteria in TLMP, the old-growth reserve system must meet minimum size, spacing, and composition requirements, as follows:

- **Large old-growth reserves** – A large reserve must be 40,000 acres; 20,000 of those acres must be productive old-growth forest (over 8,000 board feet (BF) per acre). At least 10,000 acres of the productive old-growth forest should be in the high volume class (over 20,000 BF per acre).
- **Medium old-growth reserves** – A medium reserve is 10,000 acres; 5,000 of those acres must be productive old-growth forest. At least 2,500 acres should be in the high volume class.
- **Small old-growth reserves** – Small reserves are required in all value comparison units (VCUs) of the Tongass National Forest. Small reserves must be at least 16 percent of the area of the VCU, and at least 50 percent of that area must be productive old-growth forest. Each reserve should contain at least 800 acres of productive old-growth forest, but must contain a minimum of 400 acres of productive old-growth forest.

Evaluation of any modification of reserves must include consideration of Non-Development LUDs that have not been mapped but function as medium or large old-growth reserves to maintain the integrity of the old-growth forest ecosystem and contribute to a forest-wide system of reserves. Where the Non-Development LUDs do not fulfill size, spacing, and composition criteria of Old-Growth Habitat reserves, it would be necessary to add or modify old-growth reserves to meet the criteria.

There are six intermittent small blocks of high volume old-growth forest at or near the shore between Point Saint Mary and the Katzehin River. Two of the small intermittent blocks of high volume old-growth forest are within one mapped small old-growth reserve in the areas of Comet to Met Point (VCU 190), and four intermittent blocks of high volume old-growth are in the mapped small old-growth reserve in VCU 200. There are also several intermittent small blocks of low volume old-growth forest near the shoreline.

There are six small intermittent blocks of high volume old-growth forest on the west side of Lynn Canal in the vicinity of Alternative 3: one between William Henry Bay and Endicott River, four south of Sullivan River delta, and one opposite the middle of Sullivan Island. There are also several intermittent small and large blocks of low volume old-growth near the shoreline.

3.3.4 Marine and Anadromous Fish and Shellfish

The waters in the Lynn Canal area support anadromous, resident, and marine finfish, and shellfish. The varied and dramatic topography of the area provides habitat for a diversity of fish species along the canal. See Section 3.3.2 for habitat descriptions.

3.3.4.1 Marine Finfish

The following marine fish in the Lynn Canal were assessed for the Final EIS: sablefish, yelloweye rockfish (*Sebastes ruberrimus*), other rockfish (*Sebastes* spp.), sculpin, skate, Pacific herring, and forage (prey) fish (eulachon, capelin, and sand lance).

Sablefish spawn at depths of 984 to 1,640 feet near the edges of the continental slope. Larval sablefish move into shallow nearshore waters for the first one to two years of their lives and begin moving offshore again to the continental slope and deep-water coastal fjords. Young sablefish have been known to occur in Lynn Canal estuaries (e.g., Berners Bay). Sablefish are highly mobile during part of their life. Substantial movement between the Bering Sea/Aleutian Islands and the Gulf of Alaska has been documented. Larval sablefish feed on small zooplankton. Juveniles and adults are considered opportunistic feeders and feed on euphausiids, shrimp, cephalopods, squid, jellyfish, and other fish species.

Rockfish use three types of habitat: demersal shelf, pelagic shelf, and slope. Demersal shelf rockfish are nearshore bottom dwellers, inhabiting the continental shelf in rocky-bottomed areas. Pelagic shelf rockfish are nearshore schooling fish, inhabiting the continental shelf water column rather than along the ocean floor. Slope rockfish, which are deepwater species inhabiting the edge of the continental shelf, are unlikely to occur in Lynn Canal. Rockfish diet varies by species. In general, juvenile rockfish eat plankton and fish eggs, and adults feed on crustaceans and fish species.

Sculpins are bottom dwelling fish that lay adhesive eggs in nests against rocks. Larval sculpin are generally found in food-rich habitats, including fast-moving cold-water streams; rocky intertidal zones; and pier, wrecks, and reefs. Sculpin species have been caught near Skagway during marine and freshwater fish inventories and were observed in tidal pools during intertidal surveys conducted in 2003 for the Juneau Access Improvements Project. Sculpin feed on small invertebrates (e.g., shrimp, crab, barnacles), small flatfish, eelpouts, other sculpin, and smelt.

Skate inhabit inner and outer shelf areas, most commonly soft-bottom areas. Skates lay fertilized eggs on the ocean floor where they hatch and grow to maturity. Skates have been collected in Lynn Canal trawl surveys. Skate prey on pollock, shrimp, crab, small flatfish, sculpin, eelpouts, smelt, and other bottom-dwelling species.

Pacific herring spawn primarily in shallow, vegetated intertidal and subtidal areas. After spawning, adults move offshore to feed. The young rear in sheltered bays and inlets and appear to remain segregated from adult populations until they mature. Pacific herring currently spawn in Berners Bay. Young herring feed on small copepods and nauplii, diatoms, and ostracods, and change to feed on crustaceans and medium-size zooplankton as they mature. Adult herring feed on zooplankton, pollock larvae, sand lance, capelin, and smelt.

The Pacific herring population in Lynn Canal has been substantially reduced over the decades to the point that it is no longer a viable commercial fishery. Various hypotheses have been made about why the stocks have declined, although none have been substantiated by scientific analysis. These hypotheses include one or some combination of the following factors: overfishing, increased predator populations, disease, habitat alteration/degradation, water pollution, and unfavorable oceanographic conditions.

In a quantitative assessment of the frequency with which explanations have been attributed to herring stock collapses worldwide, Pearson et al. (1999) found that overfishing (74 percent of the cases) was the most frequently cited cause, followed by environmental change (50 percent of cases), changes in food supply (15 percent), predation (2 percent), disease (2 percent), and habitat modification (2 percent). In most cases, these factors were seen to have acted in combination with others; single-factor causes other than overfishing (37 percent) or environmental change (13 percent) alone were rare.

Overfishing may have played a role in the initial decline of Lynn Canal herring stocks. As previously noted, stocks were harvested at a relatively low rate (<1,000 tons) until stock declines led to a fishery closure in 1982. Harvest did occur in some seasons when minimum spawning biomass thresholds were not met, and the Lynn Canal stock may have been especially susceptible to brief periods of overfishing due to poorly understood factors, such as its limited migratory range.

Eulachon aggregate near the bottom of estuarine and riverine channels prior to their spawning migration to the lower reaches of rivers with moderate velocities. Eulachon mass spawn at night. Most adults die following their first spawning. Newly hatched larvae are quickly flushed to the marine environment by the river currents where they will remain for several weeks. Juveniles and adults feed on planktonic prey. Eulachon spawn in Berners Bay rivers and the Katzehin, Chilkat, Skagway, and Taiya rivers.

Capelin spawn in intertidal zones with coarse sand and fine gravel substrate. Very few adult capelin survive after spawning. Capelin feed on planktonic prey for the most part although marine worms and small fish are also consumed.

Sand lance spawn in coastal inshore waters. Newly hatched larvae and adults migrate offshore in early summer and return to inshore waters to overwinter. Sand lance feed in the water column on crustaceans and zooplankton when young and adults feed on fish larvae, amphipods, annelids, and common copepods.

3.3.4.2 Marine Shellfish

Shellfish species found in Lynn Canal include red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), golden king crab (*Lithoides aequispinus*), bairdi Tanner crab (*Chionoecetes bairdi*), Dungeness crab (*Cancer magister*), Pacific blue mussels (*Mytilus trossulus*), clams (*Macoma* spp.), and shrimp (*Decapoda* spp.). All of the shellfish except golden king crab inhabit the intertidal and subtidal zones at some time during their life history. Red and blue king, bairdi Tanner, and Dungeness crabs are all found at depths between the intertidal zone and approximately 600 feet (depending on their life stage), whereas golden king crabs are usually found much deeper, usually between 600 to 1,600 feet (ADF&G, 2004). Mussels and clams, which are less motile than crabs, are restricted to the intertidal and subtidal zones. Shrimp species inhabit varying depths and habitat types, but are generally found between the intertidal zone and depths of 1,800 feet.

3.3.4.3 Anadromous Fish

Anadromous fish occurring in the Lynn Canal study area were identified by a 1994 field survey of streams in Lynn Canal and a recent review of OHMP's Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes. The anadromous fish species found in Lynn Canal are all five Pacific salmon species (chinook, coho, sockeye, chum, and pink), steelhead/rainbow (*O. mykiss*) and cutthroat trout (*O. clarki*), Dolly Varden char (*Salvelinus malma*), round whitefish (*Prosopium cylindraceum*), and eulachon.

Depending upon the species, anadromous fish spend from one to several years rearing in freshwater (chinook, coho, and sockeye salmon; rainbow/steelhead and cutthroat trout; and Dolly Varden) or leave immediately upon emerging from the spawning gravels (chum and pink salmon). Still others move into fresh water with the tides, spawn, and return to saltwater (eulachon). Steelhead trout, rainbow trout that have spent a portion of their lives at sea, commonly spawn more than once, unlike salmon.

Chinook salmon tend to favor large river systems such as the Chilkat River for spawning and rearing, while sockeye seek out river systems that include lakes, such as the Berners, Chilkoot, and Chilkat rivers. Coho salmon will rear in lakes but are usually found in small streams that empty directly into saltwater. In the Lynn Canal area, round whitefish are found only in the Chilkat River system. Round whitefish are less tolerant of the marine environment than other anadromous species, so during spring and summer, they move from freshwater out to nearshore brackish waters to feed, and then in fall move upstream to spawn and/or overwinter.

3.3.5 Wildlife

Hundreds of wildlife species (mammals, birds, and amphibians) live within or pass through the study area for the Juneau Access Improvements Project. The 1997 Draft EIS primarily analyzed five species based on 1994 agency scoping comments. The Final EIS evaluates 29 species, including species identified in 2003 agency scoping comments. Some of these species were selected because they are listed on federal or state agency conservation plans. Other species are included because they are susceptible to the effects of highway construction or represent management concerns for similar species. The principal discussion on bald eagles is provided in Section 3.3.6. Federal and state threatened and endangered species (Steller sea lions [*Eumetopias jubatus*] and humpback whales [*Megaptera novaeangliae*]) are discussed in Section 3.3.7. Figures 3-20 through 3-23 depict wildlife and habitat locations.

Many species have been placed into various categories by the USFS, State of Alaska, or other agencies, according to multiple population characteristics, predictable responses to certain human activities, low abundance, or susceptibility to habitat disturbance or loss. The following subsections identify both the categories applicable to the species found in the study area and the species selected for analysis.

3.3.5.1 Species Selected for Analysis

During 2003 agency scoping, resource agencies identified species to be analyzed. The species selected for analysis were drawn from USFS management indicator species (MIS), USFS species of concern, USFS sensitive species list, state species of special concern, and other species identified by agencies of particular concern or representative of a group of species.

USFS Management Indicator Species – MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. The USFS recognizes limitations in the MIS concept but uses it to represent the complex of habitats, species, and associated management concerns for planning, assessment, and monitoring purposes (USFS, 1997b). Seven mammal species and one bird species identified for analysis are included in this category: mountain goat (*Oreamnos americanus*), Sitka black-tailed deer (*Odocoileus hemionus sitkensis*), river otter (*Lutra Canadensis*), marten (*Mares Americana*), brown bear (*Ursus arctos*), black bear (*U. americanus*), Alexander Archipelago wolf (*Canis lupus ligoni*), and bald eagle (*Haliaeetus leucocephalus*).

USFS Species of Concern – These species are considered vulnerable to habitat loss or overexploitation, at least on a localized basis. Species identified for analysis include four mammals and three birds: moose (*Alces alces*), Alexander Archipelago wolf, brown bear, marten, Queen Charlotte goshawk (*Accipiter gentiles*), marbled murrelet (*Brachyramphus marmoratus*), and great blue heron (*Ardea herodias*).

USFS Sensitive Species – These species are considered susceptible or vulnerable to habitat alterations and management activities to the extent that there is concern for the long-term persistence of the species. Two bird species identified for analysis fall under this category: trumpeter swan (*Cygnus buccinator*) and the Queen Charlotte goshawk.

State Species of Special Concern – This list includes species native to Alaska that have undergone a long-term decline in abundance or are vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance. The management goals for these species include preventing them from declining to endangered status and focusing conservation efforts on ecosystem and habitat-level problems. Six bird species and one marine mammal species are included for analysis under this category: American peregrine falcon (*Falco peregrinus*), Queen Charlotte goshawk, olive-sided flycatcher (*Contopus cooperi*), gray-cheeked thrush (*Catharus minimus*), Townsend's warbler (*Dendroica townsendii*), blackpoll warbler (*D. striata*), and harbor seal (*Phoca vitulina*).

Other Species – Species not included in the above categories but included in analysis for the Final EIS include two birds, one amphibian, and five marine mammals. Kittlitz's murrelet (*Brachyramchus brevirostris*) was petitioned for Endangered Species Act (ESA) listing in 2001 (Center for Biological Diversity et al., 2001). The USFWS designated this species as a candidate species in 2004[25]. Harlequin duck (*Histrionicus histrionicus*) is included as a representative species of the waterfowl that inhabit Lynn Canal. Wood frog (*Rana sylvatica*) is representative of other amphibians such as the spotted frog and boreal toad that inhabit Lynn Canal. Sea otter (*Enhydra lutris*), minke whale (*Balaenoptera acutorostrata*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), and killer whale (*Orcinus orca*) are

[25] Candidate species are plants and animals for which USFWS has sufficient information to propose them as endangered or threatened under the Endangered Species Act but for which development of a listing regulation is precluded by other higher priority listing activities. Candidate species are not subject to regulatory protection, and human activities that may effect them are not restricted.

included because they are found in Lynn Canal and they are species protected by the Marine Mammal Protection Act (MMPA) (16 USC 1361 *et seq.*).

3.3.5.2 Terrestrial Habitat Use

The dominant terrestrial cover type, Sitka spruce/western hemlock forest, provides habitat for a variety of both mammal and bird species. The presence of large trees, decaying logs, lush undergrowth, and multiple canopy layers that characterize the spruce/hemlock forest of the study area provide unique habitat for many species for foraging, resting, nesting or denning, and as escape cover from predators. Forested wetlands, muskegs and bogs, and emergent wetlands occur in small, isolated pockets or large expanses, provide openings or breaks in forest cover, and are important to the overall habitat diversity in the region by providing both food and cover for some species of wildlife.

Migratory birds are protected under the Migratory Bird Treaty Act of 1918, which regulates the taking of migratory birds and their eggs or nests, and the Migratory Bird EO (EO 13186), which encourages federal agencies to avoid or minimize to the extent practicable adverse impacts on migratory bird resources. Forest habitat is used as foraging and nesting habitat by a number of migratory birds, several of which are species of special concern such as the olive-sided flycatcher, gray-checked thrush, Townsend's warbler, and blackpoll warbler. Marbled murrelets also use the forest habitat for nesting. Resident forest-dwelling bird species such as woodpeckers, finches, sparrows, and thrushes also use these areas for foraging, nesting, and rearing young.

Brown bears use forest habitat for feeding (during the summer) and cover. Forest habitat is important for cover and foraging for black bears during the spring, summer, and fall and for denning during the winter. Black and brown bears are attracted to palustrine emergent and scrub-shrub wetlands for berry-producing shrubs, wetland grasses, sedges, and forbs such as skunk cabbage. Brown and black bears migrate to estuarine areas in the spring and again in the fall along well-established corridors (Christensen and Van Dyke, 2004).

Forested wetlands provide a variety of plant forage species not found in upland forests. Other key forest-dwelling wildlife species in the study area include the marten and Alexander Archipelago wolf, both of which require forest habitat for foraging and reproduction. Forested areas are important for the Sitka black-tailed deer, especially to avoid deep snow during the winter, after spending summer months in alpine and subalpine areas feeding on herbs and shrubs.

Emergent and scrub-shrub wetlands provide habitat for wildlife such as the Alaska wood frog and the boreal toad. Alaska wood frogs are common in various types of wetland habitat (Broderson, 1994).

Moose populations in the Berners Bay to Independence Lake watersheds and Chilkat Range use primarily riparian forest and tall shrub communities along rivers and floodplain areas as forage habitat in the winter, and closed canopy Sitka spruce/western hemlock forest for cover and to escape from deep snow.

The higher alpine and subalpine habitats support mountain goats during the spring and summer. During winter, goats use forest habitats for cover when snow forces them out of higher areas. Subalpine and alpine habitats are used by black bears to forage, brown bears to den (winter), and Sitka black-tailed deer to forage in the summer months. Kittlitz's murrelets nest at scattered sites located high on recently deglaciated rocky slopes. This species forages in glacially-fed waters during the breeding season.

Salt marsh habitats are one of the more important habitats in the region and support a large number of resident and migratory waterfowl and shorebird species at certain times of the year, as well as resident water bird species such as great blue heron. These areas are also important for terrestrial mammal species such as brown bear and black bear for scavenging and foraging on vegetation during the spring. The mudflats adjacent to estuarine wetlands provide a resting place for harbor seals and their pups during low tide.

Proximity to the shoreline along either exposed coastline (beach fringe) or along protected bays and coves (estuary fringe) is an important wildlife habitat feature. Beach fringe habitat, a mixture of both uplands and wetlands, has high seasonal value for black and brown bears, river otters, bald eagles, and Sitka black-tailed deer. Estuary fringe habitat consists of upland forest, palustrine wetlands, and often extensive estuarine wetlands (salt marsh). The estuarine fringe habitat along Berners Bay has been identified as potentially high value for many wetland functions, including habitat for disturbance-sensitive wildlife, and provides important habitat for moose, brown and black bear, and several species of migrant and resident waterfowl species. See the *Wildlife Technical Report* (Appendix Q) and its addendum in Appendix W for additional information on wildlife in the study area.

3.3.5.3 Marine Habitat Use

Marine habitats in Lynn Canal are used by marine birds, Steller sea lion, humpback whale, harbor seal, sea otter, minke whale, harbor porpoise, Dall's porpoise, and killer whale. Steller sea lion and humpback whale are discussed in Section 3.3.7. The marine birds and other marine mammals are discussed below.

A variety of marine birds and waterfowl use Lynn Canal throughout the year. Harlequin ducks, common and king eiders, oldsquaws, and several species of scoter winter along the coast of Southeast Alaska, including Lynn Canal. Mew gulls, kittiwakes, murres, and other marine birds feed on invertebrates and fish in the Canal.

Harbor seals occur in marine waters and estuaries throughout Alaska. They are most often found in water but come onto land to rest, birth, and care for their young. In the project study area, haulout sites include a number of sand bars and rocky beaches including sand bars in Berners Bay and at the mouth of the Katzehin River. Harbor seals feed on a variety of fish, including pollock, Pacific cod, Pacific sand lance, sculpins, salmon and flatfishes, and oily fish such as capelin, eulachon, smelt, and Pacific herring. Harbor seals reach sexual maturity between three and seven years of age and females bear one pup between May and mid-July. Natural predators include transient killer whales, Steller sea lions, and sharks (NMFS, 2003). The stock structure of harbor seals is currently being reviewed in light of new genetic information (Angliss and Lodge, 2003). Population estimates are not available for the project study area but harbor seals appear to be increasing in most areas of Southeast Alaska (Angliss and Lodge, 2003).

Minke whales are relatively small baleen whales (up to 31 feet long) and are found in all oceans of the world (Leatherwood et al., 1982). Two minke whale stocks are recognized in U.S. waters; Alaskan stock and the California/Oregon/Washington stock (Angliss and Lodge, 2003). Minke whales are not listed as threatened or endangered under the ESA nor are they listed as depleted under the MMPA. It is not known whether the whales that occur in Southeast Alaska are from the Alaskan or California/Oregon/Washington stocks. No population estimates exist for the Pacific population as a whole or for the Alaskan stock. Females in the North Pacific reach sexual maturity at approximately 24 feet (7.3 meters) in length; males reach sexual maturity between 21 and 23 feet (6.4 and 7 meters). Gestation time is estimated to be 10 months, resulting in birthing peaks from December through January and June through July (Horwood, 1990).

In Glacier Bay, west of the project study area, minke whale sightings of between five and eight individuals annually were reported between 1996 and 1999 (Gabriele and Lewis, 2000). From these numbers, relatively few minke whales are expected to occur in the project study area in Lynn Canal.

Research studies have identified 250 resident killer whales in Southeast Alaska as of 1999 (total for Alaska is approximately 745 residents). Of the four main pods that occur in Southeast Alaska, pods AF (42 individuals) and AG (24 individuals) are the most likely to occur in the project study area (Dahlheim et al., 1997). AF pod, the largest pod in the region, ranges from the inland waters of northern Southeast Alaska to Prince William Sound (Dahlheim et al., 1997). The number of transient killer whales that range within Southeast Alaska and B.C. waters includes approximately 219 individuals in several pods and assemblages (Dahlheim et al., 2000; Angliss and Lodge 2003).

Harbor and Dall's porpoises are odontocetes (toothed whales), like the killer whale. Based on aerial surveys, the most recent estimate (1977) of harbor porpoise numbers in Southeast Alaska, including Lynn Canal, is approximately 11,000 individuals. Dall's porpoises are endemic to the northern North Pacific Ocean and adjoining seas, inhabiting both nearshore habitats and pelagic deep waters over the continental shelf and the oceanic basins (Rice, 1998; Angliss and Lodge, 2003).

The range of the Southeast Alaska stock of sea otters extends from Cape Yakataga to the southern boundary of Alaska (Gorbics and Bodkin, 2001). Until recently, the species was not present in Lynn Canal, but they are now beginning to move into the project study area. Sea otter densities are still very low, and aerial surveys of northern Southeast Alaska for sea otters in 2003 did not cover Lynn Canal due to the low numbers.

3.3.6 Bald Eagles

The Bald Eagle Protection Act of 1940 prohibits the taking or possession of bald (and golden) eagles, their body parts, nests, or eggs, with limited exceptions for religious and scientific purposes. The definition of *take* includes to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb eagles. Regulatory authority resides with the Secretary of the Interior and is delegated to the USFWS. The Migratory Bird Treaty Act and the Fish and Wildlife Coordination Act also provide regulatory authority to the USFWS for the protection of bald eagles.

Bald eagles are abundant in Southeast Alaska, with a population estimated at more than 19,000 adults (Jacobson and Hodges, 1999). They are common, year-round inhabitants of the Lynn Canal area. During the summer months, nesting pairs disperse to nest sites along the coast. In winter, they tend to congregate in areas where food resources are plentiful.

Nesting pairs of bald eagles usually return to their previous nest sites or begin seeking a new site in early March. Most pairs will have chosen a nest site or constructed a new one by May. In Lynn Canal, nests are typically found in old-growth Sitka spruce trees within 700 feet of saltwater (Hodges and Robards, 1982). Some nests are occupied more frequently than others, and the productivity of each nest varies greatly. Only 25 to 55 percent of available nests are occupied during any given year. Bald eagles are most susceptible to disturbance during the breeding and nesting season, which in Lynn Canal begins in March and continues through August.

In 1994, USFWS biologists conducted surveys from a helicopter outfitted with recording GPS instruments. Nests were spotted from the helicopter, which then hovered over the nest for 10 to 30 seconds while the GPS location was recorded. The positions of nests within 0.5 mile of the alternative highway alignments were incorporated into the Geographic Information System (GIS) project database.

The USFWS has conducted annual nest surveys along the East Lynn Canal route since 1997 with funding and administrative support from DOT&PF. These surveys recorded the locations of all observed nests, including some nests that were more than 0.5 mile from the proposed highway alignments, and also recorded information on reproductive success at each site. The 1997 to 2005 East Lynn Canal surveys were conducted from helicopters and consisted of two flights per season. Because the West Lynn Canal Highway was determined to be a reasonable alternative in 2003, USFWS biologists conducted two similar surveys for nests along the west side of Lynn Canal during the summer of 2003. The 2003 survey identified at least 37 active bald eagle nests along the east side of Lynn Canal (out of 100 nest sites within 0.5 mile of the alignment). On the west side of Lynn Canal, at least 22 active nests were documented out of 45 nest sites within 0.5 mile of the alignment. The 2004 survey was flown on both the east and west side of Lynn Canal; 50 nests were located on the west side within 0.5 mile of the alignment, with 24 of those within 330 feet. In 2005, a survey was flown only on the east side along the Alternative 2B alignment. A total of 92 nests were within 0.5 mile of the alignment, of these 49 were within 330 feet. The locations of bald eagle nests relative to the highway alignments are shown in Figures 3-24 and 3-25 for the northern and southern ends of Lynn Canal, respectively.

The USFWS has conducted surveys to identify several key seasonal concentration areas for bald eagles within the study area (Jacobson, 2003). During spring and during spawning aggregations of certain fish species, eagle concentrations have been observed in Berners Bay, the Katzehin River, and the Endicott River. Similarly, in the summer months, the tributaries of the Lace and Berners rivers, the Katzehin River, the Endicott River, and the Chilkat River also have high bald eagle concentrations. In the fall, large numbers of eagles can be found in the Alaska Chilkat Bald Eagle Preserve feeding on late runs of chum salmon. Fish comprise the majority of the bald eagle diet. Eagles also prey on waterfowl, small mammals, sea urchins, clams, crabs, and carrion.

The USFWS is responsible for the conservation of bald eagles and has regulatory authority under the Bald Eagle Protection Act of 1940, as amended (16 USC 668–668d). This law prohibits the taking of bald eagles and the disruption of bald eagle nests. The Bald Eagle Protection Act applies to all nest sites, regardless of whether they are active in a particular year.

See the *Bald Eagle Technical Report* (Appendix R) and its addendum in Appendix W for additional information on bald eagles in the study area.

3.3.7 Threatened and Endangered Species

Threatened and endangered species are plant and animal species that have been determined to be in danger of extinction based on criteria established by the Endangered Species Act of 1973. The Act defines an endangered species as one that is likely to become extinct in the foreseeable future. A threatened species is defined as one in danger of extinction throughout all or a significant portion of its range. The Endangered Species Act requires federal agencies to ensure that their projects do not have an adverse effect on populations of species protected under the Act. Section 7 of the Act requires consultation with the appropriate federal agency (USFWS and/or NMFS) to ensure that the project is not likely to jeopardize a threatened or endangered species or its habitat.

Of the wildlife species known to occur in the study area for the Juneau Access Improvements Project, two are considered in the threatened and endangered species analysis: humpback whales (endangered), and Steller sea lions (two populations, one threatened and one endangered). Figure 3-20 identifies locations within the study area that are frequented by humpback whales and Steller sea lions. The Kittlitz's murrelet listed as a candidate species by the USFWS in 2004 is also included in the wildlife analysis.

3.3.7.1 Humpback Whale

Humpback whales were decimated by commercial whaling until the International Whaling Commission imposed a moratorium in 1965. Humpback whales were listed as endangered under the ESA in 1973 and were consequently listed as depleted under the MMPA. Humpback populations are currently divided into management stocks based on their fidelity to particular summer and wintering grounds. The whales that spend the summer and fall in Southeast Alaska tend to winter in Hawaiian waters and are considered part of the Central North Pacific stock (Angliss and Lodge, 2003). Surveys conducted in Hawaii during the early 1990s provided an estimate of about 4,000 whales in this stock, with an estimated 961 whales migrating to Southeast Alaska in summer (Angliss and Lodge, 2003). NMFS is currently considering whether to designate the whales in Southeast Alaska as a separate stock under the MMPA, based on a lack of interchange with whales that summer elsewhere in the Gulf of Alaska (Angliss and Lodge, 2003).

3.3.7.2 Steller Sea Lion

The MMPA, as amended, gives management and regulatory authority for Steller sea lions to NMFS. The eastern stock of Steller sea lions, including the animals in Lynn Canal, are listed as threatened under the ESA of 1973 (16 USC 1531 et seq.). Only one site within the study area for the Juneau Access Improvements Project, the Gran Point haulout, has been designated as a Steller sea lion Critical Habitat Area (50 CFR 226.202). Under Section 7 of the ESA, as part of the consultations on the effects of the proposed project, DOT&PF agreed to monitor the use of the Gran Point haulout throughout the year. DOT&PF installed a remote video camera system in late 2002 to determine periods of Steller sea lion use.

There appears to be an east-west seasonal movement of Steller sea lions in Southeast Alaska waters. Calkins and Pitcher (1982) suggest that they shift from inside waters such as Lynn Canal that they use during the winter to more exposed outside waters in the summer breeding season. Pupping and breeding occur in rookeries on remote islands, rocks, and reefs in the Gulf of Alaska. Immature animals tend to disperse farther than adults, but as they approach breeding age, they have a propensity to stay in the general vicinity of the breeding grounds during the summer (Raum-Suryan et al., 2002).

Video camera monitoring at Gran Point in 2003 through 2005 indicates that Steller sea lions are typically present most days in the winter and spring months. Use of the haulout becomes more extensive in spring, with hundreds of animals present at the main haulout and smaller rocks within 500 yards to the north and south. Sea lions use other areas in Lynn Canal for haulouts, including one near Met Point. DOT&PF monitored the use of the Met Point haulout via commercial overflight in 1998, 2004, and 2005 and found that use of the haulout parallels use of the Gran Point haulout. Sea lions are also known to congregate in areas with spring spawning aggregations of herring and eulachon, particularly in Berners Bay, the Katzehin Delta, and Chilkat River. Sea lions use a seasonal haulout at Point St. Mary during the spring run of herring and eulachon, then tend to move northward during fish runs in rivers farther north. During June, the numbers of sea lions at haulouts tend to drop. Typically from mid-July to early September, the haulouts are vacant or have infrequent use by small groups.

The *Steller Sea Lion Technical Report* (Appendix S) and its addendum in Appendix W includes additional information on Steller sea lions.

4.0 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

This chapter describes the likely direct, indirect, and cumulative effects of proposed project alternatives on the social, economic, physical, and biological environments of Lynn Canal. A substantial amount of the information on the potential environmental effects of project alternatives presented in the 1997 Draft EIS remains valid. To assist the reviewer, that information was carried forward in the Supplemental Draft EIS, as appropriate, and continues to be provided in the Final EIS.

The environmental impact assessment presented in this chapter is based on the following technical reports and addenda, as appropriate:

- *Alternative Screening Report*
- *Marine Segments Technical Report*
- *Traffic Forecast Report*
- *Technical Alignment Report*
- *User Benefit Analysis*
- *Land Use and Coastal Management Technical Report*
- *Visual Resources Technical Report*
- *Socioeconomic Effects Technical Report*
- *Household Survey Report*
- *Snow Avalanche Report*
- *Hydrology and Water Quality Technical Report*
- *Noise Analysis Technical Report*
- *Initial Site Assessment Technical Report*
- *EFH Assessment*
- *Wetlands Technical Report*
- *Anadromous and Resident Fish Streams Technical Report*
- *Wildlife Technical Report*
- *Bald Eagle Technical Report*
- *Steller Sea Lion Technical Report*
- *Air Quality Modeling Memorandum*
- *Indirect and Cumulative Effects Technical Report*[26]
- *Karst Technical Report*
- *Cultural Resources Technical Report*

The technical reports and their addenda contain detailed analyses that are summarized in this chapter. Except for the *Karst Technical Report* and the *Cultural Resources Technical Report*,

[26] The indirect part of this report continues to be used for the analysis in the Final EIS. The cumulative impact analysis in the Final EIS does not rely primarily on the technical report.

all of the technical reports are appendices to the Final EIS. These two technical reports are not being distributed to the public to protect sensitive resources. All of the technical reports have addenda in Appendix W except for the reports on alternative screening, marine segments, visual resources, household survey, hydrology and water quality, initial site assessment, air quality, indirect and cumulative effects, karst, and cultural resources.

This chapter begins with a discussion of the analytical methods used to evaluate potential project impacts. This discussion of methodology is followed by a discussion of the potential direct and indirect impacts of the proposed build alternatives, the potential cumulative impacts of the proposed project, the relationship between the local short-term uses of the project area and the maintenance and enhancement of long-term productivity, and the irreversible and irretrievable commitments of resources that would be involved in the proposed project.

4.1 Methods for Analyzing Impacts

This section presents a summary of the methodologies used for impact assessment. Impacts have been evaluated based on the projected environmental changes caused by the build alternatives relative to the No Action Alternative in 2008 and 2038, the planning years for this impact assessment. Technical reports for each environmental discipline prepared in support of the EIS only address direct impacts. Indirect and cumulative effects are addressed in Section 4.9 of the Final EIS. The Council on Environmental Quality (CEQ) regulations for implementing the NEPA define direct effects as those caused by the action and that occur at the same time and in the same place as the action (40 CFR 1508.8). Indirect effects are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8). Cumulative effects on the environment can result from the direct and indirect effects of an action in combination with other actions over time (40 CFR 1508.7). This chapter addresses direct and indirect impacts together in the individual alternative discussions. Cumulative impacts for all alternatives are discussed later in the chapter.

4.1.1 Land Use

The impact assessment approach for land use is the same as the approach that was used for the 1997 Draft EIS. The evaluation of impacts to land uses and the applicability of enforceable policies in the ACMP and district coastal management plans was based on a comparison of the project alternatives and temporary construction facilities with land use plans and policies. Potential improvements to existing ferry terminal facilities are not addressed in the impact analysis because no land use changes would occur at those locations.

> Note: In order to assess the maximum potential impact on land ownership, the land use assessment evaluates a 300-foot-wide corridor where alternatives would traverse federal or state lands, as this is the right-of-way width DOT&PF would prefer. In the past, the USFS has authorized right-of-way based on construction limits, which in most locations would be substantially less than 300 feet. DOT&PF would negotiate with the USFS on the actual right-of-way width.

Roadless Areas as a Resource – Roadless areas are a resource for future wilderness designation. The USFS uses three criteria for a wilderness evaluation: capability, availability, and need. For this assessment, potential impacts of project alternatives on roadless areas were evaluated on the basis of their effects to the elements of the capability criterion. The other two criteria, availability and need, pertain to USFS management issues and responsibilities that neither the FHWA nor DOT&PF can direct. Therefore, they were not used in the impact analysis. Elements or values of the capability criterion used in the impact assessment were natural integrity and appearance (apparent naturalness); opportunities for solitude and serenity, self-reliance, adventure, challenging experiences, and primitive recreation; wilderness attribute rating system; and scientific and education values.

4.1.2 Visual Resources

The visual impact assessment focused largely on the highway alignments included in project alternatives because improved ferry service would not alter landscape quality except in localized areas where new alternative ferry terminals could be constructed. Visual inventories were based on the existing Tongass National Forest database. Potential impacts of project alternatives on visual resources were based on management directives in the TLMP with a focus on LUDs, specifically the Transportation and Utility Systems LUD. In addition, VQOs of LUDs adjacent to the Transportation and Utility System LUD were accounted for in the analysis. A field review was conducted in the summer of 2003 to obtain photographs to develop visual simulations of the most current alternative highway alignments. The viewpoints for field photography as well as the final viewpoints for visual simulations were coordinated with the USFS. The impact assessment compared potential changes in visual quality in sensitive viewsheds resulting from proposed project alternatives.

4.1.3 Historical and Archaeological Resources

The APE of project alternatives was established in consultation with the SHPO. Field surveys were conducted on areas of the APE with a high probability of containing cultural resources. Areas with a low potential for containing cultural resources were surveyed by shoreline observations and aerial photography. FHWA made a determination of the eligibility for the NRHP of resources found during the field surveys. Potential disturbance or visual modification that could impact the cultural integrity of resources eligible for or on the NRHP was evaluated for each proposed project alternative, with additional consultation as required by the revised regulations for implementing the National Historic Preservation Act.

4.1.4 Socioeconomic Resources

Because socioeconomic conditions can change rapidly over time, a new analysis was prepared for the Supplemental Draft EIS. The Supplemental Draft EIS evaluates potential project-related impacts on the economy, public utilities, and the social environment of Lynn Canal. The new socioeconomic analysis was conducted using a combination of primary and secondary research. Primary research included interviews with Juneau, Haines, and Skagway businesses as well as government and other community representatives. In addition, interviews were conducted with state and local government agencies throughout the research process to gather data and assess the effects of the project alternatives. Secondary research used for the socioeconomic analysis included collection of published data and information prepared by local, state, and federal agencies as well as private-sector entities. Except where stated otherwise, economic effects are stated in 2003 dollars, as the analysis was conducted in 2003. These figures are not used to support other financial analyses of the project that were done for different years. By the nature of socioeconomic projections, the figures presented are relatively broad estimates and should be used to compare among alternatives instead of as absolute projections of dollar amounts. For further information on the socioeconomic assumptions and analysis, see the *Socioeconomic Effects Technical Report* (Appendix H) and its addendum in Appendix W.

4.1.5 Transportation

A traffic forecast analysis was conducted in 1996 in support of the 1997 Draft EIS. Forecasts of future traffic for various alternatives considered for the proposed project are difficult to prepare because no road currently exists linking Juneau to the U.S. or Canadian highway systems. For this reason, it is necessary to make some logical assumptions concerning the use of the highway alternatives. In the 1997 Draft EIS, a number of travel demand assumptions for the forecast were supported by a 1994 household survey (McDowell Group, Inc., 1994) conducted in Juneau, Skagway, and Haines regarding the importance of improved access to Lynn Canal communities and the amount of travel that would occur for different transportation modes. In response to the comments on the Draft EIS and the 2003 scoping comments for the Supplemental Draft EIS, another household survey was conducted in Juneau, Skagway, Haines, and Whitehorse in 2003 to obtain current information on the importance of transportation improvements and the projected travel on different transportation modes. In this 2003 survey, 365 households in Juneau, 150 in Haines, 104 in Skagway, and 100 in Whitehorse were contacted regarding their current travel patterns, needs, and preferences for potential transportation improvements in Lynn Canal (McDowell Group, Inc., 2003). The 2003 survey had fewer questions than the 1994 survey but there was sufficient overlap between the results of the two surveys to confirm that information in the 1994 survey is still valid.

The information obtained from the 1994 and the 2003 household surveys was used in the new traffic forecast analysis conducted for the Supplemental Draft EIS. The analysis also provided a more detailed analytical approach to estimating future traffic demand and the use of alternative modes of transportation. The traffic analysis took into account existing and unmet travel demand, travel costs, and travel time. The analysis was done in the following steps:

- **Baseline Conditions** – Baseline traffic (2002) in Lynn Canal was updated from the 1997 Draft EIS, including 2002 ferry (AMHS and private) passenger and vehicle traffic, air traffic, and barge traffic.
- **Market Components** – Baseline traffic was segregated into the following market components: Juneau residents, Haines and Skagway residents, other Alaska residents, Yukon residents, and other non-residents (i.e., travelers from outside of Alaska and the Yukon).
- **Traffic Volume Estimates** – The volume of traffic that would be induced or diverted from existing ferry service as a result of implementing the least-constrained transportation alternative in the Lynn Canal corridor (Alternative 2) was estimated by market component using the household surveys.
- **Travel Costs** – Travel costs were calculated for each project alternative.
- **Travel Demand Model** – A travel demand model was developed based on user costs and traffic for current ferry service and predicted traffic for the most direct and least restrictive mode of transportation. Model parameters included distance, speed, load/unload time, individual and vehicle fares, accident cost, value of time, and frequency delay time (a measure of schedule convenience).
- **Traffic Demand Estimates** – The travel demand model was used to estimate 2002 traffic demand for each leg of each project alternative. A leg is defined by each mode of travel required between Auke Bay in Juneau and either Haines or Skagway. For example, in the No Action Alternative there is only one leg between Auke Bay and Haines or one leg between Auke Bay and Skagway, as travel to either destination is accomplished in a single ferry trip. Alternative 3, the West Lynn Canal Highway, has three legs to Haines and four to Skagway.

- **Traffic Forecasts** – The traffic demand for each project alternative developed above was used in combination with growth rates in key traffic markets to forecast traffic by alternative in 2008 and 2038.

A user benefit analysis was prepared for the project in 2004. User benefits were estimated by the reduction in user costs compared to the user costs for the No Action Alternative. The costs included in the analysis were travel time; AMHS fares; vehicle operating, maintenance, and ownership costs; and accident costs. A life-cycle cost analysis was also prepared for the project.

In the user benefit analysis, future benefit and costs are discounted at a rate of 7 percent. This was the rate recommended in 2002 by the Federal Office of Management and Budget for evaluating federal programs whose benefits and costs are distributed over time. Different discount rates were used for the life-cycle cost analysis (which addresses only costs and not user benefits). For capital costs, a rate of 2.65 percent was used. This represented the State of Alaska's real borrowing cost for capital improvement projects in 2003. A 5 percent discount rate was used for operating costs. This represented the opportunity cost to the State of spending its own money in 2002 (5 percent is the projected total return of the Alaska Permanent Fund). An understanding of discounting is important because present value is an important tool in evaluating alternatives.

The concept of residual value is also important in understanding the present value of future benefits and costs. The cost of an alternative includes all the initial construction costs (ferries, terminals, highways) and on-going maintenance (for highways) and operations costs (ferries and terminals). Benefits include those enjoyed by travelers in terms of travel time-savings and reduced out-of-pocket travel expenses. In addition to these costs and benefits, a critical consideration is the future value of a capital investment made today. Each capital improvement has a useful economic life. The value of a capital improvement declines over time, until there is no value remaining at the end of its useful life. At any point in time, the capital asset's remaining value is referred to as its residual value.

In addition to a user benefit analysis, a life-cycle cost analysis was prepared. The life-cycle cost analysis addresses all costs associated with the project regardless of who pays. It does not evaluate any benefits. For both analyses, construction was assumed to begin in 2004 and be completed by 2008. A 30-year post-construction operation period was evaluated, resulting in a 35-year analysis period (2004/20038) for each alternative.

> Note: Initial construction costs have been updated to 2005 dollars in this Final EIS to reflect the actual funding that would be required to implement each alternative. The user benefit analysis and the life-cycle cost analysis are comparative analyses and therefore the use of 2004 estimates and 2004 dollars provides a consistent, equal treatment of all alternatives. The largest cost increases since the preparation of the user benefit and life-cycle cost analyses have been in steel and fuel. These increases would have the greatest effect on those alternatives that would use the most fuel, which are marine alternatives (see Section 4.7.6), particularly those with FVFs, and alternatives that have the highest proportion of their construction costs in steel vessels (Alternatives 4B and 4D). Incorporating 2005 cost changes into each analysis would change the overall numbers, but would not change the relationship between alternatives. Furthermore, the current high cost of fuel and steel relative to the overall cost of other materials and labor may be a short-lived phenomenon rather than a change that would persist through the construction period (in regards to steel) or the 30-year operation period (in regards to fuel). For these reasons, the user benefit and life-cycle cost analyses have not been revised and remain in 2004 dollars.

For further discussion of the assumptions used in developing these analyses, see the *User Benefit Analysis* (Appendix E) and its addendum in Appendix W.

4.1.6 Geology

The impact assessment for geology considered both the impacts of project alternatives on geologic resources and the potential effects of geologic hazards on project facilities. As indicated in Section 3.2.1.1, the only geologic resource of concern in the project area is karst on the west side of Lynn Canal.

Geologic hazards associated with alternative project facilities were identified in the *Reconnaissance Engineering Report* (DOT&PF, 1994b). Further geotechnical engineering investigations would be done during engineering design of the alternative selected for the project. This Final EIS provides an assessment of the effects of those hazards on alternative project facilities.

4.1.6.1 Karst

The karst impact assessment was conducted in four steps that take into account the TLMP, the Tongass Plan Implementation Team vulnerability criteria, and management objectives for karst resources. Those steps are:

- **Step 1 – Identification of Potential Karstlands and Features** – This step involved the compilation and review of available information and preliminary characterization to identify potential karst terrains and features.
- **Step 2 – Field Inventory of Karst Resources** – On completion of Step 1, a field inventory of karst resources and potential karst features was completed for the segments of the West Lynn Canal Highway alignment (Alternative 3) determined to be underlain by carbonate bedrock.
- **Step 3 – Delineation of Karst Hydrologic System and Catchment Area** – Concurrent with Step 2, hydrologic information was collected and synthesized with other data to define, to the extent necessary and practicable for the proposed land use, the karst hydrologic system and approximate recharge or catchment areas along West Lynn Canal. The objective of this step was to understand the karst hydrologic system well enough to assess and characterize potential project-related impacts to downgradient resources.
- **Step 4 – Assessment of Vulnerability to Management Activity** – Step 4 involved the processing and synthesizing of the data from Steps 1 through 3 to assess karst sensitivity to the relevant project alternatives and adjustment of the alignment where feasible.

4.1.6.2 Avalanche

The avalanche hazard associated with the highway alternatives for the proposed project was assessed in terms of the avalanche hazard index (AHI). The AHI is a dimensionless standard index number representing the probability of encounters between avalanches and vehicles on a highway and the likely resulting damage. It was developed in 1974 in Canada by the Avalanche Task Force and is published in its current form by Peter Schaerer (1989). The AHI provides a uniform standard for comparing the probability of an avalanche from one avalanche path to another. The standard is also useful for comparing highway avalanche hazards from one region or snow climate to another. The unmitigated AHI was determined for each alternative and compared to several highways in North American. The North American standard for this hazard was used to determine appropriate mitigation measures and a mitigated AHI was calculated.

4.1.7 Hydrology and Water Quality

Where project alternatives would encroach on base floodplains, each alternative was evaluated for the following based on FHWA regulations 23 CFR 650.111:

- Flooding risks
- Impacts on natural and beneficial floodplain values
- Potential for incompatible floodplain development
- Measures to minimize floodplain impacts
- Measures to restore and preserve natural and beneficial floodplain values

As indicated in Section 3.2.3, the Federal Emergency Management Agency has not mapped floodplains in the study area. A floodplain analysis was conducted by DOT&PF as part of the Reconnaissance Engineering Study (DOT&PF, 1994). That analysis was used to evaluate flood risks and potential impacts of project alternatives to natural and beneficial floodplain values.

The potential impact of project alternatives on local surface water and groundwater hydrology was evaluated based on preliminary engineering hydraulic design for project alternatives.

The analysis of potential water quality impacts evaluated the pollutants from highway stormwater runoff and accidental spills that could enter surface water drainages crossed by project alternatives. The potential impacts of the disposal of sanitary waste generated at proposed new ferry terminals and shuttle ferries were also evaluated. ADEC Water Quality Standards (18 AAC 70) and the ADEC Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances were used to evaluate water quality impacts.

4.1.8 Air Quality

The Clean Air Act prohibits federal actions that delay attainment of any air quality standard. This Act requires a review of all planned stationary sources of air pollution and transportation projects in areas that do not attain NAAQS (non-attainment areas) to ensure that they will not inhibit the ability of the state to ultimately achieve attainment of those standards. The review for stationary sources and other non-transportation emission sources is known as “general conformity,” and the review of transportation projects is termed “transportation conformity.” Because the proposed project is in an area that is either unclassified or classified as being in attainment by the EPA, a conformity analysis is not required.

The pollutants of concern associated with the Juneau Access Improvements Project are elevated concentrations of CO and PM_{10}. Simplified CO modeling was completed for the 1997 Draft EIS by first determining the CO emission factors using the EPA MOBILE 5 computer model. CO concentrations (unadjusted) were then determined using standard methods.

No air quality monitoring data are available for the study area. Therefore, background CO levels of 1 part per million (ppm) for the rural section and 2 ppm for the more urbanized areas near the endpoints of the project were then added to the modeled CO concentrations for comparison to the state and federal standards (1-hour CO average). The background CO concentrations were assumed based on ADEC input for the 1997 Draft EIS *Air Quality Analysis Technical Report* and guidance provided by the FHWA in *Appropriate Level of Highway Air Quality Analysis for a Categorical Exclusion, Environmental Assessment/Finding of No*

Significant Impact, and EIS (FHWA, 1986). FHWA guidance does not require modeling for 8-hour CO concentrations if the 1-hour average is determined to be less than 9 ppm (FHWA, 1986).

The CO emission model has been rerun using traffic data provided in the *Traffic Forecast Report* (Appendix C). Emission factors were determined using the updated MOBILE 5B computer model. EPA has also developed a newer emission factor model using the MOBILE 6 software and an updated CALINE 4 dispersion model. However, for the purposes of this analysis, no significant differences were noted during comparison runs of the older and newer models, other than those due to differences in inputs for traffic volume, temperatures, and highway design speeds.

The updated 2004 model simulation included CO estimates for the construction year (2008) and the design year (2038) using the peak week average daily traffic (peak week ADT) data predicted for those two years. A factor of 20 percent was applied to the peak week ADT data to convert that value into a peak summer hourly traffic volume (both directions). The *Traffic Forecast Report* (Appendix C) provided the factor of 26 percent for converting the summer peak hourly volume to a peak winter hourly volume. Where possible, the most conservative values were assumed for the model inputs so that a worst-case scenario for CO could be developed (highest value). Although travel time on highway segments has been calculated based on an average speed of 45 mph, 40 mph was used for air quality modeling for new highway segments to provide a conservative (worst-case) estimate of air quality impacts, as lower travel speeds would involve longer travel time and therefore greater overall emissions. A minimum distance of 50 feet from the roadway centerline was also modeled using worst-case meteorological conditions.

Project-related PM_{10} concentrations were evaluated on a qualitative basis by comparing project-related traffic volumes to the traffic volumes in a similar environment where PM_{10} measurements have been made.

Results of the 1997 and 2004 analyses were compared to the AAAQS (18 AAC 50.010), which adopt the federal NAAQS promulgated in 40 CFR 50.8.

Further information on the CO modeling conducted for the EIS is provided in the *Air Quality Modeling Memorandum* (Appendix T).

4.1.9 Noise

Comments received on the 1997 Draft EIS indicated the need to conduct additional noise analyses of project alternatives. Baseline noise data gathered for the project in 2003, together with projected traffic volumes, were used as input to FHWA noise models to predict future traffic noise with and without the project alternatives. Potential impacts were assessed by comparing projected future noise levels with and without project alternatives to the FHWA NAC.

4.1.10 Hazardous Waste

An ISA was conducted in 2003 to identify any known or likely areas of hazardous materials along the alignments and facility locations of the project alternatives. Federal and state databases were reviewed for this assessment. A limited on-site field review was made for the portions of alternative alignments that were within the cities of Skagway and Haines. Past use of any property of potential interest and adjoining properties was researched by reviewing historical aerial photographs. Sites that are known to contain or could potentially contain contamination because of past activities were assigned a site hazard rating. Sites with a high or medium hazard within a 300-foot-wide corridor centered on the alternative alignments and related facilities were further evaluated and assigned an impact rating based on the potential cost of remediation.

4.1.11 Wetlands

This assessment evaluated potential project impacts on wetlands, wetland functions, and marine waters of the U.S. as required under Section 404 of the Clean Water Act and EO 11990. Impacts on rivers and streams (freshwater waters of the U.S.) are addressed under marine and freshwater habitat. The principal direct impact of project alternatives on wetlands is their long-term loss through the placement of fill and modification of local hydrologic patterns.

4.1.12 Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat)

Potential project-related impacts to freshwater habitat and fish were evaluated by estimating the potential for direct and indirect mortality of fish and disruption or disturbance of spawning and rearing behavior as a result of construction and highway maintenance and operation. The *Anadromous and Resident Fish Streams Technical Report* (Appendix P) and its addendum in Appendix W contain an analysis of these impacts. Habitat-related impacts (i.e., destruction of spawning and/or rearing habitat for anadromous fish) were assessed separately in the *EFH Assessment* (Appendix N) and its addendum in Appendix W.

The EFH assessment serves a dual purpose: it documents potential impacts of project alternatives on the intertidal and subtidal environments of Lynn Canal and it is being used to comply with the Magnuson-Stevens Fishery Conservation and Management Act requirement that federal agencies assess the effects of their actions on essential fish habitat for commercial fish stocks in all life stages and associated habitats. Potential project effects on EFH are summarized in Sections 4.3.13, 4.4.13, 4.5.13, 4.6.13, 4.8.11, and 4.9.2.10 for project alternatives.

The potential effects of project construction and operation on the fish species included in this analysis were evaluated based on projected changes in habitat quality and quantity and the estimated effect of those changes to local fish populations.

4.1.13 Terrestrial Habitat

The assessment of the potential impacts of project alternatives on terrestrial habitat was based on the long-term loss of those habitats resulting from the construction of project facilities. The effect of habitat loss on wildlife is addressed in the *Wildlife Technical Report* (Appendix Q) and its addendum in Appendix W.

4.1.14 Wildlife

The 1994 *Wildlife Technical Report* assessed potential project-related impacts to wildlife using Habitat Capability Index (HCI) models, and still provides valid information for the proposed project. These HCI models were developed for black bear, brown bear, marten, and mountain goat, which were management indicator species identified by the USFS, the ADF&G, and the USFWS. Public and agency comments on the 1997 Draft EIS requested an expansion of the number of species considered for analysis and pointed out the limitations of the HCI models for assessing impacts from highway development. The wildlife evaluation for the Supplemental Draft EIS assessed the direct impacts of project alternatives on 22 representative species of mammals, birds, and amphibians. The impact analysis presented in the Supplemental Draft EIS did not rely on any new HCI modeling. However, the Supplemental Draft EIS summarizes statistics from the previous HCI model analyses where appropriate.

Note: The consensus during resource agency scoping efforts was that data from the 1997 HCI modeling was still valid as approximations of habitat capability impacts and should be incorporated into the Supplemental Draft EIS wildlife analysis. Some agency comments on the Supplemental Draft EIS requested that the limitations of the HCI models be more clearly explained. Some of these limitations are:

1. Habitat capability is a measure of the amount of habitat available and affected, not an actual measure of populations.
2. The models assess impact based on an assumed limiting factor for each species (e.g., late summer feeding habitat for brown bears and old-growth, south-facing slopes within 1,300 feet of a cliff for goats). Other limiting factors may affect the population.
3. The models were developed in 1988 and used 1994 USFS forest data for habitat calculation, which may no longer be totally accurate.
4. The models were developed to analyze the effects of clearcut logging and associated roads; they may not work as well for impacts that are from roads alone.
5. The models do not incorporate the potential impact reduction provided by wildlife underpasses.

The potential impacts of project alternatives on wildlife were assessed in the following steps:

- **Step 1 – Setting up the Analysis** – The geographic scope of the wildlife analysis was defined using a combination of U.S. Geological Survey (USGS) and USFS maps and ADF&G Wildlife Analysis Areas.

- **Step 2 – Describing the Situation** – Wildlife species' preferred habitats, population trends (if known), and the types of interactions they have with humans in the study area, including how they interact with the existing transportation systems in Alaska, were described. This information was summarized from other documents and incorporated by reference.

- **Step 3 – Identifying Issues** – A number of federal laws and EOs address wildlife and development issues, including the Endangered Species Act, the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, EO 13186[27], and the MMPA. A list of the issues to be considered was derived from these laws, public and agency comments during scoping for the Supplemental Draft EIS, and from USFS documents concerning road impact analysis (USFS, 1999 and 2000).

- **Step 4 – Assessing Benefits, Problems, and Risks** – For biological resources, guidelines for the NEPA recommend that population-level measures be used to evaluate the intensity of project-related effects and that the evaluation be quantifiable where possible. If quantitative information is unavailable, professional judgment on the likelihood of an impact occurring or its severity may be used. Historical population survey data from resource management agencies and academic sources were used in the impact assessment to the extent possible. Given the uncertain nature of predicting the future effects of project alternatives, a combination of quantitative estimates and qualitative judgments was used to describe potential impacts.

See the *Wildlife Technical Report* (Appendix Q) for additional information on the impact assessment methodology.

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[27] The Migratory Bird Treaty Act prohibits the taking of migratory birds, eggs, or nests. The Migratory Bird Executive Order (13186) specifically encourages all federal agencies to avoid or minimize to the extent practicable adverse impacts to migratory bird resources.

4.1.15 Bald Eagles

The 1997 Draft EIS assessed the potential impacts of project alternatives on bald eagles by measuring the distances between nests and alternative highway alignments. Based on many years of experience in Southeast Alaska, the USFWS developed a set of guidelines for state- and federal-funded highway construction activities to ensure compliance with the Bald Eagle Protection Act and prevent disruption of bald eagle nests. Those guidelines are incorporated into a USFWS and USFS interagency agreement. The guidelines were used in the updated (2003) *Bald Eagle Technical Report* (Appendix R) and its addendum in Appendix W to evaluate potential project-related impacts on the bald eagle population in the Lynn Canal corridor.

In general, the guidelines prohibit construction activities within 330 feet (primary zone) of an existing nest during the eagle's nest selection (initiation) period from March 1 through May 31. A secondary zone, between 330 feet and up to 0.5 mile from an existing nest, is established in the guidelines to screen the nest from particularly loud and obtrusive activities, such as blasting, and to protect the habitat within the primary zone. If a pair of eagles is actively using a nest by June 1, all construction activities within 330 feet of the nest should be avoided, and blasting activities should not occur within 0.5 mile of the nest during the nesting season, which usually ends by August 31. In certain circumstances, the USFWS does not object to limited blasting within a 0.5-mile radius of an active nest. Factors considered include the acclimation of the nesting eagles to human activity, terrain shielding, blasting loads, and monitoring of the nest disturbance. The USFWS has agreed that some highway construction activities may proceed within 330 feet of an active nest under the condition that it is monitored continuously by observers and that construction activities stop immediately if the eagles exhibit any signs of disturbance (Dunn, 2000).

The distances between eagle nests identified in the USFWS surveys and the cut-and-fill limits of each alternative were calculated. Where nests were within 330 feet of the alignment, the alignment was shifted when feasible to take it out of this primary zone of protection. For those nests that could not be reasonably avoided by at least 330 feet, the constraint factors that prevented realignment were described.

The number of nests within the primary and secondary zones for each alternative alignment were evaluated in relation to the total number of nests identified in the study area. This information, together with literature on the effects of noise on bald eagles, was used to evaluate potential project-related impacts on this species.

4.1.16 Threatened and Endangered Species

As indicated in Section 3.3.7, only two species in the study area are classified as threatened or endangered under the Endangered Species Act: the humpback whale and the Steller sea lion. The 1997 Draft EIS included the following mitigation measures to minimize impacts on sea lions:

- Initiate multi-year monitoring study to provide additional information on year-round sea lion use of Gran Point and Met Point haulouts if the East Lynn Canal Highway is selected as the preferred alternative.
- Maintain as large a distance and vegetation buffer between the highway and the haulouts as possible.
- Limit road construction within the Gran Point Critical Habitat Area to times when sea lions are not present at the haulout unless authorized by NMFS.

- Install signage and fencing along the highway near Gran Point and Met Point to discourage pedestrian disturbance of sea lions, if deemed necessary.

The 1997 Draft EIS concluded that these measures would avoid construction disturbance and that overall impacts to sea lions would not adversely affect their chances of recovery or adversely modify their critical habitat. DOT&PF sent a biological assessment to NMFS in August 1998 detailing the basis for the not likely to adversely affect determination and requested concurrence with this finding. NMFS responded that it would concur with a finding of no adverse impact if DOT&PF agreed to follow the mitigation measures described in the 1997 Draft EIS and the following three conditions:

- Construct no boat launches or structures that enhance boat access anywhere along the East Lynn Canal Highway
- Expand year-round monitoring at Gran Point and Met Point to include an assessment of human behavior around the haulouts. This study is to be conducted for a period of at least three years after the highway is constructed and it should focus on whether access from the highway is causing disturbance to sea lions. If human disturbance is documented, additional mitigation measures would be required.
- Employ independent observers during construction to ensure that sea lions are not present at the Gran Point haulout. If sea lions are present at any time during construction in the Gran Point Critical Habitat Area, all work must cease and NMFS must be consulted before any further construction proceeds.

The impact assessment for Steller sea lions provided in this EIS uses the same disturbance factors considered in the 1997 Draft EIS (i.e., construction noise and vibration, human presence, and traffic noise). The impact assessment includes the new traffic predictions and noise analysis data developed in 2004 and 2005. DOT&PF, on behalf of FHWA, provided an updated biological assessment to NMFS with further analysis of the potential effects of the preferred alternative on these species in accordance with Section 7 of the Endangered Species Act (see Section 4.3.17 and the addendum to the *Steller Sea Lion Technical Report* in Appendix W).

4.2 Alternative 1 – No Action

The No Action Alternative would consist of continued operation of the AMHS in Lynn Canal. As indicated in Section 1.2.1, ferry service was modified in 2004 with the addition of the *M/V Fairweather*. In this Final EIS it is assumed that absent the implementation of a build alternative, Lynn Canal service would continue as it is currently, with two exceptions. First, the SATP identifies the need for a Haines/Skagway shuttle, as the *M/V Fairweather* does not provide this service in summer. Second, the No Action Alternative is projected to have an average of three mainline vessels a week, a reduction from the five or more in summer and the three in winter during 2004 and 2005. This reduction is based on the SATP, which projects that the mainline fleet will be reduced from five vessels to three by 2010, due to mainline vessel age and high replacement cost.

This section describes the environmental consequences to resources discussed in Chapter 3 during the analysis period from 2008 and 2038. This section discusses only the environmental areas for which changes from conditions described in Chapter 3 have been forecasted within the project planning horizon. No changes to existing conditions were identified for land use, visual resources, historical and archaeological resources, environmental justice, subsistence, geology, floodplains, Wild and Scenic Rivers, air quality, hazardous materials, and biological resources.

4.2.1 Socioeconomic Resources

As discussed in Section 4.2.2, summer average daily traffic (summer ADT), which represents average daily traffic during the summer travel period in Lynn Canal, is projected to increase from 124 vehicles in 2002 to 170 vehicles in 2008, which is close to the capacity of the AMHS under the No Action Alternative. The demand[28] is projected to reach 230 summer ADT by 2038; this demand would not be met based on current AMHS vessel deployment and operation. The increased traffic would bring more money into the economies of Lynn Canal communities from the traveling public, particularly in Juneau, as it is the transportation hub of the region. However, even though the projected increase in daily traffic is relatively large as a percentage, it remains small in absolute terms. Therefore, the increased economic activity associated with this traffic increase would not noticeably change economic conditions in Lynn Canal. In addition, the No Action Alternative would not substantially alter the quality of life for residents in Juneau, Haines, and Skagway.

4.2.2 Transportation

The 2004 SATP calls for construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. The No Action Alternative would not contain any of these elements and is therefore not consistent with the plan.

Based on travel data maintained by AMHS, traffic averaged 80 vehicles per day (80 annual ADT) between Juneau, Haines, and Skagway in 2002, and summer traffic averaged 124 vehicles a day (124 summer ADT). During the busiest week of the summer, which is the busiest week of the year, traffic averaged 200 vehicles a day (200 peak week ADT). In the winter, average daily traffic dropped to 45 vehicles a day (45 winter ADT).

The summer of 2002 was the last season the *M/V Malaspina*, with a vehicle capacity of 88, was used as a shuttle in Lynn Canal. The AMHS also operated up to five mainline ferries in the canal that summer. Because of operating costs and logistical considerations, AMHS has reduced vehicle capacity in Lynn Canal since 2002. In 2003, shuttle service was replaced with a combination of smaller ferries, including the *M/V Aurora*, with a vehicle capacity of 34, and the *M/V Taku*, with a vehicle capacity of 69. Starting in the summer of 2004, shuttle service was provided five days per week to Haines and four days per week to Skagway by the fast ferry *M/V Fairweather*, with a vehicle capacity of 35. As discussed in Chapter 2, the projected combined daily summer traffic capacity under the No Action Alternative is 167 vehicles. This is approximately 51 ADT less than the current (2005) summer service.

Based on current trends in key traffic markets, including population growth in Juneau, Whitehorse, Haines, and Skagway, and growth in the non-resident visitor market, travel demand under the No Action Alternative is projected to reach an annual average of 90 vehicles per day in 2008 and 130 vehicles per day in 2038. By 2008, travel demand under the No Action Alternative is projected to reach an average of 170 vehicles per day in the summer and 330 vehicles per day in the peak week. By 2038, travel demand is projected to increase to an average of 230 vehicles per day in the summer and 460 vehicles per day in the peak week. As indicated above, the capacity of the ferry system under the No Action Alternative is limited to approximately 167 vehicles per day during the summer in those future years. Therefore, summer demand would exceed capacity under the No Action Alternative.

Unconstrained surface transportation demand (demand constrained only by access to a vehicle and operating cost) in the Lynn Canal corridor is estimated to reach approximately 930 annual

[28] Demand projected for a particular mode of transportation, in this case ferry service, assuming no capacity limitations on that transportation mode.

ADT by 2038. The capacity of the No Action Alternative is 167 vehicles/day, which falls far short of meeting the demand.

The No Action Alternative would provide eight round-trips per week between Juneau and Haines and seven round-trips per week between Juneau and Skagway. Using the fast ferry, travel time from Juneau to Haines and Skagway would be 3.5 and 3.8 hours, respectively. Using a mainline ferry, travel time from Juneau to Haines and Skagway would be 7.1 and 9.1 hours, respectively.

The Haines/Skagway shuttle ferry would take approximately 1.3 hours for a one-way trip. The *M/V Aurora* would make up to three round-trips per day in the summer and two round-trips per day in the winter. This would provide a daily summer capacity of 204 vehicles, which would more than provide for the projected summer shuttle demand (67 ADT in 2008 and 98 ADT in 2038).

The 30-year life-cycle cost[29] of the No Action Alternative would be $267 million, which includes all state and federal capital costs and all state operating costs. The net cost to the state during the analysis period would be about $61 million discounted to present dollars (January 2004), or about $45 per vehicle transported in Lynn Canal. AMHS expenditures in Lynn Canal for 2003 and 2004 exceeded $11 million a year, of which $5 million per year was paid by the state. The average annual operating cost of the No Action Alternative from 2008 to 2038 is estimated to be about $10.2 million. This projected reduction from actual 2003 and 2004 costs is due in large part to a planned decrease in mainline service. The 2008 revenue for the No Action Alternative is projected to be $6.9 million, which would result in a $3.3 million annual state payment for transportation in Lynn Canal. By 2038, revenue for the No Action Alternative is projected to be $8.5 million, which would result in a $1.7 million annual state payment for Lynn Canal transportation.

Based on the 2004 AMHS rate structure, the cost for a family of four in a 19-foot-long vehicle to travel from Juneau to Haines would be $180 on a mainline vessel and $198 on the *M/V Fairweather*. The cost for the same family to travel from Juneau to Skagway would be $237 on a mainline vessel and $261 on the *M/V Fairweather*. Travel between Haines and Skagway on a shuttle is estimated to be $41 for a family of four.

4.2.3 Hydrology and Water Quality

Treated wastewater from mainline ferry vessels would continue to be discharged into Lynn Canal under the No Action Alternative. Wastewater would be stored in tanks on the *M/V Fairweather.* These tanks would be pumped out and the sewage would be hauled to an existing landside treatment facility. Some discharges would introduce concentrations of fecal coliform (FC) and total suspended solids (TSS) above Alaska Water Quality Standards (AWQS) to ambient waters. Dilution on discharge to marine water would reduce the toxic effects of FC and TSS, as well as other potential pollutants. Discharges occurring while ferries are traveling away from shore would have the least impact on water quality. Because wastewater discharges from ferries are automatic and can occur while the vessels are near shore or docked, some short-term impact to water quality from elevated levels of FC and TSS are anticipated. New compliance regulations effective beginning in 2004 require wastewater discharges to meet water quality standards; therefore, elevated FC and TSS discharges may decrease substantially in the next few years.

[29] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period discounted to 2004 dollars.

4.3 Alternative 2B (Preferred) – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

Under this alternative, there would be a highway extending from Echo Cove to the Katzehin River delta and ferries would provide service to Skagway and Haines from a new terminal located there (Figure 2-6). Mainline ferry service would terminate at Auke Bay.

DOT&PF and the USFS have identified appropriate sites for pullouts and scenic overlooks. These sites are listed below (Figure 4-1).

- A pullout near the crossing of Sawmill Creek.
- The USFS cabin in Berners Bay would remain and become a road-accessed cabin. A handicapped-accessible pullout and trailhead would be located on the highway adjacent to the cabin and DOT&PF would construct a trail to the cabin.
- An Antler River pullout would be located just south of the bridge over the Antler River.
- A Lace and Berners River pullout would be located just west of the bridge over the Lace River.
- A Slate Cove pullout would be located west of Slate Cove.
- The planned Comet highway maintenance building would include a rest stop with public facilities. A pullout and scenic overlook on the canal side of the highway would also be provided.
- A pullout on the east side of the highway and a pullout and scenic overlook on the canal side of the highway would be located near the Brown Point geodetic marker.
- A pullout and scenic overlook would be located near Eldred Rock.
- A pullout on the east side of the highway and a pullout and scenic overlook on the canal side of the highway would be located near Yeldagalga Creek.
- A pullout and scenic overlook would be located in a valley south of the Katzehin River.
- A pullout and scenic overlook would be located north of the Katzehin River.

The environmental impact assessment provided in Section 4.3 includes consideration of the potential impacts of the proposed pullouts and scenic overlooks. The USFS has indicated that trails at four of the pullouts are reasonably foreseeable if the highway is constructed. (See USFS letter dated November 2, 2005, in Chapter 7 for information regarding trails envisioned by USFS.) These four trails are included in the cumulative assessment provided in this chapter. A separate environmental analysis would be completed by the USFS for these trails prior to their construction.

4.3.1 Land Use

4.3.1.1 Land Ownership

Current ownership of the land that would be required for the highway right-of-way and the new ferry terminal facility for Alternative 2B is presented in Table 4-1. As indicated in that table, over 95 percent of the land is either part of the Tongass National Forest under the management of the USFS or it is managed by other federal agencies. This land would remain under federal ownership with a highway easement conveyed to the state. Goldbelt and private owners would be compensated for lands taken for a new highway right-of-way at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Table 4-1
Land Ownership of Required Right-of-Way for Alternative 2B

Alternative [1]	Ownership (acres)				Total (acres)
	USFS	U.S. Coast Guard	Goldbelt	Private	
2B	1,719	29	55	5	1,808

Note: [1]Based on the maximum right-of-way width of 300 feet on federal and state lands and 150 feet on private and municipal lands.

4.3.1.2 Consistency with Land Use and Management Plans

As described in Section 3.1.1.1, the TLMP for the Tongass National Forest identifies a transportation corridor along the alignment for Alternative 2B; therefore, this alternative is consistent with the TLMP. A portion of the USFS land crossed by the Alternative 2B alignment along the east shore of Berners Bay is currently managed under LUD II, which refers to Congressionally designated lands where the principal management goal is to retain the primitive wildland character of the area while allowing necessary state highways (Figure 3-3). Much of the rest of the USFS land along the alignment is managed under the TLMP designation of Semi-Remote Recreation. A small amount is managed under the designations of Old-Growth Habitat and Scenic Viewsheds. Some areas such as the Kensington Gold Project area are managed under the designations Modified Landscape and Minerals. Based on language in the 1997 TLMP and consultation with the USFS, if Alternative 2B is selected as the final preferred alternative for the proposed project and a highway is constructed on the alignment, the USFS would change the management of the highway corridor to Transportation and Utility Systems. The USFS, in consultation with ADF&G and USFWS, would adjust the boundaries of the affected Old-Growth Habitat LUDs in accordance with old-growth reserve standards in the TLMP (see old-growth reserve discussion in Section 4.3.14).

The regional transportation policy set forth in the CBJ Comprehensive Plan is to support the improvement and expansion of air, marine, and highway transportation systems to maintain and expand Juneau's role as the capital city and a regional transportation center (CBJ, 1996). The 1996 update to the CBJ Comprehensive Plan maintains plans for the consideration of all alternatives, including highways, high-speed ferries, and light rail or railroad, to improve transportation links throughout Southeast Alaska and Canada. Therefore, Alternative 2B is consistent with the CBJ Comprehensive Plan.

The existing Haines Borough Comprehensive Plan (HBCP) discusses the importance of consistent, daily AMHS service and expresses concern regarding a highway link to Juneau (Haines Borough, 2004). Alternative 2B crosses USFS lands with a general use designation in the HBCP. Haines Borough Ordinance 03-02-007 indicates that the intent of the general use designation is to provide a minimum of planning, platting, and land use regulation in rural areas. A transportation facility would be consistent with this zoning designation.

Goldbelt's Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternative 2B is consistent with this plan and would use the alignment of the newly constructed road. Alternative 2B may facilitate development of the other plan elements.

4.3.1.3 Land and Resource Uses

Alternative 2B would substantially improve access to the east Lynn Canal coastline for recreation and tourism. In recognition of this potential improvement, the USFS has evaluated development of scenic turnoffs and trailhead parking along this alignment to provide use of Tongass National Forest lands (Figure 4-1).

Alternative 2B would improve opportunities for recreational activities such as hiking, camping, sightseeing, rafting, canoeing, kayaking, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway systems in Juneau, Haines, and Skagway. Berners Bay and the Katzehin River delta are already popular locations on the east side of Lynn Canal for remote and semi-remote recreation. A highway through these areas would make them more accessible for people looking for a rustic but not totally remote outdoor experience. A highway would also make the USFS-maintained Berners Bay cabin and the unmaintained cabin east of the Katzehin River delta more accessible for recreation. The highway would not impact the landing strip north of the Katzehin River. A highway could also provide opportunities for outfitters to make more recreational trips available to the public in the region. For example, river crossings often provide good places for putting in or taking out kayaks. Bridges associated with Alternative 2B could open up opportunities for new kayak trips.

Opening up the recreation opportunities of the coastline along the east side of Lynn Canal would be perceived as a negative impact to the quality of the experience by those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there. Current users of Berners Bay who travel there by kayak, canoe, small boat, or float plane would find the experience there different. As mitigation for impacts to remote recreation, DOT&PF would construct a new remote-access cabin to be managed by the USFS at a location selected in consultation with the USFS.

Many of the rivers and streams that would be crossed by Alternative 2B contain resident and anadromous fish stocks available for sport fishing. The region also supports populations of mountain goat, bear, and moose, big game species available for take by resident and out-of-state hunters. Hunting and fishing pressure has increased along every highway in Alaska that has opened a formerly remote area. Increases in recreational hunting and recreational and personal use fishing would be expected along Alternative 2B. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and make recommendations to the Board of Fish and Game to adjust fish and game regulations, as necessary, to protect those resources from over utilization.

Improved access to fish streams and the resultant higher level of use by sport fishers would require a greater level of effort by ADF&G in terms of surveying streams and enforcing regulations. Increased access to Juneau and the resultant increase in visitors would put additional pressure on existing sport fishing facilities in Juneau, including boat ramps. The CBJ would be responsible for evaluating the need for additional or expanded facilities as demand in the Borough increases.

The commercial activities of Goldbelt could be expanded with improved access to its Echo Cove lands. Better access and through-traffic resulting from Alternative 2B would facilitate development opportunities, including transportation-related activities, recreation, tourism, and residential development.

Alternative 2B would benefit the Kensington Gold Project by facilitating the transport of goods and services to the mine site from Juneau and making it more convenient for workers in Juneau, Skagway, and Haines to reach the site. A highway would provide easier and less expensive access to other mineral occurrences, prospects, and former mines along the east side of Lynn Canal. It is unlikely that any mineral deposits in the region would be developed solely because of this improved access. Development of mineral resources is capital intensive, involving many other costs besides access. Market conditions must be high enough to account for all of these costs before development can occur.

Roadless Areas – Alternative 2B would not substantially change the natural integrity and appearance or opportunities for solitude in Roadless Area 301. Area 301 encompasses 1,201,474 acres, of which 98 percent is managed as Non-Development LUDs. Alternative 2B would have a cleared width of approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the highway is closer that 1,200 feet from the shore), for a maximum total width of 2,500 feet. Therefore, Alternative 2B would impact 10,375 acres largely along the eastern boundary of Area 301. This represents less than 1 percent of the land encompassed by Roadless Area 301.

Repositioning the boundary of the roadless area to exclude the area of highway influence would not substantially reduce the amount of land remaining roadless that would appear natural, and these areas would still provide opportunities for solitude, self-reliance, adventure, and primitive recreation. Access to the roadless area would change from water access to a combination of water and highway access. Alternative 2B would not affect any identified scientific or educational features in Area 301. Alternative 2B is also consistent with the TLMP which indicates that the Forest Plan retains a proposed state road corridor along the alignment for Alternative 2B in Roadless Area 301.

4.3.1.4 Parks and Recreation Facilities

Alternative 2B would require no land from a municipal, state, or federal park or recreation area. Based on a USFS request, the Berners Bay cabin would be provided with handicapped access from the highway under this alternative. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

4.3.2 Coastal Zone Management

Alternative 2B is within the coastal zone. Federal lands owned, leased, or held in trust or whose use is otherwise subject by law solely to the discretion of the federal government, are excluded from the coastal zone boundary of the ACMP and local plans. Uses and activities on excluded federal lands that affect the coastal zone must be consistent with the ACMP.

The ACMP statewide standards are the criteria used during a State of Alaska coastal consistency review of activities within and affecting coastal zone uses and resources. Enforceable policies, developed by local districts, provide supplemental criteria that are specifically applicable to the local district. The topics addressed by the enforceable policies of the ACMP and the district coastal management plans that are relevant to Alternative 2B are coastal development; geophysical hazards; recreation; transportation and utilities; timber harvest; mining and mineral processing; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources.

Alternative 2B has been sited in consideration of the enforceable policies of the ACMP and district coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the Coastal Zone Management Act, DOT&PF will obtain a determination from ADNR of the consistency of the selected alternative with the state coastal management program and Juneau coastal management plan following the USACE and ADNR public notice period as part of the process to obtain the necessary state and federal permits for the project.

The following is a brief description of how Alternative 2B would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource and Ocean Management (OCRM).

Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternative 2B. DOT&PF has adjusted the highway alignment to avoid all palustrine emergent wetlands and to avoid other wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternative 2B, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality. Best management practices (BMPs) would be used to avoid downstream water degradation below water quality standards.

Historic, Prehistoric, and Archaeological Resources (6 AAC 80.150) – No historic, prehistoric, and archaeological areas of significance are identified in the CBJ coastal management plan. DOT&PF has worked closely with the SHPO to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory. DOT&PF would implement mitigation measures to protect the Jualin Mine Tram and Comet/Bear/Kensington Railroad (see Section 5.12).

City and Borough of Juneau Coastal Management Program Enforceable Policies

Coastal Development (49.70.905) – DOT&PF would comply with the coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important to resident or anadromous fish. Transportation facilities are exempt from meeting the policy prohibiting intertidal fill below mean high tide.

Geophysical Hazards (49.70.910) – Alternative 2B would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and BMPs during design and construction. Hazards, such as avalanche and rockslide chutes, have been identified, and design and avalanche control measures would be implemented to ensure the safety of the public and property. Areas impacted during construction would be revegetated with native species where necessary. All large floodplains along the highway corridor would be crossed with bridges. Multiple-span bridges would be supported on pilings that would be of size and distribution as to create no significant flood risks. Smaller flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF, to the extent feasible, has located the highway alignment to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternative 2B to avoid all palustrine emergent wetlands and to reduce impacts to estuarine wetlands. All anadromous stream crossings would be designed and constructed to avoid impacts to fish passage and habitat disturbance, including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment has been adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternative 2B would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (see Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternative 2B would be done to minimize any environmental impacts, and avoid impacts to movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as part of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas are identified and mitigated to maintain habitat values of estuaries, wetlands, tideflats, rivers, and streams. The alignment was designed to avoid these areas to the greatest extent possible, avoiding all palustrine and estuarine emergent wetlands in the CBJ. The highway would be constructed with a minimum-width fill footprint in wetlands. Impacts to vegetated and mud tideflats have been avoided; impacts to rocky tideflats would be minimized by using steepened side slopes and sidecasting only in steep areas where the material would settle in subtidal depths. Impacts to streams and rivers would be minimized by bridging over all anadromous fish streams, timing in-water work to avoid fish, and clear spanning the eulachon spawning area in the Antler River. Based on these measures, and the extent of the remaining areas of estuary, wetland, and tideflat habitat in the project area, these habitats would continue to sustain necessary biological, physical, and chemical characteristics.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternative 2B, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

4.3.3 Visual Resources

Visual simulations were made of Alternative 2B at typical viewpoints that represent characteristic viewing conditions in each of the major landscape units described in Section 3.1.2. The locations of those viewpoints are provided in Figure 4-2. A description of the visual character of the alternative at each viewpoint is provided below.

4.3.3.1 Berners Bay

Views from the Bay – In Berners Bay, the most susceptible views to potential impacts from Alternatives 2B include:

- Views from Berners Bay
- Views from small boats and ferries

- Views from the Berners Bay cabin
- Views from lower reaches of Berners, Lace, and Antler rivers
- Views from Point Bridget State Park

Figure 4-3 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway is approximately 2.4 miles from the viewer, and it is located in an area not requiring substantial cuts and fills. Therefore, the highway is not likely to dominate the existing natural setting. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, this condition is highly dependent on the view distance.

Figure 4-4 is a visual simulation of the highway under Alternative 2B just south of the confluence of the Berners, Lace, and Antler rivers on the east side of Berners Bay within proximity of the Berners Bay cabin. Topography within this area varies from gentle to moderately steep. As a result, it is likely that cut-and-fill areas would be intermittently visible from this viewpoint. A distinct line created by the removal of vegetation would also be noticeable. The layering of landscapes surrounding primarily all but the central western portion of the bay dominates existing viewsheds.

Figure 4-5 provides a visual simulation of Alternative 2B within Berners Bay. A strong linear band created by exposing lighter soil and rock in cut-and-fill areas would be most noticeable. The proposed bridge would create contrast in form; however, depending on the angle of view as well as the distance, the bridge would be more or less noticeable. Steep road cuts on the eastern edge of Berners Bay would dominate the existing setting out to the middleground viewing threshold. The bridge and highway would dominate the existing setting when they are included in foreground views.

Views from the Highway – Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense old-growth forest in most places. Crossing the Berners River and Antler River delta, views to the east would open up to an extensive marsh in front of a forested valley cut through steep and rugged mountains. Many of the views looking west from a highway would be panoramic, taking in Berners Bay and Lynn Canal with the snow-capped peaks of the Chilkat Range in the background approximately 12 miles away.

4.3.3.2 Point St. Mary to Eldred Rock

Views from Lynn Canal – From Point St. Mary to Comet, views most susceptible to potential impacts from Alternative 2B include:

- Views from mining roads in the vicinity of Comet
- Views from cruise ships and small boats

Figure 4-6 is a visual simulation of Alternative 2B from Lynn Canal looking east toward Point Sherman. The existing viewshed is unique, as it has scenes that contain rolling terrain in the foreground and middleground and mountains in the background. Because of the highway being sited within an area of less steep topography, the visibility of cut-and-fill areas is reduced. However, the linear band created by the removal of vegetation would be noticeable primarily in the middle and foreground viewing thresholds.

Figure 4-7 provides a visual simulation of Alternative 2B within middleground views of the area from the canal north of Comet. The highway would traverse steep topography in an area interspersed with vegetation. A waterfall occurs in the viewshed as well as a noticeable rockslide. The highway would create a distinct linear feature across the existing setting that would compete with and detract from natural landscape features. This conclusion is primarily a factor of substantial cut-and-fill areas occurring within the existing viewshed.

From just north of Comet to Eldred Rock, the most susceptible views to potential impacts from Alternative 2B include:

- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from and around Eldred Rock Lighthouse
- Views from cruise ships and small boats

Figure 4-8 provides a visual simulation of Alternative 2B from a traveler in the Lynn Canal on a vessel near Eldred Rock, with the highway at a distance of approximately 1.5 miles. As indicated in the simulation, the highway would represent a strong linear feature introduced to an otherwise natural setting. Some portions of the roadway would be sited close to the water's edge, thus reducing visibility of this linear band. In other areas the highway would be sited 60 to 80 feet above the water's edge and traverse areas of extreme slope, creating dominant shear-cut faces.

Views From the Highway – Views from a highway would alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the east shoreline in the foreground and the water of the Canal in the middle- and background, with background views of the rugged, snow-capped peaks of the Chilkat Range across the Canal.

4.3.3.3 Eldred Rock to Mount Villard

Views from Lynn Canal – Alternative 2B would be visible in the viewshed of the Katzehin River delta. Views most susceptible to impact in this area include:

- Views from the Katzehin River Valley downstream reach proposed as a Wild and Scenic River
- Views from Portage Cove Campground
- Views from Haines
- Views from cruise ships and small boats
- Views from shoreline cabins

Figures 4-9 and 4-10 show visual simulations of Alternative 2B within the middleground viewing threshold in this area. From the location assumed in Figure 4-9, a viewer traveling within Chilkoot Inlet in the vicinity of the Katzehin River would likely notice a linear band created by the exposure of lighter soils as well as the bridge spanning the river mouth. Although the proposed bridge would be noticeable, the scale of both landform and vegetation modifications is less than that of cut-and-fill areas constructed on mountain slopes. Southbound travelers would not notice this portion of the highway to the same degree as northbound travelers approaching the river headwaters because the highway would be masked by topography as the inlet turns to a more northwesterly direction than a northern direction.

As shown in Figure 4-10, the highway would appear as a linear band along the base of Mount Villard. Topography along this link is very steep and vegetation intermittent. As a result, cut-and-fill areas would be highly noticeable in middle- and background views. The proposed ferry terminal north of the Katzehin River delta for Alternative 2B would be noticeable as an interruption in the line associated with the roadway. The existing natural setting dominates this viewshed, and it is unlikely that the highway would visually compete with the existing setting. The proposed bridge crossing the Katzehin River, from this viewpoint, would not compete substantially with the natural setting.

Views From the Highway – Views from a highway would typically alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the east shoreline in the foreground and the water of the Canal in the middle- and background, with background views of the rugged, snow-capped peaks of the Chilkat Range across the Canal. At the bridge over the Katzehin River, views would encompass the broad floodplain of this river and the deep, forested valley extending to the east.

4.3.3.4 Consistency with USFS Visual Quality Objectives (VQOs)

As explained in Chapter 3, the TLMP has assigned VQOs for each LUD. The VQO for the Transportation and Utility Systems LUD is Modification with only the foreground of views considered. This VQO should be achieved within one year of construction. Alternative 2B would be consistent with this VQO. Wherever possible, the alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway from Lynn Canal. Vegetation within this buffer would be maintained to the extent practicable. Also, to the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. In many locations, the alternative would exceed the VQO of Modification and would be consistent with the VQO of Partial Retention. In order to demonstrate the overall visual effect of Alternative 2B and address the USFS guideline to meet the VQO of adjacent LUDs to the extent feasible, DOT&PF also evaluated the alternative's consistency with the VQOs of the adjacent LUDs.

Berners Bay – USFS LUD II land in Berners Bay has a VQO of Retention. However, from Echo Cove to Sawmill Cove, the VQO is Partial Retention. Alternative 2B would be partially visible from many of the views of the coastline from the bay. Therefore, at most locations it would meet the VQO of Partial Retention. It would not meet the VQO of Retention where it is visible from the bay. To the extent feasible, soil would be spread on the rock slopes and seeded to minimize visual impacts.

Slate Cove to Eldred Rock – Most of the USFS land along the Lynn Canal coast from Slate Cove to a point north of Eldred Rock has a VQO of Modification. However, the VQO is Retention within the two Old-Growth Habitat LUDs along this section. Alternative 2B would meet or exceed the VQO of Modification. The highway would be visible in the Old-Growth Habitat LUD north of Comet from some views from Lynn Canal. Therefore, it would not meet the VQO of Retention in this location, but would meet the VQO of Partial Retention by minimizing clearing and vegetating slopes.

Eldred Rock to Katzehin Ferry Terminal – Most of the USFS land from Eldred Rock to the Katzehin Ferry Terminal has a VQO of Partial Retention. The VQO adjacent to the alignment from the Katzehin River to the terminal site has a VQO of Retention. Alternative 2B would be visible from some but not all views from Lynn Canal and would therefore meet the VQO of Partial Retention. At the Katzehin River and at several locations where the road crosses steep terrain, the highway would be visible and in these sections meeting a VQO above Modification is not feasible.

4.3.4 Historical and Archaeological Resources

Based on record searches and surveys of the study area, Alternative 2B would not affect any known prehistoric resources. Consultations with Native Tribes and organizations have not indicated that this alternative would impact any traditional cultural properties. Historic resources potentially affected by Alternative 2B are discussed below.

Alternative 2B would cross the Jualin Mine Tram, a contributing element of the Jualin Historic Mining District, as well as the encompassing Berners Bay Historic Mining District, just inshore from Berners Bay (Figure 3-7). At this location, the rails on the tram are visible on the ground between the shore and a rock bluff to the west. The alternative would bridge over the tram to the top of the rock bluff, leaving the tram intact. Alternative 2B would impact no other structures or features that contribute to the Jualin Historic Mining District. For these reasons, FHWA has determined that Alternative 2B would have no adverse effect on the Jualin Tram or the Jualin Historic Mining District.

Alternative 2B would cross the Comet/Bear/Kensington Railroad (Figure 3-7), a contributing element of the Comet/Bear/Kensington and Berners Bay Historic Mining Districts, in a forested area where the rail sections are missing but where the cleared right-of-way and evidence of the supporting pilings and trestles can be seen heading easterly toward the Comet/Bear/Kensington mill site. The alternative would bridge over the railroad right-of-way, and would cross no other structures or features that contribute to the Historic Mining District. For these reasons, FHWA has determined that Alternative 2B would not have an adverse effect on the Comet/Bear/Kensington Railroad or the Comet/Bear/Kensington Historic Mining District.

Alternative 2B would pass between two discontinuous units of the Ivanhoe/Horrible Historic Mining District (Figure 3-7). Therefore, FHWA has determined that Alternative 2B would have no effect on the Ivanhoe/Horrible Historic Mining District.

Alternative 2B would pass through the Berners Bay Historic Mining District. The only contributing elements affected are the Jualin Mine Tram and the Comet/Bear/Kensington Railroad, both of which would be crossed by a bridge. Therefore, FHWA has determined that Alternative 2B would not have an adverse effect on the Berners Bay Historic Mining District.

Alternative 2B would increase human access in the east Lynn Canal area. Increased access could result in indirect impacts because of disturbance to historic and prehistoric cultural sites from hikers, hunters, and other recreational users.

DOT&PF and FHWA have consulted with the USFS and the SHPO regarding potential impacts to historic properties in the APE of Alternative 2B. On October 5, 2005, SHPO concurred with FHWA's determination that Alternative 2B would have no adverse effect on any historic property (see letter at end of Chapter 7).

4.3.5 Socioeconomic Resources

4.3.5.1 Overview

The improved access in the Lynn Canal that would result from Alternative 2B would facilitate the movement of goods and people through and to the northern Southeast Alaska region. This would create closer links between the economies of Juneau, Haines, Skagway, and Whitehorse.

In the near-term, improved access to Juneau is not expected to result in new major economic development in Alaska. Instead, improved access to Juneau would redistribute within the state some of the economic benefits received from one of Alaska's primary industries, the visitor industry. Independent visitors (i.e., non-cruise ship visitors) could shift their travel patterns, perhaps spending more time and money in Southeast Alaska, particularly in Juneau.

The redistribution of tourism-related economic benefits might result in net economic gain in one area of the state, offset by economic loss in another. On a regional basis, improved access would result in a net gain to Juneau's local retail industry, and Haines and Skagway could realize some loss in certain types of retail sales such as durable goods.

Population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by the improved access resulting from Alternative 2B. Improved access, however, would possibly enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors, particularly health care services and cultural activities. To the extent that this occurs, Haines' population would grow as a result of improved access. Better access to Haines would also increase the number of Juneau residents with second homes or cabins in the Haines area. Of the three major communities in the Lynn Canal corridor, Juneau would experience the most population growth due to improved access, though as mentioned previously, that growth would not be large.

The population increase associated with better access to Juneau could be accommodated within the existing housing stock of that community. Property values in Haines might increase because of its growing reputation as a retirement community and/or demand for second homes or cabins by Juneau residents. The increased traffic through Skagway resulting from Alternative 2B could increase the value of the commercial property in that town.

Local governments would be affected by improved access in the Lynn Canal corridor in the following ways:

- Increased demand for public safety services in remote areas of the Juneau and Haines Boroughs as well as outlying Skagway areas
- Potential increased demand for some public utilities
- Increased local road maintenance costs
- Increases in sales and bed tax revenues from traveler-related spending
- Increases in property tax revenues

Improved access would affect the health care industry in several ways. Haines and Skagway residents would have better access to Juneau's well-developed health care sector. This improved access would mean less reliance on local and/or Whitehorse health care providers. Provision of emergency medical services is a key function of clinics in Haines and Skagway. Demand for these kinds of services would increase as non-resident traffic through those communities increased.

Improved highway access to northern Southeast Alaska would have minor or negligible effects on other segments of the region's economy. The cruise ship industry is principally affected by berth facilities at points of origin (e.g., Seattle and Vancouver) and destination (Juneau, Skagway, and Haines), and is projected to grow at an annual average rate of 1 to 2 percent over the next 10 to 20 years. The manufacturing sector in Juneau would benefit from better access to markets in Haines, Skagway, and Whitehorse. Better access to the Alaska/Canada highway system would also improve the economics associated with serving markets in Interior Alaska from the Lower 48 states. The region's wholesale trade sector would benefit from the lower cost of transportation between Juneau, Haines, and Skagway. Currently, wholesalers, primarily in Juneau, compete with Seattle distributors for this regional business.

The following subsections provide a more detailed discussion of the economic and social effects to Juneau, Haines, and Skagway projected for Alternative 2B. A portion of the information presented here is based on interviews with industrial representatives and public service providers. See the *Socioeconomic Effects Technical Report* (Appendix H), for references to these interviews as well as further discussion of the socioeconomics analysis.

4.3.5.2 Juneau

Population, Economics, Housing, and Municipal Revenues – The total increase in non-Juneau resident traffic to and from Juneau associated with Alternatives 2B is estimated to be 125 annual ADT in 2008[30]. Assuming all traffic is round-trip, two annual ADT equals one additional visiting vehicle carrying an average of 2.3 people[31]. Therefore, Juneau is projected to receive a total of 52,000 new non-Juneau resident visitors in 2008. From the 2003 Alaska Travelers Survey (see Appendix H) and the 1994 household survey (McDowell Group, Inc., 1994) conducted for this project, in-state visitors to Juneau are estimated to spend $80/visitor/trip and non-Alaskan visitors (e.g., Canadians and people from the Lower 48 states) are estimated to spend $160/visitor/trip. Based on these assumptions, visitor spending in Juneau would increase by $5.7 million in 2008 as a result of Alternative 2B (Table 4-2).

The economic impact of this additional spending would include new employment and payroll sources in Juneau. This increase in visitor spending in Juneau would generate $3.2 million in new payroll and 110 additional annual average jobs (Table 4-2).

Table 4-2
2008 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Juneau

Description	Alternative 2B
Highway Traffic (Annual ADT)	380
Vehicle Traffic Less Residents and Baseline Traffic	125
Total New Visitors[1] per year	52,000
Total New Visitor Spending per year	$5,700,000
New Local Payroll per year	$3,200,000
New Local Employment	110

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not Juneau residents.

Traffic on Alternative 2B is predicted to increase at an annual rate of approximately 2 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 80 percent higher than in 2008 (Table 4-3).

[30] This estimate is less than half of total traffic associated with Alternative 2B because Juneau residents would account for the majority of traffic on a highway. The estimate of new traffic also does not include baseline traffic because that traffic is already affecting the economy.
[31] Based on the Skagway and Haines border crossings average vehicle occupancy (USDOT, 2001).

Table 4-3
2038 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Juneau

Description	Alternative 2B
Highway Traffic (Annual ADT)	670
Vehicle Traffic Less Residents and Baseline Traffic	225
Total New Visitors[1] per year	93,600
Total New Visitor Spending per year	$10,440,000
New Local Payroll per year	$5,760,000
New Local Employment	200

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not Juneau residents.

Generally, each new job in the Juneau economy results in an increase in population of about 1.5 people[32]. Therefore, the 110 new jobs in Juneau resulting from Alternative 2B in 2008 would be expected to result in a population increase of about 170 residents. By 2038, the population increase would reach about 300 residents. A population increase in Juneau of up to 300 residents would represent an overall increase of about 1 percent of Juneau's current population (approximately 31,000).

Based on 2.6 persons per household (from 2000 Census data), a population increase of 170 residents would result in additional demand for about 65 housing units in 2008, and a population increase of 300 residents in 2038 would result in a demand for about 115 housing units. Juneau had approximately 320 vacant housing units in 2001. Although the projected housing demand associated with Alternative 2B in 2008 and 2038 is less than the vacancy rate, some additional housing development would probably occur in anticipation of increased demand.

Alternative 2B would increase the value of private property along the highway, though the extent of that increase is difficult to estimate. For example, Goldbelt's property in and north of Echo Cove would increase in value. In addition, a proposed land trade in Berners Bay between the USFS and the Cape Fox Corporation would put additional land in private-sector ownership. If this land trade were approved, highway access to this property would increase that land's value as well as the property taxes associated with the land.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $5.7 million in 2008 would generate (assuming all of the spending is taxable) about $290,000 in additional sales tax revenues (based on a 5 percent tax rate). In 2038, additional visitor spending of between about $10.4 million would generate about $520,000 in additional sales tax revenues. Property values along Glacier Highway would increase. CBJ would have an increase in property tax revenues because of this increase in property values. Residents in this area would pay higher property taxes.

Industry/Commercial Sectors – Alternative 2B would not impact the cruise ship industry in Juneau. Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety. Alternative 2B would not impact any of these factors.

[32] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

Alternative 2B would benefit the independent visitor industry in Juneau. With this alternative, Juneau would become the mainline terminus for the AMHS, resulting in a significant number of independent visitors traveling to Juneau that otherwise might not visit the community. Approximately 60 percent of the non-resident travelers now using the ferry between Juneau and Haines/Skagway are actually spending time in Juneau. Most of the current pass-through visitors (15,000 to 20,000) would be spending some time in Juneau with Alternative 2B. Based on the 2003 *Household Survey Report* (Appendix I) conducted for this project, the traffic forecast (see Section 4.3.7) projects that Whitehorse residents would increase the number of household trips a year to Juneau. Also, Juneau would capture a somewhat larger share of the Alaska Highway market.

According to AMHS data, approximately 900 RVs visited Juneau in 2002, at least 90 percent of them in the May to September period. The total number of 2002 RV nights (i.e., nights that RVs spend in Juneau) is estimated to be between 3,000 and 4,000. The total number of annual Juneau RV nights expected in the first year that Alternative 2B is in operation is estimated to be approximately 7,500 to 8,900, 90 percent of which would also occur during the summer season. This increase results because Juneau would become the terminus for AMHS in the Lynn Canal corridor. RV travelers on the ferry who otherwise would have gone directly to Haines or Skagway would disembark in Juneau, and many would spend some time there.

There are several RV parks in Juneau, totaling about 100 RV parking sites. The capacity of these parks is 12,000 RV nights from May 15 to September 15. Although this total capacity is more than the predicted number of RV nights that would result from Alternative 2B by 2008, Juneau would still need additional RV capacity. The current capacity would not be enough to accommodate estimated demand during peak periods, and average summer demand would exceed capacity by 2038.

The process of planning and building an RV park in Juneau would present some challenges to prospective RV park operators. According to city officials, it is difficult to find developable land in Juneau appropriate for RV parks. The land would need to have easy highway access, water and electrical utilities, and accommodating neighbors. Such a location is likely to be desirable to a variety of interests, and in the past, RV parks have not been able to promise the revenues that other operations would.

The increase in RV traffic associated with Alternative 2B would not occur until after construction was completed, and then would increase gradually over time. Construction is estimated to take at least four years. This would provide time during which the CBJ could work with interested landowners to develop a plan for RV facilities expansion.

Construction of Alternative 2B would result in logging incidental to clearing the highway right-of-way. A highway would improve access to timber stands that at some future date could be made available for harvest. However, the USFS manages most of the Tongass National Forest (over 95 percent of the highway alignment) within the study area primarily as a natural setting. An area of approximately 12 miles along the eastern shore of the canal between Point Sherman and a point east of Sullivan Island is designated for moderate development. Although timber harvest is an approved use of this LUD in the TLMP, the USFS has no plans for logging over the next 5 to 10 years.

Development of Alternative 2B could affect operation of the Kensington Gold Project. The decision to develop the mine and its productive life are not contingent on a highway. In fact, the mine will be fully operational before Alternative 2B could be constructed. Coeur plans to ship supplies into the mine and product out by barge to and from Seattle. Shipping would be from Slate Cove, the nearest place for a deepwater port. This method of moving supplies and product would continue even if Alternative 2B were implemented, because it would be more cost-effective to ship directly to and from the mine rather than bear the expense of shipping to or from Juneau or Skagway first and rehandling the materials. A highway under Alternative 2B could reduce the cost of transporting workers to the site. It could also help to ensure prompt medical responses to injuries of mine personnel.

Alternative 2B would benefit Juneau's seafood processing industry due to lower-cost access to fresh fish markets, such as Seattle. In the fresh fish market, shipping cost and logistics are critical. From the perspective of seafood processors, barge transport has the advantage of being relatively low cost ($0.05/pound), but has the disadvantage of being slow. Alternatively, air shipment of fresh fish can have product in Seattle in a few hours, though at a cost of between $0.33 and $0.46 per pound. Highway transport offers a third option with faster delivery times than a barge to Seattle or locations in other Lower 48 states at lower cost than air freight ($0.15/pound).

Juneau processors indicate that a highway would result in more fresh fish moving out of Juneau. Overland shipping of fresh seafood has proven economical in other regions of the state. A McDowell Group study conducted for the World Trade Center in 2001 found that of the 42 million pounds of fresh seafood shipped out of Southcentral Alaska, half was trucked south via the Alaska Highway.

Water transportation is the primary method of moving freight to and from Juneau, with Seattle being the primary port of origin and destination. Alaska Marine Lines (AML) and Northland Services provide this barge service. Although improved access would provide some short-term transportation benefit, transportation by barge would likely remain the mode by which most freight is shipped to Juneau. The economies of scale possible with barge service, and the relatively frequent service offered into Juneau (three barges/week) places the economics on the side of barge transportation.

Utilities and Public Services – Alternative 2B is not expected to impact Juneau utilities. All of the utilities are adequate to accommodate any population increases attributable to the improved access afforded by Alternative 2B through 2038.

Much of the information provided below on the effects of Alternative 2B is based on interviews with public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Appendix H).

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum impact on Juneau's population from Alternative 2B would be an increase of less than 1 percent by 2038. This increase would mean an additional 20 students spread across all grades.

Health and social services demand is mainly a function of population, and would therefore not be expected to change substantially under Alternative 2B. Additional independent visitors to Juneau, particularly older retirees, would place some new demands on emergency room and other medical and dental services in Juneau. Demand for health care services resulting from additional highway accidents would be negligible when compared with existing demand.

Traffic increases resulting from improved access would not affect fire and emergency medical services within the current service area. According to local officials, a new highway might warrant consideration of another station further north and/or redeployment of a light-duty/fast-response vehicle to the existing Lynn Canal station at Lena Cove.

Improved access would have a modest impact on the ability of police services to handle the increase in local traffic congestion and to respond to occasional emergency calls on the new highway within the CBJ. Local officials do not anticipate that additional staff would be required to patrol the area. State police would be responsible for the highway north of Eldred Rock in the Haines Borough, and would patrol the highway enroute.

The Juneau Police Department has discussed whether connecting Juneau to the outside highway system would result in new types of crime or more serious crime. Although Alternative 2B would not create a direct highway link, it would create easier and cheaper access. Currently, only 5 percent of arrests in the CBJ involve non-residents and less than 1 percent involve people from outside Alaska. Juneau also has very low rates for many of the crimes associated with more “connected” communities, such as gang activity and car theft. It has relatively higher incidences of crime that may be associated with isolation (e.g., domestic and alcohol-related crimes). One possibility raised in public scoping is that ending either a highway or mainline ferry service in Juneau would precipitate an “end-of-the-road” effect, bringing to town more transients who are unable to support themselves and individuals with mental and behavioral problems. However, the U.S. and Canadian customs stations on the Haines and Klondike highways act as a significant filter in this regard, and Haines and Skagway do not have this problem.

The Juneau Police Department believes that there is not enough evidence or precedents to suggest that simply improving access would affect the nature and rates of local crime. Much more of a factor than access is Juneau’s distance from other population centers, particularly large cities. The Juneau Police Department believes a highway connection might be associated with some increase in teen runaways and perhaps some additional auto theft and credit card incidents. There could be an increase in importation of illegal drugs; however, local officials indicate it is already relatively easy to move these substances in and out of Juneau.

Quality of Life – The household surveys conducted in 1994 and 2003 indicated that more than three-quarters of Juneau residents agree that improved access to their community is important. There is less agreement on whether quality of life is best served by highway access. Many proponents of a highway acknowledge that better ferry service would improve quality of life, but not by enough. Many proponents of ferry service believe that better access is important, but only ferry access would result in an overall improvement in the quality of life. In October 2000, Juneau voters were split on an advisory ballot question regarding preference for a long-range plan for surface access north from Juneau, with 5,840 choosing enhanced ferry service and 5,761 choosing a road.

The reasons for these differing views are complex and interwoven with how individuals view Juneau’s lack of highway access. Research and public comment over the past two decades have shown that some residents cherish this condition while others deplore it. Further, improved transportation is generally associated with growth opportunities, and growth typically affects the quality of life. Finally, as noted in the *Socioeconomic Effects Technical Report* for the 1997 Draft EIS, the isolation associated with lack of highway access induces a sense of psychological comfort in some residents and a feeling of frustration and claustrophobia in others.

4.3.5.3 Haines

Population, Economics, Housing, and Municipal Revenues – The total increase in non-Haines resident traffic to Haines associated with Alternative 2B is estimated to be 100 annual ADT in 2008. Growth in Juneau resident travel accounts for the majority of this traffic increase, as the Juneau Household Survey conducted for this project measured a strong interest among Juneau residents in more travel to Haines.

This annual ADT is projected to result in an increase of 42,000 in non-Haines resident visitors in 2008. Assuming that visitors would spend an average of $50 to $60 per trip in Haines (City of

Skagway, 2000 and McDowell Group, Inc., 2002), visitor spending in the community would increase by $2.5 million in 2008 as a result of Alternative 2B.

In terms of economic impact, increased spending in Juneau by Haines residents would offset some of the new visitor spending in Haines. Approximately 12 percent of new spending that would occur in Juneau with Alternative 2B would be by Haines residents, and would amount to about $700,000 in 2008. Based on these estimates, total visitor spending in Haines would result in an increase of approximately $1.8 million in 2008 (Table 4-4). A net increase in visitor spending in Haines of $1.8 million would generate $700,000 in new payroll and an annual average of 35 additional jobs.

Table 4-4
2008 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Haines

Description	Alternative 2B
Highway Traffic (Annual ADT)	190
Vehicle Traffic Less Residents and Baseline Traffic	100
Total New Visitors[1] per Year	42,000
Total New Visitor Spending per Year	$2,500,000
Less New Haines Resident Spending in Juneau	$700,000
Net Annual Change In Spending In Haines	$1,800,000
New Local Payroll per Year	$700,000
New Local Employment	35

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not residents of Haines.

Traffic on Alternative 2B is predicted to increase at an annual rate of approximately 2 percent for the 30-year forecast period considered in this Final EIS. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 80 percent higher than in 2008 (Table 4-5).

Table 4-5
2038 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Haines

Description	Alternative 2B
Highway Traffic (Annual ADT)	340
Vehicle Traffic Less Residents and Baseline Traffic	180
Total New Visitors[1] per Year	75,600
Total New Visitor Spending per Year	$4,500,000
Less New Haines Resident Spending in Juneau	$1,260,000
Net Annual Change In Spending In Haines	$3,240,000
New Local Payroll per Year	$1,260,000
New Local Employment	65

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not residents of Haines.

Each new job in the Haines economy would result in a population increase of about 1.5 people[33]. Therefore, for the 35 new jobs in Haines in 2008, the population would increase by about 53 residents or about 2 percent of the existing Haines population (2,360). In 2038, the population would increase by a maximum of about 100 residents, which represents about 4 percent of the existing Haines population.

A population increase of 53 residents would result in additional demand for about 22 housing units in 2008, based on 2.4 persons per household (from 2000 Census data). In 2038, housing demand would reach about 40 units. Improved access would enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors. To the extent that this occurs, demand for property in Haines would increase. Further, because of land availability in Haines and its drier climate when compared to Juneau, additional Juneau residents may seek seasonal or year-round homes in Haines with Alternative 2B. Finally, improved access to the Kensington Gold Project could result in demand among mine workers for Haines area housing. This impact could range from a few to several dozen housing units, depending on how ferry schedules mesh with mine shift schedules, ferry rates, availability of company-provided transportation, and other factors. The housing demand that would be stimulated by Alternative 2B may increase housing development in Haines and increase local property values as well as property taxes.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of about $1.8 million in 2008 would generate about $100,000 in additional sales tax revenues (based on a 5.5 percent tax rate). In 2038, additional sales tax revenues would be about $180,000. Haines would also receive an increase in property tax revenues as a result of the potential increase in private property values mentioned above.

Industry/Commercial Sectors – Haines is having difficulty maintaining a position in the independent and cruise visitor markets. Independent visitor travel to Haines has been declining, direct cruise traffic has been erratic, and the local visitor industry has a growing dependence on Skagway cruise passengers taking excursions to the Haines area. Alternative 2B would affect Haines' non-Alaskan independent market but would not affect the cruise market.

As indicated previously, visitor traffic to Haines is expected to increase with Alternative 2B. The economic impact of this change in traffic depends primarily on visitors' length of stay. The key factor regarding length of stay now and after construction of Alternative 2B would be the degree to which Haines develops and promotes local assets and attractions.

Alternative 2B would provide better opportunities for Haines residents to find employment with the Kensington Gold Project or for employees of the mine to relocate to Haines. The mine is within the City and Borough of Juneau but about equidistant between Haines and Juneau. A variety of factors could persuade employees to live in Haines, including housing affordability, smaller schools, and access to fish and game resources.

Haines is an important transshipment point, linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. Waterborne freight arrives in Haines on a weekly basis through AML barge service. AMHS ferries also provide freight service to Haines.

The critical issue for local commercial truck drivers is AML's plans for serving Haines should a highway be constructed. AML currently has three to four full-time truckers living in Haines and they often add one to two additional staff in the summer. Representatives of AML have stated

[33] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Haines population participates in the local labor force.

that they would not alter their barge service to Haines should a highway be constructed. The cost of off-loading vans in Juneau and trucking to Haines would not be competitive with continued barge service to Haines.

Utilities and Public Services – Much of the information provided below on the effects of Alternative 2B is based on interviews with public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Appendix H).

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The increase in students resulting from Alternative 2B would be about 10 in 2038 spread across all grades.

Solid waste, hazardous waste, and electric utilities would not be affected in the Haines Borough by the development of Alternative 2B based on the potential population growth associated with this alternative through 2038. Haines' water supply and wastewater treatment system is adequate to accommodate 10 percent population growth. Alternative 2B would generate a maximum of about 4 percent population growth by 2038. This growth would not be sufficient to require expansion of these public utilities.

Improved access would make it somewhat easier and faster to transport patients either on an emergency or a scheduled basis to Juneau from Haines. However, air transport for medical emergencies would remain the method of choice. The medical clinic in Haines is operated by SEARHC. SEARHC is a regional organization with substantial facilities in Juneau. Improved access between Juneau and Haines would reduce cost and increase the efficiency of SEARHC operations by facilitating movement of staff, supplies, and samples between SEARHC locations.

Increased traffic through and to Haines would place additional demands on the community's fire and emergency response services. If fire and emergency response personnel respond to incidents outside current service areas, which includes the portion of the Haines Borough on the east side of Lynn Canal, it would reduce capacity to deliver normal services while those personnel and equipment are occupied.

The Haines Police Department does not expect substantial impacts from improved access. Most crime in Haines involves local residents in spite of its highway connection to the north. Although the highway for Alternative 2B from Katzehin to opposite Eldred Rock is in the Haines Borough, patrol and enforcement would generally be conducted by state police.

Quality of Life – Alternative 2B would change Haines' quality of life in a number of ways. The household surveys indicate that 87 percent of Haines residents agreed that improved access to their community is important. In the 1994 household survey, Haines residents cited increased recreation opportunities, economic growth, and better access to health care and job markets as potential improvements to quality of life that could result from a highway. The principal negative impact on quality of life cited by Haines residents was social change, such as increased crime and the appearance of undesirable transients, increased traffic, and declining local businesses. As discussed previously and in Section 4.3.7, traffic would increase in Haines with Alternative 2B. It is also projected that residents of Haines would increase their spending in Juneau. For Alternative 2B, increased spending in Juneau may be offset by increased visitor spending, though a shift in consumer type may have an impact on the types of retail businesses in Haines. There is no evidence that crime would increase in Haines because of Alternative 2B because most crime in Haines involves local residents in spite of the community's highway connection to the north.

4.3.5.4 Skagway

Population, Economics, Housing, and Municipal Revenues – Based on the 1994 household survey (McDowell Group, Inc., 1994) conducted for this project, Skagway households spent a total of about $900,000 that year in Juneau. If the 1994 spending data were adjusted for inflation, annual Skagway household spending in Juneau would total about $1.2 million in 2004.

In the 1994 survey, with improved access to Juneau, Skagway households indicated that they would spend more money in Juneau than they did at the time of the survey. In fact, 72 percent of Skagway households indicated that their spending in Juneau would increase with improved access.

Despite this leakage from the Skagway economy, Alternative 2B is expected to economically benefit the community. The total increase in non-Skagway resident traffic to Skagway associated with Alternatives 2B is estimated to be 100 annual ADT in 2008. Growth in Juneau resident travel accounts for the majority of this traffic increase, as the Juneau Household Survey conducted for this project measured a strong interest among Juneau residents for more travel to Skagway.

This increase in annual ADT is projected to result in an increase in new independent visitors to Skagway of about 43,000 in 2008. Independent visitors would spend an average of $50 per trip in Skagway (City of Skagway, 2000). This expenditure would result in an annual increase in visitor spending of $2.1 million in 2008 (Table 4-6). This net increase in visitor spending in Skagway would generate approximately $900,000 in new payroll and an annual average increase in jobs of 30 (Table 4-6).

Table 4-6
2008 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Skagway

Description	Alternative 2B
Highway Traffic (Annual ADT)	190
Vehicle Traffic Less Residents and Baseline Traffic	100
Total New Visitors[1] per year	43,000
Total New Visitor Spending per year	$2,100,000
New Local Payroll per year	$900,000
New Local Employment	30

Note: Annual ADT = annual average daily traffic
[1]New visitors are all visitors who are not Skagway residents.

Traffic on Alternative 2B is predicted to increase at an annual rate of approximately 2 percent for the 30-year forecast period considered. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 80 percent higher than in 2008 (Table 4-7).

Table 4-7
2038 East Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Skagway

Description	Alternative 2B
Highway Traffic (Annual ADT)	340
Vehicle Traffic Less Residents and Baseline Traffic	180
Total New Visitors[1] per year	78,000
Total New Visitor Spending per year	$3,780,000
New Local Payroll per year	$1,620,000
New Local Employment	55

Note: Annual ADT = annual average daily traffic
[1]New visitors are all visitors who are not Skagway residents.

Because of the nature of much of the Skagway population, each new job in the economy results in a population increase of about 1.3 people[34]. Therefore, the population of Skagway would increase by about 40 new residents in 2008 and by about 70 new residents in 2038. This would represent an increase of 5 percent over the year-round population of the community (840) and approximately 2 percent over the summer population in 2008, and about double that in 2038.

A population increase of 40 residents would result in additional demand for about 18 housing units in 2008. The demand for housing would increase to a maximum of about 30 units in 2038. This increase in housing demand would be in excess of available housing in Skagway. It is likely that the private sector would respond by constructing additional single-family and multi-family housing. This increase in housing demand would have a strong seasonal component and would result in an increase in local property values with a corresponding increase in property tax.

Skagway would experience an increase in sales and bed tax revenues in conjunction with increased visitor spending. The estimated initial increase in visitor spending would generate about $80,000 in additional sales tax revenues in 2008. In 2038, sales tax revenues would increase by about $140,000.

Industry/Commercial Sectors – Construction of a highway on the Alternative 2B alignment would not alter cruise lines' decisions on port calls in either community. During public scoping for the Supplemental Draft EIS, concern was expressed about the possible loss of cruise ship traffic to Skagway if a highway were constructed to Juneau. The concern is that in an effort to reduce fuel costs and travel times, cruise lines would bus passengers to Skagway rather than actually make a port call.

Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety.

Members of the NorthWest CruiseShip Association (NWCA) discussed the proposed highway alternatives during the 2003 NWCA Operations and Technical Committee meeting as well as the Government Affairs and Community Relations Committee meeting. As a follow-up to their discussions, NWCA sent a letter to the Governor of Alaska stating that construction of a highway would have no effect on members' itineraries. The NWCA consists of Carnival Cruise

[34]Based on an estimated participation rate of 77 percent, meaning that 77 percent of the Skagway population participates in the local labor force.

Line, Celebrity Cruises, Crystal Cruises, Holland America, Norwegian Cruise Line, Princess Cruises, Royal Caribbean International, Seabourne Cruise Line, World Explorer Cruises, and Radisson Seven Seas Cruises. NWCA estimates their member lines carry 97 percent of Alaska cruise passengers. Given that cruise line managers think that a direct highway link would not affect their operations, Alternative 2B is unlikely to have any effect.

Regional managers for Princess Tours and Gray Line, the primary ground transportation providers for all large ships have stated that terminating voyages in Juneau and busing cruise ship passengers to Skagway is not feasible due to limitations regarding tour capacity, pricing, and timing. A round-trip bus excursion would require a minimum of six to seven hours, leaving little time for passengers to experience the sites and activities in Skagway or the popular rail excursion. Although a flight and bus tour combination might reduce the overall transportation time, this option is not practical due to the high cost of the flight, capacity limitations, and potential for weather cancellations. Given that bus excursions on a through highway are unlikely, Alternative 2B, with a shuttle link to all destinations is also not likely to generate bus excursions that replace cruise ports of call.

The other concern expressed during public scoping is the aesthetic impact a highway visible from the water would have on the quality of the cruise experience in Lynn Canal. According to cruise operators, it is likely that Alternative 2B would have little or no effect on current cruise itineraries. Cruise ships generally sail at night and visit a port during the day; therefore, the aesthetic impact of the highway is not an issue for the cruise industry.

Skagway is also an important transshipment point linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. In 2001, 84,000 tons of freight moved through the Skagway port, primarily (85 percent) petroleum products (USACE, 2001). Freight is also transported by AMHS.

Skagway would see reduced costs for freight shipped from Juneau. In 2002, of the 210 vans transported on the AMHS to Skagway, 139 originated in Juneau. The cost of transporting these vans over Alternative 2B would be lower than the cost of ferry transport.

With the exception of freight currently moved from Juneau to Skagway on the ferry, Skagway is not expected to see any change in waterborne freight service with Alternative 2B. The cost of off-loading vans or fuel in Juneau, trucking to Katzehin, and then shuttling to Skagway is more than the cost associated with barge transportation.

Public Utilities and Services – Much of the information provided below on the effects of Alternatives 2B are based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Appendix H).

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The increase in students resulting from Alternative 2B would be about 8 in 2038 spread across all grades.

Alternative 2B would increase demand for water supply and solid waste disposal in Skagway. Current water supply capacity for the community is adequate for the next two to three years, but probably not much longer at current rates of growth. Skagway's solid waste incinerator is adequate for non-peak demand but use is maximized during the summer peak. Anticipated growth in cruise ship traffic will place additional demands on the system. It is likely that Skagway will address peak solid waste demand capacity issues before Alternative 2B is constructed.

The medical clinic in Skagway is operated by SEARHC. Improved access between Juneau and Skagway would reduce cost and increase the efficiency of SEARHC operations by facilitating movement of staff and supplies between SEARHC locations.

The emergency response demands resulting from additional traffic would have a small impact the Skagway fire department. The department's small size and reliance on volunteers would make responding to multiple emergencies difficult, but the service area (Skagway to the Canadian border) would not change. Continued growth in demands on the department would mean a need for more paid staff.

Skagway police would not experience substantial increase in activity as a result of Alternative 2B. The department adds two seasonal officers to address the influx of summer population and visitors and believes that this action is enough to handle the additional demand that would be generated by Alternative 2B.

Police incidents in Skagway tend to involve residents, seasonal workers, cruise visitors, and Canadian visitors. The proportion of non-resident arrests is relatively high, perhaps 75 percent by department estimates. Police activity occasionally correlates with the celebration of Canadian holidays, when visitors drive down the Klondike Highway to Skagway.

Quality of Life – In 1994, Skagway residents indicated that increased tourism, economic growth, and enhanced recreational opportunities would be the principal benefits of improved access in Lynn Canal. Negative impacts on quality of life from improved access cited by Skagway residents included increased crime, the presence of undesirable transients, and loss of spending in local businesses. In the 2003 Household Survey, most Skagway residents said that improved access to Juneau is important (24 percent) or very important (59 percent). Many residents said the best way to provide surface access is by ferry (53 percent), while 41 percent chose a highway. Much of the concern Skagway residents appear to have with a highway is the potential loss in cruise ship visitors and the resulting economic loss for the community. As discussed under "Industry/Commercial Sectors," the cruise ship industry has indicated that the presence of a highway between Juneau and Skagway would not change its plans for calling on Skagway. Therefore, a highway between Juneau and Katzehin would similarly not affect cruise operations. As indicated in Section 4.3.7, traffic would increase in Skagway with Alternative 2B. It is also projected that residents of Skagway would increase their spending in Juneau. For Alternative 2B, this increased spending may be offset by increased visitor spending, though the shift in consumer type may have an impact on the types of retail businesses in Skagway. With regard to undesirable transients and increased crime, an East Lynn Canal Highway would primarily provide for an increase in Juneau travelers. The Skagway Police Department does not anticipate that these visitors would be a major source of crime.

For more information on the economic and social effects of Alternative 2B on Juneau, Haines, and Skagway, see the *Socioeconomic Effects Technical Report* (Appendix H) and the addendum to that report in Appendix W.

4.3.6 Subsistence

Alternative 2B would not impact subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty islands, the lands adjacent to Taiya Inlet, or the south shore of James Bay. It would not impact subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

Haines and Skagway residents use the Katzehin River area for subsistence harvest of marine invertebrates and marine mammals. Alternative 2B, combined with USFS plans for potential public access locations along the highway, would increase access to areas for subsistence harvest activities that previously were accessible only by boat or aircraft. This access could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but for others the increased competition for resources would be negative.

Juneau is not recognized as a subsistence community under the Alaska National Interest Lands Conservation Act. However, some residents of Juneau use Berners Bay and Lynn Canal for personal use harvests of fish and shellfish.

Based on the 1988 USFS subsistence study, the 1994 ADF&G analysis of subsistence impacts, 2003 scoping comments for the Supplemental Draft EIS, Supplemental Draft EIS hearing and written comments, and an analysis of these sources of information, FHWA has determined that Alternative 2B would not significantly restrict subsistence uses.

4.3.7 Transportation

The 2004 SATP calls for construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. The highway to Katzehin and the Katzehin terminal are consistent with the plan. The two new shuttles in northern Lynn Canal called for in Alternative 2B are not consistent with the plan.

4.3.7.1 Capacity and Demand

Traffic demand for Alternative 2B was projected for 2008 and 2038 using the transportation model summarized in Section 4.1.5. These projections were based on 2002 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay. The travel demand expressed as ADT is a combination of the demand between Juneau and Haines and Juneau and Skagway. It is also, therefore, an estimate of the through traffic on the highway segments common to both destinations.

Projected traffic demand in 2008 for the No Action Alternative and Alternative 2B is provided in Table 4-8. A comparison between the No Action Alternative and Alternative 2B indicates that Alternative 2B would generate and accommodate substantially more travel demand in the Lynn Canal corridor than the No Action Alternative. At least four times as much traffic would travel under Alternatives 2B than on the AMHS system under the No Action Alternative in 2008.

Table 4-8
2008 Forecast Demand and Capacity to Haines and Skagway for the No Action Alternative and Alternative 2B

Alternative	2008 Annual ADT	2008 Summer ADT	2008 Winter ADT	2008 Peak Week ADT	Summer Capacity (vehicles per day)
1 – No Action	90	170	40	330	167 (96/71)
2B	380 (190/190)	680 (340/340)	180 (90/90)	1,340 (670/670)	1,180 (544/636)

Note: Numbers in parenthesis are the demand or capacity split between Haines and Skagway. The first number is for Haines and the second number is for Skagway.

As traffic demand grows with time, the ability of Alternative 2B to accommodate the demand relative to the No Action Alternative would become more pronounced. Table 4-9 provides projections of traffic demand and capacity in 2038 for the No Action Alternative and Alternative 2B. These projections assume an increase in travel demand of 1.9 percent annually. As indicated in Table 4-9, five times as much traffic would travel on Alternative 2B than on the AMHS system under the No Action Alternative in 2038.

Table 4-9
2038 Forecast Demand and Capacity to Haines and Skagway for the No Action Alternative and Alternative 2B

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1—No Action	130	230	60	460	167 (96/71)
2B	670 (335/335)	1,190 (595/595)	310 (155/155)	2,350 (1,175/1,175)	1,276 (640/636)

Note: Numbers in parenthesis are the demand or capacity split between Haines and Skagway. The first number is for Haines and the second number is for Skagway.

The capacity of Alternative 2B is limited by the capacity of the ferry link between Katzehin and Haines and Skagway. It is projected that the summer demand for this ferry travel between Juneau and Skagway or Juneau and Haines would be about 340 vehicles in 2008 and 595 vehicles in 2038. The number of ferry trips and ferry capacity between Haines and Katzehin and Katzehin and Skagway have been sized to accommodate the projected summer ADT to and from both communities.

Because of these ferry links, the capacity of Alternative 2B would not meet the projected unconstrained travel demand in the Lynn Canal corridor. As indicated in Section 1.4.1.3, latent demand in the corridor is estimated to currently be about 500 annual ADT. Unconstrained travel demand would be about 510 annual ADT by 2008 and 930 annual ADT in 2038 (Appendix C, *Traffic Forecast Report*). Alternative 2B would generate and accommodate about 75 percent of this annual demand in 2008 and 72 percent of this annual demand in 2038.

4.3.7.2 Travel Flexibility and Opportunity

Alternative 2B would provide increased flexibility and opportunity for travel relative to the No Action Alternative. Under Alternative 2B, travel from Juneau to Skagway and Haines would be linked to shuttle ferries from Katzehin. In the summer, there would be eight round trips per day to Haines and six round trips per day to Skagway. In winter, service would decrease to six round-trips per day to Haines and four round trips per day to Skagway.

In winter, the road would be closed at times because of weather conditions or avalanches. As indicated in Table 4-16, Alternative 2B would be closed an average of 16.5 times per year with a total projected closure time of about 34 days per year. Service to and from Juneau during a road closure would be by one or more of the shuttle ferries that would be part of Alternative 2B. Generally, a shuttle ferry would be used for this purpose if the road were closed for more than one day. The larger of the three shuttles could transport 53 vehicles to and from Auke Bay. This same ferry could shuttle 106 vehicles in each direction if Coeur Alaska's Slate Cove dock is available. See Section 4.3.8.2 for more detail.

4.3.7.3 Travel Time

Table 4-10 provides a comparison of travel times between the No Action Alternative and Alternative 2B. Travel times are based on the assumption of an average highway travel speed of 45 mph and include load and unload time for ferry travel, but no additional wait time. Under Alternative 2B, travel between Juneau and Skagway would take approximately 3.0 hours, and travel to Haines would take about 2.5 hours. The No Action Alternative travel times are longer by one hour for each trip taken on an FVF, and by at least four hours for each mainline vessel trip. However, the Alternative 2B travel time is based on arriving at the Katzehin, Haines, or Skagway terminal in time to load. Many travelers would choose to arrive early to ensure space on these first come–first serve shuttles[35]. Missing a scheduled departure due to lateness or a full boat would entail a 1.5-hour wait for the Haines/Katzehin shuttle, and a 2.5-hour wait for the next Skagway/Katzehin shuttle. Similarly, many FVF travelers under the No Action Alternative would choose to arrive before the minimum check-in time to avoid losing their reservations.

Table 4-10
Travel Times for the No Action Alternative and Alternative 2B

Route	Summer (hours)
No Action Alternative	
Auke Bay – Haines	3.5/7.1[1]
Auke Bay – Skagway	3.8/9.1[1]
Haines - Skagway	1.3
Alternative 2B	
Auke Bay - Haines	2.5
Auke Bay - Skagway	3.0
Haines - Skagway	1.3

Note: [1]The first number is the time for the trip on the fast vehicle ferry (FVF) and the second number is the time for the trip on a mainline vessel. Mainline vessel times include a 2-hour check-in. FVF includes a 1-hour check-in, although 2 hours is recommended by AMHS.

4.3.7.4 State and User Costs

The 30-year life-cycle costs[36] for the No Action Alternative and Alternative 2B discounted to 2004 dollars are provided in Table 4-11. These costs include state and federal capital costs and state maintenance and operating expenses. Capital costs include design, right-of-way acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

Table 4-11
Thirty-Year Life Cycle Costs for the No Action Alternative and Alternative 2B ($millions)

Alternative	Capital Cost	Operating Cost	Total Life Cycle Cost
No Action	$87	$179	$267
2B	$194	$158	$352

Table 4-12 provides an estimate of the state's portion of these costs. As indicated in the table, the capital cost of Alternative 2B would be higher than the No Action Alternative due to the required highway and ferry terminal facilities. However, because the operating cost is lower for Alternative 2B, the total state cost, before considering estimated revenues, would be less for this build alternative than for the No Action Alternative. As explained in Chapter 2, Alternative

[35] On shuttle systems with relatively short runs, multiple round trips per day, and capacity to meet projected demand, taking reservations is an unnecessary expense and would also increase travel time.
[36] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period discounted to 2004 dollars.

2B would have an annual operating cost of approximately $9.0 million versus $10.2 for the No Action Alternative.

Table 4-12
Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternative 2B

Alternative	State Funds[1]					
	Capital Costs ($million)	Operating Costs ($million)	Total State Cost ($million)	Revenue ($million)	Net State Cost ($million)	State Cost/Vehicle (dollars)
No Action	$8	$179	$187	$126	$61	$45
2B	$18	$158	$176	$88	$88	$15

Note: [1]Value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.
The revenue estimates in the table include ferry fares and fuel tax receipts.

Table 4-12 indicates that the net cost to the state of Alternative 2B during the analysis period would be about $27 million more than the No Action Alternative. This is because revenues generated by Alternative 2B would be less than those generated by the No Action Alternative due to lower fares for shorter distances traveled. Alternative 2B would carry more vehicles than the No Action Alternative. Therefore, Alternative 2B would cost the state less than the No Action Alternative on a per vehicle basis.

The total cost[37] of travel between Juneau and Skagway or Haines for a family of four in a vehicle 19 feet long is listed in Table 4-13 for the No Action Alternative and Alternative 2B. This table also lists the out-of-pocket cost[38] of travel between Juneau and Skagway or Haines for the same family. As indicated in the table, Alternative 2B would reduce the total travel cost by two thirds of the cost to travel on a mainline vessel under the No Action Alternative. The savings to the traveler would be greater when compared to travel on a FVF. The out-of-pocket cost (fuel and fares) would be 80 percent less for Alternative 2B than for the No Action Alternative.

Table 4-13
Juneau to Haines and Skagway Total and Out-of-Pocket User Cost for a Family of Four in a 19-Foot Vehicle for the No Action Alternative and Alternative 2B

Alternative	Haines User Cost[1]	Skagway User Cost[1]
No Action	$180/$180[2]	$237/$237[2]
2B	$60/$34	$77/$51

Note: [1]Fist number is total user cost and second number is out-of-pocket cost. Total cost is based on fares plus $0.44 per mile for vehicular travel (AASHTO, 2003). Out-of-pocket cost based on fares and gasoline consumption.
[2]Cost is for a mainline ferry. Cost for FVF would be 10 percent higher.

Based on total user costs, travel time cost, and the projected travel in the Lynn Canal corridor through 2038, total user benefits in terms of reduced travel cost for Alternative 2B in present

[37] Total user costs are out-of-pocket costs and vehicle maintenance, ownership, and accident costs based on highway miles traveled.
[38] Out-of-pocket costs are a combination of estimated fares and gasoline on highway segments. Fares for the No Action Alternative are actual 2004 fares charged. Estimated fares for shuttle travel are based on flat fees of $2/passenger and $6/vehicle plus $0.30/mile for passengers and $0.80/mile for vehicles (DOT&PF, 2005b).

dollars is provided in Table 4-14. As indicated in that table, Alternative 2B would provide benefits to travelers of $226 million relative to the No Action Alternative during the 30 years after construction.

Table 4-14
User Benefits and Net Present Value of Alternative 2B Versus the No Action Alternative[1]

Alternative	User Benefits ($million)	Net Incremental Project Costs ($million)[2]	Net Present Value ($million)
2B	$226	$156	$70

Note: [1]For the period 2004 to 2038 discounted to 2004 dollars.
[2]Overall project costs minus revenues.

The projected cost of taking the shuttle ferry between Haines and Skagway would remain the same regardless of the alternative because both the No Action Alternative and Alternative 2B would have a dedicated Haines/Skagway shuttle. The fare for a family of four is estimated to be about $40, based on the cost of providing this shuttle service.

One economic measure of an alternative is its net present value. Net present value is the total of the user benefits minus the net cost of an alternative over and above the net cost of the No Action Alternative for a given period of time. The 2004 to 2038 net present values of Alternative 2B are provided in Table 4-14. The net present value of Alternative 2B for this period is about $70 million.

4.3.7.5 Other Transportation Impacts

Freight – Water transportation is the primary method of moving freight within Lynn Canal. Freight is transported from Seattle by barge to Juneau, Skagway, and Haines. AMHS ferries also move freight in vans between the communities of Lynn Canal. Haines and Skagway are important transshipment points, linking Inside Passage barge and ferry freight to the Yukon and Interior Alaska.

Alternative 2B would not substantially alter freight traffic between Juneau and Seattle. Trucking companies servicing other Alaska communities were asked to approximate the cost of trucking between these two cities if a highway were available. Those estimates averaged about $0.15 per pound of freight compared to the existing barge freight cost of $0.05 per pound. Although trucking goods from Seattle is not competitive with barge service, a highway link to Juneau may provide opportunities for transporting time-sensitive freight, such as fresh fish. Air freight, which currently serves this function, costs between $0.33 and $0.46 per pound between Juneau and Seattle.

Alternative 2B would not result in a change in scheduled barge service to Haines and Skagway. Freight that now moves from Juneau to Haines and Skagway on the ferry would instead be trucked at a lower cost.

Air Taxi – Alternative 2B is likely to divert traffic from the air taxi operations currently serving Lynn Canal. In interviews conducted for the Supplemental Draft EIS, local air taxi operators noted that the addition of the Lynn Canal day ferry in 1998 reduced air passenger loads in Lynn Canal. For example, the air traffic from Juneau to Haines dropped from 10,014 passengers in 1998 to 6,939 passengers in 2001. The degree to which travelers might change their current air travel behavior would depend on travel times and costs. For Alternative 2B, an estimated 40 percent of air traffic would be diverted.

AMHS – With Juneau serving as the northern terminus for mainline AMHS service under Alternative 2B, the AMHS would only need to operate short shuttles in Lynn Canal. The projected annual AMHS operating costs and estimated AMHS state support for Alternative 2B in 2008 is provided in Table 4-15. As indicated in the table, the No Action Alternative is estimated to require state funding of about $3.3 million in 2008. Alternative 2B is estimated to require state funding in 2008 of $3.2 million, approximately $100,000 less than the funding that would be required for the No Action Alternative.

As stated in the 2004 SATP, the mainline ferry fleet would be reduced based in part on Lynn Canal service no longer being needed. Service south of Lynn Canal would be augmented by greater use of point-to-point shuttles. Because of the high cost of mainline ferry operations and the inconvenience of their schedules, DOT&PF envisions reduced mainline service south of Lynn Canal even if a highway alternative is not constructed.

Table 4-15
Annual AMHS Operating Costs and Estimated AMHS State Funding in 2008 for the No Action Alternative and Alternative 2B

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Funding ($million)
No Action	$10.2	$3.3
2B	$7.7	$3.2

Note: Source DOT&PF, 2004d.

Safety – The potential for accidents on the highway segment of Alternative 2B was estimated based on highway accident statistics from 1993 to 2003 and the projected number of miles that would be traveled on Alternative 2B. The Haines, Klondike, and Glacier (16 mile to end) highways were used for the analysis because they are located near Lynn Canal and are similar in design and annual ADT as the Alternative 2B highway (DOT&PF, 2004e). There have been four fatalities on these highways during the 11-year period of record, one on the Haines Highway and three on Glacier Highway. All four fatalities were due to speeding, and the fatality on the Haines Highway also involved alcohol. This number of fatalities over the period of record provides a fatality rate of one death per 48.7 million vehicle miles. Based on this rate, there is projected to be approximately six traffic fatalities over the 30-year study period (2008 to 2038) on Alternative 2B.

There have been no fatalities on the AMHS system since 1975. There was a fatality in 1975 when the *M/V Malaspina* ran over a fishing boat, resulting in the drowning of one person. There have been five cases over the past 10 years where ferries ran aground or hit submerged rocks, causing substantial damage to the vessel. There have been two cases of electrical fires onboard the *M/V Columbia* that caused the ship to lose propulsion and passengers to be evacuated. None of these accidents resulted in reportable injuries to passengers.

Capital Move – Lack of highway access is often cited by capital move proponents as one of the reasons to move the state capital. Alternative 2B would not provide a direct highway link to Juneau, but would improve access in terms of cost, frequency, and capacity. This may reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the state capital.

Pedestrians and Cyclists – The highway proposed for Alternative 2B would include 4-foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Shuttle ferries for this alternative would accommodate bicyclists and foot passengers.

Approximately 100,000 passengers travel on AMHS vessels in Lynn Canal per year. It is estimated that approximately 36,000 are walk-on passengers. As indicated in the *Traffic Forecast Report* (Appendix C), many current walk-on passengers would choose to travel by car if a highway were available in the Lynn Canal corridor. Based on the 2000 Census, approximately 90 percent of the households in Juneau, Haines, and Skagway own at least one vehicle and 50 to 60 percent of the households own two or more vehicles. Travelers without vehicles would be forced to rent vehicles, take a commuter flight, or travel on private carriers, (if they develop) to accommodate this demand.

The percentage of AMHS walk-on passengers that would choose to travel in their own vehicle if Alternative 2B were selected for the project would depend on a variety of factors such as the cost, frequency, and convenience of a bus or van service. On the other hand, the cost, frequency, and convenience of a bus or van service would depend on the size of the market. Following completion of highway construction, there would be a period of transition as entrepreneurs or established service providers tested the market by offering some moderate level of service, such as one or two round-trips daily between communities during the summer.

For the purpose of this EIS, the initial size of the market for bus or van service was estimated at between 9,000 and 18,000 annual northbound and southbound travelers (25 to 50 percent of the current walk-on passengers) if a bus service was available and reasonably affordable. This is not a measure of the number of travelers who would be unable to make a trip in the absence of ferry service between Auke Bay and Haines and Skagway, but rather an estimate of the number of travelers that would choose to use a bus service if it were available and reasonably affordable.

Assuming that this market was split roughly 70 percent into a 150-day summer season and 30 percent into a 215-day winter season, peak summer passenger traffic would be between 40 and 85 passengers per day (split equally northbound and southbound). Winter traffic would be between 12 and 25 passengers per day.

The potential for bus/van service to develop between Katzehin and Juneau with Alternative 2B was evaluated based on case studies of bus service elsewhere in Alaska[39] and interviews with 12 land transportation service providers (see addendum to the *Socioeconomic Effects Technical Report* in Appendix W). Based on this evaluation, it is likely that Alternative 2B would result in daily summer coach service linking Juneau, Haines, Skagway, and possibly Whitehorse. Winter service would be less frequent, with bus service offered perhaps every other day to Haines/Skagway. Cost would ultimately depend on the size of the market but would likely be in the range of $35 to $50 one-way between Juneau and Haines or Skagway based on the projected shuttle fares and rates on similar existing bus services. This would place the cost in the same range as the current AMHS adult passenger fares for the Juneau/Skagway Juneau/Haines links.

It should be noted that Skagway has the only ferry terminal in Lynn Canal that is within reasonable walking distance from residential areas. All other existing terminals must be reached by private vehicle or private carrier. The ferry terminals have been located based on the efficiency of ferry moorage and routes rather than the convenience of walk-on passengers.

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[39] Bus services examined in these case studies were Alaska Park Connection between Seward and Denali National Park, Homer Stage Lines between Homer, Soldotna, Kenai, and Seward, Alaska Trails between Anchorage, Wasilla, and Talkeetna with continuing service to Healy, Alaska Direct Bus Lines between Fairbanks and Whitehorse, and Yukon Alaska Tourist Tours between Skagway and Whitehorse.

Navigable Bridges – The Katzehin, Lace, and Antler rivers are navigable in accordance with U.S. Coast Guard guidelines. The bridges over these rivers would require bridge permits from the U.S. Coast Guard. These bridges would be constructed to maintain navigation at all tide stages.

4.3.8 Geology

Alternative 2B would impact no unique geologic resources in the study area. This alternative would be subject to a variety of geologic hazards, including earthquake-induced ground tremors, avalanches, and landslides. Geotechnical investigations would be used in support of the final engineering design of the selected alternative. These studies would minimize the impact of geologic hazards on the road embankment and related structures.

4.3.8.1 Seismic Activity

As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). Based on USGS hazard maps published in 1999, there is a 10 percent probability of an earthquake in the next 50 years that would cause ground accelerations in the range of 0.1 to 0.2 g[40] in the project area (Wesson et al., 1999). These types of ground accelerations would be taken into account in the design of roadway pavement and highway structures. It is probable that a maximum ground acceleration in the project area would cause damage to a highway, as is the case with many other Alaskan highways in seismic areas.

4.3.8.2 Avalanches

The proposed highway alignment for Alternative 2B crosses 36 avalanche paths (the other four identified paths do not reach the alignment). Avalanche risk assessment is based on the AHI, a dimensionless standard that calculates the probability of encounters between avalanches and vehicles and the likely damage. The 1997 Draft EIS reported an unmitigated AHI value of 369.5 for the highway proposed on the East Lynn Canal Highway alignment at that time. Using more accurate survey data, refined alignments, long-term climate studies, and additional winter observations, the calculated unmitigated AHI for Alternative 2B is 186.

These unmitigated figures are considered very high, but are in the middle range for highways operated with good safety records in avalanche terrain. (For example, Rogers Pass, B.C., has an unmitigated AHI of 1,004, the previous Seward Highway alignment from Anchorage to Seward had an unmitigated AHI of 331, and the previous Seward Highway alignment from Anchorage to Girdwood had an unmitigated AHI of 188.) With appropriate hazard reduction and operational risk management, the mitigated AHI for Alternative 2B would be reduced to an AHI value of approximately 27. Hazard reduction methods are physical changes such as constructing barriers or adjusting the alignment of a highway. Risk management methods include forecasting, warnings, temporary highway closures, and use of explosives to release unstable snow during temporary highway closures. A mitigated AHI value of 30 or less is the North American standard for safe operation of a highway.

DOT&PF is proposing to use helicopter placement of explosive charges to release unstable snow. The explosive charges would be dropped by hand from a low-hovering helicopter with the door removed. Helicopter delivery has proven to be an effective, accurate, and flexible

[40] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

method for covering large areas in a short time. The major disadvantage is that helicopter delivery requires calm ridgetop winds and good visibility. The lack of good flying weather can result in substantial delays and missed opportunities. The *Snow Avalanche Report* prepared for the proposed project (Appendix J) calculated closure periods using the same data used in the AHI calculations. The closure period calculations and AHI calculations are based on 100 years of weather records from Juneau correlated with 6 years of avalanche observations in Lynn Canal. Estimates of average closure time per year, average number of closures per year, closure length, and capital and operating budgets for highway maintenance relative to avalanche hazards for Alternative 2B are provided in Table 4-16. The capital costs of avalanche control equipment and facilities have been included in the construction cost estimate, and the annual operating cost for avalanche control has been included in the maintenance and operating cost estimate for each alternative.

Table 4-16
Costs, Closures, and Mitigated Avalanche Hazard Index for Alternative 2B

Alternative	Capital Cost	Annual Operating Cost	Average Closure Time per Year (days)	Average Number of Closure per Year	Closure Length (days)	Mitigated Avalanche Hazard Index
2B	$2,668,070	$719,446	33.9	16.5	0.8 to 7.8	26.5

Alternative 2B includes three shuttle ferries with two operating in the winter. One or more shuttle ferries would carry northbound and southbound traffic between Haines, Skagway, and Juneau when the highway is closed for one day or more. Having an alternative means of moving essential traffic provides not only convenience but reduces the pressure to open the highway in marginal conditions.

Shuttle ferries would operate to either Auke Bay or Slate Cove. On a run to Auke Bay, the largest of the shuttle ferries could transport 53 vehicles each way per day. If the Coeur Alaska dock at Slate Cove is available, this ferry could transport 106 vehicles each way per day. The second winter shuttle ferry could make runs in Lynn Canal if greater capacity is necessary.

4.3.8.3 Landslides

Four slide areas have been identified near Alternative 2B (Figure 3-12). All of these slides are rockfall slides, with little soil movement, although the initial slides removed large amounts of vegetation. One of these slides stops above the alignment of Alternative 2B and would not pose a problem in terms of safety or maintenance. The three rockslides with the potential to reach the alignment of Alternative 2B are within avalanche paths. These rock slides would be mitigated as part of avalanche control by constructing raised embankments with large culverts. A raised roadway would prevent rock and avalanche debris from flowing onto the road, while the culverts would pass water and small debris. Other avalanche paths may also have rockslides in the spring and summer but these slides tend to be smaller than the avalanches on the same path and generally do not extend to the bottom of the path.

New slides could occur in the vicinity of the East Lynn Canal alternative due to rock conditions and steep uphill slopes. There are six identifiable slides, one of which occurred during the 11-year period after the initial geological investigation took place. A rough conservative estimate of potential new rockslide activity is approximately one per decade. Slides actually reaching the roadway would occur somewhat less often. Stabilization of all potential rockslide areas above the alignment of Alternative 2B is not practical. Geotechnical studies during design would identify appropriate locations for alignment adjustments, rockfall barriers, and slope stabilization.

These measures, along with the normal maintenance action of removing slide material from catchment ditches and shoulders, would make road closure due to slides an infrequent event.

4.3.8.4 Outburst Floods

As described in Section 3.2.1, the Meade Glacier at the head of the Katzehin River creates a glacially dammed lake that discharges annually. Glacial outburst floods also have the potential of occurring on the rivers in Berners Bay. The bridges crossing these rivers would be designed to safely pass these floods.

4.3.9 Hydrology and Water Quality

4.3.9.1 Floodplains

Planning and preliminary design of Alternative 2B has been done in compliance with EO 11988, Floodplain Management and FHWA regulations in 23 CFR 650.11.

Flooding Risks – The alignment for a highway between Echo Cove and Katzehin runs perpendicular to most of the natural drainages along the east side of Lynn Canal. Therefore, it is not possible to avoid transverse encroachments of these drainages. Alternative 2B would have no longitudinal encroachments of any drainages. No regulatory floodways occur in the project area. The transverse encroachments are mainly bridge piers that would be designed so that Alternative 2B would not create significant flood risks.

Impacts on Natural and Beneficial Floodplain Values – Alternative 2B would cross 46 streams. Most of these streams are less than 50 feet wide. Bridges would be used to cross 19 streams, including all anadromous fish streams. Eleven of the bridges would be single-span structures. For these bridges, each bridge and its piers would be located outside of the predicted 100-year flood elevation of the streams, as determined by hydraulic studies to be conducted during the final engineering design of the selected alternative. Five streams would have a single support but the support would not be within ordinary high water. Multi-span bridges would be constructed at the crossings of the Katzehin, Lace, and Antler rivers. These larger bridges would extend beyond the outer most channels at each river delta to protect their natural, meandering flow. The multi-span bridges would require placement of supports in the river floodplain. These supports would be spaced and designed to accommodate the predicted 100-year flood volume with no more than a one-foot rise in backwater.

The Katzehin, Lace, and Antler rivers are navigable in accordance with U.S. Coast Guard guidelines. The bridges over these rivers would require bridge permits from the U.S. Coast Guard. These bridges would be constructed to maintain navigation at all tide stages.

Potential for Incompatible Floodplain Development – There are no community floodplain development plans for the project area. The streams crossed by Alternative 2B that have a large enough floodplain for development are located within the Tongass National Forest. All of these lands are designated as either LUD II or semi-remote recreation areas, where the principal management goal is to retain the natural character of the area. Therefore, no incompatible floodplain development would occur in the project area.

Alternative 2B would provide a highway where there are currently no roads. The highway would serve as a new evacuation route for emergencies for private properties adjoining the road and for Juneau.

Measures to Minimize Floodplain Impacts and Preserve Natural and Beneficial Floodplain Values – All of the larger floodplains would be crossed with bridges. Bridge abutments would be located outside the floodplains. Multiple-span bridges would be supported on piles with groups of in-line piles spaced at least 130 feet apart.

Compliance with EO 11988 – In accordance with the analysis required in 23 CFR 650 Subpart A, FHWA has determined that Alternative 2B is in compliance with EO 11988. This alternative cannot avoid transverse encroachments of 100-year floodplains along the alignment; however, the alternative would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially impact natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

4.3.9.2 Hydrology

Alternative 2B would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would percolate through the shot-rock fill or eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downgradient side through culverts. This flow diversion would include sufficient cross-culverts to adequately maintain the water's natural downgradient flow. Culverts would be designed for the 50-year rainfall event and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

The ferry terminal north of the Katzehin River would require the placement of fill (shot-rock generated during highway construction) at the terminal site and dredging to approximately 25 feet below mean lower low water. These encroachments would not measurably change the hydrodynamics of Lynn Canal or Berners Bay.

4.3.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to watercourses whose drainages include Alternative 2B principally through runoff from the highway.

Results from stormwater research by the FHWA indicate that stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT & FHWA, 1987). Studies conducted in Anchorage, Alaska, under the Municipality of Anchorage (MOA) Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). These studies showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below the AWQS. Only dissolved concentrations of copper and lead were noted to be above their AWQSs; however, modest dilution would likely reduce these concentrations below their AWQS. Identified concentrations would not adversely impact streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of Alternative 2B and the predicted low annual ADT, fewer impacts to water quality in the project area would occur than were found in the Anchorage studies. Studied runoff was collected from Anchorage roadways that ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). Studied melt water was from snow collected from a mix of these types of roads. In comparison, Alternative 2B would have a maximum ADT in 2008 and 2038 of approximately 1,530 and 1,660 vehicles, respectively, based on ferry capacity and non-through traffic. During winter, ADT would be less than 1,000 vehicles per day.

Highway runoff and melt water from Alternative 2B would have lesser quantities of potential contaminants than what was observed in the Anchorage studies due to a lower traffic volume and less development in the Lynn Canal corridor. Snow would be cleared from the highway and deposited along its length, instead of being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area. Runoff from the proposed highway and bridges would not exceed AWQS or adversely impact the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be lower than on most highways due to the rural setting of the highway and the low predicted highway traffic volume. Nevertheless, the potential for spills due to a highway vehicle accident would be created.

The following BMPs would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments.
- Rock would be used to stabilize toes of slopes at ponds and stream crossings.
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- Roadside swales would be designed to keep surface water within the natural drainage basins.
- Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternative 2B would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal north of Auke Bay would be eliminated. The ferries that would be used for Alternative 2B would have sanitary waste holding tanks,[41] or would discharge treated wastewater meeting applicable standards. A sewage treatment facility with a permitted outfall would be installed at the Katzehin Ferry Terminal. Discharges from the sewage treatment facility would be within permit guidelines. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would be used; therefore, no adverse impacts to water quality would occur. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternative 2B.

Highway and bridge runoff would contribute small amounts of turbidity and pollutant loads to local drainages flowing to Lynn Canal. Contaminant concentrations in runoff from the proposed highway and/or bridges would not exceed AWQS or adversely impact the water quality of receiving waters for the long term.

[41] Holding tanks would be pumped out and the waste treated onshore for disposal.

4.3.10 Air Quality

The increase in traffic on Egan Expressway and Glacier Highway predicted for Alternative 2B would not affect the Mendenhall Valley non-attainment area based on consultations with the EPA for the 1997 Draft EIS, the current status of the area, and the impact analysis presented in this section.

4.3.10.1 Carbon Monoxide

Simplified dispersion modeling was conducted for CO emissions from projected maximum peak traffic volumes.[42] Using the most conservative climatic conditions (i.e., low wind speeds and a stable atmosphere that produces the highest pollutant concentrations), the modeling indicated that the maximum one-hour average CO concentration associated with these emissions would be 1 ppm. Adding this concentration to an estimated background value of 1 ppm and 2 ppm for rural and urban (e.g., Haines, Skagway, and Auke Bay) segments of Alternative 2B indicates that CO concentrations would not approach the 9 ppm CO NAAQS.

Marine vessel CO emissions were not modeled for Alternative 2B. Marine vessel traffic in the Lynn Canal would decrease with this alternative, as mainline ferry service north of Juneau would be discontinued, but ferry operations in Chilkoot and Taiya Inlets would increase. However, ferry operations under this alternative would have little effect on air quality. This conclusion is supported qualitatively by the fact that Juneau has no reported exceedances of CO standards with much larger port facilities, a larger concentration of marine vessels, and a larger frequency of marine vessel operations than elsewhere in Lynn Canal.

4.3.10.2 Particulates

A qualitative analysis was done for PM_{10} for Alternative 2B. This analysis compared project-related traffic with traffic in an area with similar meteorological conditions where PM_{10} has been monitored.

PM_{10} is monitored at Floyd Dryden Middle School on Mendenhall Loop Road in Juneau. Peak-hour traffic volume on this road was 1,201 vehicles in 2000. The 24-hour and annual average PM_{10} concentrations measured at this monitoring station were 27 and 7.5 $\mu g/m^3$, respectively, in that year. Projected peak hour traffic for Alternative 2B was estimated at 9 percent of the summer average daily traffic (summer ADT). Summer ADT for Alternative 2B is projected to be 680 and 1,190 vehicles in 2008 and 2038, respectively. Therefore, the peak hour traffic for this alternative would be about 60 and 110 vehicles in 2008 and 2038, respectively. These traffic volumes are 20 (2008) and 10 (2038) times smaller than the volumes recorded on Mendenhall Loop Road in 2000. Multiplying these factors by the PM_{10} concentrations measured at Floyd Dryden provides the following estimates for PM_{10} concentrations that could result from peak hour traffic volumes for Alternative 2B:

- Year 2008 – 24-hour average: 1.3 $\mu g/m^3$ annual average: 0.4 $\mu g/m^3$
- Year 2038 – 24-hour average: 2.5 $\mu g/m^3$ annual average: 0.7 $\mu g/m^3$

These estimates are substantially below the 150 $\mu g/m^3$ 24-hour average NAAQS and 50 $\mu g/m^3$ annual average NAAQS for PM_{10}. Because the Mendenhall Loop Road PM_{10} data include dust from unpaved roads in the valley and paved roads generally contribute only a small fraction of

[42] These volumes were 1,800 in 2008 and 3,250 in 2038 based on Alternative 2; Alternative 2B projected volumes are less; therefore, emissions would be less.

the total PM_{10}, this estimate of project-related PM_{10} concentrations overestimates the actual concentrations that would result from Alternative 2B.

Overall, Alternative 2B would burn approximately 10 percent less fuel than the No Action Alternative (Table 4-64); because of the shorter ferry routes, it would result in an even greater reduction in the combustion of diesel fuel. Diesel combustion emits 20 times more particulates than combustion of gasoline (California Air Resources Board, 1998).

4.3.10.3 Conformity

The project area is located in an air quality attainment area where the SIP does not contain any transportation control measures. Therefore, conformity procedures do not apply to this project, and a conformity determination is not required per 40 CFR 51.

4.3.11 Hazardous Materials

From the ISA review, one site along the alignment of Alternative 2B was identified as having the potential for hazardous materials involvement (Figure 3-13). As explained in Section 4.1.10, an impact rating was assigned to those sites within a 300-foot-wide corridor centered on the alternative alignments and facility sites. The impact rating was based on contaminant type, contaminant quantity, groundwater and groundwater gradient, age of contaminant, extent (if any) of previous or ongoing cleanup actions, and potential cleanup costs.

The alignment for Alternative 2B would come within about 150 feet of three above-ground diesel fuel storage tanks at Comet. There have been no recorded leaks or spills from these tanks. Therefore, the probability for hazardous materials involvement at this location is low. Based on the ISA screening process, no preliminary site investigation was recommended for the Comet site because it was determined to have a low impact rating.

See the *Initial Site Assessment Technical Report* (Appendix M) for further information on the hazardous waste assessment for the proposed project alternatives.

4.3.12 Wetlands

Alternative 2B would result in the loss of approximately 70 acres of wetlands and 32 acres of marine waters of the U.S. The specific aquatic habitats that would be impacted by Alternative 2B, including habitats impacted by the proposed ferry terminal, are provided in Table 4-17. The preliminary alignment for highway segments of Alternative 2B has been adjusted several times to avoid wetlands and reduce the impacts to wetlands that could not be avoided. During design DOT&PF will investigate additional measures to reduce impacts, including further small alignment changes, steepened slopes, and reduced embankment heights.

All but approximately 1 acre of the wetlands that would be impacted by Alternative 2B are forested wetlands. The wetland functions and values that would be affected by a highway include a reduction in groundwater recharge and discharge, lateral flow, surface hydrologic control, wildlife habitat functions, and riparian support.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Flow of surface water as well as shallow groundwater blocked by the highway embankment that would eventually flow to the surface would be conveyed downgradient by culverts under the highway embankment. Alteration of hydrology because of the highway embankment could result in corresponding changes to the vegetation and over time could affect wetland functions within and outside the highway right-of-way. The extent of this effect would depend on localized hydrologic patterns; however, effects would be minimized through the use of porous fill material and cross-drainage structures.

Comments on the 1997 Draft EIS and during 2003 scoping requested further analysis of the impacts of development on the Berners Bay region. The Berners Bay region is an ecologically diverse area that supports several species of migratory birds, mammals, and plant species. Alternative 2B impact 19.7 acres of palustrine forested, and 0.7 acre of palustrine scrub-shrub wetlands in the Berners Bay area from Echo Cove to the Slate Creek drainage. The alignment was adjusted in 2005 to avoid all palustrine emergent wetlands (muskegs and fens).

The salt marsh at the head of Berners Bay and adjacent to the Lace and Berners rivers provides several important ecological functions, including surface hydrologic control, riparian support, and wildlife habitat functions. This wetland is rated very high for wildlife functions based on documented use by waterfowl, bald eagles, and marine mammals. Portions of this wetland provide fish habitat functions, depending on the elevation of the wetland. Regional ecological diversity is rated high, as this wetland receives substantial use by wildlife and this type of wetland is limited in the project study area. The alignment for Alternative 2B was adjusted in 2003 to avoid this wetland and further adjusted in 2005 to provide greater separation between the highway and the salt marsh area.

Adjacent to the Antler and Berners rivers and on the west shore of Berners Bay, the proposed alignment for Alternative 2B would impact primarily palustrine forested wetlands. The effects of this action would include modifying the groundwater recharge functions, the discharge/lateral flow functions, the surface hydrologic control functions, and the sediment retention functions of these wetlands. Large areas of similar habitat in the surrounding areas, and adequate ditching and drainage structures, would moderate losses of any of these functions. Wildlife habitat functions would be reduced due to the loss of forest, but an abundance of similar habitat is adjacent to the alignment.

From the Slate Creek drainage to Sherman Point, Alternative 2B would impact approximately 48 acres of wetlands, all of which are palustrine forested wetlands. The alignment was adjusted in 2005 such that no emergent wetlands would be impacted. The functions affected by Alternative 2B in this area would be the same as those described for the palustrine forested wetlands along Berners Bay. Regional ecological diversity would not be substantially affected by this loss of wetlands, as this habitat type is common and widespread throughout the surrounding area. The proposed alignment avoids the seasonally flooded emergent/scrub-shrub wetland between Slate Cove and Sherman Point. Approximately 28 acres of the wetlands that would be impacted in this subregion are the result of a mid-1990s alignment adjustment to avoid bald eagle nest trees. From about five miles north of Point St. Mary to Comet there is a narrow band of uplands along the shore. At the request of resource agencies, the alignment was shifted uphill into forested wetlands in this area in order to avoid the numerous eagle nest trees in the upland area along the shore and to avoid intertidal fills.

From Sherman Point to the Katzehin River, Alternative 2B would affect just over 1 acre of palustrine forested wetland near Independence Lake. This would have little effect on wetland functions and values in the area. Approximately 75 percent of all shoreline impacts of Alternative 2B would occur in this portion of the proposed alignment. A total of 24 acres of marine habitat would be filled in this area. Potential impacts of this fill are discussed in Section 4.3.13.

The alignment of Alternative 2B was adjusted in 2005 to avoid filling estuarine emergent wetlands near the Katzehin River crossing and along the upper levels of the large flats on the north side of the delta. This salt marsh habitat on the Katzehin River outwash plain is important in terms of wildlife habitat functions. The current highway alignment and ferry terminal would fill approximately 5 acres of unvegetated intertidal shoreline and a small (0.2 acre), isolated estuarine emergent wetland area north of the Katzehin flats. The breakwaters for the Katzehin terminal would fill 2.7 acres of intertidal and subtidal area.

The indirect effects of Alternative 2B on wetlands include the potential introduction of contaminants from de-icing and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These activities could cause the further loss of wildlife habitat functions, reduction of ecological diversity, and sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for wetland users, would minimize the risk of these effects occurring.

Sand would be used on the highway in the winter. A small quantity of salt (up to 5 percent of the total weight of the sand) is used to keep the sand friable. Because the amount of salt is minimal, it is unlikely to substantially damage adjacent vegetation.

The proposed project does not include access facilities for off-road vehicles (ORVs); however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through vegetation destruction, erosion, and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the road is constructed.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternative 2B. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands. A compensatory mitigation plan has been developed to address the wetland losses associated with Alternative 2B (Preferred Alternative) (see Section 5.2 for further information on mitigation).

Appendix X includes the Wetlands Finding, Draft Section 404(b)(1) Analysis, and Draft Section 404/10 Permit Application for Alternative 2B.

Table 4-17
Alternative 2B Impacts to Wetlands and Other Waters of the U.S. (Acres)

Subregion	Classification	Areas of Fill (acres)
Echo Cove to Slate Creek Drainage	**Wetlands**	
	Palustrine Forested	19.7
	Palustrine Scrub-Shrub	0.7
	Subtotal	**20.4**
	Marine Areas	
	Subtotal	**0.0**
Slate Creek Headlands to Sherman Point	**Wetlands**	
	Palustrine Forested	48.2
	Subtotal	**48.2**
	Marine Areas	
	Subtotal	**0.0**
Sherman Point to Katzehin River	**Wetlands**	
	Palustrine Forested	1.2
	Subtotal	**1.2**
	Marine Areas	
	Rocky Shores	24.0
	Subtotal	**24.0**
Katzehin River to Terminal Area	**Wetlands**	
	Estuarine Emergent	0.2
	Subtotal	**0.2**
	Marine Areas	
	Beach Bar	1.6
	Rocky Shores	6.4
	Subtotal	**8.0**
All East Lynn Canal Subregions	**Wetlands**	
	Palustrine Forested	69.1
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	0.2
	Subtotal	**70.0**
	Marine Areas	
	Beach Bars	1.6
	Rocky Shores	30.4
	Subtotal	**32.0**
	Subregion Totals	
	Total Wetlands	70.0
	Total Unvegetated Marine Areas	32.0
	Total Acres	**102.0**

Note: This total does not include fill associated with culvert placement in non-anadromous streams. This additional acreage would be determined during design and permitting.

4.3.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

During environmental studies for the Supplemental Draft EIS, the FHWA determined that the project alternatives may adversely affect EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act. Following this determination, DOT&PF prepared an EFH assessment to assess the effects of project alternatives on commercial fish stocks in all life stages and associated habitats. This section summarizes that assessment, which is provided in the *EFH Assessment* (Appendix N) and the addendum to the assessment in Appendix W.

Construction of Alternative 2B would include deposition of materials from sidecasting of shot rock into marine waters. Areas where sidecasting would be done are typically steep. Therefore, most of the material would pass through the intertidal zone and be deposited in subtidal areas. Intertidal and subtidal areas would also be impacted by placement of fill for road embankment and construction of ferry terminals.

Alternative 2B would generate approximately 2.3 million cy of excess excavation material, mostly rock. Under this alternative, approximately 900,000 cy of shot rock would be stockpiled at the south end of the project for future use. Up to 1.4 million cy of rock would be sidecast in Lynn Canal between Comet and the Katzehin River. During design, DOT&PF would evaluate raised grades, flattened slopes, and short tunnel segments to determine locations where this would be a cost effective method to reduce excess rock quantities. Intertidal areas impacted by sidecasting exhibit typical zonation with various narrow band combinations of *Fucus*, mussels, barnacles, and *Verucaria*. While these areas may support prey organisms for commercial fish species, they are not likely to serve as refuge or areas important for the spawning or growth to maturity of those species. The intertidal areas are typically narrow and steep, and much of the sidecast material would pass by them and settle in the adjacent subtidal zone. For these reasons, direct effects on marine fish habitat due to sidecasting of materials in intertidal areas would be below measurable levels.

Bryozoan complexes often dominate deeper subtidal areas. Common macroinvertebrates in subtidal areas that would be impacted by sidecasting include mussels, urchins, small crabs, and shrimp. These areas principally serve as foraging habitat for commercial fish species, and are not likely to serve as refuge or areas important for the spawning or growth to maturity of those species. The sidecasting would be dispersed over a broad area along the shore down steep slopes, and most of the material would be deposited in deep subtidal habitat. The sidecast rock would be large and would not produce evenly blanketing fill. This sidecasting would not produce substantially different habitat than already exists except where the bottom consists of mud. Benthic plants and animals would become established on this substrate. Therefore, direct effects on EFH due to sidecasting of materials in subtidal areas would be below measurable levels.

The approximate loss of EFH (intertidal and subtidal habitat) due to highway and ferry terminal construction under Alternative 2B is 32 acres (25.6 acres filled for highway, and 6.4 acres filled for the Katzehin Ferry Terminal including breakwaters). An additional 4.4 acres of subtidal habitat would be impacted by dredging.

Placement of in-water fill in 25.6 acres for highway construction would bury all intertidal and subtidal organisms at the specific fill locations and alter the habitat. Intertidal and subtidal invertebrate species are opportunistic, and the slopes of fill areas would likely be colonized by similar intertidal and subtidal species over a few seasons. However, because the amount and character of the area available for recolonization would be different from the undisturbed intertidal and subtidal zone, recolonization would not restore the community to its original state, reducing its value as foraging habitat for commercial fish species. Because of the small amount of intertidal and subtidal habitat that would be filled by Alternative 2B relative to the total available, this impact would not affect regional populations of any fish or invertebrate species.

A new ferry terminal would be constructed north of the Katzehin River for Alternative 2B. Because the terminal would not be located near the river mouth, it would not interfere with anadromous fish passage in the Katzehin River. The breakwaters at the terminal would be constructed with gaps or large culverts to allow passage of juvenile fish near the shore.

The proposed Katzehin Ferry Terminal site consists of a steep boulder beach transitioning to a less steep cobble beach. There is a boulder-cobble-gravel substrate in the upper subtidal/lower intertidal zone and a muddy substrate in the lower subtidal zone at this site. Vegetation is present in the shallow intertidal zone, and stalked kelp is present in one part of the lower intertidal zone; however, no seabed vegetation was seen in video imagery of the lower subtidal zone. Due to the steepness of the beach, potential wave exposure, and lack of subtidal vegetation, the proposed Katzehin Ferry Terminal site is less important to commercial fish and crab species than other more protected coves. For this reason, the loss of 6.4 acres of intertidal and subtidal habitat and the dredging impact to 4.4 acres from construction of a new ferry terminal as well as maintenance dredging in approximately 30 years time would not measurably alter fish populations in the Katzehin River delta area or in Lynn Canal. Operations of this ferry terminal would not impact Pacific salmon, Pacific herring, or eulachon because of the spatial separation of the terminal from the Katzehin River and other areas of Lynn Canal important to these species.

There is the potential for accidental fuel spills from ferries at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location. Spill prevention and cleanup plans would be in place for shuttle ferry operations to minimize potential impacts from accidental spills.

The ferries that would be used for Alternative 2B would have sanitary waste holding tanks[43]or would discharge treated wastewater meeting applicable standards. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the EPA (National Pollutant Discharge Elimination System [NPDES] permit) and/or ADEC (Water Quality Permit) and would meet EPA- and Alaska-established waste discharge limitations. For this reason, the effluent should not impact fish or crab habitat or affect fish and crab populations in Lynn Canal, including Berners Bay.

Alternative 2B would bridge nine streams that support anadromous fish populations, including the Lace, Antler, and Katzehin rivers. The bridges crossing all but the Lace, Antler, and Katzehin rivers would not encroach on the stream channel. Piers for the bridges over the Lace, Antler, and Katzehin rivers would be placed at least 130 feet apart and would not impede fish movement in these rivers. The northern-most channel of the Antler River identified as a eulachon spawning area would be clear-spanned to avoid impacts to this habitat.

Stormwater and melt water runoff from bridges over anadromous fish streams would not alter water quality sufficiently to impact crab or anadromous and marine fish habitat. As discussed in Section 4.3.9.3, studies of highway runoff in Alaska indicate that the volume of traffic on Alternative 2B would not be large enough for runoff from the highway to cause the exceedance of any AWQS in receiving waters.

In summary, the construction of Alternative 2B would result in the direct loss of 32 acres of EFH as a result of filling for highway and ferry terminal construction, as well as the modification of subtidal habitat resulting from dredging and sidecasting shot rock. Alternative 2B would bridge all streams crossed by highway segments that support anadromous fish populations. Piers for the bridges over the Lace, Antler, and Katzehin rivers that would be required for Alternative 2B would be placed at least 130 feet apart and would not impede fish movement in these rivers.

The direct loss of 32 acres of foraging habitat through highway fill and ferry terminal construction, as well as the modification of some subtidal habitat as a result of sidecasting and dredging, would not substantially affect any fish and invertebrate populations in Lynn Canal. NMFS has offered the following additional EFH conservation recommendations for this alternative pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act:

- Realign the Berners/Lace and Antler River multi-span bridges so that they are located as far upstream as possible, minimizing the adverse effects of bridge construction and the effects on in-stream flows. Eulachon are important forage for federally managed fish species (as well as marine mammals) and spawn up to 4 miles upriver. Moving the

[43] Holding tanks would be pumped out and the waste treated onshore for disposal.

bridge alignments upstream would decrease the amount of wetland habitat impacted, reduce effects on eulachon and Steller sea lions and other wildlife that use the mudflats, and minimize future human impacts to the river deltas by providing additional distance between the roadway and river outlets in Berners Bay.

- Provide compensatory mitigation sufficient to compensate for the loss of intertidal, subtidal, and wetland habitats.

The alignment for Alternative 2B and the siting of the Katzehin Ferry Terminal have been adjusted through preliminary engineering studies to limit intertidal and subtidal fill. During design of the selected alternative, DOT&PF would continue to investigate ways to further reduce this fill. The bridges over the Berners/Lace and Antler rivers have been realigned as far upstream as possible in response to the conservation recommendations. A compensatory mitigation plan has been developed to address impacts to intertidal, subtidal, and wetland habitats (see Section 5.4 for further information on mitigation).

4.3.14 Terrestrial Habitat

Alternative 2B would result in the loss of vegetation within the cut-and-fill limits of the highway and a narrow band of right-of-way clearing adjacent to the highway. The acreages of vegetation types that would be removed for this alternative are estimated to be:

- 286 acres of old-growth forest[44]
- 128 acres of other forest
- 13 acres of open shrub and meadow[45]

Old-growth forest in the project area was defined as forest over 150 years old with an average diameter-at-breast-height greater than 9 inches, and timber volume greater than 8,000 BF per acre. Other forest consists of timber stands smaller than this, a small area of which is second growth. Old-growth and other forests consist of the following coniferous forest plant series: western hemlock, western hemlock-yellow cedar, Sitka spruce, mixed conifer, mountain hemlock, and Sitka spruce-black cottonwood. The remaining vegetation that would be removed for Alternative 2B consists of shrub (non-forest brush) and open meadow or muskeg vegetation communities.

Most of the terrestrial habitat that would be impacted by Alternative 2B is in the Tongass National Forest. As discussed in Section 3.3.3, the TLMP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternative 2B would impact three mapped small old-growth reserves established under the reserve system:

- **VCU 160** – Alternative 2B would run through a mapped small old-growth reserve in VCU 160 in the Slate Cove area. There is a concentration of blocks of high volume old-growth and a larger amount of low volume old-growth. Within the reserve, Alternative 2B would run through the high volume old-growth forest. The reserve covers 1,454 acres. Alternative 2B would reduce the entire small mapped reserve by about 29.8 acres, and the highway corridor would separate the reserve into two areas. The remaining inland reserve area would be 930.6 acres, and the remaining reserve area on the shoreward side would be 493.6 acres. Alternative 2B would reduce the VCU 160 mapped small old-growth reserve by 2 percent.

[44] Includes 69.4 acres of forested wetlands and does not include land already cleared for Cascade Point Road.
[45] Includes 0.7 acre of scrub-shrub wetlands.

- **VCU 200** – Alternative 2B would intersect the mapped small old-growth reserve in VCU 200 located at the south end of Point Saint Mary peninsula adjacent to VCU 160. This reserve consists of much land that is not old-growth, and most of the old-growth forest is medium volume forest. The reserve contains four intermittent small blocks of high volume old-growth near the south tip of the peninsula. Within the VCU 200 reserve, Alternative 2B would run through low volume old-growth and would not affect the high volume old-growth forest blocks in the reserve. The reserve contains 3,306.2 acres. Alternative 2B would reduce the entire small mapped reserve by about 18 acres, and the highway corridor would separate the reserve into two areas. The remaining inland area would be 456.0 acres, and the remaining shoreward area would be 2,832.2 acres. Alternative 2B would reduce the VCU 200 mapped small old-growth reserve by 0.5 percent.
- **VCU 190** – Alternative 2B would cross this mapped small old-growth reserve from north of Comet to approximately Met Point. This reserve consists of much land that is not old-growth, and some medium volume old-growth forest. There are two intermittent blocks of high volume old-growth located inland. In the reserve, Alternative 2B would run through medium volume old-growth forest. The reserve covers 1,462.0 acres. Alternative 2B would reduce the size of the reserve by about 20.4 acres, and the highway corridor would separate the reserve into two areas. The remaining inland reserve area would be 1,408.4 acres, and the shoreward reserve would be 33.2 acres. Alternative 2B would reduce the VCU 190 mapped small old-growth reserve by 1.4 percent.

The USFS in consultation with ADF&G and USFWS would adjust boundaries to make the Old-Growth Habitat LUDs meet the requirements of the old-growth reserve system established in the TLMP.

In addition to the mapped old-growth reserves, Alternative 2B would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within all of these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternative 2B would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into inland and shoreward areas. Alternative 2B would remove approximately 286 of 76,279 acres of old-growth forest along the east side of Lynn Canal (USFS, 2003).

As discussed in Section 4.3.13, Alternative 2B would involve sidecasting 1.4 million cy in Lynn Canal. Sidecasting would be located in areas where the highway is either next to the shoreline or in steep cliff or slide areas where impacts to terrestrial vegetation would be minimized.

The loss from each vegetation type represents less than 1 percent of that type in the study area and is minimal compared to the approximate forest cover of 117,000 acres in the Lynn Canal region (NPS, 2003). The loss of this vegetation would not adversely affect any rare or unique community types or any listed threatened and endangered or USFS sensitive plant species. This alternative may affect two plant species considered rare by the Alaska Natural Heritage Program (paper birch and wild blue lettuce).

Clearing of the highway right-of-way would increase the potential for blow-down of trees adjacent to the right-of-way or slides in unstable areas.

Alternative 2B could have indirect effects on terrestrial vegetation. By improving the access to the area, human activity would increase along the highway corridor. This increase could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

4.3.15 Wildlife

4.3.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall's porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.3.18, Threatened and Endangered Species.

Harbor seals frequently haul out at a number of rocky beaches and sand bars in the study area, including sand bars in Berners Bay and at the mouth of the Katzehin River. Many harbor seals use Berners Bay in the spring and summer for feeding and hauling out, especially near the confluence of the Antler and Lace Rivers (Marston, Willson, and Gende, 2002; USFWS, 2003). Vehicle traffic would not have any effect on harbor seals where the proposed highway is at least 100 yards from the shoreline. Beyond this distance, traffic noise would be at an intensity similar to other noise sources in the natural environment. The alignment of Alternative 2B is several hundred yards away from beaches and sand bars in Berners Bay. The proposed highway alignment for Alternative 2B would be immediately adjacent to the beach at a number of locations north of Sherman Point. It is possible that harbor seals could abandon haulouts they may currently use in these locations. Seals may habituate to highway traffic at the Katzehin River or may choose to utilize areas further down stream from the bridge. Operation of the ferry terminal at Katzehin is not expected to cause disturbance to harbor seals at haulouts because of the distance between this terminal and seal haulouts.

Minke whales tend to be attracted to motor vessels. Therefore, the presence of such vessels would not drive minke whales away from an area. For this reason, shuttle ferries in Chilkoot and Taiya inlets associated with Alternative 2B would not be expected to displace this species. Because of this attraction, increased ferry traffic may increase the risk of collision; however, collision accidents with minke whales are very rare (Angliss and Lodge, 2003). Therefore, Alternative 2B is unlikely to impact the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid motor vessels and would not be impacted by the ferry traffic associated with Alternative 2B.

Sea otters occur in low numbers in Lynn Canal. Like the harbor seal, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternative 2B. Alternative 2B is unlikely to impact the small sea otter population in Lynn Canal.

4.3.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz's murrelets, harlequin ducks, and trumpeter swans.

Great blue herons nest in trees near preferred feeding areas, typically quiet shorelines and marshy areas. Alternative 2B would result in the loss of potential nest trees on the banks at large river crossings. The type of nesting and feeding habitat preferred by great blue herons is not limited in Berners Bay or the Katzehin River delta. Great blue herons have habituated to human presence and vehicle traffic in many urban areas, including Juneau, so they would be expected to habituate to normal vehicle traffic from Alternative 2B. For these reasons, Alternative 2B should not result in population-level effects on this species.

Marbled murrelets are common in nearshore waters along the eastern shore of Lynn Canal and in Berners Bay and are presumed to nest throughout the study area (USFWS, 2003). This species nests in old-growth trees, often near the coast. Alternative 2B would impact a small percentage of the available nesting habitat preferred by marbled murrelets. Therefore, Alternative 2B would not have population-level effects on this species.

The Kittlitz's murrelet appears to be rare in the project area. It nests in high-elevation talus slopes and feeds in nearshore waters. Highway traffic is expected to have no effect on this species.

Harlequin ducks are also common in nearshore waters along the eastern shore of Lynn Canal and in Berners Bay (USFWS, 2003) and nest along the banks of swift-running streams. These birds are wary of people and will swim or fly away when approached (Rosenberg, Patten, and Rothe, 1994). Highway traffic noise could disturb harlequins in nearshore resting and feeding areas where the highway alignment is at the shoreline. The majority of the highway is not located on the shoreline. Therefore, disturbances that would result in population-level effects on this species are not expected.

Trumpeter swans typically nest in marshy areas near small lakes and are very sensitive to disturbance, with consistent disturbance causing abandonment of nests (Rosenberg and Rothe, 1994). They nest and rear young from April through September in the wetlands of the Antler, Lace, and Berners River drainages, with a concentration of nests on the Lace River near its confluence with Berners Bay (USFS, 2001). Most of these nests are well upstream of the alignment for Alternative 2B. At least one nest site is known to exist approximately 3,200 feet from the highway alignment on the delta between the Antler and Lace rivers (USFS, 2001). This site is separated from the alignment by a wide belt of spruce forest. At this distance, vehicle noise would not be noticeable at the nesting site and the forest would prevent visual disturbance of swans using the site.

The USFWS conducted all-season surveys of water birds in Berners Bay but did not record trumpeter swans. However, these surveys did not go upstream into the estuarine areas most likely to be used by swans. Given the number of nesting trumpeter swans in the area, it is likely that some of them, and perhaps wintering swans from other parts of Alaska, spend at least some time foraging in estuarine and marshy areas of the Berners Bay drainages. Alternative 2B passes primarily through forested areas as it approaches the Antler and Lace rivers, so vehicle traffic would not be expected to cause disturbance of wintering swans.

4.3.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, and mountain goat. The assessment of project effects for these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and indirect impacts of increased human activity in the study area.

The direct loss of wetland and terrestrial habitat described in Sections 4.3.12 and 4.3.14 would amount to less than 1 percent of these habitats available in the study area. Additional loss of habitat because of windblown trees adjacent to the right-of-way or changes in local hydrologic patterns may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and moose and spring and fall beach habitat is important for bears.

Behavioral avoidance of a highway on the alignment for Alternative 2B or physical features of the highway such as steep embankments or retaining walls may function as a barrier to movement for some species and may fragment their habitat by limiting their ability to use all of their range. Alternative 2B would have little effect on the movement of moose or mountain goats. Moose readily cross highways; therefore, habitat fragmentation is not an issue for that species. Mountain goat habitat is primarily at higher elevations than the proposed highway alignment; however, they often venture down to low elevation forest and other habitat, including rock bluffs close to shore, in winter. They seldom venture far from steep escape terrain. Because the highway would be close to the water in areas where mountain goats winter, most of the winter range for this species would not be affected by Alternative 2B. However, winter goat habitat below the highway would be fragmented from habitat upslope of the highway. The highway would fragment as much as 1,141 acres of winter fringe habitat. Goats would have to cross the highway to access this habitat. The HCI model data prepared for the 1997 Draft EIS predicts that Alternative 2B would decrease mountain goat habitat capability on the east side of Lynn Canal by less than 1 percent compared to present conditions based in part on the assessment that goats prefer to be near steep escape terrain. It is not known how often goats use areas close to shore.

Sitka black-tailed deer use a variety of habitat types, so it is unclear how habitat fragmentation might affect their survival (USFS, 1997a). They appear to be limited by heavy snow conditions and the quality of winter habitat. Based on a lack of high-quality winter habitat, the deer population is considered very small on the east side of Lynn Canal north of Berners Bay (Barten, 2001).

Black bears in Southeast Alaska tend to migrate seasonally between winter dens at higher elevations and summer feeding grounds at lower elevations. Radio collared bears in Berners Bay have been shown to move between high elevations and shorelines on a regular basis (Robus and Carney, 1996). Also, black bears are known to feed on salmon at the Sawmill Creek estuary in the fall. For this reason, many bears would likely have to cross portions of the proposed highway alignment at least twice a year. A lack of escape cover near some portions of Alternative 2B and traffic disturbance could block some bears from portions of their existing home ranges, such as lower reaches of anadromous fish streams. Because black bears are highly adaptable and often learn to coexist near human development, a highway is not expected to result in a substantial effect on black bear populations in the study area. The highway would likely result in mortality of some black bear from vehicle collisions. The HCI model results for the 1997 Draft EIS predicted that an East Lynn Canal Highway would decrease black bear habitat capability on the east side of Lynn Canal by about 6 percent compared to present conditions.

Brown bears also move seasonally between higher elevation dens and lower elevation foraging habitat, for example, in Berners Bay in the isthmus between the Lace and Antler rivers (Christensen and Van Dyke, 2004). Brown bears tend to avoid highway traffic more than black bears. One study found that brown bears avoided roads regardless of traffic volume (McLellan and Shackleton, 1988). Thus, they would be more likely than black bears to abandon certain parts of their range rather than cross a highway. Because Alternative 2B would separate higher elevation habitats from beach fringe and estuary habitats and because those areas often contain important resources for brown bears, the effective loss of habitat could reduce the reproductive success or survival of some bears (Schoen et al., 1993). The HCI model results for the 1997 Draft EIS predicted that an East Lynn Canal Highway would decrease brown bear habitat capability on the east side of Lynn Canal by 26 percent compared to present conditions. To reduce this habitat fragmentation, bridges over streams would be designed to provide underpasses for wildlife migration. In addition, if Alternative 2B is constructed, two wildlife underpasses would be included for the major brown bear migration corridors identified in the inland area between the Lace and Antler rivers and potentially minimize habitat fragmentation.

A highway on the alignment for Alternative 2B is not likely to fragment the range of marten, as they would readily cross the road to access favorable habitat. The mature forest habitat along the shoreline potentially serves as a movement corridor for marten between high-density forest areas such as found in Berners Bay, the Katzehin River drainage, and other drainages on the east side of Lynn Canal. A highway would reduce the size of this corridor of fringe habitat and may potentially reduce movement of marten between these areas (N. Barten, personal communication, 2005). The largest impact of this alternative on marten would be the indirect impact of trapping. Marten are highly desirable as a furbearing species and are relatively easy to trap. Alternative 2B would increase human presence and access in the region, probably increasing the number of marten trapped in the East Lynn Canal region. The HCI model results for the 1997 Draft EIS predicted that an East Lynn Canal Highway could decrease marten habitat capability on the east side of Lynn Canal by 32 percent primarily because of trapping. The effects of this increased pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc.

Wolves travel widely in pursuit of prey and strongly avoid areas of human activity (USFS, 2000; Person, 2001). Some wolves use estuarine areas to feed on marine mammals and fish, but the importance of these areas for wolves in the Berners Bay area is not known. The proposed highway would likely not create a barrier to wolf movement, but provide more access for people to beaches and riparian areas, potentially inhibiting the use of these areas by wolves.

Alternative 2B would not fragment the ranges of marten and river otter except possibly in the area of Gran Point and Met Point. As discussed in Section 4.3.18.1, Gran Point and Met Point are important haulout areas for Steller sea lions. To discourage people from accessing them, the design for Alternative 2B would include cut banks, retaining walls, and screening structures, where necessary, within approximately 3,000 feet of each location. These barriers could inhibit the movement of martens and river otters in these two areas although there would be culverts these animals could use to cross the highway. Although a highway could impact individual animals, it is not expected to have population-level effects on martens and river otters in the study area.

Collisions with vehicles would result in an increase in mortality among many terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as moose and deer, and those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are expected to occur with species that tend to avoid roads such as the wolf and brown bear. Mountain goats would probably not be substantially impacted by collisions, as they would generally not be found adjacent to the highway. It is not possible to quantify the effect of mortality from vehicle collisions on wildlife populations in the study area, but there would be some losses.

The moose population around Berners Bay consists of only about 100 to 150 animals and is subject to a highly popular but very limited permit-only hunt (Barten, 2001). The number of moose killed by vehicles each year would fluctuate with weather conditions and the density of moose near the highway. ADF&G would have to consider this source of mortality in its management plans for the Berners Bay herd and the hunting limits on that herd.

DOT&PF would use helicopters to deliver explosive devices to unstable avalanche zones along Alternative 2B during the winter. Mountain goats are very sensitive to human disturbance in their alpine habitats, especially from helicopters (USFS, 2001). During heavy snow conditions, when avalanche danger is highest, goats tend to retreat to lower elevations and seek shelter under dense-canopied old-growth forests. However, goats have also been observed at high elevations and traversing slide zones during late winter in the study area. Therefore, mountain goats could be susceptible to disturbance from helicopters and explosive devices used to keep the highway clear during the winter, and could be injured or killed in slides induced for highway maintenance. However, regular maintenance of avalanche chutes would reduce the frequency that debris from large avalanches reaches forested areas. This would minimize the likelihood of goat mortality from these larger events.

Alternative 2B would make a large area more accessible to hunters and trappers. As is the case elsewhere in Alaska where roads from populated areas have been built into semi-remote and remote areas, hunting and trapping pressure on species such as black and brown bears, moose, deer, mountain goats, martens, and river otters would increase on the east side of Lynn Canal with Alternative 2B. Although not identified as a species of concern during scoping, ADF&G is also concerned about the potential for over trapping of wolverines in the Berners Bay area. Based on trapping history, Berners Bay is an area of high wolverine productivity. The effects of this increased hunting and trapping pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. Therefore, it is expected that this increased pressure would not result in undesirable population-level effects in addition to those due to habitat loss and fragmentation.

To address the potential for population changes and the need for more aggressive game management in response to increased access, DOT&PF has committed to funding population studies for moose, brown bear, wolverine, and mountain goat. These studies would involve collaring and monitoring individual animals in Berners Bay for moose, bear, and wolverine, and along the Lynn Canal corridor for mountain goats. See Section 5.8 for a discussion of these and other mitigation measures for terrestrial wildlife.

4.3.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend's warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily old-growth forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). There are approximately 76,279 acres of old-growth forest on the east side of Lynn Canal. Alternative 2B would affect up to approximately 286 acres, or 0.4 percent, of the old-growth forest. Therefore, the proposed project is not expected to result in population-level impacts to these species.

Alternative 2B would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create "edge effects," which is the edge between forest and grass or shrub lands that can be used by some avian predators such as ravens, jays, and crows. These effects would add to the decreased value of nesting habitat for neo-tropical migrants near the highway.

4.3.15.5 Amphibians

Frogs and toads such as the wood frog, spotted frog, and boreal toad live in both marshy and forested wetlands as well as upland areas adjacent to ponds. Because amphibians have small home ranges and do not appear to travel far from their natal pools (NatureServe, 2003), the potential impacts resulting from highway maintenance and operation would be limited to those animals that live near the proposed alignment. The potential impacts of a highway to amphibians would occur through mortality from roadkill and potential pollution of habitat from highway runoff of pollutants from accidental spills. To avoid impacts to amphibian breeding areas and to reduce overall amphibian effects, the alignment has been moved to avoid open water and emergent wetlands. A pre-construction survey would be conducted to confirm the highway would not impact any amphibian ponds. Impacts are not expected to affect amphibian populations.

4.3.16 Bald Eagles

The principal concerns for construction and operation of Alternative 2B with regard to bald eagles is disturbance of nesting birds and abandonment of nesting sites. The alignment for Alternative 2B has been located to avoid the direct loss of known trees with eagle nests based on USFWS nest surveys of the project area. However, a number of trees with eagle nests are located near the alignment. As indicated in Section 4.1.14, the USFWS has developed a set of distance guidelines for construction activities near active eagle nests that have been used for this impact assessment. Table 4-18 lists the known trees with eagle nests within specified distances from the proposed highway alignment for Alternative 2B. Based on USFWS surveys from 1997 to 2005, approximately 25 to 55 percent of nests along Lynn Canal are active in a given year.

Table 4-18
Known Eagle Nest Trees within the Vicinity of Alternative 2B

Distance from Highway	Number of Eagle Nests
0 to 0.5 mile	92
0 to 330 feet	49

In Southeast Alaska, bald eagles that have chosen nest sites in or near urban areas are often acclimated to high levels of human activity (Johnson, 1990). Bald eagles are most susceptible to disturbance during the breeding and nesting season, which in Lynn Canal begins in March and continues through August.

Maintenance and operation of Alternative 2B would involve a persistent source of noise that may result in the relocation of individual eagle pairs to alternate nest trees within their nesting territory. Individual eagle pairs may even abandon their nesting territory and associated hunting perches altogether, especially during the summer months, when traffic volumes are predicted to peak. Because food availability has been identified as a key factor that influences breeding success, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the east shoreline of Lynn Canal. As a result, Alternative 2B is not likely to adversely affect the overall population of bald eagles in the Lynn Canal area. See Section 4.8.12.6 for construction impacts and mitigation regarding bald eagles.

4.3.17 Threatened and Endangered Species

Section 7 consultation for threatened and endangered species included humpback whales, Steller sea lions, and Steller sea lion critical habitat at Gran Point. A revised Biological Assessment was prepared by DOT&PF and submitted to NMFS. On September 27, 2005, NMFS concurred with FHWA's determination that Alternative 2B is not likely to adversely affect humpback whales or Steller sea lions, or adversely modify Steller sea lion critical habitat (see letters at the end of Chapter 7).

4.3.17.1 Steller Sea Lions

There are two principal haulouts along the proposed alignment for Alternative 2B that are used on an annual basis by Steller sea lions: Gran Point and Met Point. Gran Point is designated as critical habitat under the Endangered Species Act. Although Met Point is not used by sea lions as extensively as Gran Point, it is still an important haulout for this species. Steller sea lions also haul out seasonally on Point St. Mary, approximately two miles southwest of Slate Cove, during the spring when feeding on spawning aggregations of eulachon and Pacific herring in Berners Bay. Tidal wash rocks at the tip of land forming the east side of Slate Cove are also used by Steller sea lions during the spring feeding period.

Modeling was done to estimate traffic noise from Alternative 2B at the Gran Point haulout (see the *Steller Sea Lion Technical Report,* Appendix S). The highway would be approximately 320 feet from the haulout. The modeling results indicated that noise levels in the haulout area during the peak summer traffic hour would be at background levels approximately 150 feet from the centerline of the highway. Measured background noise levels in the project area ranged from mid-30 to upper-40 dBA. Background noise levels at the haulout was estimated to be approximately 45 dBA. Therefore, traffic noise from Alternative 2B would not increase noise levels at the Gran Point haulout, and Steller sea lions would not be impacted by traffic noise. Based on the distances from the haulouts to the highway and background noise levels, traffic noise impacts on Steller sea lions at Met Point would be the same as those projected for Gran Point. Highway noise at Point St. Mary is not a concern because of the distance between the haulout and the proposed highway.

Normal winter and summer maintenance activities such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out would not produce levels higher than the predicted 30-year peak hour traffic. Winter operation would also require infrequent detonation of unstable snow in the three avalanche starting zones within the 3,000-foot radius around the two sites (*Snow Avalanche Report*, Appendix J). Detonation would be done by helicopter, with the helicopter approach made from the closest point outside the 3,000-foot radius. Each of the three avalanche starting zones is projected to require detonation with a single charge at a frequency of once every 10 years or more at each zone.

Sea lions have been observed to approach and investigate marine vessels and other noise sources and appear to adapt to noise and human presence under some conditions (Richardson et al., 1995). Several major haulouts are located near busy shipping lanes and ports along the Pacific coast, with sea lions exhibiting little disturbance even as human activities increase (Johnson et al., 1990). In some areas, sea lions haul out on man-made structures close to humans (Richardson et al., 1995). In a study of Steller sea lions at a haulout in Glacier Bay National Park, the proximity and behavior of approaching marine vessels affected the activity rate of sea lions at the haulout (Mathews, 1997). Vessels that maintained a slow, steady course and kept the engines on seemed to disturb sea lions less than vessels with an erratic course or speed. This study may indicate that private vessels, which are more maneuverable and whose operators may be less aware of protection rules, might disturb Steller sea lions more than larger commercial vessels (NPS, 2003). Alternative 2B would not include any new boat launch sites for private or commercial vessels. Under Alternative 2B, the only ferry traffic south of Katzehin would be intermittent shuttle service to Auke Bay or Slate Cove during winter road closures, and possible summer interim service to and from Slate Cove after construction reaches that point. Neither operation would disturb Steller sea lions at Lynn Canal haulouts or during spring feeding periods in Berners Bay.

In response to NMFS concerns about potential pedestrian access and disturbance at the Gran Point and Met Point haulouts, highway design elements have been incorporated into Alternative 2B that are intended to prevent motorists from leaving the highway corridor and approaching these haulouts. The measures include steep road cuts and approximately 8- to 10-foot-high barriers within 3,000 feet of either haulout. DOT&PF would monitor the effectiveness of these design elements after highway construction and make additional changes, if necessary, to keep people away from these haulouts.

During highway construction, work within 1,000 feet of the Gran and Met points haulouts would only be done when the haulouts are vacant unless authorized by NMFS. The haulouts would be monitored when construction work is being done within 3,000 feet of the haulouts to ensure that Steller sea lions are not disturbed.

FHWA has determined that Alternative 2B is not likely to adversely affect Steller sea lions or adversely modify the Gran Point Critical Habitat Area. As indicated in Section 4.3.17, NMFS has concurred with this determination.

4.3.17.2 Humpback Whales

Alternative 2B would increase marine traffic in Chilkoot and Taiya inlets. The increase in ferry traffic associated with this alternative would not be high enough to substantially increase the risk of collisions with humpback whales.

Pile driving for construction of the ferry terminal at Katzehin could disturb humpback whales in the area. Monitors would be used during pile driving to ensure that this activity does not occur when humpback whales are within 660 feet of the construction area.

FHWA has determined that Alternative 2B is not likely to adversely affect humpback whales. As indicated in Section 4.3.17, NMFS has concurred with this determination.

4.3.18 Permits and Approvals

Alternative 2B would require the following permits and approvals:

- USFS special use permit for project facilities in the Tongass National Forest
- USACE Section 404 (Clean Water Act) permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit (Rivers and Harbors Act) for dredge, fill, and structures placed below mean high water
- U.S. Coast Guard Bridge Permits for bridges over navigable waters
- EPA NPDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 (Clean Water Act) Water Quality Certification in support of Section 404 permits
- ADNR Title 41 fish habitat permit for any work below ordinary high water in streams with anadromous or resident fish
- ADNR Coastal Consistency Determination
- ADNR Interagency Land Management Assignment for use of tidelands at the Katzehin Ferry Terminal and easements for highway segments built below mean high water
- Authorization from EPA and/or ADEC for treated wastewater discharge from the Katzehin Ferry Terminal

- ADEC review of the Storm Water Pollution Prevention Plan (SWPPP) under the NPDES Alaska General Permit

4.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 proposes a new highway primarily on the west side of Lynn Canal. This alternative would include a highway from Echo Cove to Sawmill Cove on the same alignment as Alternative 2B (on the east side of Lynn Canal) and a highway on the west side of the canal from William Henry Bay to Mud Bay Road in Haines. New ferry terminals would be located at Sawmill Cove and William Henry Bay to provide for shuttle ferry service across Lynn Canal.

DOT&PF and the USFS considered appropriate sites for pullouts and scenic overlooks for Alternative 3 in 2003. The proposed locations of these sites are listed below and provided in Figure 4-11.

- A pullout near Sawmill Creek
- A pullout at William Henry Bay Ferry Terminal
- A scenic overlook on the shoreline near Lance Point
- A pullout near the Endicott River
- A pullout and scenic overlook north of the Cant geodetic marker
- A pullout near the Sullivan River
- A pullout and scenic overlook near the Gen geodetic marker
- A pullout near the Deep geodetic marker

The environmental impact assessment provided in Section 4.4 includes consideration of the potential impacts of the proposed pullouts and scenic overlooks. The USFS has indicated that trails at four of the pullouts are reasonably foreseeable if the highway is constructed. (See November 2, 2005 letter from USFS in Chapter 7.) A separate environmental analysis would be completed by the USFS for these trails prior to their construction. These four trails are included in the cumulative impacts section of this chapter (Section 4.9).

4.4.1 Land Use

4.4.1.1 Land Ownership and Management

Current ownership of the land that would be required for the highway right-of-way and new ferry terminal facilities for Alternative 3 is presented in Table 4-19. As indicated in that table, approximately 69 percent of the 1,324 acres of required right-of-way for Alternative 3 is federal land in the Tongass National Forest under the management of the USFS. This land would remain under federal ownership with a highway easement conveyed to the state. About 246 acres, or 19 percent, of the right-of-way is already owned by the state. The remaining land required for the Alternative 3 right-of-way is under private or University of Alaska ownership. Private landowners, Goldbelt, and the University of Alaska would be compensated for lands required for a new highway right-of-way at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Table 4-19
Land Ownership of Required Right-of-Way for Alternative 3

Ownership (acres)						Total (acres)
USFS	State of Alaska	Alaska Native Allotment	Goldbelt	University of Alaska	Private	
912	246	35	55	35	42	1,324

Note: Based on the maximum right-of-way width of 300 feet on federal and state lands and 150 feet on private and municipal lands.

4.4.1.2 Consistency with Land Use and Management Plans

As described in Section 3.1.1.1, the TLMP for the Tongass National Forest identifies a transportation corridor along the alignment for Alternative 3; therefore, this alternative is consistent with the TLMP (USFS, 1997b). The USFS land crossed by the alternative along the east shore of Berners Bay is currently managed under Semi-Remote Recreation and Scenic Viewshed designations (Figure 3-3). Most of the USFS land crossed by Alternative 3 on the west side of Lynn Canal is currently managed under the designations Semi-Remote Recreation and Modified Landscape. A small area around William Henry Bay is managed as Scenic Viewshed. If the Alternative 3 highway was constructed on the alignment, the USFS would change the designation of the highway corridor to Transportation and Utility Systems.

The regional transportation policy set forth in the CBJ Comprehensive Plan is to support the improvement and expansion of air, marine, and highway transportation systems to maintain and expand Juneau's role as the capital city and a regional transportation center (CBJ, 1996). The 1996 update to the CBJ Comprehensive Plan maintains plans for the consideration of all alternatives, including highways, high-speed ferries, and light rail or railroad, to improve transportation links throughout Southeast Alaska and Canada. Therefore, Alternative 3 is consistent with the CBJ Comprehensive Plan.

Goldbelt's Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternative 3 is consistent with this plan and would use the alignment of the newly constructed road. Alternative 3 may facilitate development of the other plan elements.

The majority of the land on the west side of Lynn Canal from north of the Tongass National Forest to the Pyramid Harbor area (Figures 3-1 and 3-2) is owned by the State of Alaska and is managed by the ADNR under the Haines State Forest Plan. Alternative 3 would cross approximately 7 miles of this state forest. The plan identifies preferred uses for forest land and the policies for managing these uses, emphasizing management flexibility. Transportation projects are consistent with the plan as long as they follow the State of Alaska Forest Resources and Practices Act and its regulations.

On the west side of Lynn Canal, the northern part of the Alternative 3 highway would be located within the Haines Borough. The Haines Comprehensive Plan was updated in April 2004. The plan discusses the importance of daily AMHS service and expresses concern about a highway link to Juneau. The proposed highway alignment is within the general use zoning district of the plan outside the city limits of the former City of Haines. The intent of this general use designation is to provide a minimum of planning, platting, and land use regulation in rural areas. A transportation facility would be consistent with this zoning designation.

The Alternative 3 alignment crosses the Chilkat River/Inlet at Pyramid Island and joins Mud Bay Road within the Haines Townsite Planning Zone boundaries. The highway would pass through or adjacent to land zoned Residential, Business Transition and Residential, and Development. Alternative 3 terminates at Mud Bay Road in Haines and would be consistent with this existing transportation use.

4.4.1.3 Land and Resource Uses

The West Lynn Canal Highway would improve opportunities for recreational activities such as hiking, camping, sightseeing, boating, bicycling, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway systems in Juneau, Haines, and Skagway. The Haines State Forest is already a popular location for remote and semi-remote recreation. A highway through this area would make it more accessible for people looking for a rustic but not completely remote outdoor experience. A highway could also provide opportunities for outfitters to make more recreational trips available to the public in the region. A highway and Sawmill Cove Ferry Terminal would improve access to Berners Bay for canoers and kayakers. Opening up these recreational opportunities on the coastline along the east side of Lynn Canal to Sawmill Cove and the west side of Lynn Canal from William Henry Bay to Haines would have a negative effect on the quality of the experience to those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there. The West Lynn Canal Highway would not impact the landing strip north of the Endicott River.

Many of the rivers and streams that would be crossed by the West Lynn Canal Highway contain resident and anadromous fish stocks available for sport fishing. The region also supports populations of mountain goat, bear, and moose available for take by resident and out-of-state hunters. Hunting and fishing pressure has increased along every highway in Alaska that has opened formerly remote areas. Increases in hunting and fishing would occur along the West Lynn Canal Highway. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect these resources from over utilization.

Improved access to fish streams and the resultant higher level of use by sport fishers would require a greater level of effort by ADF&G in terms of surveying streams and enforcing regulations. Increased access to Juneau and the resultant increase in visitors would put additional pressure on existing sport fishing facilities, including boat ramps. The CBJ would be responsible for evaluating the need for additional or expanded facilities as demand increases.

The commercial activities of Goldbelt could be expanded with improved access to its Echo Cove lands. Better access would facilitate development opportunities, including transportation-related activities, recreation, tourism, and residential development.

A highway would provide easier and less expensive access to mineral occurrences, prospects, and claims along the west side of Lynn Canal; however, it is unlikely that this improved access alone would enhance the economic viability of any of these mineral deposits. Development of mineral resources is capital intensive, involving many other costs besides access. Market conditions must be high enough to account for all of these costs before development can occur.

Roadless Areas – Alternative 3 would not substantially change the natural integrity and appearance or opportunities for solitude in Roadless Areas 301, 303, and 304. Area 301 encompasses 1,201,474 acres, of which 98 percent is managed as Non-Development LUDs. Area 303 consists of 66,143 acres, 78 percent of which is managed as Non-Development LUDs. Area 304 covers 198,109 acres and 77 percent of this area is managed as Non-Development LUDs. Alternative 3 would have a cleared width of approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the alignment is closer than 1,200 feet from shore), for a total width of 2,500 feet. Therefore, Alternative 3 would impact 642 acres of Area 301, 3,678 acres of Area 303, and 975 acres of Area 304. Alternative 3 would reduce Area 301 by 0.05 percent, Area 304 by 0.5 percent, and Area 303 by about 5.5 percent.

Repositioning the boundaries of the roadless areas to exclude the area of highway influence would not substantially reduce the amount of land remaining roadless that would appear natural and would still provide opportunities for solitude and other aspects of primitive recreation. Access to the roadless area would change from solely by water and air to include access via highway. Alternative 3 would not affect any identified scientific or educational features in Areas 301, 303, and 304. Alternative 3 is also consistent with the TLMP, which indicates that the Forest Plan retains a proposed state road corridor along the alignment for Alternative 3 in Roadless Areas 301, 303, and 304.

4.4.1.4 Parks and Recreation Facilities

No land from a municipal, state, or federal park or recreation area would be required by Alternative 3. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

4.4.2 Coastal Zone Management

The proposed West Lynn Canal Highway and ferry terminals are located in the coastal zone. The highway from Echo Cove to Sawmill Cove and the proposed Sawmill Cove Ferry Terminal are within the CBJ coastal management area. The West Lynn Canal Highway connection to Mud Bay Road would be in the Haines Borough coastal management area. Therefore, Alternative 3 would need to comply with the enforceable policies of the ACMP and segments of the alternative would need to comply with the CBJ and Haines coastal management plans.

The topics addressed by the enforceable policies of the ACMP and the coastal management plans that are relevant to Alternative 3 are coastal development; geophysical hazards; recreation; transportation and utilities; timber harvest; mining and mineral processing; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources. These policies provide goals and performance criteria for activities within the coastal zone, including transportation projects.

Alternative 3 has been sited in consideration of the enforceable policies of the ACMP and district coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the Coastal Zone Management Act, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and Juneau and Haines coastal management plans prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternative 3 would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternative 3. DOT&PF has adjusted the highway alignment to avoid fill of emergent and palustrine wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternative 3, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality. BMPs would be used to avoid downstream water degradation below water quality standards.

Historic, Prehistoric, and Archaeological Resources (6 AAC 80.150) – No historic, prehistoric, and archaeological areas of significance are identified in the City of Haines coastal management plan. DOT&PF has worked closely with the SHPO to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory. DOT&PF would implement mitigation measures to protect the Dalton Trail (see Section 4.4.4).

City and Borough of Juneau Coastal Management Program Enforceable Policies

The 5.2-mile extension of the highway from Echo Cove to Sawmill Cove and construction of the Sawmill Cove Ferry Terminal would be within the CBJ Coastal Zone Management District. For this reason, some of the following enforceable policies are applicable to Alternative 3.

Coastal Development (49.70.905) – DOT&PF would comply with the coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important for resident or anadromous fish. All in-water construction for the Sawmill Cove terminal would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations. Transportation facilities are exempt from meeting the policy prohibiting intertidal fill below mean high tide.

Geophysical Hazards (49.70.910) – Alternative 3 would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary. Anadromous fish streams would be spanned. Small flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF to the extent feasible, has located the highway alignment and Sawmill Cove Ferry Terminal to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternative 3 to avoid all emergent wetlands on the east side of Lynn Canal and reduce impacts to palustrine wetlands. All anadromous stream crossing would be designed to avoid impacts to fish passage and habitat disturbance including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment has been adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternative 3 would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (see Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternative 3 would be done to minimize any environmental impacts, and to avoid impacts to movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as part of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas within the CBJ district are identified and mitigated to the greatest extent possible to maintain habitat values of wetlands, tideflats, rivers, and streams. DOT&PF has adjusted the highway alignment to avoid fill of emergent wetlands and palustrine wetlands and in sensitive habitats to the greatest extent possible. In addition to changes to the alignment, a minimum-width fill footprint with steepened slopes would be used for the highway in wetland areas to reduce the footprint. Impacts to tideflats from the ferry terminal at Sawmill Cove would be minimized by timing construction to avoid impacts to fish, by using clean fill, and by minimizing the terminal and dredging footprints to the smallest size practicable. The remaining undisturbed tideflats in Sawmill Cove would be of sufficient size to continue to provide adequate important habitat for fish and wildlife. Impacts to streams would be mitigated by a clearspan bridge over Sawmill Creek, an anadromous fish stream, and by the use of BMPs to avoid water quality impacts. Based on these measures, and because of the large size of remaining wetland and tideflat habitats in the project area, the habitats in wetlands, tideflats, and streams would continue to sustain the biological, physical, and chemical characteristics necessary to support living resources. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands and tideflats. If Alternative 3 were selected, further consultation with NMFS and OHMP would occur to determine whether additional conservation measures regarding herring spawning in Sawmill Cove would be required.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternative 3, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

Haines Coastal Management Program Enforceable Policies

The connection of the Chilkat River bridge, from the mean lower low water line to the Mud Bay Road, in Haines, would be subject to the Haines District Coastal Management Plan. Pyramid Island is outside the Haines Coastal District.

Coastal Development (A-1 through A-7, A-9 through A-12) – DOT&PF would comply with the applicable Coastal Development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction within the district would avoid to the greatest extent possible highly productive tidelands, wetlands, or subtidal lands important for fish. No wetlands or anadromous streams within the Haines coastal district would be impacted by this alternative. All in-water construction would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations where the Pyramid Island Bridge joins the Chilkat Peninsula.

Geophysical Hazard Areas (B-1 through B-3) – DOT&PF would comply with these policies by reducing erosion possibilities and reducing visible scarring to the landscape through mitigation and BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary.

Recreation and Tourism (C-3 through C-7) – DOT&PF would maintain public access to waters within the Chilkat Inlet. DOT&PF would also ensure any easements and rights of way for public and private land owners within the Alternative 3 alignment are maintained.

Transportation and Utilities (E-2 through E-4) – DOT&PF through BMPs and necessary mitigation measures would limit adverse impacts to habitats, biological resources, coastal resources and uses, and recreation and traditional subsistence use activities. Further, design of the Pyramid Island Bridge would be designed to maintain water circulation in harbor areas.

Habitats (J-2, J-3A, J-6, andJ-7) – Design, operation, and maintenance of the Pyramid Island Bridge would maintain the habitat values of the tideflats for anadromous fish (rearing, migration, overwintering, access to spawning habitat), bald eagles, humpback whales, and Steller sea lions. Impacts to tideflats would be minimized by timing construction to minimize impacts to fish, using clean fill, and by placing the east abutment of the Chilkat River/Inlet crossing above the high tide line on the Chilkat Peninsula. The habitats would continue to sustain the biological, physical, and chemical characteristics to support living resources.

Historic, Prehistoric, and Archaeological Resources (L-2 and L-3) – DOT&PF has worked closely with the SHPO to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory.

4.4.3 Visual Resources

Visual simulations were made for Alternative 3 at viewpoints in each of the major landscape units described in Section 3.1.2. The locations of those viewpoints are provided in Figure 4-2. A description of the visual character of the alternative at each viewpoint is provided below.

4.4.3.1 Berners Bay

Views from the Bay – In Berners Bay, the most susceptible views to potential impacts from Alternative 3 are views from boats in the bay. Figure 4-12 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway is approximately 2.4 miles from the viewer and is located in an area not requiring substantial cuts and fills. Therefore, the highway is not likely to dominate the existing natural setting. At closer distances, the ferry terminal at Sawmill Cove and the highway would be more noticeable. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, this condition is highly dependent on the view distance.

Figure 4-13 is a visual simulation of the highway in the foreground at the Sawmill Cove Ferry Terminal proposed for Alternative 3. The highway would be noticeable intermittently along the eastern edge of Berners Bay. However, the proposed ferry terminal would likely be highly visible from this distance (approximately one mile) and through the middleground viewing threshold. The changes to form, line, color, and texture introduced by the ferry terminal would dominate the existing viewshed.

Views from the Highway – Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense old-growth forest in most places. Many of the views looking west from the highway would be panoramic, taking in Berners Bay and Lynn

Canal with the snow-capped peaks of the Chilkat Range in the background approximately 12 miles away.

4.4.3.2 William Henry Bay to Sullivan Island

Views from Lynn Canal – Views most susceptible to potential impacts from Alternative 3 in this area:

- Views from within the Endicott River Wilderness
- Views from Sullivan Island and Sullivan Island State Marine Park
- Views from cruise ships, ferries, and small boats
- Views from private land

Figure 4-14 is a visual simulation of Alternative 3 from William Henry Bay, approximately 0.3 mile from the proposed project. Topography along this portion of the proposed alignment consists primarily of rolling to steep hills. Vegetation is of a closed canopy forest character. William Henry Bay is a small enclosed bay. Middleground and background views of the proposed highway would be limited for marine travelers. The roadway itself would be visible intermittently as it traverses east and north around the outer edge of the bay. The proposed ferry terminal is likely to dominate the existing viewshed because it would introduce a high degree of change in form, line, color, and texture to the existing natural setting.

Figure 4-15 is a visual simulation of Alternative 3 looking west from Lynn Canal toward William Henry Mountain. Viewers of the proposed highway from this location are likely to notice an intermittent linear band around the toe of William Henry Mountain. The Alternative 3 alignment has reduced linear visibility based on the roadway being sited on a gentle topographic bench. This view demonstrates the effectiveness of vegetative screening.

Figure 4-16 is a visual simulation of Alternative 3 looking from Lynn Canal to the Endicott River delta with the Alternative 3 alignment in the foreground. Topography consists mainly of rolling hills within a closed-canopied forest and wetlands associated with the Endicott River. It is likely that the proposed highway would be intermittently noticeable from foreground and middleground views. The proposed bridge crossing the Endicott River may become a dominant feature within this viewshed. The existing natural setting contains many features that dominate the viewshed (e.g., the Endicott River delta and mountain ranges as well as coastline features [rock outcrops]). Minimal, if any, areas of cuts would be visible within the river delta.

Views from the Highway – Views from the highway would typically alternate between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the Canal in the middle- and background, with background views of the rugged, snow-capped peaks alone the east side of Lynn Canal. The crossings of the Sullivan and Endicott Rivers would open scenes to the west up forested valleys.

4.4.3.3 Sullivan Island to Chilkat River

Views from Lynn Canal – Views most susceptible to potential impacts from Alternative 3 in this area:

- Views from residential areas in Haines and along roadways
- Views from small boats
- Views from Chilkat State Park

- Views from cabins
- Views from resorts/camps
- Views from the Haines State Forest Resource Management Area
- Views from visitors accessing Davidson Glacier

Figure 4-17 is a visual simulation of Alternative 3 from Lynn Canal where the proposed highway would traverse the headwater delta of the Davidson Glacier. The topography is very flat along this portion of the proposed alignment. The highway would have limited, if any, visible cuts in this area. In addition, vegetative screening would not make it very visible from Lynn Canal.

Figure 4-18 is a visual simulation of Alternative 3 from Chilkat River near Pyramid Island looking north to the proposed bridge that would cross the Chilkat River under this alternative. From this viewpoint, the bridge would provide a contrast in line, form, and color to the existing natural/semi-modified setting. This proposed crossing is of such a large scale that it may be noticeable even in background views. It is likely that the bridge would dominate views when it is in the foreground to middleground.

Views from the Highway – At the southern end of this segment of the highway, views would alternative between confined foreground and middleground views of dense forest to panoramic scenes of Lynn Canal. Those panoramic views would include the Canal in the middle- and background, with background views of the rugged, snow-capped peaks alone the east side of Lynn Canal. Davidson Glacier would be very prominent in views from the road where the alignment crosses below it. At the northern end of the highway, views would encompass the Chilkat River/Inlet and the community of Haines.

4.4.3.4 Consistency with Visual Quality Objectives

The VQO for the Transportation and Utility Systems LUD is Modification with only the foreground of views considered. This VQO should be achieved within one year of construction. Alternative 3 would be consistent with this VQO. Wherever possible, the alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway from Lynn Canal. Also, to the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. In many locations, the alternative would exceed the VQO of Modification. In order to demonstrate the overall visual effect of the alternatives, DOT&PF also evaluated the consistency of Alternative 3 with the VQOs of the adjacent LUDs.

USFS land from Echo Cove to Sawmill Cove has a VQO of Partial Retention. The highway for Alternative 3 would not be visible from the coastline until Sawmill Cove. At this point, the access road to the new terminal and the terminal facility would be visible from Berners Bay. This segment of the project meets the VQO of adjacent land except at the terminal site. It is not feasible to achieve a VQO of Partial Retention at the Sawmill Cove Ferry Terminal.

USFS lands on the west side of Lynn Canal have a VQO of Retention at river deltas and William Henry Bay and a VQO of Partial Retention to Modification in all other areas. The West Lynn Canal Highway would be largely masked from views from Lynn Canal except at river crossings and the ferry terminal proposed at William Henry Bay. Therefore, the highway would achieve a VQO of Partial Retention and conform to the VQOs of adjacent LUDs except at river crossings and in views from within William Henry Bay, where it would be visible in foreground and middleground views. It is not feasible to achieve a VQO of Retention at river crossings and the William Henry Bay terminal.

4.4.4 Historical and Archaeological Resources

Alternative 3 would cross the Dalton Trail just north of Pyramid Harbor. This is the only property within the APE that is eligible for the NRHP.

The Dalton trail would be bridged. Alternative 3 would have a visual effect on the trail. However, this effect would not be adverse because the visual context of the trail has changed from historical conditions and the primary view would be from the highway, as the trail is not currently in use. For this reason, FHWA has determined that Alternative 3 would not have an adverse effect on the Dalton Trail.

Indirect effects on historical and archaeological resources for Alternative 3 could result from increased access. Implementation of Alternative 3 would increase human access in the west Lynn Canal area. Increased access could result in disturbance of historic and prehistoric cultural sites from hikers, hunters, and other recreational users.

4.4.5 Socioeconomic Resources

4.4.5.1 Overview

Improved access in Lynn Canal resulting from Alternative 3 would facilitate the movement of goods and people and create closer links between the economies of Juneau, Haines, Skagway, and Whitehorse.

A redistribution of the independent visitor market would result if Alternative 3 were implemented. Overall, the number of independent travelers passing through Juneau and Haines is expected to increase. Cruise ship traffic to Juneau, Haines, and Skagway would not be affected by Alternative 3.

Alternative 3 would not substantially affect the population and demographics of Juneau, Haines, and Skagway. Haines would experience the largest population growth due to improved access. This growth would translate into a demand for approximately 55 additional housing units in Haines.

4.4.5.2 Juneau

Population, Economics, Housing, and Municipal Revenues – The total increase in non-Juneau resident traffic to and from Juneau associated with Alternative 3 is estimated at 40 annual ADT in 2008. Assuming all traffic is round-trip, 2 annual ADT equals one additional visiting vehicle carrying an average of 2.3 people. Therefore, Juneau is projected to receive a total of about 17,000 new non-Juneau resident visitors in 2008. From the 2003 Alaska Travelers Survey and the 1994 Household Survey conducted for this project (McDowell Group, Inc., 1994), it is reasonable to assume that in-state visitors to Juneau would spend $80/visitor/trip and non-Alaskan visitors (e.g., Canadians and people from the Lower 48 states) would spend $160/visitor/trip. Based on these assumptions, visitor spending in Juneau would increase by about $2 million in 2008 because of Alternative 3 (Table 4-20). This increase in visitor spending in Juneau would generate about $1.1 million in new payroll and an annual average of about 40 additional jobs.

Table 4-20
2008 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Juneau

Description	Impact
Highway Traffic (Annual ADT)	310
Traffic Less Local Residents and Baseline Traffic	40
Total New Visitors[1] per Year	17,000
Total New Visitor Spending per Year	$2,000,000
New Local Payroll per Year	$1,100,000
New Local Employment	40

Note: Annual ADT = annual average daily traffic
[1]New visitors are all visitors who are not Juneau residents.

Alternative 3 traffic is predicted to increase at an annual rate of approximately 1.8 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 70 percent higher than in 2008 (Table 4-21).

Each new job in the Juneau economy results in an increase in population of about 1.5 people[46]. Therefore, the 40 new jobs in Juneau resulting from Alternative 3 in 2008 would result in a population increase of 60 residents. In 2038, Juneau's population would increase by about 100 residents. This increase would represent an overall increase of about 0.3 percent in Juneau's current population (approximately 31,000).

Based on 2.6 persons per household (from 2000 Census data), a population increase of 60 residents would result in additional demand for about 25 housing units in 2008. In 2038, housing demand would increase by about 40 units. In 2001, Juneau had approximately 320 vacant housing units. The demand generated by Alternative 3 would be within the vacant housing capacity.

Table 4-21
2038 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Juneau

Description	Impact
Highway Traffic (Annual ADT)	530
Traffic Less Local Residents and Baseline Traffic	70
Total New Visitors[1] per Year	28,900
Total New Visitor Spending per Year	$3,400,000
New Local Payroll per Year	$1,870,000
New Local Employment	70

Note: Annual ADT = annual average daily traffic
[1]New visitors are all visitors who are not Juneau residents.

[46] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

Alternative 3 would increase the value of private property along the highway, though the extent of the increase cannot be estimated. For example, Goldbelt's property in and north of Echo Cove would increase in value.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $2 million in 2008 would generate (assuming all of the spending is taxable) $100,000 in additional sales tax revenues (based on a 5 percent tax rate). In 2038, new visitor spending would increase sales tax revenues by about $170,000. Property values along Glacier Highway would increase. The CBJ would have an increase in property tax revenues because of this increase in property values. Residents in this area would pay higher property taxes.

Industry/Commercial Sectors – Alternative 3 would not impact the cruise ship industry in Juneau. Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety. Alternative 3 would not impact any of these factors.

As indicated in the previous discussion on population, economics, housing, and municipal revenues, the independent visitor industry in Juneau would benefit under Alternative 3. With completion of a highway, Juneau would become the mainline terminus for the AMHS, resulting in a number of independent visitors stopping in Juneau that otherwise might not visit the community. The number of RVs traveling to Juneau would increase.

The total number of 2002 RV nights (i.e., nights that RVs spend in Juneau) is estimated to have been between 3,000 and 4,000. The total number of annual Juneau RV nights expected in the first year of highway access is estimated to be less than 10,000. There are several RV parks in Juneau with a capacity of about 12,000 RV nights from May 15 to September 15. It is estimated that by 2038 the demand for RV accommodations with Alternative 3 would exceed this existing capacity and additional RV parks or expansion of existing parks would be required.

The process of planning and building an RV park in Juneau would present some challenges to prospective RV park operators. According to city officials, it is difficult to find developable land in Juneau appropriate for RV parks. The land would need to have easy highway access, water and electrical utilities, and accommodating neighbors. Such a location is likely to be desirable to a variety of interests, and in the past RV parks have not been able to promise the revenues that other operations would.

The increase in RV traffic associated with Alternative 3 would not occur until after construction was completed, and then would increase gradually over time. Construction is estimated to take at least four years. This would provide time during which the CBJ could work with interested landowners to develop a plan for RV facilities expansion.

Construction of Alternative 3 would result in logging incidental to clearing the highway right-of-way. A highway would improve access to timber stands that at some future date could be made available for harvest. The USFS manages most of the Tongass National Forest within the study area primarily as a natural setting, though that portion of the National Forest north of Sullivan Rock is classified as Moderate Development, which allows logging. The state's current forest management plan for that portion of the Haines State Forest, which is in effect for another 10 to 15 years, precludes commercial logging. Mental Health Trust and University Trust lands are managed to provide income to the trusts. Highway access would increase the likelihood that logging would occur on these lands. Although a highway would help facilitate logging in the area, it would not be the main impetus for future logging. State and federal management policies and market conditions for Alaska's forest products in general would have a greater effect on future logging possibilities.

The West Lynn Canal Highway would provide access to areas with known mineral potential, such as the area west of Sullivan Island. Improved access would increase the likelihood of future exploration.

Water transportation is the primary method of moving freight to and from Juneau, with Seattle being the primary port of origin and destination. This barge service is provided by AML and Northland Services. Although improved access would provide some short-term transportation benefit, transportation by barge would likely remain the mode by which most freight is shipped to Juneau. The economies of scale possible with barge service, and the relatively frequent service offered into Juneau (three barges/week) places the economics on the side of barge transportation.

Utilities and Public Services – Much of the information provided below on the effects of Alternative 3 are based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Appendix H).

A West Lynn Canal Highway would not impact Juneau utilities. All of the utilities are adequate to accommodate any population increases attributable to the improved access afforded by Alternative 3 through 2038.

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum impact on Juneau's population from Alternative 3 would be an increase of less than 1 percent. This would mean an additional 10 students spread across all grades.

Health and social services demand is mainly a function of population, and would therefore not be expected to change substantially under Alternative 3. Additional independent visitors to Juneau, particularly older retirees, would place some new demands on emergency room and other medical and dental services in Juneau. Demand for health care services resulting from additional highway accidents would be negligible when compared with existing demand.

Traffic increases resulting from improved access would not affect fire and emergency medical services within the current service area. According to local officials, a new highway might warrant consideration of another station further north and/or redeployment of a light-duty/fast-response vehicle to the existing Lynn Canal station at Lena Cove.

In response to concerns voiced in the 2003 public scoping meetings for the Supplemental Draft EIS, the Juneau Police Department has discussed whether connecting Juneau to the outside highway system would result in new types of crime or more serious crime. Currently, only 5 percent of arrests in the CBJ involve non-residents and less than 2 percent involve people from outside Alaska. Juneau also has very low rates for many of the crimes associated with more "connected" communities, such as gang activity and car theft. It has relatively higher incidents of crime that may be associated with isolation (e.g., domestic and alcohol-related crimes). One possibility raised in public scoping is that ending either a highway or mainline ferry service in Juneau would precipitate an "end-of-the-road" effect, bringing to town more transients who are unable to support themselves and individuals with mental and behavioral problems. However, the U.S. and Canadian customs stations on the Haines and Klondike highways act as a significant filter in this regard, and Haines and Skagway do not have this problem.

The Juneau Police Department believes that there is not enough evidence or precedents to suggest that simply improving access would affect the nature and rates of local crime. Much more of a factor than access is Juneau's distance from other population centers, particularly large cities. The Juneau Police Department believes a highway connection might be associated with some increase in teen runaways and perhaps some additional auto theft and credit card incidents. There could be an increase in importation of illegal drugs; however, local officials indicate it is already relatively easy to move these substances in and out of Juneau.

Quality of Life – According to the 2003 household survey, more than three-quarters of Juneau residents agree that improved access to their community is important. There is less agreement on whether quality of life is best served by highway access. Many proponents of a highway acknowledge that better ferry service would improve quality of life, but not by enough. Many proponents of ferry service believe that better access is important, but only ferry access would result in an overall improvement in the quality of life. The household survey indicated 36 percent of Juneau residents preferred an East Lynn Canal Highway, 36 percent preferred improved ferry service, and 16 percent preferred the West Lynn Canal Highway.

The reasons for these differing views are complex and interwoven with how individuals view Juneau's lack of highway access. Research and public comment over the past two decades have shown that some residents cherish this condition while others deplore it. Further, improved transportation is generally associated with growth opportunities, and growth typically affects the quality of life. Finally, as noted in the *Socioeconomic Effects Technical Report* for the 1997 Draft EIS, the isolation associated with lack of highway access induces a sense of psychological comfort in some residents and a feeling of frustration and claustrophobia in others. Alternative 3 would still leave Juneau unconnected by a direct highway link to the continental highway system; therefore, for those that perceive quality of life in terms of connectedness the quality of life would not substantially change.

4.4.5.3 Haines

Population, Economics, Housing, and Municipal Revenues – Currently, northbound ferry travelers with vehicles can take mainline ferry service to either Haines or Skagway. With Alternative 3, these mainline ferry travelers would disembark in Juneau and then all travel through Haines, creating a substantial increase in traffic to the community. The total increase in non-Haines resident traffic to Haines associated with this alternative is estimated to be 220 annual ADT in 2008. Growth in Juneau resident travel accounts for the majority of this traffic increase, as the 2003 household survey measured a strong interest among Juneau residents in more travel to Haines.

This annual ADT of 220 is projected to result in an increase of 93,000 visitors to Haines in 2008. Assuming that visitors would spend an average of $50 to $60 per trip in Haines, visitor spending in the community would increase up to $5.6 million in 2008 as a result of Alternative 3. In terms of economic impact, increased spending in Juneau by Haines residents would offset approximately $1 million of this new visitor spending in Haines, resulting in a net increase in spending in Haines of $4.6 million (Table 4-22). A net increase in visitor spending in Haines of $4.6 million would generate $1.8 million in new payroll and an annual average of 90 additional jobs.

Table 4-22
2008 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Haines

Description	Impact
Highway Traffic (annual ADT)	310
Traffic Less Local Residents and Baseline Traffic	220
Total New Visitors[1] per Year	93,000
Total New Visitor Spending per Year	$5,600,000
Less Haines Resident Spending in Juneau	$1,000,000
Net Annual Change in Spending in Haines	$4,600,000
New Local Payroll per Year	$1,800,000
New Local Employment	90

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Traffic on the West Lynn Canal Highway is predicted to increase at an annual rate of approximately 1.8 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 70 percent higher than in 2008 (Table 4-23).

Table 4-23
2038 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Haines

Description	Impact
Highway Traffic (annual ADT)	530
Traffic Less Local Residents and Baseline Traffic	375
Total New Visitors[1] per Year	158,100
Total New Visitor Spending per Year	$9,520,000
Less Haines Resident Spending in Juneau	$1,700,000
Net Annual Change in Spending in Haines	$7,820,000
New Local Payroll per Year	$3,060,000
New Local Employment	155

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Generally, each new job in the Haines economy results in a population increase of about 1.5 people[47]. Therefore, for the maximum of 90 new jobs in Haines in 2008, the population would increase by about 135 residents, or about 6 percent of the existing Haines population (2,360). In 2038, population would increase by about 230 residents, which is about 10 percent of the existing Haines population.

A population increase of 135 to 230 residents would result in additional demand for about 55 housing units in 2008 and 95 units in 2038, assuming 2.4 persons per household. Improved access would enhance Haines' reputation as a retirement community through better access to Juneau's retail and service sectors. To the extent that this occurs, demand for property in Haines would increase. Also, because of land availability in Haines and its drier climate when compared to Juneau, it is possible that additional Juneau residents may seek seasonal homes in Haines with the West Lynn Canal Highway. It is likely that few residents of Juneau would seek year-round housing in Haines because of the ferry link Alternative 3 would require.

[47] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Haines population participates in the local labor force.

Alternative 3 would improve the opportunity for development of some type on property owned by the University of Alaska. The university owns a substantial amount of land in the Glacier Point and Pyramid Point areas, and would manage these lands to the maximum financial benefit of the university. Development could include logging, which would depend on market conditions, subdivision development, leases for commercial development, or some combination of these options. The Alaska Mental Health Trust also owns a small parcel of the land in the Glacier Point area and could pursue similar profit-oriented development with improved access. Highway access to private property near Haines would increase the value of land in that area with a corresponding increase in the property taxes associated with the land.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $4.6 million in 2008 would generate $250,000 in additional sales tax revenues (based on a 5.5 percent tax rate). New visitor spending of about $7.8 million in 2038 would generate about $430,000 in additional sales tax revenues. Haines would also experience an increase in property tax revenues because of the increase in private property values mentioned above.

Industry/Commercial Sectors – Haines is struggling to maintain a position in the independent and cruise visitor markets. Independent visitor travel to Haines has been declining, direct cruise traffic has been erratic, and the local visitor industry has a growing dependence on Skagway cruise passengers taking excursions to the Haines area. As indicated above, Alternative 3 would substantially improve Haines' independent visitor market, but would not affect the cruise market.

As discussed previously, small parcels of University of Alaska and private land near Pyramid Harbor and Glacier Point would be more easily developed with the West Lynn Canal Highway. This development could include visitor industry facilities, small-scale logging, or a combination of development activity.

Utilities and Public Services – Much of the information provided below on the effects of Alternative 3 is based on interviews with industrial representatives and public service providers. References to these interviews are provided in the *Socioeconomic Effects Technical Report* (Appendix H).

School enrollment is a function of population. Because population impacts are expected to be minimal, the same would be true of impacts on enrollment. The maximum increase in students resulting from Alternative 3 would be about 20 in 2038 spread across all grades.

Haines' water supply and wastewater treatment system is adequate to accommodate 10 percent population growth. Population growth associated with Alternative 3, which is projected to be about 10 percent by 2038, would result in the need for expansion of these facilities if any other population growth occurs in Haines.

Improved access would make it somewhat easier and faster to transport patients either on an emergency or scheduled basis to Juneau from Haines. However, air transport for medical emergencies would remain the method of choice. The medical clinic in Haines is operated by SEARHC, a regional organization with a large presence in Juneau. Improved access between Juneau and Haines would reduce cost and increase the efficiency of SEARHC operations by facilitating movement of staff and supplies between SEARHC locations.

Increased traffic through and to Haines would place additional demands on the community's fire and emergency response services. If fire and emergency response personnel respond to incidents outside current service areas, such as currently inaccessible parts of the borough south of Haines, it would substantially reduce their capacity to deliver normal services while those personnel and equipment are occupied.

The Haines Police Department does not expect substantial impacts from improved access. Most crime in Haines involves local residents in spite of the highway connection to the north. State troopers would patrol the highway from the Chilkat River bridge to the William Henry Bay terminal, as this is beyond the Haines Police Department service area.

Quality of Life – Haines' quality of life would change in a number of ways under Alternative 3. The household surveys indicate that 87 percent of Haines residents agree that improved access to their community is important. In the 1994 household survey, Haines residents cited increased recreation opportunities, economic growth, and better access to health care and job markets as potential improvements to quality of life that could result from a highway. The principal negative impact on quality of life cited by Haines residents was social change such as increased crime and the appearance of undesirable transients, increased traffic, and declining local businesses. As indicated above, traffic would increase in Haines with Alternative 3. It is also projected that residents of Haines would increase their spending in Juneau. For Alternative 3, increased spending in Juneau would be offset by increased visitor spending, though a shift in consumer type may have an impact on the types of retail businesses in Haines. There is no evidence that crime would increase in Haines with Alternative 3 because most crime in Haines involves local residents in spite of the community's highway connection to the north.

4.4.5.4 Skagway

Population, Economics, Housing, and Municipal Revenues – The total increase in non-Skagway resident traffic to Skagway associated with Alternative 3 is estimated to be 10 annual ADT in 2008. This annual ADT is projected to result in an increase of 3,000 independent visitors to Skagway in 2008. Assuming that visitors would spend an average of $50 per trip in Skagway, visitor spending in the community would increase by up to $200,000 in 2008 as a result of Alternative 3. This small increase in visitor spending is not expected to increase local payroll or employment (Table 4-24). Therefore, the alternative would not stimulate population growth in the community.

Table 4-24
2008 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Skagway

Description	Impact
Highway Traffic (annual ADT)	90
Traffic Less Local Residents and Baseline Traffic	10
Total New Visitors[1] per Year	3,000
Total New Visitor Spending per Year	$200,000
New Local Payroll per Year	-
New Local Employment	-

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Traffic on the West Lynn Canal Highway is predicted to increase at an annual rate of approximately 1.8 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new highway traffic in 2038 would be approximately 70 percent higher than in 2008 (Table 4-25). Independent visitor spending in 2038 would not be high enough to increase local payroll or employment. Therefore, the alternative would not stimulate population in Skagway over the period of analysis for the proposed project.

Table 4-25
2038 West Lynn Canal Highway Alternative
Visitor Spending and Related Impacts in Skagway

Description	Impact
Highway Traffic (annual ADT)	155
Traffic Less Local Residents and Baseline Traffic	20
Total New Visitors[1] per Year	5,100
Total New Visitor Spending per Year	$340,000
New Local Payroll per Year	-
New Local Employment	-

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Skagway would experience an increase in sales and bed tax revenues associated with increased visitor spending. The estimated initial increase in visitor spending would generate about $8,000 in additional sales tax revenues in 2008. This additional sales tax would increase to about $17,000 in 2038.

Industry/Commercial Sectors – Construction of the West Lynn Canal Highway would not alter cruise lines' decisions on port calls in Skagway. Port-of-call decisions are based on a combination of factors, including the availability of berthing space, appeal to passengers, and the overall capacity and profitability of tour offerings. Also considered are operational issues such as vessel speed, fuel consumption, docking fees, and safety.

Members of the NWCA discussed the proposed highway alternatives during the 2003 NWCA Operations and Technical Committee meeting as well as the Government Affairs and Community Relations Committee meeting. As a follow-up to their discussions, NWCA sent a letter to the Governor of Alaska stating that construction of a highway would have no effect on members' itineraries. The NWCA consists of Carnival Cruise Line, Celebrity Cruises, Crystal Cruises, Holland America, Norwegian Cruise Line, Princess Cruises, Royal Caribbean International, Seabourne Cruise Line, World Explorer Cruises, and Radisson Seven Seas Cruises. NWCA estimates its member lines carry 97 percent of Alaska cruise passengers. Given that cruise line managers think that a direct highway link would not affect their operations, Alternative 3 is unlikely to have any effect.

Regional managers for Princess Tours and Gray Line, the primary ground transportation providers for all large ships, have stated that terminating voyages in Juneau and busing cruise ship passengers to Skagway is not feasible due to limitations regarding tour capacity, pricing, and timing. A round-trip bus excursion to Skagway on a West Lynn Canal Highway could not be accomplished in a single day, requiring two shuttle ferry trips as well as the highway link. Therefore, passengers on ships terminating their cruise in Juneau could not experience the sites and activities in Skagway or the popular rail excursion. Given that bus excursions on a through highway are unlikely, Alternative 3 is also not likely to generate bus excursions that replace cruise port of calls.

Skagway is also an important transshipment point linking Inside Passage barge and ferry traffic to the Yukon and Interior Alaska. In 2001, 84,000 tons of freight moved through the Skagway port, primarily (85 percent) petroleum products (USACE, 2001). Skagway would continue to be an important transshipment point with Alternative 3. Freight moving through Skagway to the Yukon from barge shipments would still be less expensive than transporting it via the West Lynn Canal Highway.

Utilities and Public Services – Because Alternative 3 would not stimulate population growth in Skagway, it would not appreciably impact utilities and public services.

Quality of Life – Skagway currently has about 800,000 visitors a year, primarily in the summer months (in 2003, 630,000 cruise ship visitors and another 160,000 visitors arriving by other modes of transportation). Alternative 3 would increase the number of annual visitors by less than 1 percent. This increase would not result in a change in the quality of life in the community.

Alternative 3 would improve access to Skagway by improving trip opportunity. Improved access would be considered a beneficial effect on quality of life by some. Other residents would not feel that it improved their quality of life because of the two ferry trips required to and from Juneau.

For more information on the economic and social effects of Alternative 3 on Juneau, Haines, and Skagway, see the *Socioeconomic Effects Technical Report* (Appendix H).

4.4.6 Subsistence

Alternative 3 would not impact subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty islands, the lands adjacent to Taiya Inlet, and the south shore of St. James Bay. It would not impact subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

A West Lynn Canal Highway would have no direct effects on subsistence uses. Improved access to subsistence use areas along the West Lynn Canal Highway in the Sullivan River area could indirectly affect the intensity of subsistence harvest and the availability of resources. Alternative 3, together with USFS plans for potential public access locations along the highway, would make Lynn Canal much more accessible for other hunters. Alternative 3 could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but for others the increased competition for resources would be perceived as a negative impact.

Based on the 1988 USFS subsistence study, the 1994 ADF&G analysis of subsistence impacts, 2003 scoping comments for the Supplemental Draft EIS, Supplemental Draft EIS hearing and written comments, and an analysis of these sources of information, FHWA has determined that Alternative 3 would not significantly restrict subsistence uses.

4.4.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. Alternative 3 is not consistent with the plan.

4.4.7.1 Capacity and Demand

Traffic demand on Alternative 3 was projected for 2008 and 2038 using the transportation model summarized in Section 4.1.5. These projections were based on 2002 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Table 4-26 compares projected traffic demand and capacity for Alternative 3 with the No Action Alternative. As indicated in the table, the West Lynn Canal Highway is projected to generate and accommodate substantially higher travel demand in the Lynn Canal corridor than the No

Action Alternative. Three times as much traffic would travel on the West Lynn Canal Highway than on the AMHS system under the No Action Alternative in 2008.

Table 4-26
2008 Forecast Demand and Capacity for the No Action Alternative and Alternative 3[1]

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1 – No Action	90	170	40	330	167(96/71)
3	310 (310/94)	550 (550/166)	140 (140/43)	1,100 (1,100/330)	1,008/408[2]

Note: [1]Numbers in parenthesis are the demand or capacity split between Haines and Skagway. The first number is for Haines and the second number is for Skagway.
[2]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Haines and Skagway.

As traffic demand grows with time, the ability of the West Lynn Canal Highway to accommodate that demand relative to the No Action Alternative would become more pronounced. Based on an annual growth rate of 1.8 percent, projected traffic demand and capacity for the West Lynn Canal Highway and the No Action Alternative in 2038 is provided in Table 4-27. As indicated in Tables 4-26 and 4-27, Alternative 3 has the capacity to meet the projected summer ADT in 2008 and 2038. Because of the capacity limit of the shuttle between Sawmill Cove and William Henry Bay, Alternative 3 would provide capacity for 95 percent of peak week ADT in 2008 and 60 percent of the projected peak week ADT for 2038. As indicated in Table 4-27, four times as much traffic would travel on the West Lynn Canal Highway as on the AMHS system under the No Action Alternative in 2038.

Table 4-27
2038 Forecast Demand and Capacity for the No Action Alternative and Alternative 3[1]

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1—No Action	130	230	60	460	167(96/71)
3	530 (530/160)	940 (940/280)	250 (250/75)	1,860 (1,860/560)	1,008/456[2]

Note: [1]Numbers in parenthesis are the demand or capacity split between Haines and Skagway. The first number is for Haines and the second number is for Skagway.
[2]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Haines and Skagway.

By providing a highway on the west side of Lynn Canal, Alternative 3 would have the indirect effect of increasing travel demand between Haines and Skagway. Under the No Action Alternative, the summer ADT between Haines and Skagway is projected to be 67 vehicles in 2008 and 98 vehicles in 2038. With Alternative 3, travel demand between Haines and Skagway is projected to increase to 89 vehicles in 2008 and 138 vehicles in 2038.

The summer ADT between Juneau and Skagway is projected to be 166 vehicles in 2008 and 281 vehicles in 2038. The number of ferry trips and ferry capacity between Haines and Skagway has been sized to accommodate the projected 2038 summer ADT.

Because of the ferry links for this alternative, the capacity of Alternative 3 would not meet the projected unconstrained travel demand in the Lynn Canal corridor. As indicated in Section 1.4.1.3, latent demand in the corridor is estimated to currently be about 500 annual ADT. Unconstrained travel demand would be about 510 annual ADT by 2008 and 930 annual ADT in

2038 (Appendix C *Traffic Forecast Report*). Alternative 3 would generate and accommodate about 61 percent of this annual demand in 2008 and 57 percent in 2038.

4.4.7.2 Travel Flexibility and Opportunity

Alternative 3 would improve flexibility and opportunity for travel between Juneau and Haines relative to the No Action Alternative. Travelers would be dependent on the shuttle ferry schedule between Sawmill Cove and William Henry Bay, which is projected to make 12 round-trips per day in the summer. This level of service is a substantial improvement over the No Action Alternative, which offers eight ferry round-trips per week between Juneau and Haines.

An indirect impact of the forecast demand for Alternative 3 would be increased opportunities for travelers to take shuttle ferry trips between Haines and Skagway. Under the No Action Alternative, the shuttle would operate up to three times per day in the summer. Shuttle ferries between Haines and Skagway in the summer would operate six times per day under Alternative 3.

The West Lynn Canal Highway would be susceptible to avalanches in the winter, and is estimated to be closed an average of 6.4 days per year due to avalanches (Table 4-33). No closure is expected to exceed a day.

4.4.7.3 Travel Time

Table 4-28 provides a comparison of travel times between the No Action Alternative and Alternative 3. The travel time between Juneau and Haines with Alternative 3 is estimated to be about half an hour less than under the No Action Alternative, when taking the FVF. The travel time between Juneau and Haines would be four hours faster under Alternative 3 than traveling on a mainliner under the No Action Alternative.

Travel time between Juneau and Skagway under Alternative 3 would be a half hour longer than under the No Action Alternative, when taking the FVF. This is because there would be two ferry links to Skagway under Alternative 3. With Alternative 3, traveling between Juneau and Skagway would take almost five hours less than the time required to travel on a mainliner under the No Action Alternative. However, the Alternative 3 travel time is based on arriving at the Sawmill Cove, William Henry Bay, Haines, or Skagway terminal in time to load. Many travelers would choose to arrive early to ensure space on these first come–first serve shuttles[48]. Similarly, many travelers on the FVF under the No Action Alternative would choose to arrive before the minimum allowed check-in time. Also under Alternative 3, the Haines/Skagway shuttle would run at a different frequency than the cross-Lynn Canal ferries, so some travelers would have to wait for their second ferry connection, increasing the time to and from Skagway.

Alternative 3 would have no impact on travel times between Haines and Skagway. The travel time, 1.3 hours, would be the same for the Haines/Skagway shuttle under the No Action Alternative and Alternative 3.

[48] On shuttle systems with relatively short runs, multiple round trips per day, and capacity to meet projected demand, taking reservations is an unnecessary expense and would increase travel time.

Table 4-28
Travel Times for the No Action Alternative and Alternative 3

Route	Summer (hours)
No Action Alternative	
Auke Bay – Haines	3.5/7.1[1]
Auke Bay – Skagway	3.8/9.1[1]
Haines – Skagway	1.3
Alternative 3	
Auke Bay – Haines	2.9
Auke Bay – Skagway	4.3
Haines – Skagway	1.3

Note: [1]The first number is the time for the trip on the fast vehicle ferry, and the second number is the time for the trip on a mainline vessel. Mainline vessel times include a 2-hour check-in. FVF includes a 1-hour check-in although 2 hours is recommended by AMHS.

4.4.7.4 State and User Costs

The 30-year life-cycle costs[49] for the No Action Alternative and Alternative 3 discounted to 2004 dollars are provided in Table 4-29. These costs include state and federal capital costs and state maintenance and operating expenses. Capital costs include design, right-of-way acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

Table 4-29
Thirty-Year Life Cycle Costs for the No Action Alternative and Alternative 3 ($millions)

Alternative	Capital Cost	Operating Cost	Total Life Cycle Cost
No Action	$87	$179	$267
3	$214	$161	$375

Table 4-30 provides an estimate of the state's portion of these costs. As indicated in the table, the capital cost of Alternative 3 would be higher than the No Action Alternative due to the cost of required highway, shuttle ferries, and ferry terminal facilities. However, because the operating cost is lower for the West Lynn Canal Highway, the total state cost, before considering revenues, would be less for Alternative 3 than the No Action Alternative. As explained in Chapter 2, Alternative 3 would have an annual operating cost of approximately $9.2 million versus $10.2 million for the No Action Alternative.

[49] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period, discounted to 2004 dollars.

Table 4-30
Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternative 3

Alternative	State Funds[1]					
	Capital Costs ($million)	Operating Costs ($million)	Total State Cost ($million)	Revenue ($million)	Net State Cost ($million)	State Cost/Vehicle (dollars)
No Action	$8	$179	$187	$126	$61	$45
3	$19	$161	$180	$94	$86	$18

Note: [1]Value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

Table 4-30 indicates that the West Lynn Canal Highway would have a larger net cost to the state during the analysis period than the No Action Alternative. This is partly due to its higher capital cost than the No Action Alternative and partly because the state would receive more revenue from the longer ferry runs under the No Action Alternative than under Alternative 3. The overall lower net cost to the state of the No Action Alternative would be the direct result of higher out-of-pocket costs for travelers under that alternative. The West Lynn Canal Highway would carry more vehicles than the No Action Alternative. Therefore, Alternative 3 would cost the state less than the No Action Alternative on a per vehicle basis.

The total cost[50] and out-of-pocket cost[51] of travel between Juneau and Haines or Skagway on the West Lynn Canal Highway for a family of four in a vehicle 19 feet long are provided in Table 4-31. As indicated in the table, under Alternative 3, the cost to travel to Haines would be 39 percent of the cost of the same travel on a mainline vessel under the No Action Alternative. For travel to Skagway, Alternative 3 would cost 47 percent of the cost of the same travel on a mainline vessel under the No Action Alternative. The savings to travelers would be greater in comparison to travel on a FVF. Based on total user costs, travel time cost, and the projected travel in the Lynn Canal corridor through 2038, total user benefits in terms of reduced travel cost for the West Lynn Canal Highway are estimated to be about $173 million relative to the No Action Alternative during the 30 years after construction.

Table 4-31
Juneau to Haines and Skagway Total and Out-of-Pocket User Costs for Family of Four in 19-Foot Vehicle for the No Action Alternative and Alternative 3

Alternative	Haines User Cost[1]	Skagway User Cost[1]
No Action	$180/$180[2]	$237/$237[2]
3	$70/$45	$111/$85

Note: [1]First number is total user cost and second number is out-of-pocket cost. Total cost is based on fares plus $0.44 per mile for vehicular travel (AASHTO, 2003). Out-of-pocket cost based on fares and gasoline consumption.
[2]Cost is for mainline ferry. Cost for FVF is 10 percent higher.

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[50]Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

[51] Out-of-pocket costs are a combination of estimated fares and gasoline on highway segments. Fares for the No Action Alternative are actual 2004 fares charged. Estimated fares for shuttle travel are based on flat fees of $2/passenger and $6/vehicle plus $0.30/mile for passengers and $0.80/mile for vehicles (DOT&PF, 2005b).

The cost of taking the shuttle ferry between Haines and Skagway would remain the same as the No Action Alternative with Alternative 3. That fare is estimated to be about $40 for a family of four.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of the No Action Alternative for a given period of time. The total user benefit of Alternative 3 from 2004 to 2038 is $205 million. The incremental cost of Alternative 3 over the No Action Alternative for this same period is $173 million. Therefore, the 2004 to 2038 net present value of Alternative 3 is approximately $32 million.

4.4.7.5 Other Transportation Impacts

Freight – Water transportation is the primary method of moving freight within Lynn Canal. Freight is transported from Seattle by barge to Juneau, Skagway, and Haines. AMHS ferries also move freight in vans between the three communities. Haines and Skagway are important transshipment points linking Inside Passage barge and ferry freight to the Yukon and Interior Alaska.

The West Lynn Canal Highway would not substantially alter freight traffic between Juneau and Seattle. Trucking companies servicing other Alaska communities were asked to approximate the cost of trucking between these two cities if a highway were available. Those estimates averaged about $0.15 per pound of freight compared to the existing barge freight cost of $0.05 per pound. Although trucking goods from Seattle is not competitive with barge service, a highway link to Juneau may provide opportunities for transporting time-sensitive freight, such as fresh fish. Air freight, which currently serves this function, costs between $0.33 and $0.46 per pound between Juneau and Seattle.

The West Lynn Canal Highway would not result in a change in scheduled barge service to Haines and Skagway. Because of the ferry links involved in Alternative 3, barge service would continue to be the preferred mode of shipping freight to these two communities.

Air Taxi – Alternative 3 is likely to divert some traffic from the air taxi operations currently serving Lynn Canal. In interviews conducted for the Supplemental Draft EIS, local air taxi operators noted that the addition of the Lynn Canal day ferry in 1998 reduced air passenger loads in Lynn Canal. For example, the air traffic from Juneau to Haines dropped from 10,014 passengers in 1998 to 6,939 passengers in 2001. The *Traffic Forecast Report* (Appendix C) estimated a diversion of about 32 percent of the air traffic with Alternative 3.

AMHS – With Juneau serving as the northern terminus for mainline AMHS service under Alternative 3, the AMHS would only need to operate short shuttle routes in Lynn Canal. The projected annual AMHS operating costs and estimated AMHS state support for Alternative 3 in 2008 is provided in Table 4-32. As indicated in the table, the No Action Alternative is estimated to require state funding of about $3.3 million in 2008. Ferry operations for Alternative 3 are estimated to require similar state funding of $3.1 million. Therefore, Alternative 3 would not have a substantial impact on AMHS funding requirements; consequently, this alternative would likely not affect service in other parts of the AMHS system.

Table 4-32
Annual AMHS Operating Costs and Estimated AMHS State Funding in 2008 for the No Action Alternative and Alternative 3

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Funding ($million)
No Action	$10.2	$3.3
3	$8	$3.1

Source: DOT&PF, 2004d.

Based on the 2004 SATP, the mainline ferry fleet would be reduced in the future. Service south of Lynn Canal would be augmented by greater use of point-to-point shuttles. Because of the high cost of mainline ferry operations and the inconvenience of their schedules, DOT&PF envisions reduced mainline service south of Lynn Canal even if a highway alternative is not constructed.

Safety – The potential for accidents on the highway segment of Alternative 3 was estimated based on highway accident statistics from 1993 to 2003 and the projected number of miles that would be traveled on Alternative 3 (DOT&PF, 2004e). The Haines, Klondike, and Glacier (16 mile to end) highways were used for the analysis because they are located near Lynn Canal and are similar in design and annual ADT as the Alternative 3 highway. There have been four fatalities on these highways during the 11-year period of record, one on the Haines Highway and three on Glacier Highway. All four fatalities were due to speeding, and the fatality on the Haines Highway also involved alcohol. This number of fatalities over the period of record provides a fatality rate of one death per 48.7 million vehicle miles. Based on this rate, there is projected to be approximately four traffic fatalities over the 30-year study period (2008 to 2038) on Alternative 3.

There have been no fatalities on the AMHS system since 1975. There was a fatality in 1975 when the *M/V Malaspina* ran over a fishing boat, resulting in the drowning of one person. There have been five cases over the past 10 years where ferries ran aground or hit submerged rocks, causing substantial damage to the vessel. There have been two cases of electrical fires onboard the *M/V Columbia* that caused the ship to lose propulsion and passengers to be evacuated. None of these accidents resulted in reportable injuries to passengers.

Capital Move – Lack of highway access is often cited by capital move proponents as one of the reasons to move the state capital. Alternative 3 would not provide a direct highway link, but would improve access to Juneau. This may likely reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the state capital.

Pedestrians and Cyclists – The highway proposed for Alternative 3 would include 4-foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Shuttle ferries for these alternatives would accommodate bicyclists and foot passengers.

As indicated in the *Traffic Forecast Report* (Appendix C), many current walk-on passengers would choose to travel by car if a highway were available in the Lynn Canal corridor. Based on the 2000 Census, approximately 90 percent of the households in Juneau, Haines, and Skagway own at least one vehicle and 50 to 60 percent of the households own two or more vehicles. Travelers without vehicles would be forced to rent vehicles, take a commuter flight, or travel on private carriers, if they develop to accommodate this demand.

There are approximately 100,000 passengers per year traveling on AMHS vessels in Lynn Canal. It is estimated that approximately 36,000 are walk-on passengers. The percentage of AMHS walk-on passengers that would choose to travel in their own vehicle if Alternative 3 were selected for the project would depend on a variety of factors such as the cost, frequency, and convenience of a bus or van service. On the other hand, the cost, frequency, and convenience of a bus or van service would depend on the size of the market. Following completion of highway construction, there would be a period of transition as entrepreneurs or established service providers test the market by offering some moderate level of service, such as one or two round-trips daily between communities during the summer.

For the purpose of this EIS, it was assumed that the initial size of the market for bus or van service might be between 9,000 and 18,000 annual northbound and southbound travelers if a bus service was available and reasonably affordable. This is equivalent to between 25 and 50 percent of the 2004 walk-on passengers on the AMHS in Lynn Canal. This is not a measure of the number of travelers who would be unable to make a trip in the absence of ferry service between Auke Bay and Haines and Skagway, but rather an estimate of the number of travelers that would choose to use a bus service if it were available and reasonably affordable.

The potential for bus/van service to develop with Alternative 2B was evaluated based on case studies of bus service elsewhere in Alaska[52] and interviews with 12 land transportation service providers (see addendum to the *Socioeconomic Effects Technical Report* in Appendix W). Based on this evaluation, it is also likely that Alternative 3 would result in daily summer coach service linking Juneau, Haines, Skagway, and possibly Whitehorse. Winter service would be less frequent, with bus service offered perhaps every other day to Haines/Skagway. Cost would ultimately depend on the size of the market but would likely be in the range of $35 to $50 one-way between Juneau and Haines based on the shuttle fare and rates on similar existing bus services. This would place the cost roughly equal to the current Juneau/Haines passenger fare. The cost between Juneau and Skagway would be approximately $7 higher due to the additional fare for travel on the Haines/Skagway shuttle.

It should be noted that Skagway has the only ferry terminal in Lynn Canal that is within reasonable walking distance from residential areas. All other existing terminals must be reached by private vehicle or private carrier. The ferry terminals have been located based on the efficiency of ferry moorage and routes, not the convenience of walk-on passengers.

Navigable Bridges – The Sullivan, Endicott, and Chilkat rivers are navigable in accordance with U.S. Coast Guard guidelines. The bridges over these rivers would require Bridge Permits from the U.S. Coast Guard.

4.4.8 Geology

4.4.8.1 Geologic Hazards

Seismic Activity – As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). Based on USGS hazard maps published in 1999, there is a 10 percent probability of an

[52] Bus services examined in these case studies were Alaska Park Connection between Seward and Denali National Park, Homer Stage Lines between Homer, Soldotna, Kenai, and Seward, Alaska Trails between Anchorage, Wasilla, and Talkeetna with continuing service to Healy, Alaska Direct Bus Lines between Fairbanks and Whitehorse, and Yukon Alaska Tourist Tours between Skagway and Whitehorse.

earthquake in the next 50 years that would cause ground accelerations of 0.1 to 0.2 g[53] in the project area (Wesson et al. 1999). Geotechnical investigations would be used in support of the final engineering design of the selected alternative. These studies would minimize the impact of geologic hazards on the road embankment and related structures. It is probable that a maximum ground acceleration in the study area would cause damage to a highway, as is the case with many other Alaskan highways in seismic areas.

Avalanche – The proposed Alternative 3 alignment crosses 17 avalanche paths, of which 11 are considered large or very large. Using survey data, refined alignments, long-term climate studies, and additional winter observations, the calculated unmitigated AHI for Alternative 3 is 100. The average predicted closure would be about a half day long, with no closures lasting longer than a day. This unmitigated figure is considered high, but is in the middle range for highways operated with good safety records in avalanche terrain. (For example, Rogers Pass, B.C., has an unmitigated AHI of 1004, the previous alignment of Seward Highway from Anchorage to Seward had an unmitigated AHI of 331, the previous Seward Highway from Anchorage to Girdwood had an unmitigated AHI of 188, and Loveland, Colorado, has an unmitigated AHI of 80.) Through the use of appropriate hazard reduction and operational risk management, the mitigated AHI for Alternative 3 would be reduced to an AHI value of 14.6. Hazard reduction methods are physical changes such as constructing barriers or adjusting the alignment of a highway. Risk management methods include forecasting, warnings, temporary highway closures, and use of explosives to release unstable snow during temporary highway closures. A mitigated AHI value of 30 or less is within the North American standard for safe operation of a highway.

For Alternative 3, DOT&PF would use howitzer fire to release unstable snow. A howitzer could hit all of the avalanche paths on the West Lynn Canal Highway from five firing locations accessible from the highway. The *Snow Avalanche Report* (Appendix J) calculated closure periods for the West Lynn Canal Highway using the same data used in the AHI calculations. The closure period calculations and AHI calculations are based on 100 years of weather records from Juneau correlated with 6 years of avalanche observations in Lynn Canal. An estimate of average closure time/year, average number of closures/year, closure length, and capital and operating budgets for highway maintenance relative to avalanche hazards for Alternative 3 is provided in Table 4-33. The capital costs of avalanche control equipment and facilities have been included in the construction cost estimate, and the annual operating cost for avalanche control has been included in the maintenance and operating cost estimate for Alternative 3.

Table 4-33
Costs, Closures, and Mitigated Avalanche Hazard Index for Alternative 3

Alternative	Capital Cost	Annual Operating Cost	Average Closure Time per Year (days)	Average Number of Closure per Year	Closure Length (days)	Mitigated Avalanche Hazard Index
Alternative 3	$2,642,055	$733,969	6.4	10.8	0.4 to 0.9	14.6

Landslides – Two rockslides have been identified in the vicinity of Alternative 3. Neither slide reaches the proposed alignment. Avalanche paths can also produce slides during the spring and summer months, but these slides tend to be smaller than the avalanches on the same path and generally do not extend to the bottom of the path. Geotechnical studies during design would identify any areas where alignment adjustments, rockfall barriers, or slope stabilization are appropriate to reduce rockfall hazard.

[53] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

4.4.8.2 Geologic Resources

Approximately 10 percent of the Alternative 3 alignment overlaps moderate-vulnerability karst areas and less than 2 percent of the alignment overlaps high-vulnerability karst areas on the west side of Lynn Canal. Direct effects from Alternative 3 would include the alteration of hydrologic patterns, the disturbance and removal of protective surficial material and vegetation, and the destruction of surficial karst features. No known caves or other important karst features would be impacted by Alternative 3.

The strength of downgradient soil cover may be reduced over time by concentrated water flow through highway culverts, which could allow sediment, nutrients, and debris transport into subsurface karst features. Surface soils, which are typical above karst features, and vegetation create a protective barrier between surface water and karst systems. The disturbance or removal of protective surficial material, vegetation, and trees could change the karst vulnerability rating, which is based on the presence or absence of surface material. The removal of the protective barrier could also alter water table recharge rates. Cave entrances could also become blocked or permanently filled by loose sediment, debris, and downed trees.

Alternative 3 could indirectly affect karst resources due to increased accessibility to areas where karst is known to occur. Increased accessibility could result in recreational use or vandalism to caves and other karst features.

4.4.8.3 Outburst Floods

As described in Section 3.2.1, the glaciers in the headwaters of the Chilkat and Endicott rivers have the potential to cause glacial outburst flooding. The bridges crossing these rivers would be designed to safely pass these floods.

4.4.9 Hydrology and Water Quality

4.4.9.1 Floodplains

Planning and preliminary design of Alternative 3 have been done in compliance with EO 11988, Floodplain Management and FHWA regulations 23 CFR 650.11.

Flooding Risks – The alignment for the West Lynn Canal Highway runs perpendicular to the natural drainages along the west side of the canal. Therefore, it is not possible to avoid transverse encroachments of these drainages. The alternative would have no longitudinal encroachments of any drainages. There are no regulatory floodways in the study area. The transverse encroachments have been designed so that the West Lynn Canal Highway would not create a significant flood risk.

Impacts on Natural and Beneficial Floodplain Values – Alternative 3 would cross 32 streams, 26 of which would be bridged. Single-span bridges would be used to cross 10 streams. For these streams, each bridge and its piers would be located outside of the predicted 100-year flood elevation of the streams, as determined by hydraulic studies to be conducted during the final engineering design of the selected alternative. Multi-span bridges would be constructed at other crossings, including the Endicott, Sullivan, and Chilkat Rivers. These larger bridges would extend beyond the outfall channels at each river delta to protect their natural, meandering flow. The bridges would require placement of supports in the river floodplain. These supports would be spaced approximately 130 feet apart and designed to accommodate the predicted 100-year flood volume with no more than a one-foot rise in backwater. These bridges would be constructed to maintain navigation at all tide stages.

The Sullivan, Endicott, and Chilkat rivers are navigable in accordance with U.S. Coast Guard guidelines. The bridges over these rivers would require Bridge Permits from the U.S. Coast Guard.

Potential for Incompatible Floodplain Development – Alternative 3 crosses the Endicott and Sullivan Rivers in the Tongass National Forest, where floodplain development would not be allowed. The floodplain of the Chilkat River on the west side of the proposed bridge crossing is state land. Therefore, Alternative 3 would not encourage incompatible floodplain develop in that area. The floodplain on the east side is already accessible and Alternative 3 would not increase accessibility. In this location, the Chilkat River floodplain is a silt deposition area not conducive to development.

Alternative 3 would provide a highway where there are currently no roads. The highway would serve as a new evacuation route for emergencies from private properties adjoining the road and for Haines.

Measures to Minimize Floodplain Impacts and Preserve Natural and Beneficial Floodplain Values – All of the larger floodplains would be crossed with bridges. Bridge abutments would be located outside the floodplains. Multiple-span bridges would be supported on piles, with groups of in-line piles spaced at least 130 feet apart.

Compliance with EO 11988 – In accordance with the analysis required in 23 CFR 650 Subpart A, FHWA has determined that Alternative 3 is in compliance with EO 11988. This alternative cannot avoid transverse encroachments of 100-year floodplains along the alignment; however, the alternative would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially impact natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

4.4.9.2 Hydrology

A highway on the Alternative 3 alignment would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downstream side through culverts. This flow diversion would be minor and would adequately maintain the water's natural downgradient flow. Culverts would be designed for the 50-year rainfall event, and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

The ferry terminals at William Henry Bay and Sawmill Cove would require the placement of fill in Lynn Canal and Berners Bay (shot-rock generated during highway construction) at each proposed terminal site. These small encroachments would not measurably change circulation and currents in Lynn Canal or Berners Bay. The proposed terminals are sited so as not to obstruct discharge from nearby streams and creeks. Breakwaters are currently not planned for either terminal.

4.4.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to water courses whose drainages include the highway on the Alternative 3 alignment, principally through runoff from the highway.

Results from stormwater research by the FHWA indicate that stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT & FHWA, 1987). Studies conducted in Anchorage, Alaska, under the Municipality of Anchorage Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). Results showed dissolved concentrations of calcium, chromium, magnesium, and zinc below their AWQS. Only dissolved concentrations of copper and lead were noted above their AWQS; however, modest dilution would likely reduce these concentrations below their AWQS. Identified concentrations would not adversely impact streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of Alternative 3 and the predicted low annual ADT, fewer impacts to water quality in the study area are expected than were found in the Anchorage studies. The studied runoff was collected from Anchorage roadways, which ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). The studied melt water was from snow collected from a mix of these types of roads. In comparison, the West Lynn Canal Highway would have a maximum ADT of 1,210 vehicles based on ferry capacity and non-through traffic. During winter, the ADT would be less than 1,000 vehicles per day.

Highway runoff and melt water from the West Lynn Canal Highway would have lesser quantities of potential contaminants than what was observed in the Anchorage studies due to a lower traffic volume and less area development. Snow would be cleared from the highway and deposited along its length rather than being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area on the highway. Runoff from the highway and bridges would not be expected to exceed AWQS or adversely impact the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be low due to the rural setting of the highway and the low predicted highway traffic volume. Cut slopes that are composed of soil would be hydroseeded with non-invasive Alaska cultivars to minimize erosion.

The following BMPs would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soils) would be used for the roadway and ferry terminal embankments.
- Rock would be used to stabilize toes of slopes at ponds and stream crossings.
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- Roadside swales would be designed to keep surface water within the natural drainage basins.

Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternative 3 would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal north of Auke Bay would be eliminated. The ferries that would be used for Alternative 2B would have sanitary waste holding tanks,[54] or would discharge treated wastewater meeting applicable standards. Sewage treatment facilities with a permitted outfall would be installed at the Sawmill Cove and William Henry Bay Ferry Terminals. Discharges from the sewage treatment facilities would operate within permit guidelines. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would be used; therefore, no adverse impacts to water quality would occur. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternative 3.

Highway and bridge runoff would contribute a small amount of turbidity and pollutant loads to local drainages flowing to Lynn Canal. Contaminant concentrations in runoff from the proposed highway and/or bridges would not be expected to exceed AWQS or adversely impact the water quality of receiving waters for the long term.

4.4.10 Air Quality

The increase in traffic on the Glacier Highway would not affect the Mendenhall Valley non-attainment area based on consultations with the EPA during the 1997 Draft EIS process. Traffic forecasts conducted for the Supplemental Draft EIS indicate that future traffic volumes would be less than those developed for the 1997 Draft EIS.

4.4.10.1 Carbon Monoxide

As discussed in Section 4.3.10.1, simplified dispersion modeling was conducted for CO emissions from projected maximum peak traffic volumes. Peak traffic volumes for Alternative 3 in those years would be approximately 60 percent of the peak traffic volumes modeled. The modeling predicted that maximum one-hour average CO concentrations associated with maximum peak traffic combined with background CO concentrations would total 2 to 3 ppm in addition to estimated background levels of 1 to 2 ppm. The NAAQS for one-hour average CO concentrations is 9 ppm. The maximum one-hour average CO concentrations associated with Alternative 3 traffic would be less than the concentrations for the modeled traffic; therefore, Alternative 3 would not result in an exceedance of the NAAQS for CO.

4.4.10.2 Particulates

PM_{10} is monitored at Floyd Dryden Middle School on Mendenhall Loop Road in Juneau. Peak-hour traffic volume on this road was 1,201 vehicles in 2000. The 24-hour and annual average PM_{10} concentrations measured at this monitoring station were 27 and 7.5 $\mu g/m^3$, respectively, in that year. Projected peak hour traffic for Alternative 3 was estimated at 9 percent of the summer average daily traffic (summer ADT). Summer ADT for Alternative 3 is projected to be 550 and 940 vehicles in 2008 and 2038, respectively. Therefore, the peak hour traffic for this alternative would be about 50 and 85 vehicles in 2008 and 2038, respectively. These traffic volumes are 24 (2008) and 14 (2038) times smaller than the volumes recorded on Mendenhall Loop Road in 2000. Multiplying these factors by the PM_{10} concentrations measured at Floyd Dryden provides the following estimates for PM_{10} concentrations that could result from peak hour traffic volumes for Alternative 3:

- Year 2008 – 24-hour average: 1.0 $\mu g/m^3$ annual average: 0.3 $\mu g/m^3$

[54] Holding tanks would be pumped out and waste treated onshore for disposal.

- Year 2038 – 24-hour average: 2.0 $\mu g/m^3$ annual average: 0.5 $\mu g/m^3$

These estimates are substantially below the 150 $\mu g/m^3$ 24-hour average NAAQS and 50 $\mu g/m^3$ annual average NAAQS for PM_{10}. Because the Mendenhall Loop Road PM_{10} data include dust from unpaved roads in the valley and paved roads generally contribute only a small fraction of the total PM_{10}, this estimate of project-related PM_{10} concentrations overestimates the actual concentrations that would result from Alternative 3.

4.4.10.3 Conformity

The project area is located in an air quality attainment area where the SIP does not contain any transportation control measures. Therefore, conformity procedures do not apply to this project, and a conformity determination is not required per 40 CFR 51.

4.4.11 Hazardous Materials

From the ISA review, three sites along the West Lynn Canal Highway alignment were identified as having the potential for hazardous materials involvement. As explained in Section 4.1.10, an impact rating was assigned to those sites within a 300-foot corridor centered on the alternative alignment and facility sites. The impact rating was based on contaminant type, contaminant quantity, groundwater and groundwater gradient, age of contaminant, extent (if any) of previous or ongoing cleanup actions, and potential cleanup costs.

Based on the ISA screening process, no preliminary site investigations were recommended for Alternative 3 because no sites were determined to have a moderate or high impact rating. The AT&T Alascom Sullivan River Microwave Repeater Station is located approximately 600 feet from the centerline of the alignment for Alternative 3, outside the study area used for this evaluation. Because of the distance between the station and the alignment, the probability of hazardous materials involvement at this location is low.

See the *Initial Site Assessment Technical Report* (Appendix M) for further information on the hazardous waste assessment for the proposed project alternatives.

4.4.12 Wetlands

A total of 26.4 acres of wetlands and 11.8 acres of other aquatic habitat would be impacted on the east and west side of Lynn Canal under Alternative 3. The preliminary alignment for highway segments of Alternative 3 has been adjusted several times to avoid wetlands and reduce the impacts to wetlands that could not be avoided. During design DOT&PF would investigate additional measures to reduce impacts, including further small alignment changes, steepened slopes, and reduced embankment heights.

As indicated in Table 4-34, approximately 83 percent of the wetlands impacted by the West Lynn Canal Highway would be forested wetlands. The wetland functions and values that would be affected by a highway include a reduction in groundwater recharge and discharge, lateral flow, surface hydrologic control, wildlife habitat functions, and riparian support.

Alternative 3 would impact 0.7 acre of palustrine scrub-shrub and 1.2 acres of palustrine forested wetlands between Echo Cove and Sawmill Cove. Most of this impact to palustrine forested wetlands would result from widening the existing Cascade Point Road. Impacts to wetland functions would primarily consist of reduction in wildlife habitat and riparian support, and alteration of surface hydrologic control and groundwater discharge functions. Waters of the U.S. filled includes 1.9 acres of marine habitat filled at Sawmill Cove discussed in Section 4.4.13.

From William Henry Bay to the Davidson Glacier outwash plain, Alternative 3 would impact 18.7 acres of palustrine forested wetlands in five locations. The effect to these wetlands would include reduced groundwater recharge and groundwater discharge/lateral flow functions, modification of the surface hydrologic control, and a slight reduction in wildlife habitat function with the loss of forest habitat. One forested wetland north of the Sullivan River is rated high for nutrient transformation/export due to the amount of surface water flowing through it. Alternative 3 would impact a total of 1.9 acres of palustrine emergent wetlands in two locations of this segment. Impacts to functions of these wetlands would affect groundwater discharge and lateral flow. At two locations, the proposed alignment is forced toward the beach due to steep terrain. In these areas, fill in intertidal habitats includes 0.4 acre of salt marsh and 0.09 acre of beach bar habitat in addition to the 4.8 acre impact in William Henry Bay.

Most of the small wetlands associated with kettle ponds on the Davidson Glacier outwash plain would be avoided by the proposed Alternative 3 alignment. However, two small isolated emergent wetlands and a small pond with floating vegetation would be partially filled by the highway. These areas are small and would involve filling approximately 0.4 acre of palustrine emergent wetlands as well as 0.2 acre of palustrine aquatic bed. North of the Davidson River crossing, a 1.1-acre fill would be required across a portion of a newly created beaver pond. Fill of portions of the two isolated emergent wetlands and the pond would primarily reduce the sediment retention functions and the nutrient transformation/export function of these wetlands. Wildlife habitat functions would also be reduced slightly, but these wetlands are quite small and there are many similar wetlands in the area. Fill of a portion of the beaver pond would reduce the wildlife habitat functions of this wetland to a small degree. Impacts to beavers as a result of this fill would be minor.

North of the Davidson Glacier, Alternative 3 would intersect the uphill portion of a small area of palustrine forested wetland. At this location, the highway would reduce the groundwater recharge function, groundwater discharge/lateral flow function, and the surface hydrologic control function of wetlands.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. The surface water or shallow groundwater blocked by the highway embankment would eventually flow to the surface and be diverted by ditches to culverts under the highway embankment. Alteration of hydrology due to the highway embankment could result in corresponding changes to the vegetation and over time, these changes could affect wetland functions within and outside the highway right-of-way. The extent of this effect would depend on localized hydrologic patterns; however, effects could be minimized with porous fill material and cross-drainage structures.

The indirect effects of Alternative 3 on wetlands include the potential introduction of contaminants from the application of de-icers and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These activities could cause the further loss of wildlife habitat functions, reduction of ecological diversity, and a reduction in sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for wetland users, would minimize the risk of these effects occurring.

Table 4-34
Wetlands and Other Waters of the U.S. Impacted by Alternative 3 (Acres)

Sub-Region	Classification	Area of Fill (acres)
Echo Cove to Sawmill Cove	**Wetlands**	
	Palustrine Forested	1.2
	Palustrine Scrub-Shrub	0.7
	Sub Total	1.9
	Marine Areas	
	Rocky Shores	1.9
	Sub Total	1.9
William Henry Bay to Davidson Glacier Outwash Plain	**Wetlands**	
	Palustrine Forested	18.7
	Palustrine Emergent	1.9
	Estuarine Emergent	0.4
	Sub Total	21.0
	Marine Areas	
	Beach Bars	0.09
	Rocky Shores	4.8
	Sub Total	**4.9**
Davidson Glacier Outwash Plain	**Wetlands**	
	Palustrine Forested	1.1
	Palustrine Emergent	0.4
	Sub Total	**1.5**
	Freshwater Aquatic Areas	
	Palustrine Aquatic Beds	0.2
Davidson Glacier Outwash Plain	**Sub Total**	**0.2**
Davidson Glacier Outwash Plain to Haines	**Wetlands**	
	Palustrine Forested	0.9
	Estuarine Emergent	1.1
Davidson Glacier Outwash Plain to Haines	**Sub Total**	**2.0**
	Marine Areas	
	Beach Bars	4.8
	Sub Total	**4.8**
Total Wetland Alternative 3	**Wetlands**	
	Palustrine Forested	21.9
	Palustrine Emergent	2.3
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	1.5
	Total	**26.4**
Total Other Waters of the U.S. Alternative 3	**Freshwater Aquatic Areas**	
	Palustrine Aquatic Beds	0.2
	Sub Total	**0.2**
	Marine Areas	
	Beach Bars	4.9
	Rocky Shores	6.7
	Sub Total	**11.6**
	Total	**11.8**
	Total Waters of the U.S.	**38.2**

Note: This total does not include impact associated with culvert placement in non-anadromous streams. This additional acreage would be determined during design and permitting.

The use of salt-treated sand to improve road conditions during the winter could potentially affect roadside vegetation; however, high rainfall in this region would minimize most impacts from road salt (Wegner and Yaggi, 2001). Due to the small quantity of salt (up to 5 percent per total weight of sand) used to keep the sand friable for winter maintenance, no detectable impacts on adjacent vegetation are likely.

The proposed project does not include access facilities for ORVs; however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through erosion and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the road is constructed. An ORV enforcement policy would also need to be developed by ADNR for the Haines State Forest.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternative 3. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands.

4.4.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

During environmental studies for the Supplemental Draft EIS, the FHWA determined that the project alternatives may adversely affect EFH as defined by the Magnuson-Stevens Fishery Conservation and Management Act. Following this determination, DOT&PF prepared an EFH assessment to assess the effects of project alternatives on commercial fish stocks in all life stages and associated habitats. This section summarizes that assessment, which is provided in the *EFH Assessment* (Appendix N) and the addendum to the assessment in Appendix W.

The alignment for the West Lynn Canal Highway would be forced toward the beach at two locations between William Henry Bay and Davidson Glacier. This would result in the fill of 0.09 acre of intertidal beach. This small area of fill would result in the loss of some habitat for benthic organisms that form the base of the food web for some commercial fish species but would not have population-level effects on any marine species in Lynn Canal.

Under Alternative 3, 4.8 acres of intertidal habitat would be filled for the construction of the causeway on the north side of Pyramid Island. The fill would be located in an area that is subject to continuous deposition of glacial silt and does not support a substantial benthic community. Therefore, the loss of this habitat would not measurably alter the food web in this portion of the Chilkat River/Inlet. For this reason, fill placement in this area would have no measurable effect on any populations of marine organisms in Lynn Canal.

William Henry Bay was investigated as part of the 2003 intertidal survey. The intertidal zone at William Henry Bay is a rich and biologically diverse area. The ferry terminal proposed for this site consists of a sand, gravel, cobble, and boulder beach changing to boulders towards the north, away from the head of the bay. This site exhibits high value as fish habitat. Salmon, sculpins, and other small fish were observed in the intertidal zone and numerous clumps of fish eggs, likely sculpin eggs, were found in crevices and tidal pools in the lower intertidal zone. Crabs were occasionally observed on subtidal underwater camera surveys and flatfish were common throughout the subtidal survey area at depths greater than 23 feet. The proposed terminal site is habitat used for spawning, rearing, and growth to maturity by sculpin and other fish species.

The terminal would cover 800 feet of shoreline, or about 6 percent of the available shoreline in William Henry Bay. The loss of 4.8 acres of the intertidal and subtidal zones at the proposed terminal site would have a small impact to fish and crab species, as similar value intertidal and subtidal fish habitat is extensive in William Henry Bay. Although the character of the terminal substrate would differ from natural habitat, benthic organisms would recolonize it and provide some recovery of the habitat.

The seabed at the Sawmill Cove Ferry Terminal site consists almost exclusively of muds, sand, and gravels with some bedrock outcrops and occasional cobbles. Gravel content is highest in the intertidal zone and drops off rapidly in the subtidal zone, where sands and muds predominate. Vegetation cover is closely linked to the gravel component; therefore, cover drops off rapidly in the offshore. Video surveys of the site conducted in 2003 and 2004 indicated dense rockweed at the headlands on the north and south sides of the cove to about the zero foot tidal elevation. In the lower intertidal zone, rockweed was interspersed with two kinds of large-blade kelp. While this kelp is sparse, it is persistent and evenly distributed throughout the site. No eelgrass or stalked kelp is present at the site. Crabs use the subtidal and intertidal zones in Sawmill Cove and a variety of fish species have been observed at the site including yellowfin sole, rock sole, gunnels, snake prickleback, sculpin, and Pacific herring. The impact to 3.2 acres of intertidal and subtidal habitat (1.9 acres of fill and 1.3 acres of dredge), the replacement of natural substrates due to terminal construction, and the dredging of approximately 16,000 cy for a mooring basin would alter habitat usage in the disturbed area. Filling would result in the loss of habitat while dredging and ongoing use would substantially reduce habitat value in the dredged areas. The footprint of the ferry terminal would impact approximately 300 feet (0.06 mile) of shoreline at mean lower low water, which is equivalent to less than 2 percent of the alongshore herring spawn length (approximately three miles) observed in Berners Bay in 2003. This habitat loss would not measurably affect other fish populations in the Berners Bay area.

At the Sawmill Cove Ferry Terminal, turbidity could be increased over ambient conditions for short periods as ferries maneuver into and out of the terminal. Short-term turbidity increases and propeller scour could displace some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal.

There is the potential for accidental fuel spills from ferries to occur at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location.

The ferries that would be used for Alternative 3 would have sanitary waste holding tanks[55] or would discharge treated wastewater meeting applicable standards. Sanitary waste generated at the ferry terminals would undergo treatment. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged under an NPDES and/or Water Quality permit and would meet EPA- and Alaska-established waste discharge limitations. For this reason, the effluent would not impact fish habitat or affect fish populations in Lynn Canal, including Berners Bay.

Alternative 3 would cross 10 streams on the west side of Lynn Canal that support anadromous fish populations, including the Endicott and Sullivan Rivers and the Chilkat River/Inlet, as well as Sawmill Creek on the east side of Lynn Canal. The bridges crossing all but the Endicott, Sullivan, and Chilkat rivers would not encroach on the stream channel. The piers for the bridges on these rivers would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

[55] Holding tanks would be pumped out and the waste would be treated onshore for disposal.

Other, smaller non-anadromous streams crossed by the project alternatives would be channeled through culverts. Culverts in waters with the potential to have resident fish would be designed in accordance with the standards provided in the Memorandum of Agreement between ADF&G and DOT&PF for the "Design, Permitting, and Construction of Culverts for Fish Passage" (DOT&PF, 2001).

Stormwater and melt water runoff from bridges over anadromous fish streams and the Chilkat River would not alter water quality sufficiently to impact crab or anadromous and marine fish habitat. As discussed in Section 4.4.9, studies of highway runoff in Alaska indicate that the volume of traffic on the West Lynn Canal Highway would not be large enough for runoff from the highway to cause the exceedance of any Alaska Water Quality Standards in receiving waters.

In summary, the construction of Alternative 3 would result in the direct loss of 11.6 acres of EFH as a result of filling for highway and ferry terminal construction at Sawmill Cove and William Henry Bay. The habitat loss would include 1.9 acres of historically documented spawning habitat for Lynn Canal Pacific herring stock in Sawmill Cove. Ferry maneuvers at Sawmill Cove could increase turbidity in the vicinity of the terminal sufficiently to impact Pacific herring eggs and larvae at the terminal site. Alternative 3 would bridge all streams crossed by highway segments that support anadromous fish populations. Piers for the bridges over the Sullivan and Endicott rivers and the Chilkat River/Inlet that would be required for Alternative 3 would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

The incremental effect of the Sawmill Cove Ferry Terminal on Pacific herring stock would be relatively small; therefore, this loss is not expected to adversely affect the stock's ability to recover to previous population levels. However, NMFS as well as EPA and OHMP have expressed concern that the ferry terminal and ferry traffic in Berners Bay could have an adverse effect on the Lynn Canal herring stock. For other commercial fish species, the direct loss of 11.6 acres of habitat through highway fill and ferry terminal construction as well as modification of 1.3 acres of habitat through dredging would not adversely affect any fish and invertebrate populations in Lynn Canal. Both NMFS and OHMP believe special conservation measures, including no operations during the herring spawning period, would be necessary. If Alternative 3 were selected, further consultation would need to occur.

The alignment for Alternative 3 and design of ferry terminals have been adjusted through preliminary engineering studies to limit intertidal and subtidal fill. During design of the selected alternative, DOT&PF will continue to investigate ways to further reduce this fill. Compensatory mitigation would be provided for the loss of intertidal and subtidal habitat.

4.4.14 Terrestrial Habitat

Alternative 3 would result in the loss of vegetation within the cut-and-fill boundaries of the highway and a narrow band of right-of-way clearing adjacent to the highway. The acres of vegetation types that would be removed are estimated as follows:

- 286 acres of old-growth forest[56]
- 95 acres of other forest
- 14 acres of open shrub and meadow[57]

Old-growth forest in the project area was defined as forest over 150 years old with an average diameter-at-breast-height greater than 9 inches, and timber volume greater than 8,000 board

[56] Includes 21.9 acres of forested wetlands and does not include land already cleared for Cascade Point Road.
[57] Includes 0.7 acre of scrub-shrub wetlands.

feet per acre. Other forest consists of timber stands smaller than this, a small area of which is second growth. Old-growth and other forests consist of the following coniferous forest plant series: western hemlock, western hemlock-yellow cedar, Sitka spruce, mixed conifer, mountain hemlock, and Sitka spruce-black cottonwood.

The loss from each vegetation type represents less than 1 percent of that type in the study area and is small compared to the approximate forest cover of 117,000 acres in the Lynn Canal region (NPS, 2003). Clearing of the highway right-of-way would increase the potential for blowdown of trees adjacent to the right-of-way or slides in unstable areas. The loss of this vegetation would not adversely affect any rare or unique community types, any listed threatened and endangered or USFS sensitive plant species, or plants considered rare by the Alaska Natural Heritage Program.

The West Lynn Canal Highway would have indirect effects on terrestrial vegetation. By improving the access to the area, human activity would increase along the highway corridor. Increased human activity could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

Much of the terrestrial habitat that would be impacted by Alternative 3 is in the Tongass National Forest. As discussed in Section 3.3.3, the TLMP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternative 3 would not impact any mapped old-growth reserves. Alternative 3 would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within all of these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternative 3 would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. Alternative 3 would remove approximately 286 of 74,470 acres of old-growth forest along the east and west sides of Lynn Canal (USFS, 2003).

4.4.15 Wildlife

4.4.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall's porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.4.17.

Harbor seals haul out on rocky beaches and sandbars in protected waters along the west side of Lynn Canal, including beaches near the Sullivan River, Davidson Glacier delta, and Pyramid Island. It is unlikely that vehicle traffic would have any effect on harbor seals where the proposed highway is at least 100 yards from the shoreline. Beyond this distance, traffic noise would be at an intensity similar to other noise sources in the natural environment. Therefore, Alternative 3 would not impact harbor seal haulouts at Sullivan River and Davidson Glacier. The crossing over the Chilkat River would pass immediately north of Pyramid Island. Highway traffic in this area could lead to harbor seals abandoning this island as a haulout.

Minke whales tend to be attracted to motor vessels. Therefore, the presence of such vessels would not drive minke whales away from an area. For this reason, shuttle ferries across Lynn Canal and in Chilkoot and Taiya inlets associated with Alternative 3 would not displace this species. Because of this attraction, increased ferry traffic across Lynn Canal and in Chilkoot and Taiya inlets may increase the risk of collision; however, collision accidents with minke whales are very rare (Angliss and Lodge, 2003). Therefore, Alternative 3 is unlikely to impact the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid motor vessels and would not be impacted by the ferry traffic associated with Alternative 3.

Sea otters occur in low numbers in Lynn Canal. Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternative 3. Alternative 3 is unlikely to impact the sea otter population in Lynn Canal.

4.4.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz's murrelets, harlequin ducks, and trumpeter swans.

Great blue herons nest in trees near preferred feeding areas, typically quiet shorelines and marshy areas. They are likely to be present in small numbers at river and stream outlets all along the Alternative 3 alignment. A West Lynn Canal Highway would result in the loss of potential nest trees on the banks at large river crossings. The type of nesting and feeding habitat preferred by great blue herons is not limited in the Sullivan River or the Endicott River deltas. Great blue herons have habituated to human presence and vehicle traffic in many urban areas, including Juneau, so they would be expected to habituate to normal vehicle traffic on the West Lynn Canal Highway. For these reasons, the West Lynn Canal Highway is not expected to result in population-level effects on this species.

Marbled murrelets are common in nearshore waters along the western shore of Lynn Canal and are presumed to nest throughout the study area (USFWS, 2003). This species nests in old-growth trees, often near the coast. Alternative 3 would impact a small portion of the nesting habitat preferred by marbled murrelets. For this reason, the West Lynn Canal Highway should not result in population-level effects on this species.

Kittlitz's murrelets appear to be rare in the study area. It nests in high-elevation talus slopes and feeds in nearshore waters. This species is unlikely to be affected by highway traffic.

Harlequin ducks are also common in nearshore waters along the western shore of Lynn Canal, and nest along the banks of the larger rivers and streams along the alignment of Alternative 3. These birds are wary of people and will swim or fly away when approached (Rosenberg, Patten, and Rothe, 1994). Highway traffic noise could disturb harlequins in nearshore resting and feeding areas where the highway alignment is at the shoreline. The majority of the highway is not located on the shoreline. Therefore, it is expected that any disturbance would not result in population-level effects on this species.

Trumpeter swans do not nest near the Alternative 3 alignment. They would not be affected by the West Lynn Canal Highway.

Blue herons and trumpeter swans do not feed and nest in open marine waters of Lynn Canal and therefore would not be affected by Alternative 3. Marbled murrelet, Kittlitz's murrelet, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting; therefore, they would not be present along the ferry routes for Alternative 3 in the main channel of Lynn Canal. These birds may be flushed by ferries approaching terminals. This disturbance would affect a small portion of the available feeding and nesting habitat, and would not have a population-level effect on these species.

4.4.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, and mountain goat. The assessment of project effects on these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and indirect impacts from increased human activity in the project area.

The direct loss of wetland and terrestrial habitat described in Sections 4.4.12 and 4.4.14 would amount to less than 1 percent of these habitats that are available in the study area. Additional loss of habitat because of windblown trees adjacent to the right-of-way or changes in local hydrologic patterns may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and moose and spring and fall beach habitat is important for bears.

The beach fringe and numerous riparian areas along the west side of Lynn Canal provide high-value habitats for many terrestrial mammals, including bears, martens, river otters, moose, and wolves. The Alternative 3 alignment is more inland that the East Lynn Canal alignment and therefore affects more forest habitat and less beach fringe habitat. The 1997 HCI models predicted that the direct loss of habitat would reduce the habitat capability for brown bear, black bear, marten, and mountain goat by about 1 percent or less. However, behavioral avoidance of the West Lynn Canal Highway may function as a barrier to movement for some species, and may fragment their habitat by limiting their ability to use all of their range.

Because black bears are highly adaptable and often learn to coexist near human development, habitat fragmentation is not expected to result in a substantial effect on black bear populations in the study area. Black bears use the Sawmill Creek estuary area during salmon runs and would need to cross the highway or pass under the Sawmill Creek bridge. The highway would likely result in mortality of some black bears from collisions with vehicles. The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway would decrease black bear habitat capability in the areas crossed by or adjacent to the alignment by 2 percent compared to present conditions.

Brown bears tend to avoid highway traffic more than black bears. As indicated in Section 4.3.15, one study found that brown bears avoided roads regardless of traffic volume. Thus, they would be more likely than black bears to abandon certain parts of their range rather than cross the highway, and less likely to be involved in vehicle collisions. Because the West Lynn Canal Highway would separate higher elevation habitats from beach fringe and estuary habitats and because these latter areas often contain important resources for brown bears, the effective loss of habitat could reduce reproductive success or survival of some bears (Schoen et al., 1993). The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway would decrease brown bear habitat capability in the areas crossed by or adjacent to the alignment by 23 percent compared to present conditions. To reduce this habitation fragmentation, bridges over streams would be designed to provide underpasses for wildlife migration.

The West Lynn Canal Highway is not likely to fragment the range of marten, as they would readily cross the road to access favorable habitat. The largest impact of this alternative on marten would be the indirect impact of trapping. Marten are highly desirable as a furbearing species and are relatively easy to trap. Alternative 3 would increase human presence and access in the region, probably increasing the number of marten trapped in the west Lynn Canal region. The HCI model results for the 1997 Draft EIS predicted that the West Lynn Canal Highway could decrease marten habitat capability in the areas crossed by or adjacent to the alignment by 30 percent primarily because of trapping. The effects of this increased pressure could be controlled by ADF&G through season duration, take limits, lottery drawings, etc. Therefore, it is expected that this increased pressure would not result in additional population-level effects.

Wolves travel widely in pursuit of prey and strongly avoid highways (USFS, 2000; Person, 2001). Some wolves use estuarine areas but the importance of these areas for wolves is not known. Because the proposed highway alignment is mostly at lower elevations, traffic and human activity may limit access to beaches and downstream riparian areas along the alignment for wolves. The highway itself would not likely create a barrier to wolf movement.

The West Lynn Canal Highway would not fragment the ranges of marten and river otter. As indicated above, the amount of habitat that would be lost for these species because of Alternative 3 is small relative to the total available habitat. Marten density on the west side of Lynn Canal is expected to be greater due to the abundance of old-growth habitat compared to the east side of Lynn Canal. Overall, density is likely less than 0.5 marten per square mile (T. Schumacher, personal communication, 2005). It is expected that the largest impact from the West Lynn Canal Highway would be direct loss of individuals from collisions with vehicles and the increased trapping pressure resulting from improved access to the region.

Sitka black-tailed deer use a variety of habitat types, so it is unclear how small-scale habitat loss and fragmentation might affect their populations. Based on the lack of hunter success with this species, the deer population is considered very small on the west side of Lynn Canal north of William Henry Bay (Barten, 2001).

Moose distribution is more widespread on the west side of Lynn Canal than on the east side. St. James Bay, William Henry Bay, the Endicott River Valley, and the southern part of the Chilkat River Valley all have moose populations that are connected with larger herds in Glacier Bay and the Chilkat River Valley (Hessing, 2002). Direct loss of habitat would be small compared to the available habitat, and because moose readily cross roads, habitat fragmentation is not an issue with this species.

The west side of Lynn Canal does not offer as much mountain goat habitat as the east side of Lynn Canal. Mountain goat habitat is primarily at higher elevations than the proposed highway alignment; however, they often venture down to low elevations including rock bluffs close to shore in winter. The highway would potentially fragment up to 1,750 acres of winter habitat between the alignment and the coastline. Goats would need to cross the highway to access this habitat. They seldom venture far from steep escape terrain. Therefore, the home range of mountain goats would not be substantially affected by the West Lynn Canal Highway.

Collisions with vehicles would result in an increase in mortality among many terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as moose and deer, and those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are likely to occur with species that tend to avoid roads, such as the wolf and brown bear. Mountain goats would probably not be substantially impacted, as they would seldom be found adjacent to the highway alignment. It is not possible to quantify the effect of mortality from vehicle collisions on wildlife populations in the project area, but there would be some losses.

As indicated previously, the moose population along the west side of Lynn Canal is substantially larger than along the east side. Because there are more moose and moose concentration areas on the west side of Lynn Canal than on the east side, moose mortality from traffic accidents would be more likely with Alternative 3. Because of the size of the moose population on the west side of Lynn Canal, it is not likely that traffic mortality would become an important factor in the maintenance of this population.

DOT&PF would conduct snow studies along the West Lynn Canal Highway during the winter as part of an avalanche control program. Some of these studies would be conducted by helicopter. Mountain goats are very sensitive to human disturbance in their alpine habitats, especially from helicopters (USFS, 2001). During heavy snow conditions, when avalanche danger is highest, goats tend to retreat to lower elevations and seek shelter under dense-canopied old-growth forests. However, goats have also been observed at high elevations and traversing slide zones during late winter in the study area. Therefore, mountain goats could be susceptible to disturbance from helicopters and howitzer fire used to keep the highway clear during the winter, and could be injured or killed in slides induced for highway maintenance. However, regular maintenance of avalanche chutes would reduce the frequency of debris from large avalanches reaching forested areas and minimize the likelihood of goat mortality from these larger events.

The West Lynn Canal Highway would make a large area more accessible to hunters and trappers. As is the case elsewhere in Alaska where roads from populated areas have been built into semi-remote and remote areas, hunting and trapping pressure on species such as black and brown bears, moose, deer, mountain goats, martens, and river otters would increase on the west side of Lynn Canal with Alternative 3. The effects of this increased pressure could be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. Therefore, it is expected that this increased pressure would not result in population-level effects.

4.4.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend's warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily old-growth forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). There are approximately 74,470 acres of forest on the west side of Lynn Canal, most of which is old-growth. Alternative 3 could affect approximately 286 acres of old-growth forest, or 0.4 percent of the total. Therefore, the proposed project is expected to result in no population-level impacts to these species.

A West Lynn Canal Highway would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create "edge effects," which are used by some avian predators such as ravens, jays, and crows. These effects would add to the decreased value of nesting habitat for neo-tropical migrants near the highway. Other suitable nesting habitat is not limited in the area; therefore, the proposed project is not expected to result in population-level impacts to these species.

4.4.15.5 Amphibians

Frogs and toads live in both marshy and forested wetlands as well as upland areas adjacent to ponds. Because amphibians have small home ranges and do not appear to travel far from their natal pools (NatureServe, 2003), potential impacts from highway maintenance and operation would be limited to those animals that live near the proposed alignment. The potential impacts of a highway to amphibians would be through mortality from roadkill and potential pollution of habitat from highway runoff involving pollutants from accidental spills.

4.4.16 Bald Eagles

The principal concerns for maintenance and operation of the West Lynn Canal Highway with regard to bald eagles is disturbance of nesting birds and abandonment of nesting sites. The alignment for Alternative 3 has been located to avoid the direct loss of known trees with eagle nests based on USFWS nest surveys of the project area. However, a number of trees with eagle nests are located near the alignment. As indicated in Section 4.1.14, the USFWS has developed a set of distance guidelines for construction activities near active eagle nests, and these guidelines have been used for this impact assessment. Based on surveys, there are 50 trees with bald eagle nests within 0.5 mile of the Alternative 3 alignment, 10 of which are on the east side of Lynn Canal between Echo Cove and Sawmill Cove. Twenty-four of these nest trees are within 330 feet of the alignment. Of the nests surveyed in 2003 and 2004, between 42 and 52 percent were found to be active in a given year.

Bald eagle studies in Alaska and other parts of North America have found that the species regularly habituates to human presence. Maintenance and operation of the West Lynn Canal Highway would involve a persistent source of noise that may result in the relocation of individual eagle pairs to alternate nest trees within their nesting territory. Individual eagle pairs may even abandon their nesting territory and associated hunting perches altogether, especially during the summer months when traffic volumes are predicted to peak. Because food availability is identified as a key factor that influences breeding success, eagle pairs less sensitive to noise disturbance would likely habituate to highway operation near prime feeding areas. In addition, opportunistic bald eagle pairs from other territories may use previously abandoned nest sites along the west shoreline of Lynn Canal. As a result, Alternative 3 is not likely to adversely affect the overall population of bald eagles in the Lynn Canal area. See Section 4.8.12.6 for construction impacts and mitigation regarding bald eagles.

4.4.17 Threatened and Endangered Species

4.4.17.1 Steller Sea Lions

Alternative 3 does not affect any identified Steller sea lion haulout sites or designated critical habitat. Maintenance and operations of the Sawmill Cove Ferry Terminal could cause temporary disturbance to Steller sea lions in Berners Bay, particularly in late April and early May, while they are feeding on spring forage fish aggregations. However, FHWA has made the preliminary determination that this alternative is not likely to adversely affect the Steller sea lion population in Lynn Canal. Alternative 3 does not include any new boat launch facilities and is therefore unlikely to increase recreational or commercial use of motorized vessels in the area. NMFS has expressed concern that a ferry terminal at Sawmill Cove would have potential adverse direct and indirect effects on Steller sea lions (see letter dated May 9, 2005, in Chapter 7). Selection of Alternative 3 would necessitate formal consultation on Steller sea lions with NMFS under Section 7 of the ESA.

4.4.17.2 Humpback Whales

FHWA has made the preliminary determination that highway and vessel traffic and maintenance activities associated with Alternative 3 would not adversely affect the humpback whales in Lynn Canal. Ferry traffic across Lynn Canal would increase as a result of this alternative, but mainline ferry service would be terminated. The increased ferry traffic may increase the risk of collisions with humpback whales, but such events have been rare in the past and would likely continue to be rare.

Pile driving for construction of the ferry terminals at Sawmill Cove and William Henry Bay could disturb humpback whales in the area. Monitors would be used during pile driving to ensure that this activity does not occur when humpback whales are within 660 feet of the construction area.

NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternative 3 may adversely affect humpback whales. Selection of Alternative 3 would necessitate formal consultation on humpback whales with NMFS under Section 7 of the ESA.

For further information on threatened and endangered species, refer to the *Wildlife Technical Report* (Appendix Q) and the *Steller Sea Lion Technical Report* (Appendix S).

4.4.18 Permits and Approvals

Alternative 3 would require the following permits and approvals:

- USFS special use permit for project facilities in the Tongass National Forest
- USACE Section 404 permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- U.S. Coast Guard Bridge Permits for bridges over navigable waters
- EPA NPDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADNR Title 41 fish habitat permit for any work below ordinary high water in streams with anadromous or resident fish
- ADNR Coastal Consistency Determination
- ADNR Interagency Land Management Assignment for use of tidelands at the Sawmill Cove and William Henry Bay Ferry Terminals, and an easement for highway segments with fill below mean high water
- Authorization from EPA and/or ADEC for treated wastewater discharge from the Sawmill Cove and William Henry Bay Ferry Terminals
- ADEC review of the SWPPP under the NPDES Alaska General Permit

4.5 Alternatives 4A and 4C – FVF and Conventional Monohull Shuttle Service from Auke Bay

This section discusses the direct and indirect effects of Alternatives 4A and 4C. Under both of these alternatives, ferry service would be provided to Haines and Skagway from Auke Bay. With Alternative 4A, service would be provided by new fast vehicle ferries. With Alternative 4C, service would be provided by conventional monohull ferries. Mainline ferry service would continue with an average of two round-trips per week year-round.

4.5.1 Land Use

4.5.1.1 Land Ownership

Alternatives 4A and 4C would not require acquisition of any property for transportation facilities. There would be no direct impact to land ownership.

4.5.1.2 Consistency with Land Use and Management Plans

The regional transportation policy set forth in the CBJ Comprehensive Plan is to support the improvement and expansion of air, marine, and highway transportation systems to maintain and expand Juneau's role as the capital city and a regional transportation center (CBJ, 1996). The 1996 update to the CBJ Comprehensive Plan maintains plans for the consideration of all alternatives, including highways, high-speed ferries, and light rail or railroad, to improve transportation links throughout Southeast Alaska and Canada. Therefore, Alternatives 4A and 4C are consistent with the CBJ Comprehensive Plan.

The Haines Borough and Skagway plans support improvement of the AMHS to provide better access to these two communities (Haines Borough, 2004; City of Skagway, 1999). Therefore, Alternatives 4A and 4C are consistent with these plans.

Goldbelt's Echo Cove Master Plan included construction of a road from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. Alternatives 4A and 4C are not inconsistent with this plan but do not facilitate it in any way.

4.5.1.3 Land Use

Alternatives 4A and 4C would have no direct impact on land use, as they would involve existing transportation facilities in Lynn Canal. These alternatives would result in relatively small changes in the number of travelers between Juneau, Haines, and Skagway. The improved access resulting from these alternatives would have negligible indirect impacts on land use.

4.5.2 Coastal Zone Management

Modifications of the existing ferry terminal at Auke Bay would need to be consistent with the enforceable policies of the ACMP and the CBJ coastal management plan. In accordance with the Coastal Zone Management Act, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and the Juneau coastal management plan prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternatives 4A and 4C would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

Statewide ACMP Standards

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternatives 4A and 4C. Construction, operation, and maintenance would be implemented to avoid impacts to coastal habitat.

Air, Land, and Water Quality (6 AAC 80.140) – During operation, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality.

City and Borough of Juneau Coastal Management Program Enforceable Policies

The only portion of Alternatives 4A and 4C within the CBJ coastal zone district would be the construction of new berths in Auke Bay.

Coastal Development (49.70.905) – DOT&PF would comply with the applicable coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important to anadromous fish. All in-water construction would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations.

Habitat (49.70.950) – Impacts to the tideflat habitat areas at Auke Bay would be mitigated to the greatest extent possible to maintain habitat values. Some of the measures to mitigate impacts to tideflats are timing in-water work to avoid impacts to fish and the use of clean fill.

Special Waterfront Areas (49.70.960) – Reconstruction at the existing Auke Bay Ferry Terminal would be located within a Special Waterfront Area managed by a coastal management enforceable policy unique to the CBJ. Fill proposals within the special waterfront area are not subject to a fill prohibition of the Juneau Coastal Development Enforceable Policy 49.70.905(13) regarding whether a project is water dependent or water-related (49.70.960(a)(2)). Also, the significant public need and feasible and prudent alternative analysis under the Juneau Habitat Standard 49.70.950(d) does not apply to state projects (49.70.960(a)(6)). The ferry terminal reconstruction activities would comply with 49.70.960(b)(1)(B), meeting water-relevancy requirements of 49.70.905 for floats, docks, and dolphins.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternatives 4A and 4C, DOT&PF would ensure all ADEC regulations are met.

4.5.3 Visual Resources

Alternatives 4A and 4C would result in more frequent views of ferries on Lynn Canal from the land. However, the frequency would not increase to the extent that noticeably different visual impressions of the region would be created relative to the impressions that currently exist.

4.5.4 Historical and Archaeological Resources

Alternatives 4A and 4C would not require acquisition of any new property for transportation facilities. The only construction would be reconfiguring the Auke Bay terminal. There are no eligible properties in the APE of the Auke Bay terminal. Therefore, FHWA has determined that Alternatives 4A and 4C would not affect any historic properties.

4.5.5 Socioeconomic Resources

4.5.5.1 Overview

Alternatives 4A and 4C would not create any substantial change in economic conditions in Juneau, Haines, or Skagway. Both the population and the overall demographics of Juneau, Haines, and Skagway would not be substantially affected by these alternatives. These alternatives would not measurably affect public services or make major changes in the perceived quality of life in Juneau, Haines, or Skagway. The following subsections provide a more detailed discussion of the economic and social effects to Juneau, Haines, and Skagway for Alternatives 4A and 4C.

4.5.5.2 Juneau

Population, Economics, Housing, and Municipal Revenues – Alternatives 4A and 4C include continuing mainline AMHS service to Haines and Skagway. For this reason, these two alternatives would have little effect on independent visitor traffic to Juneau. The total increase in non-Juneau resident traffic to and from Juneau associated with Alternative 4A is estimated to be 20 annual ADT in 2008 (Table 4-35). It is estimated that Alternative 4C would have no effect on non-Juneau resident traffic to and from Juneau. Therefore, Alternative 4C would provide no change in economic conditions in Juneau relative to the No Action Alternative, and the changes resulting from Alternative 4A would be minor, as described below.

Assuming all traffic is round-trip, 2 annual ADT on a ferry equals one additional visiting vehicle carrying approximately 3.6 people (DOT&PF, 2004a), Juneau is projected to receive a total of about 12,000 new visitors in 2008 with Alternative 4A. From the 2003 Alaska Travelers Survey and the 1994 Household Survey (McDowell Group, Inc., 1994) conducted for this project, in-state visitors to Juneau would spend $80/visitor/trip and non-Alaskan visitors (e.g., Canadian residents and travelers from the Lower 48 states) would spend $160/visitor/trip. Based on these assumptions, visitor spending in Juneau would increase by about $1.6 million in 2008 as a result of Alternative 4A. This increased visitor spending in Juneau would generate about $900,000 in new payroll and an annual average of about 30 jobs.

Table 4-35
2008 Alternatives 4A and 4C
Visitor Spending and Related Impacts in Juneau

Description	East Lynn Canal Alternative	
	4A	4C
Highway Traffic (Annual ADT)	140	100
Vehicle Traffic Less Residents and Baseline Traffic	20	0
Total New Visitors[1] per Year	12,000	0
Total New Visitor Spending per Year	$1,600,000	0
New Local Payroll per Year	$900,000	0
New Local Employment	30	0

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Juneau.

Lynn Canal traffic on the AMHS system under Alternative 4A is predicted to increase at an annual rate of approximately 1.5 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new traffic in 2038 would be about 50 percent higher than in 2008 (Table 4-36).

Table 4-36
2038 Alternatives 4A and 4C
Visitor Spending and Related Impacts in Juneau

Description	East Lynn Canal Alternative	
	4A	4C
Highway Traffic (Annual ADT)	220	150
Vehicle Traffic Less Residents and Baseline Traffic	30	0
Total New Visitors[1] per Year	18,000	0
Total New Visitor Spending per Year	$2.4 million	0
New Local Payroll per Year	$1.35 million	0
New Local Employment	45	0

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Juneau.

Each new job in the economy results in an increase in population of about 1.5 people[58]. Therefore, the 30 new jobs in Juneau in 2008 resulting from Alternative 4A would increase population by 45 residents, which represents an overall increase of about 0.15 percent in Juneau's current population. In 2038, Juneau's population would increase by 60 to 70 residents with Alternative 4A, an overall increase in Juneau's current population of about 0.2 percent.

Assuming 2.6 persons per household, a population increase of 45 residents would result in additional demand for fewer than 20 housing units in 2008. A maximum of 28 housing units would be needed for the increased population in 2038. The latest available data indicate that Juneau had approximately 320 vacant housing units in 2001. The project demand is well within the existing vacant housing capacity of Juneau. Because of the small increase in independent visitors and population associated with Alternative 4A, the value of private property in Juneau would not measurably increase.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $1.6 million in 2008 would generate (assuming all of the spending is taxable) $80,000 in additional sales tax revenues (based on a 5 percent tax rate). Additional visitor spending of up to $2.4 million in 2038 would generate $120,000 in additional sales tax revenues.

Industry/Commercial Sectors – The principal economic benefits of Alternative 4A would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternative 4A would not measurably affect utilities and public services in Juneau relative to the No Action Alternative.

Quality of Life – Alternative 4A would double the number of summer ferry trips between Juneau and Haines and Skagway relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement to quality of life by a majority of Juneau residents, providing increased recreational opportunities. Alternative 4C would only add one or two more ferry trips per week between Juneau and Haines and Skagway; therefore, this alternative would not result in any change in the perceived quality of life relative to the No Action Alternative.

4.5.5.3 Haines

Population, Economics, Housing, and Municipal Revenues – As is the case with Juneau, Alternative 4A would have a minor benefit to the Haines economy and Alternative 4C would provide no change in economic conditions in Haines relative to the No Action Alternative (Table 4-37). The total increase in non-Haines resident traffic to and from Haines associated with Alternative 4A is estimated to be 20 annual ADT in 2008.

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[58] This number is based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

Table 4-37
2008 Alternatives 4A and 4C
Visitor Spending and Related Impacts in Haines

Description	Alternative	
	4A	4C
Ferry Traffic (Annual ADT)	80	55
Vehicle Traffic Less Residents and Baseline Traffic	20	0
Total New Visitors per Year	12,000	0
Total New Visitor[1] Spending per Year	$700,000	0
New Local Payroll per Year	$300,000	0
New Local Employment	10	0

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Assuming that all traffic is round-trip, two annual ADT on a ferry equals one additional visiting vehicle carrying approximately 3.6 people. Haines is projected to receive a total of about 12,000 new non-Haines resident visitors in 2008 with Alternative 4A. Assuming that visitors would spend an average of $50 to $60 per trip in Haines, visitor spending in the community would increase by about $700,000 in 2008 as a result of Alternative 4A. Because Alternative 4A would not change the cost of travel between Juneau and Haines, it is not expected that the number of trips that Haines residents would take to Juneau for shopping would increase substantially. Therefore, there would be little increased spending in Juneau to off set increased spending in Haines by visitors to that community. This increase in visitor spending in Haines would generate about $300,000 in new payroll and an annual average of about 10 additional jobs.

Lynn Canal traffic on the AMHS system under this alternative is predicted to increase at an annual rate of approximately 1.5 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new traffic in 2038 would be approximately 50 percent higher than in 2008 (Table 4-38).

Table 4-38
2038 Alternatives 4A and 4C
Visitor Spending and Related Impacts in Haines

Description	Alternative	
	4A	4C
Ferry Traffic (Annual ADT)	120	80
Vehicle Traffic Less Residents and Baseline Traffic	30	0
Total New Visitors per Year	18,000	0
Total New Visitor[1] Spending per Year	$1.5 million	0
New Local Payroll per Year	$450,000	0
New Local Employment	15	0

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Each new job in the economy results in an increase in population of about 1.5 people[59]. Therefore, the 10 new jobs in Haines in 2008 resulting from Alternative 4A would increase population by 15 residents. This would represent an overall increase of about 0.6 percent of Haines current population (2,360). Alternative 4A would increase Haines population by a maximum of 25 in 2038, an increase of about 1 percent in the community's current population.

Assuming 2.6 persons per household, a population increase of 15 residents would result in additional demand for about six housing units in 2008. An increase of up to 24 residents in 2038 would result in additional housing demand for about nine units. The latest available data indicate that Haines has about 127 vacant housing units not including seasonal, recreational, or occasional use units. The project demand is well within the existing vacant housing capacity of Haines. The small increase in independent visitors and population associated with Alternative 4A would not measurably increase the value of private property in Haines.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $700,000 annually would generate $38,500 in additional sales tax revenues (based on a 5.5 percent tax rate).

Industry/Commercial Sectors – The principal economic benefits of Alternative 4A would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternative 4A would not measurably affect utilities and public services in Haines Borough relative to the No Action Alternative.

Quality of Life – Alternative 4A would double the number of ferry trips between Juneau and Haines relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement to quality of life by a majority of Haines residents. Better access to shopping and other services in Juneau, and more recreational opportunities are potential benefits cited by some Haines residents. Alternative 4C would only add one or two more ferry trips per week between Juneau and Haines; therefore, this alternative would not result in any change in the perceived quality of life relative to the No Action Alternative.

4.5.5.4 Skagway

Population, Economics, Housing, and Municipal Revenues – Alternative 4A would have a minor benefit to the Skagway economy, and Alternative 4C would provide no change in economic conditions in Skagway relative to the No Action Alternative (Table 4-39). The total increase in non-Skagway resident traffic to and from Skagway associated with Alternative 4A is estimated to be 5 annual ADT in 2008.

[59] This number is based on an estimated participation rate of 65 percent meaning that 65 percent of the Haines population participates in the local labor force.

Table 4-39
2008 Alternatives 4A and 4C Visitor Spending and Related Impacts in Skagway

Description	Alternative	
	4A	4C
Ferry Traffic (Annual ADT)	60	45
Vehicle Traffic Less Residents and Baseline Traffic	5	0
Total New Visitors[1] per Year	3,000	0
Total New Visitor Spending per Year	$200,000	0
New Local Payroll per Year	$100,000	0
New Local Employment	5	0

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Assuming all traffic is round-trip, two annual ADT on a ferry equals one additional visiting vehicle carrying approximately 3.6 people, Skagway is projected to receive a total of about 3,000 new visitors in 2008 with Alternative 4A. Based on an estimate that visitors would spend an average of $50 per trip in Skagway, visitor spending in the community would increase by about $200,000 in 2008 as a result of Alternative 4A. This increase in visitor spending in Skagway would generate about $100,000 in new payroll and five additional annual average jobs.

Lynn Canal traffic on the AMHS system under this alternative is predicted to increase at an annual rate of approximately 1.5 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to new traffic in 2038 would be approximately 50 percent higher than in 2008 (Table 4-40).

Table 4-40
2038 Alternatives 4A and 4C Visitor Spending and Related Impacts in Skagway

Description	Alternative	
	4A	4C
Ferry Traffic (Annual ADT)	100	65
Vehicle Traffic Less Residents and Baseline Traffic	10	0
Total New Visitors[1] per Year	4,500	0
Total New Visitor Spending per Year	$300,000	0
New Local Payroll per Year	$150,000	0
New Local Employment	8	0

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Each new job in the Skagway economy results in an increase in population of about 1.3 people[60]. Therefore, five new jobs in Skagway would result from Alternative 4A in 2008, and these jobs would be expected to result in a population increase of less than seven residents, an overall increase of less than 1 percent of Skagway's current population. In 2038, Alternative 4A would create about eight new jobs in Skagway. This would result in a population increase of up to about 10 residents, an increase of less than 2 percent of Skagway's current population.

[60] This number is based on an estimated participation rate of 77 percent meaning 77 percent of the Skagway population participates in the local labor force.

Assuming 2.6 persons per household, a population increase of less than 10 residents would result in additional demand for fewer than four housing units in 2008. An increase of 10 residents in 2038 would result in additional demand for about 5 housing units. The latest available data indicate that Skagway has about 54 vacant housing units, not including seasonal, recreational, or occasional use units. The project demand is well within the existing vacant housing capacity of Skagway. Because of the small increase in independent visitors and population associated with Alternative 4A, it is not expected to measurably increase the value of private property in Skagway.

Sales tax revenues would increase at a rate proportional to the increase in spending in Skagway. Total additional visitor spending would generate about $8,000 in additional tax revenues.

Industry/Commercial Sectors – The principal economic benefits of Alternative 4A would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternative 4A would not measurably affect utilities and public services in Skagway relative to the No Action Alternative.

Quality of Life – Alternative 4A would double the number of ferry trips between Juneau and Skagway relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement to quality of life by a majority of Skagway residents. Increased tourism and more recreational opportunities are potential benefits cited by some Skagway residents. Alternative 4C would only add one or two more ferry trips per week between Juneau and Skagway; therefore, this alternative would not result in much change in the perceived quality of life relative to the No Action Alternative.

See the *Socioeconomic Effects Technical Report* (Appendix H) and its addendum in Appendix W for further information on the socioeconomic assessment of proposed project alternatives.

4.5.6 Subsistence

Because Alternatives 4A and 4C would not substantially change transportation facilities and visitor trips in Lynn Canal, they would not result in direct or indirect impacts to subsistence uses.

4.5.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. Alternatives 4A and 4C are not consistent with the plan.

4.5.7.1 Capacity and Demand

Traffic demand for Alternatives 4A and 4C was projected for 2008 and 2038 using the transportation model summarized in Section 4.1.5. These projections were based on 2002 traffic in Lynn Canal, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Projected traffic demand and capacity for the No Action Alternative and Alternatives 4A and 4C in 2008 are provided in Table 4-41. As indicated in the table, Alternatives 4A and 4C would provide a combined capacity (mainliner and shuttles) of 452 and 303 vehicles, respectively, which would meet the demand for this mode of transportation in all but the peak week.

Table 4-41
2008 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4A and 4C

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
No Action	90	170	40	330	167(96/71)
4A	140(77/63)	250(137/112)	70(36/29)	490(271/221)	452(229/223)
4C	100(56/46)	180(100/82)	50(26/21)	360(198/162)	303(154/149)

Note: The first number in parenthesis is vehicle demand or capacity between Juneau and Haines, and the second number is vehicle capacity or demand between Juneau and Skagway.

Table 4-42 provides projections of traffic demand in 2038 for the No Action Alternative and Alternatives 4A and 4C. These projections assume an increase in travel demand of 1.5 and 1.2 percent annually for Alternatives 4A and 4C, respectively. As traffic demand grows with time, the ability of Alternatives 4A and 4C to accommodate that demand would decrease. The summer average daily traffic would still be accommodated. However, the difference between peak week demand and the fixed capacity of the ferry service would increase.

The projected travel demand between Haines and Skagway with Alternatives 4A and 4C is the same as the No Action Alternative. The Haines/Skagway summer ADT is projected to be 67 vehicles in 2008 and 98 vehicles in 2038 for both the No Action Alternative and Alternatives 4A and 4C. The projected summer daily capacity is 204 vehicles, which is more than enough to accommodate the demand between Haines and Skagway.

Table 4-42
2038 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4A and 4C

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
No Action	130	230	60	460	167(96/71)
4A	220(122/100)	390(216/117)	100(57/46)	780(428/350)	452(229/223)
4C	150(82/67)	260(145/118)	70(38/31)	520(286/234)	303(154/149)

Note: The first number in parenthesis is vehicle demand or capacity between Juneau and Haines, and the second number is vehicle demand or capacity between Juneau and Skagway.

Because Alternatives 4A and 4C are limited to ferry service, they would not meet the projected unconstrained travel demand in the Lynn Canal corridor. As indicated in Section 1.4.1.3, latent demand in the corridor is estimated to currently be about 500 annual ADT. Unconstrained travel demand would be about 510 annual ADT by 2008 and 930 annual ADT in 2038 (Appendix C *Traffic Forecast Report*). Alternative 4A would generate and accommodate about 27 percent of this annual demand in 2008 and 24 percent of this demand in 2038. Alternative 4C would accommodate about 20 percent of latent demand in 2008 and 16 percent of this demand in 2038.

4.5.7.2 Travel Flexibility and Opportunity

Alternative 4A would result in an increase in flexibility and opportunity for travel in Lynn Canal. This alternative would approximately double the number of round-trips between Juneau and Haines or Skagway from one per day to two per day in the summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel.

Alternative 4C would leave travel flexibility and opportunity in Lynn Canal largely unchanged relative to the No Action Alternative. Under Alternative 4C, nine round-trips per week would be possible between Juneau and Haines or Skagway in the summer. Under the No Action Alternative, there would be seven to eight round-trips per week between Juneau and both Haines and Skagway in the summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel, and it would be difficult if not impossible to travel from Juneau to Haines or Skagway and return the same day.

Alternatives 4A and 4C would provide the same number of ferry trips between Haines and Skagway as the No Action Alternative.

4.5.7.3 Travel Time

Table 4-43 provides a comparison of travel times for the No Action Alternative and Alternatives 4A and 4C. As indicated in the table, Alternative 4A would have about the same travel times as the No Action Alternative. Travel times on a shuttle ferry in Alternative 4C would take more than two hours longer than the fast vehicle ferry in the No Action Alternative.

Alternatives 4A and 4C would not affect the travel time between Haines and Skagway. It would remain 1.3 hours, the same as the No Action Alternative.

Table 4-43
Travel Times for the No Action Alternative and Alternatives 4A and 4C

Route	Summer (hours)[1]
No Action Alternative	
Auke Bay - Haines	3.5/7.1
Auke Bay - Skagway	3.8/9.1
Haines - Skagway	1.3
Alternative 4A	
Auke Bay - Haines	3.8/7.1
Auke Bay - Skagway	4.1/9.1
Haines - Skagway	1.3
Alternative 4C	
Auke Bay - Haines	6.0/7.1
Auke Bay - Skagway	6.3/9.1
Haines - Skagway	1.3

Note: [1]The first number is the time for the trip on a shuttle ferry, and the second number is the time for the trip on a mainline ferry. Travel time includes two hours for check-in for mainline ferries and one hour for check-in on FVF or conventional monohull shuttles, although AMHS recommends two hours.

4.5.7.4 State and User Costs

The 30-year life-cycle costs[61] for the No Action Alternative and Alternatives 4A and 4C discounted to 2004 dollars are provided in Table 4-44. These costs include state and federal capital costs and state maintenance and operating expenses. Capital costs include design, vessel and terminal construction, vessel refurbishment, and vessel replacement.

[61] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period, discounted to 2004 dollars.

Table 4-44
Thirty-Year Life Cycle Costs for the No Action Alternative and Alternatives 4A and 4C ($millions)

Alternative	Capital Cost	Operating Cost	Total Life Cycle Cost
No Action	$87	$179	$267
4A	$232	$263	$495
4C	$129	$198	$326

Table 4-45 provides an estimate of the state's portion of these costs. As indicated in the table, Alternatives 4A and 4C would have higher capital and operating costs for the state during the analysis period than the No Action Alternative. Although state revenues from fares would be higher for Alternatives 4A and 4C than for the No Action Alternative, they would not offset the increased cost of these alternatives to the state. Therefore, the state would pay more for Alternatives 4A and 4C than for the No Action Alternative. The cost per vehicle to the state would not be substantially different with Alternatives 4A and 4C compared to the No Action Alternative.

Table 4-45
Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 4A and 4C

Alternative	State Funds1					
	Capital Costs ($million)	Operating Costs ($million)	Total State Cost ($million)	Revenue ($million)	Net State Cost ($million)	State Cost/Vehicle (dollars)
No Action	$8	$179	$187	$126	$61	$45
4A	$21	$263	$284	$186	$98	$46
4C	$11	$198	$209	$131	$78	$51

Note: [1]Value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

The total cost[62] and out-of-pocket cost of travel between Juneau and Skagway or Haines for a family of four in a 19-foot vehicle is listed in Table 4-46 for the No Action Alternative and Alternatives 4A and 4C. The total cost and out-of-pocket cost for travel from Juneau to Haines or Skagway under Alternative 4A would be the same as the No Action Alternative. FVF and mainliner fares would be the same under Alternative 4A and the No Action Alternative. Alternative 4C would cost 10 percent less than travel on a FVF under the No Action Alternative or Alternative 4A.

The cost of taking the shuttle ferry between Haines and Skagway would remain the same as the No Action Alternative with Alternatives 4A and 4C. That fare is estimated to be about $40 for a family of four.

[62]Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.

Table 4-46
Juneau to Haines and Skagway Total and Out-of-Pocket User Cost for Family of Four in 19-foot Vehicle for the No Action Alternative and Alternatives 4A and 4C

Alternative	Haines User Cost[1]	Skagway User Cost[1]
No Action[2]	$180	$237
4A[3]	$198	$261
4C[4]	$180	$237

Notes: [1]Because there is no highway travel for these alternatives, the total cost is the ferry fare, which is the same as out-of-pocket cost.
[2]Cost is for a mainline ferry. FVF would be 10 percent higher.
[3]Cost is for FVF shuttle ferry. Mainline ferry would be 10 percent less.
[4]Cost is for shuttle or mainline ferry.

Table 4-47 shows user benefits and net present values for Alternative 4A and 4C. User benefits can include reduced out-of-pocket costs[63], travel time, vehicle maintenance and ownership costs, and accident costs. Alternative 4A would provide $69 million in user benefits over 35 years primarily due to reduced travel frequency delay[64]. Alternative 4C would offer little user benefit.

Table 4-47
User Benefits and Net Present Value of Alternatives 4A and 4C Versus the No Action Alternative[1]

Alternative	User Benefits ($million)[1]	Net Incremental Project Costs ($million)[2]	Net Present Value ($million)
4A	$69	$125	-$56
4C	$4	$61	-$57

Notes: [1]For the period 2004 to 2038 discounted to 2004 dollars.
[2]Overall project costs minus revenues.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of the No Action Alternative for a given period of time. The 2004 to 2038 net present values of Alternatives 4A and 4C are negative numbers at about -$56 and -$57 million, respectively. In other words, the costs of these alternatives are greater than the value of their user benefits.

4.5.7.5 Other Transportation Impacts

Air Taxi – It is likely that some travel would be diverted from air taxi operations currently serving the Lynn Canal to ferries under Alternative 4A due to the increased convenience of more trips. The *Traffic Forecast Report* (Appendix C) estimated that Alternative 4A would divert 23 percent of air traffic and Alternative 4C would divert 17 percent of air traffic.

[63]Out-of-pocket costs are ferry fares. Fares for the No Action Alternative and Alternatives 4A and 4C are actual 2004 fares charged.
[64]Frequency delay is a measure of schedule convenience based on how often the opportunity to travel is available. For more information on frequency delay see the *Traffic Forecast Report* (Appendix C).

AMHS – AMHS service in Lynn Canal under the No Action Alternative is estimated to require state funding of about $3.3 million in 2008. Because of the increase in ferry service in Lynn Canal with Alternatives 4A and 4C, both are estimated to require more state funding than the No Action Alternative (Table 4-48). These alternatives would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

Table 4-48
Annual AMHS Operating Costs and Estimated AMHS State Funding in 2008 for the No Action Alternative and Alternatives 4A and 4C

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Funding ($million)
No Action	$10.2	$3.3
4A	$16.7	$5.7
4C	$11.7	$4.2

Source: DOT&PF, 2004d.

No other transportation impacts would be likely under these alternatives.

4.5.8 Geology

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on geological resources.

4.5.9 Hydrology and Water Quality

4.5.9.1 Hydrology

Because Alternatives 4A and 4C would only involve relatively minor reconfiguration of existing ferry terminal dock facilities, they would not impact circulation within Lynn Canal. No other changes would be made to transportation facilities; therefore, there would be no impacts to surface water resources, including floodplains.

4.5.9.2 Water Quality

Ferry operations under Alternatives 4A and 4C would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal would remain similar to discharges under the No Action Alternative. The ferries that would be used for Alternative 4A and 4C would have sanitary waste holding tanks,[65] or would discharge treated wastewater meeting applicable standards. The ferry terminal sewage treatment facilities at Auke Bay, Haines, and Skagway would continue to operate under these alternatives. There are no documented impacts associated with these systems; therefore, negligible impacts to water quality from the terminal treatment facilities are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternatives 4A and 4C.

4.5.10 Air Quality

Emissions from marine vessels and motor vehicles are directly proportional to the amount of fuel they burn. As indicated in Table 4-64, ferry and motor vehicle operations under Alternative

[65] Holding tanks would be pumped out and the waste treated onshore for disposal.

4A would consume about 2.2 times as much fuel as under the No Action Alternative, due primarily to the high fuel consumption rates of the fast vehicle ferries. Therefore, emissions of CO, NO_x, and particulates would be about 2.2 times higher under Alternative 4A than under the No Action Alternative. This would not result in violations of federal and state air quality standards because pollutant concentrations in the region are so low and the volume of emissions from Alternative 4A is relatively low compared with other more urbanized areas.

Because Alternative 4C would use conventional monohull ferries, fuel consumption would be only 8 percent higher than under the No Action Alternative. Therefore, emissions under Alternative 4C would be similar to emissions under the No Action Alternative.

4.5.11 Hazardous Materials

The ISA did not identify any sites within the boundaries of Alternatives 4A and 4C that have the potential for hazardous materials involvement.

4.5.12 Wetlands

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on wetlands.

4.5.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

Reconstruction of the Auke Bay terminal would require the removal of pilings, replacement of pilings, and placement of some fill in the bay. Fill and pilings would result in the loss of less than one acre of intertidal and subtidal habitat. This loss would not result in a measurable reduction in any benthic or fish populations in the project region or Auke Bay.

Ferry operations under Alternatives 4A and 4C would be somewhat greater than under the No Action Alternative. This increase would not be large enough to have a measurably different effect on marine and freshwater habitat or fish and other marine species than the No Action Alternative. FHWA has determined that Alternatives 4A and 4C would not have a substantial adverse effect on EFH.

4.5.14 Terrestrial Habitat

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial habitat.

4.5.15 Wildlife

4.5.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall's porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.5.18.

Seals are habituated to current ferry traffic. Because Alternatives 4A and 4C would use existing terminals, and would only increase traffic on existing routes, they would not impact harbor seal use of Lynn Canal.

Minke whales tend to be attracted to motor vessels. Therefore, the presence of such vessels would not drive minke whales away from an area. Because of this attraction, increased ferry traffic would increase the risk of collision, particularly with the fast vehicle ferries used in

Alternative 4A; however, collision accidents with minke whales are very rare (Angliss and Lodge, 2003). Therefore, Alternatives 4A and 4C are unlikely to impact the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid motor vessels, even the fast vehicle ferries proposed for Alternative 4A, and would not be impacted by the ferry traffic associated with Alternatives 4A and 4C.

Sea otters occur in low numbers in Lynn Canal. Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternatives 4A and 4C. These alternatives are unlikely to impact the sea otter population in Lynn Canal.

4.5.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered in this group include great blue herons, marbled murrelets, Kittlitz's murrelets, harlequin ducks, and trumpeter swans.

Blue herons and trumpeter swans do not feed and rest in open marine waters of Lynn Canal and therefore would not be affected by Alternatives 4A and 4C. Marbled murrelets, Kittlitz's murrelets, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting; therefore, they would not be present along the ferry routes for Alternatives 4A and 4C in the main channels of Lynn Canal. These birds may be flushed by ferries approaching terminals. Although this sort of disturbance would be more frequent with Alternatives 4A and 4C than with the No Action Alternative, it would not be frequent enough to have a population-level effect on these species.

4.5.15.3 Terrestrial Mammals

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial mammals.

4.5.15.4 Terrestrial Birds

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial birds.

4.5.15.5 Amphibians

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on amphibians.

4.5.16 Bald Eagles

Because Alternatives 4A and 4C would only involve reconfiguration of existing ferry terminal dock facilities, they would have no direct or indirect effects on terrestrial or freshwater habitats used by bald eagles.

4.5.17 Threatened and Endangered Species

4.5.17.1 Steller Sea Lion

Alternatives 4A and 4C would not affect Steller sea lions at any traditional haulouts and would not measurably change the potential for Steller sea lion/AMHS ferry interactions. For these reasons, the FHWA has made the preliminary determination that Alternatives 4A and 4C are not likely to adversely affect Steller sea lions.

4.5.17.2 Humpback Whales

Ferry traffic in Lynn Canal would increase as a result of Alternatives 4A and 4C. The increased ferry traffic would increase the risk of collisions with humpback whales. The use of fast ferries for Alternative 4A would further increase the risk of collisions because research has shown that vessel-whale collisions increase proportionately when the speed of vessels increases above 14 knots (Laist et al., 2001). Collisions have been rare in the past and would likely continue to be rare despite this increased risk. FHWA has made the preliminary determination that Alternatives 4A and 4C are not likely to adversely affect humpback whales.

For further information on threatened and endangered species, refer to the *Wildlife Technical Report* (Appendix Q) and the *Steller Sea Lion Technical Report* (Appendix S).

4.5.18 Permits and Approvals

Permits and approvals required for Alternatives 4A and 4C are limited to modifications to the Auke Bay Ferry Terminal. The following permits and approvals would be required:

- USACE Section 404 permit for fill below the high tide line
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- EPA NPDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADNR Coastal Consistency Determination
- ADNR Interagency Land Management Assignment for use of additional tidelands
- ADEC review of the SWPPP under the NPDES Alaska General Permit

4.6 Alternatives 4B and 4D – FVF and Conventional Monohull Shuttle Service from Berners Bay

This section evaluates the direct and indirect effects of Alternatives 4B and 4D. Under both of these alternatives, a 5.2-mile highway would be constructed from Echo Cove to Sawmill Cove in Berners Bay. A ferry terminal would be constructed at Sawmill Cove. Ferry service would then be provided to Haines and Skagway from Sawmill Cove during the summer months. During the winter, ferry service would be provided to Haines and Skagway from Auke Bay. With Alternative 4B, two new FVFs would be used for this service. Under Alternative 4D, two conventional monohull vessels would be used for the ferry service. Mainline AMHS service would continue with two round-trips per week year-round.

There would be one pullout near the crossing of Sawmill Creek on the highway for these two alternatives. The USFS has indicated a trail at this pullout is reasonably foreseeable if the highway is constructed. A separate environmental analysis would be completed by the USFS for this trail. The trail is included in the cumulative effects section of this chapter (Section 4.9).

4.6.1 Land Use

4.6.1.1 Land Ownership and Management

The required highway right-of-way from Echo Cove to Sawmill Cove and the new ferry terminal at Sawmill Cove would occupy up to 72 acres of federal land in the Tongass National Forest under the management of the USFS and 55 acres of land owned by Goldbelt. The Tongass National Forest land would remain in federal ownership with a highway easement conveyed to the state. Goldbelt would be compensated for lands acquired for a new highway right-of-way at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

4.6.1.2 Consistency with Land Use Plans

As described in Section 3.1.1.1, the TLMP for the Tongass National Forest identifies a transportation corridor along the alignment for Alternatives 4B and 4D to Sawmill Cove (USFS, 1997); therefore, these alternatives are consistent with the TLMP. USFS land along the east shore of Berners Bay that would be crossed by the highway for these alternatives is currently managed under the designations Semi-Remote Recreation and Scenic Viewshed. If Alternative 4B or 4D were constructed to Sawmill Cove, the USFS would change the designation of the land on which the highway corridor is located to Transportation and Utility Systems. The USFS, in consultation with ADF&G and USFWS, would adjust the boundaries of the Old-Growth Habitat LUDs affected in accordance with old-growth reserve standards in TLMP (see old-growth reserve discussion in Section 4.6.14).

The regional transportation policy set forth in the CBJ Comprehensive Plan is to support the improvement and expansion of air, marine, and highway transportation systems to maintain and expand Juneau's role as the capital city and a regional transportation center (CBJ, 1996). The 1996 update to the CBJ Comprehensive Plan maintains plans for the consideration of all alternatives, including highways, high-speed ferries, and light rail or railroad, to improve transportation links throughout Southeast Alaska and Canada. The CBJ Comprehensive Plan recognizes the need to consider highway access to the Berners Bay area (CBJ, 1996). Therefore, Alternatives 4B and 4D are consistent with the CBJ Comprehensive Plan.

Haines and Skagway local plans and policies promote the type of marine transportation improvements that would occur under Alternatives 4B and 4D (City of Skagway, 1999; Haines Borough, 2004). Therefore, these alternatives are consistent with the plans and policies of Haines and Skagway.

Goldbelt's Echo Cove Master Plan included a road that has been constructed from the northern end of Glacier Highway at Echo Cove to Cascade Point in Berners Bay. The plan also includes a ferry terminal at Cascade Point, expansion of the campground at Echo Cove, a lodge, and other developments. Alternatives 4B and 4D are consistent with this plan and would use the alignment of the newly constructed road. Alternatives 4B and 4D would generate some additional traffic in the Cascade Point area that may facilitate development of the other plan elements.

4.6.1.3 Land and Resource Uses

The highway from Echo Cove to Sawmill Cove would improve opportunities for recreational activities such as hiking, camping, sightseeing, rafting, canoeing, kayaking, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway system in Juneau. Berners Bay is already a popular location for remote and semi-remote recreation. A highway to the southern portion of that bay would make it more accessible for people looking for a rustic but not pristine outdoor experience. A highway could also provide opportunities for outfitters to make more recreational trips available to the public in the region. Opening up the recreation opportunities of the coastline along the east side of Lynn Canal to Berners Bay would be perceived as a negative impact by those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there.

Sawmill Creek would be crossed by the highway proposed for Alternatives 4B and 4D. This stream supports resident and anadromous sport fish. The region also supports populations of mountain goats and bears, which are popular big game species for resident and out-of-state hunters. Hunting and fishing pressure has increased substantially along every highway in Alaska that has opened a formerly remote area to local communities and outside visitors. Increases in hunting and fishing would be expected along the extension of the highway from Echo Cove to Sawmill Cove. As in other readily accessible regions of the state, the ADF&G would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect those resources from over utilization.

Under Alternatives 4B and 4D, Goldbelt would benefit from improved access to its Echo Cove lands. Better access would facilitate development opportunities, including transportation-related activities, recreation, and tourism and residential development.

Roadless Areas – Alternatives 4B and 4D would not substantially change the natural integrity and appearance or opportunities for solitude in Roadless Area 301. Area 301 encompasses 1,201,474 acres, of which 98 percent is managed as Non-Development LUDs. The highway segments of Alternatives 4B and 4D would have a cleared width of approximately 100 feet. The influence of the highway in terms of intruding on the apparent naturalness of the area would extend 1,200 feet on either side of this cleared area (except where the alignment is closer than 1,200 feet from the shore), for a total width of 2,500 feet. Therefore, Alternatives 4B and 4D would impact 642 acres largely along the eastern boundary of Area 301. This represents about 0.05 percent of the land encompassed by Roadless Area 301.

Repositioning the boundary of the roadless area to exclude the area of highway influence would not substantially reduce the amount of land remaining roadless that would appear natural and would still provide opportunities for solitude and primitive recreation. Alternatives 4B and 4D would not affect any identified scientific or educational features in Area 301. Alternatives 4B and 4D are also consistent with the TLMP which indicates that the Forest Plan retains a proposed state road corridor along the alignment for Alternatives 4B and 4D in Roadless Area 301.

4.6.1.4 Parks and Recreation Facilities

No land from a municipal, state, or federal park or recreation area would be required by Alternatives 4B and 4D. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

4.6.2 Coastal Zone Management

Proposed facilities for Alternatives 4B and 4D are located in the coastal zone. The highway from Echo Cove to Sawmill Cove and the proposed Sawmill Cove Ferry Terminal are within the CBJ coastal management plan. Therefore, Alternatives 4B and 4D would need to comply with the enforceable policies of the ACMP and the CBJ coastal district plan.

The topics addressed by the enforceable policies of the ACMP and the coastal management plans that are relevant to Alternatives 4B and 4D are coastal development; geophysical hazards; recreation; transportation and utilities; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources. These policies provide goals and performance criteria for activities within the coastal zone, including transportation projects.

Alternatives 4B and 4D have been sited in consideration of the enforceable policies of the ACMP and the coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the Coastal Zone Management Act, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and applicable coastal management plans prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternatives 4B and 4D would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternatives 4B and 4D. DOT&PF has adjusted the highway alignment to avoid all emergent wetlands and to avoid palustrine wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternatives 4B and 4D, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality. BMPs would be used to avoid downstream water degradation below water quality standards.

City and Borough of Juneau Coastal Management Program Enforceable Policies

The 5.2-mile extension of the highway from Echo Cove to Sawmill Cove, construction of the Sawmill Cove Ferry Terminal, and modification of Auke Bay Ferry Terminal would be within the CBJ Coastal Zone Management District. The following enforceable policies are applicable to Alternatives 4B and 4D.

Coastal Development (49.70.905) – DOT&PF would comply with the coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important for resident or anadromous fish. All in-water construction for the Sawmill Cove terminal would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations.

Geophysical Hazards (49.70.910) – Alternatives 4B and 4D would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and

BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary. Anadromous fish streams would be spanned. Small flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF, to the extent feasible, would design the highway alignment, Sawmill Cove Ferry Terminal, and Auke Bay Ferry Terminal modifications to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternatives 4B and 4D to avoid all emergent wetlands on the east side of Lynn Canal and to reduce impacts to palustrine wetlands. All anadromous stream crossings would be designed and constructed to avoid impacts to fish passage and habitat disturbance, including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment would be adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternatives 4B and 4D would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (see Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternatives 4B and 4D would be done to minimize any environmental impacts and to avoid impacts to the movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as part of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas have been identified and would be mitigated to maintain habitat values of wetlands, tideflats, and streams. Impacts to wetlands have been minimized by adjusting the preliminary alignment to avoid all emergent wetlands and to avoid palustrine wetlands and sensitive habitat to the greatest extent possible. A minimum-width fill footprint would be used for the highway in wetland areas.

Impacts to tideflats would be minimized by timing construction to avoid impacts to fish, using clean fill for the Sawmill Cove Ferry Terminal, and minimizing terminal and dredging footprints to the smallest size practicable. Remaining tideflats in Sawmill Cove would be of sufficient size to continue to provide adequate habitat. Impacts to streams would be minimized by constructing a clearspan bridge over Sawmill Creek, an anadromous fish stream, and using BMPs during culvert installation to protect water quality at other streams. Based on these measures and the large areas of wetland and tideflat habitat in the project area, the habitats in wetlands, tideflats, and streams would continue to sustain the biological, physical, and chemical characteristics to support living resources. If Alternative 4B or 4D were selected, further consultation with NMFS and OHMP would occur to determine whether additional conservation measures would be required to address herring spawning in Sawmill Cove.

Special Waterfront Areas (49.70.960) – Reconstruction at the existing Auke Bay Ferry Terminal would be located within a Special Waterfront Area managed by a coastal management enforceable policy unique to the CBJ. Fill proposals within the special waterfront area are not subject to a fill prohibition of the Juneau Coastal Development Enforceable Policy 49.70.905(13) regarding whether a project is water dependent or water-related (49.70.960(a)(2)). Also, the significant public need and feasible and prudent alternative analysis under the Juneau Habitat Standard 49.70.950(d) does not apply to state projects (49.70.960(a)(6)). The ferry terminal reconstruction activities would comply with 49.70.960(b)(1)(B), meeting water-relevancy requirements of 49.70.905 for floats, docks, and dolphins.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternatives 4B and 4D, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

4.6.3 Visual Resources

4.6.3.1 Views from the Bay

In Berners Bay, the most susceptible views to potential impacts from Alternatives 4B and 4D are views from boats in the bay. Figure 4-19 provides a visual simulation of the highway in background views from the southern end of Berners Bay. From this location, the highway is approximately 2.4 miles from the viewer and is located in an area not requiring substantial cuts and fills. Therefore, the highway is not likely to dominate the existing natural setting. At closer distances, the ferry terminal at Sawmill Cove and the highway would be more noticeable. It is likely that visitors to Berners Bay and Point Bridget in the Point Bridget State Park would notice the highway; however, from this distance it would not be a dominant feature in the viewshed.

Figure 4-20 is a visual simulation of the highway in the foreground at the Sawmill Cove Ferry Terminal proposed for Alternatives 4B and 4D. The highway would be noticeable intermittently along the eastern edge of Berners Bay. However, the proposed ferry terminal would likely be highly visible from this distance (approximately 0.5 mile) and through the middleground viewing threshold. The changes to form, line, color, and texture introduced by the ferry terminal would dominate the existing viewshed.

Alternatives 4B and 4D would result in more frequent views of ferries on Lynn Canal from the land. However, the frequency would not be increased to the extent that noticeably different visual impressions of the region would be created relative to the impressions that currently exist.

4.6.3.2 Views from the Highway

Views from a highway along the east shore of Berners Bay looking east would be limited to the foreground by dense old-growth forest in most places. At the Sawmill Cove terminal, views to the west would include Point Bridgett, Point St. Mary, and the opening of Berners Bay across to the west side of Lynn Canal.

4.6.3.3 Consistency with Visual Quality Objectives (VQOs)

The VQO for the Transportation and Utility Systems LUD is Modification with only the foreground of views considered. Alternatives 4B and 4D would be consistent with this VQO. The alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway. Except for the ferry terminal and highway approach, these alternatives would exceed the VQO of Modification. In order to be consistent with the TLMP goal of achieving the VQOs of adjacent LUDs to the extent feasible, DOT&PF also evaluated the consistency of Alternatives 4B and 4D with the VQO of the adjacent LUD.

USFS land from Echo Cove to Sawmill Cove has a VQO of Partial Retention. The highway for Alternatives 4B and 4D would not be visible from the coastline until Sawmill Cove. At this point, the access road to the new ferry terminal and the terminal facility would be visible from Berners Bay; therefore, the alternatives would conform to the VQO of adjacent lands except at the terminal area. It is not feasible to make the ferry terminal not visible from views of the area; however, during design, ways of reducing the terminal's visual dominance would be investigated.

4.6.4 Historical and Archaeological Resources

There are no eligible historic properties in the APE of Alternatives 4B and 4D. Therefore, FHWA has determined that Alternatives 4B and 4D would not affect historic properties.

These alternatives would indirectly increase recreational use of land adjacent to the new highway. Increased recreational use could result in disturbance of any undiscovered historic and prehistoric cultural sites in the area by hikers, hunters, and other recreational users.

4.6.5 Socioeconomic Resources

4.6.5.1 Juneau

Population, Economics, Housing, and Municipal Revenues – Alternatives 4B and 4D include continuing mainline AMHS service to Haines and Skagway. Because of this, these two alternatives would have little effect on independent visitor traffic to Juneau. The total increase in non-Juneau resident traffic to and from Juneau associated with these alternatives in 2008 is estimated to vary between 35 annual ADT for Alternative 4B and 10 annual ADT for Alternative 4D.

Juneau is projected to receive a total of about 23,000 new non-Juneau resident visitors in 2008 under Alternative 4B and 7,000 visitors under Alternative 4D. Based on the 2003 Alaska Travelers Survey and the 1994 Household Survey (McDowell Group, Inc., 1994), in-state visitors to Juneau would spend $80/visitor/trip and non-Alaskan visitors (e.g., Canadian residents and travelers from the Lower 48 states) would spend $160/visitor/trip. Based on these assumptions, visitor spending in Juneau would increase by about $3 million in 2008 as a result of Alternative 4B and $1 million under Alternative 4D. This increase in visitor spending would generate about $1.7 million in new payroll and an annual average of about 60 additional jobs in Juneau under Alternative 4B and $500,000 in new payroll and 20 new jobs under Alternative 4D (Table 4-49).

Table 4-49
2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Juneau

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	165	130
Vehicle Traffic Less Residents and Baseline Traffic	35	10
Total New Visitors[1] per Year	23,000	7,000
Total New Visitor Spending per Year	$3,000,000	$1,000,000
New Local Payroll per Year	$1,700,000	$500,000
New Local Employment	60	20

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Juneau.

Lynn Canal traffic on the AMHS system under these alternatives is predicted to increase at an annual rate of approximately 1.5 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to Alternatives 4B and 4D in 2038 would be approximately 50 percent higher than in 2008 (Table 4-50).

Table 4-50
2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Juneau

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	265	200
Vehicle Traffic Less Residents and Baseline Traffic	55	15
Total New Visitors[1] per Year	34,000	10,500
Total New Visitor Spending per Year	$4.5 million	$1.5 million
New Local Payroll per Year	$2.5 million	$750,000
New Local Employment	90	30

Note: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Juneau.

Generally, each new job in the Juneau economy results in an increase in population of about 1.5 people[66]. Therefore, the new jobs in Juneau resulting from Alternatives 4B and 4D would be expected to result in a population increase of 90 and 30 residents, respectively, in 2008. This would represent a maximum increase of about 0.3 percent of Juneau's current population. In 2038, the population increase associated with Alternative 4B would be a maximum of 140 residents and the increase associated with Alternative 4D would be a maximum of 45 residents. This would represent a maximum increase of about 0.5 percent of Juneau's current population.

Based on 2.6 persons per household (from 2000 Census data), a population increase of 30 and 90 residents would result in additional demand for about 12 and 35 housing units in 2008. Housing demand in 2038 would increase to a maximum of about 55 units for Alternative 4B and 15 units for Alternative 4D. The latest available data indicate that Juneau had approximately 320 vacant housing units in 2001. The project demand is well within the existing vacant housing capacity of Juneau. Because of the small increase in independent visitors and population associated with Alternatives 4B and 4D, neither of these alternatives would measurably increase the value of private property in Juneau.

Sales tax revenues (plus hotel, liquor, and tobacco taxes) for Juneau would increase at a rate proportional to the increase in spending. Total additional visitor spending of $1 million to $3 million in 2008 would generate (assuming all of the spending is taxable) $50,000 to $150,000 in additional sales tax revenues (based on a 5 percent tax rate). Total additional visitor spending of $1.5 million to $4.5 million in 2038 would generate $75,000 to $225,000 in additional sales tax revenues for Alternatives 4D and 4B, respectively.

Industry/Commercial Sectors – The principal economic benefits of Alternatives 4B and 4D would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternatives 4B and 4D would not noticeably affect utilities and public services in the City and Borough of Juneau relative to the No Action Alternative.

Quality of Life – Alternative 4B would more than triple the number of summer ferry trips between Juneau and Haines and double the number of summer ferry trips between Juneau and Skagway relative to the No Action Alternative. Alternative 4D would double the number of summer ferry trips between Juneau and Haines and Skagway. In addition, Alternatives 4B and

[66] This number is based on an estimated participation rate of 65 percent meaning 65 percent of the Juneau population participates in the local labor force.

4D would reduce most summer out-of-pocket user costs by approximately 30 and 40 percent, respectively, relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement to quality of life by a majority of Juneau residents, providing increased recreational opportunities.

4.6.5.2 Haines

Population, Economics, Housing, and Municipal Revenues – As is the case with Juneau, Alternatives 4B and 4D would have a minor benefit to the Haines economy. The total increase in non-Haines resident traffic to and from Haines associated with Alternatives 4B and 4D is estimated to be 30 and 10 annual ADT, respectively, in 2008.

Haines is projected to receive a total of about 18,000 new non-Haines resident visitors in 2008 with Alternative 4B and 9,000 new visitors with Alternative 4D. Assuming that visitors would spend an average of $50 to $60 per trip in Haines, visitor spending in the community would increase by about $1 million in 2008 as a result of Alternative 4B and $500,000 as a result of Alternative 4D. Because Alternatives 4B and 4D would not substantially change the cost of travel between Juneau and Haines, it is not expected that the number of trips that Haines residents would take to Juneau for shopping would increase substantially. Therefore, there would be little increased spending in Juneau to offset increased spending in Haines by visitors to that community. This increase in visitor spending would generate about $400,000 in new payroll and an annual average of about 20 additional jobs in Haines under Alternative 4B and $200,000 in new payroll and 10 new jobs under Alternative 4D (Table 4-51).

Table 4-51
2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Haines

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	90	70
Vehicle Traffic Less Residents and Baseline Traffic	30	10
Total New Visitors[1] per Year	18,000	9,000
Total New Visitor Spending per Year	$1,000,000	$500,000
New Local Payroll per Year	$400,000	$200,000
New Local Employment	20	10

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Lynn Canal traffic on the AMHS system under these alternatives is predicted to increase at an annual rate of approximately 1.5 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to Alternatives 4B and 4D in 2038 would be approximately 50 percent higher than in 2008 (Table 4-52).

Table 4-52
2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Haines

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	145	110
Vehicle Traffic Less Residents and Baseline Traffic	45	15
Total New Visitors[1] per Year	27,000	13,500
Total New Visitor Spending per Year	$1.5 million	$750,000
New Local Payroll per Year	$600,000	$300,000
New Local Employment	30	15

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Haines.

Each new job in the economy results in an increase in population of about 1.5 people[67]. Therefore, the 10 to 20 new jobs in Haines resulting from Alternatives 4B and 4D would be expected to result in a population increase of 15 to 30 residents in 2008. This would represent a maximum increase of about 1.3 percent of Haines' current population (2,360). In 2038, Alternatives 4B and 4D would result in a maximum population increase of 25 to 50 residents. This would represent a maximum increase of about 2 percent of Haines current population

Based on 2.4 persons per household (from 2000 Census data), a population increase of 15 to 30 residents would result in additional demand for about 6 to 12 housing units in 2008. In 2038, housing demand associated with Alternatives 4B and 4D would be a maximum of about 18 and 9 units, respectively. The latest available data indicate that Haines has about 127 vacant housing units not including seasonal, recreational, and occasional use units. The project demand is well within the existing vacant housing capacity of Haines. Because of the small increase in independent visitors and population associated with Alternatives 4B and 4D, they are not expected to measurably increase the value of private property in Haines.

Sales tax revenues would increase at a rate proportional to the increase in spending in Haines. Total additional visitor spending in Haines of $500,000 to $1 million in 2008 would generate $27,500 to $55,000 in additional sales tax revenues (based on a 5.5 percent tax rate). In 2038, additional visitor spending of up to $750,000 to $1.5 million would generate about $41,000 to $83,000 in additional sales tax revenues for Alternatives 4D and 4B, respectively.

Industry/Commercial Sectors – The principal economic benefits of Alternatives 4B and 4D would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternatives 4B and 4D would not measurably affect utilities and public services in the Haines Borough relative to the No Action Alternative.

Quality of Life – Alternative 4B would more than triple the number of summer ferry trips between Juneau and Haines relative to the No Action Alternative. Alternative 4D would double the number of summer ferry trips between these two communities. In addition, Alternatives 4B and 4D would reduce out-of-pocket user costs by approximately 30 and 40 percent, respectively, relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement

[67] This number is based on an estimated participation rate of 65 percent meaning 65 percent of the Haines population participates in the local labor force.

to quality of life by a majority of Haines residents. Better access to shopping and other services in Juneau, and more recreational opportunities are potential benefits cited by some Haines residents.

4.6.5.3 Skagway

Population, Economics, Housing, and Municipal Revenues – Alternatives 4B and 4D would have a minor benefit to the Skagway economy. The total increase in non-Skagway resident traffic to and from Skagway under Alternative 4B is estimated to be 10 annual ADT in 2008. Alternative 4D would result in no change in non-resident traffic relative to the No Action Alternative.

Skagway is projected to receive a total of about 7,000 new non-Skagway resident visitors in 2008 with Alternative 4B. Assuming that visitors would spend an average of $50 per trip in Skagway, visitor spending in the community would increase by about $400,000 in 2008 as a result of Alternative 4B. This increase in visitor spending under Alternative 4B would generate about $200,000 in new payroll and an annual average of about 10 additional jobs in Skagway (Table 4-53).

Table 4-53
2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Skagway

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	70	60
Vehicle Traffic Less Residents and Baseline Traffic	10	-
Total New Visitors[1] per Year	7,000	-
Total New Visitor Spending per Year	$400,000	-
New Local Payroll per Year	$200,000	-
New Local Employment	10	-

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Lynn Canal traffic on the AMHS system under Alternative 4B is predicted to increase at an annual rate of approximately 1.6 percent for the 30-year forecast period considered in this EIS. At that rate of growth, annual spending, employment, and payroll related to Alternative 4B in 2038 would be approximately 50 percent higher than in 2008 (Table 4-54).

Each new job in the Skagway economy results in an increase in population of about 1.3 people[68]. Therefore, the 10 new jobs in Skagway resulting from Alternative 4B would be expected to result in a population increase of about 13 residents in 2008. This would represent a maximum increase of about 1.8 percent of Skagway's current population. In 2038, Alternative 4B would add a maximum of about 20 residents to Skagway, an increase of about 2.5 percent to the community's current population.

[68] This number is based on an estimated participation rate of 77 percent meaning 77 percent of the Skagway population participates in the local labor force.

Table 4-54
2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Skagway

Description	Alternative	
	4B	4D
Ferry Traffic (Annual ADT)	120	90
Vehicle Traffic Less Residents and Baseline Traffic	15	-
Total New Visitors[1] per Year	10,500	-
Total New Visitor Spending per Year	$600,000	-
New Local Payroll per Year	$300,000	-
New Local Employment	15	-

Notes: Annual ADT = annual average daily traffic.
[1]New visitors are all visitors who are not residents of Skagway.

Assuming 2.6 persons per household, a population increase of 13 residents would result in additional demand for about five housing units in 2008. In 2038, Alternative 4B would result in additional demand for about 8 housing units. The latest available data indicate that Skagway has about 54 vacant housing units, not including seasonal, recreational, and occasional use units. The project demand is well within the existing vacant housing capacity of Skagway. Because of the small increase in independent visitors and population associated with Alternative 4B, it would not increase the value of private property in Skagway.

Sales tax revenues would increase at a rate proportional to the increase in spending in Skagway. Total additional visitor spending would generate about $16,000 in additional tax revenues in 2008 and a maximum of $24,000 in 2038.

Industry/Commercial Sectors – The principal economic benefits of Alternative 4B would be received by the local retail trade and service sectors that provide goods and services to visitors. Economic benefits to other industrial sectors would not be appreciable.

Utilities and Public Services – Alternatives 4B and 4D would not affect utilities and public services in Skagway relative to the No Action Alternative.

Quality of Life – Alternatives 4B and 4D would more than double the number of ferry trips between Juneau and Skagway relative to the No Action Alternative. In addition, Alternatives 4B and 4D would reduce most summer out-of-pocket user costs by approximately 30 and 40 percent, respectively, relative to the No Action Alternative. Based on the 1994 and 2003 household surveys conducted for the project, this improved access would be perceived as an improvement to quality of life by a majority of Skagway residents. Increased tourism and more recreational opportunities are potential benefits cited by some Skagway residents.

4.6.6 Subsistence

The only new highway segment for these alternatives would be an extension of an existing Juneau road. Juneau is not a subsistence community under ANILCA. Because Alternatives 4B and 4D would not substantially change access to locations within Lynn Canal, they would not result in direct or indirect impacts to subsistence uses.

4.6.7 Transportation

The 2004 SATP calls for the construction of a highway from Juneau to Skagway with a shuttle ferry from Katzehin to Haines. Alternatives 4B and 4D are not consistent with the plan.

4.6.7.1 Capacity and Demand

Traffic demand for Alternatives 4B and 4D was projected for 2008 and 2038 using the transportation model summarized in Section 4.1.5. These projections were based on 2002 traffic in the Lynn Canal corridor, the unmet travel demand in the region, projected growth in the region, costs of travel, travel distance and speed, value of time, accident costs, and frequency of delay.

Projected traffic volumes for Alternatives 4B and 4D in 2008 are provided in Table 4-55 along with travel demand for the No Action Alternative. As indicated in the table, Alternatives 4B and 4D would increase capacity by roughly three times the No Action Alternative capacity. This capacity would be sufficient to meet travel demand for this transportation mode except in the peak summer week.

Table 4-55
2008 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4B and 4D

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
No Action	90	170	40	330	167(96/71)
4B	170(91/74)	290(161/131)	80(42/34)	580(318/260)	511(284/227)
4D	130(72/59)	230(127/104)	60(33/27)	460(251/205)	411(208/203)

Note: The first number in parenthesis is vehicle demand or capacity between Juneau and Haines, and the second number in parenthesis is vehicle demand or capacity between Juneau and Skagway.

Table 4-56 provides projections of traffic demand in 2038 for the No Action Alternative and Alternatives 4B and 4D. These projections assume an annual increase in travel demand of 1.6 and 1.4 percent for Alternatives 4B and 4D, respectively. As traffic demand grows with time, the ability of Alternatives 4B and 4D to accommodate that demand would decrease. The summer average daily traffic demand would still be accommodated, but the gap between peak week demand and the fixed capacity of the shuttle system would increase.

Table 4-56
2038 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4B and 4D

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
No Action	130	230	60	460	167(96/71)
4B	270(147/120)	470(260/213)	120(68/56)	940(515/421)	511(284/227)
4D	200(109/89)	350(193/158)	90(50/41)	690(382/312)	411(208/203)

Note: The first number in parenthesis is vehicle demand or capacity between Juneau and Haines, and the second number in parenthesis is vehicle demand or capacity between Juneau and Skagway.

The projected travel demand between Haines and Skagway with Alternatives 4B and 4D is the same as the No Action Alternative. The summer ADT is projected to be 67 vehicles in 2008 and 98 vehicles in 2038 for both the No Action Alternative and Alternatives 4B and 4D. The projected summer capacity of 204 vehicles per day would accommodate the projected demand for travel between Haines and Skagway with Alternatives 4B and 4D.

Because Alternatives 4B and 4D are limited largely to ferry service, they would not meet the projected unconstrained travel demand in the Lynn Canal corridor. As indicated in Section 1.4.1.3, latent demand in the corridor is estimated to currently be about 500 annual ADT. Unconstrained travel demand would be about 510 annual ADT by 2008 and 930 annual ADT in 2038 (Appendix C, *Traffic Forecast Report*). Alternative 4B would generate and accommodate about 33 percent of this annual demand in 2008 and 30 percent in 2038. Alternative 4D would generate and accommodate about 25 percent of latent demand in 2008 and 22 percent of this demand in 2038.

4.6.7.2 Travel Flexibility and Opportunity

Alternatives 4B and 4D would result in an increase in flexibility and opportunity for travel in Lynn Canal. Alternative 4B would more than triple the number of round-trips between Juneau and Haines to 30 trips per week in summer. It would essentially double the number of round-trips between Juneau and Skagway to 16 trips per week in summer. Alternative 4D would also double the number of round-trips between Juneau and Haines or Skagway to 16 trips per week in summer. Travelers would still be dependent on ferry schedules and subject to reservations for the timing of their travel.

Alternatives 4B and 4D would have the same opportunity for travel between Haines and Skagway as the No Action Alternative, three trips per day.

4.6.7.3 Travel Time

Table 4-57 provides a comparison of travel times between the No Action Alternative and Alternatives 4B and 4D. As indicated in the table, Alternative 4B would have the same travel times between Juneau and Haines or Skagway as the No Action Alternative taking the fast ferry[69]. Travel time between Juneau, Haines, and Skagway under Alternative 4D would be about an hour longer than the fast ferry under the No Action Alternative.

Travel time between Haines and Skagway would be the same with Alternatives 4B and 4D as the No Action Alternative, approximately 1.3 hours.

[69] The travel time is approximately the same because the slight savings in time traveling by road from Auke Bay to Sawmill Cove is offset by the longer turn around time for the larger ferry required to meet the increased demand with Alternative 4B.

Table 4-57
Travel Times for the No Action Alternative and Alternatives 4B and 4D

Route	Summer (hours)[1]
No Action	
Auke Bay - Haines	3.5/7.1
Auke Bay - Skagway	3.8/9.1
Haines - Skagway	1.3
Alternative 4B	
Auke Bay - Haines	3.5/7.1
Auke Bay - Skagway	3.8/9.1
Haines - Skagway	1.3
Alternative 4D	
Auke Bay - Haines	5.0/7.1
Auke Bay - Skagway	5.3/9.1
Haines - Skagway	1.3

Note: [1]The first number is the time for the trip on a shuttle ferry, and the second number is the time for the trip on a mainline ferry. Mainline vessel times include a two-hour check-in. FVF includes a one-hour check-in, although a two-hour check-in time is recommended by AMHS.

4.6.7.4 State and User Costs

The 30-year life-cycle costs[70] for the No Action Alternative and Alternatives 4B and 4D discounted to January 2004 dollars are provided in Table 4-58. These costs include state and federal capital costs and state maintenance and operating expenses. Capital costs include design, right-of-way acquisition, highway, vessel, and terminal construction, vessel refurbishment, and vessel replacement.

Table 4-58
Thirty-Year Life Cycle Costs for the No Action Alternative and Alternatives 4B and 4D ($millions)

Alternative	Capital Cost	Operating Cost	Total Life Cycle Cost
No Action	$87	$179	$267
4B	$233	$249	$482
4D	$120	$193	$313

Table 4-59 provides an estimate of the state's portion of these costs. As indicated in the table, Alternatives 4B and 4D would have higher capital and operating costs for the state during the analysis period than the No Action Alternative. For Alternative 4B, state revenues from fares would be higher than for the No Action Alternative, but would not offset the increased cost of this alternative to the state. Therefore, the state would pay more for Alternative 4B than for the No Action Alternative, while individual user costs would be less (Table 4-60). The net state cost for Alternative 4D would be about the same as the net state cost of the No Action Alternative because the increased state revenues for this alternative would essentially offset increased state costs relative to the No Action Alternative. Individual user costs for Alternative 4D would be less than for the No Action Alternative. Alternatives 4B and 4D would cost the state less per vehicle than the No Action Alternative because of the larger number of vehicles transported and the shorter summer ferry routes involved.

[70] Life-cycle costs are the construction, refurbishment, and maintenance costs for a 5-year construction period and a 30-year operation period, discounted to 2004 dollars.

Table 4-59
Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 4B and 4D

Alternative	State Funds[1]					
	Capital Costs ($million)	Operating Costs ($million)	Total State Cost ($million)	Revenue ($million)	Net State Cost ($million)	State Cost/Vehicle (dollars)
No Action	$8	$179	$187	$126	$61	$45
4B	$21	$249	$269	$175	$94	$37
4D	$11	$193	$204	$134	$70	$36

Note: [1]Value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

The total[71] and out-of-pocket cost[72] of summer travel between Juneau and Skagway or Haines for a family of four in a 19-foot vehicle is listed in Table 4-60 for the No Action Alternative and Alternatives 4B and 4D. Those alternatives would reduce the cost relative to the No Action Alternative.

The cost of taking the shuttle ferry between Haines and Skagway would remain the same as the No Action Alternative with Alternatives 4B and 4D. That fare is estimated to be about $40 for a family of four.

Table 4-60
Juneau to Haines and Skagway Total and Out-of-Pocket User Cost for Family of Four in 19-Foot Vehicle for the No Action Alternative and Alternatives 4B and 4D, Summer Fares

Alternative	Haines User Cost[1]	Skagway User Cost[1]
No Action [2]	$180	$237
4B[3]	$124/$113	$174/$163
4D[3]	$114/$103	$160/$149

Notes: [1]First number is total user cost and second number is out-of-pocket cost. Total cost is based on fares plus $0.44 per mile for vehicular travel (AASHTO, 2003). Out-of-pocket cost based on fares and gasoline consumption.
[2]Cost is for mainline ferry. FVF would be 10 percent more.
[3]Cost is for Berners Bay shuttle. Mainline from Auke Bay would be the same as No Action.

User benefits encompass reductions in out-of-pocket costs, travel time, vehicle maintenance and ownership costs, and accident costs. Table 4-61 gives the 35-year value of user benefits as well as net present values of Alternatives 4B and 4D. User benefits are primarily due to the reduced cost to travel a shorter distance by ferry in summer.

[71]Total user costs are out-of-pocket cost and vehicle maintenance, ownership, and accident costs based on highway miles traveled.
[72] Out-of-Pocket costs are a combination of estimated fares and gasoline used on highway segments. Fares for the No Action Alternative are actual 2004 fares charged. Fares for Alternatives 4B and 4D are based on 2004 fares charged prorated by distance of ferry travel.

Table 4-61
User Benefits and Net Present Values for Alternatives 4B and 4D Versus the No Action Alternative[1]

Alternative	User Benefits ($million)	Incremental Project Costs ($million)[2]	Net Present Value ($million)
4B	$107	$130	-$23
4D	$53	$50	$3

Notes: [1]For the period 2004 to 2038 discounted to 2004 dollars.
[2]Overall project costs minus revenues.

One economic measure of an alternative is its net present value. Net present value is the total user benefits minus the net costs of an alternative over and above the net cost of the No Action Alternative for a given period of time. The 2004 to 2038 net present value of Alternative 4B is negative at about -$23 million. In other words, the costs of this alternative are greater than the value of its user benefits. For Alternative 4D, the net present value over the period is about $3 million.

4.6.7.5 Other Transportation Impacts

Air Taxi – It is likely that some travel would be diverted from the air taxi operations currently serving the Lynn Canal to ferries with Alternatives 4B and 4D due to increased travel opportunity. The *Traffic Forecast Report* (Appendix C) estimated that Alternative 4B would divert 23 percent of air traffic and Alternative 4D would divert 17 percent of air traffic.

Pedestrians and Cyclists – The highway proposed for Alternatives 4B and 4D would include 4-foot paved shoulders suitable for bicyclist and pedestrian use. Predicted traffic volumes would be compatible with bicycle or pedestrian use of the shoulders. Shuttle ferries for these alternatives would accommodate bicyclists and walk-on passengers. In summer, walk-on passengers would need to take a private vehicle or private carrier to Sawmill Cove or travel on the twice-weekly mainline ferry from Auke Bay. If there is sufficient demand, it is likely that private bus/van service would be instituted between the Sawmill Cove terminal and Juneau.

AMHS – AMHS service in Lynn Canal under the No Action Alternative is estimated to require state funding of about $3.3 million in 2008. The estimated subsidy for AMHS service under Alternatives 4B and 4D in 2008 is $6.8 and $4.9 million, respectively (Table 4-62). These alternatives would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

Table 4-62
Annual AMHS Operating Costs and Estimated AMHS State Funding in 2008 for the No Action Alternative and Alternatives 4B and 4D

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Funding ($million)
No Action	$10.2	$3.3
4B	$15.5	$6.8
4D	$11.3	$4.9

Source: DOT&PF, 2004d.

No other transportation impacts would be likely under these alternatives.

4.6.8 Geology

Alternatives 4B and 4D would not impact any unique geologic resources in the project area. These alternatives would be subject to earthquake-induced ground tremor. As indicated in Section 3.2.1.2, the Queen Charlotte/Fairweather fault system located within 75 miles of the project area has the capability of producing earthquakes with magnitudes greater than 7.0 on the Richter scale. The Chatham Strait fault system in Lynn Canal has the capability of producing earthquakes of at least 6.9 on the Richter scale (Lemke, 1974). Based on USGS hazard maps published in 1999, there is a 10 percent probability of an earthquake in the next 50 years that would cause ground accelerations of 0.1 to 0.2 g[73] in the project area (Wesson et al., 1999). These types of ground accelerations would be taken into account in the design of roadway pavement, highway structures, and ferry terminal structures. It is probable that a maximum ground acceleration in the study area would cause damage to project facilities, as is the case with many other Alaska transportation facilities in seismic areas.

4.6.9 Hydrology and Water Quality

4.6.9.1 Floodplains

The highway proposed for Alternatives 4B and 4D would cross Sawmill Creek. This creek would be crossed with a single-span bridge. The bridge structure and its supports would be located outside the predicted 100-year flood elevation of the creek, as determined by additional hydraulic studies to be conducted during the final engineering design of the selected alternative.

There are no floodplain development plans for the area from Echo Cove to Sawmill Cove. Sawmill Creek is located in the Tongass National Forest and is designated Semi-Remote Recreation. The principal management goal of this designation is to retain the natural character of the area. Therefore, no incompatible floodplain development would be likely in the project area.

Compliance with EO 11988 – In accordance with the analysis required in 23 CFR 650 Subpart A, FHWA has determined that Alternatives 4B and 4D are in compliance with EO 11988. These alternatives cannot avoid transverse encroachments of 100-year floodplains along their alignment; however, the alternatives would not result in any longitudinal encroachments of floodplains. The transverse encroachments would not increase flood risks, substantially impact natural and beneficial floodplain values, or support incompatible floodplain development. All stream crossings would be designed to minimize potential floodplain impacts and preserve beneficial floodplain values.

4.6.9.2 Hydrology

The proposed highway segment for Alternatives 4B and 4D would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway would eventually flow to the surface. Roadside drainage ditches would collect surface water on the upgradient side of the highway and channel it to the downstream side through culverts. Culverts would be placed to minimize roadside flow and maintain downslope hydrology. Culverts would be designed for the 50-year rainfall event, and end sections or rock dissipaters would be used to disperse high-volume/high-velocity flows to protect soils and vegetation below culvert outfalls from erosion.

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[73] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

The Sawmill Cove Ferry Terminal would require the placement of fill in Berners Bay. This small encroachment would not measurably change circulation and currents in the bay. The proposed terminal is sited so as not to obstruct discharge from Sawmill Creek. Breakwaters are currently not planned for the terminal.

4.6.9.3 Water Quality

Highway construction, maintenance, and operations can affect water quality through earth-moving activities, equipment oil and fuel spills/leaks, debris generation, winter sanding, and vehicular traffic. These activities could introduce metals, fuel, oil, and other potential contaminants to water courses whose drainages encompass the proposed highway between Echo Cove and Sawmill Cove, principally through runoff from the highway.

Results from stormwater research by the FHWA indicate stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (USDOT & FHWA, 1987). Studies conducted in Anchorage, Alaska, under the Municipality of Anchorage Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000a). Results showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below their AWQS. Only dissolved concentrations of copper and lead were noted to be above their AWQS; however, modest dilution would likely reduce these concentrations to below their AWQS. Identified concentrations would not adversely impact streams with flow rates greater than 0.5 cubic foot per second (MOA, 2000b). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of the highway between Echo Cove and Sawmill Cove and the predicted low annual ADT, fewer impacts to water quality in the project area are expected than were found in the Anchorage studies. The studied runoff was collected from Anchorage roadways that ranged from residential (<2,000 ADT) to major arterial (>20,000 ADT). The studied melt water was from snow collected from a mix of these types of roads. In comparison, a highway from Echo Cove to Sawmill Cove would have a maximum peak week ADT during the period of 2008 and 2038 of 411 to 511 vehicles because of the capacity limitations of the ferry.

Highway runoff and melt water from the highway between Echo Cove and Sawmill Cove would have lesser quantities of potential contaminants than what was observed in the Municipality of Anchorage Watershed Management Program due to a lower traffic volume and less area development. The ferry terminal would only be used in summer. Maintenance in the winter would be at the same level as other secondary roads in the Juneau road system. Snow would be cleared from the highway and deposited along its length instead of being disposed of in one location. DOT&PF does not usually use de-icing chemicals on rural roads. Sanding would be performed, as conditions required. Typically, up to 5 percent sodium chloride per total weight of sand is added to keep sand friable in winter. Potential pollutants would not be concentrated in one area. Runoff from the proposed highway and bridges would not be expected to exceed AWQS or adversely impact the water quality of receiving waters for the long term. Potential contamination from oil or hazardous substance spills would be low due to the rural setting of the highway and the low predicted highway traffic volume.

The following BMPs would be implemented to minimize long-term water quality impacts. See Section 4.8.6 for BMPs to minimize water quality impacts during construction.

- Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments

- Rock would be used to stabilize toes of slopes at ponds and stream crossings
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover
- Roadside swales would be designed to keep surface water within the natural drainage basins

Culverts would be installed in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternatives 4B and 4D would have little effect on area water quality. AMHS mainline ferry wastewater discharges in Lynn Canal would remain the same as under the No Action Alternative. Wastewater would be stored in tanks[74] or treated to applicable standards before discharge. A sewage treatment facility with a permitted outfall would be installed at the Sawmill Cove Ferry Terminal. Discharges from the sewage treatment facilities would operate within permit guidelines. Aeration and ultraviolet light disinfection, similar to the system used at the Auke Bay Ferry Terminal, would likely be used. Negligible adverse impacts to water quality from the terminal treatment facility are anticipated. Accidental discharges, spills, and leaks are possible during ferry operations. Historically, these effects have been minor, with only minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternatives 4B and 4D.

Highway and bridge runoff would contribute minimal turbidity and pollutant loads to local drainages flowing to Berners Bay. Contaminant concentrations in runoff from the proposed highway and/or bridges would not be expected to exceed AWQS or adversely impact the water quality of receiving waters for the long term.

4.6.10 Air Quality

Emissions from marine vessels and motor vehicles are directly proportional to the amount of fuel they burn. As indicated in Table 4-64, ferry and motor vehicle operations under Alternative 4B would consume about two times as much fuel as under the No Action Alternative, due primarily to the high fuel consumption rates of fast vehicle ferries. Therefore, emissions of CO, NO_x, and particulates would be about two times higher under Alternative 4B than under the No Action Alternative. This would not result in violations of federal and state air quality standards because pollutant concentrations in the region are so low and the volume of emissions from Alternative 4B is relatively low compared with other more urbanized areas.

Because Alternative 4D uses conventional monohull ferries, fuel consumption would be essentially the same as that of the No Action Alternative. Therefore, emissions under Alternative 4D would be similar to emissions under the No Action Alternative.

4.6.11 Hazardous Materials

The ISA did not identify any sites within the boundaries of Alternatives 4B and 4D that have the potential for hazardous materials involvement.

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[74] Holding tanks would be pumped out and the waste treated onshore for disposal.

4.6.12 Wetlands

A total of 1.9 acres of wetlands and 1.9 acres of other waters of the U.S. would be impacted between Echo Cove and Sawmill Cove under Alternatives 4B and 4D. A total of 1.2 acres of the wetland impact would result from widening the existing Cascade Point Road. The preliminary alignment for highway segments of Alternatives 4B and 4D has been adjusted to avoid wetlands and reduce the impacts to wetlands that could not be avoided.

As indicated in Table 4-63, 63 percent of these wetlands would be forested wetlands. The effects of filling these forested wetlands include reduced groundwater recharge and groundwater discharge/lateral flow functions, modification of the surface hydrologic control, and a reduction in wildlife habitat function with the loss of forest habitat.

Table 4-63
Wetlands and Other Waters of the U.S. Impacted by Alternatives 4B and 4D (Acres)

Wetlands and Other Waters of the U.S.	Alternatives 4B and 4D (acres)
Wetlands	
Palustrine Forested	1.2
Palustrine Scrub-Shrub	0.7
Subtotal	**1.9**
Marine Areas	
Rocky Shore Beaches	1.9
Subtotal	**1.9**
Total Acres	**3.8**

Note: This total does not include fill associated with culvert placement in non-anadromous streams. This additional acreage would be determined during design and permitting.

The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Flow of surface water or shallow groundwater blocked by the highway embankment would eventually flow to the surface and be diverted by ditches to culverts under the highway embankment. Alteration of hydrology because of the highway embankment could result in corresponding changes to the vegetation and over time could affect wetland functions within and outside of the highway right-of-way. The extent of this effect would depend on localized hydrologic patterns; however, effects would be minimized with porous fill material and cross-drainage structures.

The indirect effects of the proposed highway for Alternatives 4B and 4D on wetlands include the potential introduction of contaminants from de-icing and accidental spills of fuels and lubricants, the introduction of non-native plant species inadvertently transported to the area on vehicles and their occupants, and damage to wetlands from increased human recreational activity in the area. These wetland impacts could cause the further loss of wildlife habitat functions, the reduction of ecological diversity, and the reduction of sediment/toxicant retention functions. Implementation of BMPs in maintaining the highway, including not using salt to the extent possible, limiting the use of sand near wetlands, and posting educational signs for wetland users, would minimize the risk of these effects occurring.

The use of salt-treated sand to improve road conditions during the winter could potentially affect roadside vegetation; however, high rainfall in this region would minimize most impacts from road salt (Wegner and Yaggi, 2001). Due to the small quantity of salt used to keep the sand friable for winter maintenance there would be negligible impacts on adjacent vegetation.

The proposed project does not include access facilities for ORVs; however, a highway would afford ORVs access to adjacent lands. ORVs can damage upland and wetland vegetation resulting in the direct loss of habitat and habitat damage through destruction of vegetation, erosion and increased stream siltation. Noise and the presence of ORVs can displace some wildlife species and result in mortality from collisions or human interaction. The USFS is aware of the potential for this type of problem and plans to develop an ORV enforcement policy if the highway is constructed.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternatives 4B and 4D. The roadway would be constructed using the minimum-width fill footprint necessary for a stable road base in wetland areas. During final engineering design of the selected alternative, DOT&PF would investigate ways to further minimize encroachment on wetlands. Compensatory mitigation would be provided for wetland losses associated with the selected alternative.

4.6.13 Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat)

Under Alternatives 4B and 4D, approximately 3.2 acres of intertidal/subtidal habitat would be filled or dredged for the Sawmill Cove Ferry Terminal. Based on a subtidal survey conducted in 2003, the seabed at the proposed terminal site is almost exclusively muds, sand, and gravels, though there may be some bedrock outcrops on the seabed in one location and occasional cobbles. Gravel content is highest in the intertidal zone and drops off rapidly in the subtidal zone, where sands and muds predominate. Vegetation cover is closely linked to the gravel component; therefore, cover drops off rapidly in the offshore. Video surveys of the site conducted in 2003 and 2004 indicated dense rockweed at the headlands on the north and south sides of the cove to about the zero foot tidal elevation. In the lower intertidal zone, rockweed is interspersed with two kinds of large-blade kelp. While this kelp is sparse, it is persistent and evenly distributed throughout the site. Crabs use the subtidal and intertidal zones in Sawmill Cove and a variety of fish species have been observed at the site including yellowfin sole, rock sole, gunnels, snake prickleback, sculpin, and Pacific herring.

The impact to 3.2 acres of intertidal and subtidal habitat, the replacement of natural substrates due to terminal construction, and the dredging of approximately 16,000 cy for a mooring basin would alter habitat usage in the disturbed area. Filling would result in the loss of habitat while dredging and ongoing use would substantially reduce habitat value in the dredged areas. The Sawmill Cove Ferry Terminal would cover approximately 300 feet (0.06 mile) of shoreline at mean lower low water. This is less than 2 percent of the alongshore herring spawning length (approximately 3 miles) observed in Berners Bay in 2003. This habitat loss would not measurably affect other fish populations in the Berners Bay area.

Turbidity at the ferry terminal could be increased over ambient conditions for short periods by ferries maneuvering into and out of the terminal. Short-term turbidity and propeller or water jet scour could affect some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal.

There is the potential for accidental fuel spills from ferries at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location.

The fast vehicle shuttles or conventional monohull shuttles that would be used for Alternative 4B and 4D, respectively, would have sanitary waste holding tanks[75], or would discharge treated wastewater meeting applicable standards. Sanitary waste generated at the ferry terminals

[75] Holding tanks would be pumped out and the waste treated onshore for disposal.

would undergo treatment. Wastewater would undergo treatment and disinfection with ultraviolet light. The treated wastewater would be discharged under an NPDES and/or Water Quality permit and would meet EPA- and Alaska-established waste discharge limitations. For this reason, the effluent should not impact fish habitat or affect fish populations in Lynn Canal, including Berners Bay.

Stormwater and melt water runoff from the bridge over Sawmill Creek would not alter water quality sufficiently to impact anadromous and marine fish habitat. As discussed in Section 4.6.9, studies of highway runoff in Alaska indicate that the volume of traffic on the proposed highway for Alternatives 4B and 4D is not large enough for runoff to cause the exceedance of any AWQS in receiving waters.

The highway from Echo Cove to Sawmill Cove would cross Sawmill Creek, an anadromous fish stream. This bridge would not encroach on the stream channel. Therefore, it would not impact EFH.

In summary, the construction of Alternatives 4B and 4D would result in the direct loss of 3.2 acres of EFH as a result of filling and dredging for the Sawmill Cove Ferry Terminal. This is historically documented spawning habitat for Lynn Canal Pacific herring stock. Ferry maneuvers at Sawmill Cove could increase turbidity in the vicinity of the terminal sufficiently to impact Pacific herring eggs and larvae at the terminal site. Alternatives 4B and 4D would bridge Sawmill Creek, which supports anadromous fish populations. The bridge would not encroach on the streambed. None of these impacts would be large enough to measurably affect fish and invertebrate populations in Lynn Canal.

The incremental effect of the Sawmill Cove Ferry Terminal on Pacific herring stock is relatively small; therefore, this loss by itself is not expected to adversely affect the stock's ability to recover to previous population levels. However, NMFS as well as EPA and OHMP have expressed concern that the ferry terminal and ferry traffic in Berners Bay could have an adverse effect on the Lynn Canal herring stock. For other commercial fish species, the direct loss of 3.2 acres of habitat from ferry terminal construction would not adversely affect any fish and invertebrate populations in Lynn Canal. Both NMFS and OHMP believe special conservation measures, including no operations during the herring spawning period, would be necessary. If Alternative 4B or 4D were selected, further consultation would need to occur.

If the selected alternative includes the Sawmill Cove terminal, DOT&PF would continue to investigate ways to further reduce intertidal and subtidal impacts associated with the terminal. Compensatory mitigation would be provided for the loss of intertidal and subtidal habitat.

4.6.14 Terrestrial Habitat

Alternatives 4B and 4D would result in the loss of vegetation within the cut-and-fill boundaries of the highway to Sawmill Cove and a narrow band of right-of-way clearing adjacent to the highway. The acres of vegetation types that would be removed are estimated to be:

- Twenty-five acres of old-growth forest[76]
- Two acres of open meadow/scrub-shrub[77]

The loss from each vegetation type represents less than 0.5 percent of that type in the study area and is small compared to the approximate forest cover of 117,000 acres in the Lynn Canal

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[76] Includes 1.2 acres of forested wetlands and does not include land already cleared for Cascade Point Road.
[77] Includes 0.7 acre of scrub-shrub wetlands.

region (NPS, 2003). The loss of this vegetation would not adversely affect any listed threatened and endangered species, USFS sensitive species, or plant species considered rare by the ANHP. Clearing of the highway right-of-way would increase the potential for blowdown of trees adjacent to the right-of-way or slides in unstable areas.

Much of the terrestrial habitat that would be impacted by Alternatives 4B and 4D is in the Tongass National Forest. As discussed in Section 3.3.3, the TMLP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternatives 4B and 4D would not impact any mapped old-growth reserves. The highway segment for these alternatives would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternatives 4B and 4D would reduce the size of the old-growth forest stands in the area, as well as create a separation of some old-growth forest areas into downslope and upslope areas. These alternatives would remove approximately 25 of 74,470 acres of old-growth forest along the east side of Lynn Canal (USFS, 2003).

The proposed highway could have indirect effects on terrestrial vegetation. By improving the access to the area, human activity would increase along the highway corridor. This activity could lead to some degradation or disturbance of terrestrial habitat adjacent to the highway through camping and hiking, illegal dumping, and unauthorized collection of firewood. Invasive plant species could be introduced from visitors, vehicles, and pets.

4.6.15 Wildlife

4.6.15.1 Marine Mammals

Harbor seals, minke whales, killer whales, harbor porpoises, Dall's porpoises, and sea otters are considered in this section. Humpback whales and Steller sea lions are discussed in Section 4.6.17.

Harbor seals use the Sawmill Cove area for feeding when prey fish concentrate there, but their main haulouts in Berners Bay are on sandbars near the major rivers; therefore, they are not likely to be affected by operation of the ferry terminal or the highway. The increased frequency of ferry service in Lynn Canal is not expected to result in any appreciable changes in effects on harbor seals relative to the No Action Alternative.

Minke whales tend to be attracted to motor vessels. Therefore, the presence of such vessels would not drive minke whales away from an area. For this reason, ferries for Alternatives 4B and 4D would not displace this species. Because of this attraction, increased ferry traffic would increase the risk of collision, particularly with the fast vehicle ferries used in Alternative 4B; however, collision accidents with minke whales are very rare (Angliss and Lodge, 2003). Therefore, Alternatives 4B and 4D are unlikely to impact the population of this species in Lynn Canal.

Fast-moving and maneuverable species such as the killer whale, harbor porpoise, and Dall's porpoise can readily avoid motor vessels, even the fast vehicle ferries proposed for Alternative 4B, and would not be impacted by the ferry traffic associated with Alternatives 4B and 4D.

Sea otters occur in low numbers in Lynn Canal. Like harbor seals, sea otters are sensitive to noise and would likely avoid ferry traffic associated with Alternatives 4B and 4D. These alternatives are unlikely to impact the sea otter population in Lynn Canal.

4.6.15.2 Marine Birds

This group includes species that nest on land but forage in marine waters at least part of the year. Species considered include the great blue heron, marbled murrelet, Kittlitz's murrelet, harlequin duck, and trumpeter swan.

The proposed highway would result in the loss of some nesting habitat for great blue herons and marbled murrelets; however, the amount of habitat loss relative to the amount available in the study area is small. Nesting habitat for harlequin ducks and trumpeter swans is concentrated farther north in Berners Bay than Sawmill Cove, and Kittlitz's murrelets nest on high-elevation talus slopes, which are not present along the highway alignment for Alternatives 4B and 4D.

Trumpeter swans typically nest in marshy areas near small lakes and use estuarine areas to feed. They are principally found further north in Berners Bay, near the Lace, Antler, and Berners River drainages. Therefore, Alternatives 4B and 4D are not expected to affect this species.

Blue herons and trumpeter swans do not feed and rest in open marine waters of Lynn Canal and therefore would not be affected by Alternatives 4B and 4D. Marbled murrelets, Kittlitz's murrelets, and harlequin ducks do use open marine waters for foraging. They most frequently use nearshore, protected areas for feeding and resting; therefore, they would not be present along the ferry routes for Alternatives 4B and 4D in the main channels of Lynn Canal. These birds may be flushed by ferries approaching terminals. Although this sort of disturbance would be more frequent with Alternatives 4B and 4D than with the No Action Alternative, it would not be frequent enough to have a population-level effect on these species.

4.6.15.3 Terrestrial Mammals

Species considered in this group include the black bear, brown bear, marten, river otter, wolf, Sitka black-tailed deer, moose, and mountain goat. The assessment of project effects on these animals considered habitat loss and fragmentation, traffic disturbance, mortality caused by collisions with vehicles, and the indirect impacts of increased human activity in the study area.

The direct loss of wetland and terrestrial habitat described in Sections 4.6.12 and 4.6.14 would amount to less than 1 percent of these habitats available in the study area. Additional loss of habitat because of windblown trees adjacent to the right-of-way for the highway to Sawmill Cove or changes in local hydrologic patterns along this highway may add to the total habitat loss but not by enough to measurably increase the amount of habitat lost in the study area. For some species, there is a seasonally important habitat that has a greater influence on population levels than other types of habitat used by that species. For example, wintering habitat is important for goats and spring and fall beach fringe is important for bears.

The beach fringe between Echo Cove and Sawmill Cove provides high-value habitat for many terrestrial mammals, including bears, martens, river otters, and wolves. The highway alignment for Alternatives 4B and 4D would divide the home range of some bears that winter at higher elevations and move down to the coast during summer to forage, particularly for black bears that feed on salmon at Sawmill Creek. For species averse to human presence, the highway may limit their ability to use all of their range, thus fragmenting their habitat. Because black bears are highly adaptable and often learn to coexist near human development, habitat fragmentation is not expected to result in a substantial effect on black bear populations in the study area. The highway would likely result in mortality of some black bears from vehicle collisions.

Brown bears tend to avoid highway traffic more than black bears. Thus, they would be more likely than black bears to abandon certain parts of their range rather than cross the highway, and less likely to be involved in vehicle collisions. Because the highway for Alternatives 4B and 4D would separate higher elevation habitats from beach fringe and those latter areas often contain important resources for brown bears, the effective loss of habitat could reduce the reproductive success or survival of some bears (Schoen et al., 1993). To reduce this habitation fragmentation, the bridge over Sawmill Creek would be designed to provide an underpass for wildlife movement.

Wolves travel widely in pursuit of prey and strongly avoid areas of human activity (USFS, 2000; Person, 2001). Some wolves use estuarine areas, but the importance of these areas for wolves is not known. The proposed highway would provide more access for people to beaches in the Sawmill Cove vicinity, potentially inhibiting the use of this area by wolves.

The proposed highway for Alternatives 4B and 4D would not fragment the ranges of martens and river otters, as these species have small home ranges and readily cross roads. Sitka black-tailed deer use a variety of habitat types, so it is unlikely that the small-scale habitat loss and potential fragmentation at the northern end of its range in the project study area would affect their populations. Mountain goat habitat is primarily at higher elevations than the proposed highway alignment; however, in winter, goats often venture down to low elevations, including rock bluffs close to shore. They seldom venture far from steep escape terrain. A highway from Echo Cove to Sawmill Cove would affect the winter habitat of goats in this area.

Collisions with vehicles would result in an increase in mortality among many terrestrial mammal species in the project area. Species most likely to be affected are those attracted to roads to feed on roadside grasses, forbs, and brush and to escape deep snow, such as deer, and those that do not appear to have a substantial aversion to crossing roads, such as river otters, martens, and black bears. Fewer vehicle collisions are likely to occur with species that tend to avoid roads, such as wolves and brown bears. Mountain goats would not be substantially affected, as they would generally not be found adjacent to the highway alignment. There would be some losses, but the mortality from collisions with vehicles would not likely have population-level effects on most wildlife species in the study area.

The moose population around Berners Bay consists of only about 100 to 150 animals and is subject to a highly popular but very limited permit-only hunt (Barten, 2001). Moose rarely travel as far south as Sawmill Cove. The number of moose killed by vehicles traveling from Echo Cove to Sawmill Cove would be very low, and it is possible that no collisions would occur.

The highway for Alternatives 4B and 4D would make a small area more accessible to hunters and trappers. Hunting and trapping pressure on species such as the black and brown bear, moose, deer, mountain goat, marten, and river otter would increase along this highway segment. The effects of this increased pressure would be controlled by ADF&G and the Board of Game through season duration, take limits, lottery drawings, etc. Therefore, this small amount of increased pressure would not result in population-level effects.

4.6.15.4 Terrestrial Birds

Species considered in this group include the Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, gray-cheeked thrush, blackpoll warbler, and Townsend's warbler. Goshawks are the only resident species in this group. Peregrine falcons could be present during migration in spring and fall. The other species are neo-tropical migrants that could be present either during migration or during the nesting season. Except for the peregrine falcon, all of these species favor primarily old-growth forest habitat. Conservation concerns for these species are the result of landscape-scale loss of habitat due to commercial logging (BPIF, 1999). The amount of habitat that would be lost by the proposed highway for Alternatives 4B and 4D would be negligible in comparison. Therefore, these alternatives would not result in population-level impacts to these species.

The 5.2-mile highway segment for Alternatives 4B and 4D would cause some direct loss of habitat through clearing. The opening in the forest canopy created by the highway could cause some birds to avoid the highway area, leading to an effective loss of additional nesting habitat. Openings in the forest canopy also create "edge effects," which are used by some avian predators such as ravens, jays, and crows. This would add to the decreased value of nesting habitat for neo-tropical migrants near the highway.

4.6.15.5 Amphibians

Frogs and toads live in both marshy and forested wetlands as well as upland areas adjacent to ponds. The amount of wetlands lost as a result of the proposed highway for Alternatives 4B and 4D would be small compared to the amount of total wetlands near the proposed highway alignment. Amphibians have small home ranges and do not appear to travel far from their natal pools (NatureServe, 2003). Therefore, the potential impacts of highway maintenance and operation would be limited to those animals that live near the proposed 5.2-mile highway segment. The principal impacts of a highway to amphibians would be through mortality from vehicles and pollution of wetlands from highway stormwater runoff and accidental spills. These impacts would not affect amphibian populations on an area-wide basis.

4.6.16 Bald Eagles

The highway between Echo Cove and Sawmill Cove would pass 10 trees with bald eagle nests, none of which are within 330 feet of the alignment. The ferry terminal and associated facilities at Sawmill Cove would be at least 1,000 feet away from the nearest nest, located to the northeast of the facility. Because of the distance of Alternative 4B and 4D facilities from trees with bald eagle nests, maintenance and operation of these facilities would not have any effect on bald eagles.

4.6.17 Threatened and Endangered Species

4.6.17.1 Steller Sea Lion

Alternatives 4B and 4D would not affect Steller sea lions at any traditional haulouts or designated critical habitat. Maintenance and operations of the Sawmill Cove Ferry Terminal could cause temporary disturbance to Steller sea lions in Berners Bay, particularly in late April and early May, while they are feeding on spring forage fish aggregations; however, FHWA has made the preliminary determination that these alternatives are not likely to adversely affect the Steller sea lion population in Lynn Canal. Alternatives 4B and 4D do not include any new boat launch facilities and are therefore unlikely to increase recreational or commercial use of motorized vessels in the area. NMFS has expressed concern that a ferry terminal at Sawmill Cove would have potential adverse direct and indirect effects on Steller sea lions (see letter dated May 9, 2005 in Chapter 7). Selection of Alternative 4B or 4D would necessitate formal consultation on Steller sea lions with NMFS under Section 7 of the ESA.

4.6.17.2 Humpback Whales

FHWA has made the preliminary determination that highway and vessel traffic and maintenance activities associated with Alternatives 4B and 4D would not adversely affect the humpback whales in Lynn Canal. Ferry traffic in Lynn Canal would increase as a result of Alternatives 4B and 4D. The increased ferry traffic would increase the risk of collisions with humpback whales.

The use of fast ferries for Alternative 4B would further increase the risk of collisions because research has shown that vessel-whale collisions increase proportionately when the speed of vessels increases above 14 knots (Laist et al., 2001). However, collisions have been rare in the past and would likely continue to be rare.

Pile driving for construction of the ferry terminal at Sawmill Cove could disturb humpback whales in the area. Monitors would be used during pile driving to ensure that this activity does not occur when humpback whales are within 660 feet of the construction area.

NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternatives 4B and 4D may adversely affect humpback whales. Selection of either of these alternatives would necessitate formal consultation on humpback whales with NMFS under Section 7 of the Endangered Species Act.

4.6.18 Permits and Approvals

Alternatives 4B and 4D would require the following permits and approvals:

- USFS special use permit for project facilities in the Tongass National Forest
- USACE Section 404 permit for fill in wetlands and other waters of the U.S.
- USACE Section 10 permit for dredge, fill, and structures placed below mean high water
- EPA NPDES Alaska General Permit for storm water discharge during construction
- ADEC Section 401 Water Quality Certification in support of Section 404 permits
- ADNR Title 41 Fish Habitat Permit for work below ordinary high water in streams with anadromous or resident fish
- ADNR Coastal Consistency Determination
- ADNR Interagency Land Management Assignment for use of tidelands at the Sawmill Cove Ferry Terminal
- Authorization from EPA and/or ADEC for treated wastewater discharge from the Sawmill Cove Ferry Terminal
- ADEC review of the SWPPP under the NPDES Alaska General Permit

4.7 Other Environmental Issues

4.7.1 Wild and Scenic Rivers

There are no designated Wild and Scenic Rivers in the study area. Two rivers in the study area have been recommended for designation: the Gilkey and the Katzehin rivers, both located on the east side of Lynn Canal. The Gilkey joins the Antler River upstream of where the Antler is crossed by the proposed alignment for Alternative 2B. Therefore, the proposed project would not affect the status of the Gilkey River. The Katzehin River is crossed by the proposed alignment for Alternative 2B near its mouth. The lower 2 miles of the river have been excluded from recommendation as Wild and Scenic because that reach was reserved for a possible transportation corridor crossing. Therefore, no alternative would affect the proposed Wild and Scenic status of the Katzehin River.

The Sullivan River has not been evaluated by the USFS with regard to eligibility as a Wild and Scenic and/or Recreation River. The USFS has indicated that the lower reach of the Sullivan River, where the Alternative 3 alignment would cross, is clearly not eligible due to past development activities. The upper reaches of the river would not be affected by Alternative 3 other than creating easier access for recreational users. Therefore, Alternative 3 would not affect the Wild and Scenic or recreational status of the Sullivan River. (See USFS letter of March 21, 2004, in Chapter 7.)

4.7.2 Environmental Justice

Effective transportation decision-making depends on understanding and properly addressing the unique needs of different socioeconomic groups. A 1994 Presidential Executive Order addresses this:

> Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations (EO 12898).

FHWA defines “minority population” and “low-income population” as “any readily identifiable group of low-income (or minority) persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed FHWA program, policy, or activity” (FHWA, 1998).

Highway segments of Alternatives 2B, 3, 4B, and 4D pass through undeveloped land that is largely owned by the federal or state governments. Therefore, no highway segments of any alternative would pass through minority and/or low-income neighborhoods.

All alternatives except Alternatives 4A and 4C would add some additional traffic to Glacier Highway in the CBJ between Jordan Creek and Vanderbilt Hill. Census Tract 4 in this area has two Block Groups (1 and 3) with a higher percentage of minorities than the average for the CBJ (Table 3-1). Several of the Block Groups crossed by the Glacier Highway (Block Group 5, Census Tract 2, Block Groups 2 and 3, Census Tract 3, Block Groups 1 through 3, Census Tract 4, Block Groups 2 and 3, Census Tract 5, and Block Group 3, Census Tract 6) have median household incomes below the Juneau average; however, the median income level in these areas is not below the poverty level for any household size of eight persons or less. The increased traffic on Glacier Highway resulting from the project alternatives would not substantially affect the level of service of the highway or substantially increase noise at adjacent residences (see Sections 4.3.7 and 4.7.7 for a discussion of transportation and noise impacts, respectively, for Alternative 2B).

The community of Klukwan is a minority community when compared to state and national data. The median household income is also below the state and national averages; however, the median income level in this area is not below the poverty level for the average household size (2.2 to 2.4) for this community.

None of the proposed alternatives would affect any property in the immediate vicinity of Klukwan; therefore, there would be no disproportionate adverse effect. Under proposed project alternatives, more visitor traffic would travel the highway adjacent to Klukwan. However, this community would not be impacted any more than Juneau, Haines, or Skagway. Increased traffic near Klukwan could result in increased tourism and economic development, which are beneficial effects.

Implementation of a build alternative, particularly the West Lynn Canal or East Lynn Canal Highway, would create local employment and business opportunities for local residents, including Alaska Natives, which is a beneficial effect of the proposed project. As indicated in the discussion of land use effects of project alternatives, some of the property required for the Alternative 3 right-of-way is owned by Alaska Natives. These owners, as well as all other private property owners, would be compensated for their land at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Within the study area, an upgraded transportation system, either a highway or an improved ferry system, would improve access to regional medical care, which would be a beneficial effect. Upgrading the transportation system may increase economic development activities and provide economic opportunities for minority and low-income residents, which are beneficial effects.

Toll roads can have a disproportionate effect on low-income travelers, who may not be able to afford this additional travel cost. This is an emerging concept in environmental justice, but it does not have universal acceptance or defined analysis measures.

The current surface transportation system in Lynn Canal is essentially an expensive toll road. The high cost of travel in Lynn Canal has an impact on low-income travelers, in some cases precluding their ability to travel outside their hometown. Alternative 2B, 3, 4B, and 4D would reduce the cost of travel in this area, benefiting all travelers.

Based on the traditional measures of environmental justice, FHWA has determined that none of the build alternatives would have a disproportional affect on low-income or minority communities.

4.7.3 Farmlands

There are no prime or unique farmlands in the State of Alaska and the study area does not appear on the U.S. Department of Agriculture Natural Resources Conservation Service list of farmlands of state or local importance. None of the proposed project alternatives would impact farmland.

4.7.4 Relocation Impacts

No residences, businesses, farms, churches, or nonprofit organization facilities would be relocated by any proposed project alternative.

4.7.5 Coastal Barriers

Federal legislation requires that any federal action that could potentially affect Coastal Barrier Resources Systems must be consistent with the Federal Coastal Barriers Resource Act of 1982 and the Coastal Barrier Improvement Act of 1990. Coastal Barrier Resources Systems consist of undeveloped coastal barriers on the Atlantic and Gulf Coasts. No coastal barriers have been identified on the West Coast of the U.S. Therefore, none of the proposed project alternatives would have any effect on coastal barriers.

4.7.6 Energy

The estimated annual fuel use for transportation of each of the proposed project alternatives was computed for the years 2008 and 2038. Fuel consumption was calculated for AMHS ferries and projected highway vehicles. Ferry consumption rates were based on the vessel identified for each marine segment. For the No Action Alternative and mainline segments of Alternative 4A through 4D, reported AMHS fuel consumption rates were used. For Alternatives 2B and 3, the analysis assumes the *M/V Aurora* would be replaced by the new optimal vessel identified in the *Marine Segments Report* (Appendix B), in the year summer ADT is predicted to exceed the *M/V Aurora* capacity.

Table 4-64 presents the estimated annual operational energy usage for all project alternatives. In 2008, Alternatives 2B and 3 would have lower fuel consumption while providing greater transportation capacity than the No Action Alternative. In 2008, the No Action Alternative would use 439,000 gallons more fuel than Alternative 2B and 480,000 gallons more than Alternative 3. In 2038, the difference between the No Action Alternative and Alternative 3 would drop to approximately 126,000 gallons of fuel due to the projected increase in highway traffic. In 2038, Alternative 2B would use approximately 52,000 gallons more than the No Action Alternative primarily due to higher traffic volumes. Over the 30-year analysis period Alternative 2B would use approximately 6 million gallons less fuel than the No Action Alternative; Alternative 3 would use approximately 10 million gallons less than the No Action Alternative. All other alternatives would have greater fuel consumption than the No Action Alternative, but would also provide greater transportation capacity than the No Action Alternative.

Alternatives 2B and 3 would have substantially lower fuel use per vehicle than would the No Action and Marine Alternatives due to their lower ferry fuel consumption and higher ADT. Alternatives 4A through 4D increase the capacity of the transportation system in Lynn Canal relative to the No Action Alternative, primarily by increasing the number of ferry trips. The fast vehicle ferries proposed for Alternatives 4A and 4B consume more fuel than conventional monohull vessels; therefore, they have a higher per vehicle fuel usage than the No Action Alternative. Fuel usage per vehicle for Alternative 4D is lower than under the No Action Alternative because of the shorter travel distance from Sawmill Cove to Haines and Skagway than from Auke Bay.

Table 4-64
Estimated Annual Operational Energy Usage[1]

Alternative	Fuel (thousands of gallons)						Per Vehicle Fuel Usage (gallons)	
	Year 2008			Year 2038			2008	2038
	Ferry[2]	Vehicle[3]	Total	Ferry[2]	Vehicle[3]	Total		
No Action	2,476	0	2,476	2,476	0	2,476	75	52
2B	1,495	542	2,037	1,572	956	2,528	15	10
3	1,594	402	1,996	1,663	687	2,350	18	12
4A	5,336	0	5,336	5,336	0	5,336	104	66
4B	4,800	57	4,857	4,800	101	4,901	78	50
4C	2,664	0	2,664	2,664	0	2,664	73	49
4D	2,435	43	2,478	2,435	72	2,507	52	34

Notes: [1]All calculations are based on travel from Auke Bay to Haines and Skagway Ferry Terminals.
[2]DOT&PF, 2005a and Appendix B
[3]Passenger and recreational vehicles and commercial trucks. Based on 19.7 miles per gallon (mpg) EPA fleet average and projected ADT.

4.7.7 Noise

4.7.7.1 No Action Alternative

Noise levels in the project area would continue to be dominated by natural sounds under the No Action Alternative with intermittent man-made noise sources including marine vessels, pleasure craft, airplanes, and helicopters. As indicated in Section 3.2.6, short-term noise measurements were taken at the edge of Berners Bay near the USFS cabin in 1994 and 2003 and at the cabin in 2003. These measurements documented hourly sound levels between 47 and 52 dBA.

Noise levels were also measured on the Chilkat Peninsula, south of Haines in 2003. Those measurements documented sound levels of 35 dBA. This wide difference in sound levels is the result of meteorological conditions at the time that measurements were taken and natural water features near noise monitoring sites. These noise levels are expected to continue into the future under the No Action Alternative.

4.7.7.2 Direct Impacts of Build Alternatives

Undeveloped Areas – Noise modeling indicates that a peak-hour noise level of 65 dBA from traffic on the highway segments of the project alternatives outside of developed areas would be contained within 35 feet of the centerline of the road. Based on simple noise attenuation theory, roadway noise generally decreases by 3 to 6 dBA with every doubling of distance from the source. Where traffic is continuous and the sound travels across hard surfaces such as paving and buildings, the decrease is typically 3 dBA. Where traffic is continuous and the sound travels over soil and vegetation, the decrease is on the order of 4.5 dBA. Where traffic is light, and the noise from each vehicle can be distinguished, the decrease is about 6 dBA. Peak-hour traffic volumes are projected to reach approximately 110 to 150 vehicles in 2038 on Alternatives 3 and 2B, respectively. Traffic volumes would be much lower for Alternatives 4A through 4D. The traffic on Alternatives 2B and 3 would average approximately one vehicle every 25 to 30 seconds. At this volume, the sound of individual vehicles would be distinct; therefore, an attenuation of about 5 to 6 dBA with every doubling of distance could be expected from traffic noise on Alternatives 2B, 3, 4B, and 4D. This relationship would mean that vehicle noise associated with these alternatives is likely to decrease to existing levels typical of the undeveloped areas of Lynn Canal within about 100 to 300 yards of the roadway, depending largely on weather conditions (e.g., traffic noise would be masked at shorter distances during rain and wind storms).

Summer peak-hour through traffic noise at the USFS cabin on Berners Bay was estimated for Alternative 2B using basic noise attenuation theory. Peak-hour traffic noise at the cabin was estimated to be approximately 47 dBA in 2038. Noise levels at this cabin under the No Action Alternative would range from about 35 to 52 dBA depending on meteorological conditions. Therefore, traffic noise from Alternative 2B could be perceptible at the cabin. However, this noise would be well below 65 dBA.

Juneau – As indicated in Section 3.2.6, project alternatives would not have a direct impact on sensitive receptors in Juneau except at the Echo Cove campground. The campground is approximately 600 feet from the alignment of Alternative 2B, 3, 4B, and 4D. Of these alternatives, Alternative 2B would have the largest volume of traffic (including an additional 30 percent non-through traffic) and would therefore create the greatest traffic noise. The peak-hour traffic noise for Alternative 2B is estimated to be approximately 44 dBA at the campground. Existing noise at the campground was measured at 43 dBA. This could be expected to vary depending on meteorological conditions and campground activity. The noise from a highway on the alignment for project alternatives would not increase the peak-hour noise by more than about 1 to 2 dBA. This increase would not be perceptible to the average human ear.

Haines – Project alternatives would not have a direct impact on sensitive receptors in Haines. Noise modeling was used to predict the noise level from Alternative 2B at the Chilkat Peninsula. The acoustical conditions associated with Chilkoot Inlet, which lies between the peninsula and the proposed highway alignment, were included in the noise model. The predicted noise level due to the highway under 2038 peak summer traffic conditions would be approximately 30 dBA at the closest location in Chilkat State Park. Existing noise levels measured on the peninsula were approximately 35 dBA. Therefore, traffic noise from Alternative 2B would cause an increase of only 1 dBA to the overall noise environment. This increase would not be perceptible to the average human ear.

Skagway – Alternatives 2B, 3, and 4A through 4D would have no direct noise impacts to Skagway as these alternatives would involve no new construction there.

4.7.7.3 Noise Abatement Evaluation

As discussed in Section 3.2.6, noise abatement must be considered when the predicted future peak hour noise from highway traffic on new construction approaches or exceeds the NAC (23 CFR 772), or when a substantial increase occurs. No project alternative would approach the NAC or have a substantial increase over ambient conditions. Therefore, noise abatement has not been considered.

4.7.7.4 Indirect Impacts

No Action Alternative – Based on past trends in population growth, it was estimated that traffic in the Juneau, Haines, and Skagway areas would increase at the rate of 1 percent a year into the future. This would increase traffic volumes in these areas by approximately 35 percent by 2038. This increase in traffic would also increase noise adjacent to existing roads in these communities.

Juneau – Existing traffic noise along Egan Drive and Glacier Highway in Juneau was estimated by computer modeling using traffic volumes measured in 2002. Based on this modeling, exterior peak-hour summer traffic noise along these highways is estimated to be at or above 65 dBA at 25 housing units in Juneau (14 single-family residences, 10 condominiums, and the Auke Bay RV Park) (Table 4-65). Based on a field survey of the Juneau area, there are a number of noise sensitive receptors near Egan Drive and Glacier Highway where the exterior areas closest to the highway do not appear to receive frequent human use and therefore it is most appropriate to evaluate potential interior noise impacts. For these other receptors, modeling indicates that interior peak-hour traffic noise is at or above 50 dBA at 103 housing units (single-family residences, residence rooms in the Pioneer's Home, condominiums, apartments, DeHart's upper floor, and the Squire's Rest Building).

The increase in summer traffic associated with the No Action Alternative is projected to increase noise levels in Juneau relative to existing conditions by up to 2 dBA by the year 2038 for all modeled roadway segments. Although this noise increase would not be noticeable since the average human ear does not typically recognize noise increases below 3 dBA, it would increase the number of housing units in Juneau receiving exterior peak-hour traffic noise at or above 65 dBA by 11 (all single-family residences). It would also increase the number of housing units in Juneau receiving interior peak-hour traffic noise at or above 50 dBA by 19 (17 single-family residences and 2 apartments). The Juneau Christian School would have an interior peak-hour noise of 51 dBA under the No Action Alternative. Table 4-65 lists sensitive receptors in the Juneau area that are currently at or above the NAC and sensitive receptors that would be affected by traffic noise with the No Action Alternative in 2038.

Table 4-65
Housing Units Along Egan Drive and Glacier Highway in the Juneau Area Impacted by Summer Traffic Noise[1]

Location	Number of Housing Units									
	Modeled Existing Condition (2002)		No Action Alternative (2038)		Alternative 2B (2038)		Alternative 3 (2038)		Alternatives 4A–4D (2038)	
	In	Ex	In	Ex	In	Ex	In	Ex	In	Ex
Egan Drive from Twin Lakes Drive to Old Glacier Highway	21	1	29	3	29	3	29	3	29	3
Glacier Highway from Old Glacier Highway to Engineers Cutoff Road	23	12	26	14	26	14	26	14	26	14
Glacier Highway from Engineers Cutoff Road to Fritz Cove Road	16	10	17	12	17	12	17	12	17	12
Glacier Highway from Fritz Cove Road to Auke Bay Road	15	0	17	1	17	1	17	1	17	1
Glacier Highway from Auke Bay Road to Auke Nu Drive	23	2	26	4	26	4	26	4	26	4
Glacier Highway from Auke Nu Drive to Terminus	5	0	6	2	13	4	11	3	7 – 11[2]	2 – 3[3]
Total	103	25	121	36	128	38	126	37	122-126	36 - 37

Notes: [1]In = interior at or above 50 dBA $L_{eq(h)}$, Ex = exterior at or above 65 dBA $L_{eq(h).}$
[2]11 for Alternatives 4A, 4B, and 4D and 7 for Alternative 4C.
[3]3 for Alternatives 4A, 4B, and 4D and 2 for Alternative 4C.

Haines – Increased summer traffic in Haines under the No Action Alternative would increase traffic noise in downtown Haines by 2 dBA in 2038. Existing exterior peak-hour noise levels in Haines range from 34 to 57 dBA. As mentioned above, an increase of 2 dBA would not noticeably increase the perceived noise adjacent to roads in Haines. Therefore, project alternatives would not result in noise impacts in Haines.

Skagway – Peak-hour noise at a residence (LT-3 at 420 22nd Avenue) nearest State Street and the Skagway railroad yard was measured in 2003 at just below 65 dBA. At a residence at 12th Avenue and Broadway a block away from the WP&YR Railroad line, peak-hour noise was measured in 2003 at 60 dBA. Based on short-term noise measurements, peak-hour noise in downtown Skagway further away from the railroad line and other non-traffic noise sources was estimated to be less than 60 dBA.

Peak-hour traffic noise levels in Skagway were modeled using 2002 summer traffic levels to represent current conditions. Most traffic coming into or out of Skagway on the Klondike Highway travels on 23rd Avenue and State Street north of 21st Avenue before dispersing onto other roads in Skagway. Exterior peak-hour traffic noise at receptors along State Street between 21st and 23rd avenues and 23rd Avenue between State and Main streets was modeled to range from 57 to 62 dBA. Modeled traffic noise levels were lower than measured noise levels in Skagway. This modeling indicates that vehicle traffic is not the dominant source of noise in most of the community. Other noise sources such as rail traffic and aircraft are primarily responsible for the high measured peak hour noise levels in Skagway (60 to 65 dBA). The northeast section of town is close to the railroad tracks which have up to 120 train movements per day in the summer with many passenger trains during the measured peak hour. Airplane and helicopter noise also contributes to the high noise level with up to 130 takeoffs and landings per day in the summer. With existing traffic noise levels of 57 to 62 dBA, these other noise sources likely contribute approximately 62 to 64 dBA in order for the total peak hour noise level to be 65 dBA.

Noise measurements and modeling indicate that no sensitive receptors in Skagway currently receive exterior peak-hour traffic noise of 65 dBA or greater. However, it is estimated that interior peak-hour traffic noise at the residence where State Street becomes 23rd Avenue, the residence on the southwest corner of State Street and 22nd Avenue, and the daycare center on the southwest corner of 23rd Avenue and Main Street currently exceeds 50 dBA.

Increased summer traffic in Skagway under the No Action Alternative would also increase traffic noise in the community by 1 to 2 dBA in 2038. An increase of 2 dBA would not noticeably increase the perceived noise adjacent to roads in Skagway. Because traffic is not the dominant source of noise in the community, the small increase projected for the No Action Alternative would not increase peak-hour noise at the exteriors of any sensitive receptors to 65 dBA; however, it is estimated that this increase in noise would result in an interior peak-hour traffic noise of 50 dBA or greater at the residences on State Street and 22nd Avenue (north- and southwest corners), the residence on State and 23rd Avenue, the daycare center on the corner of 23rd Avenue and Main Street, and the apartments on the northwest corner of State Street and 21st Avenue.

Build Alternatives – Project build alternatives would increase traffic on roads in Juneau, Haines, and Skagway relative to the No Action Alternative. This would have the indirect effect of increasing traffic noise at receptors adjacent to these roads. Although analysis of the need for noise abatement is not required by FHWA regulations for these indirect impacts, NAC noise levels are useful in their evaluation.

Juneau – In most cases, exterior and interior noise exposure at sensitive receptors along Glacier Highway and Egan Drive with Alternatives 2B, 3, and 4A through 4D would be the same as estimated for the No Action Alternative (Table 4-65). As Table 4-65 shows, two additional sensitive receptors would receive exterior peak-hour traffic noise at or above 65 dBA with Alternative 2B relative to the No Action Alternative. Interior peak-hour noise levels would be at or above 50 dBA at 7 additional sensitive receptors with Alternative 2B (Table 4-65) relative to the No Action Alternative. With Alternative 3, one more receptor would receive exterior peak-hour traffic noise at or above 65 dBA and five more receptors would receive interior peak-hour noise levels at or above 50 dBA when compared to the No Action Alternative (Table 4-65). With Alternatives 4A, 4B, and 4D, one more receptor would receive exterior peak-hour traffic noise at or above 65 dBA and five more receptors would receive interior peak-hour noise levels at or above 50 dBA (Table 4-65) relative to the No Action Alternative. For Alternative 4C, the only difference from the No Action Alternative would be that one more receptor would receive interior peak-hour noise levels at or above 50 dBA (Table 4-65).

Alternative 2B would increase peak hour noise at the Adlersheim Wilderness Lodge near Yankee Cove by 8 dBA. Current (2002) peak hour noise at the lodge is estimated to be 51 dBA. Peak hour noise in 2038 with Alternative 2B would be 59 dBA.

Haines – Project alternatives would result in increased traffic on Mud Bay Road or on Lutak Road and in downtown Haines on Front and Main streets. Modeling indicates that this increased summer traffic in 2038 would increase noise levels in Haines by 2 to 7 dBA for Alternatives 2B and 3, and 1 to 4 dBA for Alternatives 4A through 4D relative to existing conditions. These noise increases would result in peak exterior traffic noise levels in Haines of 65 dBA within 35 feet of the highway centerline in 2038. No sensitive receptors would be impacted by this noise.

Skagway – Traffic associated with Alternatives 2B, 3, and 4A through 4D would enter and leave Skagway via ferry the same as traffic currently traveling between Juneau and Skagway. Alternative 2B would result in the largest increase in summer traffic in Skagway among these alternatives with an estimated peak-hour increase over the No Action Alternative of about 55 vehicles in 2038. This would increase peak-hour traffic noise at sensitive receptors along State Street in Skagway by about 1 to 2 dBA over the No Action Alternative and 3 to 4 dBA relative to existing conditions. No sensitive receptors would receive traffic noise at a level equal to or greater than 65 dBA with this alternative. Alternatives 3 and 4A through 4D would result in traffic volumes somewhat lower than Alternative 2B and would therefore increase peak-hour traffic noise by 1 dBA or less. A 1-dBA increase in noise would not be perceptible to the average human ear.

4.7.8 Traffic

4.7.8.1 No Action Alternative

Juneau – The 2003 traffic on Glacier Highway ranged from 4,152 annual ADT near the Auke Bay Ferry Terminal to 11,900 annual ADT near the junction with Egan Drive at the Mendenhall River bridge. The 2003 traffic on Egan Drive from the bridge to downtown ranged from a high of 27,100 annual ADT near the Mendenhall Loop Road to 12,834 annual ADT at Main Street. Downtown streets ranged from a high of 7,609 annual ADT on Main Street to 1,337 annual ADT on the upper part of Franklin Street. The 2003 Lynn Canal annual ADT of 77 was a very small component of the traffic on any Juneau roads. The No Action Alternative Lynn Canal annual ADT is expected to increase at approximately the same rate as local traffic. Therefore, the No Action Alternative annual ADT of 130 in 2038 would continue to be a very small component of the total Juneau traffic on any road regardless of which roads Lynn Canal travelers use in Juneau.

> Note: Summer (May through September) ADT counts in Lynn Canal are approximately 80 percent higher than the annual ADT. Traffic counts at the three permanent traffic recorders in Juneau show less of a differential, with summer ADT counts approximately 20 percent higher near the Auke Bay terminal, 10 percent higher on Riverside Drive, and 8 percent higher near 3 Mile on Egan Drive. Based on these traffic statistics, Lynn Canal traffic has a greater impact on summer ADT than annual ADT, but because of the very low existing and projected volumes, the impact of Lynn Canal traffic on Juneau roads is virtually nil. The downtown business district has greater activity during the summer cruise ship season and Glacier Highway near Echo Cove is used most heavily during the summer. It is likely roads in these areas have traffic differentials closer to those of Lynn Canal.

Haines – The 2003 traffic on Lutak Road from the ferry terminal to 2nd Avenue ranged from 959 to 1,528 annual ADT. Traffic on Main Street ranged from 1,359 to 2,538 annual ADT. Traffic on the Haines Highway from Union Street to the Canadian border ranged from 1,834 to 189 annual ADT. Based on the historic 60/40 split between Haines and Skagway, the 2003 Lynn Canal contribution to this traffic was approximately 45 annual ADT. The only road segment that may have been appreciably affected by this traffic was the Haines Highway near the Canadian border. Population and local traffic in Haines are predicted to grow at roughly half the rate of Lynn Canal traffic (0.6 versus 1.2 percent annually). The Haines portion of the No Action Alternative 2008 annual ADT of 90, and 2038 annual ADT of 130, would be 54 and 78, respectively. This would create a very small proportional increase in total traffic on all road segments other than the Haines Highway near the Canadian border. Overall, the Haines Highway would still have a very low total annual ADT even if all Lynn Canal traffic traveled on this segment.

> Note: Summer ADT counts at the permanent traffic recorder at 5 Mile on the Haines Highway are approximately 27 percent higher than annual ADT counts. Therefore, Lynn Canal traffic, with its higher summer differential, has a somewhat greater impact on summer ADT than annual ADT, but because of the low volumes overall, the contribution is small regardless of season.

Skagway – The 2003 traffic on State Street ranged from 1,255 annual ADT near 1st Avenue to 1,993 annual ADT near 9th Avenue. The traffic on Broadway Street ranged from 1,462 to 1,605 annual ADT. Traffic on the Klondike Highway ranged from 1,506 annual ADT near the Skagway River bridge to 325 annual ADT near the Canadian border. Based on the 60/40 split mentioned above, the 2003 Lynn Canal contribution to these traffic counts was approximately 30 annual ADT. Regardless of which roads in Skagway these travelers used, no road segment in Skagway was appreciably affected by Lynn Canal traffic. Population and local traffic growth in Skagway is projected to be at the same rate as Haines at 0.6 percent. The Skagway portion of the No Action Alternative 2008 annual ADT would be 36. By 2038 this would grow to 52 annual ADT. An increase of 22 annual ADT over 35 years would have no appreciable affect on Skagway traffic.

> Note: The summer ADT counts at the permanent traffic recorder on the Klondike Highway just past Dyea Road are 73 percent higher than the annual ADT counts. This is an indication that overall traffic in Skagway is nearly as seasonally affected as Lynn Canal traffic. Therefore, traffic impacts from Lynn Canal traffic relative to total traffic would be the same regardless of the season considered.

4.7.8.2 Alternative 2B

Juneau – Traffic projections for Alternative 2B are 380 annual ADT in the first year after construction, with an annual ADT of 670 at the end of the 30-year forecast period. Nearly all of this traffic would use the existing Glacier Highway from Echo Cove to Lena Loop, the first residential area of any size. The 2003 annual ADT of 217 near Echo Cove would grow to approximately 300 by 2038 absent Alternative 2B traffic. Combined with the projected 670 ADT from Alternative 2B, and an additional 200 annual ADT from non-through traffic that may use the highway to access Berners Bay, the traffic near Echo Cove could grow to 1,170 ADT. This is a substantial increase over the 2003 annual ADT of 217, but it is still low for a two-lane highway.

Approximately one half of the forecasted Lynn Canal traffic under Alternative 2B is attributed to Juneau residents traveling to and from Juneau. This half of the increased traffic would not impact downtown streets, as most Juneau residents would not pass through the downtown area on trips to and from Haines or Skagway. Downtown traffic would be affected by somewhat less than half of the Alternative 2B traffic, as some non-Juneau travelers would be destined for the Auke Bay Ferry Terminal or airport. Traffic on downtown streets would go up by approximately 170 annual ADT if half of all non-Juneau resident travelers used the downtown area once on each trip to Juneau. Traffic on Franklin Street would grow to approximately 2,000 annual ADT, and traffic on Main Street would grow to approximately 10,300 annual ADT, but the main increase would be due to growth in local traffic, not Lynn Canal traffic.

The 2001 CBJ *Area Wide Transportation Plan* identifies several future transportation problems in the Juneau downtown area, including an inadequate transition from four lanes to two on Egan Drive at Main Street, narrow lanes and inadequate sidewalks on some streets, inadequate parking, and traffic flow/circulation problems created by truck deliveries (CBJ, 2001b).

Suggested remedies include constructing parking structures or lots outside the downtown area with frequent shuttles, expanding sidewalks, and creating seasonal auto-restricted zones on key downtown segments. Although all of these problems will occur regardless of Lynn Canal traffic, Alternative 2B would increase the number of summer vehicles and would therefore exacerbate the problem. For instance, traffic on Main Street would rise by less than 2 percent, but any additional vehicles, particularly RVs, would increase the parking problem.

Haines – Under Alternative 2B, traffic to and from Haines on the Katzehin shuttle would be 190 annual ADT initially and would grow to 335 annual ADT by the end of the 30-year forecast period. Virtually all of this traffic would use Lutak Road; traffic increases on other Haines roads and the Haines Highway would be somewhat less. Based on a 0.6 percent annual increase in local traffic, the total traffic on Lutak Road near the ferry terminal would be approximately 1,500 annual ADT under the No Action Alternative. For downtown streets, an increase of approximately 260 annual ADT over the No Action Alternative traffic would not be a substantial increase; Main Street would likely have traffic volumes of 1,600 (near 1st Avenue) to 3,000 (near 3rd Avenue) annual ADT without this increase. Even if all Lynn Canal travelers entered the Main Street area, the combined volumes would be easily accommodated by existing facilities. The Haines Highway would see the biggest relative increase in traffic volumes. Near the Canadian border, traffic under the No Action Alternative would be approximately 230 annual ADT. If half of the 260 additional annual ADT arriving at the Lutak terminal under Alternative 2B traveled to the border, traffic volumes would be over 50 percent higher at 360 annual ADT. Nevertheless, this would be a low traffic volume and would not have any substantial effects on this two-lane highway.

Skagway – The Skagway split of the Lynn Canal traffic under Alternative 2B would be the same as for Haines. Initial traffic would be 190 annual ADT, growing to 335 annual ADT over 30 years. This 283 annual ADT increase over the 2038 projected traffic for the No Action Alternative would not have any appreciable effect on State Street or Klondike Highway traffic. State Street traffic would range from approximately 1,500 annual ADT near 1st Avenue to 2,400 annual ADT near 9th Avenue in 2038 under the No Action Alternative. Most of the additional traffic from Alternative 2B would use State Street, creating a 13 to 17 percent increase in traffic on this through street. Much of the additional traffic would travel on the Klondike Highway; Juneau residents taking additional trips to and from the Yukon would use the highway to the Canadian border. An additional 280 annual ADT would approximately double the traffic near the border compared to the 2038 No Action Alternative traffic projection of 280 annual ADT, based on a 0.6 percent annual growth. While this would be a substantial percentage increase, traffic volumes of 600 annual ADT are still very low for a two-lane highway.

Traffic on streets in the Skagway Unit of the Klondike Gold Rush National Historical Park (see Figure 3-6) is a concern during the summer, as high numbers of pedestrians are in this area during cruise ship visits. Broadway Street, the center street in the park unit, has traffic volumes almost as high as State Street, but also has a high volume of pedestrians and fully utilized on-street parking during multiple ship days. Both the City of Skagway and the National Park Service have expressed concern over increased traffic. Based on a medium projected annual growth rate of 0.6 percent, traffic on Broadway Street in this area would be approximately 1,750 annual ADT in 2038 under the No Action Alternative. The 2038 Alternative 2B traffic increase of 283 annual ADT would add 16 percent more traffic to Broadway in the park unit, <u>if</u> all of this traffic entered the park unit rather than staying on State Street. Given that half of the projected traffic would be Juneau residents making multiple trips per year to and from Juneau, it is very unlikely that these travelers would use Broadway Street on both legs of every trip. Many of these trips would not have Skagway as the end destination, and Juneau residents are likely to be aware of the crowded conditions on Broadway Street during the summer. While Alternative 2B traffic is unlikely to be a major component of summer traffic-related problems in the Skagway park unit, it would contribute additional traffic and may hasten the need to take steps to limit vehicles on Broadway Street during the summer.

4.7.8.3 Alternative 3

Juneau – Alternative 3 would have traffic impacts in Juneau very similar to those of Alternative 2B. The projected 2008 and 2038 annual ADTs are 310 and 530, respectively, approximately 20 percent less than those projected for Alternative 2B. Traffic impacts for the downtown area would therefore be similar but somewhat smaller. Overall impact to downtown traffic would not be appreciable, based on the high local traffic volumes in comparison to the increase in Lynn Canal traffic. Traffic on the Echo Cove to Lena Point segment of Glacier Highway would be approximately 40 percent less than under Alternative 2B, because Alternative 3 would not generate the non-through traffic that would be created by an alternative that passed through Berners Bay. Traffic on Glacier Highway near Echo Cove would be approximately 830 annual ADT by 2038 under Alternative 3, a high percentage increase over the No Action Alternative, but a low volume for a two-lane highway. As with Alternative 2B, Alternative 3 would have very small impacts in comparison to projected local traffic on highway and street segments closer to the main population areas of Juneau, where local traffic volumes would be much higher than the increase due to new Lynn Canal traffic. Alternative 3 would add to the summer traffic problems in the downtown area, but would be a very small percentage of the overall traffic.

Haines – Under Alternative 3, all traffic in Lynn Canal would pass through Haines, and virtually all of that traffic would use Mud Bay Road to get to the core area of Haines, the Haines Highway, or the ferry terminal on Lutak Road. In 2003, traffic on Mud Bay Road where Alternative 3 would intersect it was 426 annual ADT. Based on a 0.6 percent annual increase in traffic, the No Action Alternative traffic in 2038 at this location would be approximately 510 annual ADT. Alternative 3 would have an annual ADT of 530 coming onto Mud Bay Road from a bridge across the Chilkat Inlet, more than doubling traffic on this road segment in relation to the No Action Alternative. Mud Bay Road is a 35-mph road with 11-foot driving lanes and 4-foot paved shoulders. This road can easily accommodate the increase in traffic that would occur under Alternative 3.

Closer to the main part of town, Mud Bay Road and the Old Haines Highway had much higher traffic volumes in 2003, ranging from 1,023 to 2,092 annual ADT. Some of the Alternative 3 traffic would use the Haines Highway, some would frequent the downtown area of Haines, and travelers heading to or from Skagway would use Lutak Road to the ferry terminal. The Alternative 3 traffic would be a relatively small component on most of the possible routes that traffic could take. The 2038 traffic to and from Skagway is projected to be 160 annual ADT. This traffic would raise the 2038 No Action Alternative projected traffic on Lutak Road of 1,200 annual ADT by approximately 13 percent, to 1,360 annual ADT. The No Action Alternative projected traffic on the Haines Highway is approximately 1,500 annual ADT close to town and 130 annual ADT near the Canadian border. If all of the Alternative 3 2038 traffic from other than Haines residents and travelers of the Skagway component travels on the Haines Highway, the Haines Highway would have an additional 320 annual ADT throughout its length. Neither the Haines Highway nor roads in the Haines area would have capacity problems based on the projected levels of traffic.

Skagway – Skagway traffic under Alternative 3 would be approximately 95 annual ADT in 2008, growing to 160 annual ADT by 2038. The 2038 projected traffic is approximately 110 annual ADT more than under the No Action Alternative, but less than half of the projected traffic under Alternative 2B. Juneau residents would represent about half of the traffic volume, with Skagway and Yukon residents representing the majority of the remainder. As explained for Alternative 2B, some but not all of this traffic would enter the Skagway Unit of the NHL on Broadway Street, contributing to the pedestrian-vehicle traffic problems during the summer tourist season.

4.7.8.4 Alternatives 4A through 4D

Juneau – All of the marine alternatives would have small traffic impacts in Juneau relative to projected local traffic conditions. The projected 2008 Lynn Canal traffic ranges from 100 to 170 annual ADT, with Alternative 4C generating the lowest volume and Alternative 4B generating the highest. This represents a 10 to 90 percent increase over the No Action Alternative. Similarly, the projected 2038 traffic ranges from 150 to 270 annual ADT compared to 130 annual ADT for the No Action Alternative. These traffic volumes are very low, particularly in comparison to the existing and projected local traffic on all roads that could be affected other than Glacier Highway near Echo Cove. Alternatives 4B and 4D, with summer shuttle service from Sawmill Cove, would increase traffic on Glacier Highway from Echo Cove south to Juneau. Alternative 4B would have a summer ADT of 470 in 2038, although 50 of this ADT would be on mainline ferries operating out of Auke Bay. The remaining 420 summer 2038 ADT would use the Sawmill Cove terminal and Glacier Highway. Under the No Action Alternative the 2038 traffic near Echo Cove would be approximately 300 annual ADT, with summer ADT as high as 540. Alternative 4B could create a near doubling of this number, but the overall traffic volume would still be low for a two-lane, 50-mph highway. Alternative 4D, with a projected summer 2038 ADT of 350, would add approximately 300 summer ADT to Glacier Highway.

Haines – Alternatives 4A through 4D would have a 2008 annual ADT to and from Haines ranging from 56 (Alternative 4C) to 91 (Alternative 4B). This traffic is projected to increase to a range of 82 to 147 annual ADT by 2038. These traffic volumes are a small increase over the No Action Alternative volumes and would have very little effect on overall traffic volumes on the Haines streets likely to be used by this traffic.

Skagway – Alternatives 4A through 4D traffic volumes to and from Skagway would be very similar to those projected for Haines. In 2008, projected traffic ranges from 46 (Alternative 4C) to 74 annual ADT (Alternative 4B). By 2038, these volumes would increase to a range of 67 to 120 annual ADT. These traffic volumes represent a very small increase over the No Action Alternative traffic and would have very little effect on overall traffic conditions in Skagway.

All 2003 traffic information is taken from *DOT&PF Southeast Region 2003 Traffic Report* (DOT&PF, 2004e).

4.8 Construction Impacts

4.8.1 Land Use

Construction of many of the proposed project alternatives may require establishment of at least one temporary construction camp and a number of temporary materials staging areas. For Alternative 2B, it is likely that one construction camp would be set up at Comet Landing, outside of the required right-of-way for the project, and one camp at the Katzehin Ferry Terminal site, potentially located on the right-of-way acquired for the project. For Alternative 3, a camp is likely at William Henry Bay at the proposed ferry terminal site. As with the Katzehin site, this camp could be on the right-of-way for the project. For Alternatives 4B and 4D, a construction staging area would be likely at the Sawmill Cove Ferry Terminal site. The number and location of other sites would depend on the contractor’s work plans/schedule and sequencing of work areas in concert with approval by DOT&PF. In the event that temporary construction camps and/or staging areas are needed outside of the permanent right-of-way for proposed project facilities, it would be necessary to obtain a use permit from the USFS for sites located on Tongass National Forest land, and a lease for sites on private or local government land. These requirements would apply for any material source sites or sites required for setting up rock crushers or other material processing equipment.

4.8.2 Visual Resources

Viewers from boats or ferries on Lynn Canal would see construction activities where they are not screened by vegetation and fugitive dust created during right-of-way clearing, grading, and blasting. These activities would contrast with the natural landscape and may dominate some viewsheds for a short period.

4.8.3 Historical and Archaeological Resources

No known National Register-eligible archaeological resources are present within the construction limits of any project alternative. The Jualin Mine Tram and the Comet/Bear/Kensington Railroad are known eligible historic resources on the alignment for Alternative 2B, and the Dalton Trail is the only known eligible historic resource on the alignment for Alternative 3. The boundaries of these historic properties would be flagged in the field to ensure that equipment operators do not inadvertently damage these resources. In the event a previously unknown cultural resource is discovered during construction, work in the vicinity of the site would cease until DOT&PF has evaluated the site, FHWA has determined its eligibility for the NRHP, and, if the site is determined to be eligible, DOT&PF, FHWA, and the SHPO have agreed to a plan to avoid or mitigate adverse impacts. If the site is determined to contain human remains subject to the provisions of the Native American Graves Protection and Repatriation Act, the appropriate tribal consultation would be conducted.

4.8.4 Socioeconomic Resources

4.8.4.1 Alternative 2B

Table 4-66 lists the estimated construction costs for all project alternatives and the corresponding annual labor employment required to construct each alternative. Labor employment was derived from the estimated construction cost. In major construction projects of this nature, labor constitutes from one-third to one-half of the total project cost. The total labor cost was calculated assuming it would be 45 percent of construction costs. Total labor cost was broken down into annual labor cost; construction was assumed to take approximately four years. Based on 2001 DOL&WD data, the total annual salary for highway, street, and bridge construction workers in Alaska was about $71,000. Total labor cost includes this annual salary plus 20 percent for benefits and other labor-related overhead, or approximately $85,000 per annual-equivalent job. The estimate of annual labor employment was determined by dividing this annual-equivalent job cost into the total estimated annual labor cost.

In 2002, there were 13 firms designated as heavy construction employers in the Juneau/Haines/Skagway area with average annual employment of 298 workers. As indicated in Table 4-66, Alternative 2B would increase this employment by 86 percent. It is unlikely that the Juneau/Haines/Skagway region would have enough qualified workers for this construction project; therefore, workers would be needed from other areas to construct any of these this alternative.

As the region's commercial and population center, Juneau would receive the largest construction-related impacts under Alternative 2B. Haines would not experience appreciable socioeconomic impacts from the alternative because Haines is not located on the alignment for this alternative. However, Haines-area construction contractors and labor could participate in the project. Skagway is not likely to be affected by construction of Alternative 2B.

Table 4-66
Project Construction Phase Employment Impacts

Alternative	Construction Cost ($Million)	Estimated Annual Employment (people)
2B	205	270
3	203	270
4A	12	25
4B	33	65
4C	12	25
4D	33	65

Note: Construction costs include only highway and ferry terminal costs; vessel construction is not included. Estimates are based on a four-year construction period for Alternatives 2B and 3, and a two-year construction period for Alternatives 4A through 4D.

The highway construction effort for Alternative 2B would be initially staged out of Juneau and possibly Haines, and camp-supported facilities near Comet and/or the Katzehin Ferry Terminal would likely be used.

The location of the major workforce concentration is important in terms of where construction-related socioeconomic impacts would occur. Regardless of location, the types of impacts that could occur include:

- Increased sales with construction equipment, rental, and repair companies
- Increased sales with food wholesalers and other businesses providing goods and services to the construction camp(s)
- Increased sales with fuel distributors
- Increased sales to businesses providing goods and services to construction workers and dependents
- Increased sales tax revenues
- Increased demand for rental and other housing
- Increased enrollment in local schools
- Increased demands on other public services such as law enforcement, fire and emergency services and health care services

Table 4-67 provides an estimate of total annual employment and payroll associated with Alternative 2B. The estimates provided in Table 4-67 are high-case estimates because indirect impacts (those associated with business spending on goods and services in support of the construction project) and induced impacts (those associated with construction workers spending their payroll) develop over time and are generally lower for short-term projects such as construction of this alternative.

Table 4-67
Construction Phase
Direct and Total Employment and Payroll Effects for Alternative 2B

Estimated Annual Direct Employment (people)	Estimated Annual Direct Payroll ($Million)	Estimated Annual Total Employment (people)	Estimated Annual Total Payroll ($Million)
270	19	380	23

Note: Estimates are based on a four-year construction period.

Table 4-68 provides an estimate of construction-related population increases, total new housing demand, and additional school-age population projections for Alternative 2B. These estimates are based on half of the total construction-related labor force seeking some form of housing in Juneau, including construction workers relocating to Juneau. For construction workers relocating to Juneau, 75 percent are estimated to bring dependents, family size would average 3.1, and 20 percent of the dependent population would be school age. Workers seeking housing in Juneau who do not have dependents are estimated to seek shared housing with other construction workers at two people per housing unit.

Table 4-68
Construction Phase
Maximum Potential Population-Related Effects for Alternative 2B

Total Construction Related Population Increase (people)	Total New Housing Demand (No. of Units)	Additional School Age Population (children)
490	165	90

Note: Estimates are based on a four-year construction period.

Juneau had approximately 320 vacant housing units in 2001. Although the construction-related housing demand associated with Alternative 2B is less than existing vacancies, some additional housing development would probably occur in anticipation of increased demand.

The effect on the school district of additional school-age residents would depend on the age and geographic distribution of the construction-related population. Total public school enrollment in Juneau has declined by about 250 students over the past five years; therefore, the infrastructure is in place to serve this additional enrollment. Additional enrollment would also result in increased state funding, which is based in part on enrollment.

4.8.4.2 Alternative 3

Construction of Alternative 3 is estimated to cost approximately $203 million. This alternative would create approximately 270 construction jobs, which is the same as the construction workforce estimated for Alternative 2B. Other economic impacts for Alternative 3 in terms of annual total employment and payroll, construction-related population increase, new housing demand, and additional school-age population are shown in Table 4-69.

Table 4-69
Construction Phase
Direct and Total Employment and Payroll Effects for Alternative 3

Estimated Annual Direct Employment (people)	Estimated Annual Direct Payroll ($Million)	Estimated Annual Total Employment (people)	Estimated Annual Total Payroll ($Million)
270	19	340	23

Note: Estimates are based on a four-year construction period.

Construction-phase impacts related to the West Lynn Canal Highway differ from an East Lynn Canal Highway in that Haines could potentially be substantially affected. Alternative 3 would likely be staged out of Haines and a camp at the William Henry Bay Ferry Terminal area. Potential socioeconomic effects in Haines from Alternative 3 could be similar to those estimated for Juneau under Alternative 2B depending on how many workers are housed in a camp as opposed to living in Haines.

Based on 75 percent of the construction jobs for Alternative 3 being filled by non-residents, and about half of those non-residents bringing dependents , a population increase of approximately 500 to 550 residents could be expected, including those residing in a local construction camp. That would represent a temporary 20 percent increase in the population of Haines. An estimate of these increases is shown in Table 4-70.

Table 4-70
Construction Phase
Maximum Potential Population-Related Effects for Alternative 3

Total Construction Related Population Increase (people)	Total New Housing Demand (No. of Units)	Additional School Age Population (children)
500	150	80

Note: Estimates are based on a four-year construction period.

There are approximately 430 vacant housing units in Haines, of which about 130 may be available for year-round rental. Therefore, approximately 20 additional housing units could be required in Haines depending upon how many workers may be based in construction camps.

This population increase would increase public school enrollment by approximately 80 new students in all grades. Physical facilities in the Haines school district are adequate to meet this demand; however, depending on the distribution of students among grades, it may be necessary to hire one or more teachers.

4.8.4.3 Alternatives 4A through 4D

The only in-state construction expenditures associated with Alternatives 4A and 4C would be minor reconfiguration of the Auke Bay Ferry Terminal, requiring about 25 workers. This construction would have no appreciable effect on the Juneau economy. Construction for Alternatives 4B and 4D would include the Sawmill Cove Ferry Terminal and the highway between Echo Cove and Sawmill Cove. These alternatives would require about 65 construction workers, which is equal to 22 percent of the existing heavy construction workforce in the region. The economic effects to Juneau, Haines, and Skagway from this increase in construction jobs over a two-year period would be negligible.

4.8.5 Transportation

DOT&PF may set up interim ferry service during construction of Alternatives 2B or 3. For Alternative 3, interim ferry service to Haines and Skagway could be instituted from Sawmill Cove after construction of the ferry terminal and the highway from Echo Cove. For Alternative 2B, interim ferry service could be initiated to Haines and Skagway from Slate Cove after highway construction reaches the Jualin mine road if Coeur Alaska constructs a floating vehicle dock in Slate Cove as indicated in their operating plan and U.S. Army Corps of Engineers permit. In both cases this service could be provided by a combination of the Haines/Skagway shuttle and the *M/V Fairweather*. The Haines/Skagway shuttle could add a run to Slate Cove in the middle of the day between runs to and from Haines and Skagway. The *M/V Fairweather* would remain based in Juneau until any highway alternative was completed, but could depart Auke Bay to Haines or Skagway, then sail south to Slate Cove, head north to Haines or Skagway, and then return to Auke Bay. This would reduce the overall running time and cost of operation.

4.8.6 Hydrology and Water Quality

During construction of the highway segments of the project alternatives, small non-anadromous fish streams with perennial flow would need to be diverted during placement of culverts. Diversions would not be required for anadromous fish streams and rivers to be spanned by bridges.

Diversion of streams would be done during low-flow periods to avoid downstream water quality impacts using standard procedures to minimize water quality impacts. Depending on flows, water may be pumped around the site where the culvert is being placed, or the stream may be diverted to a temporary lined channel. When the culvert is in place and the stream is re-established in its natural channel, there would be a short-term, one-time increase in turbidity. Based on past experience, this short-term increase in turbidity would not change stream profiles or result in a long-term degradation of fish habitat.

Bridges crossing streams would be built from shore. No temporary roads would be established in streambeds. This would minimize turbidity caused by bridge construction.

Bridges crossing major rivers would require placement of piers in the river bed. This construction activity would be timed to periods of low flow to minimize turbidity; however, there would be a short-term increase in turbidity during this activity. Based on past experience, this short-term increase in turbidity would not change river profiles or result in a long-term degradation of fish habitat.

Construction of the proposed ferry terminals at Katzehin (under Alternative 2B) and Sawmill Cove (under Alternatives 3, 4B, and 4D) would require dredging to approximately 25 feet below mean lower low water. The proposed William Henry Bay Ferry Terminal for Alternative 3 would not require dredging. The new terminals proposed for the project alternatives would require placement of in-water fill. Alternative 2B would also require in-water fill in intertidal/subtidal areas for highway construction. Dredging and in-water fill placement would result in short-term (hours or days) localized increases in turbidity. Based on past studies of dredging impacts conducted by the USACE, fish would avoid the dredge or fill sediment plume. Benthic invertebrates that cannot rapidly move away from the sediment as it settles out of the water column would be buried and killed. Kelp and aquatic vegetation in close proximity to dredging would be covered with sufficient sediment to hamper photosynthesis and some of this vegetation may die. Areas impacted by sediment deposition would be expected to recolonize within one to two seasons. The fill used for the project would be shot-rock generated during highway construction; therefore, no pollutants would be introduced into marine waters from this fill material.

Highway and ferry terminal construction would involve earth-moving activities. Exposed soils susceptible to erosion can be discharged to natural water bodies, resulting in short-term increased turbidity.

Fuel and lubricant spills and leaks could occur during construction. These potential pollutants could flow directly to area water bodies or be transported to them by stormwater runoff.

Debris and waste are generated during construction. If not properly managed, they can contribute to water pollution through stormwater runoff.

During design of the selected alternative, an erosion and sediment control plan would be developed to provide a general plan to minimize erosion and sedimentation during construction. Project contractors would use this plan to develop SWPPPs for their work. Each SWPPP would detail the resources that a contractor has on-hand and the procedures and BMPs that the contractor would use to prevent construction activities from jeopardizing area hydrology or water quality. BMPs would include:

- Erosion and sediment control measures would be employed as early in construction as possible.
- Staking would be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area.
- Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
- Silt fences would be used adjacent to waterways just beyond the estimated toe of fill.
- Ditch check dams would be used to reduce erosion during construction.
- Sedimentation basins would be used, as necessary, during construction.

The NPDES Stormwater General Permit for construction projects in Alaska requires the contractor to submit a project SWPPP to ADEC for review. The provisions of the General Permit require the contractor to inspect the project regularly and after rain events of a half-inch or more in a 24-hour period. Any problems must be corrected by repairing malfunctioning BMP features or altering the SWPPP. The General Permit requires that inspections and changes to the SWPPP be documented, with records available for compliance review.

The General Permit authorizes projects that will not exceed the appropriate water quality standards. All contractor and DOT&PF inspections, and most reviews by ADEC and EPA, are based on visual inspections, with a problem addressed if noticeable erosion or sedimentation is occurring.

4.8.7 Air Quality

Construction can be a source of dust emissions that have temporary impacts on local air quality (i.e., exceedances of the NAAQS for PM_{10}). Construction particulate emissions would result from drilling and blasting and use of heavy equipment involved in land clearing, ground excavation, cut-and-fill operations, and the construction of project facilities. Dust emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather. Dust emissions would be minimized by application of BMPs, such as watering exposed soil surfaces in active work areas, if necessary. Most of the study area is distant from populated areas, so dust would primarily be a concern for workers and habitat areas adjacent to the project.

In addition to particulate emissions from earth moving, there would be pollutant emissions (CO, NO_x, PM_{10}, and reactive organic compounds) from construction equipment engines. These emissions are not expected to result in exceedances of NAAQS for any pollutant because of the low background levels of pollutants in the study area and the relatively small amount of construction equipment.

4.8.8 Noise

The evaluation of construction noise was based on typical noise levels from public works projects, such as road construction, developed by the EPA. Using that information, the overall noise level generated on a construction site for proposed project alternatives was estimated to be 88 dBA at 50 feet, except where blasting is to be done which would produce higher short-term noise levels. Noise levels generated by construction equipment decrease at a rate of approximately six decibels per doubling of distance away from the source (Diehl, 1973). For all build alternatives, typical noise from project construction would drop to background levels at about 3,300 feet from the construction site. In many places, the noise would attenuate over much shorter distances because of terrain.

Because of the different phases of construction (e.g., clearing, grading, cut and fill, etc.), no single location would experience a long-term period of construction noise. Instead, construction activities and associated noise would move along the right-of-way as construction proceeds.

DOT&PF would include specific noise abatement requirements in the construction contracts for the proposed project. Those requirements would include proper maintenance of noise control equipment like mufflers.

4.8.9 Wetlands

Highway construction for all project alternatives except Alternatives 4A and 4C require work in wetland areas. Excavation, grading, and cut-and-fill activities could alter local hydrologic patterns, which could affect these wetlands. The erosion and sediment control plan developed by DOT&PF for implementation by construction contractors would contain specific BMPs to avoid construction impacts to wetlands including:

- The roadway would be constructed using the minimum-width fill footprint necessary to provide a stable road base.
- Separate identification of slope limits to insure workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.
- Construction camps, staging sites, borrow pits, and waste areas will be located in upland areas and stabilized during and after use to avoid water quality impacts to wetlands and water bodies.

The SWPPP (see Section 4.8.6) would include provisions to avoid contaminating these wetlands. Wetland fill limits would be separately identified to raise the awareness of workers on the need to avoid impacts beyond the toe of the slope.

No borrow sites, waste sites, staging areas, or construction camps would be located in wetlands. No storage areas or truck turnaround areas are anticipated to be in wetlands other than within the actual footprint of the highway. The locations for these activities would be further evaluated during design.

4.8.10 Terrestrial Habitat

Construction of the selected alternative would require a combination of temporary facilities, such as borrow sources, waste sites, staging areas, and possible construction camps. The specific locations and sizes of these temporary facilities would be determined by the construction contractors. These sites would be small relative to the area of clearing required for project facilities themselves and, to the extent possible, would be located within the final footprint of the project. Large quantities of borrow material would not be required for highway construction, as most embankment material would come from necessary rock cuts. Most waste soil would either be buried below the embankment or used as topsoil in non-wetland areas. As discussed in the impact assessment for all project alternatives, the permanent loss of terrestrial habitat associated with the Juneau Access Improvements Project would be a small percentage of the total area of similar habitats available in the Lynn Canal region. Clearing of remote temporary construction facilities would not substantially affect terrestrial habitats, and those areas outside the footprint of the project would be revegetated to natural plant communities following construction.

Construction activities have the potential to introduce invasive plant species to the Lynn Canal region. There are three pathways for this potential impact. Construction equipment brought to the project site from other areas could contain seeds or plant parts that could then be spread to the construction site. Seed mixtures used to vegetate exposed soils could contain invasive species. Soil containing invasive species excavated from one area could be moved to another area, thus spreading the invasive species. For more information on invasive species, including a list of existing species in Southeast Alaska, refer to Section 4.2.1.1 of the *Wildlife Technical Report* (Appendix Q). See Section 5.3 of the EIS for information on mitigating these potential impacts.

4.8.11 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)

Construction of ferry terminals would result in a short-term increase in turbidity near the construction sites. This turbidity could result in the loss of some Pacific herring eggs in the vicinity of the Sawmill Cove Ferry Terminal site under Alternatives 3, 4B, and 4D and sculpin eggs at the William Henry Bay terminal site under Alternative 3. Timing of in-water construction to avoid the spawning and egg maturation period would avoid this impact. At other proposed terminal sites, this increased turbidity could result in the loss of some benthic organisms. These impacts would not have population-level effects on any benthic species, fish, or crab species in Lynn Canal.

Highway construction for Alternative 2B would require sidecasting of up to 2 million cubic yards of rock from road cuts into Lynn Canal. Sidecasting would create a sediment plume that could smother benthic organisms for an area outside the principal fill zone for the material. Fish would typically avoid these plumes. These temporary impacts are not expected to have population-level effects on any benthic species, fish, or crab species in Lynn Canal.

Construction of multi-span bridges across the Antler (Alternative 2B), Lace (Alternative 2B), Katzehin (Alternative 2B), Sullivan (Alternative 3), Endicott (Alternative 3), and Chilkat (Alternative 3) rivers would require placement of support structures in the river channels. Based on recent experience with bridge construction in San Francisco Bay, it is possible that the energy generated by pile driving could cause some fish kills within about 100 feet of that activity (FAA, 2003). Construction in the river channels would also result in short-term turbidity that could affect migrating fish and smother fish eggs. Although bridge construction in these rivers may lead to some mortality of resident or anadromous fish, the full width of each river would not be impacted at once and construction would be timed to avoid periods when anadromous fish are active in the area. Therefore, it is not expected that bridge construction would result in long-term population-level effects on resident or anadromous fish.

4.8.12 Wildlife

4.8.12.1 Marine Mammals

Harbor seals may be disturbed by loud noises caused by highway and ferry terminal construction activities near the shore. It is likely that harbor seals would perceive active construction areas in or immediately next to the water from a distance and avoid the area if noise levels are bothersome. Harbor seals haul out on sandbars in Berners Bay and at the Katzehin River delta. They have also been observed to haul out on the west side of Taiya Inlet at the base of Halutu Ridge. On the west side of Lynn Canal, harbor seals haul out in protected waters near the Sullivan River, Davidson Glacier delta, and Pyramid Island. Construction noise caused by any of the alternatives may cause harbor seals to temporarily abandon some haulout sites. However, they are likely to return to those sites after the noise has ceased. In addition, there are numerous haulout sites that seals use throughout Lynn Canal. This temporary disturbance would not result in population-level effects on this species.

4.8.12.2 Marine Birds

Project construction could result in flushing some marine birds, such as marbled murrelets and harlequin ducks, resting or feeding in nearshore waters. These short-term displacements would cost birds a small amount of energy and time but would not affect reproductive success or survival.

Disturbance of nesting birds could decrease their chances of reproductive success for the season or could cause them to abandon their nests. The waterfowl and herons in the study area begin breeding activities in late April or early May and some do not fledge their young until the middle of August. Marbled murrelets nest in old-growth forest, the most common habitat type crossed by the proposed highway alignments on the east and west sides of Lynn Canal. Therefore, marbled murrelets may be the species most affected by highway construction. Clearing in old-growth areas for Alternatives 2B or 3 would be spread over more than one season. Alternatives 4B and 4D would impact a 5-mile-long, 100-foot-wide strip of vegetation. For any of the build alternatives, only a small portion of available habitat would be impacted during any nesting season.

Disturbance of nesting birds would not have population-level effects on waterfowl and herons in Lynn Canal. Highway construction would proceed in stages over the alternative alignments. Construction would not take place over the entire length of any alignment in one season with the possible exception of the relatively short extension of Glacier Highway from Echo Cove to Sawmill Cove for Alternatives 4B and 4D. Therefore, only a small area of nesting habitat relative to the amount available throughout the region would be disturbed during any one breeding season.

Trumpeter swans nest in the wetlands of the Antler, Lace, and Berners rivers, with a concentration of nests on the Lace River near its confluence with Berners Bay (USFS, 2001). Most of these nests are well upstream of the alignment for Alternative 2B; however, at least one known nest site is approximately 3,000 feet from the alignment on the delta between the Antler and Lace rivers (USFS, 2001). As indicated in Section 4.8.8, this is far enough away from construction activities that noise from construction equipment would be at background levels typical for the area. To ensure that no trumpeter swan nests are impacted, a pre-construction survey would be conducted. Therefore, construction of project facilities should not have a substantial impact on nesting trumpeter swans.

4.8.12.3 Terrestrial Mammals

Some species of terrestrial mammals such as bears, wolves, river otters, and martens give birth in dens during the winter or spring. It is possible that highway construction could cause some direct mortality of adults and young in dens inadvertently destroyed during clearing operations in the early spring. However, only a few individuals are expected to be affected and therefore construction would not result in population-level effects on any species in the Lynn Canal region. To reduce the likelihood of impacting denning wolves, a den survey would be conducted (see Section 5.8).

Black and brown bears typically avoid human activity. However, they are attracted to human garbage and food supplies, which often brings them into conflict with humans and results in bears being shot in defense of life or property. This problem often occurs in remote construction camps (McLellan, 1989). Best management practices for food and waste disposal would be implemented for construction camps, staging areas, and day-to-day activities to minimize bear-human interactions.

Goats overwinter in wooded slopes near steep terrain. From north of Independence Lake to the Katzehin River the alignment for Alternative 2B passes through or near typical overwintering habitat. To the extent feasible, construction would be avoided from January through April in locations that goat monitoring indicates are high-use areas for goats.

4.8.12.4 Terrestrial Birds

Project construction effects on terrestrial birds are similar to those described for marine birds. Loud noises from construction activities are likely to disturb birds within 0.25 to 0.5 mile of the alignment. If the birds are feeding or resting, they would fly away from the disturbance and resume their normal behavior in another location. Disturbance of nesting birds would decrease their chances of reproductive success for the season and would be avoided to the extent practicable. It is not expected that project construction would have population-level effects on terrestrial birds in Lynn Canal. As explained above, highway construction would proceed in stages over the alternative alignments. Construction would not take place over the entire length of any alignment in one season except for the relatively short extension of Glacier Highway from Echo Cove to Sawmill Cove for Alternatives 4B and 4D. Therefore, only a small area of nesting habitat relative to the amount available throughout the region would be disturbed during any one breeding season. A pre-construction goshawk nest study would be conducted to ensure that there are no impacts to nesting goshawks.

4.8.12.5 Amphibians

Project construction could result in the loss of individual frogs and toads in the wetlands crossed by the highways for Alternatives 2B, 3, 4B, and 4D. No palustrine emergent wetlands or open water would be filled by Alternatives 2B, 4B, and 4D. A pre-construction survey would be conducted to confirm that no amphibian breeding areas would be affected. Therefore, the loss of individuals is not expected to have population-level effects on any species in the Lynn Canal region, as the area disturbed is small relative to the total regional habitat available to amphibians.

4.8.12.6 Bald Eagles

As discussed in Section 4.1.15, the USFWS has established a 330-foot primary buffer zone around active bald eagle nests to protect them from typical construction noise, and a 0.5-mile secondary buffer for loud construction noises such as blasting. Based on past experience, bald eagles may not select an existing nest or abandon their nest when construction activities are at closer distances. Alternative 2B has 49 known trees with bald eagle nests within 330 feet of the alignment and 92 known nest trees within 0.5 mile of the alignment. There are 24 bald eagle nest trees within 330 feet of the proposed alignment for Alternative 3, and 50 nest trees within 0.5 mile of the alignment. No bald eagle nest trees are known to be within 330 feet of the proposed highway alignment from Echo Cove to Sawmill Cove under Alternatives 4B and 4D, but 10 nest trees occur within 0.5 mile of the alignment.

Construction along the alignments of Alternatives 2B and 3 would be staged; therefore, construction would not occur along the entire alignment in any one season. In addition, not all eagle nests are actively used each year. Construction would be timed to avoid nest tree areas during the nest occupation period, and to avoid active nests during the rearing season. In specific locations, monitors may be used to allow construction during these periods if agreed to by USFWS.

New bald eagle nests are built each year and some older nests may be destroyed each winter. The locations of all nest trees within the construction zone would be surveyed each year prior to construction. Site-specific mitigation would be the subject of ongoing consultations with the USFWS and would be agreed to on a case-by-case basis during design and construction. A blasting plan would be developed in consultation with USFWS for areas where blasting would be required within 0.5 mile of active eagle nests.

4.8.12.7 Threatened and Endangered Species

Construction of a highway for Alternative 2B would place construction equipment in close proximity to the Gran Point Critical Habitat Area for Steller sea lions as well as the Met Point haulout. Average noise levels from typical construction equipment would be approximately 88 dBA at 50 feet. Background noise levels at remote shorelines in Berners Bay have been measured at 47 to 52 dBA. The alignment for Alternative 2B is approximately 285 feet behind and 140 feet above Gran Point. Shielding from trees, rocks, and earth between the haulout and the noise source would decrease noise levels by an additional 5 dBA or more in addition to the normal noise decrease rate of approximately 6 dBA per doubling of distance without shielding. This would mean that typical construction noises would be, for example, 88 dBA at 50 feet, 77 dBA at 100 feet, 66 dBA at 200 feet, 55 dBA at 400 feet, and 44 dBA at 800 feet. The closest point of construction activity to the haulout would be 320 feet. Therefore, noise from construction activities in the vicinity of the Gran Point haulout would not produce noise levels above ambient except directly opposite the haulout. Noise levels would be similar at the Met Point haulout, which is 400 feet from the nearest point of construction.

Based on surveys including daily monitoring of the Gran Point haulout, sea lions use the haulout through the fall, winter, and spring months. By mid-July, sea lions generally stop using the haulout and do not return until the end of August. To ensure no disturbance, construction work in the immediate vicinity of the haulouts (1,000 feet) would occur when the haulouts are vacant.

Blasting would also be required in this area for highway construction. An analysis of blasting effects was conducted for the 1997 Draft EIS. The two major components of blasting disturbance are the air blast and ground vibration. Ground vibration levels expected at the haulout were estimated to evaluate possible disturbance to Steller sea lions. Vibration is expressed in terms of inches per second (ips), which represents the velocity of the particles in the ground during a seismic wave caused by blasting. According to the U.S. Bureau of Mines, human tolerance levels for ground vibrations often depends on an individual's feelings about the blasting activity. If an individual is hostile or objects to blasting, the tolerance level can be lower than 0.1 ips. For those supporting the activity, the tolerance level can be as high as 0.50 ips. The level of 0.1 ips was used as the disturbance threshold for sea lions.

Rather than requiring the use of particular charge sizes, the contractor would be required to monitor blasting effects when blasting within 3,000 feet of the haulouts and avoid vibrations greater than 0.05 ips at a haulout while it is occupied. This would keep blasting effects well below 0.1 ips, the presumed vibration threshold for sea lion disturbance (see the revised Biological Assessment in the addendum to the *Steller Sea Lion Technical Report* in Appendix W).

Blasting is a source of sound as well as vibration. Typical sound energy levels (air blast over pressure) generated by construction blasting are in the range of 0.007 pounds per square inch, equivalent to 95 dBA at 665 feet for 50-pound charges (FHWA, 1991). As with vibration, the sound energy level can be controlled by using lower weight charges. The contractor would be required to monitor blasting noise and avoid noise energy levels greater than 45 dBA at the haulout when blasting within 3,000 feet of either site.

Sea lions on the Gran Point and Met Point haulouts would be monitored when construction activities occur within 3,000 feet of these haulouts. This monitoring would be done to ensure that sea lions are not disturbed.

Humpback whales near shore may hear or feel construction activities that take place at ferry terminal sites or on highway alignments close to shore. The reaction of humpback whales to underwater noise would depend on how far away they were from the disturbance and what they were doing at the time. In some cases, whales change course and speed to avoid a noisy ship. In other cases, especially when they are feeding in an area of high prey availability, whales tolerate very loud noises. To minimize construction impacts to whales, monitors would be on-site in areas with a high probability of noise impacts, including pile driving at ferry terminals and bridge sites, to watch for the presence and/or disturbance of whales. No pile driving would occur when humpback whales and other marine mammals are within 660 feet. The short-term disturbance due to construction noise would not impact the humpback whale population in Lynn Canal.

4.9 Cumulative Impacts

The geographic area for the cumulative effects assessment encompasses the following areas:

- Auke Bay Ferry Terminal and Echo Cove within the City and Borough of Juneau for all resources, and the Glacier Highway in Juneau for noise impacts
- Echo Cove, around Berners Bay, and north along the east side of Lynn Canal and Taiya Inlet to Skagway
- City of Skagway
- Haines Borough
- William Henry Bay to Mud Bay Road in Haines, on the west side of Lynn Canal

Baseline conditions and current actions within the study area were evaluated in 2003 and reevaluated in 2005. The time frame for past actions ranged from the nineteenth century, when the earliest mining operations began, to 2005. The time frame for reasonably foreseeable actions extends to 2038 and includes projects that are funded or have submitted permit applications to appropriate regulatory and resource agencies.

As discussed below, most of the reasonably foreseeable projects that have been identified for the cumulative effects assessment are located in the vicinity of Juneau. None of the projects is near Haines, and only one project, the proposed Otter Creek Hydroelectric Project on Kasidaya Creek, is near Skagway.

The discussion of cumulative impacts presented in the Supplemental Draft EIS was based entirely on the *Indirect and Cumulative Effects Technical Report* (Appendix U). The cumulative analysis presented in the Final EIS is no longer based entirely on that technical report. The cumulative impact discussion presented here is a revised analysis of potential cumulative impacts based on comments submitted during the public review period for the Supplemental Draft EIS.

4.9.1 Past, Present, and Reasonably Foreseeable Projects

Past, present, and reasonably foreseeable actions in the project area were identified using planning documents, personal communications with resource agency representatives, NEPA documentation, current events reported in the local and regional news, best professional judgment, and the Juneau Access Improvements Project comment database (including comments on the 1997 Draft EIS, comments received in 2003 scoping, and comments on the Supplemental Draft EIS). Sections 4.9.1.1 through 4.9.1.4 explain the actions included in this analysis. Section 4.9.1.5 lists actions not included in the analysis and the basis for their exclusion.

4.9.1.1 Mining

On the east side of Lynn Canal, the project study area lies within a large mineral region known as the Juneau Mining District, which has produced large quantities of gold, silver, and lead since 1869. The larger-scale mining activities have occurred primarily outside the project corridor, to the southeast of the project, near Juneau. However, the proposed alignment for Alternative 2B runs through areas of prospects, claims, and historic and current mines. Mining and prospecting within the project corridor have been primarily for copper, gold, silver, and zinc, with the primary area of historic mining activity along the Berners Bay area at the Jualin and Kensington Mines.

At present, no mining is occurring along the east side of Lynn Canal in the project area. Coeur Alaska, Inc., a mining company based in Idaho, acquired the Kensington and Jualin Mines in the 1990s and received all permits required to begin construction and operations following publication of the *1997 Kensington Gold Project Final Supplemental Environmental Impact Statement* and issuance of a USFS ROD. In an effort to increase efficiency and reduce disturbance in the area, Coeur Alaska submitted an amended Plan of Operations, which was approved in the USFS 2004 ROD (USFS, 2004). For the purpose of this cumulative impact assessment, it is assumed that mine development will take place before 2010. The proposed mine has an expected life of 10 years following an 18-month construction period, though additional ore discovery could extend its operating life. It is assumed that the mine will be constructed and operate within the time frame of the Juneau Access Improvements Project.

Mining has been minimal along the west side of Lynn Canal with the exception of the Alaska Endicott Mine, near William Henry Bay, and the Dream Prospect, on the mainland across from Sullivan Island. The former Alaska Endicott Mine is approximately 1 mile southwest of the beginning of the proposed Alternative 3 alignment at William Henry Bay. It was mined from the early 1900s to 1924 for copper and incidental amounts of gold and silver. The Dream Prospect was extensively explored for zinc and copper with no significant mineral recovery. Several other mineral occurrences, prospects, and mines are in the project study area on the west side of Lynn Canal. No mining is currently taking place or planned on the west side of Lynn Canal in the project area.

4.9.1.2 Timber Harvests

In 1997, 1999, and 2000, Goldbelt conducted timber harvests in the Cascade Point/Echo Cove area. A 40-acre site that was clean cut in 1999-2000 is now permitted for use as a rock quarry. In 2005, the right-of-way for the Cascade Point Road was logged. There are no plans for timber harvest on national or state forest lands in the project area. Management plans for these lands are unlikely to change in the foreseeable future. There are no current plans to harvest timber on private or trust lands; however, construction of a highway on the west side of Lynn Canal could lead to some timber harvest on Mental Health and University Trust lands. It is not possible to quantitatively predict a reasonably foreseeable amount of timber harvest; therefore, the potential effects of logging on these lands was evaluated qualitatively. The only logging included as reasonably foreseeable in a quantitative evaluation of cumulative impacts is the logging within the right-of-way for construction of one of the alternatives for the Juneau Access Improvements Project, the logging associated with the Kensington Mine Project, and land clearing associated with Goldbelt development at Cascade Point.

4.9.1.3 Development

State Development – Major projects developed by the state within the project area have included construction of the State of Alaska Auke Bay, Haines, and Skagway Ferry Terminals, and the Echo Cove boat ramp. The Echo Cove boat ramp and access road were designed in 1996 and built by DOT&PF. The facility consists of a 16-foot-by-192-foot concrete ramp and a parking area. The CBJ maintains the facility.

Alaska Glacier Seafoods Company – Alaska Glacier Seafoods has constructed 12,000 square feet of office space and a processing plant next to the Auke Bay Ferry Terminal at 12-Mile Glacier Highway. In addition, the company has constructed a timber dock and a saltwater intake system for the processing facility.

Goldbelt – Goldbelt has prepared a master plan for its Echo Cove landholdings, and has indicated that industrial or commercial uses related to transportation and recreation would be more likely future uses than residential development. This long-range plan includes development on 10 percent of Goldbelt land at Echo Cove, including a 40-acre commercial development site at Cascade Point (road, dock development, and service station), an 80-acre cultural center in Echo Cove, a camping area adjacent to the CBJ boat ramp in Echo Cove, and a low-impact recreational and cultural development. The master plan considered two development options: low development (Option A) and high development (Option B). Based on Goldbelt activities and permitting to date, this EIS includes most of the activities of Option A in the cumulative impact assessment. This option includes the recently completed Cascade Point Road, a ferry terminal, gas station and related facilities, a tourist lodge, and expansion of the camping area adjacent to the existing boat launch at Echo Cove.

Goldbelt obtained a CBJ Conditional Use Permit in November 2004 to reopen and expand an existing rock quarry on its land near Echo Cove. This quarry is permitted for use during construction of the road to Cascade Point. Goldbelt could expand the existing 1.5-acre quarry to a total of 3 acres under this permit. In May 2005, Channel Construction obtained a CBJ Conditional Use Permit to develop a new quarry nearby on a previously clean cut 40-acre parcel of Goldbelt land.

Other – There are Alaska Mental Health Trust, Native allotments, and other private lands on both the east and the west sides of Lynn Canal (Figures 3-1 and 3-2). A highway would increase the likelihood of development of these lands, but nothing specific is reasonably foreseeable. Therefore, these lands are not discussed further in this cumulative analysis. DOT&PF controls access to any state highway. The location and configuration of driveways off of a state highway would conform to DOT&PF standards.

West of the Lace River, the highway for Alternative 2B would intersect an existing unpaved road that runs from the dock at Slate Cove to the Jualin mine. This road is a public road that will be upgraded as part of Coeur Alaska's proposal to build a deepwater floating dock at Slate Cove. The State of Alaska is funding part of the road upgrade as an Industrial Roads Project. If Coeur Alaska and the State of Alaska develop a cooperative use agreement for the Slate Cove dock, DOT&PF could use the dock and road in two ways: to provide interim ferry shuttle service during construction of a highway north of Slate Cove, and to provide temporary winter ferry service during extended road closures for avalanche control.

As discussed in Sections 4.3, 4.4, and 4.6, USFS has indicated that trails at several pullouts are reasonably foreseeable if a highway is constructed on the east or west side of Lynn Canal. If either Alternative 2B or 3 is selected for the project, the USFS has indicated that four trails are reasonably foreseeable. If either Alternative 4B or 4D is selected, only a trail at the pullout at Sawmill Creek would be reasonably foreseeable. A separate environmental analysis would be completed by USFS for these trails prior to their construction. The potential cumulative impacts of these trails in conjunction with the Juneau Access Improvements Project is included in this analysis.

4.9.1.4 Utilities

Alaska Power and Telephone Company has a Federal Energy Regulatory Commission (FERC) permit for a 6-acre, 3-megawatt hydroelectric project, called the Otter Creek Hydroelectric Project on USFS land at Kasidaya Creek in Taiya Inlet, 3 miles south of Skagway. Major infrastructure for the project includes an impoundment structure; a 3,700-foot-long, 40-inch-diameter penstock; a metal powerhouse with an adjacent staging area and transformer pad; a 75-foot-long tailrace; three helicopter pads; and a jetty (FERC, 2002). Construction began in 2005 and is scheduled to be complete by mid-2007.

The CBJ operates three wastewater treatment plants, all of which have NPDES permits (Juneau – Douglas, Mendenhall, and Auke Bay). The Auke Bay Wastewater Treatment Plant discharges effluent to Auke Bay at 30 feet below mean low water after secondary treatment. The Auke Bay Ferry Terminal also discharges effluent to Auke Bay after treatment at 20 feet below mean lower low water.

4.9.1.5 Actions Not Considered

The following actions were determined not to be reasonably foreseeable actions or pertinent present actions and, therefore, were not evaluated in the cumulative effects analyses.

Timber Sales – There are no timber sales currently planned by any of the major landholders in the project area in the next 10 years. The cumulative impact analysis includes the logging described in Section 4.9.1.2.

Alaska Interstate Gas Company Natural Gas Service – Alaska Interstate Gas Company proposes to provide natural gas service for Juneau and 16 other communities in Southeast and Southcentral Alaska. The project is currently in the marketing and feasibility stage; project development timelines are uncertain.

Lace River Hydroelectric Project – Lace River Hydroelectric was granted a preliminary permit on December 11, 1995, for a hydroelectric project to be located on a tributary of the Lace River. On November 5, 1997, the company requested to terminate its permit, as there was no market for the power. The permit officially expired on November 30, 1998 (Federal Register v. 63, n. 58, 1998). It is unlikely that this project would be developed in the reasonably foreseeable future.

Cape Fox Land Entitlement Adjustment Act of 2003 – This bill would give approximately 2,700 acres of USFS lands in the Johnson and Slate Creek drainages to Cape Fox Corporation and 9,300 acres of land in the Johnson, Sherman, and Sweeny Creek drainages to Sealaska Corporation. In exchange, the USFS would get 3,000 acres of private lands near Ketchikan. If the land exchange is executed, it is expected that Cape Fox Corporation will use its new land to develop support services for the Kensington Gold Project (U.S. Senate Bill 1354). This land exchange was not used in the analysis because the bill has not been passed and no specific projects have been identified; therefore, no detailed potential impacts are reasonably foreseeable.

DOT&PF Ferry Terminal at Cascade Point – In 2005, the AMHS Director indicated interest in using the Cascade Point terminal to run new shuttles to Haines and Skagway. In July 2005, in a letter to FHWA, the Commissioner of DOT&PF clarified that the State of Alaska may consider creating a temporary terminal at Cascade Point with state funds if Juneau Access Improvements Project implementation is delayed. Possible action that is contingent upon another action not occurring is not reasonably foreseeable; therefore, a temporary state terminal at Cascade Point is not included in this analysis.

4.9.2 Cumulative Impact Analysis

Alternatives were analyzed to determine if they would have either direct or indirect effects on area resources. Numerous past, present, and reasonably foreseeable impacts were identified that, in combination with direct or indirect impacts, would result in cumulative impacts. Resources that would not have direct or indirect impacts from project alternatives were not evaluated for cumulative impacts. Further, resources that could potentially have direct or indirect impacts from project alternatives, but were not impacted by any past, present, or reasonable foreseeable actions, were not evaluated for cumulative impacts. Potential cumulative effects were identified for the following resource areas: land use, visual resources, historical and archaeological resources, economics, social effects, water quality, air quality, noise, wetlands, marine fish habitat, terrestrial habitat, wildlife, bald eagles, and threatened and endangered species. The cumulative impact analysis is projected to the year 2038.

4.9.2.1 Land Use

Alternatives 2B and 3 – Alternatives 2B and 3 would make the east side or west side of the Lynn Canal substantially more accessible to recreational uses such as hunting, fishing, hiking, boating, and camping. The USFS envisions trails from DOT&PF pullouts and has indicated that the following trails are reasonably foreseeable:

- Alternative 2B
    - Sawmill Creek Trail
    - Slate Creek Cove to Comet Cove Trail
    - Yeldagalga Creek Trail
    - Katzehin River Trail

- Alternative 3
  - Sawmill Creek Trail
  - Expanded day use facilities, trailhead and trail at William Henry Bay
  - Sullivan River Trail
  - Glacier River/Davidson Glacier Trail

Outdoor recreation is a principal leisure time activity for Juneau, Haines, and Skagway residents. The improved access provided by Alternatives 2B and 3 and USFS trails, and the increase in visitors to the region expected with these highway alternatives, combined with the population increases that would be associated with the development of the Kensington Gold Project and commercial development by Goldbelt, would increase the use of the recreational resources along the coastline of either the east side or the west side of Lynn Canal. It is also likely to increase commercial ventures related to outdoor activities such as recreational equipment retail stores and guide services.

Alternative 2B, in combination with the expansion of camping facilities at Echo Cove, a lodge and Goldbelt Ferry Terminal at Cascade Point, quarries on Goldbelt land, and USFS trails at Sawmill Creek and Slate Cove, would change the remote character of recreation in the Berners Bay area. The introduction of these facilities would increase boat and plane traffic in the bay area, and introduce automobile traffic in the area as well as increase the number of hikers and campers in the region. While recreation in most of the Berners Bay area would remain largely a remote experience, it would not have the characteristics that currently exists.

The cumulative effect of improved recreational opportunities associated with any of these alternatives would likely be perceived as a negative impact by those who enjoy the existing primitive nature of the region, including some outfitters who currently provide wilderness trips there. However, those who would take advantage of the new outdoor recreation opportunities would perceive increased access as beneficial.

Alternatives 4A through 4D – Alternatives 4A through 4D would improve opportunities for recreation in the vicinity of Haines, Skagway, and in the case of Alternatives 4B and 4D the southern end of Berners Bay, but would not improve recreational access to large areas of Lynn Canal in the same way as Alternatives 2B and 3. The proposed Goldbelt developments from Echo Cove to Cascade Point and the planned USFS trail at Sawmill Creek would provide additional recreational opportunities. The cumulative effect of the improved recreational opportunities associated with Alternatives 4B and 4D would likely be more noticeable in the Berners Bay area due to the proposed Goldbelt development, quarries, USFS trail, and easier access for personal kayakers and kayak guides in Berners Bay. This effect would likely be perceived as a negative impact by those who enjoy the existing natural setting of the area. However, those who would take advantage of the new recreational opportunities would perceive increased access as beneficial.

4.9.2.2 Visual Resources

Alternatives 2B, 3, 4B, and 4D would increase the visual presence of man in primarily a natural landscape, most noticeably in views from ferries and boats. The Goldbelt Cascade Point marine facility, the Kensington Gold Project Slate Cove marine facility, and the Otter Creek Hydroelectric Plant on Kasidaya Creek would be visible from a few locations. The 40-acre clear cut on Goldbelt land is visible from the water and parts of Glacier Highway; this disturbed area would be more visible if developed as a quarry. Their addition to a few views of the coastline would be minor in relation to the number of views that would include a highway paralleling the coastline, particularly along the east side of Lynn Canal, where a highway would be visible at many locations because of topography and vegetative cover. The cumulative visual effect for any of these alternatives would be substantial, but the contribution from other reasonably foreseeable projects would be small because little commercial development other than mining is planned for the region and the planned developments would only be visible from a few locations in Berners Bay.

4.9.2.3 Historical and Archaeological Resources

The increased population and visitors associated with either Alternatives 2B or 3, together with the improved access associated with these project alternatives and USFS trail developments, would result in increased personal and guided outdoor recreation in the Lynn Canal region. These activities would increase the potential for discovery of currently unknown historic and prehistoric cultural sites or the loss of cultural resources through souvenir hunting at known and unknown sites. The cumulative effect on cultural sites for any of these alternatives would be beneficial if new sites were located and reported undamaged, but the effect would be negative if known or unknown sites are looted by artifact hunters. This incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

None of the proposed project alternatives would have a direct adverse effect on the historical mining districts in the region. The Kensington Gold Project would have direct effects on the elements of the Berners Bay Historic Mining District. The population growth and increased visitors associated with Alternatives 2B and 3 combined with improved access could result in cumulative effects to elements of the District through vandalism or artifact hunting.

4.9.2.4 Economics

Alternative 2B – Alternative 2B is projected to create about 200 new jobs in Juneau by 2038. The Kensington Gold Project (225 permanent jobs) and Goldbelt development are also projected to increase employment in Juneau. Each new job could result in a population increase of about 1.5 people. Alternative 2B is projected to add 300 people to the Juneau population by 2038. The only other reasonably foreseeable project that would have an appreciable effect on Juneau’s population is the Kensington Gold Project, which is projected to increase the population of Juneau by approximately 1,164 people. If the Kensington Gold Project is still in production in 2038, the cumulative population increase in Juneau would represent up to about 5 percent of the community’s existing population (Juneau’s 2003 population estimate is 31,000 people).

It is possible that Kensington Mine employees may reside in Haines and Skagway. Alternative 2B is projected to add about 100 people to the Haines population and 70 people to the Skagway population by 2038. In combination with the Kensington Mine, the cumulative population increase could exceed 5 percent of the existing Haines population and 10 percent of the existing year-round population of Skagway.

Sales tax revenues for Juneau would increase due to a predicted increase in visitor spending. It is estimated that Alternative 2B would generate approximately $12.1 million in additional sales tax dollars over the 30-year study period. CBJ and the State of Alaska would receive approximately $10.1 million from Kensington Gold Project taxes over the 10-year life of that project.

The Otter Creek Hydroelectric Project at Kasidaya Creek would reduce electrical costs to Skagway and possibly Haines. Alternative 2B would reduce transportation costs to these communities. This could provide a cumulative benefit by reducing the overall cost of living for residents of Haines and Skagway.

Alternative 3 – Alternative 3 is projected to provide an additional 78 new jobs in Juneau in 2038. As stated above, the Kensington Gold Project and Goldbelt development are also projected to increase employment in Juneau. Alternative 3 is projected to result in an increase of about 100 people in Juneau in 2038. Together with the Kensington Gold Project projected population increase (1,164 people), an overall population increase of approximately 4 percent would be expected in Juneau. It is less likely that Kensington Mine employees would reside in Haines or Skagway under Alternative 3 because they would have a minimum of one AMHS shuttle ferry ride in addition to a drive down the west side of Lynn Canal and a ferry ride across Berners Bay.

Increased visitor spending associated with Alternative 3 would generate approximately $4 million in additional sales tax dollars in Juneau over the 30-year study period. CBJ and the State of Alaska would receive approximately $10.1 million from Kensington Gold Project taxes over the 10-year life of that project.

The Otter Creek Hydroelectric Project at Kasidaya Creek would reduce electrical costs to Skagway and possibly Haines. Alternative 3 would reduce transportation costs to these communities. This could provide a cumulative benefit by reducing the overall cost of living for residents of Haines and Skagway.

Alternatives 4A, 4B, and 4D – Alternatives 4A, 4B, and 4D are estimated to add about 30 to 90 new jobs in Juneau by 2038. The Kensington Gold Project and Goldbelt development are also projected to increase employment in Juneau. Alternatives 4A, 4B, and 4D are projected to result in an increase of about 45 to 140 people in Juneau by 2038. Together with the Kensington Gold Project projected population increase (1,164 people), a maximum overall population increase of approximately 4 percent would be expected in Juneau.

Increased visitor spending associated with these three alternatives would generate approximately $3 million (Alternative 4A) to $5.6 million (Alternative 4B) in additional sales tax dollars in Juneau over the 30-year study period. CBJ and the State of Alaska would receive approximately $10.1 million from Kensington Gold Project taxes over the 10-year life of that project.

Economic Cumulative Effects –The cumulative effect of the new jobs and corresponding increase in Juneau's population associated with the proposed project alternatives and reasonably foreseeable projects would cause an increase in housing demand greater than the existing housing supply and a corresponding increase in property values in Juneau. If the Kensington Gold Project is still in operation in 2038, housing demand associated with this project in combination with the housing demand resulting from economic growth associated with the Juneau Access Improvements Project and other foreseeable developments in the region would range from about 460 (Alternative 4A) to 580 (Alternative 2B) units. Juneau had approximately 320 vacant housing units in 2001.

This population growth is projected to place an increased demand on public utilities, the CBJ school system, and health care services. Most of this impact would be associated with the Kensington Gold Project. As indicated previously, that project would increase population in Juneau by approximately 1,164 people, whereas the Juneau Access Improvements Project would increase population from 70 to 300 in 2038. The Kensington Gold Project may increase the number of school-aged children in Juneau by 323, while Alternative 2B would increase the number of school-aged children by 20 to 30, for a maximum total of 353 in 2038. Due to a stagnant economy in Juneau over the last five years, most public utilities are not operating at full capacity and could accommodate increased demand, especially in light of the additional tax revenues that would be generated by sales taxes and the Kensington Gold Project. Cumulatively, these taxes would range from about $13 million (Alternative 4A) to $22 million (Alternative 2B) over the 30-year study period.

4.9.2.5 Social Effects

The increased population and visitors associated with improved access, particularly with Alternatives 2B and 3, the Kensington Gold Project, and Goldbelt development would reduce the isolation of Juneau, Skagway, and Haines and provide economic stimulation (primarily to Juneau). Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to the quality of life by some. Others would feel that their quality of life is diminished by reducing their isolation and bringing more people into the region.

4.9.2.6 Water Quality

The proposed project alternatives and reasonably foreseeable projects would have the greatest cumulative water quality effects in Berners Bay. The Kensington Gold Project and Goldbelt development would increase marine traffic and associated hydrocarbon discharges in Berners Bay. Stormwater runoff and treated wastewater discharges would also be introduced to the bay. Alternative 2B could add to pollutant loading in Berners Bay from stormwater runoff. Based on stormwater runoff studies in Alaska, this cumulative contribution to water quality impacts would not be measurable. Alternatives 3, 4B, and 4D would further increase marine traffic in Berners Bay. Based on the existing water quality of the bay and past evidence of water quality impacts associated with marine traffic in Lynn Canal, the cumulative increase in marine traffic associated with Alternatives 3, 4B, and 4D in combination with reasonably foreseeable projects is not expected to exceed AWQSs in Berners Bay.

4.9.2.7 Air Quality

Alternatives 2B and 3 – These alternatives could result in some increases in air pollutants and particulates due to vehicular and marine traffic emissions.

Alternatives 4A through 4D – These alternatives could result in some increases in air pollutants and particulates due to marine emissions.

Air Quality Cumulative Effects – Area air quality has been affected by several past and present events, including marine vessel operations, urban area emissions (e.g., motor vehicle emissions, heating systems, and fugitive emissions), mining, and timber harvesting, but lingering effects are not observable. Alaska does not have a statewide air toxics emission inventory to assess the impact of these urban environments to the air quality of Lynn Canal. However, the air quality within the northern Lynn Canal area is considered very good due to the absence of air pollution sources. This conclusion is further supported by data compiled for the proposed Kensington Gold Project showing that background concentrations of air pollutants were substantially below NAAQS in the East Lynn Canal area (USFS, 1992). However, on rare occasions, elevated concentrations of PM_{10} may exist in the project area when smoke from forest fires is carried south from the Yukon under northerly winds.

Reasonably foreseeable actions, including the Kensington Gold Project, Goldbelt developments, logging, non-AMHS vessels, and urban emissions, would affect air quality within the project region. The primary emission sources from the Kensington Gold Project include combustion emissions from power plant generators (four 3.3-megawatt units), smaller generator units at various facilities and haul road vehicles, and particulate emissions from the tailings facility, borrow pits, rock crushing and mine haul roads. These emissions were modeled as part of the Kensington Gold Project Supplemental EIS; the resulting pollutant concentrations were found to be below federal and state air quality standards and Prevention of Significant Deterioration requirements for the build alternatives.

Proposed Goldbelt land development construction would cause localized, short-term increases in air emissions in the area (e.g., particulates or CO). Potential development in the area would also increase air pollutant emissions from other sources, such as combustion from heating of buildings, aircraft and watercraft use, and wood burning.

The limited amount of logging projected over the 30-year study period would primarily contribute to particulate matter from logging equipment operating in the woods and on unpaved logging roads. There would also be a relatively small increase in air pollutant emissions from the engines of logging equipment.

The reasonably foreseeable projects in the Lynn Canal region are located several miles apart and therefore would not have a cumulative impact for non-reactive pollutants, such as most particulates and CO. Where the highway associated with Alternative 2B passes by the Kensington Gold Project or Goldbelt development, concentrations of particulates and CO would be increased by a few percent, but would still be well below air quality standards. The volume of reactive pollutants such as NO_x and reactive organic gases from the proposed project and reasonably foreseeable projects would be too small in combination with background concentrations to result in the formation of substantial concentrations of O_3.

4.9.2.8 Noise

The principal noise source from project alternatives would be traffic noise on those alternatives that include a highway. Noise modeling is discussed in Sections 4.1.9 and 4.7.7 and presented in the *Noise Analysis Technical Report* (Appendix L).

Alternative 2B – This alternative would introduce a new noise source in an area that is principally undeveloped, adding traffic noise to existing intermittent man-made noises from helicopters, airplanes, jet boats, and other vessels in Lynn Canal and Berners Bay. Ambient noise measurements along the shoreline of Lynn Canal ranged from 35 to 52 dBA, depending on weather conditions and proximity of streams. Taking the average of about 40 dBA and using simple noise attenuation theory (explained in Appendix L and Section 4.7.7 discussions on noise), traffic noise is estimated to be at background levels at approximately 200 to 250 feet from centerline along the coastline.

The Kensington Gold Project Slate Cove access road, the Goldbelt Cascade Point Road, quarry operation, and other potential Goldbelt developments would generate vehicular traffic noise. A cumulative effect of increased noise over ambient levels would occur from Echo Cove to Cascade Point Road turnoff and at Slate Cove, where the Kensington Gold Project access road would be in close proximity to the Alternative 2B highway alignment. No residences would be impacted and vehicular noise levels are anticipated to have negligible effects on wildlife due to the predicted volume of traffic.

Ambient noise in Berners Bay includes boat and plane noise. This would increase with the reasonably foreseeable developments in the bay, along with the addition of vehicle noise. This would further change the remote experience in Berners Bay, particularly for kayakers and other non-motorized users.

Alternatives 3, 4B, and 4D – The traffic noise under Alternative 3, 4B, and 4D would be the same as discussed above for Alternative 2B from Echo Cove to Sawmill Cove. The Alternative

3 highway segment on the west shore of Lynn Canal is not discussed here because the only future foreseeable actions that would generate new traffic noise are located in Berners Bay.

4.9.2.9 Wetlands

Alternative 2B would result in the loss of approximately 70 acres of wetlands. Alternative 3 would result in the loss of 26 acres of wetlands. Alternatives 4B and 4D would fill 2 acres of wetlands. The majority of the wetlands filled by any of the project alternatives would be palustrine forested wetlands. Specific breakdowns of wetland types by alternative and subregion are presented in Sections 4.3.12, 4.4.12, and 4.6.12. Indirect effects could occur due to the introduction of invasive plant species from increased access, from accidental spills from vehicles, and from damage caused by ORVs.

The USFS and USACE identified past projects that have resulted in the loss of approximately 11 acres of palustrine wetland on the east side of Lynn Canal (USFS, 2003; USACE, 2005). The Kensington Gold Project would result in the loss of 36 acres of wetlands (and 24 acres of open water habitat) with all but 7 acres of wetland to be restored at the end of the project. Development of the Cascade Point Road by Goldbelt resulted in the loss of approximately 5 acres of forested wetland.

Wetland Cumulative Effects – The maximum known cumulative loss of approximately 125 acres of wetlands from the Kensington Gold Project, Alternative 2B, and past activities would constitute approximately 1.1 percent of the total wetlands on the east side of Lynn Canal (approximately 11,259 acres) and 0.9 percent of the wetlands in the entire Lynn Canal region (approximately 13,710 acres). The maximum known cumulative loss of wetlands in Berners Bay, prior to any Kensington Gold Project restoration, would be approximately 76 acres, or about 1.6 percent of the total wetlands in this area (4,609 acres). The affected wetlands are relatively abundant within the Lynn Canal region and Berners Bay, and there are no known adverse effects on threatened, endangered, or sensitive species or habitats. The loss of these wetlands would not adversely affect the overall diversity of regional wetland habitats.

4.9.2.10 Marine Fish Habitat (Including Essential Fish Habitat)

Alternatives 2B, 3, 4B, and 4D – Lynn Canal and Berners Bay – Alternatives 2B and 3 would fill a total of 32 and 12 acres of marine habitat in Lynn Canal, respectively. The Goldbelt Cascade Point marine facility would fill about 1.3 acres of beach/intertidal habitat. The Kensington Gold Project marine facility in Slate Cove would fill approximately 2 acres of intertidal habitat. The cumulative loss of marine habitat in Lynn Canal would total about 15 to 35 acres. From the standpoint of the entire Lynn Canal region, this would be a relatively small cumulative impact; however, for Alternative 3, some of this would occur in Berners Bay.

Alternatives 3, 4B, and 4D would fill approximately two acres of intertidal and subtidal habitat in Sawmill Cove. Dredging would occur in 1.2 acres of subtidal habitat for the Sawmill Cove mooring basin. All of the Goldbelt and Kensington Mine Project marine fill described above would occur in Berners Bay. In addition, the Goldbelt project would dredge approximately 1.4 to 1.6 acres of subtidal habitat in Berners Bay. If Alternative 3, 4B, or 4D was chosen as the project action and the Goldbelt Cascade Point terminal was constructed, there would be approximately nine acres of marine habitat impacted by filling and dredging in the Berners Bay area. This loss would not appreciably alter fish or invertebrate populations in Berners Bay or Lynn Canal.

The Pacific herring population in Lynn Canal has been substantially reduced over the decades to the point that it is no longer a viable commercial fishery. Various hypotheses have been put forth as to why the stocks have declined, though none have been substantiated by scientific analysis. These hypotheses include one or some combination of the following factors: overfishing, increased predator populations, disease, habitat alteration/degradation, water pollution, and environmental changes such as unfavorable oceanographic conditions.

In a quantitative assessment of the frequency with which explanations have been attributed to herring stock collapses worldwide, Pearson et al. (1999) found that overfishing (74 percent of the cases) was the most frequently cited cause, followed by environmental change (50 percent of cases), changes in food supply (15 percent), predation (2 percent), disease (2 percent), and habitat modification (2 percent). In most cases, these factors were seen to have acted in combination with other; single-factor causes other than overfishing (37 percent) or environmental change (13 percent) alone were rare.

Overfishing may have played a role in the initial decline of Lynn Canal herring stocks. As previously noted, stocks were harvested at a low rate (<1,000 tons) until stock declines led to a fishery closure in 1982. Harvest did occur in some seasons when minimum spawning biomass thresholds were not met, and the Lynn Canal stock may have been especially susceptible to brief periods of overfishing due to poorly understood factors, such as its limited migratory range.

The Goldbelt Cascade Point marine facility and the proposed DOT&PF Sawmill Cove Ferry Terminal would impact Pacific herring spawning habitat, and operations of these facilities would displace some Pacific herring eggs and larvae in the immediate vicinity of the facilities. The footprint of the Sawmill Cove Ferry Terminal impact is approximately 300 feet (0.06 mile) of shoreline at mean lower low water, which is equivalent to less than 2 percent of the alongshore herring spawning length (approximately three miles) observed in Berners Bay in 2003. The footprint of the Cascade Point marine facility as proposed in the Kensington Gold Project EIS would cover 400 feet of shoreline. Combined with the Alternatives 3, 4B, or 4D, the cumulative loss of herring spawning habitat in Berners Bay would be 4.4 percent.

NMFS, EPA, and OHMP have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternatives 3, 4B, and 4D in conjunction with Kensington Mine and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock. Both NMFS and OHMP believe special conservation measures, including no operations during the herring spawning period, would be necessary.

It should be noted that DOT&PF has committed to investigating a joint use facility at Cascade Point if Goldbelt's marine facility appears imminent and the selected project action requires a ferry terminal in Berners Bay. This facility would reduce the potential cumulative impact to herring spawning habitat and EFH.

Alternatives 4A through 4D – Auke Bay – Nearshore intertidal and shallow subtidal habitat in Auke Bay is used by juvenile salmon, particularly pink salmon, during their early marine life stages, as well as by prey species for fish stocks in Lynn Canal. Limited herring spawning also occurs in Auke Bay. In addition to these fish species, crabs could be present in nearshore areas of the bay. In late winter, adult red king crab return to nearshore areas; young-of-the-year red and blue king crab require nearshore shallow habitat with protective cover. Early juvenile bairdi Tanner crab also occupy shallow waters and mud habitat.

Alternatives 4A through 4D in combination with the Alaska Glacier Seafoods Plant would result in the loss of about 1.5 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. Other marine facilities have been constructed in Auke Bay including the existing Auke Bay Ferry Terminal, a boat launch ramp, several marinas including fueling facilities, a harbor master's office, associated parking, and residential and commercial wastewater discharge facilities. Although the acreage of impacted intertidal and subtidal habitat has not been computed, development occurs all along the waterfront of Auke Bay. A larger proportion of most of the facilities is on the surface of the water away from the nearshore habitat (such as the finger float system of a marina), and parts of the facilities occupy a smaller portion of intertidal or subtidal habitat (such as a staging dock and access ramp). In such instances, the amount of the nearshore habitat impacted is not commensurate with the size of the entire development. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

4.9.2.11 Terrestrial Habitat

The maximum terrestrial habitat loss associated with the proposed project is approximately 430 acres under Alternative 2B. Past impacts to terrestrial habitat have occurred due to timber harvests and mine developments. The Goldbelt Cascade Point Road removed approximately 36 acres of terrestrial habitat. Other existing and reasonably foreseeable Goldbelt projects (lodge, gas station, and 3.0 acre quarry) would impact approximately 14 acres of terrestrial habitat (campground expansion would affect 11 acres but would involve little clearing of timber). Channel Construction's proposed 40-acre quarry in the Echo Cove area would remove all vegetation from previously clearcut lands. The Kensington Gold Project would impact an additional 120 acres, and the Otter Creek Hydroelectric Project on Kasidaya Creek would impact about six acres of terrestrial habitat. The proposed USFS trails would result in the direct loss of an unknown but small area of terrestrial habitat, primarily shrub vegetation. Together, these losses result in a maximum potential cumulative loss of approximately 640 acres of terrestrial habitat. This cumulative loss represents about 0.5 percent of the estimated 117,000 acres of terrestrial habitat in the Lynn Canal region. This loss would not represent a substantial loss of terrestrial habitat and it would not adversely affect any rare or unique vegetation community types or any known rare or sensitive plant species.

About 240 acres of the terrestrial habitat that would be cumulatively impacted is located in Berners Bay. This would represent about 3 percent of the estimated 8,030 acres of terrestrial habitat in Berners Bay. The impact that Juneau Access Improvements Project alternatives would have on USFS old-growth reserves are not cumulative because the USFS has already addressed the impacts of the Kensington Gold Project through boundary changes.

Alternative 3 would impact about 400 acres of terrestrial habitat primarily on the west side of Lynn Canal. The proposed USFS trails would result in the direct loss of an unknown but small area of terrestrial habitat, primarily shrub vegetation. This alternative would provide access for possible logging on private land and land owned by the University of Alaska on the west side of Lynn Canal. Even if all of this private and University land were cleared, the cumulative loss would still represent a small percentage of the terrestrial habitat in the Lynn Canal region because of the small area of private and University land along the highway alignment (see Figures 3-1 and 3-2).

4.9.2.12 Wildlife

Marine Mammals – Alternatives 3, 4B, and 4D would increase the marine traffic in Berners Bay with shuttle ferries. In addition, increased access would increase the recreational use of Berners Bay. Although no boat ramp facilities would be constructed at Sawmill or Slate coves, personal craft could be launched at these locations. Disturbance from increased recreational and commercial marine traffic and increased recreational uses of beaches may cause harbor seals to periodically leave some haulouts. The proposed Kensington Gold Project Berners Bay shuttle ferry could also disturb harbor seals. However, harbor seals use a variety of haulouts. There are alternative spots for them to rest if they are temporarily displaced from a particular location. Therefore, the cumulative increase in disturbance at haulouts is not likely to affect the survival or reproductive success of this species. Increased marine traffic would increase the risk of vessel collisions with minke whales and sea otters. This increased risk is not likely to affect populations of these species in Lynn Canal.

Marine Birds – Marine birds nest in wetlands and old-growth forest in Berners Bay. Alternative 2B, 3, 4B, and 4D highway maintenance activities and vehicle traffic are likely to inhibit marine birds from nesting, resting, or foraging near the highway. The Cascade Point Road and Kensington Gold Project facilities would cause similar impacts. The maximum area of terrestrial habitat that would be cumulatively impacted by the Juneau Access Improvements Project and reasonably foreseeable projects is about 600 acres. Much of this would be old-growth forest including forested wetlands. Approximately 200 acres of the impacted habitat would be in Berners Bay. This would represent less than 1 percent of the nesting, resting, and foraging habitat in Lynn Canal and less than 3 percent of these habitats in the Berners Bay area. Therefore, the cumulative effect is not expected to have population-level effects on any marine bird species.

Terrestrial Mammals –As indicated, the maximum cumulative terrestrial habitat loss associated with the proposed project and reasonably foreseeable projects is approximately 600 acres under Alternative 2B . This loss represents about 0.5 percent of the estimated 117,000 acres of terrestrial habitat in the Lynn Canal region. The direct loss of habitat for terrestrial mammals from the proposed project would be minor compared with the overall available habitat.

About 200 acres of the terrestrial habitat that would be cumulatively impacted is located in Berners Bay. This would represent about 2.5 percent of the estimated 8,030 acres of terrestrial habitat in Berners Bay. The direct loss of this habitat would also be minor compared with the overall available habitat in the bay region.

A more important factor than direct habitat loss is the potential for the highway to fragment habitat for species sensitive to human presence. In Lynn Canal, brown bears move seasonally between higher elevation dens and lower elevation foraging habitat, and this species tends to avoid highway traffic. The highway could present a barrier to brown bear movement, resulting in the loss of important lower-elevation habitats such as salt marsh vegetation and concentrations of salmon at river mouths. For Alternative 2B, the highway could reduce the habitat capability of the east side of Lynn Canal for the brown bear by 26 percent compared to present conditions. Alternative 3 would also present a similar barrier to brown bear movement on the west side of the canal. Because the highway for Alternatives 4B and 4D is relatively short (5.2 miles), habitat fragmentation for brown bears would be minor.

Of the reasonably foreseeable projects in the region, only the Kensington Gold Project would contribute to cumulative impacts to brown bears. The Kensington Gold Project, including upgrading the Slate Cove to Jualin road, would result in the loss of approximately 120 acres of habitat, most of which is old-growth forest habitat. This loss was projected to result in an impact to brown bears in the Supplemental EIS prepared for the project (USFS, 2004), but the level of impact was not quantified. The Kensington Gold Project would result in the direct loss of a relatively small amount of habitat concentrated at higher elevations than Alternative 2B and would not cause substantial habitat fragmentation. The Kensington Gold Project would reduce bear habitat in the Berners Bay area; however, it would be a relatively small increase above the impact of Alternative 2B. The Kensington Gold Project would impact a relatively small amount of bear habitat. The majority of the impact of Alternative 2B would be from the creation of a potential barrier for bears moving between wintering den habitat and important spring and fall coastal habitats. This impact would be partially mitigated by wildlife underpasses at anadromous streams and at other major brown bear migration corridors.

The Kensington Gold Project and Alternative 2B would also have a cumulative impact on mountain goats. The Kensington Gold Project would remove some mountain goat foraging habitat. Alternative 2B would create a barrier to movement of goats to rocky bluffs on the coast in winter. This impact would be partially mitigated by goat collaring and monitoring in order to ensure that the combination of legal hunting and Alternative 2B and the Kensington Gold Project does not have population-level effects.

A major impact of Alternative 2B and 3 to terrestrial wildlife is to improve access resulting in increased human-wildlife interactions, hunting, and trapping. The Jualin Road improvements and proposed USFS trails associated with these project alternatives would increase these human-wildlife interactions, resulting in increased pressure on wildlife populations. To mitigate the impact of increased access for hunting and trapping, DOT&PF would fund monitoring for goat, brown bear, moose, and wolverine to ensure that legal hunting and trapping, in combination with Alternative 2B or 3, do not have population-level effects on these species.

Terrestrial Birds – Terrestrial birds nest in wetlands and old-growth forest in Berners Bay. Alternative 2B, 3, 4B, and 4D highway construction would decrease available habitat. Construction and maintenance activities as well as vehicle traffic are likely to inhibit marine birds from nesting, resting, or foraging near the highway alignment. The Kensington Gold Project facilities would have the potential to cause similar impacts. The maximum area of terrestrial habitat that would be cumulatively impacted by the Juneau Access Improvements Project and reasonably foreseeable projects is about 600 acres. Much of this would be old-growth forest, including forested wetlands. Approximately 200 acres of the impacted habitat would be in Berners Bay. This would represent less than 1 percent of the nesting, resting, and foraging habitat in Lynn Canal and less than 3 percent of these habitats in the Berners Bay area. Therefore, this cumulative effect would not have population-level effects on any terrestrial bird species.

4.9.2.13 Amphibians

The project alternatives avoid wetlands and open water that amphibians use. By avoiding breeding habitat, the alternatives may impact individual amphibians but would not measurably affect population levels. Therefore, the project would not have a cumulative impact on amphibian populations.

4.9.2.14 Bald Eagles

Past, present, and reasonably foreseeable projects in combination with the proposed project would result in the loss of a small amount of habitat, no loss of known nest trees for bald eagles, and no measurable loss of food sources. In light of the ability for bald eagles to habituate to human presence, the cumulative impact of increased human presence in the region is not likely to have a population-level effect on bald eagles.

4.9.2.15 Threatened and Endangered Species

The humpback whale recovery plan prepared for NMFS identifies a number of factors that could affect the reproductive success and survival of whales (NMFS, 1991). These factors include incidental take in fishing gear, collisions with ships, disturbance and displacement from commercial and recreational marine vessel traffic, introduction of pollution and pathogens from runoff and waste disposal, disturbance and/or pollution from resource development, and effects on whale prey species from coastal development and fisheries. The factors that would be associated with past, present, and future foreseeable projects in Lynn Canal are commercial and recreational marine vessel traffic and impacts to humpback whale prey species.

Alternative 2B would increase stormwater runoff into Berners Bay. It could also intermittently increase marine traffic in Berners Bay. This could occur in the summer over two to three years if temporary summer ferry service is provided from Kensington's proposed Slate Cove terminal until the highway is completed between Slate Cove and the Katzehin terminal. It could also occur during winter road closures if the shuttle ferries run between Slate Cove and Skagway/Haines. The increased stormwater runoff associated with the highway would not substantially contribute to cumulative water quality impacts in Berners Bay. Ferry operations in Berners Bay associated with Alternative 2B would, at most, only occasionally occur during the late April and early May herring and eulachon spawning periods; these ferry operations would not contribute to impacts on prey for threatened and endangered marine mammals.

Alternatives 3, 4B, and 4D would increase marine traffic in Berners Bay. This would be in addition to marine traffic created by the Kensington Gold Project and existing commercial fishing vessels, tour vessels, and personal watercraft. This increased traffic would increase the risk of collisions between marine vessels and humpback whales. Alternative 4B would involve a high-speed ferry, which would further increase the risk of collisions with humpback whales (Laist et al., 2001). In the Biological Opinion on the Kensington Gold Project, NMFS indicated that the use of observers during vessel operations and slow vessel speeds (speeds of 12 to 13 knots) during the spring foraging period should eliminate two of the primary factors associated with ship strikes (NMFS, 2005).

Alternatives 3, 4B, and 4D in combination with the Kensington Gold Project and Goldbelt development may alter distribution of juvenile and adult forage fish in Berners Bay, which would pose potential risks to the humpback whales that forage in the bay. Individual whales may alter their behavior as a result of this effect and vessel noise in the bay, and in some cases reduced fitness of individuals may result. Because only a small number of whales are known to use Berners Bay (no more than about 18), NMFS does not expect that the Kensington Gold Project would jeopardize population viability (NMFS, 2005). However, as indicated in Sections 4.4.17.2 and 4.6.17.2, NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternatives 3, 4B, and 4D may adversely affect humpback whales and would require formal consultation to determine whether cumulative impacts would jeopardize the species.

As indicated earlier in this chapter, stormwater runoff from the highway is not expected to result in the exceedance of AWQS based on the results of stormwater runoff studies in the Anchorage area, where traffic volumes are orders of magnitude higher than projected levels for the proposed project. In addition, all wastewater discharges associated with the proposed project and reasonably foreseeable projects would be required to meet NPDES discharge limitations. The proposed project in combination with reasonably foreseeable projects would not measurably decrease water quality in Lynn Canal; therefore, no water quality impacts to marine mammals would likely occur.

Based on information in the NMFS Biological Opinion for Kensington Gold Project, Alternatives 3, 4B, and 4D, in combination with reasonably foreseeable projects, including commercial fishing, recreational, and commercial marine traffic (including Kensington mine vessel traffic) in the Berners Bay area, are likely to cause acute stress responses in some Steller sea lions exposed to this vessel traffic and noise. According to the conclusion of the NMFS Biological Opinion for the Kensington Gold Project, this is not likely to impair the health of sea lions by depleting their energy reserves. However, NMFS is concerned that Alternatives 3, 4B, and 4D in combination with other reasonably foreseeable projects in Berners Bay could substantially impact populations of forage fish such as herring and eulachon. Such an impact may result in a depletion of energy reserve for some individual Steller sea lions. For example, in response to a reduction in the availability of herring or eulachon, Steller sea lions may have to behaviorally compensate by dedicating more time to foraging on species with less energetic value, which may result in a greater expenditure of energy for the same or less energy gain, or by relocating to other areas to feed which would also incur an energetic cost. In its Biological Opinion on the Kensington Gold Project, NMFS concluded that the Kensington Gold Project in combination with an East Lynn Canal Highway (Alternative 2B) and Goldbelt development would not have a subpopulation or population effect on Steller sea lions (NMFS, 2005). However, as indicated in Sections 4.4.17.1 and 4.6.17.1, NMFS has expressed concern that ferry traffic in Berners Bay associated with Alternatives 3, 4B, and 4D may adversely affect Steller sea lions and would require formal consultation to determine the alternatives cumulative impact on this species.

4.9.3 Summary of Cumulative Impacts

4.9.3.1 Alternative 2B

Alternative 2B in combination with reasonably foreseeable development would change the remote character of recreation in Berners Bay. Boat, plane, and automobile traffic would increase in the region, as well as the number of hikers and campers. The visual presence of humans would increase, primarily in views from boats in the bay. Ambient boat and plane noise would increase with the reasonably foreseeable developments, along with the addition of vehicle noise. This would further change the remote experience in Berners Bay, particularly for kayakers and other non-motorized users.

The increased population and visitors associated with Alternative 2B and reasonably foreseeable development coupled with improved access would increase the potential for discovery of currently unknown cultural resource sites and increase the potential for adverse impacts to known and unknown cultural resources through vandalism. This incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

Most cumulative socioeconomic impacts would occur in Juneau. If the Kensington Gold Project is in operation in 2038, the cumulative population increase in Juneau would be almost 1,500 people, about 5 percent of the community's existing population. The cumulative increase in housing demand would be about 580 units. Juneau had approximately 320 vacant housing units in 2001. There could be a maximum of about 353 new school-aged children in Juneau in 2038. Alternative 2B in combination with the Kensington Gold Project would increase tax revenues to Juneau and the state by about $22 million over the 30-year study period.

It is possible that Kensington Mine employees may reside in Haines and Skagway. Alternative 2B is projected to add about 100 people to the Haines population and 70 people to the Skagway population by 2038. In combination with the Kensington Mine, the cumulative population increase could exceed 5 percent of the existing Haines population and 10 percent of the existing year-round population of Skagway.

Cumulative development in Lynn Canal would reduce the sense of isolation and geographic separateness of Juneau, Skagway, and Haines. Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to quality of life by those that view the current degree of isolation as negative. It would be perceived as a reduction in the quality of life by those that value the current degree of isolation and separateness.

Increased marine traffic from the Kensington Gold Project and the Cascade Point Terminal, stormwater runoff from the Alternative 2B highway, the Kensington Gold Project, and Cascade Point development, and treated wastewater discharges from the Kensington Gold Project and Cascade Point development would result in a cumulative increase in pollutant loads to Berners Bay. Based on the conclusions of the USFS ROD on the Kensington Gold Project, impacts of the Juneau Access Improvements Project, and expected development effects at Cascade Point, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS.

The volume of pollutant emissions would also increase in the Berners Bay region as a result of cumulative development. Based on the conclusions of the USWFS ROD on the Kensington Gold Project, analysis of the Juneau Access Improvements Project, and expected development at Cascade Point, cumulative emissions of criteria pollutants would not exceed National Ambient Air Quality Standards or Alaska Ambient Air Quality Standards.

There would be a maximum cumulative loss of approximately 125 acres of wetlands with Alternative 2B. Except for the widening of Cascade Point Road for Alternative 2B, none of the wetlands that would be impacted by reasonably foreseeable development are contiguous. This wetland loss represents about 1.1 percent of the total wetlands on the east side of Lynn Canal. The maximum cumulative loss of wetlands in Berners Bay would be approximately 76 acres, or about 1.6 percent of the total wetlands in this area.

The permanent cumulative loss (dredged areas remain as habitat, but would be of lower value after dredging) of marine habitat in Lynn Canal would total about 35 acres. This impact is small and would be spread over about 40 miles of coast. There would be no cumulative impact to the marine habitat in Berners Bay resulting from Alternative 2B. For these reasons, the cumulative loss of marine habitat is unlikely to result in a substantial impact to fish or marine mammals.

The maximum area of terrestrial habitat that would be cumulatively impacted by Alternative 2B and reasonably foreseeable projects is about 640 acres. Much of this would be old-growth forest. Approximately 240 acres of the terrestrial habitat that would be cumulatively impacted is located in Berners Bay. This would have little impact on marine or terrestrial birds because it represents less than 1 percent of the terrestrial habitat available on the east side of Lynn Canal (3 percent in Berners Bay).

Alternative 2B in combination with reasonably foreseeable projects would result in cumulative impacts to terrestrial wildlife, primarily as a result of habitat fragmentation caused by the highway, increased access associated with Alternative 2B, and increased population associated with all of the reasonably foreseeable projects. Cumulative wildlife impacts of these actions would be focused primarily on Berners Bay. Habitat fragmentation would have the greatest impact on species sensitive to human presence, such as the brown bear. Alternative 2B in combination with reasonably foreseeable projects could have a population-level effect on brown bear in Berners Bay. Increased hunting and trapping would result from improved access to Berners Bay and increased population in Juneau. This could have a population-level effect on marten in the Berners Bay region. Increased hunting pressure, habitat loss, and habitat fragmentation would impact mountain goats in the Lynn Canal region. This impact is not anticipated to have a population-level effect due to population monitoring and corresponding hunting management.

4.9.3.2 Alternative 3

The increased access and population growth associated with Alternative 3 and reasonably foreseeable development would increase the use of the recreational resources along the Lynn Canal coastline, particularly along the west side of the canal. The visual presence of humans in the region would increase, primarily in views from boats.

The increased population and visitors associated with Alternative 3 and reasonably foreseeable development coupled with improved access would increase the potential for discovery of currently unknown cultural resource sites and increase the potential for adverse impacts to known and unknown cultural resources through vandalism. The incremental increase in access and potential impacts to resources could be lessened by constructing USFS trails in areas removed from known resources.

Most cumulative socioeconomic impacts would occur in Juneau. If the Kensington Gold Project is in operation in 2038, the cumulative population increase in Juneau would be almost 1,300 people, about 4 percent of the community's existing population. The cumulative increase in housing demand would be about 505 units. Juneau had approximately 320 vacant housing units in 2001. There could be a maximum of about 343 new school-aged children in Juneau in 2038. Alternative 3 in combination with the Kensington Gold Project would increase tax revenues to Juneau and the state by about $14 million over the 30-year study period.

Cumulative development in Lynn Canal would reduce the sense of isolation and geographic separateness of Juneau, Skagway, and Haines. Increased economic opportunities, easier travel among the Lynn Canal communities, and better connections to areas outside Lynn Canal would be viewed as an improvement to quality of life by those that view the current degree of isolation as negative. It would be perceived as a reduction in the quality of life by those that value the current degree of isolation and separateness.

Increased marine traffic associated with Alternative 3, the Kensington Gold Project, Cascade Point development, stormwater runoff from these developments, and treated wastewater discharges from the Kensington Gold Project and Cascade Point development would result in a cumulative increase in pollutant loads to Berners Bay. Based on the conclusions of the USFS ROD on the Kensington Gold Project, impacts of the Juneau Access Improvements Project, and expected development effects at Cascade Point, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS.

The volume of pollutant emissions would also increase in Berners Bay primarily as a result of increased vessel traffic and operations at Kensington Mine. Based on the conclusions of the USFS ROD on the Kensington Gold Project and analysis of the Juneau Access Improvements Project, cumulative emissions of criteria pollutants would not exceed NAAQS or AAAQS.

The bulk of the wetland impacts caused by Alternative 3 would be on the west side of Lynn Canal, but there are no known wetland impacts from past, present, or reasonably foreseeable projects on the west side of the canal. The cumulative impact of Alternative 3 and reasonably foreseeable development would be limited to Berners Bay. The maximum cumulative loss of wetlands in Berners Bay would be approximately 70 acres, or about 1.5 percent of the total wetlands in this area.

Alternative 3 in combination with the Kensington Gold Project and Cascade Point development would result in the filling of about 5 acres of marine habitat and dredging of about 3 additional acres of this habitat in Berners Bay. This impact is small relative to the total marine habitat available in the bay. However, NMFS, EPA, and OHMP have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternative 3 in conjunction with Kensington Gold Project and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock and forage fish important to Steller sea lions and humpback whales.

Most of the terrestrial habitat impacted by Alternative 3 would be on the west side of Lynn Canal. This alternative would provide access for possible logging on private lands and lands owned by the University of Alaska on the west side of Lynn Canal. This cumulative loss would represent a small percentage of the terrestrial habitat in the Lynn Canal region.

4.9.3.3 Alternatives 4A and 4C

Alternatives 4A and 4C would have few direct and indirect impacts to create cumulative impacts in Lynn Canal. Alternative 4A would increase population in Juneau by about 70 people by 2038. This would have a minor economic effect when compared to the Kensington Gold Project. Increased vessel traffic associated with Alternatives 4A and 4C in combination with other foreseeable projects in the region would increase the volume of pollutants entering Lynn Canal but this is unlikely to cause an exceedence of AWQS.

Alternatives 4A and 4C in combination with the Alaska Glacier Seafoods Plant would result in the loss of about 1.5 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. This habitat is used for rearing by juvenile salmon, prey species, and crabs. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

4.9.3.4 Alternatives 4B and 4D

Extension of the Glacier Highway from Echo Cove to Sawmill Cove in combination with reasonably foreseeable projects would increase vessel use in Berners Bay. The visual presence of humans would increase in Berners Bay, impacting recreational boaters.

Most cumulative socioeconomic impacts would occur in Juneau. If the Kensington Gold Project is in operation in 2038, the cumulative population increase in Juneau would be almost 1,230 people, about 4 percent of the community's existing population. The cumulative increase in housing demand would be about 460 units. Juneau had approximately 320 vacant housing units in 2001. There could be a maximum of about 343 new school-aged children in Juneau in 2038. Alternatives 4B and 4D in combination with the Kensington Gold Project would increase tax revenues to Juneau and the state by about $13 million over the 30-year study period.

Increased marine traffic associated with Alternatives 4B and 4D, the Kensington Gold Project, Cascade Point development, stormwater runoff from these developments, and treated wastewater discharges from the Kensington Gold Project and Cascade Point development would result in a cumulative increase in pollutant loads to Berners Bay. Based on the conclusions of the USFS ROD on the Kensington Gold Project, impacts of the Juneau Access Improvements Project, and expected development effects at Cascade Point, this cumulative increase in pollutant loads is not likely to be large enough to cause water quality impacts great enough to exceed AWQS

The volume of air pollutant emissions would also increase in Berners Bay, primarily as a result of increased vessel traffic and operations at Kensington Mine. Based on the conclusions of the USFS ROD on the Kensington Gold Project and analysis of the Juneau Access Improvements Project, cumulative emissions of criteria pollutants would not exceed NAAQS or AAAQS.

Alternatives 4B and 4D in combination with the Kensington Gold Project and Cascade Point development would result in the loss of about 5 acres of marine habitat and dredging of about 3 acres of this habitat in Berners Bay. This impact is small relative to the total marine habitat available in the bay. However, NMFS, EPA, and OHMP have expressed concern that the cumulative marine traffic in Berners Bay associated with Alternatives 4B and 4D in conjunction with the Kensington Gold Project and Goldbelt activities could have an adverse effect on the Lynn Canal herring stock and forage fish important to Steller sea lions and humpback whales.

Alternatives 4B and 4D in combination with construction of the Alaska Glacier Seafoods Plant would result in the loss of about 1.5 acres of nearshore intertidal and shallow subtidal habitat in

Auke Bay. This habitat is used for rearing by juvenile salmon, prey species, and crabs. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provide suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Auke Bay or Lynn Canal.

4.10 The Relationship Between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The build alternatives would permanently convert a maximum of approximately 460 acres of natural habitat, principally old-growth forest, to transportation facilities. This overall loss of habitat represents less than 1 percent of the natural habitat that exists in the Lynn Canal region.

The increase in population and visitors associated with improved transportation facilities in Lynn Canal would result in increased pressure on fish and wildlife species, principally big game and furbearing species such as bears, moose, deer, mountain goats, martens, and river otters and game fish such as Pacific salmon, steelhead, and Dolly Varden, as a result of recreational hunting and fishing and collisions with vehicles. Project-related effects on populations of these species can be controlled through management plans implemented by ADF&G.

The long-term productivity of Lynn Canal region would be enhanced by a better transportation system to move goods, services, and people. Based on household surveys conducted in Juneau, Haines, and Skagway in 1994 and 2003 and the growth in traffic on transportation corridors adjacent to Lynn Canal, there is substantial latent travel demand in the Lynn Canal corridor that cannot be met by existing AMHS service. In addition to serving local needs, tourist/recreation travel and intra-regional movement would be improved by the build alternatives. Depending on the alternative, these improvements would result in substantial economic benefits to Juneau, Haines, and Skagway. The magnitude of these benefits to each community would depend on the specific project alternative that was implemented.

The long-term benefit of improved access in Lynn Canal is recognized in the state and local comprehensive planning for the region. Improving surface transportation in the region is consistent with DNR's Juneau State Land Plan, the CBJ Comprehensive Plan, the ACMP, and district coastal management plans.

4.11 Irreversible and Irretrievable Commitments of Resources

Depending on the alternative selected, up to approximately 460 acres of land and intertidal and subtidal habitat would be committed to the proposed project. Construction of transportation facilities would result in the permanent commitment of energy, concrete, aggregate, asphalt, water, and other construction materials. Project construction costs ranging from $103 million to $268 million would be committed; these costs would be offset by savings in travel time and energy use and the economic stimulus of improved access to the communities of the Lynn Canal region.

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5.0 PROPOSED MITIGATION AND COMMITMENTS

The DOT&PF would make a number of commitments and implement a variety of mitigation measures to address the potential impacts of a build alternative if one is selected for the Juneau Access Improvements Project. The preliminary alignments for highway segments of all alternatives have been adjusted several times over the course of environmental and preliminary engineering studies to avoid impacts to wetlands, marine areas, wildlife, and cultural resources. During design of the alternative selected for the project, DOT&PF would investigate additional measures to reduce potential impacts, including further small alignment changes and changes to reduce the roadway footprint in wetlands and other sensitive areas (such as steepened slopes and reduced embankment heights). Specific commitments and mitigation measures for the project are described below by resource area. Sections 5.1 through 5.11 contain commitments for all reasonable alternatives. Section 5.12 contains the proposed mitigation plan specifically for the Preferred Alternative.

5.1 Water Quality

1. An erosion and sediment control plan would be prepared to describe the BMPs to use to avoid water quality impacts to wetlands and other water bodies. This plan would be made available to resource agencies for review and comment before being included in project plans.
2. Only clean fill material (excavated rock or mineral soil) would be used for the roadway and ferry terminal embankments.
3. Staking would be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area.
4. In wetland areas, the roadway would be constructed using the minimum-width fill footprint necessary to provide a stable road base.
5. In wetland areas, the roadway would be constructed with a low-profile embankment to limit the fill footprint.
6. Rock would be used to stabilize the toes of slopes at ponds and stream crossings.
7. Grass seed would be placed on any road slope containing soil. To protect the integrity of the natural plant communities, plant species indigenous to the area would be used for vegetating road slopes, except that non-native annual grasses may be used to provide initial soil cover.
8. No grubbing would be done outside of the fill footprint and only the minimum clearing required for safety would be done beyond the toe of slope.
9. Silt fences would be used to reduce erosion during construction.
10. Sediment basins would be used, as necessary, during construction.
11. Roadside swales would be designed to keep surface water within the natural drainage basins.
12. Culverts would be installed through fill slopes in appropriate locations to maintain natural flow patterns for surface water.

5.2 Wetlands

1. Embankment heights and side slopes would be minimized during design to reduce wetland footprints.

2. During construction, slope limits in wetlands areas would be separately identified to ensure that workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.
3. Construction camps, staging sites, borrow pits, and waste areas would be located in upland areas and stabilized during and after use to avoid water quality impacts to wetlands and water bodies.
4. DOT&PF would provide compensatory mitigation for wetland impacts based on the amount and function of wetlands impacted by the proposed project. Initial discussions with resource agencies have not identified any restoration projects in the watersheds affected or nearby watersheds. DOT&PF would work with resource agencies to develop a fee-in-lieu payment plan for restoration or protection of off-site wetlands if no on-site or nearby restoration areas are agreed to.

5.3 Terrestrial Habitat

1. Only certified seed mixtures would be used to seed exposed soils.
2. Soil from outside the project boundaries would not be imported to the project site. Any soil within the project boundaries identified as containing invasive species would not be transported to other areas of the project.
3. Construction equipment would be steam cleaned prior to use on the project.
4. To the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility.

5.4 Intertidal and Subtidal Areas

1. During design, DOT&PF would investigate ways to further reduce intertidal fills, including alignment shifts and steepened slopes. DOT&PF would also investigate ways to reduce the amount of sidecast material into subtidal areas.
2. To the extent practicable, beach access points would be chosen to take advantage of existing landings, previously disturbed sites, or locations of planned fill. Additional necessary access points identified during construction would be sited to minimize impacts to habitat and would be restored to pre-existing condition after project completion.
3. In-water work for fill placement, dredging, or pile driving would be timed to avoid impacts to spawning and migrating fish species.
4. Shuttle ferries would have wastewater holding tanks to avoid discharge of waste while moored at the new terminal sites.
5. If the selected alternative includes a ferry terminal in Berners Bay and a private terminal is existing or appears imminent at Cascade Point, DOT&PF would pursue development of a joint facility at that location.
6. Impacts to intertidal and subtidal areas would be included in the evaluation of compensatory mitigation needed for the project.
7. DOT&PF will work with resource agencies to develop a compensatory mitigation plan for affected intertidal and subtidal habitat. This may include fee-in-lieu payments for restoration or protection of offsite marine habitat.

5.5 Anadromous and Resident Fish Streams

1. All anadromous fish streams would be crossed by bridges. Anadromous fish streams that can be crossed with 130-foot or shorter bridges would not have any structure or fill in the stream channel. Anadromous fish streams that require pier supports would have the minimum possible piers using 130-foot spacing, placed to reduce impact to the streams.

2. Streams identified as having resident fish, or the potential to have resident fish in the future, would have culverts placed to provide fish passage, in accordance with the Memorandum of Agreement between ADF&G and DOT&PF entitled "Design, Permitting, and Construction of Culverts for Fish Passage."

3. In-water work at anadromous and resident fish streams would be timed to minimize impacts to fish species.

5.6 Bald Eagles

1. On-the-ground nest surveys would be conducted before clearing takes place to confirm the location of trees with eagle nests. Construction activities in the vicinity of bald eagle nests would be coordinated with the USFWS to determine the need for alignment changes, blasting plan changes, or other measures to avoid impacts to eagles.

2. No construction would occur within 330 feet of an eagle nest, and no blasting would occur within 0.5 mile of an eagle nest, during the March 1 to May 31 nest selection period. If a nest is active, no construction or blasting would occur within these distances until after August 31, unless the USFWS approves a plan to avoid impacts while operations continue.

3. In areas where clearing occurs to within 100 feet of a nest tree, DOT&PF and USFWS would jointly assess the potential for windthrow and stabilize the tree or adjacent trees, if determined necessary.

4. During construction, DOT&PF and USFWS would assess the sufficiency of natural screening between the highway and any eagle nests below the elevation of the road within the 330-foot zone. Additional screening would be developed if necessary.

5. DOT&PF would continue to fund USFWS aerial surveys for a period of five years to assess the impact, if any, of the project on the Lynn Canal bald eagle population.

5.7 Migratory Birds

1. In appropriate habitats, nesting surveys for trumpeter swan and Queen Charlotte goshawk would be conducted prior to construction. Clearing would be avoided in the vicinity of active nests.

5.8 Wildlife

1. Planning for any camps necessary during construction of the project would include BMPs for handling food, trash, and other potential wildlife attractants to reduce impacts.

2. Bridges across streams would be designed to also function as wildlife underpasses. In addition, if Alternative 2B is the selected alternative, wildlife underpasses would be located at the two identified major brown bear migration corridors on the isthmus between the Antler and Lace rivers.

3. Mitigation for impacts to wildlife would include funding for bear, goat, wolverine, and moose population monitoring studies to enable the ADF&G to address impacts from lost habitat, collision mortality, and improved access.

4. No construction would occur in April or May within one mile of identified harbor seal haulouts.

5. Preconstruction wolf den surveys would be conducted in consultation with the USFWS.

5.9 Threatened and Endangered Species

1. If the selected alternative includes a new ferry terminal and/or bridges below the high-tide line, trained observers would monitor for the presence of marine mammals during construction. Pile driving would be halted if any marine mammals come within 660 feet (200 meters) of the activity.

2. Pile driving at the Katzehin terminal and the Antler, Lace, and Katzehin rivers would be done with vibratory hammers to the extent possible.

3. Construction within 1,000 feet of the Met Point or Gran Point haulouts would occur during periods when sea lions are absent, unless authorized by the NMFS. Trained observers would be employed to ensure that no sea lions are present during construction work within 1,000 feet of the haulouts.

4. Any construction within 3,000 feet of Gran Point or Met Point would include through-cuts[78] and walls to avoid lines of sight between the haulouts and the highway and to discourage human disturbance of sea lions. Prior to beginning construction, NMFS would review and approve final detailed construction plans in these zones, including planned vegetation removal and blasting requirements. This review would include an on-site tour of the area by NMFS.

5. Monitoring would be conducted during any construction within 3,000 feet of the Gran Point and Met Point haulouts. The haulouts would be monitored for the presence of sea lions. If a haulout is occupied, monitoring will document that ground vibrations at the haulout are no greater than 0.05 ips and noise levels are not greater than 45 dBA.

6. No temporary barge landings would be constructed within 3,000 feet of the Gran Point and Met Point haulouts.

7. Any blasting within 3,000 feet of the Gran Point and Met Point haulouts, if occupied, would be monitored to document that ground vibrations at the haulout are no greater than 0.05 ips and noise levels are not greater than 45 dBA.

8. During construction, helicopters would not operate within 3,000 feet of the Gran Point and Met Point haulouts if occupied.

9. As large of a buffer as possible of undisturbed vegetation would be retained between the highway and the Gran Point and Met Point haulouts.

10. Helicopter operations during avalanche control would minimize activity within a 3,000-foot radius around the Gran Point and Met Point haulouts and would not be conducted within 1,000 feet of the haulouts when occupied.

[78] Through-cuts are areas where the highway is built lower than the surrounding ground on both sides by excavating down to the desired elevation without removing either cut slope.

11. Video monitoring at the Gran Point haulout and aerial and ground monitoring at the Met Point haulout would continue during construction and for five years after any construction in these areas to determine the extent of human disturbance of sea lions. Annual reports on this monitoring would be provided to NMFS that describe construction activities (during the construction phase of the project), monitoring activities, and impacts or responses of Steller sea lions. At the end of the monitoring period, a final report would be provided to NMFS summarizing the project, the impacts, and the likely effects on Steller sea lions or their critical habitat.
12. To minimize recreational boating activity in the vicinity of the two haulouts, no boat launches or other boat access points would be included in the project.

5.10 Cultural Resources

1. Known archaeological and historical resources in the vicinity of the project would be identified in the construction plans to ensure that the contractor is aware of the need to avoid impacts to these resources.

2. Cultural resources within the project limits would be flagged in the field to ensure that equipment operators do not inadvertently damage these resources.
3. The Jualin Mine Tram and the Comet/Bear/Kensington Railroad would be bridged to avoid impacts to these historic properties.
4. In the event that a previously unknown cultural resource is discovered during construction, work in the area would cease and DOT&PF would contact the SHPO and develop an approved plan before proceeding.

5.11 Recreation and Visitor Facilities

1. Any ferry terminals constructed for the project would include restrooms that would be available to highway users as well as ferry customers.

2. Any highway in the vicinity of the USFS cabin in Berners Bay would be located as far from the cabin as the topography allows, but no less than 100 feet from mapped use areas. A handicap-accessible trail would be constructed from the highway parking area to the cabin.
3. To mitigate impacts to remote recreation in Berners Bay, DOT&PF would construct a new remote access cabin to be maintained by USFS at a location determined in consultation with USFS.
4. If an East Lynn Canal Highway is constructed, a visitor facility with restrooms would be included in the maintenance facility at Comet. DOT&PF would maintain restrooms at any joint visitor/maintenance facility. DOT&PF would maintain constructed pullouts including collection of refuse from containers supplied at these pullouts. Any composting toilets at trail heads would be maintained by the USFS.

5.12 Proposed Mitigation Plan for the Preferred Alternative (Alternative 2B)

The following discussion of proposed mitigation for the Preferred Alternative, Alternative 2B, is divided into five sections: final design and construction, pre- and post-construction monitoring, maintenance and operations, compensatory mitigation, and estimated mitigation cost.

5.12.1 Final Design and Construction

A key consideration in mitigation is avoidance. Over the past decade to the present, DOT&PF has made many design changes, including highway alignment and ferry terminal layout changes, to avoid or reduce impacts to habitat, including anadromous streams, wetlands, bald eagle nest trees, sea lion haulouts, and marine waters. For example, the highway alignment across the Berners/Lace and Antler rivers has been moved upstream as far as possible in response to a conservation recommendation by NMFS made during the review of the Supplemental Draft EIS. During final engineering design of Alternative 2B, DOT&PF will investigate additional measures to reduce potential impacts, including further small alignment changes, changes in the footprint of the roadway, and ways to reduce the amount of material sidecast into subtidal areas. Within wetlands and other sensitive areas, the roadway will be designed with a low-profile embankment to limit embankment heights and side slopes so that the fill footprint is minimized. Culverts will be installed in appropriate locations to maintain natural flow patterns for surface water. Roadway swales will be designed to keep surface water within the natural drainage basins. The breakwater for the Katzehin Ferry Terminal will be designed with gaps or culverts to allow fish passage.

All anadromous fish streams will be crossed by bridges. Anadromous fish streams that can be crossed with 130-foot or shorter bridges will not include any structure or fill in the stream channel. Anadromous fish streams that require pier supports will have the minimum possible piers using at least 130-foot spacing, placed to reduce impact to the streams. Bridges across streams will also be designed to function as wildlife underpasses where practicable. The Lace and Antler rivers will both have 50-foot bridge extensions on each side. At the Katzehin River, an additional 100-foot section will be added to the north side of the bridge. These bridge extensions will also reduce impacts to riparian wetlands. Additional wildlife underpasses will be located at the two identified major brown bear migration corridors on the isthmus between the Antler and Lace rivers. The Jualin Mine Tram and the Comet/Bear/Kensington Railroad will also be bridged to avoid impacts to these historic properties.

The roadway within 3,000 feet of Gran Point and Met Point will be designed to include through-cuts and walls to avoid lines of sight between the haulouts and the highway and to discourage human disturbance of sea lions. Prior to beginning construction, NMFS will review and approve final detailed construction plans in these zones, including planned vegetation removal and blasting requirements. This review will include an on-site tour of the area by NMFS. As large of a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts. To further protect marine mammals from human disturbance, no boat launches or other boat access points will be included in the project or constructed at a later date. No tidelands permits for boat launches or other boat access will be granted to adjacent landowners unless NMFS concurs that the activities are not likely to adversely effect sea lions.

The highway alignment will be located as far from the existing USFS cabin in Berners Bay as the topography allows with a minimum of 100 feet from mapped use-areas. A handicap-accessible trail will be designed and constructed from the highway parking area to the cabin. To mitigate impacts to remote use areas, DOT&PF will also construct another wilderness cabin in Berners Bay at a location determined in coordination with the USFS. A visitor facility with restrooms will be included in the design of the maintenance facility at Comet. Construction workers transported to the site for work purposes will be prohibited from hunting or trapping on-site before or after their work shift. Any construction workers located at a construction camp would be prohibited from hunting from the construction camp.

Construction Procedures – DOT&PF and the contractor will both file Notices of Intent to use the NPDES General Permit for stormwater discharge during construction. The construction contractor will be required to prepare a SWPPP that describes the BMPs to be used to avoid water quality impacts. This plan will be made available to ADEC for review and comment and approved by DOT&PF before being included in project construction plans. The SWPPP will include procedures for locating and installing silt fences and sediment basins and installation of temporary erosion controls such as mulching and hydroseeding. As required by the General Permit, DOT&PF and the contractor would monitor stormwater discharge from the project and adjust the SWPPP as necessary and maintain records of inspections and any SWPPP changes.

The construction contractor will provide plans for DOT&PF approval for any construction camps. These plans will include procedures to avoid water quality impacts from wastewater discharges and stormwater runoff from the camps. They will also include procedures for handling food, trash, and other potential wildlife attractants. Construction camps, staging sites, borrow pits, and waste areas will be located in upland areas and stabilized during and after use to avoid water quality impacts.

Known archaeological and historical resources in the vicinity of the project will be identified on the construction plans provided to the contractor. Cultural resources within the project limits will be flagged in the field to ensure that equipment operators do not inadvertently damage these resources. Before and after photographs will be provided to the SHPO for crossings of the Jualin Tram and the Kensington/Comet/Bear Railroad.

Before clearing takes place, DOT&PF will conduct surveys of wolf dens, amphibian breeding ponds, and bald eagle, trumpeter swan, and Queen Charlotte goshawk nests in appropriate habitats. Clearing will be avoided to the extent practicable at the sites of active wolf dens, trumpeter swan nests, Queen Charlotte goshawk nests, or amphibian ponds. Construction in the vicinity of bald eagle nests will be coordinated with the USFWS to develop earth moving and blasting plans and to assess the need for nest monitoring during construction. During construction, DOT&PF and USFWS will assess the sufficiency of natural screening between the highway and any eagle nests below the elevation of the road within 330 feet of the edge of the roadway. During construction, DOT&PF and USFWS will evaluate the need to provide support to any nest tree or tree in the vicinity of the nest tree against windthrow.

Staking will be done at the planned outside limits of disturbance prior to construction to ensure that impacts are limited to that area. No grubbing will be done outside of the fill footprint and only the minimum clearing required for safety will be done beyond the toe of slope. During construction, slope limits in wetland areas will be separately identified to ensure that workers are aware of wetlands and the need to avoid impacts beyond the slope and clearing limits.

Only clean mineral soil or rock excavated from construction limits or immediately adjacent to the highway will be used for the highway and Katzehin ferry terminal embankments. No soil will be imported to the project site. Any soil within the project boundaries identified as containing invasive species will not be transported to other areas of the project. Construction equipment will be steam cleaned prior to use on the project to reduce the potential for introducing invasive species.

Rock will be used to stabilize the toes of slopes at ponds and stream crossings. Grass seed will be placed on all slopes containing soil. To the extent practicable, shot rock slopes would be covered with overburden and seeded to reduce their visibility. To protect the integrity of the natural plant communities, plant species indigenous to the area will be used for vegetating road slopes, except that non-invasive annual grasses may be used to provide initial soil cover. Only seed mixtures certified for purity will be used to seed exposed soils. In moose habitat areas, low-growing grasses and fertilizer will be used to avoid establishment of shrubs that would encourage moose to browse near the highway.

To the extent practicable, beach access points will be chosen to take advantage of existing landings, previously disturbed sites, or locations of planned fill. Additional necessary access points identified during construction will be sited to minimize impacts to habitat and will be restored to pre-existing condition after project completion. No temporary barge landings will be constructed within 3,000 feet of the Gran Point and Met Point haulouts.

Pile driving at the Katzehin ferry terminal and the Antler, Lace, and Katzehin rivers will be done with vibratory hammers to the extent possible. If vibratory hammers cannot be used, NMFS will be provided with an explanation of why they cannot be used before alternative measures are implemented. During construction, helicopters will not operate within 3,000 feet of the Gran Point and Met Point haulouts when occupied by sea lions.

Construction Timing and Monitoring – In-water work for fill placement, dredging, or pile driving will be timed to avoid impacts to spawning and migrating fish species. In-water work at the Antler, Lace, and Katzehin rivers will not occur between March 15 and June 15 to protect out-migrating salmonids and spawning eulachon.

No construction will occur within 330 feet of an eagle nest, and no blasting will occur within 0.5 mile of an eagle nest, during the March 1 to May 31 nest selection period unless agreed to by USFWS. If a nest is active, no construction or blasting will occur within these distances until after August 31, unless the USFWS approves a plan to avoid impacts while operations continue.

No construction will occur in April or May within one mile of identified harbor seal haulouts. Monitoring for marine mammals will be conducted during pile driving at the Katzehin Ferry Terminal and for the Katzehin, Antler, and Lace river bridges. Pile driving will be halted if any marine mammals come within 660 feet (200 meters) of the activity.

No construction will occur within 3,000 feet of Gran or Met Point before a monitoring and construction plan is submitted for review to NMFS. The review will include an on-site tour. Construction at Gran Point will not occur until NMFS reviews the results of construction and monitoring at Met Point. Construction within 1,000 feet of Met Point or 3,000 feet of Gran Point will occur during periods when sea lions are absent, unless authorized by NMFS. Trained observers will be employed to ensure that no sea lions are present during work within 1,000 feet of the haulouts. Monitoring will occur during construction within 3,000 feet of the Gran Point and Met Point haulouts to ensure noise levels above background (45 dBA) or vibration levels above 0.05 ips occur at the haulouts when they are occupied.

If goat monitoring identifies areas where pregnant nannies congregate in late winter or early spring, DOT&PF will coordinate with ADF&G to avoid construction from January through April in those areas to the extent feasible.

In the event that a previously unknown cultural resource is discovered during construction, work in the area will cease. DOT&PF will contact the SHPO and develop an approved plan before proceeding.

5.12.2 Pre- and Post-Construction Monitoring

To facilitate game management after construction of the highway, DOT&PF will fund bear, moose, goat, and wolverine surveys to determine population characteristics. The goat study will be of 4-year duration, and brown bear, moose, and wolverine study of 3-year duration. The brown bear study will include recommendations for a long term monitoring study to determine the effectiveness of wildlife underpasses for this species. DOT&PF will continue to fund aerial surveys of bald eagles for a period of five years following project construction. Also, video monitoring at the Gran Point haulout and aerial and ground monitoring at the Met Point haulout will continue for a period of five years following construction. Annual reports on the Steller sea lion monitoring during and after construction will be provided to NMFS and a final report will be provided to NMFS following completion of the monitoring period.

5.12.3 Maintenance and Operations

Shuttle ferries will have wastewater holding tanks that will discharge to wastewater treatment facilities or wastewater will be treated onboard before discharge. DOT&PF will maintain public restrooms at the Comet maintenance facility. The restrooms at the Katzehin Ferry Terminal will be available to highway users as well as ferry travelers. DOT&PF will also maintain constructed pullouts including collection of refuse from containers supplied at those pullouts. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the Gran Point and Met Point haulouts and will not be conducted within 1,000 feet of the haulouts when occupied. After the highway is open, no tidelands permits for boat launches or other boat access will be granted to adjacent landowners unless NMFS concurs that the activities are not likely to adversely effect sea lions.

5.12.4 Compensatory Mitigation

As discussed previously, Alternative 2B will result in the loss of 70 acres of wetlands and 32 acres of unvegetated intertidal and shallow subtidal habitat. The wetlands affected by the project consist of 69.1 acres of palustrine forested, 0.7 acre of palustrine scrub-shrub, and 0.2 acre of estuarine emergent wetlands.

The eastern side of Lynn Canal where Alternative 2B is located is largely undeveloped and does not contain substantial areas of degraded wetland, intertidal, or subtidal habitat. Therefore, it is not practicable to mitigate project impacts on wetlands and marine habitats by restoring similar degraded habitat within the project area. For this reason, DOT&PF proposes to provide a combination of on-site out-of-kind mitigation and in-lieu fee compensation to mitigate project impacts on wetlands and other waters of the U.S. and unvegetated intertidal and subtidal habitat.

The forested wetlands that would be impacted generally have a moderate to low wildlife habitat function. The principal functions of these wetlands are groundwater discharge, lateral flow, and nutrient transport/export. They are the most common wetland habitat on the east side of Lynn Canal (about 60 percent of total wetlands), covering about 6,720 acres. The scrub-shrub wetland that would be impacted provides low quality wildlife habitat. Its principal functions are sediment retention, groundwater recharge and discharge, and lateral flow. This wetland type covers about 2,133 acres on the east side of Lynn Canal and is the second most common wetland habitat type (about 19 percent) in the region (scrub-shrub wetlands adjacent to fish streams are often important for riparian support; however, the scrub-shrub wetland that would be impacted is not adjacent to a stream). To mitigate for impacts to palustrine wetlands, DOT&PF would construct a wildlife underpass at the identified bear travel corridor in the northwest part of the peninsula between the Lace and Antler rivers. This wildlife underpass, estimated to cost $440,000, would provide a connection between the habitat east of the highway and the estuarine emergent wetlands west of the highway.

To establish an appropriate level of in-lieu fee compensation for estuarine emergent wetlands and unvegetated intertidal and subtidal habitat, DOT&PF used the in-lieu fee values developed for the Ketchikan Airport West Taxiway Construction project (FAA and DOT&PF, 2002) and the

Gravina Access Project (FHWA and DOT&PF, 2004). The Ketchikan Airport project involved the first major use of in-lieu fee by DOT&PF in Southeast Alaska. The evaluation examined mitigation on other projects in Southeast Alaska, wetland values established by the Greatland Trust wetland bank in Anchorage[79], and property values. It also involved substantial coordination among DOT&PF, ADF&G, USFWS, NMFS, USACE, and ADEC. DOT&PF and FHWA used the same basis for in-lieu fee compensation on the Gravina Access project.

Greatland Trust assigned a value of $2,800 per acre for low value wetlands and $50,000 per acre for moderate/high value wetlands. Because there are no other functional value-based models in Alaska, DOT&PF adapted the Trust's range of values for several southeast projects. Forested, scrub-shrub and wetland muskegs in areas where these wetland types are abundant have been assigned the $2,800 per acre value. Unvegetated marine intertidal and subtidal areas have been assigned an intermediate value of $20,000 per acre. The highest value of $50,000 per acre has previously been assigned to high value freshwater habitat such as ponds.

To account for increases in real estate costs during the period after the original per acre values were established, and to insure that the in-lieu fee per acre will allow a two to one compensatory ratio when acquiring similar land, the original values were increased by 20 percent for the Juneau Access Improvements Project. Note that this increased per acre value, if applied to the forested and scrub-shrub wetlands impacted would result in an in-lieu fee payment of $235,200. The mitigation proposed would cost more than would an in-lieu fee payment.

Unvegetated intertidal and shallow subtidal habitats affected by Alternative 2B have been assigned a value of $24,000 per acre. These EFH areas impacted by Alternative 2B provide low to moderate foraging habitat for juvenile and adult fish and marine invertebrates.

Estuarine emergent wetlands have been assigned the highest value of $60,000 per acre. The estuarine emergent wetland that will be impacted by Alternative 2B has high wetland function ratings for wildlife habitat, riparian support, regional ecological diversity, and ecological replacement cost. This type of EFH is relatively limited on the east side of Lynn Canal, representing only about 5 percent of all the wetlands in the region and covering a total of about 574 acres.

Based on these acreages and values, DOT&PF will provide a total of $780,000 in-lieu fee compensation for impacts to wetlands and other waters of the U.S. This payment will be used to purchase parcels containing high value wetlands and intertidal habitat in the project vicinity threatened by development and/or to fund habitat restoration/enhancement projects. Currently available parcels and projects are being investigated. Potential preservation parcels include private land within Point Bridget State Park, estuarine wetlands in the Vanderbilt and Switzer Creek intertidal areas (in Juneau), and land adjacent to Sawmill Creek in Haines. Potential restoration/enhancement projects include a Pullen Creek culvert replacement project in Skagway and a Lynn Canal subtidal enhancement project. If no parcels or projects have been agreed to before construction starts, the money would be deposited with a non-governmental land trust with stipulations that the funds be used as described above.

5.12.5 Estimated Mitigation Cost

As indicated, there have been many design changes over the past decade to avoid potential habitat impacts. Most of these changes have not been tracked in terms of their effect on cost estimates. One notable exception is the cost of the commitment to cross all anadromous fish streams with bridges. This commitment was made early in the development of the 1997 Draft

[79] There are no wetland banks in Southeast Alaska.

EIS in recognition of the fact that restoration and enhancement opportunities in the project area were limited and therefore a greater emphasis should be placed on avoidance and minimization.

Bridging streams that could otherwise be crossed with structural plate pipe will avoid direct impacts to anadromous fish streams and reduce habitat fragmentation by providing migration corridors. Bridging rather than culverting at Sawmill, Antler Slough, Slate, Sweeny, Sherman, and Independence creeks adds approximately $4.2 million to the Alternative 2B construction estimate.

The mitigation estimate now includes the following specific mitigation item estimates:

1. Bridges instead of culverts at smaller anadromous streams: $4,200,000
2. 100-foot extensions on multi-span bridges at the Antler, Lace and Katzehin rivers to serve as wildlife underpasses – (300 feet x $4,400/foot): $1,320,000
3. Two 100-foot-long wildlife underpasses at high use bear trails and surrounding land on the Antler/Lace peninsula – (200 feet x $4,400/foot): $880,000
4. Screening structures at Gran Point and Met Point (2,800-foot concrete barrier with fence at $135/foot and 2,750-foot fence at $75/foot): $584,250
5. Wildlife monitoring studies to assess impacts and manage wildlife populations
   - A. Mountain goat monitoring, Berners River to Katzehin River, four-year collaring study: $567,700
   - B. Moose monitoring in the Berners Bay watershed, three-year collaring study: $398,100
   - C. Bear monitoring, Sawmill Creek to Sherman Creek, three-year collaring and hair snare study: $535,900
   - D. Wolverine monitoring in Berners Bay watershed, three-year collaring and hair snare study: $231,200
6. Wildlife monitoring to assess impact and to determine if additional measures are needed:
   - A. Helicopter monitoring of eagle nests, for four years of construction and for five years post construction (2 flights per year at $5,000/flight): $90,000
   - B. Video, aerial and ground monitoring at Gran Point and Met Point sea lion haulouts, for two years of construction (four construction seasons) and for five years post construction ($57,000/year for 7 years): $399,000
7. Wetlands and marine waters in-lieu fee compensation payments to a land trust for parcel purchase or restoration project:
   - A. Estuarine emergent wetlands (0.2 acre x $60,000/acre): $12,000
   - B. Unvegetated intertidal/subtidal fill areas (32 acres x $24,000/acre): $768,000
8. Remote prefabricated recreational cabin in Berners Bay to mitigate the loss of remote experience, to be maintained by the USFS: $50,000

Based on the listed items, current proposed mitigation for Alternative 2B totals approximately $10 million. Structural mitigation items ($7 million) have been included in the unit quantities of the Engineers Estimate in the addendum to the *Technical Alignment Report* in Appendix W. Nonstructural mitigation ($3 million) continues to be listed under the heading “Mitigation” in the Engineers Estimate.

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6.0 SECTION 4F

6.1 Introduction

Section 4(f) of the Department of Transportation Act (codified at 49 USC 303 and 23 USC 138)) states that the FHWA may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that there is no feasible and prudent alternative to use of land from the property, and the action includes all possible planning to minimize harm to the property resulting from such use. Use is defined as permanently incorporating land into a transportation facility or having proximity impacts that are so severe that the protected activities, features, or attributes that qualify a resource for Section 4(f) protection are substantially impaired. The latter is termed "constructive use" and only occurs when the protected activities, features, or attributes are substantially diminished.

In order to comply with this regulation DOT&PF and FHWA inventoried potentially protected sites in the project vicinity and determined Section 4(f) applicability. This section of the Final EIS details the step-by-step process followed and the applicability determinations made.

6.2 Parks and Recreation Areas

6.2.1 Parks

Section 3.1.1.6 provides general information on the parks and recreation areas in the project area. Municipal parks in the project area include Molly Walsh Park, and Pullen Creek Shoreline Park, all in Skagway (Figure 3-6). State parks in the vicinity include Point Bridget State Park, Sullivan Island State Marine Park; Chilkat Islands State Marine Park, Chilkat State Park, Portage Cove State Recreation Site, and Chilkoot Lake State Recreation Site (Figures 3-1 and 3-2). The only federal park in the project area is the Skagway unit of the Klondike Gold Rush National Historical Park (KLGO) in downtown Skagway (Figure 3-6).

No park land would be required for any of the alternatives under consideration, nor would proximity impacts create a constructive use.

6.2.2 Recreation Areas

Several alternatives would require state and/or federal land not specifically designated as parks or recreation areas, but administered under land management plans. These management plans were evaluated to determine if any of the land units were significant public recreation areas.

6.2.2.1 State Land

Alternative 3 would also pass through three parcels in the Northern Southeast Area Plan, LT02, H28, and HT11. Parcel LT02 is a large tract of intertidal and submerged land in William Henry Bay, designated as land for Shoreline Use and Habitat. HT11 is the intertidal area around Pyramid Island in Chilkat Inlet, designated as land for Transportation and Habitat use. H28 is a parcel of uplands north of William Henry Bay (Figure 3-2), designated for General use. None of these lands are designated for or function for recreation other than dispersed activities. FHWA regulations (23 CFR 771.135) state that where public land is managed for multiple uses, Section 4(f) applies only to those portions of the land which function for, or are designated in the management plans as being for significant park, recreation, or wildlife and waterfowl purposes. FHWA guidance, based in part on case law, further states that land designated or used for dispersed recreational activities is not protected by Section 4(f) [Section 4(f) Policy Paper, Question 2, FHWA, 2005].

Alternative 3 would pass through a land management unit of the Haines State Forest, Unit 6. Unit 6 of the Haines State Forest is classified as Public Recreation Land. The Haines State Forest Plan (ADNR, 2002) states that this land "will primarily be managed …for public recreational uses". However, the Plan also states "the Haines State Forest will be managed for multiple use, consistent with the establishment of the State Forest (AS 41.15.300)." The statute recognizes the importance of continuing traditional uses. The Plan specifically allows personal timber harvest in sub-unit 6a and salvage timber harvest in both sub-units a and b. Mineral extraction is allowed under certain circumstances. Based on the review of the Plan and the points noted above, FHWA has determined that this land is multiple use. Currently the unit is used for dispersed recreation; the only specific significant recreation facility is a trail, under construction, from the shore to the Davidson Glacier Lake. Alternative 3 would avoid use of land from this trail by bridging over the trail. No constructive use would occur. The trail would still provide access to the Davidson Glacier Lake, and although the trail experience would be altered, no substantially diminishment of its qualifying activities, features, or attributes would occur. A parking area and trail connection would be provided as an enhancement.

The ADNR has concurred that the only specific recreational facilities on state land in the project area are the Sturgill's Landing Trail (near Skagway) and the Davidson Glacier Lake Trail (Irwin, 2004).

FHWA has determined that Alternative 3 would pass through State of Alaska land but would not require the use of any State of Alaska land protected by Section 4(f).

6.2.2.2 Federal Land

All build alternatives with highway segments would pass through federal land under management of the USFS. As explained in Section 3.1.1.1, the 1997 TLMP assigned LUDs to land to identify management goals and policies (Figure 3-3). Alternatives 4B and 4D would primarily pass through land designated as Semi-Remote Recreation and also pass through small parcels designated Scenic Viewshed. Alternative 3 would pass through multiple land use designations, including Semi-Remote Recreation, Scenic Viewshed, and Modified Landscape. Alternative 2B would pass through the following LUDs: Scenic Viewshed, Semi-Remote Recreation, Old-Growth-Habitat, Modified Landscape, and LUD II.

A review of the management policies for these LUDs indicates that all of them meet the definition of multiple use areas and the recreation activities that occur and are envisioned are dispersed. Two other aspects of the 1997 TLMP further support the determination that none of the LUDs crossed are in themselves protected under Section 4(f). The first is that TLMP includes a LUD entitled Special Interest Areas that specifically includes designated recreation areas. In instances where the USFS has determined an area larger than a specific facility should be reserved for recreation or refuge purposes, the Special Interest Area LUD is used. No land in the project vicinity is designated as a Special Interest Area. The second point of note is that TLMP identifies a Proposed State Road Corridor on both the east and west sides of Lynn Canal; this is a Transportation and Utility Systems LUD overlying the other LUDs described. TLMP indicates that the land should be managed under the underlying LUD until a highway alternative is constructed.

As with municipal and state land, after determining that the broad land designations are multiple use areas, further investigation and consultation with the land manager occurred to determine which portions or specific facilities, if any, function or are designated for significant recreation.

TLMP contains a Recreation Places Inventory that delineates "areas of small to moderate size which have one to several features that are particularly attractive to people engaging in recreation activities and receive recurring use." (Although described as "small to moderate size" in some cases the inventory identifies areas that include multiple LUDs, for instance the area identified around Berners Bay covers approximately 150 square miles.) The inventory further identifies some of these areas as important for commercial recreation and tourism. Within Recreation Places there are often specific sites such as cabins, shelters, picnic sites, trails and campgrounds. The USFS has confirmed that Recreation Places as identified by the Inventory are areas of dispersed recreation, including hunting (Vaughan, 2004a). There are no specific recreational sites or facilities on USFS land on the west side of Lynn Canal. The only specific recreational sites or facilities on USFS land in the project study area on the east side of Lynn Canal are the Berners Bay cabin, the trail to Sturgill's Landing, and the Sturgill's Landing Day Use Area. The USFS has identified all three of these features as significant for recreation purposes (Griffin, 2004). None of the alternatives would impact the Sturgill's Landing Day Use Area or the trail to it.

The USFS has indicated that the Berners Bay cabin is a water-oriented cabin and therefore the zone of influence applies to the shoreline rather than the hillside behind the cabin (Ouderkirk, 2004). The USFS has also indicated that the recreation facility is the cabin itself, not the land it occupies, as the cabin could be relocated (Vaughan, 2004b), and in fact was placed with the knowledge that it may be moved in the future. The USFS has determined that a handicap accessible cabin on the Juneau road system would be a desirable development and has requested that DOT&PF design the alignment of applicable alternatives such that a handicap accessible trail could be constructed from the highway to the cabin. DOT&PF has mapped the discernible use areas (e.g. trails, outbuildings, cleared areas) at the cabin and would avoid any disturbance within 100 feet of these areas. The nearest point of disturbance (toe of slope) would be approximately 100 feet from this boundary, resulting in approximately 200 feet between the highway and closest use area other than the access trail itself.

FHWA has determined that the construction of a highway in the vicinity of the cabin, with a handicap accessible trail to the cabin, would not be a constructive use. The experience at the cabin would change, but this change would not be so severe as to create a substantial impairment of the protected activities, attributes, or features of the facility. Rather than being a remote access cabin (visitors currently usually access the site by small boat or float plane), the cabin would be accessible by both road and water. Rather than hearing only boat, plane or helicopter noise, visitors would also hear vehicle traffic noise. Use of the cabin would shift somewhat from those seeking a remote, water access experience to those seeking a road accessible water view cabin. The fact that the USFS sees the creation of a road accessible cabin as desirable is an indication that substantial impairment would not occur.

The USFS has concurred that the Berners Bay cabin, Sturgill's Landing trail and Sturgill's Landing Day Use Area are the only specific recreational sites on USFS land in the project study area (Griffin, 2004). The USFS also concurred that no alternatives would take land from a recreation site (Griffin, 2004).

FHWA has determined that Alternatives 2B, 3, 4B and 4D would pass through USFS land but would not require use of land protected by Section 4(f).

6.3 Refuges

There are no designated or functioning significant wildlife or waterfowl refuges in the project vicinity. As described in Section 5.2, state and federal land management plans applicable to the project area include designations such as Shoreline Use and Habitat (ADNR), Transportation and Habitat (ADNR), and Old-Growth Habitat (USFS). Review of these designations indicates these are multiple use designations. No specific areas function as wildlife or waterfowl refuges. Both ADNR and USFS have concurred that no refuges exist in the project vicinity (Irwin, 2004; Griffin, 2004).

6.4 Significant Historic Sites

Section 4(f) applies to significant historic sites. This includes all properties on or eligible for the National Register of Historic Places.

6.4.1 Berners Bay Historic Mining Districts

Alternative 2B would pass through the Berners Bay Historic Mining District (BBHMD). This alternative would also pass through two smaller historic mining districts located within the BBHMD: the Jualin and the Comet/Bear/Kensington. The BBHMD also includes a third historic mining district, the Ivanhoe/Horrible, as well as some contributing properties not part of any of the three smaller districts (Figure 3-7). No land would be required from any contributing property within these historic districts. Alternative 2B would bridge over the Jualin Mine Tram. Alternative 2B would also bridge the Comet/Bear/Kensington Railroad. At these two locations the land easement from the landowner, the USFS, would only be for air rights. With the exception of the crossings of the tram and railroad, the only lands impacted within the districts are undeveloped natural areas.

In order to decide if land within a historic district is protected by Section 4(f), FHWA must first determine if the land is individually historic or contributes to the factors that make the district historic [Section 4(f) Policy Paper, Question 3c, FHWA, 2005]. FHWA has determined the undeveloped natural land areas that would be crossed are not individually historic, are not an integral part of the historic district, and do not contribute to the factors which make the district historic.

FHWA has determined that construction of a highway over the Jualin Mine Tram and Comet/Bear/Kensington Railroad would not result in a constructive use. Although a highway and bridges would have an effect on both properties, the effect would not be so severe as to substantially impair their qualifying activities, features or attributes. Neither of these historic properties derives a substantial part of its significance from its setting.

6.4.2 Skagway and White Pass District National Historic Landmark

The boundaries of the Skagway and White Pass District NHL (Figure 3-6) include natural areas surrounding Skagway and the Klondike Highway. Alternatives 2, 2A, and 2C would pass through one of the natural areas within the NHL. The highway alignment for these alternatives traverses the hillside above the North end of Skagway and crosses over the WP&YR railroad tracks before connecting to 23rd Avenue. During 2003 alternative screening, the potential for Section 4(f) impacts to the NHL was considered, as Section 4(f) was one of the Environmental Factors considered (See Appendix A). The only contributing resources listed in the 1999 NHL nomination that would be directly impacted by these alternatives are the railroad tracks. The remaining land affected is a previously logged undeveloped area. The bridge over the railroad tracks would only require the purchase of air rights. Because the alignment had been located to avoid listed contributing sites, neither FHWA nor DOT&PF believed that these alternatives would require land protected by Section 4(f).

In August 2004 FHWA and DOT&PF consulted with the NPS, the federal agency responsible for NHLs. During consultation regarding NPS concerns with potential visual and auditory impacts, the issue of the historic significance of the natural land areas that would be crossed by these alternatives and its relevance to Section 4(f) was discussed. As explained, applicability of Section 4(f) to land within a historic district is based on whether or not the land is individually historic or contributes to the factors that make the district historic. Consultation with the NPS was expanded to include this issue. The Supplemental Draft EIS indicated that a determination of the applicability of Section 4(f) to the natural land that would be crossed by these alternatives would be made at the conclusion of consultation with the NPS and the SHPO.

Comments from the Office of the Secretary, U.S. Department of the Interior, in response to the Supplemental Draft EIS made clear the NPS position that all natural areas within the NHL contribute to the factors that make the landmark historic (See March 25, 2005 letter in Chapter 7). Furthermore, the NPS believes this contribution is documented in the Boundary Justification of the 1999 nomination. The Boundary Justification states, in part: “sufficient natural areas have been included so as to provide an understanding for the physical setting and cultural landscape that defined the historic corridor” (NPS, 1999). Based on this language, the NPS position on its meaning, and existing FHWA guidance, FHWA has determined that natural areas within the NHL are protected by Section 4(f). Consequently, Alternatives 2, 2A, and 2C have been dropped from the range of reasonable alternatives, based on the original screening criteria.

6.4.3 Dalton Trail

Alternative 3 would cross the Dalton Trail on Green Point north of Pyramid Harbor (Figure 3-1). A bridge would be constructed over the trail (continuing across Chilkat Inlet); neither the bridge abutment to the west or the first pier would require land from the trail. Only air rights would be acquired for the bridge above the trail.

FHWA has determined that construction of a highway associated with Alternatives 3 would not result in a constructive use of the Dalton Trail. Although a highway would have an effect on the trail, it would not be so severe as to substantially impair its activities, features or attributes. This historic property does not derive a substantial part of its significance from its setting.

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7.0 PUBLIC AND AGENCY COORDINATION

The 1997 Draft EIS developed and implemented a consultation and coordination program according to requirements set by the NEPA and CEQ regulations for implementing NEPA. The purpose of the program was to ensure that the public; tribal entities; and federal, state, and local agencies were contacted, consulted, and given an adequate opportunity to be involved in the environmental analysis and Draft EIS process.

7.1 1997 Draft EIS Public and Agency Scoping

The 1997 Draft EIS detailed the public and agency coordination from the start of the reconnaissance study through the release of the Draft EIS in June 1997. Coordination with the public and agencies began during the preparation of the Reconnaissance Engineering Study in April 1993 to May 1994 (DOT&PF, 1994). In March 1994, community meetings were held at Juneau, Haines, and Skagway to solicit public comments on the proposed project. A public information office was opened in the Mendenhall Mall in Juneau in November 1994 to disseminate project information. Public and agency involvement was ongoing throughout the development of the 1997 Draft EIS and played an integral part in the development and evaluation of alternatives. The goals of the coordination were as follows:

- To inform the public and local, state, and federal agencies about the need for the project
- To identify and consider values and concerns of the public and agencies
- To ensure all reasonable alternatives were identified and evaluated
- To inform the public and agencies regarding potential impacts associated with each of the alternatives under consideration
- To integrate public input and agency policy into the decision-making process
- To establish and maintain credibility of the engineering performed to determine the characteristics of each alternative and the environmental program used to assess potential impacts

7.2 2003 Notice of Intent and Scoping

A Notice of Intent to prepare the Supplemental Draft EIS was published on March 11, 2003, in Volume 68, Number 47 of the *Federal Register*. The purpose of the Notice of Intent was to notify the public, tribal entities, agencies, and local governments of the plan to prepare a Supplemental Draft EIS due to the passage of time during which some field conditions changed, new regulations were passed, new land plans were approved, and new analytical methods were developed. The Notice of Intent also solicited participation in scoping specific to the Supplemental Draft EIS.

Public scoping for the Supplemental Draft EIS was conducted in Juneau, Skagway, and Haines on April 8, 9, and 10, 2003, respectively. An agency scoping meeting was held on April 14, 2003. The public and agencies were asked to submit comments on the range of alternatives that should be studied in the Supplemental Draft EIS and the need for additional field studies or technical reports. A summary of the public and agency meetings is included in the *Scoping Summary Report* along with copies of all comments (DOT&PF, 2003b).

7.3 2003 and 2004 Public Coordination

Public coordination continued throughout the Supplemental Draft EIS preparation. The following activities were conducted to provide additional information about project development subsequent to the 2003 scoping activities.

7.3.1 Presentations

- July 25, 2003 – Juneau Chamber of Commerce – Introduction and overview of the EIS process
- August 1, 2003 – KINY Radio, Juneau – Capital City Chat with Chris Burns – Summary of Supplemental Draft EIS alternatives
- October 23, 2003 – Yaakoosge Daakahidi Alternative High School – Project update
- May 25, 2004 – Yaakoosge Daakahidi Alternative High School – Project update
- September 5, 2003 – Project update in Skagway
- January 26, 2004 – International Union of Operating Engineers Local 302 in Juneau

7.3.2 Newspapers and Newsletters

- *Juneau Empire,* September 30, 2003, "My Turn" by Reuben Yost
- *Juneau Empire,* December 7, 2003, full-page project newsletter
- *Juneau Empire***,** January 16, 2004, "My Turn" by Pat Kemp

7.3.3 Meetings

- April 8, 2003 – Scoping meeting in Juneau
- April 9, 2003 – Scoping meeting in Skagway
- April 10, 2003 – Scoping meeting in Haines
- January 26, 2004 –SATP public meeting in Haines
- January 26, 2004 – SATP public meeting in Juneau
- January 27, 2004 – SATP public meeting and Juneau Access Improvements Project Informational Meeting, Skagway

7.3.4 Local Government

- May 28, 2003 – Presentation to Juneau Assembly Public Works Committee at CBJ Chambers
- June 12, 2003 – Meeting with Juneau Mayor Sally Smith, Skagway Mayor Tim Bourcy, and Haines Deputy Mayor Jerry Lapp
- July 23, 2003 – Meeting with Haines Mayor Mike Case
- June 30, 2004 – Meeting with Haines Borough Mayor Mike Case and other Haines Borough officials

7.4 2003 and 2004 Agency Coordination

The following coordination meetings were held with agencies:

- May 29, 2003 – Agency coordination meeting in Juneau to clarify issues, agree on methodology, and define required fieldwork associated with the Juneau Access Improvements Project 2003 wetland and EFH technical studies.
- June 25, 2003 – Agency coordination meeting via teleconference to clarify issues, agree on methodology, and define required fieldwork associated with the Juneau Access Improvements 2003 karst technical study on the west side of Lynn Canal.
- October 4, 2003 – Agency coordination meeting with the USFS regarding visual impacts.
- October 30, 2003 – Agency coordination meeting in Juneau to update agency representatives on the status of the Juneau Access Improvements Supplemental Draft EIS. Agency representatives were provided copies of the draft *Anadromous and Resident Fish Streams Technical Report* (Appendix P), *Alternatives Screening Report* (Appendix A), and *Comment Analysis Report* (DOT&PF, 2003c) for agency review.
- September 9, 2004 – Agency coordination meeting in Juneau with NPS representatives to discuss visual, auditory, and traffic impacts to the Skagway and White Pass District NHL.

7.5 1997 and 2003-2004 Government-to-Government Coordination

Letters were sent to local federally recognized tribes and Native corporations inviting them to participate in the 1997 and 2003 scoping process. In compliance with the federal laws and regulations regarding cultural resources, DOT&PF sent letters to local federally recognized tribes and other Native entities inviting them to participate in the Supplemental Draft EIS process of identifying cultural properties (prehistoric and historic) and determining the effects of the alternatives on such properties. A courtesy follow-up phone call was made to each letter recipient, and interviews were held with tribal entities that expressed further interest (Yarborough, 2004). In August 2004, FHWA sent letters to the same Native organizations inviting them to comment on FHWA's determination of historic property eligibility for the National Register and determination of potential effects on historic properties in the APE.

7.6 Summary of 1997 Draft EIS Comments and Response to Comments

The NEPA requires all substantive comments received on a Draft EIS to be included in a final EIS. A final EIS must include responses to the comments, and, if changes are made to a Draft EIS because of the comments, indicate where the changes were made in the document. The Juneau Access Improvements Project *Comment Analysis Report (CAR)* (DOT&PF, 2003c) serves as a public and agency comment summary. Responses to substantive comments received during the 1997 Draft EIS comment period are presented in the Supplemental Draft EIS *Responses to Comments* (Appendix Y).

7.7 Summary of 2003 Scoping Comments

The *2003 Scoping Summary Report* contains copies of all of the scoping comments (DOT&PF, 2003b). The CAR analyzes the substantive comments made during 2003 scoping (DOT&PF, 2003c). A summary of 2003 scoping comments was also included in the 2005 Supplemental Draft EIS.

7.8 Cooperating Agency Review of the Preliminary Supplemental Draft EIS

After the 2003 scoping meetings, draft technical reports were distributed to cooperating agencies and state agencies with jurisdiction or expertise for review and comment. These comments were incorporated into the revised technical reports. In August 2004, cooperating agencies were requested to review the preliminary Supplemental Draft EIS. Their comments and DOT&PF responses were included in Chapter 7 of the Supplemental Draft EIS.

7.9 Relevant Correspondence Involving Local Government, Federal and State Agencies, and Organizations

Relevant 2003 and 2004 correspondence related to issues other than scoping was provided at the end of Chapter 7 of the Supplemental Draft EIS.

7.10 Supplemental Draft EIS Public Comment Period

A Notice of Availability of the Supplemental Draft EIS for the Juneau Access Improvements Project was published in the *Federal Register* on January 24, 2005. At that time, copies of the Supplemental Draft EIS were made available at the Juneau, Haines, and Skagway public libraries and printed copies were distributed to the cooperating agencies. Compact discs were distributed to individuals and interested organizations that requested to be on the mailing list. Printed copies of the Supplemental Draft EIS and CDs were available by request from the project information center in the Mendenhall Mall in Juneau and at the DOT&PF project office in Juneau. The Supplemental Draft EIS and appendices were also available for review or download on the project website. Public notice of the availability of the Supplemental Draft EIS and all appendices and dates of public hearing sessions and location of the information center were placed in the *Juneau Empire*, *Chilkat Valley News*, *Skagway News*, and the *Anchorage Daily News*.

In January 2005, a Project Newsletter was published describing the purpose and need for the project, the proposed alternatives, an overview of the project schedule, the public hearing schedule, location of the information center at the Mendenhall Mall in Juneau, and a request for public comment.

During the review and comment period, public input was solicited and oral testimony recorded at public hearing sessions held in Juneau on February 16 and 17, 2005, in Haines on February 23, 2005, and in Skagway on February 24, 2005. An open house session before each public hearing session provided the public an opportunity to review the Supplemental Draft EIS and display boards, ask questions of project staff, and to provide both oral and written comments. Comments were also submitted via letter, e-mail, hand delivery or fax to the DOT&PF project office. The public review and comment period ended on March 21, 2005. All comments received or postmarked by or on March 21, 2005, were analyzed in the CAR. Comments from state and federal agencies and DOT&PF responses are included at the end of this chapter.

7.11 2005 Public Coordination/Presentations

- January 27 – Juneau Chamber of Commerce – Supplemental Draft EIS overview
- February 9 – Glacier Valley Rotary – Supplemental Draft EIS overview
- February 10 – Gastineau Rotary – Supplemental Draft EIS overview
- February 12 – Juneau Downtown Rotary – Supplemental Draft EIS overview
- March 4 – Alaska Bar Association, Juneau Chapter – Supplemental Draft EIS overview

- August 24 – KINY Radio Capital City Chat – Update on new Preferred Alternative
- October 14 – Juneau Chamber of Commerce – Update on new Preferred Alternative and question/answer session

7.12 Supplemental Draft EIS Comment Analysis Report

The CAR summarizes comments and testimony received during the public review and comment period according to issue categories. Analysis of the comments was a multi-stage process that included coding, sorting, and summarizing all public comments and testimony received into statements of concern (SOCs). After each submission was reviewed to identify the specific comments conveyed, the individual comments were then assigned a unique code number. Each comment was assigned to one or more issue categories that best reflected the substance of the comment, such as socioeconomic effects or wetland concerns. Some comments did not readily fall into a specific issue category and were placed into an "Unclassified Comment Category." Section 2 of the CAR describes, in greater detail, the process and methodology used to track and code comments. Section 4 of the CAR identifies the SOCs according to issue category. The CAR was published on the project website in June 2005. Responses to the comments received during the 2005 public comment period are found in Appendix Y, *Responses to Supplemental Draft EIS Comments*.

7.13 2005 Agency Coordination

The following coordination meetings were conducted:

- August 26 – Meeting to update agencies on recent alignment changes and Draft Mitigation Plan including in-lieu fee proposals and potential mitigation projects
- November 17 – Meeting with NMFS, EPA, USFWS, and OHMP to establish initial priority of potential projects to be funded by in-lieu fee mitigation funds

7.14 Relevant Correspondence after the Supplemental Draft EIS Comment Period

Relevant 2005 correspondence received after the Supplemental Draft EIS comment period is provided at the end of this chapter.

7.15 Cooperating Agency Review of the Preliminary Final EIS

The Preliminary Final EIS was provided to the cooperating agencies for review on October 31, 2005. Comments received and DOT&PF responses are provided at the end of this chapter.

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STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION
OFFICE OF HISTORY AND ARCHAEOLOGY

FRANK H. MURKOWSKI, GOVERNOR

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1366

ALASKA DOT & PF
MAR 21 2005
SPECIAL PROJECTS

March 16, 2005

File No.: 3130-1R FHWA
3130-2R DOT

SUBJECT: Juneau Access Improvements
Project No. 71100

Reuben Yost, Project Manager
DOT & PF, Southeast Region
6860 Glacier Highway
Juneau, AK 99801-7999

Dear Mr. Yost,

The Alaska State Historic Preservation Office (SHPO) has reviewed the *Juneau Access Improvements Supplemental Draft Environmental Impact Statement (January 2005)* which we received on February 7, 2005. On page 4-25, the document states that DOT & PF and FHWA have consulted with SHPO regarding potential impacts to historic properties in the area of potential effect. We wish to clarify that although we have concurred with FHWA's findings regarding eligibility of historic properties for inclusion to the National Register of Historic Places, we have not yet concurred on assessment of effect. The September 29, 2004 letter from FHWA to SHPO did not address effects other than to say that consultation with the National Park Service was ongoing. Our response letter (October 19, 2004) therefore, specifically stated that we looked forward to continued consultation with FHWA in regards to determination of effect.

Please contact Stefanie Ludwig at 269-8720 if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner

Judith E. Bittner
State Historic Preservation Officer

JEB:sll

Cc: Tim A. Haugh, Environmental and Right of Way Programs, Federal Highway Administration, Alaska Division, P. O. Box 21648, Juneau, AK 99802

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
ALASKA DIVISION
709 West Ninth Street, Room 851
P.O. Box 21648
Juneau, Alaska 99802
907-586-7418 | 907-586-7420 FAX

ALASKA DOT & PF
SEP - 7 2005
SPECIAL PROJECTS

September 1, 2005

REFER TO
HDA-AK
File #: MGS-STP 000S(131)/71100

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

SUBJECT: Juneau Access Improvements Project. Finding of **No Adverse Effect,** pursuant to 36 CFR 800.5(d)(1)

Dear Ms. Bittner:

Thank you for your letter of October 19, 2004 concurring with our determinations of eligibility for historic properties within the Area of Potential Effect (APE) for this project. Also, thank you for your review comments on the Supplemental Draft Environmental Impact Statement (EIS). I am writing to address your comments and to request your concurrence with our finding of No Adverse Effect for the preferred alternative.

Supplemental Draft EIS Comments

We recognize that the statement on page 4-25 of the Supplemental Draft EIS could be interpreted to mean that consultation with your office had concluded, although that was not the intent. The paragraph would have been clearer if it had stated that a request for concurrence on determination of effect would be sent to your office after ongoing consultation with the National Park Service (NPS) concluded. We regret any confusion created. The Final EIS will include your letters and will be specific as to any concurrence on effect.

Preferred Alternative

The preferred alternative for this project has changed. The Supplemental Draft EIS identified Alternative 2, East Lynn Canal Highway with Katzehin Terminal, as the State of Alaska's preferred alternative. This alternative would construct a highway from Echo Cove to Skagway, with a shuttle ferry from the Katzehin Delta to Haines. As indicated in the Supplemental Draft, consultation with the NPS was ongoing regarding undeveloped land in the Skagway and White Pass District National Historic Landmark. As a result of that consultation, the FHWA has determined that alternatives that pass through the Landmark would require land protected by

Section 4(f) of the Transportation Act. Based on this determination, those alternatives (2, 2a, and 2C) are no longer considered reasonable and will not be further evaluated. On August 10, 2005 the Alaska Department of Transportation and Public Facilities (AKDOT&PF) identified Alternative 2B, East Lynn Canal Highway to Katzehin with shuttles to Haines and Skagway, as its preferred alternative. This alternative would construct a highway from Echo Cove to north of the Katzehin delta, with shuttle ferries providing service to both Haines and Skagway (see enclosed Figure 2B). Alternative 2B will be identified as the preferred alternative in the Final EIS.

The alignment of Alternative 2B is the same as the Echo Cove to Katzehin terminal portion of Alternative 2 that was provided to your office in 2003 (1996 & 2003 Alignment Comparison East Lynn Canal, Sheets 1-9) with one exception. The enclosed map (Sheet 2, 8-15-05) shows the changes made to the alignment across the head of Berners Bay to address resource agency concerns. The current alignment was developed to address potential impacts to river and upland habitat in Sections 32, 29, and 19. The most recent change only affects on historic property, the Jualin Mine Tram, which is described below.

Area of Potential Effect

As stated in previous communications, the area of potential effects (APE) is a 100-meter wide corridor that includes the actual footprint of the highway alignment and approximately 35 meter-wide buffer zones to either side. The APE also includes the ferry terminal north of Katzehin. The likely presence of historic properties within the APE was established through background research, consultations, and field investigations. The level of effort has been commensurate with the likely effects of the undertaking and the discussions with your office and the U.S. Forest Service (USFS).

Historic Properties in the Area of Potential Effect

There are five eligible properties in the APE of the preferred alternative:

- JUN-928 Berners Bay Historic Mining District is significant in the historic context of minerals exploration and development of the Juneau Mining District from the 1870s to 1944. It contains several productive mines in the high density of prospects (criterion (a). Its association with Alaska District Governor Wilford Bacon Hoggatt and famous mining pioneer Bart Thane is commemorated under criterion (b). Criterion (c) is met in the technological innovations of railroads and semi-diesel engines (the first in Alaska). The properties have potential to yield information regarding the miners' lives, the applications of technologies, and the internal workings of a mine (criterion (d). The Berners Bay Historic District includes four historic properties within the project APE.
- JUN-022 Jualin Historic Mining District was one of the more successful operations. It had the semi-diesel engine that operated the Jualin Mine Tram described below.
- JUN-932 Jualin Mine Tram operated between the wharf and the mining camps, carrying fuel oil and other supplies in.
- JUN-945 Comet/Bear/Kensington Historic Mining District includes the Comet Townsite, Comet Mine (the 8th largest producer of gold in the Juneau Mining District), the Bear Mine,

and the Kensington Mine and Mill, and among other associated properties, the railroad mentioned below.

- JUN-946 Comet/Bear/Kensington Railroad connected the landing on the Lynn Canal with the mill, moving shipped goods and ore in, and among the mines.

Consultation

In September 2003, the AKDOT&PF sent formal tribal consultation letters to the Chilkoot Indian Association of Haines; Klukwan, Inc.; Chilkat Village of Klukwan; Skagway Traditional Council; Goldbelt, Inc.; Sealaska Corporation; Sealaska Heritage Institute; Douglas Indian Association; Tlingit and Haida Central Council; Aukquan Traditional Council; and Hoonah Indian Association. The letters were followed by an October 2003 meeting with the executive director of the Sealaska Heritage Institute and follow-up telephone calls to the other organizations. Tribal consultation failed to reveal any potential traditional cultural properties in the general project area, except one near Point Sherman. Identified during ethnographic research for the Kensington Gold Project SEIS, this site is outside the project's APE.

On August 9, 2004 a letter explaining the FHWA's determinations of eligibility and effect was sent to the tribes and native organizations listed above (see enclosure). The FHWA did not receive any comments on its determinations.

Determination of Effect

This project will affect historic properties in the APE, but as per 36 CFR Part 800.5(d)(1), these effects will not be adverse. The project will not result in the physical destruction of any of the historic properties in the APE; nor will the project alter the characteristics of any historic property that qualify it for inclusion in the National Register; none of the properties identified are visually, atmospherically, or audibly sensitive. All possible planning to minimize harm, including shifting alignments, identifying alternative routes, and bridging over historic properties has successfully reduced impacts to a level that would not be an adverse effect. Construction impacts would be short term, and would not alter the qualities for which any of the properties were determined to meet the criteria for the National Register.

Alternative 2B would pass through portions of the Berners Bay Historic Mining District (JUN-928) and two smaller districts within it, the Jualin Historic Mining District (JUN-022) and the Comet/Bear/Kensington Historic Mining District (JUN-945). The only contributing properties that would be affected are the Jualin Mine Tram (JUN-932), and the Comet/Bear/Kensington Railroad (JUN-946).

Alternative 2B would cross the Jualin Mine Tram just inshore from Berners Bay, near the boundary between Sections 24 and 25. The highway would affect the tram, but this effect would not be adverse. At the crossing location the tram tracks are still visible on a shot rock bench next to the Lace River; due to erosion some of the track is hanging over the water. The highway would cross the tram with a bridge that terminates beyond the top of a rock cliff approximately 20 feet above the bench. The alignment of and access to the tram would remain unchanged, and the characteristics that made the site eligible for the National Register (minerals exploration and development within the Juneau Mining District, and the smaller Jualin Mining District) would not be diminished.

Alternative 2B has been modified from the original plan in order to minimize effect on historic properties. The earlier design crossing the Comet/Bear/Kensington Railroad included fill in a forested area where both the rail sections and supporting pilings are missing. Although there is no cultural integrity there, the original alignment of the railroad would have been crossed and severed from the parts that do have integrity. Consequently, this area was redesigned to bridge over the railroad alignment with a large bottomless arch culvert, approximately 20 feet wide by 8 feet high. With the present design concept, the highway would cross over the alignment of the railroad, but this affect would not be adverse. The alignment will remain intact, and can still be followed on foot, although no cultural features are present in the vicinity. The qualities that made the site eligible for the National Register (minerals exploration and development within the Juneau Mining District and the smaller Comet/Bear/Kensington Mining District) would not be diminished.

Due to the effects discussed above, the project would affect the districts, but the effect would not be adverse. Other than the crossings of the tram and railroad, no contributing properties of the districts would be affected. Throughout the remainder of the districts the highway would traverse natural areas that are not contributing elements of these districts.

Conclusions

Based on the foregoing, the FHWA has determined that Alternative 2B would not have an adverse effect on any historic property. Your concurrence is requested. Please direct your response or comments to me at the address above, by telephone at 907-586-7430, or by e-mail at tim.haugh@fhwa.dot.gov.

Sincerely,

Tim A. Haugh
Environment and Right of Way Programs Manager

Enclosures:
Letter to tribes
Map of 2B
Revised Sheet 2 of 9

cc w/o enclosures:
Reuben Yost, AKDOT&PF Southeast Region, Project Manager
Van Sundberg, AKDOT&PF Southeast Region, Regional Environmental Coordinator
Laurie Mulcahy, AKDOT&PF HQ, Environmental Program Manager

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

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ALASKA DOT & PF
OCT 19 2005
SPECIAL PROJECTS

October 5, 2005

File No.: 3130-1R FHWA
3130-2R DOT

SUBJECT: Juneau Access Improvements Project, Project No. 71100
Alternative 2B, East Lynn Canal Highway to Katzehin
Assessment of effects on historic properties

Tim A. Haugh
Environmental and Right of Way Programs
Federal Highway Administration
Alaska Division
P. O. Box 21648
Juneau, AK 99802

Dear Mr. Haugh,

We have reviewed your correspondence (received 9/6/2005) regarding the referenced project for conflicts with cultural resources under Section 106 of the National Historic Preservation Act. As stated in your letter, the preferred alignment (Alternative 2B) will pass through three historic districts:

- Berner's Bay Historic Mining District (JUN-928)
- Jualin Historic Mining District (JUN-022)
- Comet/Bear/Kensington Mining District (JUN-945)

Alternative 2B will also intersect two linear features that are eligible for the National Register of Historic Places:

- Jualin Mine Tram (JUN-932)
- Comet/Bear/Kensington Railroad (JUN-946).

According to your letter, bridges will be constructed across JUN-932 and JUN-946 thus allowing the alignment of the tram and railroad features to be uninterrupted. We recommend that the features are flagged by an archaeologist so that they are not inadvertently impacted by staging or construction activities. We also request that Federal Highways Administration provide us with photographs showing the condition of JUN-932 and JUN-946 after the project is completed.

Federal Highway
Administration
OCT 11 2005
Juneau, Alaska

Based on our records, there is another National Register eligible site, the Portland Mill Site (JUN-958), in the vicinity of the project area. This site was not addressed in your correspondence and it was not possible to tell from your map (Figure 2-6) if it is indeed within the road alignment. Fortunately we were able to locate a set of larger scale maps in our office files that show the Juneau Access Road alignment proposed in 2003. According to these maps, the road will be slightly inland of JUN-958.

We concur that no historic properties will be adversely affected by this project provided that the historic properties are avoided and we obtain the requested photographs after the project is complete.

Please contact Stefanie Ludwig at 269-8720 if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner

Judith E. Bittner
State Historic Preservation Officer

JEB:sll

Tim A. Haugh 10/5/2005 Page 2

United States Department of Agriculture | Forest Service | Alaska Region | Regional Office
P.O. Box 21628
Juneau, AK 99802-1628

1364

File Code: 1950-4-2
Date: MAR 21 2005

ALASKA DOT & PF
MAR 24 2005
SPECIAL PROJECTS

Mr. Reuben Yost
Special Projects Manager
Alaska Department of Transportation and Public
Facilities Southeast Region
6860 Glacier Highway
Juneau, AK 99801

Dear Mr. Yost:

Enclosed are the Forest Service comments on the Supplemental Draft Environmental Impact Statement for Juneau Access. The team preparing the comments consisted of Pete Griffin, Betty Wilt, Eric Ouderkirk, and Ken Vaughan. They are available to discuss the comments at any time.

Sincerely,

Dennis E. Bschor

DENNIS E. BSCHOR
Regional Forester

Enclosure

cc:
Tim Haugh, Alaska Division, Federal Highway Administration
Forest Supervisor, Tongass National Forest
District Ranger, Juneau Ranger District

Caring for the Land and Serving People

Printed on Recycled Paper

Juneau Access Supplemental Draft Environmental Impact Statement

Topic Outline for Comments

(General comments and comments specific to alternatives)

The Forest Service expects to be involved in discussions with the lead federal agency and with the Alaska Department of Transportation and Public Facilities (ADOT&PF) during the development of the Final NEPA documents. We believe these comments will likely need further discussion and clarification that will lead to the Final NEPA documents. The Forest Service intent is to better strengthen the Final products and lead to sound decisions.

Environmental Impact Processes and Procedures Comments

Purpose and Need Statement

The Purpose and Need Statement (Section 1.4, page 1-7) includes 5 elements. Two of these elements focus on costs (user costs and state costs). A third element, travel time, is often a surrogate for costs. The analysis and comparisons of the alternatives does not provide clarity of presentation and clear differences between choices concerning these three interrelated elements. The lack of clarity may require some additional analysis, but probably can be accomplished with more expansive discussion and editing. G

Cumulative Effects Analysis

The cumulative effects analysis and documentation, especially in Appendix U did not present a clear and compelling analysis or summary. As presented, the analysis is substantially less complete and thorough than the standard the courts are applying to Forest Service Final documents in other Forest Service Regions. A weak presentation of cumulative effects analysis and the associated weak support for the conclusions made from the analysis leaves the document more vulnerable to challenge.

In the cumulative impacts section there is no discussion of the impacts from the following anticipated recreation developments that are likely in the foreseeable future for implementation of a land based alternative (Final list would depend on alternative selected):

- Slate Creek Cove to Comet Cove Trail
- Yeldagalya Creek Trail
- Katzehin River Trail
- Expanded Day Use Facilities, Trailhead and Trail at William Henry Bay
- Sullivan River Trail
- Glacier River/Davidson Glacier Trail

It may be a matter of semantics but the document refers to future trails as requiring an "Environmental Assessment". The more correct term would be to describe it as an "environmental analysis." It is not appropriate for a lead federal agency to limit the appropriate choices of a cooperating agency. Most likely these projects would be completed using a Categorical Exclusion with a Decision Memo.

There is nothing in the Cumulative Effects analysis, which includes a consideration of any other potential land management activities in the project area (Kensington Gold Mine, Cape Fox Land Exchange, Cascade Point Development, etc…).

There is nothing in the Cumulative Effects that addresses an analysis of changes in Old Growth and Old Growth Reserves. This analysis will assist with any related Forest Plan amendments that may be required in order to provide the Right of Way for the selected alternative.

Comparison of Alternatives

Chapter 2.3.2.3 Page 2-11. We suggest you include a discussion on what type of intersection or traffic controls would be constructed, such as bridge, overpass, underpass, stoplights, etc. that would accommodate cross traffic or mine support vehicles if the preferred alternative is selected. This is especially important where mining or mining support traffic is using the road. If the preferred alternative is constructed, it will provide increased logistical traffic associated with the Kensington Mine for fuel, supply, personnel, and concentrated access to and from the mine site.

The draft SDEIS for the preferred alternative states that a maintenance station/ rest stop would be located at Comet Landing. Would it be located on Coeur Alaska property, and if so, is there an agreement in place to accomplish this action? Will this station and rest stop disturb an additional acreage of land that was not accounted for in the draft?

Special Expertise, Statutory and Regulatory Authority Comments

Subsistence uses

Subsistence use on National Forest Systems lands is one of the areas where the Forest Service does have statutory and regulatory responsibilities. The analysis presented in the SDEIS is substantially less robust and thorough than it would be in a Forest Service project environmental analysis. The less thorough treatment may be appropriate, but there does appear to be a possibility of a significant effect on subsistence resources along portions of the route. Greater examination of actual subsistence uses and perhaps subsistence hearings in Lynn Canal communities may be appropriate. If any of the rivers, estuaries, etc., especially in the northern part of Lynn Canal, are claimed to be used for subsistence by Haines, Skagway, etc. that claim will be made. From ANILCA process standpoint, it would be more appropriate if Hearings were held at least in Haines and Skagway.

Government to Government Consultation

The Draft SDEIS document gives credit for many invitations to participate, but does not give much credit for actual consultation. This should be strengthened to give credit where credit is due. If actual face-to-face consultations with each Tribe has not taken place, it needs to happen. The Forest Service would be willing to facilitate such meetings. These items would strengthen the Final product.

Minimization and Mitigation of Effects on NFS Lands

Rock utilization

The road construction alternatives and especially the preferred alternative are projected to generate a large/huge amount of rock in excess of what is needed to construct the project. The proposed solution to the excess rock excavation is to waste the rock into marine waters. As a valuable National Forest Resource, utilization of a significant portion of the rock for applications throughout Southeast Alaska within the foreseeable future needs to be evaluated and considered. The Forest Service asks for more analysis and the development of alternative methods to better utilize valuable rock resources. For example, large solid rock will be needed in the foreseeable future in Yakutat for riprap as there is no apparent local source. Another example would be to stockpile rock for use as a durable wearing surface (hard rock in hot mix asphalt) for paving projects in Southeast Alaska in the foreseeable future. The Forest Service understands that there are costs associated with the handling and stockpiling of rock, but those costs can in large measure be recovered from reduced costs for future projects and with increased quality and durability of paving with durable rock in contrast to the rapid wear and failure of pavements made with soft aggregate. If this rock is not better utilized, other impacts and quarry activities in other locations will need to happen with a greater systems effect. Existing mining claims and private land holdings do provide opportunities along portions of the route for stockpiling rock.

With over 13 million cubic yards of rock required to construct the preferred alternative as outlined in Alternative 2 questions arose about where on the route the rock would come from. Perhaps a larger area of disturbance needs to be accounted for rock pits.

The Forest Service normally develops arterial road systems progressively starting with a pioneer road and over time increasing the standard of the road. The Draft SDEIS discusses the land base construction alternatives in terms of the "full build out" as is appropriate for determining environmental effects. Were the road construction alternatives to be implemented progressively, the full effects predicted for many resources would not occur for some time. It would be appropriate if staged or phased construction is being considered to discuss the scenarios and effects along with the cumulative effects. The staged or phased construction does allow for increased opportunities for rock conservation and utilization.

Chapter 3.1.1.1, Page 3-1 thru 3-3. Changes were made to the Old-Growth Habitat LUDs or Reserves (OGR) in the area north and west of Berners Bay (see Kensington Gold Project ROD, Appendix 1). These changes need to be included and evaluated.

Roadless as a Resource

The reviewers could not find a discussion of roadless status as a resource along with disclosure of affects. The Forest Service believes this is necessary. The Juneau Access IDT should use the Forest Service *Tongass Land Management Plan Revision; Supplemental Environmental Impact Statement (SEIS); Roadless Area Evaluation for Wilderness Recommendations* information including GIS mapping as a base. The *SEIS* documents are available at *http://www.tongass-seis.net/seis/index.html*. The IDT should identify key roadless values for each inventoried roadless area affected, display the effects of the new road corridors consistent with the *SEIS*, and then discuss/disclose the potential effects on key roadless values. Roadless is considered a resource that deserves consideration, especially since any of the land construction alternatives will make fundamental changes in roadless status and values. The changes in roadless resource conditions also need to be discussed in the cumulative effects section.

The document provides some baseline information regarding the existing recreation management (Recreation Opportunity Spectrum) in Technical Report F. However, the document fails to describe the direct impacts from changing the existing ROS from semi-primitive to another condition – most likely roaded natural – as a result of constructing one of the road alternatives.

South Sullivan River

The Sullivan River apparently was not evaluated for Wild, Scenic, and Recreation River suitability during Forest Planning. The Final document needs to indicate the eligibility for the upper reaches of the Sullivan River system that have not been fully evaluated. However, the road corridor would cross the River in the lower reaches, that have been developed by past activities, and clearly is not eligible. Make the case that the upper reaches would not be affected by the road across the lower reaches, except create possible easier access by recreationists.

Visual Quality

In section 4.3.3.5 it is noted a number of instances where the alternatives will not meet the adopted Visual Quality Objective, but there does not seem to be mitigation measures described that could be, or are being, used. It also fails to disclose what VQO the action is consistent with.

From Appendix G, Visual Resources Review Comments

Section 2.1.5.3 – last paragraph, 2nd sentence – It would be more accurate to state that Modification is the upper limit of desirable visual change in the foreground of the TUS LUD. Additional discussion about development within this LUD can be found in TLRMP.

Section 2.1.5.5 – Last paragraph, last sentence – TLRMP (4-76) states that Modification should be met in the foreground distance zone within one year.

Section 2.1.5.6 – 2nd paragraph – The Forest Service derives VQOs from LUDs and distance zones only – not VC and viewer concern as noted here. Also, LUDs are not derived from VQOs.

Section 3.1.1.1 – Links E20 – E28 – An interesting grouping, combining E-20 – E23 and E24 – E28 would be more accurate due to the steep rocky slopes of the Kakuhan Range (20-23) and the moderate tree covered hills of Pt. St. Mary area (24–28).

Section 3.4 – 3rd sentence – States "…and low lying mud flats that provide screening…" This could be re-written for clarity.

Section 3.5 – It would be more accurate to say a large portion of the study area has a VQO of PR, as a result of the LUD and distance zone.

Tables 11 & 17 – What is meant by NC? If this means that mitigation is required to meet VQO, then it should be stated so here.

Section 4.3/Figure 26 – It is stated here that the road meets TUS LUD VQO of Modification, but Table 11 shows a caveat (NC). Also, Table ES-2 shows Alternatives with 20 – 82 acres of "Very High Impact on Forest Service Land." It would seem likely that some form of mitigation will be required in these areas – where are mitigation measures discussed?

Road Standards

The Document and Appendices fail to disclose why the Juneau Access EIS uses an 11-foot lane width and a 4-foot width of shoulder when both Alaska State NHS and AASHTO standards are for a 12-foot lane width and a 6-foot width of shoulder. Given that the SDEIS indicates a desire to encourage RV, bicyclists, pedestrian, and other tourist traffic on the route, a wider lane and shoulder width would be more appropriate. In addition, the section of the road provided in the document indicates an 11' travel lane and 4' shoulders. Reference: From Juneau Access Improvements Technical Alignment Report 2.2 Design Exceptions.

Conditions of Rights of Way (for alternatives requiring Rights-of-Way)

The Forest Service has already indicated that it will require future access to the road at locations along the routes. These access points will be identified in any rights-of-way granted. The Forest Service expects that the road design will facilitate safe and efficient access to the adjacent National Forest System lands and that the final buildout of the highway will provide aprons or "pull outs" to make effective connections to the road. Several of these locations are itemized above.

Berners Bay Cabin

Since the start of the project there has been considerable discussion of the cabin and the potential effects in relationship to the preferred alternative. The most recent analysis of cabin use on Juneau Ranger District indicates that the conversion of the access from a water based to land/road based access will narrow the range of recreation cabin opportunities. The Juneau Ranger District distribution of recreation opportunities will best be served by movement of the Cabin to a different location with water based access. The Forest Service requests that the FSEIS note that movement as a mitigation of effects. Accordingly, the associated trail and parking areas will not be needed for cabin access.

Technical and Editorial Comments

Chapter 4.9.11 Pages 4-169 thru 4-170. Update discussion to show a Final SEIS/ROD for the Kensington Gold Project, dated December 2004.

Appendix D: Update 3.1.4.6 and 3.2.2.3.1 to indicate a Final SEIS? ROD for the Kensington Gold Project with a date of December 2004.

The Document and Appendices fail to disclose how the unit costs for road construction were developed. This is particularly noticeable in the following items, which are less than similar Forest Service (FS) unit costs for road construction projects using Davis Bacon wages.

- Item 203(2) Rock Excavation @ $6.25 per cubic yard.

- Item 603(1a) 24 inch Diameter Corrugated Steel Pipe @ $30.00 per linear foot.
- Item 603(1b) 48 inch diameter corrugated steel pipe @ $50.00 per linear foot.
- Item 611(1) Rip rap @ $15.00 per cubic yard.
- Unit costs from Appendix D Technical Alignment Report Engineers Estimate Page 1 of 2 for 71100 - Alt2, 2C, 2A, 2B, 3, 4B, and 4D dated 30 June 2004.

It is unclear from the document and appendices whether the cost estimates used Davis Bacon wage rates for developing the road construction cost estimates. Will the project be required to use Davis Bacon wage rates for the road construction projects?

From Juneau Access SDEIS – Appendix G, Visual Resources Review Comments
When using adopted Forest Service Visual Management System terminology within this document that it is all capitalized.

Section 2.1.3 – The first paragraph is awkwardly worded and not altogether accurate, the second sentence especially so. Not a fatal flaw, but there is room for improvement.

Section 2.1.4 – 3rd bullet - "Agency concerns for increased views from recreation areas" does not really do a good job describing a legitimate concern.

Section 2.1.4 – Bullets 7 – 10 - Are described as "issues" and are actually just viewpoints of some level of sensitivity.

Section 2.1.5.2.2 – 1st paragraph, last two sentences – Do not really relate to EVC and are not accurate in all cases.

Section 3.5.2 – For consistency's sake – why do bullets 1, 4 & 5 not also state "adjacent to the TUS LUD."?

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
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October 28, 2005

RE: Juneau Access Improvements
Project No. 71100

Ken Vaughan
Deputy Director, EAM
Alaska Region
USDA Forest Service
P. O. Box 21628
Juneau, AK 99802-1628

Dear Mr. Vaughan:

Thank you for the Forest Service's comments on the Supplemental Draft Environmental Impact Statement (EIS). The following is a response to those comments, and is based in part on discussions held on April 21, 2005 with representatives of Forest Service, the Alaska Department of Transportation and Public Facilities (DOT&PF), and the Federal Highway Administration (FHWA).

Purpose and Need Statement

The third element of the purpose and need statement, to reduce travel time, is not a surrogate for cost. Only in the user benefit analysis are travel times converted to a user cost. In the life cycle cost analysis travel times are not considered a cost; operating costs are costs incurred by the State, and net costs are operating costs minus revenues (fares). The Summary, Project Alternatives (Section 2), and Environmental Consequences (Section 4) all treat travel time independently from user costs or state costs, and present these times clearly. Reducing travel times does affect overall project costs, in terms of road construction or higher speed ferries. User costs are more directly related to state costs, because the higher the user fees, the lower the State's cost, unless the higher fares depress demand. The purpose and need statement does not prioritize or weight the elements, therefore reducing travel time is not presented as being more or less important than the other elements. Additional explanation of the relationship between the purpose and need elements has been added to Section 1.4 of the Final EIS.

Cumulative Effects Analysis

The cumulative effects analysis is based on FHWA guidance that states only reasonably foreseeable actions should be included in the analysis. Projects that are only conceptual and have

"Providing for the movement of people and goods and the delivery of state services."

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no funding, permits or detailed plans are not considered reasonably foreseeable; to include them in the analysis would be speculative. In that regard the cumulative effects analysis is similar to the Forest Service EIS for the Kensington Gold Project, and relies in part on its analysis of direct effect for that project. Based on discussion at our meeting, part of the perceived lack of a clear and compelling analysis was due to the many alternatives and no summary by alternative. The analysis has been amended to include a cumulative impact summary for each alternative.

The cumulative effects analysis specifically includes the impacts from the Kensington Gold Mine and the reasonably foreseeable elements of Goldbelt's Cascade Point development. The analysis does not include the land management impacts of the proposed Cape Fox Land Entitlement Adjustment Act because it is proposed legislation that has not been enacted and therefore it is not considered reasonably foreseeable.

The supplemental draft did not include impacts to the Forest Service Old Growth Reserve (OGR) system, as this was not raised during scoping and we have never had access to the actual reserve mapping. Based on the meeting discussion, we have combined the alignment information with OGR data from the Forest Service and have included an OGR impact analysis in the preliminary Final EIS.

At the meeting we also discussed the trails listed in your original letter. As agreed, we have included in the Final EIS the potential impacts of trails the Forest Service has indicated are reasonably foreseeable if a particular alternative is constructed.

Please note that the Supplemental Draft EIS did not state that future trails would require an "Environmental Assessment". It stated that "a separate environmental assessment would be completed by the USFS" but did not say what form the assessment would take. To remove any confusion the word "assessment" has been replaced with "analysis". We interpret the statement that "most likely these trails would be completed using a Categorical Exclusion" as an indication the Forest Service thinks there is very little likelihood of significant impacts and have considered that in our cumulative effects analysis.

Comparison of Alternatives (Alternative details)

Alternative 2B would have two intersections with the road from the Slate Cove dock to the Kensington mine at Jualin. Based on the topography in the area, we envision two three-way intersections (separated by a short highway segment common to both routes) with stop signs on the Jualin Road and free flowing traffic on the East Lynn Canal Highway. The first intersection could include a free right for northwest bound traffic turning onto the mine road. As with all such intersections, traffic movements would be monitored yearly to see if intersection improvements were warranted. The Alternative 2B description in Section 2 has been amended to include this information.

The maintenance station at Comet identified for the East Lynn Canal highway alternative would be located on Coeur property. DOT&PF has a verbal agreement with Coeur Alaska to acquire land and buildings at Comet if an East Lynn Canal highway alternative is selected. DOT&PF cannot acquire land with federal aid funds until after a Record of Decision, so no written agreement has been signed. Based on this plan, no additional land would be disturbed.

Information about the maintenance station has been added to the Section 2 alternative description.

Subsistence Uses

The amount of analysis devoted to subsistence was based in part on the level of concern indicated during 2003 scoping. Based on the analysis of existing information, including comments on the Supplemental Draft, we have concluded that none of the alternatives "would significantly restrict subsistence uses", the threshold stated in ANILCA. We believe that the public hearings held in Haines and Skagway during the comment period were a sufficient opportunity for subsistence users to comment on subsistence uses and potential impacts identified in the document. ANILCA identifies a requirement for a subsistence hearing in the vicinity of the area involved before allowing an action that would significantly restrict subsistence uses, not to determine if a significant restriction would occur. No Haines or Skagway subsistence user of Forest Service land indicated a problem with the data or analysis. The subsistence impact discussion of the preliminary Final EIS has been expanded and includes a determination by FHWA that no alternative is likely to significantly restrict subsistence uses.

Government to Government Consultations

The Supplemental Draft EIS does more than "give credit for many invitations to participate". Section 7.5 states that three separate written communications were sent to federally recognized tribes and Native Corporations, follow-up phone calls were made to all entities, and interviews were held with those entities that expressed further interest. These actions were consistent with FHWA guidelines for government to government consultation and Section 106 consultation. A reference has been added to Section 7.5. The letters included in the Supplemental Draft EIS were copies of ones sent to the Executive Director of the Sealaska Heritage Institute because only one letter from each distribution was printed to reduce repetition. Each Native organization on the distribution list, including all federally recognized tribes in the area, received an original individually addressed letter. Given your statement that it is not appropriate for a lead agency to limit the choices of a cooperating agency, you can appreciate that FHWA does not believe it is appropriate for a cooperating agency to dictate the manner of government to government consultation conducted by the lead federal agency.

Rock Utilization

The preferred alternative, Alternative 2B, would generate up to 7.5 million cubic yards of excavation, most of which would be rock. Embankment would absorb approximately 5.2 million cubic yards, resulting in excess rock in the amount of 2.3 million cubic yards. Of this amount, up to 900,000 cubic yards would be stockpiled near the Echo Cove end. This rock would be used for future projects in Juneau. Stockpiling greater quantities would involve hauling rock farther than 10 miles and additional stockpiling area. Barging rock to stockpile would involve trucking and handling it twice before it is handled and trucked again to its ultimate use location. Stockpiling costs would be prohibitive. The remaining 1.4 million cubic yards of excess rock would be generated in Lynn Canal between Level Point and the Katzehin River. Only Forest Service managed land is available in these areas.

Please note, as indicated above, Alternative 2B would generate 6.5 million cubic yards of rock. Also as discussed above, this alternative would require 5.2 million cubic yards of embankment. The 6.5 million cubic yards of rock is part of the total 7.5 million cubic yards of material that would be excavated. All of the 1 million cubic yards of unclassified material (non-rock) would be embanked as well as 4.2 million cubic yards of the rock, leaving 2.3 million cubic yards of excess rock. Because the project would generate excess excavation, new rock pits are not anticipated.

At this time DOT&PF does not envision construction of a pioneer road that is brought up to standard over time. While a pioneer road may be developed during construction to allow for movement of geotechnical survey equipment as well as construction equipment and materials, there is no plan to open a road segment to the public until it is developed to the standard identified in the EIS.

Road Standards

The highway segments of any alternative selected would be constructed according to the typical section in the EIS. This typical section has 11 foot wide travel lanes, 4 foot wide paved shoulders, and a minimum of 8 feet of traversable side slope (4:1 or flatter) on either side, except in guardrail areas. The lane width conforms to the appropriate American Association of State Highway and Transportation Officials (AASHTO) standard, which is also the Alaska National Highway System (NHS) standard. The shoulder width is an exception to the AASHTO standard (and therefore the Alaska NHS standard) of six feet, but follows the AASHTO recommendation for shoulder width to reduce construction impacts. The Final EIS cites the four-foot shoulder width as an exception to the ASSHTO standard.

The typical section for Juneau Access was established in late 1993 during the Reconnaissance Engineering Study. A four-foot shoulder was determined to be best suited for the rugged terrain. Cost was a consideration as well as the amount of use the shoulder would likely receive. The typical section also shows that widened shoulders would be created with excess material in upland areas. These widened areas, turnouts, and no parking signs in particular areas would minimize parking on the paved shoulders.

The Supplemental Draft EIS did not indicate a desire to encourage bicyclists and pedestrians; a more correct statement would be that the document explained how pedestrians and cyclists would be accommodated. Existing roads demonstrate the ability of the typical section to accommodate non-motorized traffic. The North Douglas Highway from Fish Creek Road to the boat ramp is the same width (11 foot lanes and 4 foot shoulders) and has traffic numbers (2003 ADT 750) higher than projections for the Alternative 2B highway (2008 ADT 380, 2038 ADT 670). The North Douglas highway segment accommodates fairly high levels of non-motorized use, particularly bicycles. Given the distance from residential areas, use by cyclists and pedestrians on the new highway would likely be less than on this North Douglas Highway segment.

Reducing the shoulder width as traffic and housing density drops is a standard practice. The shoulder on the North Douglas Highway is seven feet wide from the bridge to the Heliport. From the Heliport to Fish Creek Road the width is six feet; from Fish Creek Road it drops to four feet as described above. Glacier Highway will be similar to this pattern. The new Indian Point to

Point Louisa segment has shoulders that vary between six and eight feet. The older segment from Point Louisa to Tee Harbor has shoulders that vary from 5.5 to 2.5 feet, but has 12-foot lanes. Tee Harbor to Amalga Harbor is currently being reconstructed with 11-foot lanes and 6-foot shoulders. The second phase, from Amalga to Eagle Beach is planned for 11-foot lanes and 4-foot shoulders. The Eagle Beach to Echo Cove segment will be chip sealed with 2.5-foot shoulders this summer. Eventually it will be paved to match the highway to the south.

Roadless as a Resource

The Supplemental Draft EIS did not contain a section addressing Forest Service inventoried roadless areas because it is not an impact category normally evaluated in a FHWA EIS, and was not a specific issue raised during scoping or review of the preliminary Supplemental Draft EIS. The document does address impacts to remote areas in the Land and Resource Uses sections as well as the Visual Resource sections. Based on your concerns and the discussion at the meeting, we have added a section called Roadless as a Resource to the Land Use and Coastal Management Technical Report and each Land Use section of the preliminary Final EIS. This includes an explanation of the Forest Service inventoried roadless areas and an analysis of the potential impacts to these areas, based on Forest Service analysis methods.

Sullivan River

The preliminary Final EIS includes the information you provided on the eligibility status of the Sullivan in the Wild and Scenic Rivers section.

Visual Quality

Section 4.3.3.5, Consistency with USFS Visual Quality Objectives (VQO), has been revised in the preliminary Final EIS to make clearer that although the VQO of the Transportation and Utility Systems LUD is modification, the VQO of the adjacent LUD should be achieved to the extent feasible. The revision will include the mitigation measures to be used, and the VQO that will be achieved. With regard to the Tables (11 and 17) in Appendix G, the "NC" means that compatibility with the VQO of the adjacent LUD cannot be determined until final design. These areas will be further evaluated during final design and appropriate mitigation identified if feasible.

Right of Way Conditions

All pullouts indicated in the preliminary Final EIS would be located and constructed such that entering and exiting the pullout is safe for all highway users. Any additional pullouts identified in a right of way grant would be located and constructed in a similar manner after the appropriate environmental review.

Berners Bay Cabin

Apparently there has been some confusion within the Forest Service regarding the Section 4(f) applicability determination for the cabin at Berners Bay. As FHWA explained at the meeting, it is not a question of where the cabin would best meet the Juneau Ranger District's needs. While the Forest Service considers the cabin a moveable resource, Section 4(f) addresses the use of land. FHWA has determined that the cabin and use area around the cabin is a significant recreation facility and the alternatives that would pass behind this area would not use land from this facility. On August 27, 2004 the Forest Service concurred the cabin area is significant and a trail and parking area are desirable. At our meeting the Forest Service explained that it considers a road accessible cabin desirable, but is concerned about the loss of a water-access experience within the Juneau Ranger District. Based on this discussion DOT&PF and FHWA agreed to provide a trail to the existing cabin as an enhancement of an existing Section 4(f) resource, and provide a new water accessed cabin as a general mitigation for impacts to Berners Bay users desiring a remote, water access experience. The preliminary Final EIS includes commitments to provide handicap access to the existing cabin and to provide a new water access cabin.

Road Unit Costs

The unit costs for road segments of each alternative were based on 2002 and 2003 bids on federal aid projects in Alaska. In some instances costs were reduced based on the premise that a large project with higher unit quantities would attract larger contracting firms with resulting lower bids. Another factor that was contributed to lower unit costs was the absence of the need for any traffic control, utilities coordination, and weight restrictions. All of these can substantially affect unit costs. Updated estimates have been prepared for all reasonable alternatives, with a detailed explanation of the rationale for each major unit cost. The preliminary Final EIS includes updated initial construction costs for each reasonable alternative. All construction contracts would be funded with federal aid, requiring the payment of Davis Bacon wages.

Thank you for your comments. Your letter and this response will be included in the preliminary Final EIS. Please contact me if you have any questions.

Sincerely,

Reuben Yost
Special Projects Manager

cc: Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Susan Walker, NMFS
Tim Haugh, FHWA

1365

MEMORANDUM

STATE OF ALASKA
Department of Natural Resources
Office of Habitat Management and Permitting

ALASKA DOT & PF
MAR 21 2005
SPECIAL PROJECTS

TO:	Reuben Yost Project Manager ADOT&PF	DATE:	March 21, 2005
		FILE NO:	ADOT&PF Project Nº 71100 Federal Project Nº STP-000S (131)
THRU:	Jackie Timothy	TELEPHONE NO:	465-4287
FROM:	Carl Schrader CJ Habitat Biologist	SUBJECT:	Juneau Access Improvements - Supplemental Draft Environmental Impact Statement

The Office of Habitat Management and Permitting has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS) for the Juneau Access Improvements Project and provides the following comments with regard to impacts to fish and wildlife resources and habitats. The SDEIS assesses environmental impacts from a range of highway and ferry alternatives to improve surface transportation between Juneau, Haines and Skagway in Lynn Canal. Our comments include those submitted to us by the Alaska Department of Fish & Game (ADF&G) per a Memorandum of Understanding between DNR and ADF&G. Included in our comments are some recommended mitigation measures that we believe will be needed to address impacts resulting from the build alternatives.

Wildlife Management Authorities

The document correctly identifies the likely need for wildlife managers to adjust hunting and trapping season lengths, bag limits, and permit requirements to account for increased hunting and trapping pressure and mortality from habitat loss and collisions resulting from new roads (e.g. SDEIS 4-66, 4-103, 4-104, 4-143). However the SDEIS incorrectly attributes such management authority to ADF&G. The Alaska Board of Game, not ADF&G, sets season lengths, bag limits, and permit requirements. ADF&G does have authority to limit harvest by issuing emergency orders closing seasons. Much of the project area is on federal land where wildlife is also managed by the Federal Subsistence Board.

Tongass Old Growth Reserve (OGR) System

The SDEIS needs to consider effects of road-building alternatives in meeting the requirements of the Tongass Old Growth Reserve (OGR) system. The OGR system is the cornerstone of the wildlife conservation strategy outlined in the 1997 Tongass Land and Resource Management Plan (TLMP). This system consists of small (at least 1600 acres), medium (at least 10,000 acres) and large (at least 40,000 acres) OGRs with specific size, habitat composition, and spacing requirements connected by corridors of old-growth forest that allow for movement of old growth associated species among OGRs. OGRs can be comprised of lands in any non-development Land Use Designation. Although provisions for variances exist, TLMP requires that management of OGR lands should minimize building new roads or other development. The 1997 TLMP commits the Forest Service to work with ADF&G and the U. S. Fish & Wildlife Service to review the location, size, and suitability of OGRs during project-level planning. As part of the recent Kensington Gold Mine SEIS, the Small OGRs in VCU's 160, 190 and 200 were modified to bring them in compliance with TLMP requirements. The East Lynn Canal road corridor would cut through these OGRs, potentially compromising their value in protecting old growth dependant species. If the East Lynn Canal road alternative is selected, the USFS will need to again review these OGRs for compliance with TLMP requirements. *DOT&PF needs to coordinate with the Forest Service to determine any modifications to the project or to the OGRs needed to be consistent with the wildlife conservation goals set forth in TLMP. The impacts of road building and conservation measures to protect martens, bears and wolves should be considered in the context of the OGR system.*

Habitat Capability Index (HCI) Models

The SDEIS relies heavily on habitat capability model (HCI) results from the 1997 DEIS to assess impacts from road development on wildlife. These models are an appropriate tool for this analysis, provided the limitations of the models are acknowledged. The SDEIS identifies some of the limitations of the HCI models, and separately discusses many other impacts from a road, such as barriers to movements, collisions with automobiles, and indirect impacts. However, the extent to which HCI models include habitat fragmentation is not clear. *The EIS should clarify the degree to which habitat fragmentation resulting from a road is addressed by the Tongass HCI models.*

The use of appropriate inputs to these models is critical for the results to be valid. For example, the Tongass model for brown bears includes habitat capability values for each habitat type, but those values can be adjusted to incorporate effects of communities of different sizes, different types of roads, and the presence of remote camps and access points. Without knowing which values were given to each habitat type, or how other factors were incorporated, it is not possible to assess the validity of the model results. ADF&G did not request this during review of the Wildlife Technical Report, but *requests the opportunity to review the inputs (coding) used to run these models in order to validate the interpretation of the model results.*

Habitat Fragmentation

The SDEIS may underestimate the impacts of the road build options as a barrier to wildlife movement. For example, Section 4.3.15.3, paragraph 6 states that East Lynn Canal road alternatives would have little effect on movement of moose or mountain goats because moose readily cross roads, and goats are found primarily at higher elevations. Moose do readily cross roads. However, studies conducted by Carney and Robus (1997) and Coeur Alaska (2003) in the vicinity of Berners Bay show that goats cross the proposed road corridor to access winter habitat ands goats are frequently observed down to tidewater in upper Lynn Canal during winter. Therefore, *DOT&PF should consider that a road along East Lynn Canal could effect mountain goat movement between beach habitat and higher elevations.*

Bears move about the landscape to make use of seasonally available resources such as beach vegetation in the spring and salmon in the fall. Recent data from GPS collars on brown and black bears in Southeast Alaska shows that they often travel from low elevation coastal areas or salmon streams to high elevation avalanche slopes or forest one or more times per day. This could result in daily crossings of a road during some times of the year with increased risk of vehicle collisions, vulnerability to hunting, or limited access to resources. Salmon in Sawmill Creek are an important seasonal resource for bears in this area. Even though a bridge is proposed for this crossing, a road crossing the creek and the increased human activity in the area could impact bears access to salmon. *DOT&PF should consider the effects of a road on brown and black bears feeding on spawning salmon in Sawmill Creek.*

Percentage of Available Habitat Affected Underestimates Impacts

The SDEIS and appendices conclude that impacts to many species from habitat loss or disturbance from the build alternatives would be small because the loss or disturbance would only affect a small percentage of suitable habitat in the project area Section 4.3.15.3, para. 2). This approach does not consider that suitable habitat for a given species often varies seasonally, with low elevation habitats often disproportionately important, especially in winter. *DOT&PF should consider the amount of seasonally-important habitat impacted, such as access to the beach fringe for bears and low elevation winter habitat for mountain goats.*

Road Construction and Avalanche Control Impacts on Mountain Goats

Studies by Fox (1979), Schoen (1979) and Coeur Alaska (2003) have documented use of habitat along the road alignment and adjacent areas by mountain goats. During winter months goats along the East Lynn Canal road corridor and on adjacent steep wooded hillsides would be disturbed by noise-producing construction activities such as blasting, and from helicopters and explosive devices used for avalanche control. Disturbance to goats is particularly a concern during winter-early spring (approx. January 1 – April 30) when nannies are pregnant and energy reserves are at their lowest. At other times of the year goats are expected to be in the higher sub-alpine and alpine areas and would not be significantly affected by the project. *Impacts to goats from road construction activities could be mitigated by prohibiting construction activities during January 1- April 30.*

The SDEIS on page 4-66, paragraph 4 states that avalanche control activities would reduce goat mortality. However, impacts to goats from avalanche control are a concern, because goats are expected to be present in the area during avalanche control operations. It is not clear from the SDEIS how these impacts could be mitigated, or what the population-level impacts would be. It is difficult to accurately estimate impacts from avalanche control activities or to develop effective mitigation measures without a better understanding of winter habitat use along the proposed road corridor, and a better understanding of how goats react to disturbance. *We request that if a build alternative is selected, DOT&PF provide funding for ADF&G to conduct a study to document goat population levels, seasonal movements and winter habitat use. Results of this study would be used to develop mitigation strategies to address impacts from winter road construction, maintenance and avalanche control measures. The study should be conducted before, during and after road construction.*

Species Distribution

Wildlife Technical Report figures 3-1 through 3-3 showing species distribution should be revised to reflect that the lower elevation range for these species is saltwater. For more current information on species distribution contact Neil Barten at ADF&G (465-4265).

Martens

The Wildlife Technical Report, Section 3.3.3.3 states that martens are abundant throughout forested regions of Alaska, and that although population estimates are not available for the project area, they appear to be stable and common based on trapper interviews and harvest data. ADF&G recently completed density estimates for marten populations on eight study areas in Southeast Alaska and found them to be quite scarce in some areas. *Though martens are widely distributed, they are not necessarily abundant throughout forested portions of Alaska.*

Wolverines

During scoping meetings, resource agencies agreed on a list of representative wildlife species to be assessed in the SEIS. This species list included marten as representative of furbearers in the project area. Among furbearers, wolverines may be particularly susceptible to impacts because they are generally found in low densities, and harvest by trappers in the Berners Bay area is conspicuously higher than almost anywhere else in Alaska. Wolverines make use of seasonal runs of eulachon and salmon, and local populations would be more vulnerable to trapping if any of the East Lynn Canal road alternatives were built.

Demographic information and ecology of wolverines in coastal environments are virtually unknown. Wolverines are prized by trappers and hunters and could be disproportionately affected by greater access for hunting and trapping offered by any of the road build alternatives. *We would request that wolverines be added to the list of species (page 4-38, 2nd paragraph) potentially impacted by increased hunting and trapping. If the East Lynn Canal road build alternative were selected, ADF&G requests that prior to construction, funding be provided to conduct a study of wolverine ecology, reproduction, and survival to assess likely effects of the roads to be used to develop conservation measures.*

Wolves

Page 4-103, paragraph 5 states that the road may limit access to beaches and riparian areas along the alignment for wolves. *The EIS should describe the relative importance of beach habitat for wolves and determine what affects limiting access to these areas would have on the population.*

Moose

Page 4-39 paragraph 5 should clarify that the moose population on the east side of Lynn Canal is not limited to the head of Berners Bay, but that moose are found throughout forested habitat surrounding Berners Bay and north at least to Comet. Moose may be attracted to shrubs and other early successional vegetation maintained by mowing roadside vegetation, increasing the risk of vehicle collisions. *The EIS should identify mitigations to reduce this risk.*

Amphibians

The SDEIS concludes in Section 4.2.2.6 and elsewhere that road impacts from wetlands loss, habitat fragmentation, etc., are not expected to affect amphibian populations on an area-wide basis. This conclusion is based on the small percentage of wetland habitat that would be lost. Amphibian populations appear to be declining in the region and little is known about amphibian populations in the project area. Because roads can contribute to amphibian mortality through habitat loss, alteration, pollution, and vehicle collisions, this document should deal with the topic in greater detail. Any of the road-building options would cross low-elevation wetlands where amphibians are most likely to be found. *Prior to road construction wetlands should be surveyed for amphibians and appropriate measures prescribed to minimize effects on wetlands documented to support amphibian populations.*

Marine Mammals

The SDEIS assessment of impacts to seals and sea lions should include an assessment of impacts from marine terminal construction and ferry traffic to animals feeding and resting in Berners Bay. Seals and sea lions congregate in Berners Bay in large numbers, particularly during the eulachon and herring spawning period in April and May. This is a critical time of year for seals and sea lions as it occurs just prior to the pupping season. Vessel traffic could disrupt sea lions during this critical time of the year, particularly in Slate Creek Cove where cooperative feeding behavior has been documented. We are particularly concerned about the potential cumulative impacts in conjunction with the proposed Kensington Mine Project. The Kensington Mine Project would include marine terminals at Slate Creek Cove and Cascade Point with associated ferry and barge traffic. The U.S. Forest Service *Kensington Gold Project, Final Environmental Impact Statement,* December 2004 and NMFS March 18, 2005 *Endangered Species Act, Section 7 Consultation – Biological Opinion* should be consulted for background information and conservation recommendations to protect sea lions in Berners Bay.

Anadromous and Resident Fish Streams (Appendix P)

Dewey Creek is the outlet from Lower Dewey Lake, which supports brook trout, rainbow trout, and Dolly Varden char. This stream would be crossed by the East Lynn Canal road alternatives. *Dewey Creek should be included in Appendix P.*

Sturgill's Creek (Stream 58E) is identified in Appendix P as a Class III (not fish-bearing) stream. ADF&G documented brook trout and Dolly Varden in Sturgill's Creek during a survey conducted August 4, 2003. Brook trout were documented above and Dolly Varden below a presumed barrier to anadromous fish passage. *The classification of this stream should be changed from Class III to Class IIA.*

Pullen Creek (Stream No.115-34-10310) is not listed in Appendix P, but will likely be crossed to tie into Skagway. *This stream should be listed in Appendix P.*

Section 4.2 states "*The areas where the Antler and Berners/Lace rivers would be crossed are upstream, away from the mouth of the river, which is used by eulachon for spawning.*" This appears to contradict Appendix N, Attachment C page 16 that cites radio telemetry studies showing eulachon migrating up to 4 km up the Antler River.

Marine Fishery Resources

In general, we agree with the findings of the Essential Fish Habitat Assessment (Appendix N) that there would not be substantial adverse impacts to fish habitat from the project alternatives. The exception to this is the *potential for significant impacts to the depleted Lynn Canal herring stock from the ferry terminal at Sawmill Cove proposed under Alternatives 2A and 3.*

As discussed in the EFH Assessment Section 4.4.6.1 the Lynn Canal herring stock declined precipitously in the early 1980s and has not recovered. Various hypotheses have been proposed about why the stock has declined, but none have been substantiated by scientific analysis. The decline was likely the result of a combination of factors such as: over-fishing, disease, habitat degradation, water pollution, predation, and changes to oceanographic conditions. The reason the stock has not recovered is not known, but over-fishing is clearly no longer a factor as the commercial fishery has been closed since the early 1980s. Because the Lynn Canal herring stock is severely depressed, this stock is subject to increased vulnerability from impacts associated with any of these factors. As stated in the EFH Assessment, the stock may be particularly vulnerable to impacts to spawning habitat. We believe that to promote recovery of this stock it is critical to minimize disturbance and degradation of the remnant spawning habitat utilized in Berners Bay. Because the Sawmill Cove ferry terminal would be located in center of important herring spawning habitat, we believe that without substantial additional mitigation measures, construction and operation of a ferry terminal at this location could have significant adverse impacts to this depleted stock.

State and federal agencies are in the final stages of permitting a similar ferry terminal at nearby Cascade Point in Berners Bay that would support the Kensington Mine Project. A substantial amount of information has been generated during the review for that project regarding the status of the Lynn Canal herring stock, its regional ecological importance and vulnerability, and potential adverse impacts to spawning habitat. In the March 2005 *Endangered Species Act, Section 7 Consultation – Biological Opinion* NMFS identifies the importance of the Lynn Canal herring stock as a prey base for sea lions, and proposes conservation recommendations to protect spawning habitat in Berners Bay. DNR has proposed mitigation measures for the Cascade Point terminal that would likely also be required for a terminal at Sawmill Cove. Mitigation measures focus on restrictions to construction and operations during the spawning period. Proposed mitigation measures include the following:

Construction Impacts: Construction of the marine facilities at Sawmill Cove would have short-term adverse impacts on herring spawning and rearing habitat. Increased turbidity is expected from dredging and filling, and there will be short-term loss of spawning habitat through dredging of the boat basin and filling for the breakwater. *To minimize construction impacts, in-water construction activities would be prohibited during the period when pre-spawning adult herring are in Berners Bay through the time most herring larvae would be dispersed from the area - March 15 through June 30.*

Operational Impacts: The most likely impacts to herring would result from operation of the marine terminal during the spawning period. Disturbance from vessel noise, lights, and other sources could discourage herring from utilizing spawning habitat in the vicinity of Sawmill Cove. Fuel spills and sedimentation from vessel operations could impact survival of herring spawn. The following mitigation measures would minimize potential impacts from operation of the terminal on herring at Sawmill Cove and nearby areas. These restrictions are consistent with the State's approach to mitigating impacts to herring from similar operations such as log transfer facilities.

Vessel operations from the Sawmill Cove terminal would be prohibited from the time pre-spawning aggregations are observed near Sawmill Cove until spawning has been completed as determined by the Alaska Department of Fish & Game (typically 2 weeks).

Fueling of vessels at the Sawmill Cover terminal would be prohibited from the time pre-spawning aggregations of herring are observed near Sawmill Cove until the herring eggs have hatched as determined by the Alaska Department of Fish & Game (typically 4-5 weeks).

A monitoring program would be required to assess the long-term effects of construction and operation of the marine terminal on herring habitat and populations. The monitoring program would include the following elements:

- *PAH concentrations in the water column, sediments and mussel tissue*
- *Colonization and spawning habitat value of the constructed breakwater*
- *Monitoring and documentation of herring spawning location and spawn biomass*

Indirect and Cumulative Effects (Appendix U)

The report correctly identifies that Alternatives 2, 2A, 2B, 2C and 3 will improve access to more remote areas of Lynn Canal for recreational use, which would increase hunting and sport fishing opportunities. Increased road access to Juneau would also likely increase fishing on streams on the current Juneau road system. While increased hunting and fishing opportunities would be a benefit to the public, increased harvest pressure on fish and wildlife resources will place additional burdens on agencies to manage these resources. For example, ADF&G conducts surveys to monitor fish populations on a regular basis in order to manage fishery resources to assure a sustained yield. Because streams in the project area currently receive little recreational use they are not currently being surveyed. Additional fishing pressure on these streams will require additional staff resources to monitor and manage these streams. *The EIS should consider the need for additional funds to manage the sport fisheries impacted by improved access.*

Additional sport fishing activity would necessitate improvements to parking areas and access trails at both freshwater access areas and saltwater boat launching facilities. Saltwater boat launch ramps on the Juneau road system are at their maximum capacity for parking, and public land with good sites for additional launch ramps is very limited. *The EIS should consider the need for additional funds to develop and maintain fishing access facilities.*

Wildlife will be particularly vulnerable to indirect and cumulative impacts from increased harvest pressure in combination with habitat loss, collisions, barriers to movement, etc. Accurate information on species distribution and population levels is needed for ADF&G to manage these resources. In recent years declining budgets have forced ADF&G to reduce or eliminate survey effort for some wildlife species. *If either of the road-build alternatives are selected, additional funding would be needed for ADF&G to assess population status and effects of increased harvest on wildlife populations before, during, and for some years after road construction is complete.* These studies **would not be needed to complete the EIS**, but would be needed to manage direct and indirect impacts to wildlife. Species of particular concern to ADF&G include mountain goats, moose, brown bears, and wolverines.

Information on abundance, movements, and habitat use by moose and goats could be gathered through repeated aerial surveys and telemetry studies using GPS collars. Estimates of numbers of brown bears using salmon streams that are crossed by a road both before and after construction could be accomplished by a protocol for hair snare surveys along salmon spawning streams recently developed on Chichagof Island. Movement patterns could be documented using GPS collars already owned by ADF&G.

Section 3.4.1 Mining - should consider the rock and gravel quarry (Echo Cove Materials Source) currently under permit review by the City and Borough of Juneau. Channel Construction has applied for a Conditional Use Permit to construct this new facility on Goldbelt, Inc. lands adjacent to the existing highway at Echo Cove. ADF&G has raised concerns over potential impacts of this facility to mountain goat use of winter habitat.

The potential for habitat damage from illegal or irresponsible use of Off Road Vehicles (ORVs) should be assessed, and a strategy identified to manage these impacts.

Literature Cited

Fox, J.L. 1979. Site selection by mountain goats wintering in forest habitat. Final report for cooperative agreement 153 between USDA Forest Service Pacific Northwest Research Station and University of Washington College of Forest Resources. 15 pp.

Schoen, J.W. and M.D. Kirchhoff. 1982. Habitat use by mountain goats in Southeast Alaska. Federal aid wildlife research final report, projects W-17-10, W-17-11, W-21-1, and W-21-2. 67 pp.

Carney B.L. and M.H. Robus. 1997. Effects of Kensington Mine development on black bears and mountain goats. Wildlife baseline studies and monitoring plan. Draft report. Alaska Department of Fish and Game, Division of Wildlife Conservation, Douglas, AK. 29 pages.

Coeur Alaska. 2003. Cascade Point Access Road 2003 Multi-Season Wildlife Monitoring Study. Final Report. 48 pages.

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MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Design and Engineering Services - Southeast Region
Special Projects

TO:	Carl Schrader Habitat Biologist Office of Habitat Management And Permitting Department of Natural Resources	DATE: TELEPHONE: FAX:	December 23, 2005 465-1774 465-2016
FROM:	Reuben Yost *Reuben Yost* Project Manager	SUBJECT:	Juneau Access Improvements Project Number 71100 Response to SDEIS Comments

Thank you for your comments on the Supplemental Draft Environmental Impact Statement (EIS). The following is a response to your comments.

Wildlife Management Authorities

The Final EIS includes the clarification you provided with regard to control of harvest levels. It states that the Department of Fish and Game (ADF&G) has authority to limit harvests only by issuing emergency orders to close seasons, and normally manages wildlife populations by making recommendations to the Alaska Board of Game. It identifies the Board as having the authority to set season lengths, bag limits, permit requirements and determine the areas where different regulations will apply. The Final EIS also includes the information that on federal land wildlife is also managed by the Federal Subsistence Board.

Tongass Old Growth Reserve System

The Supplemental Draft EIS did not address the US Forest Service (USFS) Old Growth Reserve (OGR) system because it was not identified as an issue during scoping or in agency review comments on the draft Wildlife Technical Report or the preliminary Supplemental Draft EIS. The Supplemental Draft EIS did identify impacts to old growth forest as well as the Land Use Designations (LUDs) of the Tongass Land and Resource Management Plan (TLMP). TLMP indicates that old growth in the Tongass is mapped and managed in large, medium, and small OGRs, but in the Juneau Access project area only small reserves in the vicinity of Kensington/Jualin holdings have been mapped and designated as Old-Growth Habitat. The other non-development LUDs in the project area are presumed to function as medium/and or large OGRs but have not actually been mapped. In fact there is little high volume old growth north of Berners Bay except for stands in the Katzehin River drainage beginning two miles from the potential highway alignment. We have worked with the USFS to identify impacts to

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the three Old Growth Habitat LUDs in the project area, which function as small OGRs for the affected Value Comparison Units. These LUDs surround the Kensington Gold Project (KGP) and were recently adjusted to account for impacts from the KGP. The Juneau Access Final EIS addresses the potential impacts to OGRs of each alternative as well as impacts to high volume old growth in non-development LUDs. Based on the impacts identified, the USFS would adjust the boundaries of the OGRs in consultation with ADF&G and the US Fish and Wildlife Service.

Habitat Capability Index Models

It would be more accurate to state that the Supplemental Draft EIS relied heavily on the Habitat Capability Index Models for quantification of the potential impact of road development on the four indicator species selected in 1996. The Supplemental Draft EIS also contains a qualitative analysis for those same four species as well as ten additional species selected by resource agencies during 2003 scoping. The results of the HCI modeling have been retained because the consensus among resource agencies during 2003 scoping was that this data is still useful. We have added information to the Final EIS that further explains the assumptions used in the HCIs and the limitations to these models.

The HCI models address the effects of habitat fragmentation to the extent that habitat fragmentation was considered to be an issue for each species. For instance, for brown bears, thought to be reluctant to cross even low volume roads, habitat suitability was reduced by 60 percent within one mile of a highway alignment and 30 percent from one to five miles. (The potential for bridges to serve as wildlife underpasses was not included in the model; that and the fact that wildlife biologists have pointed out that brown bears in Alaska do regularly cross roads may mean the model overstates the extent of fragmentation.) For black bears, thought to be less sensitive to roads, habitat suitability within two miles of a highway alignment was reduced by 20 percent. The same reduction was used for mountain goats. For marten, habitat fragmentation was not an issue; however, habitat suitability was reduced by 80 percent within two miles of a highway alignment based on the access that would be created for trappers. The Final EIS includes information on how the HCI models addressed habitat fragmentation.

The Habitat Suitability Index Values and the habitat reduction percentages used in the HCI modeling were those developed by ADF&G and the USFS in 1988 with some revisions in 1993. Modeling inputs and results were reviewed by both agencies informally in 1996 and as part of the Draft EIS in 1997. These values and factors are in Appendix A of the 1997 Wildlife Technical Report, which has been supplied to ADF&G for review.

Habitat Fragmentation

We have revised the EIS wildlife sections and the Wildlife Technical Report to reflect the information that goats are known to travel to tidewater and would have to cross the highway to do so if a highway alternative is constructed. The Final EIS also quantifies the narrow band of habitat that would be potentially fragmented, and discusses the relative importance of this habitat. While goats are often sighted during winter at tidewater or rocky benches overlooking the water, access to estuarine habitat is not considered critical for goats.

The EIS and the Wildlife Technical Report address the potential for habitat fragmentation for both brown and black bears, and discuss that the greater the extent bears cross a highway, the greater the likelihood of vehicle collisions. We have added specific information to the Wildlife Technical Report about the potential impact to bears using the Sawmill Creek estuary. The crossing of Sawmill Creek for Alternatives 2B, 3, 4B, and 4D would be approximately 1,200 feet upstream of the mouth, in an area where the stream is about 15 feet wide. The bridge crossing would provide a corridor for bears to cross under the highway. Nevertheless the highway could have an impact on bears in this area, and the Final EIS acknowledges that.

Percentage of Available Habitat Affected Underestimates Impacts

Although the Supplemental Draft EIS and the Wildlife Technical Report did not address seasonal habitat impacts for all species discussed, this does not mean that habitat impacts were underestimated, particularly for the two species mentioned, bears and goats. The Final EIS provides more information on the potential impacts to the most important seasonal habitat for species considered. The conclusion about overall impact has not changed; however, because the amount of this habitat directly affected (for instance low elevation winter habitat) would still be a small percentage of the available habitat. With regard to brown bears, the bulk of the estimated impact, up to a 26 percent reduction in habitat capacity, is precisely because of indirect impacts to seasonally important habitat, including estuarine meadows. For goats some low elevation habitat would be impacted, but the overall impact is predicted to be less, because the alignment is closer to the shore in many of the areas of goat winter habitat, and access to estuarine areas is not critical.

Road Construction and Avalanche Control Impacts on Goats

The Final EIS addresses potential impacts to goats during construction, particularly during the months of January through April when goats are likely to be in the vicinity of construction and pregnant nannies are most susceptible to disturbance. While DOT&PF would avoid construction activity during this time period in areas likely to be used by goats to the extent practicable, it cannot agree to eliminate construction during this period. Construction would be constrained by the need to comply with regulations protecting Steller sea lions, bald eagles and anadromous streams. Agreeing to a blanket prohibition for a third of the year to avoid impacts to a currently hunted game species would not be a prudent use of public resources. While construction may occur during this period, it is unlikely that more than one area of goat winter habitat would be affected in any given year. DOT&PF has funded a study of goat population levels, including seasonal movements and winter habitat use. In addition to providing information important for goat management, this monitoring may provide information about specific winter habitat areas and time periods that should be avoided.

The Supplemental Draft EIS did not state that avalanche control would reduce goat mortality. It stated that regular maintenance of avalanche chutes would reduce the frequency at which debris from larger avalanches would reach forested areas. This would in turn reduce the likelihood of goat mortality from these larger events. We do not know the extent to which goats are injured or killed by naturally occurring avalanches, but creating smaller avalanches that stay within the established debris field means goats in the trees near the debris field would be unaffected by the sliding snow. It is unlikely that goats would be within the established slide area, but that could be ascertained by the control crew in the helicopter before dropping a charge.

A close examination of the avalanche risk management program may reduce the level of concern over impacts to goats. Avalanche control (blasting) often receives the most attention, but it is not the main part of the program. Avalanche forecasting and highway closures during periods of avalanche danger are a larger part of the program. Most of the estimated highway closure time for East Lynn Canal alternatives is for periods of time when unstable snow will either avalanche naturally or stabilize. Because helicopter bombing missions cannot be carried out during snowstorms or high winds, generally only the tail end of a closure would involve avalanche control. The Snow Avalanche Report estimates there will be an average of 2.5 helicopter bombing missions per year.

Although there are 36 avalanche paths that cross the Alternative 2B East Lynn Canal highway alignment, not all of them would need explosive delivery every mission. The avalanche control plan predicts that 16 would require detonation less than once a year, and 12 of these would have an average frequency of one mission every ten years. The bulk of the avalanche hazard (AHI 176.6-95% of total) is associated with 10 avalanches clustered in 5 avalanche zones. These avalanches would require detonation during each mission. Helicopter blasting would involve dropping from one to fifteen 50-pound satchel charges in the starting zones at the top of the avalanche chutes. A 50-pound charge produces a momentary peak sound level of 95 dBA at 665 feet. Most starting zones are a greater distance above the low elevation forest where goats would be expected during heavy snow months.

Both helicopter noise and blasting have the potential to disturb goats in forested habitat adjacent to avalanche chutes. Based on the fact that only two to three helicopter explosive missions would be conducted each year in a small number of discrete areas, we believe it is reasonable to conclude that this activity is unlikely to have a population level impact on mountain goats in the Lynn Canal area. We do agree it is difficult to predict impacts to individual goats at specific locations, and therefore agree that the goat monitoring surveys may provide useful information to develop modifications to construction and avalanche control plans. However, the primary purpose of this study remains that of providing necessary population management information as mitigation for the impact of increased access for hunters and other highway generated indirect effects.

Species Distribution and Marten Abundance

The addendum to the Wildlife Technical Report provides clarification as to the shoreward extent of habitat for marten, wolf, goat and bear (and revised figures), based upon the most recent publications and information from Neil Barton, the ADF&G Area Wildlife Biologist. The addendum also provides additional information on marten abundance based on ADF&G population estimates.

Wolverines

Although the primary analysis for furbearers continues to be for marten, wolverines have been added to the list of species potentially impacted by increased hunting and trapping that may result from improved access. Wolverines have also been added to the goat, moose, and bear monitoring studies to be funded by DOT&PF as mitigation for indirect impacts to wildlife.

Wolves and Moose

The Wildlife Technical Report has been amended to include more information on the use of beach habitat by wolves, the extent to which access to this habitat will be limited, and the potential impacts of any limitations. This information has been summarized in the appropriate sections of the Final EIS.

Figure 3-22 in the Supplemental Draft EIS shows moose range extending beyond Comet to Independence Lake. This figure is in the Final EIS along with clarifying language regarding their range. A commitment has been added to Section 5.8 to seed and fertilize all disturbed areas within expected moose range with low growing grasses to discourage the growth of moose browse such as willow or alder. That measure, underpasses, and warning signs would help to reduce the risk of vehicle collisions.

Amphibians

Two measures have been included in the Final EIS to reduce the likelihood of impacts to amphibians. Minor alignment changes have been made to avoid all mapped palustrine emergent wetlands. In most cases this resulted in a similar or smaller impact to adjacent forested wetlands. Avoiding palustrine emergent wetlands as well as ponds would greatly reduce the risk of impacting amphibian breeding areas. A pre-construction survey of the alignment in wetland areas would be conducted to confirm that no amphibian ponds were missed during wetland mapping.

Marine Mammals

Information has been added to the Steller Sea Lion Technical Report and the appropriate sections of the Final EIS regarding the potential for vessel traffic to disturb sea lions (and to a lesser extent seals) in Berners Bay during spring herring and eulachon spawning. Alternatives with a Berners Bay terminal (3, 4B, 4D) would all introduce ferry traffic in the Bay, with Alternative 3 having the greatest potential effect by virtue of its higher number of sailings and cross bay traffic into Slate Cove. Alternatives 4B and 4D would have fewer sailings and would only use a Berners Bay terminal from approximately May 15 to October 15, which would reduce the likelihood of impacting sea lions. Alternative 2B would not construct a ferry terminal in Berners Bay. The only potential ferry traffic in Berners Bay associated with this alternative is occasional shuttle trips to the Coeur operated Slate Cove Terminal during winter when the highway is closed for avalanche control and in summer when interim ferry service may be initiated while construction continues past Slate Cove. Alternative 2B would reduce the overall amount of vessel traffic and potential cumulative impacts to marine mammals in Berners Bay by removing the need to shuttle Kensington mine workers to Slate Cove.

Anadromous and Resident Fish Streams

Thank you for the information regarding the presence of brook trout and Dolly Varden char in Sturgill's Creek. The Anadromous and Resident Fish Streams Technical Report (ARFSTR) has been revised to include this information and list this creek as a Class IIA stream. Sturgill's Creek would not be crossed by any of the alternatives currently under consideration.

The report will also be revised to correct the inaccuracy concerning the location of the Antler River crossing relative to eulachon spawning activity. The crossing is not above the area used by eulachon, but the crossing has been modified to avoid placing piers in the channel identified as a main spawning reach.

Dewey Creek was not listed in the technical report because it essentially no longer exists below Dewey Lake. Dewey Creek is shown on most maps, including USGS quad maps, as both the inlet and outlet of a small lake (now known as "the reservoir") northwest of Dewey Lake. However, a hydroelectric project started in the early 1900's dammed the outlet of this lake such that all flow down the ravine to Skagway is in flume pipes. A dam at the south end of Dewey Lake diverts water from Dewey Lake into the reservoir and flume pipes. Both dams have an overflow spillway but approximately 30 years ago a lower spillway was built adjacent to the southern dam such that any overflow goes down Sturgill's Creek.

Information about Pullen Creek, an anadromous fish stream in Skagway, has been included in the addendum to the ARFSTR. Neither Pullen nor Dewey Creek would be affected by any of the reasonable alternatives.

Marine Fisheries Resources

The Final EIS has been revised to include the continued concern expressed by resource agencies regarding the potential impact of construction and operation of a Berners Bay ferry terminal on the herring stock In Lynn Canal. The Final EIS reflects your stated need for restrictions on construction and operation to mitigate this potential impact. The preferred alternative does not include a ferry terminal in Berners Bay. If an alternative is selected with a Berners Bay terminal, no in-water work would occur between March 15 and June 30, and a long term monitoring program would be instituted to assess impacts of the terminal. Alternatives 4B and 4D would only have summertime operations from a Berners Bay terminal. If either of these alternatives was selected, seasonal operation would not commerce until after the herring spawning period. If Alternative 3 were to be selected, further discussions on other potential operational mitigation would be necessary. This alternative is based on year round operation of shuttle service from the east side of Berners Bay, and a two week prohibition would be difficult to incorporate into an operational plan.

Indirect and Cumulative Effects

The Final EIS addresses the impacts you identified. Please note that with regard to additional recreational fishing pressure on streams in the project area, we have identified in the Final EIS the need for additional ADF&G stream surveys but not specifically identified the need for additional funds. All streams in the area, including those that currently contribute to existing commercial fisheries, would be much more accessible for surveys, reducing the costs of existing surveys. Also, to the extent increased fishing effort in the project area is by local residents, it may be offset by decreased effort elsewhere. Increased effort by new visitors would generate additional license revenue.

The Final EIS addresses the increased use of fishing access areas and boat ramps that would result from additional visitors to the area. Increased use could result in the need for expanded facilities. This increased use would be part of an overall increase in use of public infrastructure and would require the appropriate borough, state and federal planning teams to manage for this growth. The USFS manages almost all of the undeveloped land in the project area. No new boat ramps are currently envisioned; parking pullouts (including those from which the USFS believes trails are reasonably foreseeable) would be constructed at the same time as highway construction. Many existing facilities that could be impacted by additional users are owned by the City and Borough of Juneau (CBJ). The Final EIS estimates the increased revenue the CBJ would receive from the projected increase in visitors and visitor spending. The State of Alaska cannot compel local actions, but it is reasonable to project that some of this revenue increase would be used to fund necessary infrastructure improvements.

DOT&PF and FHWA recognize the need for detailed wildlife population and habitat use data in order to revise management of these populations to reflect habitat loss and change in use, loss due to vehicle collisions, and hunting, both legal and illegal. DOT&PF has committed to funding detailed population studies, with animal collaring, for goats, moose, brown bears, and wolverine as mitigation for indirect impacts to wildlife. These multi-year studies are estimated to cost approximately 1.7 million dollars and are in addition to wildlife underpasses and wetland fee in lieu mitigation. The mountain goat study is a joint Juneau Access Improvements and Kensington Gold Project study and began this year in order to maximize information crossover between the Kensington study area and East Lynn Canal Highway study areas.

The Cumulative Impacts Analysis (Section 4.9) in the Final EIS includes the recently permitted Channel Construction quarry on Goldbelt, Inc. land at Echo Cove. The primary potential cumulative impact, raised as a concern by ADF&G, is disturbance of over-wintering goats in the immediate vicinity by quarry activities, particularly blasting. The CBJ Conditional Use Permit prohibits quarry operation from January 1 to April 30 to address this concern. Use of the planned Channel Construction pit by the Juneau Access project is unlikely, as the highway segment from Echo Cove to Sawmill Cove (Alternatives 3, 4B and 4D) and north to the Antler River (2B) would generate more material than required. Use of the existing Goldbelt quarry is likely to be limited to storage of excess rock, as DOT&PF has committed to stockpiling excess rock for use on other projects.

The potential for habitat damage from unauthorized off road vehicles (ORVs) has been added to the Final EIS, particularly in regards to indirect impacts to wetlands. This damage tends to be greatest in wetland areas, as riders tend to go off roads or designated trails where there is an absence of heavy vegetation, and emergent wetlands often provide travel corridors although they are highly susceptible to erosion. Identification of a strategy to prevent impacts and address unpreventable impacts would primarily be the responsibility of the land manager. On the east side of Lynn Canal, this would be the USFS, with a few areas of exception. DOT&PF has revised the East Lynn Canal Highway alignment in the Berners Bay area to make access to estuarine emergent wetlands more difficult. The alignment has also been moved completely out of palustrine emergent wetlands to avoid potential impacts to amphibians. This change would also help to protect against ORV impacts.

Again, thank you for your review comments. Your letter and this response will be printed in the Public and Agency Coordination section of the Final EIS.

cc: Tim Haugh, FHWA
Cooperating agency representatives

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I362

March 25, 2005

Reply to
Attn. Of: ETPA-087

Ref: 92-091-FHW

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ALASKA DOT & PF
MAR 29 2005
SPECIAL PROJECTS
Received by fax 3-25-05

Dear Mr. Haugh and Mr.Yost:

The U.S. Environmental Protection Agency (EPA), Region 10, has reviewed the **Juneau Access Improvements Project Supplemental Draft Environmental Impact Statement (SDEIS)** (CEQ No. 050028). These comments are provided in accordance with our responsibilities and authorities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), the Clean Water Act, and as a Cooperating Agency. The SDEIS evaluates the environmental impacts associated with surface transportation improvements to and from Juneau within the Lynn Canal corridor. Alternative 2 (East Lynn Canal Highway with Katzehin Ferry Terminal) has been identified as the lead agencies' preferred alternative.

EPA commends FHWA and ADOT&PF for reevaluating the Juneau Access Improvements Project through this SDEIS, and providing the public with an opportunity to review and comment on the lead agencies' preferred alternative (Alternative 2). The SDEIS incorporates improvements to Alternative 2, such as relocating the bridge crossing to avoid estuarine wetlands in Berners Bay, shifting the road alignment between Slate Cove and Comet Beach to avoid bald eagle nests, and requiring bridge crossings over anadromous fish streams. We appreciate the inclusion of proposed project mitigation measures and commitments to the SDEIS (Section 5) which was not part of the 1997 Draft EIS.

We support an alternative that provides safe, reliable, all-season surface access to and from Juneau and that represents the least environmentally damaging practicable alternative (LEDPA). The Clean Water Act §404(b)(1) Guidelines require, in part, that *no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem.* We are concerned that the SDEIS contains insufficient information to demonstrate that the preferred alternative is the least environmentally damaging practicable alternative in compliance with the Section 404(b)(1) Guidelines. EPA recommends that the Final EIS include a preliminary 404(b)(1) evaluation so that the public can review and comment on it prior to publication of the Record of Decision (ROD). A preliminary 404(b)(1) evaluation would assist in streamlining the 404 permitting process. In addition, the Final EIS should propose compensatory mitigation for any unavoidable impacts to the aquatic environment.

We believe that the Auke Bay ferry alternatives (1, 4A and 4C) most effectively avoid and minimize potential adverse environmental impacts. However, if these alternatives do not fulfill the purpose and need of this action, then we support Alternative 2B, as EPA's preferred alternative, with the following mitigation measures: (1) move the Katzehin ferry terminal south of the Katzehin River Delta; (2) remove the road segment north of the Katzehin River; and (3) remove the bridge over the Katzehin River. In our opinion, this variation on Alternative 2B would result in substantially less adverse environmental impact on the aquatic ecosystem than Alternative 2 by avoiding the Katzehin River Delta. We believe that such a revised alternative would meet the purpose and need, and significantly control costs and environmental impacts of the project.

Based on our review of the SDEIS, EPA has assigned a rating of "EO-2" (Environmental Objections - Insufficient Information) to the Juneau Access Improvements Project SDEIS. Please find enclosed detailed written comments that provide the basis for our rating (Enclosure 1), and a copy of the EIS rating system criteria used in conducting our environmental review (Enclosure 2). This rating and a summary of our comments will be published in the *Federal Register*.

EPA appreciates the opportunity to review and provide comments on the Juneau Access Improvements Project SDEIS. As a cooperating agency, EPA is committed to working closely and collaboratively with the FHWA and ADOT&PF to resolve our outstanding concerns and issues regarding this project. In particular, we want to offer our technical assistance in developing the preliminary 404(b)(1) evaluation and compensatory mitigation package. We request that the lead agencies engage the cooperating agencies in an interdisciplinary approach to jointly identify the environmentally preferable alternative and the preferred alternative prior to publishing the Final EIS. If you have any questions regarding our comments, please do not hesitate to contact Teena Reichgott, Manager of the NEPA Review Unit at (206) 553-1601.

Sincerely,

Richard B. Parkin

for Michelle Pirzadeh, Director
Office of Ecosystems, Tribal and Public Affairs

Enclosures

ENCLOSURE 1

EPA REGION 10 COMMENTS ON THE JUNEAU ACCESS IMPROVEMENTS PROJECT SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT MARCH 25, 2005

As part of our independent review responsibilities pursuant to Clean Air Act §309 and our *Policies and Procedures for the Review of Federal Actions Impacting the Environment (1984)*, EPA has developed a set of criteria for rating Draft EISs. These criteria include the environmental impact of the action (agency preferred alternative) and the adequacy of the EIS. Our EIS rating system criteria provide a basis upon which EPA makes recommendations to the lead agency for improving the draft. For the Juneau Access Improvements Project SDEIS, EPA has assigned a rating of "EO-2" (Environmental Objections – Insufficient Information). The following represents the basis for our rating.

I. ENVIRONMENTAL IMPACT OF THE ACTION (ALTERNATIVE 2)

Lead Agencies' Preferred Alternative (Alternative 2). EPA has assigned a rating of "EO" (Environmental Objections) to the environmental impact of the action (Alternative 2 - East Lynn Canal Highway with Katzehin Ferry Terminal) as described in Section 2.3.2 of the SDEIS. Alternative 2 includes construction of a 69-mile long, two lane highway from the Glacier Highway/Echo Cove boat launch area, around Berners Bay and along the east side of Lynn Canal/Taiya Inlet to the City of Skagway. A ferry terminal would be constructed north of the Katzehin River Delta, and operation of the *M/V Aurora* would change to shuttle service between Katzehin and the Lutak Ferry Terminal in Haines. Mainline ferry service would end at Auke Bay in Juneau, and the existing Haines/Skagway shuttle would be discontinued.

EPA's Preferred Alternative. Based on the information in the SDEIS, EPA believes that the Auke Bay ferry alternatives (1, 4A and 4C) most effectively avoid and minimize potential adverse environmental impacts. However, if these alternatives do not fulfill the purpose and need of this action, then we recommend Alternative 2B, as EPA's preferred alternative, with the following mitigation measures: (1) move the Katzehin ferry terminal south of the Katzehin River Delta; (2) remove the road segment north of the Katzehin River; and (3) remove the bridge over the Katzehin River. Compared to Alternative 2, this variation on Alternative 2B would result in substantially less adverse environmental impact on the aquatic ecosystem by avoiding the Katzehin River Delta. Furthermore, this modified Alternative 2B would accomplish the following:

- meet most, if not all of the purpose and need elements;
- save approximately $40 million in construction costs;
- avoid 4.7 acres of estuarine wetlands;
- avoid excess wasting of 4.4 million cubic yards of material into Taiya Inlet;
- avoid 13 stream crossings, including one anadromous river;
- avoid approximately 180 acres of terrestrial habitat for brown and black bear, marten and mountain goat;

1

- avoid 12 eagle nests;
- avoid 25 avalanche paths and two landslide areas; and
- fairly balance the economic and social interests of Juneau, Haines and Skagway (without favoring the interests of one community at the expense of another).

Environmental Impacts to Aquatic Resources. According to the SDEIS, Alternative 2 would have the greatest impact on wetland and marine sites of the alternatives analyzed (Appendix O; Page 4-3). Construction of the East Lynn Canal Highway and the Katzehin Ferry Terminal, as proposed under this alternative, would require placement of fill into approximately 124 acres of wetlands and marine intertidal/subtidal areas (essential fish habitat). Of this total, 87 acres are palustrine forested wetlands, 6 acres are estuarine emergent wetlands, and 31 acres are marine intertidal/subtidal habitat areas.

Berners Bay is considered to be the most sensitive environmental area of concern with substantial resource and recreational values. There are serious public concerns that increased access to Berners Bay would alter recreation and resource values and change the character of the area (1997 DEIS; Page S-3). Development activities that occur along the shoreline or in the nearshore region of Berners Bay could result in the additional loss or degradation of historically documented Pacific herring spawning habitat, which is now limited to the eastern shoreline between Echo Cove and the Antler River. Since the 1970s, the documented herring spawning locations along Lynn Canal have been reduced to less than 50 percent.[1] In addition, large and historic eulachon smelt spawning runs have occurred in and around the Antler and Berners/Lace Rivers – pre-spawning adult eulachon aggregate above the sand flats at the mouth of these rivers (Page 5-6).

Pacific herring and eulachon populations are recognized as critical links in the marine food web and are viewed as necessary to ensure healthy populations of predatory fish, marine birds and mammals.[1] They are also important for personal use and subsistence harvesters. Steller sea lions (threatened) and humpback whales (endangered) congregate and feed with the spring spawning of herring and eulachon. Steller sea lions use a seasonal haulout at Point St. Mary. A designated Critical Habitat for Steller sea lion haulout is located at Gran Point.

Alternative 2 would result in the direct loss and fragmentation of 649 acres of terrestrial habitat. Approximately 60 percent (382 acres) are identified as old growth forest habitat (Page 4-62). Improving access to the Lynn Canal area would contribute to adverse indirect and cumulative impacts resulting from habitat loss, fragmentation, and degradation; traffic disturbance and disruption of wildlife corridors; and mortality caused by collisions with vehicles. Physical features of the highway such as steep embankments or retaining walls may function as a barrier to movement of some species and may fragment their habitat by limiting their ability to use all of their range (Page 4-64).

In Berners Bay, between the Lace and Antler Rivers, brown bears move seasonally between higher elevation dens and lower elevation foraging habitat – beach fringe and estuary habitats.

1 G.D. Williams, O'Rourke L.K. and Pearson, W.H. (October 2004). Reconnaissance Evaluation of Ecological Effects to Forage Fish Populations Associated with the Juneau Access Improvements Project. Battelle Marine Science Laboratory, Sequim, Washington.

The loss of habitat could reduce the reproductive success or survival of some bears. The Habitat Capability Index (HCI) model results predicted that the East Lynn Canal Highway would decrease brown bear habitat capability by 29 percent compared to present conditions (Page 4-65).

The proposed Katzehin Ferry Terminal located north of the Katzehin River Delta would directly impact approximately 9 acres of marine intertidal/subtidal areas – dredging for a mooring basin (5 acres) and filling for a breakwater and the terminal (4 acres) (Page 5-8). According to the SDEIS, the Katzehin River and delta is scenic, pristine, and has no evidence of past mining or timber harvest activities. The U.S. Forest Service has recommended that the Katzehin River be designated as a component of the National Wild and Scenic River System, except for the lower two miles to accommodate a future highway. The Katzehin River outwash plain is quite extensive and provides important functions for surface hydrological control, riparian support, and wildlife habitat (Page 4-56). At the location of the ferry terminal, the intertidal rocky shore is rated high for fish and wildlife habitat. In Spring, eulachon spawn in the sandy substrates of the delta where Steller sea lions and harbor seals congregate to feed.

EPA's analysis of the relative environmental impact of the alternatives considered in detail focuses on the preferred alternative and whether any of the other alternatives would have less adverse environmental impact on the aquatic ecosystem. To focus the analysis, the ten alternatives can be grouped into three categories, as follows:

1. the Auke Bay ferry alternatives (1, 4A and 4C);
2. the Berners Bay ferry alternatives (2A, 3, 4B and 4D); and
3. the remaining road alternatives (2, 2B and 2C).

In general, the Auke Bay ferry alternatives would have less adverse impact than the preferred alternative because they avoid the significant freshwater and terrestrial impacts of Alternative 2, and their marine impacts are not significant. Conversely, the Berners Bay ferry alternatives would result in more adverse environmental impact than the preferred alternative due to the direct, indirect and cumulative effects of ferry terminals and ferry operations on humpback whales (endangered), Steller sea lions (threatened) and Pacific herring (suppressed stock).

Of the remaining road alternatives, Alternative 2B would have less adverse impact than the preferred alternative because the road would end at the Katzehin ferry terminal, thereby avoiding all of the impacts between the Katzehin Delta and Skagway. Likewise, Alternative 2C would have less adverse impact than the preferred alternative because it does not include the Katzehin ferry terminal.

As the above analysis demonstrates, there are several alternatives (1, 2B, 2C, 4A and 4C) that would have less adverse environmental impact than the lead agencies' preferred alternative (Alternative 2). EPA requests a meeting with the lead agencies and other interested cooperating agencies to discuss this issue in more detail prior to the publication of the Final EIS.

<u>Actions to Minimize Potential Adverse Impacts</u>. The following actions should be incorporated into the lead agencies' preferred alternative:

- Reduce excess rock quantities by incorporating raised grades, flattened slopes, tunnel segments, other beneficial uses, and identifying community needs, wherever practicable;
- Identify and evaluate methods to minimize impacts of excess material wasting into the marine intertidal and subtidal area – such as spreading the material, controlling the speed of discharge, etc.
- Incorporate wildlife corridor crossings along the highway in areas of known wildlife movement and use. In particular, Berners Bay is used by brown bears, black bears, and moose;

Clean Water Act Section 404(b)(1) Guidelines. We are concerned that the SDEIS contains insufficient information to demonstrate that Alternative 2 is the LEDPA in compliance with the Section 404(b)(1) Guidelines of the Clean Water Act. Therefore, EPA recommends that the Final EIS include a preliminary 404(b)(1) evaluation so that the public can review and comment on it prior to publication of the Record of Decision (ROD). A preliminary 404(b)(1) evaluation would also assist in streamlining the 404 permitting process.

Purpose and Need. The Juneau Access Improvements Project Purpose and Need statement includes consideration of "reducing state costs and user costs for transportation in the Lynn Canal corridor." EPA understands that these are important criteria that will be used in selecting the agency preferred alternative. However, as part of our 404(b)(1) evaluation, EPA will consider other factors, in addition to cost, to determine the Least Environmentally Damaging Practicable Alternative (LEDPA). The Guidelines state that *an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.*

Least Environmentally Damaging Practicable Alternative (LEDPA). The Guidelines require, in part, that *no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem* (see 40 CFR §230.10(a)). LEDPA establishes two requirements. One requirement addresses the practicability of alternatives and the other requirement addresses the relative environmental impact of alternatives.

Based on the information in the SDEIS, EPA is unable to discern whether any of the action alternatives are "practicable" under the 404(b)(1) Guidelines. Thus, the Final EIS should clearly evaluate and document the practicability of each alternative to aid in the section 404(b)(1) analysis of all alternatives. Once a practicability determination has been reached, the Agencies will be in better position to determine the LEDPA based on environmental impacts and additional measures needed to avoid and minimize impacts to aquatic resources.

Compensatory Mitigation. The Final EIS should include proposed measures to compensate for the unavoidable impacts to waters of the United States, including wetlands, resulting from the preferred alternative. EPA requests that the lead agencies organize a meeting with interested cooperating agencies to identify and discuss possible options for compensatory mitigation.

Consistency with the Tongass Land Management Plan. Under the preferred alternative, approximately 90 percent of the highway alignment is within Inventoried Roadless Areas on the Tongass National Forest (TNF). The Tongass Land Management Plan (TLMP) includes forest-

4

wide standards and guidelines and area-specific Land Use Designations (LUD). The northwest side of Berners Bay has two areas designated as Old Growth Habitat LUD, located both east and west of Slate Cove. An additional area of Old Growth Habitat LUD occurs along East Lynn Canal (midway between Comet and Met Point). In addition, TLMP provides standards and guidelines for Beach and Estuary Fringe. The beach fringe is an area of approximately 1,000-feet slope distance inland from mean high tide around all marine coastlines. Estuary fringe is an area of approximately 1,000-feet slope distance around all identified estuaries. These ecological areas are critical elements of the conservation strategy for TNF. Roads are generally inconsistent with the management objectives for these areas, unless no feasible alternative is available. The proposed highway ROW along East Lynn Canal may not be consistent with these standards and guidelines for Old Growth Habitat and Beach and Estuary Fringe. EPA recommends that the proposed highway alignment along East Lynn Canal avoid the Old Growth Habitat LUD, wherever feasible, but especially in areas around Berners Bay and the Katzehin River Delta.

II. ADEQUACY OF THE SUPPLEMENTAL DRAFT EIS

The Juneau Access Improvements Project SDEIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment. EPA has assigned a rating of "2" (Insufficient Information) to the adequacy of the SDEIS. As indicated above, we have identified a reasonably available alternative that is within the spectrum of alternatives analyzed in the SDEIS, which could reduce the environmental impacts of the proposal. We have identified additional information, data, analyses, or discussion that should be included in the Final EIS to meet the requirements of Clean Water Act §404:

Hydrological Studies for Bridge and Culvert Designs. EPA recommends that site specific hydrological information and analysis be included in the Final EIS for the Lace/Berners, Antler/Gilkey, and Katzehin in order to ensure proper design of the bridge crossings. This information may include, but not be limited to, the following: estimates of peak discharge, flow velocities and patterns; channel stability; sediment and bed load transport; flooding regime (50-year to 100-year flood frequency and magnitude); cross-section profiles of channel morphology and water surface elevations, etc. Hydrological information for smaller stream crossings should be included to determine the adequacy of culverts to maintain cross draining.

Temporary Construction Camp, Material Source Sites, and Staging Areas. Identify locations and area (acres) for temporary construction camp, material source sites, waste sites, and staging areas, including sites for storage, rock crushing, other material processing equipment, and truck turnaround areas. The location of material source sites should be identified, including quantity of materials (cubic yards).

Monitoring and Adaptive Management. Monitoring is important to assess the accuracy of predictions of effects and to ensure the success of mitigations. In addition, monitoring provides the means to identify the need for modifying (increasing or decreasing) mitigation. Adaptive management provides the flexible program for achieving these changes to mitigation. The Final EIS should include a section that describes all of the proposed monitoring that would be necessary to implement the preferred alternative.

Field Verification of Wetland Acreage Estimates. According to the SDEIS, of the 116 wetland sites potentially impacted, 51 sites were field checked. This represents approximately 67 percent of the wetland acreage potentially impacted (Page 3-43). EPA recommends that the other wetlands sites be field verified and the wetland estimates adjusted as appropriate.

Indirect and Cumulative Impacts. The SDEIS has identified the potential types of impacts (direct and indirect) to physical, biological, and social resources from the preferred alternative. However, the Draft EIS does not assess the magnitude and significance of the cumulative environmental consequences of past, present, and reasonably foreseeable future actions. The cumulative impacts analysis for the Juneau Access Improvement Project EIS should be consistent with Council of Environmental Quality (CEQ) Guidance, *Considering Cumulative Effects Under the National Environmental Policy Act (1997).* The CEQ Guidance provides examples of how to characterize cumulative impacts: (1) categorizing the magnitude and significance of effects to resources into a set of classes (e.g., high, medium, and low) and (2) using best professional judgment. Such a classification system could be used in the Final EIS as the basis for focusing agency efforts on mitigation and monitoring for those resources where the cumulative impacts may be considered "high" or above the level of significance. Significance thresholds should be estimated for the resource categories evaluated. For example, the Habitat Capability Index (HCI) model results for the 1997 DEIS predicted that an East Lynn Canal Highway would decrease brown bear habitat capability by 29 percent compared to present conditions. For marten, the HCI model results predict habitat decrease of 38 percent. The Final EIS should indicate whether these HCI thresholds represent a "significant" impact to brown bear and marten, or determine appropriate thresholds when the impact to these resources may be significant. Quantitative "significance thresholds" could include the National Ambient Air Quality Standards (NAAQS), which are concentrations known to cause significant human health or other environmental effects. The Alaska Water Quality Standards should serve as thresholds for evaluating water quality impacts in the project study corridor.

III. Specific Comments on the SDEIS

Summary (Page S-13). EPA has reviewed Appendix K (Hydrology and Water Quality Technical Report), which refers to EPA's National Pollutant Discharge Elimination System (NPDES) permit requirements under Clean Water Act §402, including the requirement for authorization under the NPDES General Permit (GP) for storm water construction activities. The Final EIS should include this permit under the heading "Federal Actions Necessary."

Appendix K. The Final EIS should include any research or monitoring studies on whether ADOT&PF's best management practices (BMPs) are effective in protecting water quality, especially with respect to preventing erosion and controlling sediments. The Final EIS should note whether any such research or effectiveness monitoring was conducted in Alaska. Any conclusions in the Final EIS about BMP effectiveness should be supported by valid research or monitoring studies. In the absence of such research or monitoring, the Final EIS should reflect the degree of scientific uncertainty.

Water Quality Impacts. EPA recommends that the Final EIS and Appendix K assess potential water quality impacts resulting from the release of ferry fuel into waters of the United States due to incomplete combustion. In particular, for each ferry type (i.e., mainline vessel, conventional monohull shuttle and fast vehicle ferry), the following should be addressed in the Final EIS:

- How much diesel fuel is combusted (e.g., converted to energy for ferry operations or emitted into the air)?
- How much fuel is released to waters of the United States due to incomplete combustion (i.e., chronic releases incidental to normal operations, as opposed to acute fuel spills)?
- What are the direct, indirect and cumulative impacts of such releases?

ENCLOSURE 2

U.S. Environmental Protection Agency Rating System for
Draft Environmental Impact Statements
Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonaby available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
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October 28, 2005

RE: Juneau Access Improvements
Project Number 71100

Mark Jen
U.S. Environmental Protection Agency (EPA)
222 W. 7th Avenue, Room 537 (#19)
Anchorage, AK 99513

Dear Mr. Jen:

Thank you for your agency's comments in response to the Supplemental Draft Environmental Impact Statement (EIS) prepared by the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA). As you are aware, Alternatives 2, 2A, and 2C have been eliminated from the range of reasonable alternatives and are not being evaluated further. Therefore, the following is a response to your comments that pertain to the remaining reasonable alternatives.

Preferred Alternative Identified in the Final EIS

The Final EIS identifies Alternative 2B as the preferred alternative. This alternative was chosen after careful consideration of information in the Supplemental Draft EIS and comments received. As explained in the preliminary Final EIS, alternatives that would construct a highway to Skagway have been dropped from the range of reasonable alternatives. This action was taken because FHWA determined that these alternatives would require land within the Skagway and White Pass District National Historic Landmark protected by Section 4(f) of the Transportation Act. Of the remaining alternatives, Alternative 2B best addresses the five elements of the purpose and need while minimizing impacts to the extent practicable.

Several changes have been incorporated in the preliminary design of this alternative to address concerns raised in your letter and by others. The alignment and toe of slope have been altered in the area north and south of the Katzehin River to avoid all but 0.2 acres of estuarine emergent wetland. The alignment from Echo Cove to Cascade Point now incorporates the existing road to minimize wetland impacts. The alignment from Cascade Point to Point Sherman has been revised to avoid all palustrine emergent wetlands. The crossings of the Antler and Lace rivers have been adjusted to avoid documented eulachon spawning habitat and to provide greater separation from estuarine emergent wetlands. In addition to bridge extensions to provide for

"Providing for the movement of people and goods and the delivery of state services."

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wildlife movements along waterbodies, two wildlife underpass bridges have been added over identified high use bear trails.

Other actions to minimize adverse impacts would be evaluated further during permitting and final design. The Final EIS contains a commitment to minimize sidecasting by stockpiling material as well as raising grades and flattening slopes in non-jurisdictional areas. Exact locations and methods for sidecasting would also be developed during design to minimize impacts.

EPA's Preferred Alternative

DOT&PF has analyzed the modification to Alternative 2B suggested by your agency. A ferry terminal south of the Katzehin is not practicable for several reasons. The prevalent storm wind and wave direction is from the southeast. The upland areas of the delta provide protection to the shore immediately to the north. The shoreline south of the Katzehin River is completely exposed to the southeast. The uplands of the delta also provide a degree of protection from the constant deposition of glacial silt from the Katzehin River. The five-fathom contour extends more than a mile offshore on the south side of the river. To construct a terminal there, extensive dredging would be required initially, and maintenance dredging would be required periodically.

The Katzehin Terminal location was also chosen for its proximity to Haines and Skagway. Siting a terminal south of the Katzehin River would add at least four miles of travel distance to both communities. This would negatively impact the alternative's ability to meet purpose and need. It would reduce the number of shuttle trips that could be made on an eight-hour shift from four to three for Haines and from three to two for Skagway. Round trips to Haines and Skagway from the Katzehin would increase by more than one half-hour. Larger boats or longer operating hours would be needed to achieve the necessary capacity. Either change would involve higher operating costs which would mean higher user costs and greater state funding. Longer loading times (for larger boats) and travel times as well as higher user costs would tend to decrease the very demand we are trying to accommodate.

As discussed above, Alternative 2B has been revised to address your concern regarding fill of estuarine wetlands north of the Katzehin River. The alignment has been moved uphill and slopes steepened to avoid all but one isolated area (0.2 ac) of estuarine wetland. This is at a location where a steep cliff and an eagle nest tree prevent moving out of the intertidal area.

Environmental Impacts to Aquatic Areas

Alternative 2B would fill approximately 69 acres of forested wetlands, 0.7 acre of palustrine scrub/shrub, and 0.2 acre of estuarine emergent. Approximately 32 acres of unvegetated intertidal areas would be filled, and 4.4 acres of silty substrate subtidal area would be dredged. About 1.4 million yards of rock would be sidecast into steep subtidal areas. Herring spawning habitat would be avoided. The main eulachon spawning channel in the Antler River would be clear spanned; the only impacts to other river channels would be concrete bridge piers placed at least 130 feet apart and a rock fill approach on the south side of the Katzehin River. All other stream banks would not be impacted. All anadromous fish streams other than the Antler, Lace and Katzehin would be clear spanned.

Alternative 2B would impact about 428 acres of terrestrial habitat, including about 286 acres of old growth forest. In addition to direct habitat loss, this alternative would fragment habitat for those species unable or unwilling to cross the highway. Another major indirect impact would be the increase access for hunters, trappers, and other recreaters. The Habitat Capability Index models estimate there could be a 26 percent reduction in habitat capability for brown bear, a 6 percent reduction for black bear, a 32 percent reduction for marten, and 0.4 percent reduction for goats. (These estimates were prepared for the 1997 alignment which did not include wildlife underpasses.)

Alternative 2B would pass within 100 meters of 45 identified eagle nest trees. An additional 43 nests would be within one half mile. Alternative 2B would pass through designated Steller sea lion critical habitat at Gran Point and also pass behind an identified sea lion haulout at Met Point. The alignment has been developed to avoid adverse impacts to the haulouts. The National Marine Fisheries Service has concurred that Alternative 2B would not be likely to adversely affect Steller sea lions or adversely modify critical habitat if agreed upon measures are implemented as part of the project.

Mitigation Including Compensation

Alternative 2B includes many measures to avoid and minimize adverse impacts. The preliminary Final EIS includes a draft mitigation plan detailing avoidance, minimization and other mitigation measures. The biggest concerns regarding wildlife impacts centered on habitat fragmentation and the indirect impact of increased access for hunters and trappers. DOT&PF proposes to address the issue of habitat fragmentation by extending bridges to act as wildlife underpasses and adding two bridges (on land) to provide underpasses at identified wildlife corridors. DOT&PF has committed to funding detailed multiyear monitoring studies for goat, bear, moose and wolverine to insure that wildlife managers have sufficient data to maintain viable populations. The goat study has already begun. Based on the assessment of habitat impacts and the collection of data via collaring, hair snares, and overflights, population impacts would be limited to reductions in the harvestable surplus.

Mitigation for wetland impacts would be separate from wildlife monitoring. Due to the absence of viable restoration or creation opportunities onsite, compensatory mitigation would be directed at improving and/or protecting threatened wetland and upland habitat in the project vicinity. If appropriate projects or parcels are not available at the time the 404 permits are issued, fee in lieu compensatory payments would be made to an agreed upon non-governmental organization for future purchase of threatened habitat.

Clean Water Act Section 404(b)(1) Guidelines

The Supplemental Draft EIS did not contain a preliminary 404(b)(1) evaluation because we believed it would be premature prior to review of comments from the public and agencies. The preferred alternative identified in the Supplemental Draft EIS was a preliminary preferred alternative. The preliminary Final EIS includes a draft 404(b)(1) analysis that concludes the new preferred alternative, 2B, is the least environmentally damaging practicable alternative. We agree that Alternatives 4A and 4C are less environmentally damaging but they do not sufficiently meet the purpose and need of the project. Neither of these alternatives sufficiently increases the frequency and opportunity to travel, or come close to meeting the actual demand in the corridor. Neither alternative reduces travel time; Alternative 4C reduces user costs but increases travel time over the No Action Alternative.

Consistency with the Tongass Land and Resource Management Plan (TLMP)

Alternative 2B is generally consistent with TLMP, because the highway would be within an identified Proposed State Road corridor that would become a Transportation and Utility Systems Land Use Designation (LUD) upon construction. The Supplemental Draft EIS identified the extent to which each alternative would impact old growth forest, beach fringe and estuary fringe. Given the topography of the project area, in many locations it is not feasible to avoid beach and estuary fringe. Also, in some locations moving away from the shoreline avoids or reduces fringe impacts but increases impacts to old growth forest and other important habitats. The Final EIS includes an analysis of impacts to inventoried roadless areas and old growth reserves. It is not possible to avoid passing through the three Old Growth Habitat LUDs that serve as small old growth reserves in the Comet/Kensington/Jualin area. The preliminary Final EIS indicates the extent of old growth forest that would be lost and the acreage within old growth reserves that would be lost or segmented. If Alternative 2B is selected in the Record of Decision, the Forest Service would work with the Alaska Department of Fish and Game and the US Fish and Wildlife Service to adjust the boundaries as deemed necessary. These boundary changes would be minor amendments to TLMP.

Adequacy of the Supplemental Draft EIS

The Final EIS identifies a new preferred alternative and contains additional information on why other reasonable alternatives with less environmental impacts are not practicable. We have also added information with regard to wetland impacts, bridges, monitoring commitments, and cumulative impacts. In some cases the information you recommend including in the Final EIS is not normally developed until final design, and is not necessary to access impacts and select an alternative.

<u>Hydrological Studies for Bridge and Culvert Designs</u>: Basic hydrologic information for major crossings was developed in 1994 and presented in the Hydraulics Report appended to the project Reconnaissance Engineering Report. Preliminary bridge designs are based on this information. Additional analysis would be done during final design. The existing level of information is sufficient to assess the impact of bridges. All anadromous fish streams other than the Antler, Lace, and Katzehin rivers would be clear spanned, with clearances well above the 100 year flood. Bridges over the Lace, Antler and Katzehin would have bridge girders with a 20 foot clearance above the bank height, placed on pilings spaced 130 feet or greater. Except at the south side of the Katzehin River, no fill would encroach on the banks; neither fish passage, flood capacity, or channel characteristics would be changed. Hydraulic requirements of culverts in non fish bearing streams would be sized during final design to adequately accommodate 50 year flood flows. The sizes of culverts in perennial and intermittent drainages will be specified in the Section 404 permit, based on hydraulic analysis.

Temporary Construction Camps, Material Source Sites, and Staging Areas: The preliminary Final EIS identifies probable construction camps at the existing Comet facility and at the Katzehin ferry terminal site. No other temporary construction camps are anticipated. Most equipment staging, truck turnarounds, and material storage would occur within the project footprint. Marine access sites would be planned to utilize marine fill locations. The Slate Cove terminal being built by Coeur Alaska for the Kensington Gold Project would likely be used as transfer point for construction material and equipment. Other sites may be desired by the contractor based on his plan of attack, but these cannot be identified now, are likely to be few in number, and are not necessary to assess overall impacts. Any additional marine access points or activities in wetlands or other waters of the US would require modification of Section 10 and Section 404 permits and would be reviewed by resource agencies.

The project would generate excess rock, so materials sites would not be necessary. The project would be located primarily on National Forest lands, so waste material would be placed on the side slopes in non wetland areas rather than in separate waste sites. Excess rock would that could not be economically hauled to the project termini (approximately 1.4 million cubic yards) would be sidecast as discussed in the EIS and permit application.

Monitoring and Adaptive Management: Chapter 5 of the preliminary Final EIS describes the proposed mitigation and other commitments made for this project. The last section of the chapter is a proposed mitigation plan for the preferred alternative. This plan includes all the monitoring that DOT has committed to implementing before, during, and after project construction. Some of this monitoring to is confirm avoidance of impacts, some is to facilitate wildlife management to reduce overall level of impact, and some may provide information to reduce impacts on latter phases of construction.

Field Verification of Wetland Acreage Estimates:
As a part of 2003 scoping, the areas to be field verified during wetlands assessments were identified by resource agency representatives, including EPA, during a May 29, 2003 meeting scheduled specifically for that purpose. Areas were selected based upon agency concerns for potentially high value wetlands that might have been missed in the 1994 fieldwork. The areas identified for additional fieldwork on the east side of Lynn Canal were Berners Bay and the Katzehin River area. The bulk of the wetlands identified from the National Wetlands Inventory and verified by checking recent aerial photographs (rather than field verification) are in two locations: Echo Cove to Cascade Point and Slate Cove to Sherman Point. The wetlands in the first group of 10 wetland areas were field verified for the Cascade Point Road project, and represent only one acre of proposed fill. The second group of 17 wetlands are largely palustrian emergent wetlands that are easily identified on aerial photographs. Only one of them, a forested wetland (1220-1) would be impacted by 1.8 acres of fill. For the preferred alternative, all but four acres of the 70 acres of fill would be in areas that were field verified.

Indirect and Cumulative impacts: Your request that the cumulative impact analysis assess the significance of cumulative impacts is counter to FHWA guidance which specifically directs that the term significance not be used in an EIS (FHWA Technical Advisory T6640.8A). Determining the significance of cumulative impacts in an Environmental Assessment is critical, as it is the basis for a Finding of No Significant Impact or a decision to prepare an EIS. An EIS is prepared because significant impacts would occur with some or all of the alternatives;

determinations of significance have no relevance. The nature and degree of impacts, whether significant or not, must be evaluated, and any adverse impact may be mitigated if feasible.

Mitigation is being considered based on the magnitude and importance of the impact, whether direct, indirect, or cumulative, as commented on by the public and cooperating agencies. For two of the examples cited, brown bear and marten, the cumulative impacts would be of a magnitude that warrants mitigation and agencies have identified feasible measures. For brown bear, this would be in the form of wildlife underpasses and population monitoring. For marten the cumulative impact would be almost completely from increased access for hunters and trappers; the most effective mitigation would be through regulatory action by the Board of Game. The air and water quality standards cited are being used to evaluate impacts to these resources. The preliminary Final EIS has a revised cumulative impact analysis and provides a summary of cumulative impacts for each alternative.

Specific Comments on the SDEIS

Summary: The Federal Actions Necessary part of the preliminary Final EIS includes authorization for discharge of storm water during construction under the NPDES General Permit for Alaska, as does the Permits and Approvals section for each alternative. These sections identify the Alaska Department of Environmental Conservation as the agency that reviews the contractor's Stormwater Pollution Prevention Plan (SWPPP) as required by the General Permit.

Appendix K: The preliminary Final EIS includes an explanation in the Construction Hydrology and Water Quality section explaining that the primary responsibility for ensuring the SWPPP is effective in controlling erosion and preventing sediment from entering waters of the US is shared jointly by the contractor and DOT&PF. The explanation includes information on inspection, revision, and record keeping requirements. There has been no scientific monitoring of BMP effectiveness on DOT&PF projects. Field visits by EPA and ADEC are relatively infrequent and are often conducted only when there has been a report by another agency or private party of a potential violation. Both FHWA and DOT&PF emphasize the importance of avoiding impacts to water quality during construction. There have been no citations for General Permit violations by DOT&PF on Southeast Region construction projects since the beginning of NPDES stormwater discharge permitting.

Water Quality Impacts: The preliminary Final EIS contains information in the Hydrology and Water Quality subsections of each alternative section and the Cumulative Impacts section regarding water quality impacts from ferries. The focus of these sections is on potential discharge of sewage and acute discharge of fuel from accidents. Although the fast vehicle ferries have higher efficiency engines due to their turbochargers, and therefore produce less soot, none of the ferries in the existing fleet or proposed in alternatives would have chronic fuel releases to waters of the US. The primary result of incomplete combustion in diesel engines is the production of carbon monoxide and soot (carbon). Both of these emissions are released to air, from stacks approximately 50 feet above the water. Some carbon settles in the water, but a negligible amount of fuel (hydrocarbon chains) is released to water.

Again, thank you from your comments on the Supplemental Draft EIS.

Sincerely,

Reuben Yost
Special Projects Manager

cc: Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS
Tim Haugh, FHWA

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, DC 20240

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SPECIAL PROJECTS

Mr. Reuben Yost
Project Manager
Alaska Department of Transportation
and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Dear Mr. Yost:

This letter is in response to the request for the U.S. Department of the Interior's (Department) comments on the Supplemental Draft Environmental Impact Statement (SDEIS)/Section 4(f) Evaluation for the **Juneau Access Improvements Project** in the Lynn Canal/Taiya Inlet Corridor between Juneau and Haines/Skagway, City and Borough of Juneau.

PRELIMINARY SECTION 4(f) EVALUATION COMMENTS:

General Comments:

At this time, the Federal Highway Administration (FHWA) has not made a determination as to the applicability of Section 4(f) of the Department of Transportation Act to the Skagway and White Pass District National Historical Landmark (NHL). The proposed road project Alternatives 2, 2A, and 2C are located within the boundaries of the NHL. As indicated in the evaluation, a determination of the applicability of 4(f) to the lands in the NHL that would be crossed by these alternatives will be made at the conclusion of consultations with the National Park Service (NPS) and State Historic Preservation Offices. The Department looks forward to reviewing the Section 4(f) evaluation upon its completion.

The Department's preliminary concerns relating to the incomplete Section 4(f) evaluation are as follows:

- The SDEIS/Section 4(f) evaluation provides limited analysis on the auditory, visual, and land-use impacts of routing the road through the NHL. The Final EIS Section 4(f) evaluation will need to provide an adequate analysis of auditory, visual, and land-use impacts to 4(f) properties.

- Depending on the 4(f) evaluation, specific and detailed mitigation measures may need to be developed and included in the Final EIS that mitigate visual and noise impacts on the NHL as well as the effects of crossing the railroad grade at the north end of Skagway.

- It appears that existing developments and impacts within the historic landmark's boundary are viewed as justification for allowing additional impacts. However, each new development's effect on historic value of the NHL needs to be considered separately.

Specific Comments:

Section 6.2.1, Parks, paragraph 2: This paragraph needs to be clarified to explain the fact that the road would pass within 500 feet of Skagway segment of Klondike Gold Rush National Historical Park, referred to as "the KLGO." Also, the Mollie Walsh Park referenced exists within Klondike Gold Rush National Historical Park and the Skagway Historic District.

Section 6.2.1, page 6-1, paragraph 4: The City of Skagway's Dewey Lakes Recreational Area is located within the Area of Potential Effect in Alternatives 2, 2A, and 2C.

Section 6.2.2.3: No mention is made of "federal lands" administered by the National Park Service (NPS) under the *Federal Lands* heading. Inasmuch as proposed routes 2, 2A, and 2C indirectly impact an NPS unit and federal lands that are contained within that unit, the Section 4(f) evaluation should be revised to address federal lands administered by the NPS.

Section 6.4.2, paragraph 1: Regarding the last two sentences in the paragraph, three clarifying statements are needed; 1) it is not historically true that "the only lands impacted in the hydroelectric complex district are previously disturbed (logged) undeveloped areas." Historical photographs show that some of this area was logged, but other areas around Lower Dewey Lake were not. 2) The presence of logged-over lands does not necessarily reduce its historical value, because logging was a one-time-only activity that modified the local landscape for a fairly short time and is largely invisible today. 3) The paragraph's last sentence ("These lands are not individually historic…") is subject to interpretation, inasmuch as all areas within the Skagway Hydroelectric Complex District may be considered to have equal historical value. See the NPS comments dated October 29, 2004, page 2 (page 7-108 of the SDEIS), and the SDEIS comments in Section 6.4.3, paragraph 2.

Section 6.4.3, paragraph 1: The statement "the only contributing resources listed in the 1999 NHL nomination that would be directly impacted by these alternatives are the railroad tracks" is not true in light of FHWA's comments (noted elsewhere in the SDEIS) that questions surrounding what constitutes "contributing" resources have not yet been resolved. Also, the statement "the bridge over the railroad tracks would only require the purchase of air rights" suggests that such a purchase would constitute adequate mitigation. No decision has yet been made as to whether bridging a contributing resource avoids a significant impact to that resource.

Section 6.4.3, paragraph 2: The Department is satisfied at present with recognition that "consultation with the NPS" will take place regarding the "potential visual and auditory impacts" of Alternative 2, 2A, and 2C on the significance of the Skagway-White Pass NHL. It is expected that further consultations will take place on this issue, and a decision will be made by the FHWA, prior to the issuance of the Final EIS.

PROJECTS INVOLVING SECTION 6(f) OF THE LAND AND WATER CONSERVATION FUND ACT:

Missing from the SDEIS is any discussion of Section 6(f) compliance. We recommend that a section addressing Section 6(f) compliance be added to the body of the Final EIS.

SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT COMMENTS:

General and specific comments from the Department on the SDEIS are provided in the attachment.

SUMMARY COMMENTS:

Because an applicability determination and the Section 4(f) evaluation have not been completed, it is premature for the Department to make a determination as to concurrence with the provisos of Section 4(f). Upon completion of the 4(f) evaluation, the Department will provide an expeditious review of the final Section 4(f) documentation that may be circulated for review and comment. We appreciate the opportunity to review and comment on the SDEIS/Section 4(f) evaluation. For Section 4(f) resources comments, please contact Joan Darnell, National Park Service, Environmental Resources Team Manager, Alaska Regional Office at (907) 644-3526.

The U.S. Fish and Wildlife Service is available to assist in identifying and implementing Best Management Practices and other conservation measures such as mitigation for loss of wetland habitat and stream siltation, in order to reduce the impacts of road construction activities on trust resources. For assistance in these matters, please contact, Bruce Halstead, U.S. Fish and Wildlife Service, Field Supervisor, Juneau Fish and Wildlife Field Office at (907) 780-1161.

Sincerely,

Willie R. Taylor

Willie R. Taylor
Director, Office of Environmental Policy
and Compliance

Attachment

ATTACHMENT

SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (SDEIS) COMMENTS

GENERAL COMMENTS:

The SDEIS addresses nine action alternatives and a "No Action" alternative for access to and from Juneau through the Lynn Canal corridor. Alternatives 2 through 2C and 3, which require extensive new road construction, would have the most impact on resources under DOI responsibility.

Bald Eagles. Our comments are focused on effects to bald eagles under the East Lynn Canal road alternatives. Under Alternatives 2 (preferred) and 2C, 57 of 100 eagle nest buffers cannot be avoided. Almost every eagle nest tree buffer (37 out of 40) is likely to be impacted between Berners Bay and the Katzehin River (Appendix R). Appendix R discusses the removal of eagle nest trees during construction. The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d) only allows for removal of nest trees for scientific and religious purposes. The document states that construction impacts to bald eagles due to increased windthrow vulnerability would be mitigated case-by-case, but lacks any explanation of how that could be accomplished. Highway construction through most of the 330-foot buffer zones would result in long-term degradation of nesting habitat (permanent loss of nest areas) and productivity along Lynn Canal. For bald eagles, alternative nesting opportunities are very limited along Lynn Canal, due to the steep terrain and nearby glacial fields. Thus, eagles displaced by road construction will have a limited opportunity to locate suitable nest trees. We recommend that the selected alternative avoid as many nest trees and buffers as possible.

National Historic Landmark. The proposed road project Alternatives 2, 2A, and 2C are located within the boundaries of the Skagway and White Pass District National Historical Landmark (NHL). The National Park Service (NPS) administers the NHL program on behalf of the Secretary of the Interior in accordance with the Historic Sites Act of 1935 and the National Historic Preservation Act of 1966, as amended. Federal agencies undertaking projects that may adversely affect NHLs must comply with both Sections 106 and 110 of the National Historic Preservation Act which contain special provisions for the consideration of these landmarks.

The SDEIS provides some inaccurate information as well as inconsistent conclusions regarding the significance of the NHL and the potential impacts. Our specific comments are provided in the appropriate sections that follow. However, based on the information provided in the SDEIS, and considering the potential visual, auditory, and indirect impacts, the NPS would conclude that the proposed project (Alternatives 2, 2A, and 2c), as presently described, would have an adverse impact on the NHL.

It is important to reiterate NPS Alaska Regional Director Blaszak's response to Division Administrator's request for an opinion regarding the status of the "land" within the landmark (letter dated December 3, 2004). This letter states that the "nomination language is the basis for its eligibility to the National Register of Historic Places and is specifically important for determinations of effect under Section 106…" The language within the nomination clearly describes the natural setting as being considered a part of the NHL for the purposes of protecting the historic character of the setting.

Historical and Archeological Resources. Based on information provided in the SDEIS, the road construction in this area would have an adverse impact on the Skagway-White Pass NHL. The study notes that the proposed highway would have "potential impacts" to views from the Skagway Historic District, the White Pass & Yukon Railroad (WP&YR) railroad, to residences throughout the valley bottom in Skagway, from various watercraft, and from Dyea. By the Federal Highway Administration's (FHWA) own estimation (p. 4-22, para. 4), "Alternatives 2, 2A, and 2C would be visible in the background of views from the Skagway and White Pass District NHL and Klondike Gold Rush NHP." The proposed road consists of approximately 7,500 feet of highway and 2 bridges that would be located within the NHL district (Figure 3-5). The Technical Alignment Report (Appendix D, p. 20) describes this section of the proposed highway with the steep topography, with some of the cut backslopes reaching 100 feet in height, and the need for retaining walls as well as two 300-400 foot bridges. The visibility of this proposed highway is particularly evident in ELVP 1.5 (in Appendix G), which notes that "large and continuous cuts would insert a distinct linear feature into the existing setting. The form, line, and texture of the highway would be a noticeable contrast within the natural landscape, and would likely make the highway a dominant feature within this viewshed" (p. 4-22, paragraph. 2 makes a similar statement). ELVP 1.5 should be revised to reflect some of the potential "cutback slopes" that would reach 100 feet in height.

It is apparent, from where the road enters the NHL at its southern end to where it enters the Skagway townsite near 23rd Avenue, that the majority of the road would be clearly and distinctly visible from most places in town as well as from the Dyea Road overlook as seen in the visual simulation ELVP1.5 ("Visual Simulation of Alternatives 2, 2A, and 2C from Dyea Road Looking East). The study should include visual simulations of the proposed 400-foot-long railroad tracks overpass that connects with a retaining wall to 23rd Avenue and Main that shows how the proposed road would appear to northbound traffic on State Street and southbound traffic from Main Street. From the description in SDEIS, the proposed road would create an adverse visual impact to the NHL.

Traffic Analysis. We believe the Final EIS should identify all sources of potential traffic. Since the highway is not limited to just Haines, Skagway, and Whitehorse residents, traffic analysis should be included for traveling to and from Juneau by Alaska residents located Anchorage and Fairbanks (e.g., residents who want to visit the capital city as described in Appendix C Traffic Analysis). In addition, the Final EIS should identify whether traffic in Skagway and Haines would increase, if this category of travelers is evaluated, and what the additional impacts would be.

Noise Abatement. All information in this section is predicated on "simple noise attenuation theory" [in which] "roadway noise generally decreases by 3 to 6 dBA with every doubling of distance from the source." [see 4.7.7.2, lines 3-5] As the NPS has noted previously [October 21, 2004, letter to Alaska Department of Transportation & Public Works (AKDOT&PF), pp. 4-5], narrow valleys or steep rock faces (such as is the case in the Skagway area) may be positive conduits for noise, with the net effect that vehicles located one-half mile or more from the valley floor (in Skagway) may be heard by many, if not most, of the town's residents and visitors. This section needs to consider any possible impact that traffic noise from up on the cliff face—either near the proposed Dewey Creek bridge or at the north end of town—may have on Skagway and its residents. More studies need to be done to quantify this potential noise impact. To cite a real-world example of the impact of this noise, one should visit Georgetown, Colorado, a 19th-century mining town that is now a National Historic Landmark. A highway on the cliff face just north of town—located more than half a mile away—has a strong, negative auditory impact on that town. Just as at Georgetown, the proposed Juneau-Skagway road would alter the historic characteristics of the "setting" as well as "feeling and association" of the area, qualities which are considered as contributing to the NHL.

SPECIFIC COMMENTS:

Page S-4, Environmental Consequences: The summary of Environmental Consequences should include all impact topics identified in the Table of Contents and analyzed for each alternative. This section is missing impact summaries for Land Use, Hydrology & Water Quality, Air Quality, and Hazardous Materials.

Page S-7, Cultural Resources: The cultural resource summary indicates that Alternatives 2, 2A, and 2C would have a visual effect on the Skagway and White Pass District NHL. The summary should briefly describe the visual effects resulting from these alternatives.

Page S-7, Cultural Resources: Specific design elements need to be developed to mitigate the visual effects on Skagway and White Pass District NHL. While these mitigating measures would be developed in coordination with NPS and City of Skagway, they need to be incorporated in the Final EIS. Currently no mitigating measures have been presented to lessen visual effects on the NHL.

Page S-13, Unresolved Issues, 2nd paragraph: This paragraph states that the NPS has not concurred with FHWA's determination under Section 4(f) of the Department of Transportation Act of 1966. This is incorrect. Until the FHWA makes a determination on the applicability of Section 4(f) to the Skagway and White Pass District NHL, any concurrence evaluation by NPS would be premature.

Pages S-14 to 15, table S-1: The study should include a summary of cultural resource impacts in these tables. The study should include an indication of other land statuses (such as recreational lands) that potentially would be impacted.

Page 1-8, Section 1.4.1.1, paragraph 2: The SDEIS states that "Dyea Road is a low-volume rural road used principally by local residents." This statement needs to be revised to include the significant amount of traffic on the Dyea Road that is generated during the summer months through permitted commercial activities in the Dyea and Chilkoot Trail unit of Klondike Gold Rush National Historical Park. Over 12,000 visitors traveled to Dyea in the summer of 2004 from Skagway to Dyea. The Final EIS should adequately address potential indirect impacts to Dyea from increased traffic.

Page 3-1, Section 3.1.1, paragraph 2: "The Klondike Gold Rush National Historical Park (NHP) in Skagway is administered by the United States..." Note the addition of "al" to Historic.

Page 3-5, Section 3.1.1.4, Private lands: Consultation with Native allotment owners should be made and documented in the Final EIS.

Page 3-7, Section 3.1.1.6, paragraph 1: The SDEIS states that "The United States Park Service manages the Klondike Gold Rush National Historical Park..." This should be corrected to read that the NPS manages the park.

Section 3.1.2: The document should include a description of cultural landscapes that could be affected by the proposed project. The Skagway and White Pass District NHL represents an important cultural landscape within the project area.

Page 3-11, Section 3.1.2.1, paragraph 6: This section fails to mention the visual effects of Alternative 2 on the Skagway Historic District or the Skagway and White Pass District NHL, although this information was covered in detail in Appendix G. This should be corrected.

Page 3-12, Section 3.1.2.2, paragraph 2, NPS Ownership and Management: The sentence should be revised to indicate that the Skagway Unit of the Klondike Gold Rush National Historical Park includes 13,191, acres not 12,976 acres. Ownership is split between the federal government (2,418.93 acres), State of Alaska and City of Skagway (10,199.64 acres), and private lands (572.78 acres).

Page 3-12, Section 3.1.2.2, paragraph 3, NPS Ownership and Management: The park includes 13,191 acres not 12,976. There are two administrative units of the Park – Skagway and Seattle. The Skagway administrative unit includes three separate segments: Skagway Historic District, Dyea and the Chilkoot Trail, and White Pass. To say that the Chilkoot Trail is the most popular destination in Klondike Gold Rush National Historical Park is not supported by the available statistics. The total visitation for the Skagway Unit in 2004 was 843,623 with overnight visitation (backcountry and campground users) accounting for 7,403 visits. There were 12,000 visitors last year in

Dyea on a variety of guided tours. The text should be modified to reflect the visitor statistics.

Page 3-12, Section 3.1.3, Historical and Archeological Resources: The third paragraph, refers indirectly to the September 9, 2003, letter that was sent to Rosita Worl of Sealaska, as "formal consultation" to affected area tribes. (Review of the letter, page 7-15 of Section 7.3, immediately dismisses it as "formal consultation"). "No potential traditional cultural properties were identified..." We believe that there may be traditional cultural properties in the affected area and that further investigation and documentation in the Final EIS is warranted.

Page 3-12, Section 3.1.3, paragraph 4: The study should identify that the methodology used by the Alaska Region of the U.S. Forest Service was developed by Tongass National Forest Archaeologists. This methodology has been refined since it was first published to include evaluation of areas that might be indirectly affected by the project. The Final EIS should consider potential indirect effects on historic properties. If the Alaska State Historic Preservation Officer concurred with the methodology as stated, a concurrence letter should be included in the Final EIS.

Page 3-12, Section 3.1.3., paragraph 5: The document states that "No potential traditional cultural properties were identified within the Juneau Access Improvements Project APE." The Chilkat and Chilkoot Tlingits lived and used this area for hundreds of years before the coming of the Euro-Americans. They used the area even after the Euro-Americans arrived and continue to use the area today. Additional research should be conducted. A recent publication about Native uses of this area is *2004 Klondike Gold Rush National Historical Park Ethnographic Overview and Assessment Final Report*, Anchorage, AK: National Park Service, by Thomas F. Thornton. There is a lengthy "Reference Cited" section in this report that should also be helpful. Klondike Gold Rush National Historical Park can provide copies of this document.

Page 3-14, Section 3.1.3, paragraph 1: The paragraph states that the NHL has "a log cabin and wharf built in 1897." For historical clarification - the White Pass wharf was begun in 1896, and subsequently added to several times over the years, and the "log cabin" referred to may be the Captain Moore cabin of 1887 (not 1897).

Page 3-14, Section 3.1.3, paragraph. 1: The paragraph states that the NHL includes the historic Skagway townsite, which has 152 contributing buildings; a log cabin and wharf built in 1897..." For clarification and accuracy, the study should include the correct NHL information of: 163 contributing buildings, 8 contributing sites, 3 contributing structures, for a total of 174 contributing resources. In addition, the natural areas within the NHL boundaries, which are significant elements contributing to the setting, should also be stated in this section. This information was provided to FHWA during several discussions, and most recently in a letter from NPS to AKDOT&PF dated December 6, 2004.

A discussion of the historic importance of the area at the north end of Skagway needs to be included. The Shearer Cabin and the Hestness House, both contributing elements to the NHL, are the sole remnants of a neighborhood, dating back to the gold rush, inhabited by White Pass and Yukon Route employees who worked in the railroad yards. This neighborhood is zoned for residential purposes; zoning is not just for "industrial and general business uses," as noted in both the CRC report and the FHWA letter. The railroad yards themselves are also of Gold Rush vintage; in addition, many historic WP&YR passenger cars and freight cars (some dating back to the gold rush period) are kept on a siding near the proposed road right-of-way. This is also the approach to the "Gold Rush Cemetery" where Frank Reid, who shot and killed "Soapy" Smith, is buried and memorialized with a large granite marker. The cemetery is just north of the rail yards.

There should be a discussion about indirect impacts to the Dyea and Chilkoot Trail NHL in the Final EIS. While not physically affected by Alternatives 2, 2A, and 2C, this NHL would be visually affected by the road, and indirectly affected by increased visitor traffic. The proposed actions in Alternative 2, 2A, and 2C would have direct, physical impacts to the Skagway and White Pass District NHL and its contributing elements, to the Dewey Lakes Recreation Area owned by the City of Skagway, and to the National Register-eligible historic properties that are located on City-owned lands in the Dewey Lakes Recreation Area. FHWA has described these impacts within the SDEIS as having been mitigated, yet no concurrence with any agency has been gained. The NPS has already stated in letters to AKDOT&PF that the effects to the historic resources would constitute adverse effects, both visual and auditory.

In addition, there would also be indirect impacts for each of these properties and the Chilkoot Trail and Dyea National Historical Landmark, the Klondike Gold Rush National Historical Park, and the City of Skagway's Historic District, which have yet to be evaluated.

<u>Page 3-14, Section 3.1.3, paragraph 1:</u> This paragraph states that the only contributing element in the Area of Potential Effects is the WP&YR alignment near State and 2nd Avenue. The Final EIS should also state that the proposed road alignment is within the boundaries of the NHL.

<u>Page 3-14, Section 3.1.3, paragraph. 2:</u> While it is true that the park is not within the direct Area of Potential Effects, the Final EIS needs to consider the potential for indirect effects, either beneficial or detrimental to the natural or cultural resources along the road corridor. Potential indirect effects should be included as part of the overall evaluation of the project in order to adequately address the cost/benefit comparisons. A project may have detrimental direct impacts that are off-set by significant indirect benefits (e.g., more recreational opportunities as an offshoot of road building).

<u>Page 3-17, Section 3.1.4.2, Haines</u>: Population estimates for the Chilkat Indian Village Tribe (Klukwan), and for the Chilkoot Indian Association (Haines) should be included (page 3-20 lists percentages of minorities).

Page 3-18, Section 3.1.4.3, Skagway: The Skagway IRA Tribe and its population estimate should be included.

Page 3-20, Section 3.1.5, Environmental Justice: There is only cursory information presented on census data and household incomes. We recommend that this section be expanded and further explanation and analysis of the data be included.

Page 3-23, Section 3.1.6, Subsistence: The first and second paragraphs discuss the personal use category for non-rural residents. We recommend also including information on subsistence use by tribal members, who depend on subsistence resources in the area potentially affected by the proposed project. As currently written, there is no discussion of tribal subsistence use, except in Section 3.1.6.3, where the SDEIS states that 100 percent of Klukwan households use subsistence resources and 85 percent participate in subsistence "harvesting." In the third paragraph, the SDEIS describes the absence of subsistence surveys since 1988. We recommend obtaining more recent subsistence resource use data to complete and update this analysis.

Page 3-24, Section 3.1.6.2, Juneau: Information about personal and subsistence resource uses by Juneau area residents should also be included in the analysis.

Page 3-34, Section 3.2.5 Air Quality: This section should be updated with air quality data collected by the NPS in 2000 and Alaska Department of Environmental Conservation efforts to monitor air quality in Skagway beginning in 2003. See the following website for the NPS report: http://ocid.nacse.org/airlichenPDF/AQ_KLGO.pdf

Page 3-36, Section 3.2.6, Noise: Noise analysis was conducted in a limited number of areas within Skagway, however, most locations were where the road would enter the townsite at its northern end. Noise analysis should be conducted at the City of Skagway's Dewey Lakes Recreation Area, where perhaps, the most significant increase in noise would be expected to occur. Dewey Lakes Recreation area was historically used during the gold rush, and continues to be a popular recreational destination for residents and visitors alike. Because Skagway sits in a narrow river valley bounded on either side with bedrock walls, sound reverberates between the valley walls, making small noises larger through enhanced natural acoustics of the valley. This propensity of the valley walls to amplify sound needs to be considered in the noise analysis for Skagway with additional discussion about noise abatement measures.

Section 3.3.4.1 Marine Finfish: Eulachon also spawn in the Skagway and Taiya Rivers.

Page 4-2, Section 4.1.2, and Appendix G: Visual: While maps illustrating the visual impacts of the proposed project alternatives are very easy to understand and well presented, additional maps are needed to more adequately show viewpoints from the townsite, to show the proposed highway during the predominant fall-winter-spring season, and to thereby allow for a more complete assessment of potential visual impacts to the NHL. We suggest that the Final EIS include additional visual simulations that show the following:

- Since the natural landscape (a significant contributing element of the NHL) is a mix of evergreen and deciduous trees, it is important to have more accurate visual representations of the road in the area where it enters the NHL. Because the road could be highly visible during most of the year, the simulations should show the scenes during fall, winter and spring; when leaf-off conditions prevail. The representations of the road within the NHL should include any of the proposed cut backslopes and retaining walls.

- The proposed bridge over the Dewey Lakes Recreation Area.

- The proposed highway as it enters the Skagway townsite, including the proposed retaining wall at 23rd Avenue, and views from the townsite.

Page 4-3, Section 4.1.3: The Final EIS needs to clarify the FHWA's evaluation of potential impacts to historic properties within the Area of Potential Effect. The SDEIS states that "Potential disturbance or visual modification that could impact the cultural integrity of resources eligible for or on the National Register of Historic Places was evaluated for each proposed project alternative, with additional consultation as required by the revised regulations or implementing the National Historic Preservation Act." NPS has concurred with FHWA's determinations of eligibility for historic properties found within the project's Area of Potential Effect within the 2, 2A and 2C alternatives, which includes: SKG- 189 Skagway Hydro-electric Complex District which includes SKG-190 Lower Dewey Lake Dam, SKG-191 Reservoir and Dam, SKG-192 Pipelines, SKG-193 Power Plant, SKG-194 Tramway, SKG- 198 Hoist building, and SKG-203 Lower Dewey Lake Trail. NPS, however, has not officially commented on whether an adverse effect would occur to any National Register eligible properties. The NPS letter to AKDOT&PF (December 6, 2004) specifically states that "we find it difficult to concur with that initial finding by FHWA" and goes on to ask for more specific, "additional information before we can fully assess the potential project impacts…" At this time, based on the information presented in the SDEIS, NPS would conclude that there would be an adverse impact to the NHL.

Pages 4-15 and 4-16, Section 4.3.1.2, Consistency with Land Use and Management Plans: We recommend including an analysis and discussion of Alaska Native Tribe or Corporation Strategic/Management Plans, if available.

Page 4-16, Section 4.3.1.3: This section should also describe indirect effects to historic resources that may be in the project area. The existing research only evaluated the Area of Potential Effect within a narrowly defined road corridor, without evaluating effects that additional recreational activities would incur, such as the disturbance of historic resources outside of the direct Area of Potential Effect.

Page 4-17, Section 4.3.1.3, Land and Resource Uses: The second paragraph should include a discussion of the direct or indirect effects of probable Alaska Native corporation activities as result of access. In the third paragraph, the sentence "It is highly unlikely that any mineral deposits…would be developed…" is speculative and should be deleted if not referenced. The same sentence is also found on page 4-72, sixth paragraph.

Page 4-17, Section 4.3.1.4, paragraph 4: "No land from a municipal, state, or federal park or recreational area would be required by Alternatives 2 through 2C." This is incorrect. The Lower Dewey Lakes Area in Skagway is a city municipal recreation area and it would be heavily impacted by Alternatives 2 through 2C. The Klondike Gold Rush National Historical Park would also be impacted by the road. Municipal Lands located on the east bench above Skagway are in the project area. These lands not only include the City of Skagway's Dewey Lakes Recreation Area, but also include several National Register-eligible historic sites that date to the Gold Rush Era.

Page 4-21, Section 4.3.3.4: Views from within the Skagway Historic District are identified as "most susceptible to potential impacts," and therefore visual simulations of these impacts should be provided. Page 4-22, paragraph 3 acknowledges that Alternatives 2, 2A, and 2C would be visible in the background views from the Skagway District of the NHL and NHP, and visual simulations of the road corridor from this vantage point should be provided as well.

Page 4-21, Section 4.3.3.4. The study should discuss visual impacts from and within the Skagway and White Pass District NHL, including the views within the City's Dewey Lakes Recreational Area, which contains several National Register-eligible historic properties. The road would be visible from the lower end of the NHL from the waterfront to 23rd Avenue where it is projected to enter the NHL and connect with the existing road. It would be visible from all areas within the city, from the waterfront, and from the western hillside. The NPS identified the lack of adequate graphic simulations of the potential visual impacts in its letter of December 6, 2004, to AKDOT & PF.

Page 4-23, Section 4.3.4 paragraph 6: "Based on record searches and surveys of the study area, Alternatives 2 through 2C would not affect any known prehistoric resources." Record searches and archeological surveys do not uncover every archeological site or feature even if every inch of land was covered (see page 3-12, paragraph 4 on the survey methodology). The rain forest vegetation in the area may obscure prehistoric sites. There should be a discussion of what the State would plan to do if prehistoric sites (e.g., human burials, an archeological site, and/or archeological features) are revealed during construction.

Page 4-24, Section 4.3.4: The Final EIS should identify that there was a reported shell midden site at Sturgill's Landing, within the project area for alternatives 2, 2A and 2C. The study should include documentation of tribal consultation for traditional cultural properties for historic resources in these alternative areas.

Page 4-24, Section 4.3.4: "The Skagway and White Pass District boundaries specifically include "sufficient natural area...to provide an understanding of the physical [environment] and cultural landscape that defined the historic corridor through the Skagway River Valley" (Norris, Cole, and Houston, 1999). Based on this language, Skagway's setting contributes to its historic importance.

Page 4-24, Section 4.3.4, paragraph 8; 4-25, paragraph 1: This footnote regarding the NHL setting makes reference to the hillside to the east of Skagway where the proposed highway would be constructed. It describes this as being logged during the historic period for building materials and firewood, and has been since revegetated. The area was hand logged in various areas during the Gold Rush Era, but this activity did not have a significant visual impact on the original vegetative patterns as is evidenced by historic photographs of the period. The footnote should be clear that either of these states of full or partial vegetation are considered part of the historic NHL setting.

Page 4-25, Section 4.3.4 paragraph 2: "The proposed alignment would not result in the physical loss of any of the Klondike Gold Rush NHP's or Skagway and White Pass District NHL's contributing buildings, structures, or sites." AKDOT&PF's interpretation of what constitutes physical loss is in conflict with the NPS's recognition that land itself is an integral setting of the landmark, as it was described in the nomination form. See letters exchanged between Division Administrator David Miller (October 21, 2004), and NPS Alaska Regional Director Marcia Blaszak (December 6, 2004) for this discussion.

Page 4-25, Section 4.3.4 paragraph 2: The Final EIS should consistently acknowledge properties that have already been determined historically significant and provide an appropriate evaluation of potential impacts. In this case, although the Shearer cabin is described as "being dilapidated" it continues to retain its historic significance which should not be minimized. It would probably be adversely affected by the introduction of a new highway in its vicinity. The Shearer Cabin and the Hestness House are the sole remnants of a neighborhood, dating back to the Gold Rush Era, inhabited by White Pass and Yukon Route employees who worked in the railroad yards.

Page 4-25, Section 4.3.4, paragraph 3: We disagree with the SDEIS conclusion about the NHL setting's compromised integrity. The SDEIS states that "The integrity of the setting has already been compromised by development in the greater Skagway area and by cruise ships that in essence become permanent features on the skyline during peak tourist months. Alternatives 2, 2A, and 2C would be only one of several elements already impacting the setting of the Skagway and White Pass District..." This statement is not accurate and should be revised to clarify that the NHL maintains its integrity. As the Skagway-White Pass NHL nomination indicates, Skagway is a mixture of historical and modern elements, and in recent years, additional modern elements (such as an airport runway extension and a pedestrian bridge across the Skagway River) have been added without sacrificing the town's overall historic setting. However, the modernization of the town's historically placed infrastructure (ships, trains, electric utilities, and the historic buildings) has not detracted from the historic setting in the same way that the proposed project would impact the historic scene. The project would introduce a completely new highway system and bridges in an area where substantial transportation features did not exist previously. A new highway and a new bridge, in a new location, on the bluff immediately east of the townsite would cause permanent, year-round physical intrusion on a dramatically different level that would be instantly recognizable as a modern intrusion, by both locals and visitors. Cruise ships do not compromise the setting since tourist traffic to Skagway via ship is a historic activity that continues in modern times and the cruise ships are temporary features that are gone at night during the summer and then disappear entirely during the rest of the year.

Page 4-25, Section 4.3.4, paragraph 4: There would be a change in the character of the Lower Dewey Lake area as well. Hiking on recreational trails, with a historic ambience, in a generally natural setting, is significantly different from hiking under a major highway that is elevated above the area. Because the sites within the area are considered eligible for the National Register of Historic Places, we recommend that FHWA evaluate more fully, the range of potential effects on the area.

Page 4-25, Section 4.3.4, paragraph 4: "The proposed alignment would have visual effects on the Klondike Gold Rush NHP and Skagway and White Pass District NHL. However, these effects would not be adverse in part because the cultural context of the sites has been modified extensively by recent development." This statement contradicts the information provided in Appendix G: Visual Resources Technical Report. The executive summary states that "the alteration of the existing landscape setting resulting from a highway on the alignments of Alternatives 2 through 2C, 3, 4B, and 4 D ... could potentially have a long-term adverse impacts on the visual quality and existing views." In addition, 3.1.3.1 identifies Skagway as visual condition Level II. Table 2 (p.2 – 7) of the same appendix defines a Level II landscape as: "Landscape where changes are not noticed by the average forest visitor, unless pointed out. Landscapes that have been altered but changes are not perceptible."

Page 4-25, Section 4.3.4, paragraph 6: "DOT&PF and FHWA have consulted with the USFS, NPS, and the SHPO regarding potential impacts to historic properties in the APE. Consultation with the NPS regarding potential visual and auditory impacts to the Skagway and White Pass District NHL is ongoing." The implication in this sentence is that all the foregoing discussion regarding the determination of effects on the physical property has been agreed to by the NPS, which is not the case. This needs to be corrected.

Page 4-35, Section 4.3.5.3, Haines and Skagway: Discussion of quality of life in Haines and Skagway should also include information about tribal members.

Page 4-35, Section 4.3.5.4: This section needs to address the potential impact of increased traffic within the Skagway Historic District and the NHL as a whole. This includes traffic flow, traffic, and general wear and tear on the roadways. Appendix C covers these topics in detail for Juneau, but not for Skagway. This is an important issue to the City of Skagway as well as the NHL and the NHP.

Page 4-39, Section 4.3.6, Subsistence: We believe that additional analysis of potential impacts to subsistence resources in the Area of Potential Effect is warranted.

Page 4-48 – 4.3.8 Geology 4.3.8.1 Seismic Activity and Page 4-90 – 4.4.8 Geology 4.4.8.1 Geologic Hazards – Seismic Activity and Page 4-135 – 4.6.8 Geology: There is a sentence that references U.S. Geological Survey (USGS) hazard maps that reads: "Based on USGS hazard maps published in 1999, this fault system has a 10 percent probability of producing an earthquake in the next 50 years that would cause ground accelerations in excess of 1.1 to 1.15 g20 in the project region."

There is no reference listed in the reference section for this information, but we assume the information was derived from Figure 7a in the USGS publication by Wesson, Robert L., Frankel, Arthur D., Mueller, Charles S., and Harmsen, Stephen C., 1999, Probabilistic Seismic Hazard Maps of Alaska: Open-File Report 99-36. (http://eqhazmaps.usgs.gov/html/aks.html) Examination of this map suggests the Lynn Canal area might expect peak ground accelerations of 15 to 20 percent g (0.15 to 0.20g) with a 10 percent probability of exceedance in any 50 year period. The text in the SDEIS indicates much higher ground acceleration. This information should be corrected in the Final EIS.

Page 4-51, Section 4.3.9.3, Water Quality: In the second paragraph a 1987 U.S. Department of Transportation and FHWA report was referenced in discussion of effects of stormwater runoff, as well as a 2000 study done in Anchorage. It should be clarified as to the relevancy of these reports to the pristine waters of the Area of Potential Effect.

Page 4-52, Section 4.3.9.3, Water Quality: The third paragraph, last sentence, "Potential contamination…would be low…" is speculative and should be deleted or a supporting reference cited. "Rural settings and low volume traffic" do not equate with "low" potential for contamination. One fuel tanker truck accident, for example, could negatively impact any number of natural resources.

Page 4-52, Section 4.3.9.3, Water Quality: Regarding the discussion of Best Management Practices (BMPs) during construction, the use of non-native grass seed is problematic, no matter if plants are annuals or perennials. The seed bank will establish to the possible detriment of indigenous species. Therefore, we recommend that only indigenous grasses and other plants be used. There have been many studies done on the spread of invasive species through transportation corridors (Gelbard, 2004, for one, provided by the Skagway Traditional Council). Information is forthcoming from the Central Council of the Tlingit & Haida Indian Tribes of Alaska (CCHITA) Environmental Department concerning the amount of invasive species established in Haines as a result of the road there, and the cost, thus far, for eradication efforts.

Page 4-53, Section 4.3.10 Air Quality: There are air quality data for the study area. See chapter 3 Air Quality comment.

Figures 4-16 through 4-18: The graphic simulations of what the highway would look like from various areas and angles are incomplete. Visual simulations should include more appropriate seasonal representation since most of the time the leaves are off the trees. This is important because the visitors in the summer are not the only viewers who would see this impact. Additional visual simulations should be provided of the highway as it enters the Skagway townsite. See comments under Section 4.1.2., paragraph 4-2 for specific recommendations for additional visual simulations.

Information provided in Appendix G graphics contradicts these statements by identifying the visual impacts of the proposed alternative 2 series as "high and very high" in the area of the NHL and the NHP. And (see top of page 4-5) "It is likely that very high impacts would occur on sensitive-viewers and on the visual quality along most of the highway alignment within the foreground-viewing threshold of Skagway proper." (See Appendix G Figures 6 through 13).

Page 4-56, Section 4.3.12, Wetlands: In the fifth paragraph, there is a brief discussion of indirect effects of contaminants on wetlands; however, there is no discussion of indirect effects throughout the rest of Section 4. This needs to be corrected.

Page 4-146, Section 4.7.2, Environmental Justice: We recommend expanding the discussion of potential impacts on subsistence resources and the possible affects on subsistence users and their cultural life as a result of increased population and traffic. Paragraph 5 "Native Alaskans" should be corrected to read: "Alaska Natives."

Page 4-152, Section 4.7.7.3, last paragraph and Table 4-66: The FHWA has proposed various barriers to attenuate the noise for the highway as it comes into the north end of town. The FHWA has not addressed the visual effects of various long barriers, some of which would be 10 feet high, on the intrinsic values of the NHL. These barriers would have a major visual impact on the two Gold Rush Era structures at the north end of town, namely, Shearer cabin, #249, and Hestness House, #250.

Section 4.8.3, and Section 5.10. This section describes the impacts of construction on historical and archeological resources. It is stated that "in the event a previously unknown cultural resource is discovered during construction, work in the vicinity of the site would cease until AKDOT&PF has evaluated the site." The Final EIS should explain how previously-unidentified sites would be handled.

Page 7-3, Section 7.5, 1997 and 2003 Government to Government Consultation: In Section 7.3.4, meetings are listed with city mayors by name, but there is no such listing in Section 7.5, listing Tribal leaders consulted with, which would be beneficial in documenting meaningful consultation. The first sentence of Section 7.5 states that "Letters were sent to local federally recognized tribes…" However, the 2003 letter that apparently is referenced is a letter that was sent to Rosita Worl of Sealaska, not to the presidents of the federally recognized tribes, which are listed at the end of the letter in the distribution section. We suggest citing a reference to support the "courtesy follow-up phone calls" and "interviews." We believe that documentation of meaningful government-to-government tribal consultation should be included in the Final EIS.

Page 17 of 18 Note: Page 18 is bcc Page -- NOT SENT

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

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October 28, 2005

RE: Juneau Access Improvements
Project No. 71100

Richard Enriquez
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US Fish and Wildlife Service
300 Vintage Blvd., Suite 201
Juneau, AK 99801-7100

Dear Mr. Enriquez,

Thank you for your agency's comments on the Supplemental Draft Environmental Impact Statement (EIS) that were included in the letter of March 25, 2005 from the Department of the Interior, Office of Environmental Policy and Compliance (OEPC). The following is a response to comments regarding bald eagles. Other comments in the OEPC letter appear to be from the National Park Service (NPS) and will be responded to in a letter to NPS Alaska Regional Director Marcia Blaszek.

As you know from ongoing coordination, the preferred alternative in the preliminary Final EIS is Alternative 2B, East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway. Alternatives that would construct a highway into Skagway (Alternatives 2, 2A, and 2C) have been dropped from the range of reasonable alternatives due to considerations of Section 4(f) of the Department of Transportation Act of 1966.

Alternative 2B would pass within 0.5 mile of 92 nest trees; 49 would be closer than 330 feet from the nearest point of disturbance. The preliminary Final EIS (as well as the Bald Eagle Technical Report and addendum) clearly states that there would be no loss of known nest trees, and commits to additional helicopter surveys before construction and a ground survey during construction to avoid impacting nest trees. These ongoing surveys will assist DOT&PF in avoiding as many nest tree buffer areas as possible. All but three of the trees from Echo Cove to Comet have been avoided by more than 330 feet. The section in the Bald Eagle Technical Report with the heading **Removal of trees during construction activities** discussed the removal of <u>non</u> nest trees in the vicinity of nest trees and the potential for windthrow, not removal of nest trees themselves.

"Providing for the movement of people and goods and the delivery of state services."

5A-T34LH

The case by case mitigation for increased windthrow vulnerability would involve DOT&PF and USF&WS staff reviewing each nest tree close to the highway to determine if cable stays or other reinforcing is necessary to support a tree or trees with potential to fall against a nest tree. Most of the trees within 330 feet of the nearest point of proposed slopes are in steep high wind areas and are generally windfast. In areas where nest trees are surrounded by large stands of similar age trees, there often is suitable terrain to avoid the nest tree buffer area. The survey with USF&WS staff would also look at any nests below the highway that may have insufficient natural screening. In all nest tree buffer areas only the minimum amount of clearing necessary for safe highway operation would occur. Coordination with the Raptor Management Studies staff has indicated that suitable nest tree locations is not a limiting factor for bald eagles in Lynn Canal. Even in the steepest areas suitable additional nest tree locations would still exist after highway construction.

Again, thank you for your agency's comments. We will continue to work with you and Mike Jacobson of your Raptor Management Studies section as we develop permit applications and construction commitments.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc:

Jim Helfinstine, USCG
Jeff Koschak, ACOE
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Kenneth Vaughan, USDA-FS
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December 23, 2005

RE: Juneau Access Improvements

Marcia Blaszek
Regional Director, Alaska
National Park Service
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Dear Ms. Blaszek,

Thank you for your agency's comments on the Supplemental Draft Environmental Impact Statement (EIS) that were included in the letter of March 25, 2005 from the Department of the Interior, Office of Environmental Policy and Compliance. The following is a response to issues raised by the National Park Service (NPS). Comments from the US Fish and Wildlife Service regarding bald eagles have been responded to in a separate letter to that agency.

As you are no doubt aware, the Alaska Department of Transportation and Public Facilities (DOT&PF) has changed its preferred alternative to Alternative 2B, East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway. Based on the Federal Highway Administration (FHWA) determination that natural areas in the Skagway and White Pass District National Historic Landmark (NHL) are protected by Section 4(f) of the Transportation Act, alternatives that would construct a highway to Skagway (Alternatives 2, 2A, and 2C) are no longer under consideration.

Many of your comments address Section 4(f) and Section 106 issues relating to the Skagway Unit of the Klondike Gold Rush National Historic Park and the surrounding NHL or other impacts from alternatives that would involve construction of a highway connection in Skagway. These alternatives are no longer in the range of reasonable alternatives and therefore no response to comments pertaining to them is necessary. Comments applicable to the remaining reasonable alternatives are responded to below, generally in the order in which they were made.

General Comments:

Traffic Analysis. The Traffic Forecast Report (Appendix C) includes analysis of all potential traffic for each alternative, and explains the size of each traffic component. This included Anchorage and Fairbanks residents traveling to and from Juneau as well as Haines, Skagway and

Whitehorse residents. The bulk of the predicted traffic increase would be Juneau residents traveling to and from Haines and Skagway, but all components were represented. The demand numbers in Chapter 4 of the EIS as well as all traffic related impacts used the total traffic predicted to be generated by each alternative.

Noise Abatement. Noise abatement is only considered for direct impacts, that is noise from traffic on new highway construction. None of the reasonable alternatives under consideration in the Final EIS would involve construction in Skagway, therefore no abatement is considered. The indirect impact of additional traffic on existing streets is evaluated in the Final EIS for each reasonable alternative.

Specific Comments:

Projects Involving Section 6(f) of the Land and Water Conservation Fund. A statement has been added to the Land Use section of Chapter 3 of the Final EIS clarifying that no alternative would impact any Section 6(f) land.

Comments regarding the Summary. The Summary of the EIS is exactly that, a summary. Not all impacts warrant inclusion, and not all impacts lend themselves to a summary table. The Summary was prepared in accordance with FHWA guidance on EIS preparation (FHWA Technical Advisory T 6640.8A) which states that major environmental impacts should be summarized.

Comments regarding Dyea Road. The statement in Chapter 1 has been amended to include summer tourists, although they are not the main traffic component. The 12,000 summer visitors cited in your agency's letter would account for only 30 of the 204 Dyea Road ADT (annual daily vehicle traffic, both directions) even if we assume they are traveling at the private vehicle average of 2.3 persons per vehicle. The point of this paragraph in the EIS is that even one of the lowest used state roads in the project area has more traffic than the only connection between the three communities. This is an indication of unmet demand in the corridor.

Tribal consultation and traditional cultural properties. Tribal consultation for this project has followed FHWA guidance and in fact has gone beyond the requirement to consult with federally recognized tribes by including other Native organizations. Please note that the letter to Rosita Worl of Sealaska was just one of eleven individually addressed letters sent to tribes and other Native organizations. Only one letter was included in the Supplemental Draft EIS to avoid repetition. A reference has been added to the Government to Government Coordination section that refers to follow-up phone calls. Please also note that after FHWA determined that there were no potentially affected traditional cultural properties, it sent an individually addressed letter to each tribe and Native organization, informing them of this determination. No tribe or Native organization consulted expressed disagreement with the determination. The meetings with mayors were held at the request of the mayors. No meetings were requested by tribal leaders.

Consultation with Native allotment owners. FHWA disagrees with your statement that consultation should occur with Native allotment owners. These property owners are treated no differently from other private property owners in the project area. Individual property owners will only be contacted directly, during the Right of Way phase of the project, if the selected alternative requires land from them. Formal consultation under both Section 106 and Government to Government directives is required with tribes, not individual tribe members. Similarly, unless a specific issue is raised during tribal consultation, impacts to individual tribal members, including socioeconomic impacts, are not addressed separately from impacts to the communities affected.

Cultural Resource Methodology. The State Historic Preservation Officer (SHPO) has been consulted regarding the Area of Potential Effect (APE), field methodology, eligible properties, and effect. The Supplemental Draft EIS contained copies of the SHPO responses regarding the APE/methodology and determinations of eligibility. The Final EIS contains copies of the SHPO's comments on the Supplemental Draft EIS and concurrence with FHWA's determination of no historic properties affected for the preferred alternative, Alternative 2B.

Indirect Impacts to the Dyea and Chilkoot Trail NHL, the Skagway and White Pass District NHL and the Skagway Park Unit. As explained above, the potential indirect noise impacts of each reasonable alternative are discussed in the Final EIS. Traffic and noise impacts are evaluated for different areas of each of the three communities. It is not possible to accurately predict the number of new travelers that will visit specific locations within a community, but the total increase can be considered in the context of existing traffic. The predicted first year after construction traffic for the alternative with the highest Skagway traffic is 190 ADT, half of which would be Juneau residents. The 2004 traffic on State Street was 1993 ADT; on Broadway it was 2216 ADT. This means that the potential impact from the project is a 10 percent or smaller traffic increase. Actual increases in NPS visitations or traffic at locations other than State Street, which is maintained by the state, would be less, as Juneau residents are not likely to travel on Broadway or visit an NPS facility on each of their trips to or through Skagway and back.

Environmental Justice. The information presented in these sections is not cursory; it was prepared in sufficient detail to enable the reader to determine whether the project would comply with the Executive Order, i.e. would the environment and health of any minority or low income community be disproportionately adversely affected. Subsistence impacts are addressed in the Subsistence section; they would only be discussed in the Environmental Justice discussion if there was an indication the project would have a disproportionate impact on a minority or low income community. FHWA has determined that none of the reasonable alternatives would significantly restrict any subsistence use.

Subsistence. The Alaska National Lands Conservation Act (ANILCA) established a subsistence right on federal lands for rural residents regardless of whether they were members of a tribe. The Supplemental Draft EIS therefore focussed on subsistence uses of the three rural communities potentially affected (Haines, Klukwan, and Skagway) because these activities are protected by law. Information on personal use by non-rural residents was included to provide an explanation of how personal use activities of residents of Juneau, both Native and non-Native, are managed on state and federal land. The level of data collection and analysis in an EIS is determined through scoping. Neither 2003 public scoping, coordination with land management agencies, or consultation with tribes or other Native organizations established the need to update the extensive 1988 subsistence surveys or address "tribal subsistence" separately.

Air Quality. The NPS 2000 lichen/air quality study did not include air quality monitoring and therefore does not provide baseline data for current air quality conditions in Skagway. The Alaska Department of Environmental Conservation monitoring effort did produce current air quality data and has been included in the discussion of baseline conditions in the Final EIS.

Consistency with Land Use and Management Plans. The only Native Corporation Management Plan potentially affected by the project is Goldbelt's Echo Cove Master Plan. This plan is described in the Land Use section of the Affected Environment chapter. The Land Use sections of the Final EIS include statements regarding each alternative's consistency with Goldbelt's plan. Potential effects of reasonably foreseeable Goldbelt development that would result from increased access are discussed in the Cumulative Impact Analysis.

Indirect effects to historic resources. The Land and Resource Uses section of the Final EIS addresses impacts to recreation, not impacts from recreation. Potential impacts to historic resources due to increased recreational activities facilitated by improved access are addressed in the Historical and Archeological Resource sections for each alternative and the Cumulative Impact Analysis.

Land and Resource Uses. The basis for the statement regarding the likelihood of mineral deposit development in Lynn Canal is contained in the two sentences that followed the statement, therefore this statement has been retained in the Final EIS.

Discovery of previously unknown prehistoric sites. FHWA and DOT&PF are aware that any construction project has the potential to uncover cultural resources including prehistoric sites. The Construction Impacts section of the Supplemental Draft EIS addressed this potential and briefly described the standard process to be followed. Please note that this section provided more information than the statement quoted; it explained that an eligibility determination would be made by FHWA and concurrence obtained from the SHPO before any work proceeded. This section has been expanded in the Final EIS to specifically address human burial sites. All DOT&PF construction contracts include language detailing the procedures to be followed if cultural resources are encountered.

Geology, Seismic Activity. The Seismic Activity sections of the Final EIS have corrected peak acceleration values, and the source of the USGS hazard probability maps is referenced. The statement has been amended to make clear that the predictions apply to the project area rather than the more general project region.

Water Quality Impacts. The Anchorage water quality data is relevant to Lynn Canal and its pristine streams because if an area with background sources and higher traffic volumes is not exceeding Alaska Water Quality Standards (AWQS), it is reasonable to conclude that runoff from a highway in Lynn Canal will not exceed AWQS. The statement regarding "rural settings and low volume traffic" has been amended to explain that the potential for contamination would be lower than on most highways but would nevertheless include accidental spills.

Non-native species are not necessarily invasive or detrimental. DOT&PF has been using annual rye in its seed mixes for many years with no known instances of detrimental impacts to indigenous species. Annual rye has difficulty establishing a seed bank because it cannot compete with the native perennials in the mix. Our seed mixes are recommended by the Alaska Plant Materials Center, are regularly reviewed by resource agencies, and require certification for purity. The National Pollutant Discharge Elimination System General Permit for Alaska requires soil slopes be stabilized as soon as possible but no later than two weeks after they are constructed. Quickly germinating non-invasive annual grasses provide the benefit of faster stabilization.

Wetlands, Indirect Effects. Indirect effects of operation and maintenance of each alternative are included at the end of the impact section. This includes Wetlands, Marine and Freshwater Habitat and Species, Terrestrial Habitat, Wildlife, and Noise. Construction impacts are addressed separately from operation and maintenance impacts, but the Cumulative Impact Analysis looks at the potential combined direct and indirect effects of the project, past projects, and reasonably foreseeable future projects.

Again, thank you for your comments. I believe the change to the range of reasonable alternatives addresses the bulk of your concerns. I hope the responses provided and the changes made in preparation of the Final EIS address the remainder of your concerns.

Sincerely,

Reuben Yost
Special Projects Manager

cc: Tim Haugh, FHWA
Pat Kemp, DOT&PF

1372

REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
JUNEAU REGULATORY FIELD OFFICE
8800 GLACIER HIGHWAY, SUITE 106
JUNEAU, ALASKA 99801-8079

April 6, 2005

ALASKA DOT & PF
APR 11 2005
SPECIAL PROJECTS

Regulatory Branch
East Section
POA-1994-242-9

Mr. Reuben Yost
Alaska Department of Transportation
and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Dear Mr. Yost:

This is in response to your January 21, 2005, letter requesting our comments on the Supplemental Draft Environmental Impact Statement (SDEIS) on the Juneau Access Improvement project prepared by the Alaska Department of Transportation and Public Facilities (ADOT/PF). We have also reviewed your November 30, 2004, letter responding to our comments on the preliminary SDEIS. As explained in our previous letter, the U.S. Army Corps of Engineers (Corps) has authority over this project pursuant to Section 404 of the Federal Clean Water Act and Section 10 of the Rivers and Harbors Act. The U.S. Coast Guard (USCG) has jurisdiction over the placement of structures and any dredging for the construction of bridges over navigable waters, including all tidal waters. We suggest you closely coordinate this project with the USCG at your earliest convenience, if you have not already done so. Please note, any discharge of fill or dredged material into waters and navigable waters of the United States (U.S.) in association with USCG regulated bridges or causeways would still be subject to Section 404 and Corps permit requirements.

We note that you intend to provide a detailed analysis of alternatives in the final EIS and the draft 404(b)(1) analysis that will be submitted to our office. We wish to reiterate our strong concern that this analysis must include a thorough and detailed alternatives analysis to clearly show that the preferred build alternative would have the least environmentally damaging impact. Such analysis needs to include cost comparisons and a detailed cost analysis breakdown, impact analysis, feasibility determination, and other relevant issues. The impact analysis needs to include a cumulative impact analysis, which must consider any associated impacts from the project, such as whether any borrow (fill) sources or disposal areas for excess material would impact any waters of the U.S. This alternatives analysis is the key to the Clean Water Act 404(b)(1) Guidelines, which are the guiding principles the Corps must follow in reaching its permit decision.

Our previous letter to you describes areas that must be further evaluated to determine if its feasible to further reduce impacts to waters of the U.S. Primarily, this includes using elevated bridges or causeways to go over waters or wetland areas and moving the road alignment to avoid wetland areas by routing the road on upland areas.

One area of particular concern is the proposed road alignment south of Comet Beach under the preferred Alternative 2. We believe this area warrants a much closer review and closer coordination between our offices, and the resource agencies; especially the U.S. Fish and Wildlife Service. We note that the SDEIS and your November 2004, letter state that the road alignment was shifted into 27-acres of forested wetland in this area and away from a "band of uplands" that has bald eagle nests. This is a substantial amount of wetlands, as it represents a high percentage (29%) of all wetland impacts on the preferred alternative. We recognize the importance of this species and the Bald Eagle Protection Act that protects it. However, we are also aware of numerous bald eagle nests in Alaska that are active and adjacent to busy roads and other developed areas.

In order to facilitate this review, we require scaled project plans that clearly show the accurate wetland boundaries and the precise location of eagle nests. A determination of whether the nests are abandoned or active and the date of their last use must also be provided. It may also be helpful if separate wetland maps showing their functional assessment rating are done for this area and other wetland areas.

As stated in our previous letter, the Section 404(b)(1) guidelines require that all reasonable steps be taken to avoid and minimize impacts to waters of the U.S. and then compensatory mitigation be provided for unavoidable impacts. We are growing concerned that not enough detail is being provided for an acceptable compensatory mitigation plan and that you believe such a plan is to be provided by the Corps or other resource agencies for your consideration. We note that your November 30, 2004, letter states, "If feasible restoration opportunities are identified, we will investigate them." Please note, Part 1.a. of the attached Regulatory Guidance Letter (02-2) on this issue states, "Permittees must provide appropriate and practicable mitigation for authorized impacts to aquatic resources in accordance with the laws and regulations." The Corps and other resource agencies will review the compensatory mitigation plan provided by the applicant to determine its adequacy to compensate for the project impacts. The Corps cannot design a compensatory mitigation plan for an applicant, but we can inform you of compensation methods that have been used or considered for other Corps permits. Hence, we offer the following list of compensation methods that need to be fully addressed for the project:

1) Enhancing and/or restoring wetland areas, such as by controlling noxious or invasive plants (i.e. reed canary grass, purple loosestrife, Phragmites, etc.) in wetland areas.
2) Restoration of hazardous waste sites, as shown in figure 3-12 of the SDEIS, or other polluted areas that are affecting water quality and there is no program or plan to clean up these sites.
3) Restoring eroding areas, especially wetland areas, that are affecting water quality. This should involve an inventory of all State-owned land within the study area, as shown in figure 1-1 of the SDEIS.
4) Creation of wetlands by incorporating wetland design criteria into any borrow sites. We strongly suggest such sites be identified as soon as possible so they can be included in the DA permit application.
5) Enhancing aquatic areas by filling deepwater areas that have minimal value so they have higher values, such as by filling deepwater areas along Taiya Inlet so they become areas with submerged aquatic vegetation (SAV), particularly eelgrass. We understand this proposed disposal area has been dived and videotaped and we request a copy of this videotape for our file.
6) Inventorying all SAV beds within at least the study area and providing maps showing these areas to the Corps and other resource agencies.

7) Preserving existing wetlands that are under a demonstrable non-regulated threat, such as preserving forested wetland areas that are scheduled to be logged, etc.

The above list is in no way a complete or exhaustive list and the Corps will consider all compensation methods that offset impacts that are under our direct jurisdiction, such as water quality and waters/wetlands. The above list is also in no particular order of preference, although preference is given towards the restoration of previously impacted aquatic resources and preservation should only be used as a "last resort." Please keep us informed on the precise steps you are taking to develop an acceptable compensation plan. We strongly suggest a meeting be held between our offices and the appropriate resource agencies at the earliest opportunity to provide you guidance on developing this plan.

We appreciate the opportunity to comment on the SDEIS, and remain available for continued coordination. Please contact me at the letterhead address, by telephone at (907) 790-4490, or by FAX at (907) 790-4499.

Sincerely,

Jeff Koschak
Project Manager

Enclosures

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
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PHONE: (907) 465-1774
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October 28, 2005

RE: Juneau Access Improvements
Project number 71100

Jeff Koschak
Juneau Regulatory Field Office
U.S. Army Engineer District, Alaska
8800 Glacier Highway, Suite 106
Juneau, Alaska 99801-8079

Dear Mr. Koschak:

Thank you for your comments in response to the Supplemental Draft Environmental Impact Statement (EIS). The following is a response to your comments.

U. S. Coast Guard Jurisdiction

This project has been closely coordinated with the U. S. Coast Guard (USCG); the USCG has been a Cooperating Agency in preparation of the 1997 Draft EIS and the Supplemental EIS. The Coast Guard has indicated which rivers are navigable according to their standards, and have also indicated the maximum size vessel that would need to be accommodated. Permit applications will be submitted to the USCG for bridges over navigable waters after distribution of the Final EIS. Bridges would involve only the placement of piers in navigable waters; fill for approaches in wetlands or other waters of the U. S. would be included in a Department of the Army permit application.

Alternatives Analysis

The alternatives evaluation included in the draft 404(b)(1) analysis addresses all elements of the project purpose and need, cost, impacts, and other relevant factors to demonstrate that the preferred alternative identified is the least environmentally damaging practicable alternative. The analysis also evaluates the feasibility of avoidance and minimization measures.

The alignment from Slate Cove to Sherman Point was adjusted prior to release of the Draft EIS (in 1997) based on the consensus of resource agencies. This move was made to avoid impacts to bald eagle nest trees as well as intertidal areas and the near shore area. At that time it was determined that the narrow band of upland hillside was the habitat that should be avoided, and locating the road on the abundant primarily forested wetlands above the coastal slope would have

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lower overall impacts. The current bench alignment (revised slightly from the Supplemental Draft EIS alignment to avoid emergent wetlands) would impact approximately 48 acres of palustrine wetlands in this area, as opposed to the 20 acres the original beach alignment would impact. As shown on the plan sheets discussed at the 8/26/05 agency meeting, the bench alignment avoids 11 active eagle nest tree buffers (100-meter diameter) and approximately 32 acres of intertidal fill. This alignment also reduces visual impacts.

The U. S. Fish and Wildlife Service (USF&WS), with DOT&PF assistance, has monitored eagles nests on the east side of Lynn Canal every year since 1997. The Bald Eagle Technical Report includes a report from USF&WS documenting these nests have all been used two or more times in the seven year span from 1997 to 2003. This is an area of fairly high nest density; two previously documented nests are no longer in use. The Environmental Protection Agency (EPA), USF&WS, and the Alaska Department of Fish and Game support avoiding these eagle nest trees (for example, see page 1 of EPA's March 25, 2005 comment letter).

The Wetlands Technical Report provides the delineation and functional assessment of the wetlands potentially affected. The bulk of the additional 28 acres of wetlands affected are in two wetland polygons, 955-2 and 1185-1. These are very large forested wetlands; the total acreage of these two wetlands that would be impacted by the current alignment represent a small percentage of these polygons, and a very small percentage of the forested wetlands in this area. These wetlands are not rare or unique, and are not rated "very high" for any function. They are rated "high" for nutrient transport and riparian support by virtue of the presence of woody vegetation and downslope forest areas, but there are no fish streams in the vicinity of the alignment change and both wetlands are rated "very low" for fish habitat. The most important function of these wetland areas is moderate wildlife support, while the uplands and intertidal area avoided provide a higher level of support. The explanation for this wetland impact has been expanded in the Final EIS to include these points.

Compensatory Mitigation

We do not believe that a compensatory mitigation plan is to be provided by the Corps or other resource agencies, and fully intend to provide a compensatory mitigation proposal with the DA application when submitted. My November 30, 2004 statement "if feasible restoration opportunities are identified, we will investigate them" was preceded by an explanation that neither we nor resource agencies have been able to identify any onsite mitigation and therefore we are proposing a combination of management enabling population monitoring and fee in lieu. This project has been in existence since 1994, and the potential impacts to wetlands have been generally known since that time. We have had many discussions with resource agency staff over the years, including your predecessors, and there has been general agreement to date that no worthwhile on site in kind mitigation opportunities exist, and direct offsite mitigation is not desirable. To that end suggestions have centered on greater avoidance and minimization efforts, and mitigating the biggest impact concern, wildlife effects due to increased access and fragmented habitat.

Avoidance and minimization has been aggressively pursued on this project from the very beginning. The alignment has been adjusted many times to reduce impacts to wetlands and other waters of the U. S. All anadromous waters would be bridged with most streams clear spanned and only piles placed in those that cannot be clear spanned (all abutments would be above ordinary high water except for the south Katzehin River approach). Bridging rather than culverting anadromous streams added approximately $4.2 million to the construction estimate for the preferred alternative. Extending bridge lengths to avoid in-water abutments and provide wildlife underpass corridors will add another $1.3 million. DOT&PF is also proposing two wildlife underpasses at identified high bear travel corridors, which would add up to $0.9 million to the project.

In addition to the avoidance and minimization described above, the Supplemental Draft EIS made the commitment to mitigate for wildlife, wetland, intertidal and subtidal impacts with a combination of management enabling monitoring and fee in lieu. In order to address agency concerns that monitoring related to impacts caused by access should not be used to mitigate direct impacts to wetlands and other waters of the U.S., we are separating these proposals. The preliminary Final EIS includes a fee in lieu payment proposal for impacts to waters of the U.S. as follows:

- Forested and scrub/shrub wetlands (approximately 70 ac) $2,800/acre
- Estuarine emergent wetland (approximately 0.2 ac) $50,000/acre
- Non-vegetated intertidal and subtidal areas (approx. 32) $20,000/acre

These per acre values are based on values used in recent DOT&PF projects that involved fee in lieu payments for impacts to wetlands and marine waters of the US.

Based on the current alignment of the preferred alternative, the fee in lieu payment proposed for fill in waters of the US totals approximately $846,000. Please note that all palustrine emergent wetlands and but all 0.2 acres of estuarine emergent wetlands have been avoided. Potential wetland impacts have been minimized by alignment changes, extension of bridges and slope steepening. Further minimization is not practicable. Bridging via a pile supported causeway is estimated to cost $4,400 per lineal foot. The average wetland fill width would be 80 feet, or 544.5 lineal feet per acre. The avoidance cost would therefore be $2.4 million per acre.

As discussed above, fee in lieu of wetland restoration, enhancement, creation or preservation is proposed because a physical project in the immediate watersheds or general Lynn Canal project area does not appear to be advisable, given the prevalence of unaltered wetlands. There has been little disturbance of the watersheds in the project area, beyond land that is privately owned or leased. Only a few small areas of invasive plants were identified during vegetation field studies. The potentially hazardous waste sites in the project area are at active private businesses and are therefore the responsibility of the business owners. Mapping of submerged aquatic vegetation in areas not mapped for this project is currently being developed under a joint effort by resource agencies. Developing additional areas in Lynn Canal or Taiya Inlet is not considered feasible or desirable by agencies, including the National Marine Fisheries Service, which is requesting fee in lieu for impacts to marine waters.

At this point in time we have not determined whether the fee in lieu would be used for preservation or restoration of specific habitat or if a payment would be made to a land trust fund for future perservation/restoration. We are currently working with resource agencies to identify and investigate potential preservation parcels. If no suitable currently available land is identified, payments to a land trust would include a stipulation that the funds be used to preserve or restore similar wetland and marine habitat.

Please note that all potential marine fill sites for highway or ferry terminal construction were evaluated by underwater camera tows and field survey of the intertidal area during low tides. No dive surveys with videotaping were conducted. Underwater camera tows were also conducted at representative deep water disposal sites as agreed upon by resources agencies during scoping. NMFS staff did conduct a dive survey in the vicinity of the Sawmill Cove Terminal site as an independent evaluation of the site.

Please contact me if you have any questions about this response. I look forward to your comments on the preliminary Final EIS and the draft 404(b)1 analysis and application.

Sincerely,

Reuben Yost
Special Projects Manager

cc:

Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS
Tim Haugh, FHWA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

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Mr. Reuben Yost
Project Manager
Alaska Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Re: Juneau Access Improvements, Project No. 71100
Supplemental Draft Environmental Impact Statement
Essential Fish Habitat Assessment
Steller Sea Lion Technical Report

Dear Mr. Yost:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the Supplemental Draft Environmental Impact Statement (SDEIS), Essential Fish Habitat Assessment (EFHA), and Steller Sea Lion Technical Report (SSLTR) for the Juneau Access project and provides the following comments for consideration by the Alaska Department of Transportation and the Federal Highway Administration (ADOT/FHWA). NMFS has jurisdiction for conserving and protecting living marine resources under the Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act and Endangered Species Act. These laws require NMFS to review and consult on the environmental impacts to wetlands and streams that support anadromous fish, nearshore and marine resources that support commercial and recreational fish species, as well as marine mammals and federally listed endangered species.

NMFS offers the following comments to assist ADOT/FHWA in completing the environmental review of this project. NMFS originally submitted comments on the SDEIS, EFH, and SSLTR on March 21, 2005. This letter updates those comments with additional information concerning the Katzehin Ferry Terminal.

Supplemental Draft Environmental Impact Statement (SDEIS)

The SDEIS includes analysis of ten alternatives, including the no action alternative; four

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alternatives involve a road on the east side of Lynn Canal, one alternative involves a road on the west side of Lynn Canal, and four are marine transport (ferry) alternatives. NMFS analysis focuses on effects of ADOT/FHWA's preferred alternative, 2, which includes a 69-mile highway from Juneau to Skagway, with three multi-span bridges with in-stream piers, six single-span bridges, and a ferry terminal at Katzehin. The no action alternative, alternative 4C (increased conventional ferry service from Auke Bay), alternative 4A (fast vehicle ferry service from Auke Bay), and alternative 3 (road access on the west side of Lynn Canal), are also discussed. With the exception of the no action alternative, all of the alternatives would have adverse effects on EFH, although the manner and extent of effects vary considerably among alternatives.

NMFS's concern is greatest for alternatives with the potential to adversely affect Berners Bay. Berners Bay is an aquatic resource of national importance, including significant seasonal concentrations of foraging Steller sea lions, humpback whales, harbor seals and other marine mammals, and regionally important concentrations of spawning and rearing forage fish including the remaining spawning habitat for the Lynn Canal Pacific herring population. The bay is a major estuary in Lynn Canal and is defined by Point St. Mary to the north and Point Bridget to the south. One clearwater (Berners) and three glacial (Antler, Lace and Gilkey) rivers feed the bay, and eulachon spawn in the lower reaches of these rivers. Five creeks (Slate, Sawmill, Johnson, Davies, and Cowee), also drain the Berners Bay watershed. In combination, these systems provide spawning and rearing habitat for runs of eulachon; sockeye, coho, pink, and chum salmon; steelhead and cutthroat trout; and Dolly Varden char. The bay also provides habitat for halibut, shrimp, and crab.

No Action Alternative: NMFS finds the no action alternative to be the environmentally preferable alternative, as it involves no additional impacts to EFH, marine mammals, or threatened and endangered species. However, this alternative is unlikely to meet the project purpose and need to provide improved surface transportation to and from Juneau within the Lynn Canal corridor that will provide the capacity to meet transportation demand, provide flexibility and improve opportunity to travel, reduce travel times, reduce state costs, and reduce user costs.

Alternative 4C: Increased conventional ferry service from Auke Bay is the action alternative with least potential to adversely affect NMFS trust resources. No additional ferry terminals would need to be constructed and no wetlands would be filled, although some adverse effects to EFH would occur in Auke Bay as a result of reconstructing the Auke Bay ferry terminal to include a double stern berth to accommodate the two vessels necessary for north Lynn Canal service. Due to the lower speeds of conventional ferries, the risk of ship strikes of humpback whales, Steller sea lions or other marine mammals is lower than for fast vehicle ferries. EFH would be impacted at Auke Bay, temporarily during construction and permanently during operations as described in the EFH assessment.

Alternative 4A: Fast vehicle ferry service from Auke Bay is similar to Alternative 4C in terms of adverse effects to marine resources, with the additional slight risk of collisions with endangered humpback whales and possibly (but less likely) for Steller Sea lions and other marine mammals due to the speed of vessel travel.

2

Alternative 2, ADOT/FHWA's Preferred Alternative: Construction of the preferred alternative would require 21.9 acres of intertidal/subtidal habitat to be filled, plus the construction of three multi-span bridges with in-stream piers and six single-span bridges over anadromous rivers and streams and a ferry terminal north of the Katzehin River delta that would require dredging and breakwater construction. Effects on marine EFH from highway construction would occur from fill of intertidal habitats due to sidecasting of materials during road construction. The fill would bury all intertidal and subtidal organisms. The fill areas are generally small in size and would be expected to recolonize eventually with native species recruited from adjacent undisturbed sites. Herring spawning habitat in Berners Bay would not be impacted. Temporary barge landing sites for access to construction camps would be removed and restored. Multi-span bridges with in-stream piers would be required over the Antler, Berners/Lace Rivers and Katzahin River; single span bridges without in-stream piers would be used to cross all other anadromous fish streams. Ferry terminal construction impacts from Alternative 2 affecting marine and anadromous EFH occur from excavation and fill of intertidal and subtidal areas to construct the ferry terminal and vehicle parking areas (8.8 acres), breakwater construction, pier and pile installation for the dock, and dredging of the boat basin.

We offer the following EFH Conservation Recommendations for this alternative pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act:

1) Realign the Berners/Lace and Antler River multi-span bridges so that they are located as far upstream as possible, minimizing the adverse effects of bridge construction and the effects on instream flows. Eulachon are important forage for federally managed fish species (as well as marine mammals) and spawn up to four miles upriver. Moving the bridge alignments upstream would decrease the amount of wetland habitat impacted, reducing effects on eulachon and Steller sea lions and other wildlife that use the mudflats, and minimizing future human impacts to the river deltas by providing additional distance between the roadway and river outlets into Berners Bay.

2) Provide compensatory mitigation sufficient to compensate for the loss of intertidal, subtidal and wetland habitats. We recommend that you develop a mitigation plan in consultation with NMFS and other resource agencies.

3) Minimize impacts of ferry terminal construction by incorporating a gap or large box culvert-type structure between the breakwater and the shore that would allow passage of juvenile salmonids during nearshore outmigration. This feature should be designed and constructed to accommodate juvenile passage at most tidal stages, except extreme low or minus tides. NMFS is providing standard recommendations for pile driving and construction of over water structures for use as general guidance in designing and constructing the Katzehin Ferry Terminal (Enclosure 2).

The SDEIS indicates that highway runoff is not expected to exceed state water quality standards in receiving waters, and that the project will adhere to BMPs that are protective of water quality (i.e., alignment has been shifted inland to the maximum extent possible to maximize the beach buffer width, vegetated drainage ditches will be constructed, and oil-water separators will be installed and maintained at appropriate sites). Therefore, NMFS concurs that highway maintenance and operations under this alternative would not be likely to degrade EFH or adversely affect federally managed fish species.

Alternative 3: Alternative 3 would involve constructing a highway to Skagway along the west side of Lynn Canal, with a ferry connection from Berners Bay to William Henry Bay. Plans include construction of 39 miles of highway, three multi-span bridges with in-stream piers, 8 single-span bridges without instream piers, and two ferry terminals. The most significant adverse effects to living marine resources posed by this alternative are potential effects to the Lynn Canal herring population from a ferry terminal at Sawmill Cove in Berners Bay; effects to Steller sea lions, humpback whales and their prey from ferry operations across Berners Bay to William Henry Bay; and adverse effects to sensitive and productive subtidal habitats in William Henry Bay. However, this alternative could be combined with components of other alternatives to develop a blended alternative that is less damaging to EFH. If the east side road was extended to a ferry terminal north of Berners Bay with ferry service connecting to a west side terminal north of Endicott River, or terminated at a ferry terminal located south of Berners Bay, adverse impacts to Berners Bay and William Henry Bay could be avoided entirely.

As described in the SDEIS, selection of this alternative would likely require formal consultation under section 7 of the Endangered Species Act due to potential adverse direct and indirect effects to listed species from ferry terminal construction in Berners Bay and high-speed ferry operations across the bay and Lynn Canal.

Alternatives 2A, 4B, and 4D: All marine and road alternatives involving ferry terminal construction and operations in Berners Bay are likely adversely affect both Steller sea lions and humpback whales and their prey resources, and thus would likely require formal consultation with NMFS under the Endangered Species Act to ensure that the proposed action would not jeopardize the continued existence of either species.

Alternative 2A: Due to the combination of adverse effects from both road and marine impacts, especially in Berners Bay, alternative 2A has the greatest potential to impact living marine resources. NMFS' Endangered Species Act Biological Opinion prepared for the Kensington Gold project provides a complete analysis of potential direct, indirect and cumulative effects for a similar action involving ferry terminal construction and operation and vessel access across Berners Bay. NMFS anticipates that any formal consultation with ADOT/FHWA for the Juneau Access project would include analysis similar to this Biological Opinion; thus this document should be helpful to ADOT/FHWA in preparing a Biological Assessment for this project.

<u>Essential Fish Habitat Assessment</u>

The EFH Assessment is well written and comprehensive. The investigations of nearshore, intertidal and subtidal habitat areas potentially affected by each project alternative are thorough

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and comprise a wealth of site-specific information on Lynn Canal's marine resources that will be useful for this and other projects.

ADOT on behalf of FHWA has determined that based on the scope and nature of impacts expected from the project, minimization of impacts, and the proposed mitigation measures, no substantial adverse individual or cumulative effects on EFH would occur under any project alternative. NMFS cannot concur with this determination. The SDEIS has comprehensively documented the extent of intertidal and subtidal fill, impacts from river and stream crossing, impacts from ferry terminal construction and operation and impacts from vessel operations, which would result from each alternative. All action alternatives would have adverse effects to EFH.

The Juneau Access project would adversely affect EFH in many ways: 1) construction of the marine facility at Sawmill Cove may degrade or destroy spawning habitat for Pacific herring, a species that provides forage for federally managed fish species; 2) the breakwater and boat traffic near the Sawmill Cove ferry terminal may degrade adjacent herring spawning habitat; 3) vessel traffic, noise, and changes in shoreline structure and intertidal habitat may alter the behavior of schooling adult fish and rearing juveniles in Berners Bay; 4) in-water structures and boat traffic may alter shoreline migration patterns of forage fish and juvenile salmonids, shifting the fish into areas where predation risks are greater (i.e., schooling along the edge of the breakwater, where fewer escape routes are available); and 6) vessel fuel leakage, contaminant spills, pollutant runoff and increased shoreline development of Berners Bay and Lynn Canal may impair water quality, particularly in areas where vessel activity and/or shoreline development are concentrated. Such impacts may happen alone or in tandem with other impacts. The overall effect of these stressors on forage fish resources depends on the frequency, magnitude, duration, and timing of disturbance. The extent of impacts on forage fish will also depend on the sensitivity of individual species and different life stages and whether the impacts occur alone or affect the animals as a suite of multiple stressors.

The Lynn Canal herring stock is particularly susceptible to adverse impacts from the Juneau Access Project because of the current condition of the population, its life history and its reliance on Berners Bay during all lifestages, particularly during spawning and larval development. The Lynn Canal herring population is a keystone species in the marine ecosystem of Lynn Canal. Herring are an integral component of the food web and are consumed by a wide variety of vertebrate species at different trophic levels. The Lynn Canal herring population is an important, year-round prey resource for Steller sea lions, humpback whales and other marine mammals that utilize Lynn Canal habitats. Specifically, this population supports the Steller sea lions that haul out and forage around Benjamin Island, Gran Point and Met Point. The herring are also consumed by sea lions foraging in Auke Bay during the winter months and in Berners Bay during the spring. The humpback whales commonly seen around North Pass, Shelter Island and Berners Bay feed on Lynn Canal herring and this forage fish is an important component of their diet throughout the year. Herring are also preyed upon by other fish species – during the larval and juvenile life stages, salmon, pollock, and other nearshore fish, which are also marine mammal prey resources, consume them. Further declines in the herring population could have cascading effects on the Lynn Canal food web, with affects on the fitness of other fish, marine mammals, and seabirds.

Under Section 305(b)(4) of the Magnuson-Stevens Act, NMFS is required to provide EFH Conservation Recommendations to Federal agencies for actions that would adversely affect EFH. These recommendations may include measures to avoid, minimize, mitigate or otherwise offset adverse effects. Section 305(b)(4)(B) requires a Federal agency to provide a detailed response in writing to NMFS which includes the measures proposed for avoiding, mitigating or offsetting the impact of the activity on EFH. Our conservation recommendations for the preferred alternative are listed above under the discussion of Alternative 2. NMFS will develop conservation recommendations for the final preferred selected alternative if ADOT selects an alternative other than 2.

Threatened and Endangered Species - Section 4.1.16

ADOT/FHWA plan to provide NMFS with an updated Biological Assessment addressing the potential effects of the proposed alternative on two populations of Steller sea lions, and the North Pacific population of humpback whales with special emphasis on the North Central subpopulation of this species. This BA will consider whether the effects of the proposed action is likely to adversely affect the:

(i) Western population of Steller Sea Lions (*Eumetopias jubatus*; listed as endangered on May 5, 1997 [62 FR 30772]; critical habitat designated on August 27, 1993 [58 FR 45269])

(ii) Eastern population of Steller Sea Lions (*Eumetopias jubatus*; listed as threatened on November 26, 1990 [55 FR 40204]; critical habitat designated on August 27, 1993 [58 FR 45269])

(iii) North Pacific Humpback Whales (*Megaptera novaeangliae*) listed as endangered upon passage of the ESA of 1973 (16 U.S.C. 1531 *et seq.*)

No other listed species under NMFS jurisdiction are found in the action area, or waters adjacent to the action area. Preliminarily, FHWA has determined that Alternatives 2 through 2C would not be likely to adversely affect Steller sea lions.

NMFS review of the 1997 Draft EIS for the Juneau Access Project concluded that Steller sea lions would not be adversely affected if the following mitigation measures were followed:

- No boat launches or structures that enhance boat access would be constructed anywhere along the East Lynn Canal Highway
- Expand year-round monitoring at Gran Point and Met Point to include an assessment of human behavior around the haulouts. This study would be conducted for a period of at least three years after the highway is constructed and it should focus on whether access

from the highway is causing disturbance to sea lions. If human disturbance is documented, additional mitigation measures would be required

- Employ independent observers during construction to ensure that sea lions are not present at the Gran Point haulout. If sea lions are present at any time during construction in the Gran Point Critical Habitat Area, all work must cease and NMFS must be consulted before any further construction proceeds.

During the time since this earlier consultation occurred, ADOT has monitored Steller sea lions at Gran and Met Points in 1998 and 2002 to 2004. ADOT has also adjusted the highway alignments to minimize potential impacts to sea lions. NMFS will review the Biological Assessment once it is completed and offers the following comments on the Steller sea lion Technical Report to assist ADOT/FHWA in development of the BA.

High-speed ferries increase the risk of collisions with humpback whales and, though less likely, Steller sea lions. Alternatives that include construction and maintenance of additional ferry terminals, particularly in Berners Bay, are likely to adversely affect prey resources upon which the listed species depend (Pacific herring, eulachon and capelin), and thus could adversely affect the fitness of Steller sea lion and humpback whales.

Steller Sea Lion Technical Report

The Steller sea lion Technical Report considers the effects of construction noise, human presence and traffic noise from road construction and use, ferry terminal construction and use, and vessel traffic on Steller sea lions.

Steller sea lions from both the western and eastern distinct population segments are likely to occur in the project area. Steller sea lions branded in the western population have been observed at Benjamin Island, Gran Point and Little Island in Lynn Canal, near Berners Bay. Of 348 sightings of branded individuals, 5 animals were from the western population. Thus, few animals from the western population occur in the action area. Steller sea lions branded as pups in the eastern population at the Forrester and Hazy Island rookeries have been observed at Benjamin Island, Gran Point, Met Point, and Little Island in Lynn Canal. Between 2000 and 2004, a total of 343 branded animals from the eastern population were observed at these haulouts. Of those observed, 162 branded animals were observed at Benjamin Island (77 females, 83 males); 136 were observed at Gran Point (57 females, 80 males); 39 were observed at Little Island (14 females, 27 males); and 6 were observed at Met Point (5 females, 1 male). Of the animals observed, 105, 45, and 5 animals were observed nursing or suckling at Benjamin Island, Gran Point, and Little Island respectively. In contrast, only 5 branded animals from the western stock have been observed at these haulouts. Although no branded animals have been identified in Berners Bay, the evidence presented suggests that most of the animals using Lynn Canal including Berners Bay are from the eastern population.

7

Table 1, Summary of Steller Sea Lion Monitoring at Gran Point (page 2-4) should be improved with inclusion of more exact measures of sea lion abundance. The actual numbers of animals observed should be included in the table instead of the imprecise references of "few to many, many, and decreasing." NMFS also requests a copy of the video camera monitoring log data so that we are able to use these data to document any future changes in Steller sea lion abundance at the site.

On page 3-1, current estimates of the eastern stock abundance should be updated with the more recent figure of 31,028 from Angliss and Lodge, 2004 instead of the figure of 30,453 from Angliss and Lodge 2002.

The distribution of Steller sea lions within Lynn Canal should include the ephemeral haulout at the mouth of Slate Creek Cove in Berners Bay, which is used seasonally by a large number of animals during the spring eulachon run. On page 4-5, Section 4.3, Alternative 2A this site is described, and this haulout site should also be referenced in other parts of the document.

The discussion of noise should mention that increased vessel traffic in Berners Bay would increase the possibility of vessel strikes, although the probability of striking Steller sea lions would be low due to their speed and agility. The amount and effects of noise on hauled-out Steller sea lions at Gran Point and Met Point generated from avalanche control measures should be addressed.

NMFS cautions that the mitigation measures listed on page 4-11 are actually monitoring activities, the results of which should be used to develop necessary adaptive management actions and techniques that would mitigate for any adverse effects that were discovered.

The discussion of noise on page 4-63 refers to traffic noise as occurring at a level that often occurs in the natural environment. Traffic noise is not a part of the natural environment; this is really referring to noise, other than traffic, in a natural environment that is of similar level. The reference to Minke whales' tendency to be attracted to motor vessels should be further explained.

Discussion on page 4-69 refers to the proposed ferry terminal at Slate Creek Cove as being about three miles away from the haul out at Point St. Mary. However, this terminal would be close to the Slate Creek Cove haul out.

FHWA has made a preliminary determination (page 4-69) that Alternatives 2 through 2C are not likely to adversely affect Steller sea lions or critical habitat. NMFS disagrees with this for Alternative 2A for reasons described above, and concurs for Alternatives 2, 2B and 2C if the proposed mitigation measures, including adaptive management, are adopted. The proposed mitigation measure #5 for threatened and endangered species (section 5.9) should be expanded to include "...if adverse effects are identified, mitigation measures will be employed through consultation with NMFS."

Additional minor comments are listed in Enclosure 1.

Please contact Susan Walker (907-586-7646, susan.walker@noaa.gov) with any questions regarding this review.

Sincerely,

Susan Kennedy
Acting NEPA Coordinator

Enclosures

cc: Tim Haugh - FHWA, Juneau
Moira Ingle - ADNR-OHMP
Carl Schrader - ADNR-OHM
Bruce Halstead - FWS, Juneau
Chris Meade - EPA, Juneau

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

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October 28, 2005

RE: Juneau Access Improvements
Project No. 71100

Susan Walker
Habitat Conservation Division
National Marine Fisheries Service
P. O. Box 21668
Juneau, AK 99802-1668

Dear Ms. Walker:

Thank you for the National Marine Fisheries Service's comments on the Supplemental Draft Environmental Impact Statement (EIS). The following is a response to your comments.

Alternative Impacts

We concur with your comments about the Essential Fish Habitat (EFH), marine mammal, and Threatened and Endangered species impacts of the alternatives evaluated in the Supplemental Draft EIS. Although we concur with your assessment that the No Action Alternative and Alternatives 4A and 4C would have lower impacts, we do not believe these alternatives sufficiently meet the purpose and need for the project. The preliminary Final EIS includes an alternatives evaluation in the draft 404(b)(1) analysis explaining why alternatives that are less environmentally damaging are not practicable.

With regard to Alternative 3, we agree with your statements summarizing the adverse effects to marine resources of this alternative. However, a "blended alternative" with different terminal locations but retaining a highway on the west side of Lynn Canal to avoid EFH impacts to both Berners Bay and William Henry Bay would require terminals to be located in unprotected areas of Lynn Canal. This would not be a reasonable alternative. Furthermore, a reasonable alternative, 2B, currently exists that would have this result while using the existing Haines terminal and a protected terminal location on the east side that has relatively low EFH impacts.

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EFH Conservation Recommendations

We have incorporated your EFH Conservation Recommendations into the conservation measures identified in the EFH Assessment. Items 1) and 3) will be integrated into the design of the preferred alternative. The following is a detailed response to you recommendations:

1) The alignment through Berners Bay was based on an effort to avoid estuarine emergent wetlands and eagle nest trees while minimizing palustrine wetland impacts, terrestrial habitat impacts, and river crossing lengths. Based on your comments and mapped eulachon spawning areas submitted recently, we revised the Alternative 2B Supplemental Draft alignment. The new alignment would result in fewer in-water bridge piers, and would avoid any bridge piers in the northern channel documented to have a high density of eulachon spawning. Moving further upstream would result in a longer crossing, greater impacts to terrestrial habitat on both sides of the Antler, and proximity impacts to an eagle nest tree as well as excessively steep slopes. The Lace River crossing alignment has been moved approximately 700 feet upstream to place the highway further from the vegetated intertidal area at the end of the peninsula. This change would create a 300-foot longer bridge, but would continue to take advantage of upland areas and avoid eagle trees as well as Johnson Creek.

2. The Supplemental Draft EIS indicated a commitment to provide compensatory mitigation for wetland, intertidal and subtidal impacts. The document stated that we would work with resource agencies to identify a combination of research and fee in lieu compensation. We have investigated the new suggestions for compensatory mitigation other than fee in lieu, but continue to believe fee in lieu will be necessary, and have proposed a basis for this fee.

3. The design for the breakwaters at the Katzehin terminal would include fish passage gaps or large box culverts as requested. The choice of gaps or culverts would be made during final design and would be submitted to NMFS for review before the Section 10 and Section 404 permit application is finalized. Pile driving would be limited to a period (June16 to March 14) when larval and outmigrating EFH species are not present, as stated in the Final EIS.

EFH Assessment

NMFS stated that it does not concur with FHWA's determination that the proposed project would not have a substantial adverse effect on EFH. Your letter goes on to state that all alternatives would have an adverse effect on EFH, and that the Lynn Canal herring stock is particularly susceptible to adverse impacts from project alternatives that would impact Berners Bay. The statement made in the EFH Assessment that no alternative would have a substantial adverse effect on EFH was not meant to convey that any alternative would completely avoid adverse impacts. The determination of "no substantial adverse effect" was in regard to the potential need for expanded consultation, as described in the regulations. Your agency's clarification on the process in your list of minor comments, taken with your stated concerns for potential impacts to herring in Berners Bay, makes clear that in this case a distinction between adverse effect and substantial adverse effect is not necessary. Our acceptance of your Conservation Recommendations for Alternative 2 will conclude EFH consultation, as the new preferred alternative, 2B, has identical EFH impacts other than the absence of sidecasting in

Taiya Inlet. We understand that if we were to identify a preferred alternative with a Berners Bay terminal, consultation would need to continue.

Steller Sea Lion Technical Report

The Steller Sea Lion Technical Report, as well as the EIS, have been amended to include information on the western population of Steller sea lions, based on the information NMFS provided documenting the presence in the project area of individuals from this population. The more recent abundance numbers from 2002 will be added, and the ephemeral haulout at the mouth of Slate Cove will be more fully described. The discussions of noise have been expanded. Video camera log data was included in the revised biological assessment submitted to NMFS; the revised biological assessment will be part of the addendum to the Technical Report. Please note that Table 1, Summary of Steller Sea Lion Monitoring at Gran Point, was not meant to convey abundance of sea lions throughout the year, but rather to indicate the times when the haulout is vacant or infrequently used. This parallels the purpose and methods for this monitoring. We have monitored the site to get better information on the periods of use and nonuse in order to know when construction could occur in the area without disturbing sea lions at the haulout. It was never our intention to collect more comprehensive data; we provided the video feed to NMFS (Seattle) and the Alaska Department of Fish and Game (Anchorage) so that a higher level of data could be obtained if desired. As you can see from the data we provided, when circumstances allowed we did make abundance estimates.

Minor Comments

The EFH Assessment has been amended to address the corrections and clarifications NMFS requested. Both the EFH Assessment and the Steller Sea Lion Technical Report have been updated to reference the Kensington Gold Project Biological Opinion, and appropriate information regarding forage fish is included in the EFH Assessment revision.

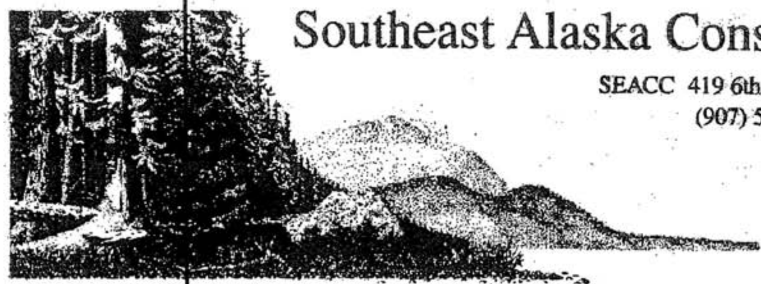
Please note that on pages 4-18, 5-16 and 5-32 of the EFH Assessment, many potential factors for the decline of the Lynn Canal herring stock are cited, including "overfishing, increased predator populations, disease, habitat alteration/degradation, water pollution, and unfavorable oceanographic conditions". The statement that "the increasing Steller sea lion population in Lynn Canal could be applying increased predation pressure to the stock" was not meant to suggest that this was the only possible cause. The statement was meant to illustrate the preceding explanation that a depressed stock has increased vulnerability to all possible decline factors, and seemed relevant given the dramatic increase in Lynn Canal sea lion numbers. However, as you point out, this particular example was unnecessarily repeated. The addendum to the assessment places equal emphasis on all factors, and reflects the likelihood that multiple factors are involved.

Thank you again for your comments. Your letter and this response are included in the preliminary Final EIS.

Sincerely,

Reuben Yost
Special Projects Manager

cc: Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Tim Haugh, FHWA



Southeast Alaska Conservation Council

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www.seacc.org • info@seacc.org

Mr. Reuben Yost
Alaska Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, AK 99801
FAX: (907) 465-2016

Dear Mr. Yost,

In light of recent statements in the Juneau Empire concerning construction of a road to the Kensington Mine, we are concerned that the state is contemplating the approval of an alternative for the Juneau Access Improvement Project that was not evaluated in the 2005 Supplemental Draft Environmental Impact Statement (SDEIS). Even worse, such a road does not meet the identified purpose and need for this project.

In an April 27, 2005 Juneau Empire story entitled "Weyhrauch marks $10 million for Glacier Highway extension," Representative Weyhrauch clearly linked the viability of the Kensington Gold Mine with construction of the proposed East Lynn Canal road saying "We need roads. We need to get to the mines." The article goes on to say that the $10 million in GARVEE bonds proposed by Representative Weyhrauch would likely go towards reaching the Kensington Mine, "but would fall short of the $40 million necessary [to reach the mine]." There is no mention of improving access to Juneau.

In an April 9, 2004 Juneau Empire article Congressional Representative Don Young also stated his interest in attempting to fund the road to the mine. That article quotes Congressman Young as saying: "If I can do it, we are going to get part of [the money] probably in conference so we can at least extend the road to Berners Bay out to the Kensington mine and try to get that section started just a little bit at a time."

Either our political leaders are ill-informed of the stated intent of the project, that is, improving access to and from Juneau, or the Department of Transportation has not been forthright with the public regarding this project's true purpose. Either way, selecting an alternative that was not evaluated by DOT and fails to meet the stated purpose and need violates the National Environmental Policy Act (NEPA). If the State intends only to construct the proposed road to the Kensington Mine, DOT must either prepare a new draft EIS or supplement the 2005 SDEIS. This is the only approach that will satisfy NEPA's twin objectives of fostering both informed decision-making and informed public participation.

ALASKA SOCIETY OF AMERICAN FOREST DWELLERS, Point Baker • ALASKANS FOR JUNEAU • CHICHAGOF CONSERVATION COUNCIL, Tenakee • FRIENDS OF BERNERS BAY, Juneau • FRIENDS OF GLACIER BAY, Gustavus • JUNEAU AUDUBON SOCIETY • JUNEAU GROUP SIERRA CLUB • LOWER CHATHAM CONSERVATION SOCIETY, Fort Alexander • LYNN CANAL CONSERVATION, Haines • NARROWS CONSERVATION COALITION, Petersburg • LISIANSKI INLET RESOURCE COUNCIL, Pelican • PRINCE OF WALES CONSERVATION LEAGUE, Craig • SITKA CONSERVATION SOCIETY • TONGASS CONSERVATION SOCIETY, Ketchikan • TAKU CONSERVATION SOCIETY, Juneau • WRANGELL RESOURCE COUNCIL • YAKUTAT RESOURCE CONSERVATION COUNCIL

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SEACC supports improving access to Juneau. As DOT's own analysis shows, maintaining and developing the existing ferry system is the most economical, environmentally appropriate, and sensible alternative for improving access to Juneau. If the Alaska Legislature wants to change the purpose and need for this project, then DOT must supplement both the alternatives and analysis previously reviewed in the Juneau Access Improvement SDEIS.

Sincerely,

Buck Lindekugel

Buck Lindekugel
Conservation Director

cc: Governor Frank Murkowski, (907) 465-3532
Senator Ted Stevens, (202) 224-2354
Senator Lisa Murkowski, (202) 224-5301
Congressman Don Young, (202) 225-0425
Senator Kim Elton, (907) 465-2108
Senator Albert Kookesh, (907) 465-2827
Representative Bruce Weyhrauch, (907) 465-2273
Representative Beth Kerttula, (907) 465-4748
Representative Bill Thomas, (907) 465-2652

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
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Preconstruction – Special Projects

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July 6, 2005

RE: Juneau Access Improvements
Project Number 71100

Buck Lindekugel
Southeast Alaska Conservation Council
419 6th Street, Suite 200
Juneau AK 99801

Dear Mr. Lindekugel:

This is in response to your May 5, 2005 letter expressing concern that the Alaska Department of Transportation and Public Facilities (DOT&PF) is considering an alternative that was not evaluated in the Supplemental Draft Environmental Impact Statement (EIS). You also state that this alternative, a road to the Kensington Mine, does not meet the purpose and need for the project. Your letter cited two recent statements in the Juneau Empire, one by State Representative Weyrauch, and another by U. S. Congressman Young. These statements indicated an interest in providing funding to extend the existing highway as far as the proposed mine in Berners Bay. Based on the fact that neither statement expressed an interest in improving access to and from Juneau, you conclude that "either our political leaders are ill-informed of the stated intent of the project, …, or the Department of Transportation has not been forthright … regarding this project's true purpose".

First and foremost, I want to assure you on behalf of DOT&PF and the Federal Highway Administration (FHWA), the federal agency responsible for the project's National Environmental Policy Act (NEPA) process, that the Supplemental Draft EIS contains the true purpose of the project. The purpose of and need for the project has not changed since the preparation of the 1997 Draft EIS. The Juneau Access Improvements project is exactly that, a project to improve surface transportation to and from Juneau within the Lynn Canal corridor. Nothing in the process we are overseeing indicates that this is not the State's intent. While the mine project and some Juneau Access Improvements alternatives have synergies, they are not interdependent.

With regard to possible explanations for statements by political leaders that emphasize access to the Kensington mine, we suggest a possibility other than them being ill-informed or DOT&PF not being forthright. In all likelihood they are expressing their own priorities in terms of funding the project such that initial construction meets their particular interest. This is a fairly common

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situation on large transportation projects, where funding for the entire project is often not available at the start. While NEPA and FHWA regulations require that all alternatives under consideration must meet purpose and need, there is no requirement that potential construction projects to implement the selected alternative individually meet any particular part of the purpose and need.

The Supplemental Draft EIS identifies several possible funding sources, with emphasis on a Congressional earmark. The document also states that if an earmark is not available, initial funding would come from the State's federal aid funding apportionment for highways. This and other statements in the document indicate that construction of a highway would most likely take place in stages. Construction projects would be planned based on the amount of funds available and the State's assessment of the best utilization of those funds.

Section 2.5 of the Final EIS, Funding Considerations, will contain an explanation about the funding available to date and the likely use of those funds in terms of construction staging. This section will make clear that legislative funding language does not drive alternative selection. If an appropriation has a stated purpose that is inconsistent with the alternative selected in the Record of Decision, the funds would have to be re-appropriated. Hopefully this information will clear up any confusion regarding potential inconsistencies between the reported intent of some elected officials and the stated purpose and need of the project.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Governor Frank Murkowski
Senator Ted Stevens
Senator Lisa Murkowski
Congressman Don Young
Senator Kim Elton
Senator Albert Kookesh
Representative Bruce Weyhrauch
Representative Beth Kerttula
Representative Bill Thomas
Tim Haugh, FHWA
Pat Kemp, DOT Preconstruction Engineer
Commissioner Mike Barton
Malcolm Menzies, DOT SE Regional Director

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
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July 8, 2005

Mr. David C. Miller, Division Administrator
Federal Highway Administration
PO Box 21648
Juneau, AK 99802-1648

Dear Mr. Miller:

As you are aware, the Department of Transportation and Public Facilities' (DOT&PF) Southeast Region is continuing to evaluate public comments concerning Juneau Access from our recent public hearings and presentations. The Comment Analysis Report is complete and has been placed on the project website. We look forward to meeting with you soon to discuss the preferred alternative to be identified in the final Environmental Impact Statement.

There have been recent reports in the media regarding construction of a ferry terminal by DOT&PF at Cascade Point. We are continually looking for means of reducing the cost of the Alaska Marine Highway System (AMHS) operation while providing improved service for Alaskans. We may evaluate the merits of creating a temporary ferry terminal at Cascade Point with State funds as an interim measure if there are delays in the construction of the Juneau Access preferred alternative.

Should you have questions with regards to our review or internal process, please contact me or Mal Menzies at your convenience.

Sincerely,

Mike Barton

Mike Barton
Commissioner

cc: John MacKinnon, Deputy Commissioner of Highways & Public Facilities, DOT&PF
Robin Taylor, Deputy Commissioner / Director of Marine Operations, DOT&PF
Mal A. Menzies, P.E., Southeast Regional Director, DOT&PF
Pat Kemp, P.E., Preconstruction Engineer, Southeast Region, DOT&PF

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STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

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July 11, 2005

Re: Juneau Access Improvements
Project 71100

James Balsiger, Administrator
Alaska Region
National Marine Fisheries Service
P. O. Box 21668
Juneau. Alaska 99802

Subject: Revised Biological Assessment

Dear Mr. Balsiger:

Thank you for your letter of March 23, 2005 providing an updated list of endangered and/or threatened species in the Juneau Access Improvements project area. As explained in the March 7, 2005 letter from the Federal Highway Administration (FHWA) and the 2005 Supplemental Draft Environmental Impact Statement, the Alaska Department of Transportation and Public Facilities has developed a revised biological assessment for this project. The enclosed revised assessment incorporates your updated list and additional information developed in the time since the original August 13, 1998 biological assessment was submitted to your agency. Per 50 CFR 402.12(g) the revised assessment incorporates the previous assessment by reference, summarizing its information and adding new or replacement information where appropriate.

The conclusion of the revised biological assessment is that the East Lynn Canal Highway (Alternative 2, 2B, 2C) is not likely to adversely affect listed species or adversely modify designated critical habitat. At this time DOT&PF, on behalf of FHWA, requests your concurrence with this determination.

Thank you for your consideration of this request.

Sincerely,

Reuben Yost
Project Manager

cc: Tim Haugh, FHWA

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

ALASKA DOT & PF
SEP 29 2005
SPECIAL PROJECTS

September 27, 2005

Reuben Yost
State of Alaska
Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Juneau Access Improvements Project, Revised Biological Assessment for Threatened, and Endangered Species

Dear Mr. Yost:

The National Marine Fisheries Service (NMFS) has reviewed the Federal Highway Administration (FHWA) revised Juneau Access Improvements Project Biological Assessment (BA) dated July 2005. In a letter received on July 11, 2005 you requested concurrence that the proposed action is not likely to adversely affect species listed under the Endangered Species Act (ESA) or their designated critical habitat. These species include endangered humpback whales, threatened eastern distinct population segment (eDPS) of Steller sea lion, the western distinct population segment (wDPS) of Steller sea lion, and designated critical habitat. The BA was forwarded to NMFS by the State of Alaska on behalf of the FHWA.

NMFS has reviewed the submitted project description and evaluation of project effects as well as the incorporated mitigation measures. The following is a description of the likely response of Steller sea lions and humpback whales to the proposed action and additional mitigation measures (conditions). Provided the proposed action is modified consistent with the conditions set forth below, NMFS concurs that the proposed action is not likely to adversely affect listed species or their designated critical habitat.

Response of Steller Sea Lions to Noise Generated by the Proposed Action

The proposed highway will be located within about 300 feet of the Gran Point haulout, well within the 3,000 foot designated critical habitat area. These critical habitat areas were designated as a buffer against disturbance, noise, harassment, and illegal shooting. Presumably, sea lions chose these sites in part because of their proximity to prey resources as well as the protection from predators or other disturbance. Although NMFS concurs with your technical assessment of the potential for noise to be attenuated from the work site to the haulout, we have limited experience with such activities and the likely response by Steller sea lions to human activity in such close proximity to an important haulout.

Man-made noise can cover a wide range of frequencies and level of sound, and the way in which a species responds depends on the frequency range it can hear, the level of sound, and the sound spectrum (Nedwell et al. 2004). Responses to noise include behavioral changes, habituation, temporary hearing impairment, and permanent physical damage to the animal. Noise can also mask biologically important signals such as intraspecific vocalizations among whales or sea lions, or the sounds of predators or prey. The impacts of noise are manifested at the level of the individual, in either short-term or long-term changes in the individual that may or may not be measurable (i.e., obvious gross behavioral changes or undetected physiological changes). Impacts of noise can also be manifested in long-term changes at the level of the population(s) if they reduce the survival or reproduction of many individuals.

A temporary shift in the hearing threshold (Temporary Threshold Shift (TTS)) due to exposure to sounds that exceed the natural threshold, occur when animals are exposed to loud instantaneous sound or to a prolonged sound that exceeds their threshold level. This temporary loss of hearing sensitivity is fully recoverable and is not considered to be an injury because no irreversible cell damage or death is involved. For marine mammals, the level has been set at 180 dB re 1 μPa @ 1m (NMFS 2005). Sounds greater than this level are likely to cause temporary or permanent hearing damage. Permanent Threshold Shift (PTS) is a loss of hearing sensitivity (even in a narrow range of frequencies) that is not fully recoverable. PTS is considered to be an injury because irreversible cell damage is involved. No data for PTS in any marine mammal currently exist, so PTS is generally estimated from the onset of TTS.

NMFS is currently developing acoustic criteria to define levels of noise that negatively affect marine mammals. The lower threshold for behavioral response is currently 160 dB re: 1μ Pa for pulsed received noise and 120 dB re: 1μ Pa for continuous noise (NMFS 2005). The impact of these noise levels will change depending on the frequency of the sound, and the response will be species-specific but also specific to individuals. From experimental studies on pinnipeds, dolphins and beluga whales, it appears that behavior begins to change, sometimes noticeably, at sound exposure levels lower than those causing the onset of TTS (180 dB re 1 μPa @ 1m). It is not clear whether this holds true for all species or all sound types, but for the test species studied, it was not uncommon for them to exhibit aberrant behavior at sound pressure levels at least 12 dB below the levels resulting in TTS onset (Finneran et al. 2002, Kastak et al. 1999).

Increased input of sound into the water column as a result of the proposed action may alter marine mammal behavior. If the noise is above-water, pinnipeds will generally dive and resurface often vocalizing if in water. If the animals are on land they will usually depart from haulouts into the water, swim with their heads above water and vocalize, or dive. If the sound persists, animals may vacate an area until the sound disappears. In-water noise may elicit diving and resurfacing often with vocalizations and departure from the area near the sound source. However, pinnipeds may follow or retreat from vessels depending on the source of the sound (i.e. may follow a fishing boat that is discarding fish or retreat from a fast-moving recreational vessel) (Loughlin 2004). Several studies in

Hawaii noted humpback whale behavioral changes in the presence of vessels. Whales surfaced without exhaling, spent less time at the surface, had longer dive intervals, dove without raising their flukes, reduced their swim speed, and altered their direction (Bauer and Herman 1986, Green and Green 1990). In 1981 and 1982, Baker and Herman (1989) conducted a study of vessel impact on humpback whales in southeast Alaska and concluded that changes in whale behavior were significantly correlated with vessel speed, size, number and proximity. The most sensitive indicators of vessel disturbance in the study were changes in the whales' respiratory behavior and orientation. In 2000, a study assessing humpback whale behavioral response to vessel activity near Juneau, Alaska, reported few cases of whale avoidance behavior in response to boats, but noted greater variability in surface interval timing and in numbers of blows per surfacing when whale watching vessels were present (Peterson 2001). However, based on these findings, the author found it difficult to conclude that existing vessel activity was disrupting the behavioral patterns of humpback whales near Juneau, Alaska.

In-water noise levels thought to elicit a behavioral response from Steller sea lions are >160 dB re 1 μPa for pulsed noise and 120 dB dB re 1 μPa for continuous noise; levels high enough to cause damage to their hearing are >180 dB re 1 μPa (NMFS 2005). Because sea lions are skittish by nature, it is likely that loud, pulsed, frequent or unfamiliar noises, such as blasting or driving pilings, are likely to disrupt resting sea lions or animals foraging near the sound source. Steller sea lions would likely abandon haulouts, or dive if resting or foraging in the water, if disturbed by construction activities. Generally, animals return to their previous behavior within an hour or so of a disturbance (Porter 1997), however they may abandon an area for longer periods of time if the disturbance continues. Because there is a paucity of information on how Steller sea lions react to construction noise, a conservative approach is warranted.

In most of their range, Steller sea lions are exposed to some level of vessel noise and traffic. Steller sea lions may be disturbed from haulout sites, rookeries, or in the water by close approach of vessels or noise. Steller sea lions may respond by retreating into the water if hauled out, vocalizing, and swimming with their heads above water. They continue this behavior until the threat is gone. Land disturbance can cause mortality if it occurs during the breeding season when pups are too young to avoid the stampede of adults to the water. Pups may be crushed or sustain trauma that eventually leads to death. Repeated disturbance of California sea lions from haulouts or rookeries may lead to permanent abandonment of those areas (S. Melin, unpublished data) and it is likely that Steller sea lions may respond in a similar manner.

Steller sea lions, like other coastal pinnipeds, can become habituated to human disturbance such that it no longer causes a response. For example, provided the vessel approaches slowly, tour boats can approach within yards of animals hauled out on the breakwater in Kodiak harbor, Alaska without causing a response. Conversely, anecdotal information indicates that sea lions abandoned the rookery at Cape Sarichef after the construction of a lighthouse in 1904. Many years after the lighthouse has been uninhabited (it was deactivated in 1979), Steller sea lions are again using this site as a haulout. Other observations by NMFS' scientists indicate that animals on some haulouts that experience relatively high amounts of tourist activity, particularly in the summer, seem to show little response to vessel traffic while Steller sea lions further west tend to be agitated much more easily by vessels. Experience in the eastern part of the range (California, Oregon, and Washington) indicates a mixture of responses to longer term human influence in the ecosystem with no clear indication of the potential influence of noise and nearby human presence such as the long term use of a road.

It is possible that some individual Steller sea lions may be affected by the construction activities, primarily above water, and by operational activities of the road. Therefore, provided the additional conditions set forth below are incorporated into the proposed action, then NMFS concurs that the proposed action is not likely to adversely affect Steller sea lions (both eDPS and wDPS) or their critical habitat. Due to concerns that the proposed mitigation measures included in the BA might not be effective in avoiding adverse effects for Steller sea lions or their critical habitat, further mitigation measures are required. This is due primarily to the uncertainty in the expected behavioral responses of Steller sea lions to construction activity and road use especially in areas of critical habitat.

Given the proposed mitigation measures in the BA, NMFS concurs that the proposed action is not likely to adversely affect humpback whales. Any noise or disturbance is likely to be limited in water due to the more transient nature of humpback whale use of this area.

Mitigation Measures and Conditions

The concern about the potential response by Steller sea lions to noise generated by the project are reflected in your mitigation measures which include the use of observers to monitor use at haulouts, avoidance of some construction activities when Steller sea lions are present at haulouts, and other actions to mitigate future disturbance such as the use of screening structures on the road near the haulouts. The additional measures provided below outline a more comprehensive monitoring plan which is intended to validate the expected lack of adverse effects on Steller sea lions and their critical habitat. The plan includes reporting requirements, additional planning responsibilities, and analysis of observations throughout the construction and post-construction phases with approval by NMFS in order to insure that the mitigation measures are effective.

The proposed measures are in essence an adaptive management program that will allow both FHWA and NMFS to move forward with the confidence that the program will avoid adverse impacts for Steller sea lions. The measures are intended to provide positive confirmation that the proposed mitigation measures are indeed effective. The areas of highest concern include the 3,000 foot zone around Gran and Met Point haulouts, as well as the long term indirect effects of building a road (within critical habitat) in such close proximity to these remote haulouts.

Monitoring plan

The FHWA will develop a comprehensive monitoring plan for the project and post-project phases to include five years after the construction phase is completed. This will include a monitoring plan for all of the activities and conditions described below. FHWA will submit this to NMFS before the beginning of the construction phase of the project. FHWA will provide NMFS with an annual report due January 1 of each year which describes the construction activities, monitoring activities, impacts or responses of Steller sea lions, and any further changes to the project. The overall plan will be re-evaluated each year during the annual report. At the end of the monitoring period FHWA will provide a final report summarizing the project, the impacts, and the likely effects on Steller sea lions or their critical habitat expected after the monitoring project ends.

Construction plan within 3,000 feet of each haulout

The BA describes a general construction plan using specific types of equipment over a range of terrain and environmental conditions. For NMFS to evaluate such a project, and insure there would be no adverse effects, much more detailed information on the specifics of the project would need to be provided. At this point in the planning phase, those conditions cannot be determined. Before construction begins within 3,000 feet of Gran Point and Met Point haulouts, FHWA must provide NMFS with a detailed description of construction plans within this zone, including the planned vegetation removal, blasting requirements, through-cuts, and screening structures. Also, before construction activities commence within 3,000 feet, NMFS must be provided with an on-site tour of the area to approve the construction plan and to verify that it is not likely to impact sea lions.

Specific measures in addition to those included in the BA

The following numbered mitigation measures are included in the BA by the FHWA (reprinted here). The additional measures required by NMFS, or "conditions," are described below.

1. Pile driving at the Katzehin terminal and the Antler, Lace and Katzehin rivers will be done with vibratory hammers to the extent possible.

   Condition: If vibratory hammers cannot be used, and before other measures are employed NMFS must be provided with a description of why vibratory hammers cannot be used. NMFS will evaluate those alternative measures.

2. A trained observer will monitor for the presence of marine mammals and pile driving will be halted if any animals come within 200 meters of the activity.

3. No boat launches or structures that enhance boat access will be constructed by DOT&PF as part of the East Lynn Canal Highway.

Condition: The indirect effect of increased access would likely result in disturbance to these haulouts from people approaching to view sea lions, recreational fishing activities, or other related activities such as tourism. Mechanisms must be in place to ensure that the road will not result in increased access to east Lynn Canal through the development of boat launches or other improved access as a result of this project. This limitation must extend beyond the construction phase.

4. As large of a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts.

Condition: Before construction within 3,000 feet of Gran Point and Met Point haulouts, FHWA must provide NMFS with a detailed description of construction plans within this zone, including the planned vegetation removal. Also, before construction activities commence within 3,000 feet of the haulout, NMFS must be provided with an on-site tour of the area to approve the construction plan and to concur that it is not likely to adversely affect Steller sea lions.

5. No temporary barge landings would be constructed within 3,000 feet of either haulout.

6. Any construction within 3,000 feet of Met or Gran Point would include through-cuts and screening structures as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts.

Condition: As described above in the construction phase, the development of screening structures and other mechanisms to avoid human impacts to the haulouts must also be described in the construction plan and be provided to NMFS for comment and evaluation and be described during the on site visit.

7. No road construction will occur within 1,000 feet of Met or Gran Point if sea lions are present unless approved by NMFS. Independent observers will be employed to ensure that no sea lions are present during work within 1,000 feet.

Condition: For Gran Point (critical habitat), no road construction will occur within 3,000 feet while sea lions are present, unless approved by NMFS in writing after evaluation of the monitoring and construction plans.

8. Met and Gran Point haulouts will be monitored during any construction within 3,000 feet to determine if any disturbance is occurring.

Condition: This is to include noise level monitoring as well as sea lion observations. Before any construction occurs within 3,000 feet of either haulout, FHWA must provide to NMFS a monitoring plan which provides the details of how and when the haulouts will be monitored, the equipment and personnel used, and training to be provided. As described above, construction will not occur within 3,000 feet of Gran Point while sea lions are present unless approved by NMFS.

9. Any blasting within 3,000 feet of either haulout, if occupied, will be monitored to document that ground vibrations at the haulout are not greater than 0.05 inches per second, and noise levels are not greater than 45 dBA.

Condition: Before blasting can occur within 3,000 feet of Gran Point, blasting at Met Point shall be monitored and documented to be not greater than 0.05 inches per second, and noise levels are not greater than 45 dBA at the haulout. This report shall be provided to NMFS before blasting can occur within 3,000 feet of Gran Point.

10. During construction, helicopters would not operate within 3,000 feet of either haulout if occupied.

Condition: The determination of occupation will be made by observers or another means other than by aircraft (to be further described in the monitoring plan).

11. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the haulouts.

Condition: In addition helicopter operations shall not be conducted within 1,000 feet around either haulout when occupied.

12. Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will continue for three years after construction to determine the extent of human access to the haulouts and disturbance of sea lions. If adverse impacts are identified, DOT&PF will consult with NMFS to determine what additional mitigation measures are necessary.

Condition: Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will occur throughout the construction phase and for five years after construction to determine the extent of human access to the haulouts and disturbance to sea lions. FHWA will provide NMFS with an annual report due Jan. 1, of each year which describes the construction activities, monitoring activities, interactions and impacts to sea lions, and any further mitigation measures necessary to avoid adverse effects.

Conditions and Initiation of Formal Consultation

If these conditions are acceptable to FHWA and are incorporated into the mitigation measures and implemented, NMFS concurs that the proposed action is not likely to adversely affect humpback whales, Steller sea lions, or their critical habitat. We ask that you provide confirmation in writing that the proposed action will be modified consistent with the above conditions.

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption.

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. No incidental take under the ESA authorization is provided here, and is therefore unlawful. In addition, the Marine Mammal Protection Act (MMPA) specifically prohibits the taking of marine mammals, including harassment, unless the activity is exempted by law or permitted under the Act.

If at any time during the project potential adverse effects are observed such as stampedes, avoidance of the haulout, or other changes in physiology or behavior which might reduce the fitness of the individuals, the FHWA shall immediately initiate consultation under section 7 of the ESA and request an incidental harassment authorization (IHA) under the MMPA. Once formal consultation is initiated, the ESA prohibits any Federal agency from making an irretrievable commitment of resources that may limit future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or adversely modifying their critical habitat.

Concurrence provided in this document requires the FHWA to accept in written confirmation the additional mitigation measures described here. If you have any further questions or concerns about this consultation or the consultation process in general, please contact Kaja Brix, Protected Resources Division, NMFS at (907) 586-7235.

Sincerely,

Robert D Mecum

for James W. Balsiger
Administrator, Alaska Region

Literature Cited

Baker, C. S. and L. M. Herman. 1989. Behavioral responses of humpback whales to vessel traffic: Experimental and opportunistic observations. Technical Report No. NPS-NR-TRS-89-01. Final report to the U.S. National Park Service, Alaska Regional Office, Anchorage, Alaska.

Bauer, G. B. and L. M. Herman. 1986. Effects of vessel traffic on the behavior of humpback whales in Hawaii. Unpublished report. National Marine Fisheries Service, Honolulu.

Finneran, J. J., C. E. Schlundt, R. Dear, D. A. Carder, S. H. Ridgway. 2002. Temporary shift in masked hearing thresholds in odontocetes after exposure to single underwater impulses from a seismic watergun. J Acoust. Soc. Amer. 111:2929-2940.

Green, M. L. and R. G. Green. 1990. Short-term impact of vessel traffic on the Hawaiian humpback whale (*Megaptera novaeangliae*). Presented at the Annual Meeting of the Animal Behavior Society, June 1990, Buffalo, NY, 9 pp.

Kastak, D., R. J. Schusterman, B. L. Southall, C. J. Reichmuth. 1999. Underwater temporary threshold shift induced by octave-band noise in three species of pinniped. J. Acoust. Soc. Am. 106:1142-1148.

Loughlin, T.R. 2004. Contract Report to Coeur, Alaska RE: Kensington Gold Project. December 17, 2004.

National Marine Fisheries Service (NMFS). 2005. Federal Register Notice of Public Scoping and Intent to Prepare an Environmental Impact Statement [to analyze new acoustic criteria for MMPA 'take' guidelines], Vol. 70, no. 7, January 11, 2005

Nedwell, J. R., B. Edwards, A. W. H. Turnpenny, and J. Gordon. 2004. Fish and marine mammal audiograms: A summary of available information. Subacoustech Report Reference: 534R0214.

Peterson, H. A. 2001. Whale behavioral responses and human perceptions: an assessment of humpback whales (*Megaptera novaeangliae*) and vessel activity near Juneau, Alaska. Masters Thesis. Nicholas School of the Environment, Duke University. 50 pp.

Porter, B. 1997. Winter ecology of Steller sea lions (*Eumetopias jubatus*) in Alaska. M.S. thesis. University of British Columbia, British Columbia, Canada. 84 p.

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
ALASKA DIVISION
709 West Ninth Street, Room 851
P.O. Box 21648
Juneau, Alaska 99802
907-586-7418 | 907-586-7420 FAX

January 11, 2006

REFER TO
HDA-AK
File #: MGS-STP 000S(131)/71100

Mr. James W. Balsiger
Administrator, Alaska Region
National Marine Fisheries Service
United States Department of Commerce
P. O. Box 21668
Juneau, Alaska 99802

SUBJECT: Acceptance of Additional Mitigation Measures

Dear Mr. Balsiger:

Thank you for your concurrence with our determination that the preferred alternative, Alternative 2B, for this project is not likely to adversely affect humpback whales, Steller sea lions, or their critical habitat. This letter is to provide written acceptance of the additional mitigation measures listed in your letter and to assure you that the proposed action will be modified consistent with your conditions.

All of the 12 mitigation measures listed in the revised Biological Assessment, as modified by your added conditions, are included in the Final Environmental Impact Statement (FEIS) under Section 5, Proposed Mitigation and Commitments. The FEIS also includes your letter and this response. If the Federal Highway Administration (FHWA) Record of Decision (ROD) for the project includes a highway on the east side of Lynn Canal, the Mitigation Plan will become a binding commitment of the FHWA. Future highway funding to the State of Alaska is dependent on the state honoring all commitments made in the ROD.

In terms of the mechanism to ensure the new highway from Echo Cove to the Katzehin ferry terminal does not result in the development of boat launches or other improved access to Lynn Canal, such as docks, we have included specific commitments in the Mitigation Plan. The first states that the Alaska Department of Transportation and Public Facilities (AKDOT&PF) will not construct any boat launches or other boat access points as part of highway construction or in the future. The second states that the Alaska Department of Natural Resources (ADNR) will not authorize use of State tidelands adjacent to the highway for water access purposes unless the National Marine Fisheries Service (NMFS) has concurred that the proposed access would not have an adverse effect on threatened or endangered species or their critical habitat. Please see the enclosed letter from ADNR agreeing to this commitment.

A requested, FHWA agrees to develop a comprehensive monitoring plan, working with AKDOT&PF. The plan will be submitted to NMFS for review well in advance of any construction scheduled within 3,000 feet of the Met Point haulout (the first haulout area to be entered, per your condition).

Please contact me if you have any questions. Again, thank you for your concurrence.

Sincerely,

Tim A. Haugh
Environmental & Realty Programs Manager

Enclosure: January 3, 2006 letter from Ed Collazzi to Tim Haugh

cc: Reuben Yost, AKDOT&PF Project Manager
Ken Vaughan, USFS Engineering & Aviation Management

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINING, LAND & WATER

400 WILLOUGHBY AVE., SUITE 400
JUNEAU, ALASKA 99801-1796
PHONE: (907) 465-3400
FAX: (907) 586-2954

January 3, 2005

Tim Haugh, Manager
FHWA Environmental Program
709 W. Ninth St., Room 851
Juneau, AK 99802-1648

Dear Mr. Haugh:

RE: Marine Access from Proposed Juneau Highway Corridor

The Department of Transportation and Public Facilities (DOTPF) has requested that the Division of Mining, Land and Water (DMLW) place a restriction on the issuing of tideland leases adjacent to the proposed new highway from Echo Cove to Katzehin. This request is based on a condition that the National Marine Fisheries Service (NMFS) included in its concurrence with the effect determination that DOTPF made on behalf of the Federal Highway Adminsitration under Section 7 of the Endangered Species Act consultation. The condition states that "mechanisms must be in place to ensure that the road will not result in increased access to east Lynn Canal through the development of boat launches or other access as a result of this project". DOTPF has previously agreed that it would not construct any marine access facilities as part of the process, but NMFS has stated that the limitation must extend beyond the construction phase.

DOTPF cannot control access via its right-of-way, as in most locations its right-of-way would not extend to the tidelands, and by regulation DOTPF cannot deny adjacent property owners access to the highway. The State of Alaska owns the tidelands adjacent to the proposed highway, and construction on these tidelands requires DMLW authorization.

The Juneau State Land Plan (JSLP) and the Northern Southeast Area Plan (NSEAP) express the State's management intent for State tidelands adjacent to the proposed highway, and both provide guidance for the protection of threatened or endangered species. Chapter 2 of the JSLP, page 2-8, states in part:

> "The Fish and Wildlife Enhancement Office of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service will be consulted on questions that involve threatened or endangered species. Consult with the National Marine Fisheries Service before authorizing activities within one mile of a sea lion haulout."

Chapter 2 of the NSEAP, page 2-13, states in part:

> "All land use activities will be conducted consistent with state and federal Endangered Species Acts to avoid jeopardizing the continued existence of threatened or endangered species of animals or plants; or to provide for their continued use of an area and to avoid

"Develop, Conserve, and Enhance Natural Resources for Present and Future Alaskans."

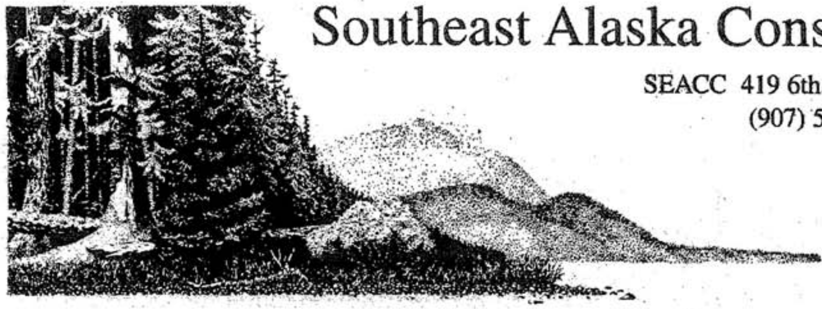
> modification or destruction of their habitat. Specific mitigation recommendations should be identified through interagency consultation for any land use activity that potentially affects threatened or endangered species."

Consistent with State management intent for these lands, and cognizant of the potential effect of increased marine access from the new highway, DMLW agrees to consult with NMFS prior to authorizing any marine access facility adjacent to the new highway between Echo Cove and the Katzehin Terminal. DMLW will not authorize any such facility without concurrence from NMFS that the proposed development will not adversely affect threatened or endangered species.

Sincerely,

Ed Collazzi
Southeast Regional Manager

cc: Mal Menzies, Southeast Regional Director, DOTPF



Southeast Alaska Conservation Council

SEACC 419 6th Street, Suite 200, Juneau, AK 99801
(907) 586-6942 phone • (907) 463-3312 fax
www.seacc.org • info@seacc.org

ALASKA DOT & PF
SEP 23 2005
SPECIAL PROJECTS

September 21, 2005

VIA EMAIL TO: REUBEN_YOST@DOT.STATE.AK.US AND FIRST CLASS MAIL

Reuben Yost
DOT&PF Southeast Region
6860 Glacier Highway
Juneau, AK 99801

Dear Mr. Yost:

As an organization with a keen interest in the Juneau Access Improvements Project, Southeast Alaska Conservation Council requests an extension of the comment period for the Final Environmental Impact Statement (FEIS) beyond the routine 30 days to a full 90 days.

The newly enacted "SAFETEA-LU" legislation requires a 30-day comment period for final environmental impact statements "unless (i) a different deadline is established by agreement of the lead agency, the project sponsor, and all participating agencies; or (ii) the deadline is extended by the lead agency for good cause." 23 U.S.C. § 139(g)(2)(B).

Additional time to examine the Department of Transportation and Public Facilities' FEIS is essential given the State's decision to switch preferred alternatives six month after the draft public comment period. The resulting substantial change in the project's focus from Alternative 2, a paved road connecting Juneau with Skagway, to Alternative 2B, a road to the Katzehin River Delta with ferry shuttle links to Haines and Skagway, brings an entirely new set of variables for the public, affected communities, and reviewing agencies to evaluate. As a result, the public, affected communities, and expert agencies will require additional time beyond the 30-day minimum to adequately review the FEIS. Moreover, the selection of a new preferred alternative establishes good cause for which the agency should extend the comment period.

Additional time to review the FEIS will allow citizens, community leaders, and the agencies the Department must consult with to more fully understand and comment on the implications of these changes.

ALASKA SOCIETY OF AMERICAN FOREST DWELLERS, Point Baker • ALASKANS FOR JUNEAU • CHICHAGOF CONSERVATION COUNCIL, Tenakee • FRIENDS OF BERNERS BAY, Juneau • FRIENDS OF GLACIER BAY, Gustavus • JUNEAU AUDUBON SOCIETY • JUNEAU GROUP SIERRA CLUB • LOWER CHATHAM CONSERVATION SOCIETY, Port Alexander • LYNN CANAL CONSERVATION, Haines • NARROWS CONSERVATION COALITION, Petersburg • LISIANSKI INLET RESOURCE COUNCIL, Pelican • PRINCE OF WALES CONSERVATION LEAGUE, Craig • SITKA CONSERVATION SOCIETY • TONGASS CONSERVATION SOCIETY, Ketchikan • TAKU CONSERVATION SOCIETY, Juneau • WRANGELL RESOURCE COUNCIL • YAKUTAT RESOURCE CONSERVATION COUNCIL

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We look forward to hearing your response to our request.

Sincerely,

Buck Lindekugel
Conservation Director
Southeast Alaska Conservation Council

Cc: Michael Barton, Commissioner, ADOT (via email)
Tim Haugh, Federal Highway Administration (via first class mail)

SEACC Letter requesting extension
September 21, 2005

Page 2

Berners Bay Alaska

Keep it WILD
Friends of Berners Bay

FRIENDS OF BERNERS BAY
16445 Point Lena Loop Road
Juneau, AK 99801

Reuben Yost
DOTPF Southeast Region
6860 Glacier Highway
Juneau, Alaska 99801

Dear Mr. Yost

Friends of Berners Bay (FOBB) is a grassroots organization consisting of people who use Berners Bay and its surrounding lands for hunting, fishing, boating, kayaking, hiking, camping, and other outdoor activities. Our members place tremendous value on Berners Bay because of its accessibility to the general public, its remarkable scenic beauty and solitude, its wilderness character, and its ecological riches. Since 1985, FOBB has worked to protect these values from various threats. We are very interested in the Juneau Access Project because the preferred alternative, a road around Berners Bay, would diminish the bay's values that are important to our members.

We understand the Southeast Alaska Conservation Council has requested an extension of the comment period for the Juneau Access Final Environmental Impact Statement to 90 days. We support such an extension. Considering how the preferred alternative has changed considerably compared to the original plan, we believe extending the comment period is necessary to properly evaluate this new alternative relative to the other alternatives for improving access to Juneau.

Thank you for considering this request.

Sincerely,

John Hudson

1

The Alaska Transportation Priorities Project
419 6th Street #200, Juneau, AK 99801, Phone (907) 209-0082, Fax (907) 463-3312

September 22, 2005

ALASKA DOT & PF
SEP 26 2005
SPECIAL PROJECTS

Reuben Yost
DOT&PF Southeast Region
6860 Glacier Highway
Juneau, AK 99801

Dear Mr. Yost

The Alaska Transportation Priorities Project is writing in support of the request made by the Southeast Alaska Conservation Council to extend the comment period for the Juneau Access Improvements Project Final Environmental Impact Statement to 90 days.

Since this project was first proposed over a decade ago the department's focus has been on a hard link to Skagway. Changing the preferred alternative to a road to the Katzehin River Delta with shuttle ferries to Haines and Skagway drastically changes the assumptions and implications of the Juneau Access Improvements Project. The questions asked and information provided in the Final EIS will be significantly different from that of the draft EIS. It is imperative that the public has the maximum amount of time possible to understand and comment on these changes.

I look forward to hearing your response to our request.

Sincerely,

Emily Ferry

Emily Ferry
Coordinator, Alaska Transportation Priorities Project

Cc: Tim Haugh, FHWA, Alaska Division
Mike Barton, Commissioner, Alaska DOT&PF

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

October 7, 2005

RE: Juneau Access Improvements
Project Number 71100

Buck Lindekugel
Southeast Alaska Conservation Council
419 6th Street, Suite 200
Juneau AK 99801

Dear Mr. Lindekugel:

This is in response to your September 21, 2005 letter requesting that the review period for the Final Environmental Impact Statement (EIS) be 90 days rather than the routine 30 days. The review period for the Final EIS will be established by the Federal Highway Administration (FHWA) with input from the Alaska Department of Transportation and Public Facilities (DOT&PF). I have discussed your request (and similar ones from the Alaska Transportation Priorities Project and the Friends of Berners Bay) with FHWA, and am responding for both FHWA and DOT&PF.

FHWA and DOT&PF do not believe the fact that the Final EIS will identify a preferred alternative different from the preliminary preferred alternative in the Supplemental Draft EIS warrants a longer review period for the Final EIS. The new preferred alternative, 2B, was fully evaluated in the Supplemental Draft EIS. The Supplemental Draft clearly indicated that the preferred alternative identified was preliminary and all reasonable alternatives were under consideration. The announcement of the change was made on August 10, giving interested parties nearly six months before the expected release of the Final EIS (in early January 2006). This time can be used to become familiar with aspects of the alternative that may have been under examined by some readers.

I would also point out that the preferred alternative identified in the Commissioner's announcement is not an "entirely new set of variables for the public, affected communities, and reviewing agencies to evaluate". Alternative 2B is not new, and is not an entirely different alternative as it has many features in common with the previous preferred alternative, Alternative 2. Its terrestrial impacts are identical to those of Alternative 2 from Echo Cove to the Katzehin terminal site. Proposed service to and from Haines is virtually the same. The only real difference is that proposed service to and from Skagway is provided by shuttle from Katzehin,

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similar to service to and from Haines. Terrestrial impacts along Taiya Inlet and in Skagway are avoided.

The Final EIS will not be substantially different from the Supplemental Draft EIS. While the range of reasonable alternatives in the Final EIS will be smaller due to dropping alternatives that would construct a highway into Skagway, the remaining alternatives, including 2B, will be essentially the same. The Final EIS will differ from the Supplemental Draft primarily in the information that is added to address comments and inclusion of a detailed mitigation plan for the preferred alternative, typical of any final EIS. Important text changes will be highlighted for easy identification by the reader. The standard 30 day review period should provide adequate time for all interested parties.

Sincerely

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Tim Haugh, FHWA
Emily Ferry, ATPP
John Hudson, FBB

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

October 31, 2005

Dear Cooperating Agency Reviewer:

Subject: Juneau Access Improvements, Project #71100
Agency Review

The Alaska Department of Transportation and Public Facilities has prepared a preliminary Final Environmental Impact Statement (EIS) for the Juneau Access Improvements project. Your review of the preliminary document is an important part of the EIS process; your comments will help us refine the Final EIS before it is released to the public.

Comments on the preliminary Final EIS will be accepted through November 30, 2005. Your comments and our response will be included in the Final EIS.

Thank you for your review.

Sincerely,

Reuben Yost
Project Manager

Distribution list:

Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS

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25A-T34LH

United States Department of Agriculture | Forest Service | Alaska Region | P.O. Box 21628
Juneau, AK 99802-1628

File Code: 1950-4/7710/2350
Date: NOV 2 2005

Mr. Ruben Yost
Project Manager - Juneau Access
Alaska Department of Transportation and Public Facilities
Southeast Region
6860 Glacier Highway
Juneau, AK 99801

ALASKA DOT & PF
NOV - 4 2005
SPECIAL PROJECTS

Dear Mr. Yost:

This letter documents and summarizes discussions e-mails you have had with members of the Forest Service Team working with the Juneau Access Project.

Trails that would be constructed in the foreseeable future: East Side Route (Preferred Alternative)

- Slate Creek Cove to Comet Cove Trail
- Yeldagalya Creek Trail
- Katzehin River Trail
- Sawmill Creek Trail (from the highway to the falls)

Trails that would be constructed in the foreseeable future: West Side Route (if selected)

- Expanded Day Use Facilities, Trailhead and Trail at William Henry Bay
- Sullivan River Trail
- Glacier River/Davidson Glacier Trail

Pull out- Scenic overlooks North Side of Berners Bay:

During the meeting at your offices on August 26, 2005 there was considerable discussion amongst the attendees concerning the crossings of the Antler and Berners/Lace Rivers. The discussion included the identification of an expectation that the traveling public would want some places, especially near water, to stop and view the rivers, Berners Bay, and the other scenic attractions. The representatives of the US Fish and Wildlife Service and the National Marine Fisheries Service suggested viewing areas by the ends of the Berners River and Antler River crossings could well serve that expected public demand.. That locations could also serve as parking for winter activities such as cross country skiing. Review with other Forest Service team members indicated that the west end of the Berners River crossing had been considered earlier as a desirable potential trail location. The east end of the Antler River crossing had also been considered for at trail location, but the opportunity was assessed as a lower priority.

Inclusion of a "pull out" or scenic overlooks in the vicinity of the west side of the Berners River and the east side of the Antler River is an appropriate action to meet anticipated public demands for viewing the river, and potentially for winter sports access such as cross country skiing. The probability of the pullout locations to provide *Watchable Wildlife* viewing, especially on the west end of the Berners River crossing, is high.

Preferred Alternative Changes:

The revised preferred alternative ends at the ferry terminal north of the Katzehin River. There is the future potential for cooperative ventures to provide visitor services such as a day use are, toilets, water system near the end of the road. Demand for recreational services such as overnight camping, picnic/day-use space, etc. are likely to build with time and use of the roadway. The change in terminus from the Klondike Highway to the Katzehin Ferry Terminal creates potential for unanticipated parking along the highway. In addition to the increased accident risks associated with roadside parking, issues with sanitation and littering are common in such circumstances. Informal monitoring of parking along the highway near the ferry terminal will likely provide useful indicators that can be used in the future to evaluate if further actions to accommodate the traveling public will be needed.

Please feel free to call me, Betty Wilt, or Eric Ouderkirk if any questions arise.

Sincerely,

KENNETH D. VAUGHAN, P.E.
Forest Service Representative

cc:
Brian Goettler, Acting District Ranger, Juneau Ranger District
Eric Ouderkirk, Landscape Architect, Tongass National Forest, Ketchikan
Betty Wilt, Highway Engineer, Tongass National Forest, Ketchikan
Larry Dunham, Engineering Staff Officer, TNF
Scott Fitzwilliams, Recreation, Lands, Minerals, and Heritage Staff Officer, TNF

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Juneau Fish & Wildlife Field Office
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801-7100
(907) 780-1162

ALASKA DOT & PF
DEC - 7 2005
SPECIAL PROJECTS

November 30, 2005

Reuben Yost
Special Projects Manager
Department of Transportation and Public Facilities
Southeast Region
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Juneau Access Preliminary Final Environmental Impact Statement
State Project No. 71100, Federal Project No. STP – 000S - (131)

Dear Mr. Yost:

The Juneau Fish and Wildlife Field Office (JFWFO) has reviewed the Juneau Access Improvements Preliminary Final Environmental Impact Statement (PFEIS). The JFWFO submits the following comments.

The body of the subject document includes some information on the inventoried roadless areas and old growth reserves that are located within the project area. Old growth reserves and roadless areas are considered to be resources that deserve consideration especially when road construction alternatives will make major changes to roadless status and old growth reserve values. The introductory summary of the Final Environmental Impact Statement (FEIS) could be expanded to include a discussion about the inventoried roadless areas and the old growth reserves that will be impacted by the road construction alternatives. Providing reviewers with this disclosure at the onset of the FEIS will add to the integrity of the document.

Alternative 2B is identified as the Alaska Department of Transportation and Public Facilities' (ADOT&PF) preferred alternative. Alternative 2B would involve construction of a 50.8 mile highway from the end of Glacier Highway at Echo Cove around Berners Bay and along the east side of Lynn Canal to a point north of the Katzehin River delta. Alternative 2B would impact the most productive and sensitive habitats, such as the major estuaries and inland habitats at the head of Berners Bay (confluence of the Antler, Lace, and Berners rivers), and the Katzehin River delta. The JFWFO supports an alternative that would result in the least amount of environmental damage to these productive areas. Based on the information provided in the PFEIS, the Auke Bay ferry alternatives (1, 4A, and 4C) would result in the least amount of adverse impact to the terrestrial and aquatic environment.

The JFWFO recommends the no action alternative be identified as the environmentally preferred alternative. Implementation of this alternative involves no additional impacts to the terrestrial and aquatic environment.

We appreciate the opportunity to review and provide comments on the PFEIS. We are committed to working closely and collaboratively with the Federal Highway Administration and the ADOT&PF on this project. If you have any questions regarding our comments, please contact Richard Enriquez at (907) 780-1162 or email at Richard_Enriquez@fws.gov.

Sincerely,

Bruce G. Halstead
Field Supervisor

cc: DNR, OHMP, Juneau, AK
DNR, OPMP, Juneau, AK
NMFS, Juneau, AK
COE, Juneau, AK
ADF&G, Douglas, AK
SEACC, Juneau, AK

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

January 11, 2006

RE: Juneau Access Improvements
Project No. 71100

Richard Enriquez
United States Department of the Interior
Fish and Wildlife Service
Juneau Fish & Wildlife Field Office
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801-7100

Dear Mr. Enriquez:

Thank you for your agency's review comments on the preliminary Final Environmental Impact Statement (EIS) for this project. Your letter and this response will be included in the Final EIS.

Based on your suggestion, we have added information to the Terrestrial Habitat section of the Summary regarding the impacts of Alternative 2B on Forest Service designated old growth reserves. We have also added a sentence to the Wildlife section of the Summary emphasizing the current roadless condition of most of the project area. This section already contains information about the effects of a highway would have in roadless areas, particularly potential habitat fragmentation. Impacts to wildlife habitat, including impacts to roadless areas, are documented in the Terrestrial Habitat and Wildlife sections of the Final EIS. The Final EIS contains information about inventoried roadless areas in the Land Use sections, because the US Forest Service asked us to include information about Roadless as a Resource, i.e. lands inventoried as potentially available for future designation as wilderness under the Wilderness Act of 1964. The Summary contains brief information about the major impacts of each alternative. We have not included information on impacts to inventoried roadless areas in the Summary, because, as explained in the body of the document, no alternative would have a substantial impact on an inventoried roadless area's potential designation as wilderness.

We agree with your statement that the Auke Bay ferry alternatives (No Action, 4A, and 4B) would result in the least adverse impacts to terrestrial and aquatic environments. The Department of Transportation and Public Facilities considered the lower level of impacts associated with these alternatives, and the degree to which they meet the purpose of and need for the project, before identifying Alternative 2B as the preferred alternative in the Final EIS. As explained in Section 2.4, Alternative 2B would best meet the elements of the purpose and need

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statement. As explained in the Draft Section 404(b)(1) Analysis in Appendix X, the No Action Alternative, as well as Alternatives 4A and 4C, are not practicable alternatives because they do not sufficiently meet the purpose and need. Section 1 of the Final EIS documents the shortcomings of the current system. The No Action Alternative would provide less capacity than the current service. Alternatives 4A and 4C would make only small improvements in capacity and convenience, while maintaining high user costs and increasing state costs.

Thank you for your recommendation that the No Action Alternative be identified as the environmentally preferred alternative. The Federal Highway Administration (FHWA) will identify the environmentally preferred alternative (and the reasons why if it is not selected) in the Record of Decision for the project.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS
Tim Haugh, FHWA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

December 2, 2005

Reply To
Attn Of: ETPA-088

Ref: 92-091-FHW

Tim A. Haugh, Program Manager
Federal Highway Administration, Alaska Division
P.O. Box 21648
Juneau, Alaska 99802-1648

SPECIAL PROJECTS
DEC - 8 2005
ALASKA DOT & PF

Reuben Yost, Special Projects Manager
Alaska Department of Transportation & Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Dear Mr. Haugh and Mr. Yost:

The U.S. Environmental Protection Agency (EPA), Region 10, has reviewed the **Juneau Access Improvements Project Preliminary Final Environmental Impact Statement (PFEIS).** These comments are provided in accordance with our responsibilities and authorities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), the Clean Water Act, and as a Cooperating Agency. The PFEIS evaluates the environmental impacts associated with surface transportation improvements to and from Juneau within the Lynn Canal corridor. Alternative 2B (East Lynn Canal Highway ending at the Katzehin Ferry Terminal) has been identified as the preferred alternative in the PFEIS.

This project continues to benefit from the collaborative process used by agencies working on it. While our comments below still favor the ferry alternatives as the Least Environmentally Damaging Practicable Alternative (LEDPA) and still prefer ending the road south of the Katzehin Delta, we note and appreciate the continual efforts of the Federal Highway Administration (FHWA) and the Alaska Department of Transportation & Public Facilities (ADOT&PF) to improve this project.

Preferred Alternative Changed to 2B

The February 2005 Supplemental Draft Environmental Impact Statement (SDEIS) identified Alternative 2 as the preferred alternative. Based on public comments on the SDEIS, FHWA determined that the Skagway and White Pass District National Historic Landmark are protected under Section 4(f) of the Transportation Act. We understand that Section 4(f) requires selection of a prudent and feasible alternative that completely avoids resources such as publicly owned parks, recreation areas, refuges and public or private historic sites. Therefore, Alternatives 2, 2A and 2C, which would require the use of these lands are no longer being considered. On August 10, 2005, the ADOT&PF announced a change in the preferred alternative from 2 to 2B.

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As a cooperating agency, EPA commends the Federal Highway Administration (FHWA) and ADOT&PF for taking steps to minimize adverse impacts to the important resources of Taiya Inlet. We believe that Alternative 2B would result in substantially less adverse environmental impact on the aquatic ecosystem than Alternative 2. The new alternative would reduce the road length by approximately18 miles, avoid approximately 25 avalanche paths and two landslide areas, avoid stream crossings, bald eagle nests, and terrestrial wildlife habitat, and avoid excess wasting of gravel into Taiya Inlet. We think that these reductions in impact are important to document. Therefore, we recommend that the Final Environmental Impact Statement (FEIS) include a discussion of the avoidance and minimization of impacts that have resulted from changing the preferred alternative from 2 to 2B. We would also recommend that the FEIS discuss the environmental factors under Criterion IV of the Alternatives Screening for supporting selection of Alternative 2B as the preferred alternative

Preliminary 404(b)(1) Guidelines Analysis

The Clean Water Act Section 404(b)(1) Guidelines and related guidance documents establish a mitigation sequence to avoid, minimize, and compensate for environmental impacts to waters of the United States. The Guidelines state that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem" (40 CFR 230.10(a)). This restriction on discharge is often referred to as the LEDPA. As stated in EPA's comments on the SDEIS, we support an alternative that provides safe, reliable, all-season surface access to and from Juneau and that represents the LEDPA.

While we agree that Alternative 2B is less damaging than Alternative 2, we would still conclude, as in our SDEIS comments, that the Auke Bay ferry alternatives (4A and 4C) most effectively avoid and minimize potential adverse environmental impacts. Regarding practicability, the Preliminary 404(b)(1) Analysis makes a good case that Alternative 2B is more practicable than the Auke Bay ferry alternatives. However, it is less persuasive in showing that the Auke Bay ferry alternatives are impracticable, especially in light of the fact that the Juneau-Haines-Skagway ferries have demonstrated their practicability for years. We recommend the FEIS include additional information and analysis to clearly demonstrate whether or not any of the Auke Bay ferry alternatives are practicable. If the Auke Bay ferry alternatives are not practicable, then the Preliminary 404(b)(1) Analysis should more thoroughly explain why the No Action Alternative is no longer practicable.

Katzehin Ferry Terminal

The 404(b)(1) Guidelines also state that "no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem" (40 CFR 230.10(d)). Thus, even if the FEIS and the 404(b)(1) analysis demonstrates that all of the Auke Bay ferry alternatives are not practicable and that Alternative 2B is the LEDPA, the project must also include aquatic impact minimization measures, as appropriate and practicable. If the FEIS can clearly demonstrate that Alternative 2B is the LEDPA, then EPA would support Alternative 2B with specific mitigation measures to avoid the Katzehin River Delta by (1) moving the Katzehin Ferry terminal south of the Delta; (2) removing the road segment north of the Katzehin River; and (3) removing the bridge over the Katzehin River. If these mitigation measures are not incorporated into Alternative 2B, the Final EIS should provide a rationale for not doing so using detailed analysis and discussion.

In our comments on the DEIS, EPA recommended modifications to Alternative 2B that would minimize adverse impacts on the Katzehin River Delta by moving the terminus of the road and the ferry terminal South of the river and eliminating the bridge crossing. In a letter to EPA, ADOT&PF identified several reasons for not including our recommendation into Alternative 2B. One reason is that storm wind and wave would deposit glacial silt south of the Delta, which would require extensive dredging. However, estimates of dredge material quantity (cubic yards) or area of impact (acres) were not provided to compare the extensiveness of dredging. According to the PFEIS, a ferry terminal to the north of the Katzehin River Delta would require 6.4 acres of fill material for the terminal and an additional 4.4 acres of subtidal habitat dredging.

In addition, ADOT&PF indicated that a terminal south of the Katzehin River Delta would add at least four miles of travel distance to both Haines and Skagway. Furthermore, this distance would involve higher operating costs, which would mean higher user costs and greater state funding. The ADOT&PF response did not provide estimates of operating costs to provide a clear basis of comparison to the costs associated with a terminal located north of the Katzehin River Delta.

Therefore, for the reasons discussed above, we recommend that the FEIS include a detailed analysis and basis for why a ferry terminal south of the Katzehin River Delta is not practicable. The reasons provided by ADOT&PF should be supported with additional information, analysis, and estimates (e.g., dredging quantity and area, and operating costs) to compare the practicability between operating a ferry terminal either north or south of the Katzehin River Delta. We recommend that this information be provided in the Final EIS.

According to the PFEIS, the construction of the Katzehin Ferry Terminal would require dredging of approximately 4.4 acres of subtidal habitat. The FEIS should include a description of the proposed dredging methods and proposed best management practices to minimize potential adverse impacts to the subtidal habitat area. The direct, indirect, and cumulative impacts of dredging should be evaluated in the FEIS. The FEIS should also identify the need for future maintenance dredging by providing a schedule with estimated dates and quantities of dredged material. The cumulative effects associated with maintenance dredging should be evaluated in the FEIS. Finally, the proposed disposal location and beneficial use of the dredged material should be discussed.

Monitoring

We commend FHWA and ADOT&PF for making a commitment to monitor potential project impacts as identified in Section 5 of the PFEIS. Storm water runoff associated with project construction represents a potential significant source of pollutants discharging into important aquatic resources of Lynn Canal and Berners Bay. To address this concern, we recommend additional commitments to monitor storm water runoff during construction activities as required under the National Pollutant Discharge Elimination System (NPDES) storm water general permit.

Compensatory Mitigation

The 404(b)(1) Guidelines state that "Habitat development and restoration techniques can be used to minimize adverse impacts and to compensate for destroyed habitat" (40 CFR 230.75(d)). If the Preliminary 404(b)(1) Analysis clearly demonstrates that Alternative 2B is the LEDPA and that all appropriate and practicable steps have been taken to minimize adverse impacts to the aquatic ecosystem, then the FEIS should include the compensatory mitigation measures that were discussed and agreed to during the November 17, 2005, cooperating agency meeting.

These measures include seven wildlife underpasses to compensate for impacts to forested wetlands, and in-lieu-fees, which includes a 2:1 compensatory mitigation ratio and approximately $800,000 to compensate for impacts to marine and estuarine habitat. The in-lieu-fees should be used to fund the proposed compensatory mitigation projects, in priority order, as follows:

1. Point Bridget State Park old growth forest preservation
2. Switzer Creek wetlands preservation
3. Vanderbilt Creek wetlands preservation
4. Sawmill Creek riparian habitat preservation
5. Lynn Canal herring habitat enhancement
6. Pullen Creek culvert replacement
7. Strawberry Creek fen preservation (more information needed)

For the Lynn Canal herring habitat preservation, EPA supports funding this project first because it is the only proposal that would result in on-site, in-kind compensatory mitigation as required under Section 404. All of the other proposed projects would result in off-site and out-of-kind compensatory mitigation. We recommend that the FEIS include the list of proposed projects agreed to by agencies and commitments for compensatory mitigation.

Thank you for the opportunity to review and provide comments on the Juneau Access Improvements Project PFEIS. As a cooperating agency, EPA is committed to continue our collaborative relationship with FHWA and ADOT&PF to resolve our remaining environmental concerns regarding this project. If you have any questions regarding our comments, please do not hesitate to contact me at (206) 553-1601.

Sincerely,

Christine B. Reichgott

Christine Reichgott, Manager
NEPA Review Unit

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

January 11, 2006

RE: Juneau Access Improvements
Project No. 71100

Mark Jen
U. S. Environmental Protection Agency (EPA)
222 W. 7th Avenue, Room 537
Anchorage AK 99513

Dear Mr. Jen:

Thank you for your agency's review comments on the preliminary Final Environmental Impact Statement (EIS) for this project. Your letter and this response will be included in the Final EIS.

Preferred Alternative Change to 2B

Text has been added to Section 2.4 of the Final EIS, Identification of the Preferred Alternative, citing some of the impacts that would be avoided or reduced by Alternative 2B in comparison to the preferred alternative identified in the Supplemental Draft EIS (Alternative 2). With regard to Alternative Screening Criterion IV, Environmental Factors, Section 2.1 of the Final EIS lists the specific environmental factors that were used. The end of the section directs the reader to Appendix A, Alternatives Screening Report, for a detailed discussion of the 2003 screening process. Appendix A provides an explanation of how and why each factor was used. The Final EIS does not discuss the Criterion IV environmental factors in regard to identifying the preferred alternative. All screening criteria, including the specific environmental factors, were developed for the sole purpose of screening alternatives for reasonableness. The basis of the Department of Transportation and Public Facilities decision to identify Alternative 2B as the preferred alternative is presented in Section 2.4 of the Final EIS.

Preliminary 404(b)(1) Guidelines Analysis

We agree Alternatives 4A and 4C would avoid and minimize adverse environmental impacts, and document this in the Draft Section 404(b)(1) Analysis in Appendix X of the Final EIS. However, as explained in the analysis, these alternatives are not practicable. We have added information to the analysis to further demonstrate that the No Action Alternative is not practicable. The information in the analysis, and the more detailed information in Section 1 of the Final EIS, clearly indicates that current service is not meeting the surface transportation needs in Lynn Canal. The current system is carrying less than one sixth of the projected demand, at a high cost per vehicle to travelers and the state. Based on past and projected ridership, Auke Bay

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ferry service is not practicable for 85 percent of surface travel needs. Under the No Action Alternative service would improve between Haines and Skagway but capacity in Lynn Canal would decrease as mainliners are retired. Alternatives 4A and 4C would make small increases in capacity and trip frequency while doing nothing to reduce user or state cost per vehicle. Capacity and trip frequency can be increased from Auke Bay, but not without increasing costs. In part because of the high user cost, demand would continue to be unmet.

Katzehin Ferry Terminal

The Draft Section 404(b)(1) Analysis has been amended to include more information explaining why a ferry terminal south of the Katzehin is not practicable. The attached evaluation by our Marine Design Group Chief provides sufficient analysis to determine that further detailed engineering analysis is not warranted. Based on increased ferry route lengths, all round trips would be at least 24 minutes longer and annual operating costs would be approximately $1.8 million higher. In addition to these costs, engineering and logistics concerns make a terminal south of the river impracticable. The lack of natural protection from southeast weather or from freshwater and sediment from the Katzehin River would require larger breakwaters, as shown in the enclosed drawing, which may not be supported by outwash sediments. A larger basin would be necessary, requiring more than twice as much initial dredging. As the attached evaluation mentions, based on the active river sediment location, maintenance dredging would be required approximately every 10 years, three times as often as at the northern location.

The Final EIS does not include a detailed analysis of a ferry terminal south of the Katzehin River because the enclosed preliminary analysis demonstrates that a terminal at this location is not practicable. This location is addressed under the heading Avoidance and Mitigation Determined Not Practicable in the Draft Section 404(b)(1) Analysis. Please also note that the highway and ferry terminal north of the Katzehin River would involve only 0.2 acres of impact to wetlands. The fill in unvegetated intertidal areas (2.6 acres for south bridge abutment, 1.6 acres for approach to terminal, and 6.4 acres for terminal and breakwaters) is less than would be necessary for a terminal, approach and breakwaters south of the river. Our proposal to bridge the Katzehin River with piers placed at least 130 feet apart would have minimal impact on river habitat.

The Final EIS does not specify the dredging methods that would be used at the Katzehin site, as that is a construction detail that would be determined by the contractor. It is likely that either a clamshell or suction dredge would be used. The document contains DOT&PF's commitment to place the clean shot rock exterior of the terminal fill during low tides, and to encapsulate the dredged material within the shot rock. All in-water work would occur from June 16 to March 14 to avoid impacts to migrating salmonids. The Final EIS describes the primarily unvegetated muddy substrate that would be dredged and the indirect and cumulative impacts of dredging. Maintenance dredging of this site is not anticipated to be necessary until the end of the 30 year analysis period, based on our experience at other locations. It is not possible to predict the availability of a beneficial use for material generated approximately 35 years from the present. If no economical use of the maintenance dredge spoil is identified at the time the work is done, the most likely disposal location would be immediately offshore from the mouth of the Katzehin River. After testing to confirm that the sediment had not been contaminated by any terminal activity, the spoils would be released in an area with glacial river water with containing sediments virtually identical to the spoils being released.

Monitoring

Section 4.8.6 of the Final EIS discusses potential water quality impacts during construction. This section explains the inspection requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater. Section 5.12.1 of the Final EIS contains DOT&PF's commitment to file a Notice of Intent to use the NPDES General Permit, prepare and implement a Stormwater Pollution Prevention Plan (SWPPP), monitor stormwater discharge, amend the SWPPP as necessary, and maintain the required records.

Compensatory Mitigation

The Final EIS, in Section 5.12.4, includes commitments for compensatory mitigation for impacts to wetlands and marine waters. Fee in lieu compensation values for unvegetated marine areas and estuarine wetland are explained, the approximate fund amount is given, and potential parcels and projects are listed. The Strawberry Creek fen preservation is not referenced in the document because there was not a consensus about it among agency staff, primarily because information was lacking. We will include Strawberry Creek as we continue investigating parcels, and will discuss parcels, projects and priorities at another agency meeting before we submit the Section 10/404 permit application.

Please note that only the wildlife underpass over the bear travel corridor close to the Lace River is identified in the Final EIS as compensatory mitigation for impacts to forested and scrub/shrub wetlands. The document contains a commitment to construct wildlife underpasses at the other six locations as mitigation for wildlife impacts independent of wetland impacts; therefore those underpasses would not be part of the 404 permit. Commitments made in the Final EIS would also be in the Record of Decision for the selected alternative, and by Federal Highway Administration regulations, would be binding on DOT&PF.

Sincerely,

Reuben Yost
Special Projects Manager

Enclosure: Evaluation of a South Katzehin Terminal

cc: Jack Beedle, DOT&PF Marine Design Group Chief
Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Jeff Koschak, ACOE
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS
Tim Haugh, FHWA

Evaluation of a South Katzehin
Ferry Terminal
By Jack Beedle, P.E.
December. 2005

The purpose of this report is to compare the user costs, vessel operation and maintenance costs and construction impacts of the proposed Katzehin Ferry Terminal to a suggested ferry terminal located south of the Katzehin River. This comparison is made using Alternative B, the preferred alternative, operating configurations.

A South Katzehin ferry terminal would reduce the length of the highway by approximately 4 miles and would increase all ferry terminal routes by a minimum of 3 nautical miles.

The following calculations follow the same methodology used in the Alternative 2B analysis:

User Costs:

The user costs are based on out of pocket travel cost traveling between Juneau and Haines or Skagway.

The shortened highway distance of 4 miles would save approximately $.40 in fuel costs per trip.

The estimated ferry fares are taken from *the Proposed Marine Segments Fare Structures Report* and based on the length of the ferry run. The extra ferry distance from South Katzehin would increase the family of four ferry cost to Haines or Skagway by $6.50. The ferry increase for a vehicle and driver only would be $4.00.

After subtracting the highway fuel cost savings of $.40 the increased user cost will vary from $3.60 for an individual traveler with vehicle to $6.10 for a family of four.

The increased annual user cost based on the 2008 Alternative 2B traffic forecast of 380 AADT would range from $499,320 (all individual traveler with vehicle) to $846,070 (all family of four).

Vessel Operating and Maintenance Costs:

To calculate the increased vessel operating and maintenance costs, the Marine Segments Report Alternative 2B configurations and methodology were used. The vessel size, speed, maneuvering distance, crew, and number of round trips was held constant for the comparison of North Katzehin and South Katzehin Ferry Terminals. The longer route lengths resulted in longer operating days, increased fuel consumption and higher maintenance costs. The increased run time is 12 minutes per leg or 24 minutes per round trip.

Based on this analysis, moving the ferry terminal to South Katzehin would result in the following annual route cost increases:

Haines – South Katzehin – Haines Vessel:

Based on 2,496 round trips per year.

Additional Crew Hours:	1460 hrs. x $346.89/hr.	= $ 506,459
Additional Fuel Cost:	998 hrs. x 189.68 gal./hr. x $1.02/gal	= $ 193,087
Additional Maintenance Cost:	998 hrs. x $31.53/hr.	= $ 31,467
		$ 731,013

Skagway – South Katzehin – Skagway Vessel:

Based on 1,766 round trips per year.

Additional Crew Hours:	1460 hrs. x $461.09/hr.	= $ 673,191
Additional Fuel Cost:	706 hrs. x 289.35 gal./hr. x $1.02/gal	= $ 208,367
Additional Maintenance Cost:	706 hrs. x $48.14/hr.	= $ 33,987
		$ 915,545

Total Annual Vessel Operating and Maintenance Cost Increase = $ 1,646,558

Notes:

- This analysis used the SDEIS vessel fuel price of $1.02 per gallon. The total would be approximately $400,000 higher at the price AMHS pays today.
- Fuel and Maintenance cost increase is based on vessel running time only. Crew cost increase is adjusted to complete round trips within reasonable and repeatable work days.

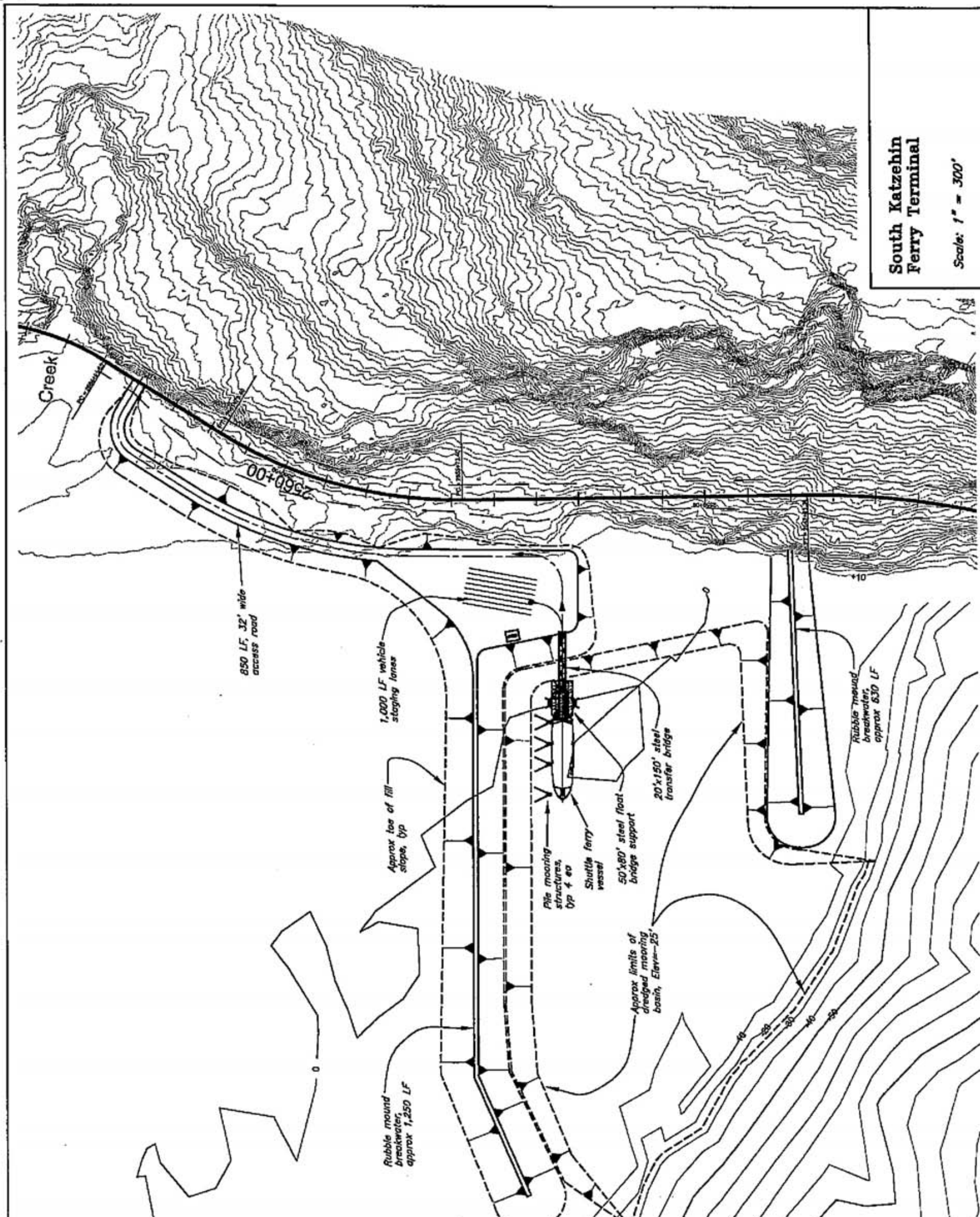
Construction Impacts:

The only possible location for a ferry terminal south of the Katzehin River is in the Southeast corner of the Katzehin River Delta. South of this location, the water depth drops off too steeply to allow breakwater construction for an all weather ferry terminal. A conceptual ferry terminal layout is attached.

The South Katzehin location would require breakwater protection from northerly and southerly wind and weather as well as breakwater protection from Katzehin River weather and ice flows. The South Katzehin location would have higher concentrations of fresh water in the mooring/maneuvering basin and be more susceptible to icing during the winter. If openings are required in the breakwaters to facilitate basin flushing, the icing problem would be worse. The South Katzehin ferry terminal breakwaters would also impact fish passage to and from the Katzehin River. If fish passage openings are required in the breakwaters, icing becomes an issue. And finally the South Katzehin location would be in the active sediment deposition area from Katzehin River sediments. This would require more frequent maintenance dredging. The Hyder Boat Harbor is a representative facility for estimating maintenance dredging requirements. The Hyder Boat Harbor is located on the edge of the Salmon River delta approximately ½ mile from the river channel. By comparison the South Katzehin ferry terminal would be on the edge of the Katzehin River and the North Katzehin location is 2 miles from where the Katzehin River intersects Chilkoot Inlet. The Hyder Boat Harbor was originally dredged in 1982 and was maintenance dredged in 2003. Based on the Hyder Boat Harbor experience and the proximity to the river channel, the South Katzehin ferry terminal would

2

require maintenance dredging of 90,000 cubic yards every 10 years and the North Katzehin ferry terminal would require maintenance dredging of 20,000 cubic yards every 30 years.
The Katzehin River delta is relatively flat and then drops off steadily to over 200 feet deep. The outer edges of the delta may not be able to support the weight of breakwaters. The foot print for the South Katzehin Ferry Terminal is shown with the breakwaters at the outer edges of the flat. In all likelihood the breakwaters would need to be moved back into the delta and an entrance channel constructed. This would increase dredge quantities and maintenance dredging requirements. A geotechnical drilling effort would be needed to confirm.


South Katzehin
Ferry Terminal
Scale: 1" = 300'
Creek
2560+00
850 LF, 32' wide access road
1,000 LF vehicle staging lanes
Approx toe of fill slope, typ
Pile mooring structures, typ 4 ea
Shuttle ferry vessel
50'x80' steel float bridge support
20'x150' steel transfer bridge
Rubble mound breakwater, approx 630 LF
Approx limits of dredged mooring basin, Elev=-25'
Rubble mound breakwater, approx 1,250 LF
+10
0

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
JUNEAU REGULATORY FIELD OFFICE
8800 GLACIER HIGHWAY, SUITE 106
JUNEAU, ALASKA 99801-8079

REPLY TO
ATTENTION OF:

December 7, 2005

ALASKA DOT & PF
DEC - 8 2005
SPECIAL PROJECTS

Regulatory Branch
East Section
POA-1994-242-9

Mr. Reuben Yost
Alaska Department of Transportation
and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Dear Mr. Yost:

This is in further response to the Alaska Department of Transportation and Public Facilities (ADOT/PF) Juneau Access Improvement project. We have reviewed the October 2005, draft Department of Army (DA) permit application, preliminary Section 404(b)(1) analysis, and preliminary Final Environmental Impact Statement (FEIS). As explained in our previous letters of September 14, 2004, and March 25, 2005, the U.S. Army Corps of Engineers (Corps) has authority over this project pursuant to Section 404 of the Federal Clean Water Act and Section 10 of the Rivers and Harbors Act.

We have determined that more information is essential before your application can be considered complete. Please provide the following information:

a. Question 21 of the DA application requires a complete description of the total amount (in cubic yards) of all fill and dredged material that would be placed in all waters of the United States (U.S.). Please note, there is a discrepancy of 5.8 acres (252,648 square feet) between this response and the response to the next question. It is unclear whether the shot rock fill referenced in this response is for the road, or is the excess material to be disposed of in Lynn Canal; so that needs to be clarified for this response and the next response. Also, other parts of the application refer to "overburden" and "mineral soil" being used for fill, which needs to be included in this response.

b. Question 22 must include the total area of waters of the U.S. that would be filled. This includes the amount of mechanized landclearing outside fill areas (for the right of way) in waters of the U.S., including wetlands. Please confirm that all mechanized landcleared debris would be hauled to an upland area, or the amount to be left in waters of the U.S. must also be provided in this response.

c. Question 23 needs to be answered "Yes", since the road to Cascade Point has been partially built. This needs to be further described as to who and when this road was built and what involvement, if any, the ADOT/PF had in the original construction of this road.

d. Question 24 should list all adjoining property owners and it should reference Table 2 for their complete addresses.

e. We require a time schedule as to when the nine segments of the project (described on Pages X-6 and X-7) would be started and completed and when the detailed engineering drawings, including full cross-sections, would be available for each segment. We expect our public notice will describe the entire project and future segments may be considered for modification later, if necessary. Segment 6 also appears to have incorrect stationing since it places part of the excess 1.4 million cubic yards of shot rock to be disposed of in Lynn Canal at Berners River on the plan view. The plan view on Sheet 51 that should show the other part of the 1.4 million cubic yards apparently is not shown since it states marine fill is only 29,600 cubic yards.

f. Please add a statement on Table 1 as to what "NF" means. Also, please add an additional column in the table giving the length of the road segments through these areas.

g. Your typical cross-section drawing on Sheet 2 of 67 states "soil/peat cut" and shows a proposed road ditch. If such ditches would be limited to hillside (groundwater slope wetlands), as shown in the drawing, only to remove excess water coming from the hillside then please so state on the drawing. However, if road ditches would be proposed in wetland areas with flat terrain then the amount of expected wetlands to be drained beyond the road ditch must be determined. An empirical formula, such as the van Schilfgaarde Equation, must be used to determine this. However, we strongly suggest such drainage road ditches be avoided to minimize wetland impacts, and the need for any such ditches must be fully justified. The drawing must also show the average and maximum peat excavation depth that is being proposed.

h. A typical cross-section also needs to be provided for the proposed shot rock fill in Lynn Canal. The high tide line (HTL) of 19.7 feet above the 0.0 foot contour and the mean high water line (MHW) of 14.79 feet above the 0.0 foot contour must also be shown on the drawing.

i. A cross-section(s) of the Katzehin ferry terminal must also be provided showing fill and dredging dimensions and depths.

j. A plan view map showing the location of close-up plan views (Sheets 12 through 59) must also be provided. We suggest using the U.S. Geological Survey topographic map as the baseline map for this overall plan view.

k. The close-up plan views must have their individual wetland impacts more clearly defined. We suggest identifying each wetland impact area (by letter or number) on the close-up plan view and correspond those impact areas with a summary table. The tables on Sheet 60 of 67 could be used for this, but it needs to be revised to list the identified impact area along with the volume and length of each fill area, area of mechanized landclearing without fill, and any ditch excavation and its expected drainage impact, if any.

l. The plan views showing the crossing of any inland waters, which could be tidal (i.e. Sawmill Creek, Antler Slough, Antler/Gilkey River, Berners/Lace Rivers, Slate Creek, Katzehin River, etc.) must show the HTL and MHWL for that area or at least one elevation reference showing that the water is above the HTL. Likewise, the plan views showing the Lynn Canal fill must show the HTL and MHW referenced above. Please note that for waters connecting to Berners Bay the HTL is also 19.7 feet above the 0.0 foot contour, but the MHWL is 15.25 feet above the 0.0 foot contour.

m. The plan view for the south side of the Katzehin River (sheet 58) is inconsistent with the other coastal plan views as they show "marine fill" when adjacent to "unvegetated marine" areas as sheet 58 shows.

n. The plan view for the Katzehin Terminal must be revised to clearly differentiate any proposed fill areas from proposed dredging areas. We also suggest you show what, if any, limiting features there are on the upland shoreline that would prevent the terminal from being built in that area or south of the river.

o. A blasting plan must be submitted with the application for any blasting that would occur in waters of the U.S. or result in a discharge of blasted material into such areas. The plan must include a location map(s) and a description of the explosive type, amount, size and number of charges to be detonated, detonation delay information, estimated start and completion data, the maximum sound level (in decibels) expected to be reached and how much (volume and area) blasted material would be discharged into waters of the U.S., including wetlands.

p. You noted on Page X-88 of the analysis that the dock that Coeur Alaska is building in Slate Cove may be used by ADOT/PF ferries when the new access road is closed due to avalanches. A review of the DA permit that was issued for this dock would indicate that the dock facility would need to be modified to accommodate State ferry vessels, which would require a modification to the DA permit. This would also appear to contradict with Condition Number 3 of the Federal Highway Administration Biological Assessment described in the September 27, 2005, National Marine Fisheries Service (NMFS) letter, which states "No boat launches or structures that enhance boat access will be constructed by the DOT&PF as part of the East Lynn Canal Highway." Further, considering the controversy that occurred with the original dock permit, we strongly recommend that the existing Auke Bay ferry terminal be used as an alternate dock location during winter road closures, as page 4-46 of the FEIS states it is a feasible alternate location. An alternate location might be the Comet Beach facility since it is located outside of Berners Bay, but this must be closely coordinated and resolved with the NMFS prior to the final DA application being submitted. Any secondary features related to the road and being done by or specifically for the ADOT/PF, such as ferry docks and ramps, must be included in the DA application.

As previously stated in our March 25, 2005, letter to you, we wish to reiterate our strong concern that the Section 404(b)(1) analysis must include a thorough and detailed alternatives analysis to clearly show that the preferred build alternative would have the least environmentally damaging practicable impact. Such analysis needs to include cost comparisons and a detailed cost analysis breakdown, impact analysis, feasibility determination, and other relevant issues. The impact analysis needs to include a cumulative impact analysis, which must consider any associated impacts from the project, such as whether any disposal areas for excess material would impact any waters of the U.S. This alternatives analysis is the key to the Clean Water Act 404(b)(1) guidelines, which are the guiding principles the Corps must follow in reaching its permit decision.

The following comments on the analysis describe the additional deficiencies of it in relation to our above statement:

a. It is unclear as to why 7.96 acres of "tidelands fill" is needed to construct the Katzehin Terminal. The analysis needs to clearly explain why the ferry terminal could not be built on the upland or area above the HTL.

The analysis also needs to explain why this facility could not be built on pilings over the water in lieu of fill and a cost comparison needs to be included if that is the reason. The analysis does state that there are "steep cliffs" south of the river, but the feasibility of blasting these cliffs back to an adequate distance to provide space for the ferry terminal needs to be addressed. We expect the blasted rock might be suitable for the needed breakwaters.

b. The analysis also needs to explain why other alternative design methods for the road, such as using elevated bridges or causeways to go over wetland areas is not practicable. A cost comparison of this alternative method should be included in the analysis.

II of p

c. Chapter art II of the analysis states that "All chapter and section references are made to the Draft EIS." However, no such references are provided in this chapter, but such references or a statement on how each checked factor was evaluated needs to be included in this chapter. The references should also be to the FEIS.

d. A "Yes/No" header should be also added to the top of Page X-110 so it is clear as to what the below replies correspond to.

e. Questions II.d.(ii) and II.d.(iii) of Part II of the analysis needs to be reconsidered since we do not agree with the statement that these parts are "Not applicable as all fill material for project will be shot rock or mineral soil." Mineral soil often contains fine sediments that can enter the aquatic ecosystems and can cause substantial impacts. It is evident that these parts are specifically for how such fine sediments would be controlled on the project to avoid or reduce such impacts. Questions II.d.(iv)6 and 7 should also be reconsidered as they would appear to apply to the project.

f. Each question in Chapter IV must be checked. Further, those questions checked as "Not Applicable" in Chapter IV need to be explained further. For example, considering the project involves the discharge of fill material into more than 32 acres of tidal waters, it has the potential of having substantial effects on the "salinity gradients" in the surrounding tidal waters. There are mudflats in Lynn Canal, and pool and riffle complexes in the many streams that would be crossed.

g. Please specify what was done to evaluate the factors checked in Chapter V.

h. Chapter VI must be completed not only for the Katzehin terminal, but also for all the road fill proposed to be placed in other waters, including freshwater streams and all tidal waters. All of these items, except Items 5 and 8, would be applicable to the project and an explanation needs to be provided for each item on how they were considered and any expected impacts on them.

i. Those items (baseflow and mixing zone) stated being "Not applicable" to the project in Chapter VIIIC must be further explained. It would appear that the project could have the potential to substantially affect baseflows considering the proposed 70 acres of wetland fill and over 500 culverts for the project, especially if road ditches result in new drainage patterns.

j. Section F in Chapter VIII must also be completed by at least referencing the appropriate section(s) of the FEIS.

Most of our above comments on the draft DA application and 404(b)(1) analysis also apply to the preliminary FEIS, which should be corrected and revised accordingly. We have one final comment on the FEIS, which is our confusion regarding the first full paragraph on page 4-194. It states,

"There would be a maximum cumulative loss of approximately 140 acres of wetlands with Alternative 2B."

This contradicts the rest of the FEIS, the application, and analysis, which all state that only 70 acres of wetlands would be impacted (filled) by the road so the FEIS needs to more clearly explain how and where the additional 70 acres of wetland impact was derived at. As explained above, the road impacts must include other regulated impacts, such as mechanized landclearing (outside fill areas) and any drainage impacts from new ditches. For your reference in determining cumulative impacts in the area, we have reviewed our DA permits that have been recently issued for any projects from Cascade Point to the Katzehin River. We found only two DA permits issued in this area, with the one being issued to Goldbelt Corporation for a dock facility, but no wetland impacts were authorized by this permit. The other DA permit was issued to Coeur Alaska for the Kensington Gold Mine. A review of our permit shows that this permit would result in the net loss of only 7.74 acres of wetlands for a rock storage site and dam after reclamation.

We wish to express our appreciation on the interagency meetings you have set up to discuss the project and compensatory mitigation projects to offset impacts from the project. As we have stated in our past letters to you, we encourage you to determine if the 1.4 million cubic yards of excess shot rock to be disposed of in Lynn Canal could be designed to enhance low quality marine areas to more productive eelgrass beds and/or vegetated shallows.

We appreciate the opportunity to comment on the DA application and FEIS, and remain available for continued coordination. The final DA application should be submitted to our office at least 45 days prior to the FEIS being published so we can complete our permit review in a timely manner. However, we must request the DA application not be submitted until the end of January 2006, so staff has returned from holiday vacation. Please contact me at the letterhead address, by telephone at (907) 790-4490, or by FAX at (907) 790-4499.

Sincerely,

Jeff Koschak
Project Manager

Copies Furnished:

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STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION
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Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
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PHONE: (907) 465-1774
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January 11, 2006

RE: Juneau Access Improvements
Project No. 71100

Mr. Jeff Koschak
Project Manager
Department of the Army
Juneau Regulatory Field Office
8800 glacier Highway, Suite 106
Juneau, AK 99801-8079

Dear Mr. Koschak:

Thank you for your review comments on the preliminary Final Environmental Impact Statement (EIS) for this project, which included a draft Section 404/10 permit application and draft 404(b)(1) analysis in Appendix X. Our response follows the form of your letter, using the same lettering of subtopics.

Draft Permit Application

A draft permit application is included as an appendix of the Final EIS to provide readers information applicable to the application to the extent that it is known at this time. It is not intended to be a complete application; the signed application will be submitted after release of the Final EIS as design details are finalized. Some of the information you indicate is needed has been added to the draft application; the remainder is being developed and will be included in the official application submitted to you.

a. Block 21 of the draft application now has a full breakdown of the amount and purpose of material that would be discharged into waters of the U.S, excluding culvert bedding material amount, which is not known at this time.

b. Block 22 now has the acreage of wetland and marine areas that would be filled. No grubbing or mechanized land clearing would occur in wetlands beyond the fill slope. Trees in the clear zone would be felled and removed. All grubbed material would be disposed of on uplands. Please note that the Final EIS and appendices, as well as tables in the draft application, provide the total acreage of wetlands that would be impacted, including excavation as well as fill.

"Providing for the movement of people and goods and the delivery of state services."

25A-T34LH

c. Block 23 now explains that the proposed project is an action separate from the Cascade Point Road, but would incorporate it rather than have parallel facilities. As explained in the Final EIS, the State of Alaska provided funding for the Cascade Point Road through the Industrial Roads Program to assist Goldbelt, Inc. to develop its land.

d. Adjoining property owners are listed in Table 2 of the text accompanying the draft application.

e. Text has been added that explains the anticipated design and construction schedule, including when individual segment details would be submitted to determine if permit modifications are necessary. The incorrect stationing of the first sidecast area has been corrected, and the drawings have been amended to show both areas.

f. The NF (which meant no fill) has been replaced with 0.0 to make clear that these bridges would not require fill. Segment lengths have been provided.

g. In wetland areas, ditches would only be constructed where there would be cut slopes above the roadway, to prevent water from running onto the road or damaging the roadbed. No ditches would be used in flat terrain, as the roadbed would be above the original ground. A note has been added to the typical section to help clarify this.

h. A typical section for highway fill in tidelands has been added to the drawings. The typical provides the elevations used for the High Tide Line (HTL) and Mean High Water (MHW), which are slightly higher than those you provided. These values were obtained by averaging the Juneau and Haines values, in order to use one set of values throughout the project.

i. Additional drawings for the Katzehin Terminal, including cross sections of the fill pad and breakwaters, have been included in the draft application.

j. The proposed project covers approximately 51 miles of land along the east side of Lynn Canal. Rather than putting the locations of plan sheets on the vicinity map, we have added five Legend drawings that show the locations of the sheets in relation to topographical map features.

k. The plan sheets have been amended to provide individual wetland impacts, matching the summary tables at the end of the plan sheets. Please note that the hatched areas are the total impact to the wetland. As explained above, ditch construction would only occur at the base of cut slopes, and are included in the total impact. No mechanized land clearing without fill would occur.

l. Tidal information has been added to bridge crossings in or near the intertidal zone. Please note that all bridge crossings have a profile showing existing ground elevation in addition to the plan view. The Sawmill Creek crossing is at elevation +89 feet, Slate Creek crossing is at elevation +43 feet.

m. "Unvegetated marine" is used for any area below the HTL that does not have vegetation. The areas at river mouths that are below the HTL are therefore hatched as unvegetated marine but have "Intertidal" added to the river name to avoid confusion.

o. Text has been added to the draft application explaining that no blasting is anticipated in waters of the U.S., and blasting adjacent to wetlands would be controlled to avoid blasting discharge into those wetlands.

p. The existing ferry terminal in Auke Bay is the planned dock location for both interim service during construction and during highway avalanche control closures. Possible use of Coeur Alaska's dock at Slate Cove is included in the Final EIS as a potential interaction with another project in the area. No modification of Coeur's dock will be included in the permit application for the Juneau Access Improvements project because the project is not dependent on use of the Slate Cove dock and no agreement to use the dock has been negotiated. Use of the dock would not conflict with the commitment by the Federal Highway Administration (FHWA) and Alaska Department of Transportation and Public Facilities (DOT&PF) regarding boat launches or other structures that enhance access in Lynn Canal. As the September, 2005 letter from the National Marine Fisheries Service makes clear, the concern is over increased access to Lynn Canal that could result in increased disturbance at sea lion haulouts from wildlife viewing, recreational fishing, and other tourism activities. The footnote in the project description section of the analysis referring to possible use of the dock has been deleted to avoid any confusion that it will be part of the permit application.

Draft Section 404 (b)(1) Analysis

The Draft Section 404(b)(1) Analysis is included as an appendix to the Final EIS in accordance with the 1992 agreement between the Army Corps of Engineers (ACOE), FHWA, and DOT&PF which states that a "draft 404(b)(1) analysis will be added to EA/EIS documents". The purpose of the draft analysis is to provide the EIS reader with DOT&PF's rationale for the proposed project with regard to Section 404(b)(1) guidelines. Hopefully it will also assist the ACOE in preparation of the actual Section 404(b) Evaluation during the permitting process. To the extent the ACOE needs additional information regarding the application, DOT&PF will provide it.

a. The Katzehin Ferry Terminal requires fill of 3.6 acres of unvegetated tideland, and 0.2 acres of estuarine emergent wetland. The breakwaters would require filling 2.7 acres of tidal and subtidal ground on either end of dredged basin. The highway connection to the terminal pad would require filling 1.6 acres of unvegetated upper intertidal area. Steep cliffs with a narrow ravine and an eagle nest tree prevent the terminal or highway approach from being located on uplands. Pile supporting the terminal pad and approach would add $13 million to the cost of the terminal. This information has been included in a section titled Avoidance and Mitigation Determined Not Practicable in the analysis, and the eagle nest tree and contour lines have been added to the terminal drawing.

b. The new section titled Avoidance and Mitigation Determined Not Practicable explains that using additional bridges to further avoid wetlands would cost approximately $2.4 million an acre and is therefore not practicable.

c. The main part of our draft analysis is the text and tables in Sections I and IX. We have included partially completed Sections II through VIII of the ACOE Preliminary Section 404(b)(1) Evaluation checklist to assist the ACOE. The statement at the beginning of Section II regarding references to the Draft EIS is part of the form. For clarity we have deleted the statement from the draft analysis. References to the Final EIS are only provided for Section IV as explained below. Specific information has been added to the analysis to explain the basis for each determination.

d. We used the form supplied by the ACOE; neither it nor actual ACOE evaluations we have on file repeat the heading above the boxes on subsequent pages.

e. Information has been added to Section II d (ii), (iii) and (iv) as applicable.

f. Based on FHWA guidance, DOT&PF does not make significance determinations for impacts documented in an FHWA EIS. Therefore we have stated this at the beginning of the section, and have not checked any of the boxes in Section IV other than Not Applicable where it applies. We have provided FEIS section references below each impact category to direct the reader to the analysis of the impact. Information regarding potential changes to salinity gradients has been added, as well as an explanation that mud flats would not be impacted, and all fish streams would be bridged, avoiding pool and riffle complexes.

g. Text has been added to Section V explaining the basis of evaluation for these factors.

h. It would appear from the factors listed that Section VI is most applicable to Katzehin ferry terminal construction, as all other fill placed in standing or flowing water would be shot rock. We have provided information about the ferry terminal but have also included a statement that all fill material placed in water would be shot rock generated from road construction.

i. and j. The sections you refer to are not part of the ACOE Preliminary Section 404(b)(1) Evaluation checklist but rather are part of the ACOE Environmental Assessment form. These sections were included in the electronic copy supplied to DOT&PF and mistakenly included in the preliminary draft you received. These sections have been deleted from our draft analysis, as it would be a duplication of information in the Final EIS and preparation of the EA form is not part of the 1992 agreement.

Final EIS Text

Many of the your comments on the draft application and Draft Section 404(b)(1) Analysis are specific to ACOE issues and are not addressed in the Final EIS other than in Appendix X. To the extent your comments indicate the need for clarification in the Final EIS text and or Appendix W (the addenda to earlier appendices) appropriate changes have been made.

Thank you for your comment on cumulative wetland loss under Alternative 2B and the observation that all but 7.74 acres of the impact from the Kensington Gold Project would be temporary. The statements in Sections 4.9.2.9 and 4.9.3.1 that Alternative 2B would result in the cumulative loss of approximately 140 acres of wetlands incorrectly included open water fill. Also, it should have explained that some wetlands would be restored. Based on information in the ACOE permit for the Kensington Gold Project, Section 4.9.2.9 has been revised to state that until mine restoration occurs, cumulative wetland loss would be approximately 125 acres. (After mine closure the total cumulative impact would be approximately 97 acres of wetlands if restoration were successful.) This is based on wetland impacts of 70 acres from Juneau Access Improvements, 4.6 acres from Cascade Point Road, 11.4 acres from previous fill near

Kensington, 36.3 acres permitted for the Kensington Gold Project, and 3 acres separately permitted for the Kensington Road and topsoil stockpile.

Sidecast Excess Rock

With regard to the potential use of excess shot rock to create eel grass beds or vegetated shallows, please note that the excess rock would be generated between Independence Creek and the Katzehin River. This is an area of relatively steep underwater slopes and high wave energy. Eel grass and other submerged aquatic vegetation require a finer substrate than shot rock, and low wave energy environments. None of the resource agency staff working on this project have expressed support for this type of mitigation. The National Marine Fisheries Service has proposed a mitigation project to enhance habitat in the vicinity of the Katzehin ferry terminal, a more sheltered area, and near some subtidal highway slopes if feasible. This is one of the fee in lieu compensatory mitigation projects under consideration.

Final EIS and Permit Application Coordination

Although DOT&PF and the ACOE have agreed to coordinate reviews, the Final EIS and Record of Decision for this project are independent of the permitting process. The Section 10/404 permit application and other federal as well as state permit applications will be submitted after the Final EIS is released. It is likely that FHWA will issue a Record of Decision for the project before the ACOE has completed the permit review. As previously discussed, submitting applications soon after release of the Final EIS will result in your Public Notice period overlapping or closely following the 30 day review period for the document. This will allow us to address any issues raised before the Record of Decision is signed.

Again, thank you for your comments. Your comments and this response will be included in the Final EIS.

Sincerely,

Reuben M Yost

Reuben Yost
Special Projects Manager

cc: Richard Enriquez, USF&WS
Jim Helfinstine, USCG
Chris Meade, USEPA
Kenneth Vaughan, USDA-FS
Susan Walker, NMFS
Tim Haugh, FHWA

8.0 LIST OF PREPARERS

Name and Education	EIS Responsibility	Professional Experience
Reuben Yost MS Zoology BS Education	Alternative Screening Report, Purpose and Need, Technical Appendix and EIS Review, and project management	DOT&PF, Regional Environmental Coordinator, 14 years experience
Pat Kemp, P.E. BS Civil Engineering	Review and engineering supervision	DOT&PF, Regional Preconstruction Engineer, 29 years experience
Jack Beedle, P.E. BS Civil Engineering	Technical Analysis, EIS and Appendix Review, and Technical Alignment Report	DOT&PF, Design Group Chief, 27 years experience
Chuck Hakari Assoc Drafting & Design	Technical Alignment Report	DOT&PF, Reconnaissance Engineer, 22 years experience
Greg Patz MS Business Management	Maintenance & Operations Cost Estimate	DOT&PF, Chief of Maintenance and Operations, 6 years experience
Lorraine Marshall	EIS and Technical Appendix Review	DOT&PF, Project Environmental Coordinator, 20 years experience
Tracy Moore, P.E. BS Civil Engineering	Highway Construction Cost Estimate	DOT&PF, Design Group Chief, 31 years experience
Tim A. Haugh BS Wildlife Science	EIS Review and Project Management	FHWA, Environmental & Right of Way Programs Manager 12 years experience
Pat Eberhardt BS Marine Engineering MS Naval Architecture	Marine Segments Report	Coastwise Engineering, Owner, 17 years experience
Bill Glude BS Geology	Avalanche Report	Avalanche researcher and educator, 28 years experience
Arthur I. Mears, P.E. BS Civil Engineering MS Geology	Avalanche Report	Arthur I. Mears, Inc Avalanche control engineering, 32 years experience
James Calvin MS Mineral Economics BS Geology	Household Survey, Socioeconomic Report, User Benefit Analysis, and Traffic Forecast Report	McDowell Group, Partner, 18 years experience
Scott Miller MS Public Administration	Traffic Forecast Report	McDowell Group, Senior Consultant, 20 years experience,
Jack Colonell, P.E. PhD, Civil Engineering MS Civil Engineering BS Civil Engineering	Technical Appendix Review and project director	URS, Principal Engineer, 40 years of experience
Tom Baily MS Plant Ecology BS Plant Ecology	Manager, EIS preparation and Technical Appendix Review	URS, Principal-in-Charge, 30 years experience

Name and Education	EIS Responsibility	Professional Experience
Dennis Papilion MS Landscape Architecture and Natural Resource Planning BS Landscape Architecture	Visual Resources Report and project management	URS, Manager Environmental Services, 19 years experience
Barry Bergdoll, P.E. BS Civil Engineering	Department Deputy Project Manager	URS, Senior Engineer, 40 years experience
Pauline Schulte BS Geology	Project Manager	URS, Senior Geologist, 12 years experience
Sue Ban MS Biological Oceanography BS Biology	Technical Lead for the Anadromous Streams Report and EFH Assessment Report; field leader for marine Intertidal surveys	URS, Senior Biologist, 18 years experience
Karen Brown BS Environmental Scientist	EIS Section 4 summaries	URS Environmental Scientist, 6 years experience
Bob Burke PhD Quaternary Research MS Geology BS Geology	Karst Report Review and field leader for karst surveys	URS, Principal Geologist, 32 years experience
Kim Busse BS Biology	Assisted in the development of technical reports and cumulative effects analyses.	URS, Biologist, 5 years experience
Kelly Clark BA Environmental Science	Assisted in the development of technical reports and cumulative effects analyses.	URS, Graduate Environmental Scientist, 2 years experience
Joe Czech BS Aerospace Engineering	Noise Report	URS, Senior Project Manager for Noise and Vibration Group, 14 years experience
Nancy Darigo MS Geology BS Geology	Karst Report and cumulative effects analysis; field leader for karst surveys	URS, Associate Geologist, 20 years experience
Dave Erikson MS Biology BS Wildlife Biology	Technical Lead for Wetlands, Bald Eagle, and Steller Sea Lion Reports; field leader for wetlands surveys	URS, Senior Biologist, 18 years experience
Jim Glaspell MS Wildlife Management BS Forest Technology	Land Use and Coastal Zone Report and cumulative effects analysis	URS, Associate Biologist, 30 years experience
Lisa Loy Gray MS Natural Resources BS Sociology	Socioeconomic cumulative effect analysis	URS, Project Environmental Planner, 6 years experience
Robert Greene BS Environmental Science	Technical Lead for Noise Report and field leader for noise field surveys	URS, Principal Scientist, 25 years experience
Mike Greene	Noise Report	URS, Project Engineer, 15 years experience
Michelle Harper BS Natural Science	Technical assistance for ISA site inspections	URS, Environmental Scientist, 4 years experience

Name and Education	EIS Responsibility	Professional Experience
Chris Holden BS Civil Engineering	Technical Lead for Initial Site Assessment Report and assisted with the Water Quality and Hydrology Report and associated cumulative effects analysis	URS, Project, Engineer, 13 years experience
Tara Howell BA Environmental Science	Technical assistance for regulatory records review, technical editing	URS, Environmental Scientist, 6 years experience
Jon Isaacs BA Environmental Studies	Land Use and Coastal Zone Report, socioeconomic cumulative effects analysis, and Technical Appendix and Supplemental Draft EIS Review	URS, Associate Planner, 29 years experience
Richard Kleinleder MS Biology BS Biology and Environmental Studies	Steller Sea Lion Report, Bald Eagle Report, and Wildlife Report and associated cumulative effects analyses	URS, Biologist/Ecologist, 20 years experience
Joan Kluwe PhD Natural Resources MS/BS Forestry, Outdoor Recreation Management	Socioeconomic cumulative effects analysis and Technical Appendix and EIS Review	URS, Principal, 14 years experience
Richard Knox BLA Landscape Architecture	Visual Resources Report and field lead for visual resource surveys	URS, Environmental Planner, 8 years experience
Richard Langendoen BS Geology	Conducted karst field surveys	URS, Associate Geologist, 24 years experience
Amy Lewis MS Environmental Science BS Forestry	Assisted with the Wildlife Report and visual and cultural resources cumulative effects analyses.	URS, Environmental Scientist, 7 years experience
Kristin Marsh BA Environmental Science	Wetlands Report and conducted wetlands field surveys.	URS, Biologist, 3 years experience
Anne Lee MS Environmental Science BS Environmental Science	Technical Lead for Water Quality and Hydrology Report	URS, Environmental Scientist, 3 years experience
Kelley Nixon BS Sociology	Water Quality and Hydrology Report and associated cumulative effects analysis	URS, Environmental Technician, 5 years experience
Joyce Payne MS Agricultural Biology BS Agricultural Biology	Technical Reports and Document Review	URS, Senior Biologist, 20 years experience
James Schick MS Geology BA Geology and Chemistry	Conducted karst field surveys	URS, Project Engineer Geologist, 12 years experience
Randy Simpson BLA Landscape Architecture BS Environmental Design	Technical Lead for Visual Resources Report.	URS, Senior Environmental Planner, 12 years experience

Name and Education	EIS Responsibility	Professional Experience
Linda Snow BA Economics	Land Use and Coastal Zone Report and cumulative effects analysis review	Southeast Strategies, Principal, 10 years experience
John Harper PhD Marine Science MS Marine Science	Marine subtidal survey analysis	CORI, Marine Scientist, 25 years experience
Dale McCullough BS Marine Biology	Marine subtidal surveys	Archipelago Marine Research, Ltd., Marine Biologist, 10 years experience
Mike Yarborough	Technical Lead east Lynn Canal archaeological surveys and Cultural Resources Report and cumulative effects analysis	Cultural Resources Consultants, Inc, Principal Archaeologist, 25 years experience
Pete Bowers	Archaeological surveys	NLUR, Principal Archaeologist, 29 years
Catherine Williams	Archaeological surveys	NLUR, Staff Archaeologist, 12 years
Walt Pearson PhD Oceanography MS Biological Sciences BS Biology	Technical Lead and author for Pacific Herring and Eulachon Technical Report	Battelle, Staff Scientist, 27 years experience

9.0 FINAL EIS DISTRIBUTION LIST

The Final EIS has been distributed to all recipients of and commentors on the Supplemental Draft EIS, and the following government agencies and organizations.

9.1 Federal Agencies

Advisory Council on Historic Preservation

Army Corps of Engineers, Alaska District

Federal Highway Administration

U.S. Forest Service, Alaska Region Office

U.S. Forest Service, Juneau Ranger District

U.S. Coast Guard

- Management and Navigation Safety Branch
- Maintenance and Logistics Command, Pacific, Realty Section

National Marine Fisheries Service

U.S. Environmental Protection Agency

- Office of Federal Activities, EIS Filing Section
- Alaska Operations Office

U.S. Department of the Interior

- Office of Environmental Policy and Compliance
- U.S. Fish and Wildlife Service
- National Park Service, Alaska Region

9.2 State Agencies

Alaska Department of Commerce, Community and Economic Development

Alaska Department of Environmental Conservation

Alaska Department of Fish and Game

Alaska Department of Natural Resources

- Division of Forestry
- Division of Mining, Land, and Water
- Office of Habitat Management and Permitting

Division of Parks and Outdoor Recreation

Division of Mental Health Trust Land Office

Office of Project Management and Permitting

State Historic Preservation Officer

Alaska Department of Public Safety

Alaska Department of Transportation and Public Facilities

Alaska Marine Highway System

Southeast Region Design and Construction

9.3 Local Governments

Haines Borough

City and Borough of Juneau

City of Skagway

9.4 Native Organizations

Chilkat Village of Klukwan

Chilkoot Indian Association of Haines

Douglas Indian Association

Goldbelt, Inc.

Hoonah Indian Association

Klukwan, Inc.

Sealaska Corporation

Sealaska Heritage Institute

Skagway Traditional Council

Tlingit and Haida Central Council

10.0 REFERENCES

Adamus Resource Assessment, Inc. (Adamus). 1987. Juneau Wetlands Functions and Values. Report prepared for the City and Borough of Juneau, Alaska.

Alaska Department of Community and Economic Development (ADCED). 2004. *Alaska Community Database Community Information Summaries (CIS).* Accessed from website: http://www.dced.state.ak.us/dca/commdb/CF_CIS.htm.

Alaska Department of Environmental Conservation (ADEC). 2003a. State of Alaska Contaminated Sites Database. Accessed from website: http://www.state.ak.us/dec/dspar/csites/cs search.htm.

ADEC. 2003b. State of Alaska Leaking Underground Storage Tanks (LUST) and Underground Storage Tank (UST) Database. Accessed from website: http://www.state.ak.us/dec/dspar/stp/search.htm.

ADEC. 2004. 1999 Air Toxics Emission Inventory Information. Accessed on January 20, 2004 from website: http://www.state.ak.us/dec/dawq/aqi/anpms/Main%20Pages/toxics/eipage.htm

Alaska Department of Fish and Game (ADF&G). 1991. Division of Subsistence. Customary and Traditional Uses of Fish and Shellfish in Southeast Alaska. January.

ADF&G. 1994. *Subsistence Resource Use Patterns in Southeast Alaska: Summaries of 30 Communities,* Technical Paper Number 216. Prepared by M.F. Betts, R.F. Schroeder, T. Thornton, and A.V. Forthcoming, Alaska Department of Fish and Game, Division of Subsistence. Reports on Klukwan, Haines and Skagway. June.

ADF&G. 2003. Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes and its associated Atlas. 1998 and 2002 metadata sets for the Southeast Region of Alaska. Accessed from website: http://www.habitat.adfg.state.ak.us/geninfo/anadcat.cfm.

ADF&G. 2004. Wildlife Notebook Series. Shellfish. Accessed in April 2004 from website: http://www.adfg.state.ak.us/pubs/notebook/notehome.php.

Alaska Department of Labor and Workforce Development (DOL&WD). 2002. Research and Analysis Section, Employment and Earnings Summary Report for the years 1980 through 2002.

Alaska Department of Natural Resources (ADNR). 2002. *Haines State Forest Management Plan*. Prepared by ADNR, Division of Mining, Land & Water, Resource Assessment & Development Section. Available from website: http://www.dnr.state.ak.us/mlw/planning/mgtplans/hsfp/. August.

Alaska Department of Transportation and Public Facilities (DOT&PF). 1994a. Juneau Access DEIS, Draft Technical Report, Air Quality.

DOT&PF. 1994b. *Juneau Access Improvements Reconnaissance Engineering Report*. Prepared by H.W. Lochner, Inc, Bellevue, Washington, for DOT&PF. May 4.

DOT&PF. 1995. *Juneau Access Improvements Land Use and Coastal Zone Technical Report.* Prepared by Sheinberg Associates for DOT&PF. April.

DOT&PF. 1997a. *Juneau Access Draft Environmental Impact Statement (Draft EIS)*. Prepared for Federal Highway Administration, Alaska Division, by DOT&PF, Southeast Region.

DOT&PF. 1997b. *Addendum to the Juneau Access Improvements Land Use and Coastal Zone Technical Report.* Prepared by Sheinberg Associates for DOT&PF. January.

DOT&PF. 1999. *Juneau Access Improvements Preferred Alternative Report*. Prepared for Commissioner Perkins and Governor Knowles by DOT&PF, Southeast Region. September.

DOT&PF. 2001. *Memorandum of Agreement Between Alaska Department of Fish and Game and Alaska Department of Transportation and Public Facilities for the Design, Permitting, and Construction of Culverts for Fish Passage.* August 3. Accessed from website: http://www.dot.state.ak.us/stwddes/dcsenviron/assets/pdf/procedures/dot_adfg_fishpass080301.pdf.

DOT&PF. 2003a. 1998 – 2002 Annual Traffic Maps. GIS/Mapping Section.

DOT&PF. 2003b. Juneau Access Supplemental Draft Environmental Impact Statement Scoping Summary Report. Prepared by McDowell Group, Inc.

DOT&PF. 2003c. Juneau Access Improvements Project 1997 and 2003 Comment Analysis Report. Prepared by URS Corporation for DOT&PF. June.

DOT&PF. 2004a. Lynn Canal Revenues and Expenditures 2001-2002 and Projected Capital Costs 2001-2038.

DOT&PF. 2004b. *Haines/Skagway Access Reconnaissance Report*. Project Number 73800/NH-9500 (97). Prepared by DOT&PF, Southeast Region. June.

DOT&PF. 2004c. Southeast Alaska Transportation Plan (SATP). August.

DOT&PF. 2004d. The 2008 Estimated Revenue, State Cost and State Subsidy, Juneau Access Alternatives. March.

DOT&PF. 2004e. DOT&PF Southeast Region Traffic and Safety Report. Prepared annually from 1993 through 2003.

DOT&PF. 2005a. AMHS 1988-2004 Annual Traffic Volume Reports.

DOT&PF. 2005b. Proposed Marine Segments Fare Structures. March 2004, revised August 2005.

DOT&PF. 2005c. Lynn Canal Corridor Revenues and Expenditures. 2003 and 2004. June 2005.

Allred, K. and S. Allred. 1995. Broken Motor Cave. The Alaskan Caver, Glacier Grotto, Vol. 15, June, 2005. No. 3. June. p. 14.

American Association of State Highway and Transportation Officials (AASHTO). 1990. Hazardous Waste Guide for Project Development. February. 9 pp.

AASHTO. 2003. User Benefit Analysis for Highways. August.

American Society for Testing and Materials International. 1999. Standard Guide for Assessment of Wetland Functions. Designation: E 1983-98. ASTM International, 100 Barr Harbor Dr., PO Box C700, West Conshohocken, PA 19428-2959, USA. February.

Angliss, R. P. and K. L. Lodge. 2003. Draft Alaska Marine Mammal Stock Assessments for 2003. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-AFSC-133, 224 p. Accessed from website: http://www.nmfs.noaa.gov/prot_res/PR2/Stock_Assessment_Program/sars.html

Ballard, W.F. 1994. Letter from DOT&PF Southeast Region Environmental Coordinator to Judith Bittner, State Historic Preservation Officer. December 12.

Barten, N. 2001. Unit 1C and 1D furbearer management reports. Pages 23-34 *in* C. Healy, editor. Furbearer management report of survey and inventory activities 1 July 1997-30 June 2000. Alaska Department of Fish and Game. Project 7.0 Juneau Alaska. Accessed on October 26, 2003 from website: http://www.state.ak.us/adfg/wildlife/geninfo/pub/division_reports/fur01mt_se.pdf

Barten, N. 2005. Personal communications regarding information from ADF&G species management reports. Alaska Department of Fish and Game. August.

Bittner, J.E. 1995. Letter from the State Historic Preservation Officer to William Ballard, DOT&PF Southeast Region Environmental Coordinator. January 6.

Boreal Partners in Flight (BPIF), 1999. Landbird Conservation Plan for Alaska Biogeographic Regions. Version 1.0. BPIF Working Group, B.A. Andres (chair). U.S. Fish and Wildlife Service, Anchorage, Alaska. 116 pp. Accessed on October 26, 2003 from website: http://www.absc.usgs.gov/research/bpif/conservation.html.

Broderson, K. 1994. Frogs and Toads. ADF&G Notebook Series. Accessed October 2, 2003 from website: http://www.state.ak.us/local/akpages/FISH.GAME/notebook/amphibia/amphib.htm.

California Air Resources Board. 1998. Initial Statement of Reason for Rulemaking. Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Staff Report. Sacramento, CA.

Calkins, D.G. and K.W. Pitcher. 1982. Population assessment, ecology and trophic relationships of Steller sea lions in the Gulf of Alaska. Environmental Assessment of the Alaskan Continental Shelf Final Report. 19(1983). NOAA. Pp. 445-546.

Center For Biological Diversity, Coastal Coalition, Eyak Preservation Council, Lynn Canal Conservation, Inc., and Sitka Conservation Society. 2001. Petition to list the Kittlitz's Murrelet (*Brachyramphus brevirostris*) as endangered under the Endangered Species Act. Submitted to the U.S. Secretary of the Interior on May 9, 2001. Accessed on July 24, 2002 from website: http://www.biologicaldiversity.org/swcbd/species/murrelet/Petition.pdf.

City of Haines. 2000. City of Haines, Alaska District Coastal Management Plan. Update with 2000 Minor Amendment. November 15, 1993 and November 20, 2000.

CBJ. 1996. *The Comprehensive Plan 1995 Update.* November.

CBJ. 2001a. Housing Assessment data for 2001 obtained in 2003 from CBJ Community Development Department.

CBJ. 2001b. City and Borough of Juneau Area Wide Transportation Plan, Volume 1, Transportation Plan Recommendations. July 9. Available from website: http://www.juneau.org/tourism2/documents2001/areawide_transpo7-9-2001.pdf.

CBJ. 2002. Unaudited Financial Statement for 2002.

City of Skagway. 1991. *Skagway Coastal Management Plan*.

City of Skagway. 1999. *City of Skagway Comprehensive Plan.* October.

City of Skagway. 2000. *Skagway Economic Impact Study*. Prepared by Southeast Strategies and Dean Runyon Associates for the City of Skagway.

Christensen, B. and C. Van Dyke. 2004. Brown Bear (*Ursus arctos*) Habitat and Signs of Use: Berners Bay, Alaska Site Survey – June 15-19, 2003. SEAWEAD. Available from website: http://www.seawead.org.

Coeur Alaska, Inc. 2004. Properties, Kensington. Accessed February 2004 from website: http://www.coeur.com.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS 79/31. Washington, D.C., U.S. Government Printing Office.

Cruise Line Agencies of Alaska. 2003. Cruise Ship Expected Calls for 2003.

Dahlheim, M.E., D.K. Ellifrit, and J.D. Swenson. 1997. Killer Whales of Southeast Alaska a Catalogue of Photo-Identified Individuals. Seattle, WA: National Marine Mammal Laboratory.

Dahlheim, M., A. York, R. Towell, J. Waite, and J. Briewick. 2000. Harbor Porpoise (*Phocoena phocoena*) Abundance in Alaska: Bristol Bay to Southeast Alaska, 1991 – 1993. Marine Mammal Science 16(1)28-45.

Dames & Moore, Inc. 1994. Draft Report, Preliminary Karst Assessment, West Lynn Canal Alternative, Juneau Access Project, Juneau, Alaska. Report prepared for FRP/Roen-Lochner Joint Venture, D&M Job No. 23696-014-020. October. 9 p.

Diehl, George M., ed. 1973. Machinery Acoustics. John Wiley and Sons, Inc. New York, New York.

Drew, D. 1999. Karst Waters and Human Activities: an Overview. *In* Drew, D., and Hotzl, H., eds., Karst Hydrogeology and Human Activities – Impacts, Consequences and Implications. International Contributions to Hydrogeology 20, International Assoc. of Hydrogeologists, A.A. Balkema Publishers, Brookfield, Vermont. Part 1, p.3-34.

Dunn, A. 2000. *Bald Eagle Monitoring Report: 1998, 1999. Juneau-Glacier Highway, Indian Point to Point Louisa, Juneau, Alaska*. Prepared by Dunn Environmental Services for the Alaska Department of Transportation and Public Facilities. 19 pp.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 100 pp. plus Appendices A-C.

Federal Aviation Administration (FAA). 2003. Hydrodynamics, Sediment Transport, Water Quality, and Aquatic Biotic Communities Associated with SFO Runway Reconfiguration Project.

FAA and DOT&PF. 2002. Ketchikan Airport West Taxiway Construction Environmental Assessment and Finding of No Significant Impacts.

Federal Energy Regulatory Commission (FERC). 2002. Final Environmental Assessment for Hydropower License, Otter Creek Hydroelectric Project, FERC Project No. 11588-001, Alaska.

Federal Highway Administration (FHWA). 1986. Appropriate Level of Highway Air Quality Analysis for a CE, EA/FONSI, and EIS. March.

FHWA. 1988. Interim Guidance – Hazardous Waste Sites Affecting Highway Project Development. Memorandum to Regional Federal Highway Administrators. August 5.

FHWA. 1991. Rock Blasting and Overbreak Control. Publication No. FHWA-HI-91-001.

FHWA. 1997. Supplemental Hazardous Waste Guidance. Memorandum to Division Administrators. January 16.

FHWA. 1998. FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. FHWA Order. December 2.

FHWA and DOT&PF. 2004. *Gravina Access Project Final Environmental Impact Statement.* Accessed from website: http://dot.alaska.gov/stwdplng/projectinfo/ser/Gravina/assetts/Final_EIS/COMPLETE_FINAL EIS.pdf. July.

FHWA. 2005. Section 4(f) Policy Paper. FHWA Office of Planning, Environmental and Realty, Project Development and Environmental Review. Available from website: http://environment.fhwa.dot.gov/projdev/4fpolicy.htm#2. March 1.

Ford, D.C., and P.W. Williams. 1994. Karst Geomorphology and Hydrology. Chapman & Hill, London.

Gabriele, C.M., and T.M. Lewis. 2000. Summary of Opportunistic Marine Mammal Sightings in Glacier Bay and Icy Strait 1994-1999. Gustavus, AK: Glacier Bay National Park and Preserve.

Gehrels, G.E., and H.C. Berg. 1992. Geologic Map of Southeastern Alaska: U.S. Geological Survey Miscellaneous Investigations Series Map I-1867, 1 sheet, scale 1:600,000, 24 p.

Gehrels, G.E. and Berg, H.C. 1994. Geology of Southeastern Alaska. *In* The Geology of North America, Volume G-1, The Geology of Alaska. The Geological Society of America. Chapter 13, p. 451-467.

Glosten Associates, Inc. (Glosten). 1999. Juneau Access Marine Alternatives Study. Report prepared for DOT&PF, Juneau, Alaska. March.

Goldbelt, Inc (Goldbelt). 1996. *Echo Cove Master Plan*. March.

Gorbics, C.S., and J.E. Bodkin. 2001. Stock structure of sea otters (*Enhydra lutris kenyoni*) in Alaska. *Marine Mammal Science* 17(3): 632-647.

Griffin. 2004. Signed concurrence letter from R. Yost regarding significant recreation facilities, August 13, 2004.

Haines Borough. 2004. *Haines Borough Comprehensive Plan*. Accessed from website: http://www.hainesborough.us/CompPlan.html. April.

Hanson, R.A. and R.A. Combellick. 1998. Planning Scenario Earthquakes for Southeast Alaska. Miscellaneous Publication #34. Published by the Stat of Alaska Department of Natural resources, Division of Geological and Geophysical Surveys.

Hessing P. 2002. Unit 1D moose management report. Pages 42-54 *in* C. Healy, editor. Moose management report of survey and inventory activities 1 July 1998-30 June 2000. Alaska Department of Fish and Game. Project 1.0 Juneau Alaska. Accessed November 17, 2003 from website: http://www.wildlife.alaska.gov/pubs/techpubs/mgt.cfm

Hickel, W. 1994. Letter from the Governor of State of Alaska to Phil Janik, USFS Regional Forester. November 16.

Hodges, J.I. and F.C. Robards. 1982. Observations of 3,850 bald eagle nests in Southeast Alaska. Pages 37-46 in W.N. Ladd and P.F. Schempf (eds.), Raptor management and biology in Alaska and western Canada. FWS/AK/PROC-82, USFWS, Anchorage, AK.

Horwood, J.1990. Biology and Exploitation of the Minke Whale. Boca Raton, FL: CRC Press, Inc.

Irwin, T. 2004. ADNR signed concurrence letter in response to request letter from R. Yost, DOT&PF. August 23.

Jacobson, M. 2003. USFWS, personal communication. October.

Jacobson, M.J. and J.I. Hodges. 1999. Population trend of adult bald eagles in Southeast Alaska, 1967-1997. J. Raptor Res. 33(4):295-298.

Johnson, N.P. 1990. *Nesting Bald Eagles in Urban Areas of Southeast Alaska: Assessing Highway Construction and Disturbance Impact*. Transportation Research Record, 1279: p. 1, 60-68.

Johnson, S. R., J. J. Burns, C. I. Malme, and R. A. Davis. 1990. Synthesis of information on the effects of noise and disturbance on major haulout concentrations of Bering Sea pinnipeds. Pp. 81-92. In Alaska OSC region 3rd Info Transfer Meeting Conf. Proc., Jan.30-Feb.1, 1991, Anchorage, Alaska. Available Alaska Fisheries Science Center, 7600 Sand Point Way NE., Seattle WA 98115.

Laist, David W., A.R. Knowlton, J.G. Mead, A.S. Collet, and M. Podesta. 2001. C*ollisions Between Ships and Whales*. In Marine Mammal Science. 17(1):35-75. January. Society of Marine Mammalogy.

Leatherwood, S., R.R. Reeves, W.F. Perrin, and W.E. Evans. 1982. Whales, Dolphins, and Porpoises of the Eastern North Pacific and Adjacent Arctic waters: A Guide to their Identification. U.S. Department of Commerce, National Oceanic and Atmospheric Administration Technical Report. National Marine Fisheries Service circular 444.

Lemke, R.W. 1974. Reconnaissance Engineering Geology of the Wrangell Area, Alaska, with Emphasis on Evaluation of Earthquake and Other Geologic Hazards. United Stated Geological Survey, Open-File Report *In* Shannon & Wilson, Inc. 1994. Juneau Access Improvement Reconnaissance Engineering Report, Appendix C, Geology Report. Report prepared for H.W. Lochner, Inc, Bellevue, Washington. February 8. 62 pp. plus app.

Love, D. 1999. West Lynn Canal Karst Inventory. The Alaskan Caver, Glacier Grotto. Vol. 19, No. 2. April. p.11-17.

Marston, B.H., M.F. Willson, and S.M. Gende. 2002. Predator aggregations during eulachon *Thaleichthys pacificus* spawning runs. Marine Ecology Progress Series 231: 229-236.

Mathews, E.A. 1997. Reactions of Steller sea lions to vessel traffic in Glacier Bay. Report to Glacier Bay Nat. Park, Gustavus, AK. 26.

McDowell Group, Inc. 1994. *Juneau Access Household Survey Results*. Prepared for the Alaska Department of Transportation and Public Facilities, Southeast Region, Alaska, August.

McDowell Group, Inc. 2002. *Haines Tourism Study*. Prepared for the City of Haines.

McDowell Group, Inc. 2003. *Juneau Access Household Survey Results: Juneau, Skagway, Haines, and Whitehorse.* Prepared for Alaska Department of Transportation and Public Facilities, Juneau, Alaska, by McDowell Group, Inc., Juneau, AK. October.

McLellan, B.N. and D.M. Shackleton. 1988. Grizzly bears and resource extraction industries: effects of roads on behavior, habitat use, and demography. J. Applied Ecology 25: 451-460.

McLellan, B.N., 1989. Dynamics of a grizzly bear population during a period of industrial resource extraction, II: mortality rates and causes of death. Can. J. Zoology 67: 1861-1864.

Miller, R.D. 1972. Surficial Geology of the Juneau Urban Area and Vicinity, Alaska with Emphasis on Earthquake and other Geologic Hazards. United States Geological Survey, Open-File Report *In* Shannon & Wilson, Inc. 1994. Juneau Access Improvement Reconnaissance Engineering Report, Appendix C, Geology Report. Report prepared for H.W. Lochner, Inc, Bellevue, Washington. February 8. 62 pp. plus app.

MOA Watershed Management Program. 2000a. Receiving Water Chemistry at Select Streams in Anchorage, Alaska: 2000 Data Report. Prepared by CH2M Hill, Inc., Anchorage, Alaska.

MOA Watershed Management Program. 2000b. Anchorage Street Deicer and Snow Disposal: 2000 Best Management Practices Guidance. Prepared by Montgomery Watson, Anchorage, Alaska. U.S. Department of Transportation, Federal Highway Administration. *Guidance for Preparing and Processing Environmental/ and Section 4 (F) Documents.* October 30, 1987.

National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS). 1991. Recovery plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

NMFS. 2003. Marine Mammal Viewing Guide. Accessed from website: http://www.fakr.noaa.gov/protectedresources/mmviewingguide.html.

NMFS. 2005. Final Biological Opinion on the Kensington Gold Project. March 18.

National Park Service (NPS). 1999. Skagway and White Pass District National Historic Landmark Nomination. April 7.

NPS. 2003. Glacier Bay National Park and Preserve, Alaska, Vessel Quotas and Operating Requirements, Final Environmental Impact Statement. Accessed on October 25, 2003 from website: http://www.glba.ene.com/.

NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life. Version 1.8. Arlington, Virginia. Accessed October 2, 2003 from website: http://www.natureserve.org/explorer/.

Northern Land Use Research, Inc. (NLUR). 1994. Archeological Survey on the West Coast of Lynn Canal: William Henry Bay to Pyramid Island. Report prepared for FPE/Roen Engineers, Inc., Fairbanks, Alaska. September. 130 pp.

Ouderkirk, E. 2004. E. Ouderkirk, USFS, teleconference with R. Yost, DOT&PF. May 25.

Pearson, W. H., Elston, R. A., Bienert, R. W., and others. 1999. Why Did the Prince William Sound, Alaska, Pacific Herring (*Clupea Pallasi*) Fisheries Collapse in 1993 and 1994? Review of Hypotheses: Canadian Journal of Fisheries and Aquatic Sciences, v. 56, no. 4, p. 711-737.

Person, D. K. 2001. Alexander Archipelago wolves: ecology and population viability in a disturbed, insular landscape. Ph.D. Dissertation, University of Alaska Fairbanks, Fairbanks, Alaska.

Pritchard, D.W. 1967. Observations of circulation in coastal plain estuaries, in *Estuaries*, Publication No. 83, American Association for the Advancement of Science, Washington, D.C., pp.37-44.

Raum-Suryan, K.L., K.W. Pitcher, D.G. Calkins, J.L. Sease, and T.R. Loughlin. 2002. Dispersal, rookery fidelity, and metapopulation structure of Steller sea lions (*Eumatopias jubatus*) in an increasing and decreasing population in Alaska. Marine Mammal Science. 18:746-764.

Rice, D.W. 1998. Marine Mammals of the World Systematics and Distribution. Lawrence, KS. Allen Press, Inc

Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and D.J. Thomson. 1995. Marine Mammals and Noise. Academic Press. San Diego, CA.

Robus and Carney. 1996. P4-61; sec 4.3.15.3

Rosenberg, D., S. Patten, and T. Rothe. 1994. Harlequin Ducks. Alaska Department of Fish and Game, Wildlife Notebook Series. Accessed September 30, 2003 from website: http://www.state.ak.us/adfg/notebook/bird/harlequn.htm.

Rosenberg, D. and T. Rothe. 1994. Swans. Alaska Department of Fish and Game, Wildlife Notebook Series. Accessed September 26, 2003 from website: http://www.state.ak.us/adfg/notebook/bird/swans.htm.

Schoen, J.W., R.W. Flynn, L.H. Suring, K. Titus, and L.R. Beier. 1993. Habitat capability model for brown bear in Southeast Alaska. Version 7.0. Appendix I *In* Suring, L.H., compiler, 1993. Habitat capability models for wildlife in Southeast Alaska. USDA Forest Service, Alaska Region, Juneau, Alaska.

Schaerer, P. 1989. The Avalanche Hazard Index. Annals of Glaciology. 13:241-247.

Schumacher, Tom. 2005. Personal communications regarding information from ADF&G species management reports. Alaska Department of Fish and Game. August.

SWCA Environmental Consultants. 2002. Juneau International Airport Environmental Impact Statement Biological Resources Affected Environment. Prepared for Federal Aviation Administration and City and Borough of Juneau. 178 pp. August 30.

United Fishermen of Alaska. 2004. Subsistence Management Information. Personal Use. Accessed February 16, 2004 from website: http://www.subsistmgtinfo.org/qa.htm

United States Department of the Army (U.S. Army). 2001. Data from *Waterborne Commerce of the United States* for the calendar year 2001.

United States Army Corps of Engineers (USACE). 2003. Alaska Port Freight Volume Report.

USACE. 2005. Department of Army Permit issued to Coeur Alaska. June 17, 2005.

United States Census Bureau. 2000. Unites States 2000 Census Information. Accessed from website: http://www.census.gov/main/www/cen2000.html.

United States Department of Transportation (USDOT) and FHWA. 1987. Guidance for Preparing and Processing Environmental and Section 4(f) Documents, FHWA Technical Advisory T6640.8A. October 30.

USDOT, Bureau of Transportation Statistics. 2001. State Transportation Profile.

United States Census Bureau (U.S. Census Bureau). 2000. United States 2000 Census. Accessed from website: http://www.census.gov/main/www/cen2000.html.

United States Forest Service (USFS). 1988a. Decision Notice and Finding of No Significant Impact, Jualin Mine Access, Exploration and Bulk Sampling. USDA Forest Service, R10, Tongass National Forest, Chatham Area, Juneau Ranger District. Available on-line at http://www.kensingtoneis.com (eShare Public Logon, Shared Documents).

USFS. 1988b. Decision Notice and Finding of No Significant Impact, Mining Operation Plan, Kensington Project, Echo Bay Exploration Inc. USDA Forest Service, R10, Tongass National Forest, Chatham Area, Juneau Ranger District. Available on-line at http://www.kensingtoneis.com (eShare Public Logon, Shared Documents).

USFS. 1992. Kensington Gold Project Final Environmental Impact Statement. Tongass National Forest. R10- MB-159. Vol I. February.

USFS. 1997a. Kensington Gold Project Final Supplemental Environmental Impact Statement. Tongass National Forest. Sitka, AK.

USFS. 1997b. Tongass National Forest Land and Resource Management Plan (TLRMP/Forest Plan). R10-MB-338dd. USDA Forest Service, Alaska Region. Accessed September 24, 2003 from website: http://www.fs.fed.us/r10/tlmp/.

USFS. 1999. Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. USDA Forest Service Misc. Rep. FS-643. Washington, D.C., 222p.

USFS. 2000. Forest Roads: a Synthesis of Scientific Information. USDA Forest Service, Gucinski, H., M.J. Furniss, R.R. Ziemer, and M.H. Brookes (eds.). 117 pp.

USFS. 2001. Helicopter Landing Tours on the Juneau Icefield, 2002-2006, Draft Environmental Impact Statement. Available on-line: http://www.fs.fed.us/r10/tongass/planning/helilanding/index.html. Accessed October 23, 2003.

USFS. 2003. Tongass National Forest Management Plan Revision Supplemental Environmental Impact Statement. Roadless Area Evaluation for Wilderness Recommendations. R10-MB-481g.

USFS. 2004. *Kensington Gold Project Final Supplemental Environmental Impact Statement.* Prepared by Tetra Tech, Inc., 143 Union Boulevard, Suite 1010, Lakewood, CO 80228. Includes USFS Record of Decision.

USFWS. 2003. Wildlife and Human Use of the Shoreline and Near-shore Waters of Berner's Bay, Southeast Alaska. Preliminary report. February. 25 pp.

URS Corporation (URS). 2005. Juneau Access Improvements Project Vegetation Technical Memorandum. Prepared for DOT&PF, Southeast Region. March.

Vaughan, K. 2004a. K. Vaughan, USFS, teleconference with R. Yost, DOT&PF. April 27.

Vaughan, K. 2004b. K. Vaughan, USFS, letter to R. Yost, DOT&PF. March 25.

Wegner, W. and M. Yaggi. 2001. *Environmental Impacts of Road Salt and Alternatives in the New York City Watershed*. The Journal for Surface Water Quality Professionals. May/June 2001. Accessed on January 15, 2004 from website: http://www.forester.net/sw_0107_environmental.html.

Wesson, R.L., A.D. Frankel, C.S. Mueller, and S.C. Harmsen. 1999. Probabilistic Seismic Hazard Maps of Alaska. U.S. Geological Survey, Denver, CO.

Yarborough, M. 2004. Letter to R. Yost, DOT&PF. December 29.

Yukon Highways and Public Works. 2003. *2002 Yukon Traffic Count Summary*.

Copies of DOT&PF references are available on request.

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11.0 INDEX

A

B

C

D

E

F

I

N

T

U

V

W