JUNEAU ACCESS IMPROVEMENTS
SUPPLEMENTAL DRAFT
ENVIRONMENTAL IMPACT STATEMENT

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

Prepared by

Alaska Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

Prepared for
Federal Highway Administration
Alaska Division
709 West 9th Street, Room 851
Juneau, Alaska 99802

JANUARY 2005

FHWA-AK-EIS-97-01-DS

Juneau Access Improvements Project

Juneau, Alaska
City and Borough of Juneau

Supplemental Draft 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

1/10/05
Date of Approval

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

1.11.05
Date of Approval

Tim A. Haugh for FHWA

The following persons may be contacted for additional information concerning this document:

Tim A. Haugh, Program Manager
Environment and Right-of-Way
FHWA, Alaska Division
P.O. Box 21648
Juneau, AK 99802
(907) 586-7418

Reuben Yost, Special Projects Manager
DOT&PF
Southeast Region
6860 Glacier Highway
Juneau, AK 99801-7999
(907) 465-1828

The Juneau Access Improvements Project would improve public access to and from Juneau in Lynn Canal. Nine 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.

Comments on this supplemental draft EIS are due by March 21, 2005 and should be sent to:

Reuben Yost, Special Projects Manager
DOT&PF – Southeast Region
6860 Glacier Highway
Juneau, AK 99801-7999

Or submit electronically at http://juneauaccess.alaska.gov

This page intentionally left blank.

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 or otherwise exempt from NEPA
- Is a major federal action (i.e., requires a permit, regulatory decision, or funding from a federal agency)
- May have a significant adverse 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. 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. This Supplemental Draft EIS includes pertinent information from the 1997 Draft EIS as well as the additional material required. Following circulation of this Supplemental Draft EIS to the public and interested government agencies, and consideration of comments received on the document, DOT&PF and FHWA will prepare a Final EIS.

Proposed Action

DOT&PF proposes to improve 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

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

communities. AMHS service from Juneau connects to the continental highway system in Prince Rupert, British Columbia, 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 on October 31, 2003. The project is consistent with the DOT&PF 2004 Southeast Alaska Transportation Plan (SATP). 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 Supplemental Draft Environmental Impact Statement

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

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) *M/V Fairweather* between Auke Bay and Haines and Auke Bay and Skagway. The *M/V Aurora* would provide shuttle service between Haines and Skagway, beginning as early as 2005.

Alternative 2 (Preferred): East Lynn Canal Highway with Katzehin Terminal

Alternative 2 would construct a 68.5-mile-long two-lane highway from the end of Glacier Highway, at Echo Cove, around Berners Bay and along the eastern coast of Lynn Canal and Taiya Inlet to Skagway. A ferry terminal would be constructed north of the Katzehin River delta, and the *M/V Aurora* would be used for shuttle service between Katzehin and the Lutak Ferry Terminal in Haines. Mainline AMHS service would end at Auke Bay, and the Haines to Skagway shuttle service would be discontinued. The *M/V Fairweather* would no longer operate in Lynn Canal.

Alternative 2A: East Lynn Canal Highway with Berners Bay Shuttle

Alternative 2A would construct a 5.2-mile two-lane highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at both Sawmill Cove and Slate Cove, and shuttle ferries would operate between the two terminals. A 52.9-mile two-lane highway would be constructed between Slate Cove and Skagway along the eastern coast of Lynn Canal and Taiya Inlet. A ferry terminal would be constructed north of the Katzehin River delta, and the *M/V Aurora* would operate between the Katzehin and the Lutak Ferry Terminals. Mainline AMHS service would end at Auke Bay, and the Haines to Skagway shuttle service would be discontinued. The M/V *Fairweather* would no longer operate in Lynn Canal.

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

Alternative 2B would construct a 50.5-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 2C: East Lynn Canal Highway with Shuttle to Haines from Skagway

Alternative 2C would construct a 68.5-mile two-lane highway from the end of Glacier Highway at Echo Cove around Berners Bay and along the eastern coast of Lynn Canal and Taiya Inlet to Skagway with the same design features as Alternative 2. The *M/V Aurora* would continue to provide service between Haines and Skagway. No ferry terminal would be constructed north of the Katzehin River delta. Mainline ferry 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 a new double stern berth 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 bridge at 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.

Further 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 Supplemental Draft 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 - Alternative 2 would accommodate the greatest travel demand of any of the alternatives considered for the proposed project. Annual ADT would be seven times higher for Alternative 2 (930 vehicles) than for the No Action Alternative (130 vehicles) in 2038. Alternative 2 would have the capacity to meet the peak demand for travel between Juneau and Skagway and the 2038 summer average demand for travel between Juneau and Haines.

Alternative 2 would provide the greatest increase in flexibility and opportunity for travel relative to the No Action Alternative. In summer, travelers to Skagway could use the highway at any time without regard for ferry schedules or reservations. In winter, the road would be closed at times because of weather conditions or avalanches. Shuttle ferries could carry northbound and southbound traffic between Haines, Skagway, and Juneau when the highway is closed.

Under Alternative 2, travelers to Haines would take a ferry from Katzehin to Haines. DOT&PF estimates there would be nine ferry trips per day to Haines in the summer and six per day during the winter. This would be a substantial increase in travel flexibility and opportunity compared to the No Action Alternative.

Alternative 2C would provide the same flexibility and opportunity for travel between Juneau and Skagway as Alternative 2. However, travelers between Juneau and Haines would be required to take a ferry between Skagway and Haines under Alternative 2C instead of Katzehin. Because of this longer ferry trip, there would be six ferry trips per day to Haines in the summer and four per day in the winter with Alternative 2C.

All of the other build alternatives would require at least one ferry link for all traffic between Juneau and Haines or Skagway. Alternative 2A would have one ferry link on trips to Skagway and two on trips to Haines. Alternative 2B would require all traffic to take a ferry to or from Katzehin. Alternative 3 would have one ferry link on trips to Haines and two on trips to Skagway. Alternatives 4A through 4D improve ferry transportation in Lynn Canal but provide less travel opportunity than any of the highway alternatives. Alternative 4C would provide the least improvement in travel flexibility and opportunity relative to the No Action Alternative (one to two more trips per week).

Travel time between the Auke Bay ferry terminal in Juneau and Skagway in the summer would be 2.1 hours with Alternatives 2 and 2C, assuming an average speed on the highway of 45 mph. Alternatives 2 and 2C would have the shortest travel time between these communities. Alternatives 2 and 2B would have the shortest travel time to Haines (2.5 hours).

As ferry links are added to alternatives, travel times would increase. For the build alternatives that include highways on the east or west side of Lynn Canal, travel times to Skagway vary from 2.1 hours for Alternatives 2 and 2C (no ferry link) up to 4.3 hours for Alternative 3 (two ferry links). Travel times for trips to Haines with these alternatives vary from 2.5 hours for Alternatives 2 and 2B to 3.4 hours for Alternative 2C. 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. 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 2 would have the lowest maintenance and operating cost of all alternatives: approximately $4.4 million versus $10.2 million for the No Action Alternative. Alternative 2C would have roughly the same annual operating cost as Alternative 2. As ferry links 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 30-year period 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 30-year period would be about $61 million. Alternative 2 would have the lowest net cost to the state of all build alternatives over this 30-year period ($68 million). Alternative 4A would have the highest net cost to the state of any of the build alternatives over the 30-year period ($98 million). All of the build alternatives would carry more vehicles than the No Action Alternative. Alternatives 2 through 2C, 3, 4B, and 4D would cost the state less than the No Action Alternative on a per vehicle basis.

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 between Juneau and Skagway and $180 between Juneau and Haines under the No Action Alternaitve[2]. 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 2 would have the lowest out-of-pocket cost for travelers of all project alternatives. A trip would cost $10 between Juneau and Skagway and $34 between Juneau and Haines under Alternative 2. 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 of the best economic measures of an alternative is its net present value[3]. 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 2004 to 2038 net present value of Alternative 2 is approximately $115 million. Alternatives 2 and 2C provide the highest net present value of all the alternatives. Other build alternatives have much lower net present value. In fact, three of the marine alternatives would have higher total project costs than the user benefits they would provide (see Table S-1).

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 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 2 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

[2] This cost is for travel on a conventional monohull ferry. Travel on a fast vehicle ferry would cost 10 percent more.

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

reduction in visitor spending. For instance, Alternative 2C would have a relatively small economical benefit to Haines. On the other hand, 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 2 being close to the shore at many locations. It would be visible from many points in Berners Bay, Lynn Canal, and Taiya Inlet, introducing man-made forms into the natural landscape. From the highway there would be many panoramic views of Lynn Canal with the rugged, snow-capped Chilkat Range in the background.

Alternatives 2A, 2B, and 2C would have the same visual effects as Alternative 2 where a highway is present along the east side of Lynn Canal. Alternative 2C would have essentially the same visual impacts as Alternative 2 since they both include a highway from Echo Cove to Skagway. Alternative 2A would have no visual impacts to Berners Bay north of Sawmill Cove, while Alternative 2B would have no visual impact to Taiya Inlet.

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 2 through 2C 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. Alternatives 2, 2A, and 2C would have a visual effect on the Skagway and White Pass District National Historic Landmark but this effect would be mitigated by design elements developed in coordination with the National Park Service and the City of Skagway.

Geology – The proposed alignment for Alternatives 2 and 2C crosses 61 avalanche paths (including subpaths). Alternative 2A crosses 60 avalanche paths, while 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 – Alternatives 2 and 2B would result in the loss of 93 acres of wetlands. Most of the wetlands filled for the highway alignment (86 percent) would be forested wetlands that provide hydrologic control functions, sediment retention functions, and wildlife habitat. The largest area of wetland loss, 62 acres, would occur between Slate Creek and Sherman Point north of Berners Bay. A total of 19 acres of forested wetlands, 3 acres of palustrine emergent wetlands, and 1 acre of palustrine scrub-shrub wetlands would be filled in Berners Bay.

Alternative 2C would have 3 less acres of wetlands impacted than Alternatives 2 and 2B (90 acres) because there would not be a new ferry terminal north of the Katzehin River. Alternative 2A would avoid the loss of 21 acres of wetlands in Berners Bay resulting in a total wetland impact of 71 acres.

Alternative 3 would result in the loss of 36 acres of wetlands. Approximately 90 percent of the wetlands filled for 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 11 acres of wetlands between Echo Cove and Sawmill Cove.

Marine and Freshwater Habitats – A total of 31 acres of intertidal and subtidal marine habitat would be filled or dredged for construction of the highway and Katzehin ferry terminal under Alternatives 2 and 2B. Alternative 2C would fill 22 acres of marine habitat. Alternative 2A would dredge or fill 35 acres of marine habitat, the largest impact of any alternative, from construction of three ferry terminals as well as a highway.

For all build alternatives, all anadromous fish streams would be crossed with bridges. Piers for the bridges over the Lace and Antler rivers (Alternatives 2, 2B, and 2C) and Katzehin rivers (Alternatives 2 through 2C) would be placed approximately 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 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 three 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. FHWA has determined that the build alternatives would not have a substantial adverse effect on Essential Fish Habitat.

Terrestrial Habitat – Alternatives 2 and 2C would result in the loss of 629 acres of terrestrial habitat. Of this total, 382 acres would be old-growth forest, 233 acres would be other forest (including a small amount of second growth), and 13 acres would be shrub (non-forest brush) and open meadow or muskeg vegetation communities. Alternative 2A would result in the loss of 534 acres of terrestrial habitat of which 294 acres would be old-growth forest, 230 acres would be other forest, and 9 acres would be shrub and open meadow or muskeg. Alternative 2B would result in the loss of 456 acres of terrestrial habitat including 314 acres of old-growth forest, 128 acres of other forest, and 13 acres of shrub and muskeg. The loss from each vegetation type represents less than one 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 known rare or sensitive plant species.

Alternative 3 would result in the loss of 423 acres of terrestrial habitat including 314 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 one 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 known rare or sensitive plant species.

Alternatives 4A and 4C would not impact any terrestrial habitat. Alternatives 4B and 4D would result in the loss of 53 acres of old-growth forest and 2 acres of muskeg.

Wildlife – The direct loss of wetland and terrestrial habitat from the build alternatives that include a highway (Alternatives 2 through 2C, 3, 4B, and 4D) would have a small effect on wildlife because that loss would be a small (less than one 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 2 through 2C and Alternative 3 would have a larger impact on wildlife, particularly terrestrial mammals.

Alternatives 2 and 2C would have the largest impacts on terrestrial wildlife. 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, Alternatives 2 and 2C are projected to reduce the brown bear habitat capability in the potentially impacted areas by up to 29 percent. Alternatives 2 and 2C would also increase the potential for mortality from vehicle collisions to the small moose population in Berners Bay. Alternative 2A would not impact wildlife populations in Berners Bay from Sawmill Cove to Slate Cove. Alternative 2B would not impact wildlife populations north of Katzehin.

Alternative 3 would have similar but smaller impacts to wildlife than Alternatives 2 through 2C. For example, this alternative is projected to 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 five miles of new road through terrestrial habitats.

Bald Eagle – The highway for Alternatives 2 and 2C would be located within 0.5 mile of 100 bald eagle nests and within 330 feet of 57 of these nests. Alternatives 2A and 2B would be in close proximity to fewer nests because the highway lengths are shorter (see Table S-1). Alternative 3 would be within 0.5 mile of 45 bald eagle nests, and within 330 feet of 25 of these nests. The highway for Alternatives 4B and 4D would be located within 0.5 mile of seven 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 2 through 2C 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.

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 east 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 (classified as threatened) and the humpback whale (classified as endangered). There are two principal haulouts along the proposed alignment for Alternatives 2 through 2C 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 the National Marine Fisheries Service. Met Point is also an important haulout for this species. Highway design elements have been incorporated into Alternatives 2 through 2C 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. Based on the above, the FHWA has determined that Alternatives 2 through 2C are not likely to adversely affect Steller sea lions.

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 with the possible exception of Alternative 2A (Alternative 2A would have 20 shuttle trips/day during the summer). Pile driving for construction of ferry terminals under Alternatives 2, 2A, 2B, 3, 4B, and 4D could disturb humpback whales in the area. Monitors would be used during pile driving to insure that this activity does not occur when humpback whales are within 330 feet of the construction area. For these reasons, the FHWA has determined that the build alternatives are 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 for the Supplemental Draft EIS, DOT&PF continues to prefer Alternative 2 because of its ability to best meet the purpose of and need for the proposed project.

All reasonable alternatives evaluated in the Supplemental Draft EIS are under consideration and have been developed to a comparable level of detail. The final identification of a preferred alternative will not be made until the alternatives' impacts, written comments on the Supplemental Draft EIS, and comments received at the public hearings have been fully evaluated and considered. Final selection of an alternative will be provided in the Record of Decision.

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 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. 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

Issues raised by the public and agencies are outlined in Chapter 7 of the Supplemental Draft 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., 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 U.S. Forest Service (USFS) Record of Decision. Construction of the new mine has not started. 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 Draft Supplemental Environmental Impact Statement.*

Several of the alternatives being considered 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 may be upgraded as part of Coeur Alaska's proposal to build a deep water floating dock at Slate Cove with funds from the Alaska Industrial Development and Export Authority (AIDEA). Use of these funds would insure state access to the dock. If Coeur Alaska develops a ship terminal at Slate Cove with AIDEA funds, 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, 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 40-acre 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 has received easements to cross USFS land, USFS special-use permits, and a U.S. Army Corps of Engineers (USACE) 404 permit for construction of the proposed road. The alignment of this road and the highway segment for some of the Juneau Access Improvements Project alternatives between Echo Cove and Sawmill Cove would be similar. If Goldbelt's Cascade Point Road is built first, DOT&PF would use that alignment and widen the road to meet the state's highway standards. If one of the Juneau Access Improvements Project alternatives that includes this highway segment is built first, Goldbelt could use the highway with the addition of a short access road to Cascade Point.

The State of Alaska is funding 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.

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

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 but there has been no resolution. The Final EIS will contain futher information on compensatory mitigation for the preferred alternative. Specific details on mitigation will be finalized for the selected alternative during the permitting process.

The National Park Service (NPS) has not concurred with FHWA's determination that Alternatives 2, 2A, and 2C would not have an adverse effect on the Skagway and White Pass District National Historic Landmark (NHL) due to concerns regarding potential visual and auditory impacts. Consultation with the NPS on ways to reduce the potential impacts is ongoing.

FHWA has not made a determination on the applicability of Section 4(f) of the U.S. Department of Transportation Act (49 U.S.C. 303 and 23 U.S.C. 138) to undeveloped land that would be acquired within the Skagway and White Pass NHL for Alternatives 2, 2A, or 2C. Consultation with the NPS is ongoing and will be followed by consultation with the State Historic Preservation Officer (SHPO) after which FHWA will make the final determination.

The SHPO has concurred with FHWA's determinations of eligibility for historic properties. However, the SHPO has not concurred that the FHWA's determination that the historic width of the Daltan Trail is 20 feet. Consultation with SHPO to resolve the boundary of this historic property is ongoing.

EIS Availability

The entire Supplemental Draft EIS is available free of charge on compact disc (CD) for viewing electronically. The document is also available for viewing on the project web site at http://juneauaccess.alaska.gov. Bound versions of the document are available upon request. A bound document with a complete set of appendices is available for a $100 printing charge. Bound versions of the document 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 Supplemental Draft EIS, contact Deborah Holman at DOT&PF at (907) 465-1828, or visit the project web site at http://juneauaccess.alaska.gov.

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

Factors	Alternatives									
	No Action	2	2A	2B	2C	3	4A	4B	4C	4D
Cost Factors										
Initial Capital Costs ($ million)	0	$281	$294	$246	$265	$269	$124	$137	$102	$98
30-Year Life Cycle Costs[1] ($ million)	$267	$323	$380	$352	$304	$375	$495	$482	$326	$313
Annual Maintenance and Operations Costs ($millions)	$10.2	$4.4	$8.4	$9.0	$4.4	$9.2	$16.7	$15.5	$11.7	$11.3
Net Present Value[2] ($ millions)	0	$115	$46	$70	$114	$32	-$56	-$23	-$57	$3
Purpose and Need Factors										
Project Summer Capacity to Skagway (vehicles per day)	71	30,000[3]	776	636	30,000[3]	408	223	227	149	203
Project Summer Capacity to Haines (vehicles per day)	96	612	544	544	408	1,008	229	284	154	208
Summer Travel Time – Auke Bay to Skagway (hours)	3.8/9.1	2.1	2.6	3.0	2.1	4.2	4.1/9.1	3.8/9.1	6.3/9.1	5.3/9.1
Summer Travel Time – Auke Bay to Haines[4] (hours)	3.5/7.1	2.5	3.0	2.5	3.4	2.9	3.8/7.1	3.5/7.1	6.0-7.1	5.0/7.1
Number of Ferry Round Trips/Week – Auke Bay to Skagway (Summer)	7	NA	140	42	NA	42	16	16	9	16
Number of Ferry Round Trips/Week – Auke Bay to Haines (Summer)	8	63	56	56	42	84	16	30	9	16
Net State Cost Over 30-Year Analysis Period ($millions)	$61	$68	$86	$88	$68	$86	$98	$94	$78	$70
Total / Out-of-Pocket User Costs – Juneau/Skagway[5]	$237 / $237	$41 / $10	$60 / $31	$77 / $51	$41 / $10	$111 / $85	$261 / $261	$174 / $163	$237 / $237	$160 / $149
Total / Out-of-Pocket User Costs – Juneau/Haines[5]	$180 / $180	$60 / $34	$77 / $55	$60 / $34	$82 / $50	$70 / $45	$198 / $198	$124 / $113	$180 / $180	114 / $103
Employment and Population Impacts										
Juneau										
New Local Employment (2038)	0	290	200	200	220	70	45	90	0	30
Population Increase (2038)	0	435	300	300	330	100	70	140	0	45

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

Factors	Alternatives									
	No Action	2	2A	2B	2C	3	4A	4B	4C	4D
Skagway										
New Local Employment (2038)	0	60	70	55	125	0	10	15	0	0
Population Increase (2038)	0	78	90	70	160	0	10	20	0	0
Haines										
New Local Employment (2038)	0	70	45	65	0	155	15	30	0	15
Population Increase (2038)	0	105	68	98	0	230	25	50	0	25
Natural Resources Impacts										
Number Of River/Stream Crossings	0	58	49	46	58	32	0	5	0	5
Number Of Anadromous Streams Crossed	0	9	5	9	9	11	0	1	0	1
Terrestrial Habitat Losses[6] (acres)	0	629	534	456	629	423	0	55	0	55
Wetland Habitat Losses (acres)	0	92.5	71.2	92.5	90	35.5	0	11	0	11
Essential Fish Habitat Losses (acres)	0	30.7	35	30.7	21.9	12.9	0	3.2	0	3.2
Eagle Nests Within 330 Feet	0	57	54	45	57	25	0	0	0	0
Total Eagle Nests Within 0.5 Mile	0	100	97	88	100	45	0	7	0	7
Precent Reduction in Brown Bear Habitat Capability	0	29	17	26	29	21	0	4	0	4
Percent Reduction in Black Bear Habitat Capability	0	7	5	6	7	2	0	1	0	1
Percent Reduction in Marten Habitat Capability	0	38	26	32	38	30	0	7	0	7
Percent Reduction in Mountain Goat Habitat Capability	0	1	1	0.4	1	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 (2004 to 2008) and a 30-year operation period (2008 to 2038) discounted to 2004 dollars. See Section 4.1.5 for an 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.
[3]Based on Transportation Research Board capacity estimate of 2,000 cars/hour for a 2-lane highway.
[4]The first number is based on travel on a shuttle ferry and the second number is the mainline ferry travel time.
[5]Total/Out-of-pocket cost for family of four traveling in 19-foot vehicle. No Action cost is on a mainline ferry, FVF would be 10 percent higher. All other costs are based on use of shuttle ferries.
[6]Includes wetlands.

This page left intentionally blank.

TABLE OF CONTENTS

Section	Title	Page
SUMMARY		S-1
Introduction		S-1
Proposed Action		S-1
Project Purpose and Need		S-2
Alternatives Evaluated in Supplemental Draft Environmental Impact Statement		S-2
No Action Alternative		S-2
Alternative 2 (Preferred): East Lynn Canal Highway with Katzehin Terminal		S-2
Alternative 2A: East Lynn Canal Highway with Berners Bay Shuttle		S-3
Alternative 2B: East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway		S-3
Alternative 2C: East Lynn Canal Highway with Shuttle to Haines from Skagway		S-3
Alternative 3: West Lynn Canal Highway		S-3
Alternative 4: Marine Alternatives		S-3
Alternatives Eliminated from Further Consideration		S-4
Environmental Consequences		S-4
Identification of the Preferred Alternative		S-10
Areas of Controversy		S-11
Related Actions and Projects		S-12
Federal Actions Necessary		S-13
Unresolved Issues		S-13
EIS Availability		S-13
1.0	PURPOSE AND NEED	1-1
1.1	Introduction	1-1
1.2	Project History	1-1
1.2.1	Marine Access	1-2
1.2.2	Highway Access	1-3
1.2.3	Existing Transportation Network	1-4
1.2.4	Aircraft Service	1-5
1.2.5	AMHS Service	1-5
1.2.6	Private Vessel Service	1-5
1.3	AMHS Service History In Lynn Canal	1-6
1.4	Purpose and Need Statement	1-7
1.4.1	Transportation Demand	1-7
1.4.1.1	Traffic Growth and Volume Comparisons	1-7
1.4.1.2	Telephone Surveys	1-8
1.4.1.3	Traffic Forecast Analysis	1-9
1.4.2	Flexibility and Opportunity for Travel	1-9
1.4.3	Travel Time	1-11
1.4.4	State Costs for Transportation System	1-11
1.4.5	User Costs	1-12
2.0	PROJECT ALTERNATIVES	2-1
2.1	Alternative Screening	2-1
2.2	Alternatives Determined Not Reasonable	2-2
2.2.1	Taku River Valley Highway	2-2
2.2.2	Goldbelt – Ferry Shuttle Service from Cascade Point	2-2
2.2.3	Haines/Skagway Intertie	2-2
2.2.4	East Lynn Canal Highway with Bridge to Haines	2-3
2.2.5	East Lynn Canal Rail	2-3
2.2.6	East Lynn Canal Highway to Katzehin with Berners Bay Shuttle Ferry (PAR Proposal 5B)	2-4

TABLE OF CONTENTS (continued)

Section	Title	Page
2.2.7	East Lynn Canal Highway from Katzehin to Skagway (PAR Proposal 5C)	2-4
2.2.8	Original Marine Alternative 4, Options A through D	2-5
2.3	Reasonable Alternatives	2-5
2.3.1	Alternative 1 – No Action	2-7
2.3.2	Alternative 2 (Preferred) – East Lynn Canal Highway with Katzehin Ferry Terminal	2-9
2.3.2.1	Echo Cove to Antler River	2-10
2.3.2.2	Head of Berners Bay	2-11
2.3.2.3	Lace River to Comet Landing	2-11
2.3.2.4	Independence Lake to Katzehin River	2-11
2.3.2.5	Katzehin River Area	2-12
2.3.2.6	Katzehin to Sturgill's Landing	2-12
2.3.2.7	Dewey Lake Bench	2-12
2.3.2.8	Skagway Area	2-12
2.3.3	Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles	2-13
2.3.4	Alternative 2B – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway	2-15
2.3.5	Alternative 2C – East Lynn Canal Highway with Haines/Skagway Shuttle	2-17
2.3.6	Alternative 3 – West Lynn Canal Highway	2-19
2.3.6.1	Echo Cove to Sawmill Cove	2-21
2.3.6.2	William Henry Bay	2-21
2.3.6.3	Endicott River Area	2-21
2.3.6.4	Sullivan River Area	2-21
2.3.6.5	Glacier River Area	2-22
2.3.6.6	Davidson Glacier to Pyramid Harbor	2-22
2.3.6.7	Chilkat River Area	2-22
2.3.7	Alternatives 4A through 4D – Marine Options	2-22
2.3.8	Alternative 4A – FVF Shuttle Service from Auke Bay	2-23
2.3.9	Alternative 4B – FVF Shuttle Service from Berners Bay	2-24
2.3.10	Alternative 4C – Conventional Monohull Shuttle Service from Auke Bay	2-26
2.3.11	Alternative 4D – Conventional Monohull Shuttle Service from Berners Bay	2-27
2.4	Identification of the Preferred Alternative	2-29
2.5	Funding Considerations	2-31
3.0	AFFECTED ENVIRONMENT	3-1
3.1	Social and Economic Environment	3-1
3.1.1	Land Use	3-1
3.1.1.1	United States Forest Service	3-1
3.1.1.2	State of Alaska	3-4
3.1.1.3	Local Government	3-4
3.1.1.4	Private Lands	3-5
3.1.1.5	Land and Resource Uses	3-5
3.1.1.6	Parks and Recreation Facilities	3-7
3.1.1.7	Residential, Commercial, Industrial, and Public Facilities	3-7
3.1.1.8	Coastal Zone Management	3-8
3.1.2	Visual Resources	3-9
3.1.2.1	East Lynn Canal	3-11
3.1.2.2	West Lynn Canal	3-12
3.1.3	Historical and Archeological Resources	3-12
3.1.4	Socioeconomic Resources	3-14

TABLE OF CONTENTS (continued)

Section	Title	Page

3.1.4.1 Juneau ... 3-14
3.1.4.2 Haines ... 3-16
3.1.4.3 Skagway ... 3-18
3.1.5 Environmental Justice ... 3-20
3.1.5.1 Poverty Guidelines ... 3-20
3.1.6 Subsistence ... 3-21
3.1.6.1 Haines ... 3-24
3.1.6.2 Juneau ... 3-24
3.1.6.3 Klukwan ... 3-24
3.1.6.4 Skagway ... 3-25
3.1.7 Transportation ... 3-25
3.2 PHYSICAL ENVIRONMENT ... 3-26
3.2.1 Geology ... 3-26
3.2.1.1 Geologic Features ... 3-26
3.2.1.2 Geologic Hazards ... 3-29
3.2.2 Hydrology and Water Quality ... 3-31
3.2.2.1 Climate ... 3-31
3.2.2.2 Freshwater Environment ... 3-31
3.2.2.3 Groundwater ... 3-32
3.2.2.4 Marine Environment ... 3-33
3.2.3 Floodplains ... 3-33
3.2.4 Wild and Scenic Rivers ... 3-34
3.2.5 Air Quality ... 3-34
3.2.5.1 Air Quality Standards and Relevant Pollutants ... 3-34
3.2.5.2 Attainment Status of Study Area ... 3-36
3.2.5.3 Ambient Air Quality in the Study Area ... 3-36
3.2.6 Noise ... 3-37
3.2.7 Hazardous Materials ... 3-40
3.3 Biological Environment ... 3-42
3.3.1 Wetlands ... 3-42
3.3.1.1 Wetland Classifications ... 3-43
3.3.1.2 Distribution Within the Project Area ... 3-45
3.3.1.3 Wetlands Functions ... 3-46
3.3.2 Marine and Freshwater Habitat (Including Essential Fish Habitat) ... 3-47
3.3.2.1 Marine Habitat in Lynn Canal ... 3-48
3.3.2.2 Freshwater Habitat in Lynn Canal ... 3-51
3.3.3 Terrestrial Habitat ... 3-52
3.3.4 Marine and Anadromous Fish and Shellfish ... 3-53
3.3.4.1 Marine Finfish ... 3-53
3.3.4.2 Marine Shellfish ... 3-55
3.3.4.3 Anadromous Fish ... 3-55
3.3.5 Wildlife ... 3-56
3.3.5.1 Species Selected for Analysis ... 3-56
3.3.5.2 Terrestrial Habitat Use ... 3-57
3.3.5.3 Marine Habitat Use ... 3-58
3.3.6 Bald Eagles ... 3-59
3.3.7 Threatened and Endangered Species ... 3-61
3.3.7.1 Humpback Whale ... 3-61
3.3.7.2 Steller Sea Lion ... 3-61

TABLE OF CONTENTS (continued)

Section	Title	Page
4.0	ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES	4-1
4.1	Methods for Analyzing Impacts	4-2
4.1.1	Land Use	4-2
4.1.2	Visual Resources	4-2
4.1.3	Historical and Archeological Resources	4-3
4.1.4	Socioeconomic Resources	4-3
4.1.5	Transportation	4-3
4.1.6	Geology	4-5
4.1.6.1	Karst	4-5
4.1.6.2	Avalanche	4-5
4.1.7	Hydrology and Water Quality	4-6
4.1.8	Air Quality	4-6
4.1.9	Noise	4-7
4.1.10	Hazardous Waste	4-8
4.1.11	Wetlands	4-8
4.1.12	Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat)	4-8
4.1.13	Terrestrial Habitat	4-8
4.1.14	Wildlife	4-9
4.1.15	Bald Eagles	4-9
4.1.16	Threatened and Endangered Species	4-10
4.2	Alternative 1 – No Action	4-11
4.2.1	Socioeconomic Resources	4-11
4.2.2	Transportation	4-12
4.2.3	Hydrology and Water Quality	4-13
4.3	Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highways	4-13
4.3.1	Land Use	4-15
4.3.1.1	Land Ownership	4-15
4.3.1.2	Consistency with Land Use and Management Plans	4-15
4.3.1.3	Land and Resource Uses	4-16
4.3.1.4	Parks and Recreation Facilities	4-17
4.3.2	Coastal Zone Management	4-17
4.3.3	Visual Resources	4-18
4.3.3.1	Berners Bay	4-18
4.3.3.2	Point St. Mary to Eldred Rock	4-19
4.3.3.3	Eldred Rock to Mount Villard	4-20
4.3.3.4	Mount Villard to Skagway	4-21
4.3.3.5	Consistency with USFS Visual Quality Objectives (VQOs)	4-22
4.3.4	Historical and Archeological Resources	4-23
4.3.5	Socioeconomic Resources	4-26
4.3.5.1	Overview	4-26
4.3.5.2	Juneau	4-27
4.3.5.3	Haines	4-32
4.3.5.4	Skagway	4-35
4.3.6	Subsistence	4-39
4.3.7	Transportation	4-39
4.3.7.1	Capacity and Demand	4-39
4.3.7.2	Travel Flexibility and Opportunity	4-41
4.3.7.3	Travel Time	4-42
4.3.7.4	State and User Costs	4-43

TABLE OF CONTENTS (continued)

Section	Title	Page
4.3.7.5	Other Transportation Impacts	4-45
4.3.8	Geology	4-48
4.3.8.1	Seismic Activity	4-48
4.3.8.2	Avalanches	4-48
4.3.8.3	Landslides	4-49
4.3.9	Hydrology and Water Quality	4-50
4.3.9.1	Floodplains	4-50
4.3.9.2	Hydrology	4-51
4.3.9.3	Water Quality	4-51
4.3.10	Air Quality	4-53
4.3.10.1	Carbon Monoxide	4-53
4.3.10.2	Particulates	4-53
4.3.10.3	Conformity	4-54
4.3.11	Hazardous Materials	4-54
4.3.12	Wetlands	4-55
4.3.13	Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)	4-58
4.3.14	Terrestrial Habitat	4-61
4.3.15	Wildlife	4-62
4.3.15.1	Marine Mammals	4-62
4.3.15.2	Marine Birds	4-63
4.3.15.3	Terrestrial Mammals	4-64
4.3.15.4	Terrestrial Birds	4-66
4.3.15.5	Amphibians	4-67
4.3.16	Bald Eagles	4-67
4.3.17	Threatened and Endangered Species	4-68
4.3.17.1	Steller Sea Lions	4-68
4.3.17.2	Humpback Whales	4-69
4.3.18	Permits and Approvals	4-69
4.4	Alternative 3 – West Lynn Canal Highway	4-70
4.4.1	Land Use	4-70
4.4.1.1	Land Ownership and Management	4-70
4.4.1.2	Consistency with Land Use and Management Plans	4-71
4.4.1.3	Land and Resource Uses	4-72
4.4.1.4	Parks and Recreation Facilities	4-72
4.4.2	Coastal Zone Management	4-72
4.4.3	Visual Resources	4-73
4.4.3.1	Berners Bay	4-73
4.4.3.2	William Henry Bay to Sullivan Island	4-74
4.4.3.3	Sullivan Island to Chilkat River	4-74
4.4.3.4	Consistency with Visual Quality Objectives	4-75
4.4.4	Historical and Archeological Resources	4-75
4.4.5	Socioeconomic Resources	4-76
4.4.5.1	Overview	4-76
4.4.5.2	Juneau	4-76
4.4.5.3	Haines	4-80
4.4.5.4	Skagway	4-82
4.4.6	Subsistence	4-84
4.4.7	Transportation	4-85
4.4.7.1	Capacity and Demand	4-85

TABLE OF CONTENTS (continued)

Section	Title	Page

4.4.7.2 Travel Flexibility and Opportunity 4-86
4.4.7.3 Travel Time 4-86
4.4.7.4 State and User Costs 4-87
4.4.7.5 Other Transportation Impacts 4-88
4.4.8 Geology 4-90
4.4.8.1 Geologic Hazards 4-90
4.4.8.2 Geologic Resources 4-91
4.4.9 Hydrology and Water Quality 4-91
4.4.9.1 Floodplains 4-91
4.4.9.2 Hydrology 4-92
4.4.9.3 Water Quality 4-93
4.4.10 Air Quality 4-94
4.4.10.1 Carbon Monoxide 4-94
4.4.10.2 Particulates 4-94
4.4.10.3 Conformity 4-95
4.4.11 Hazardous Materials 4-95
4.4.12 Wetlands 4-95
4.4.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat) 4-98
4.4.14 Terrestrial Habitat 4-100
4.4.15 Wildlife 4-101
4.4.15.1 Marine Mammals 4-101
4.4.15.2 Marine Birds 4-101
4.4.15.3 Terrestrial Mammals 4-102
4.4.15.4 Terrestrial Birds 4-105
4.4.15.5 Amphibians 4-105
4.4.16 Bald Eagles 4-105
4.4.17 Threatened and Endangered Species 4-106
4.4.17.1 Steller Sea Lions 4-106
4.4.17.2 Humpback Whales 4-106
4.4.18 Permits and Approvals 4-106
4.5 Alternatives 4A and 4C – FVF and Conventional Monohull Shuttle Service from Auke Bay 4-107
4.5.1 Land Use 4-107
4.5.1.1 Land Ownership 4-107
4.5.1.2 Consistency with Land Use and Management Plans 4-107
4.5.1.3 Land Use 4-107
4.5.2 Coastal Zone Management 4-107
4.5.3 Visual Resources 4-108
4.5.4 Historical and Archeological Resources 4-108
4.5.5 Socioeconomic Resources 4-108
4.5.5.1 Overview 4-108
4.5.5.2 Juneau 4-108
4.5.5.3 Haines 4-110
4.5.5.4 Skagway 4-112
4.5.6 Subsistence 4-114
4.5.7 Transportation 4-114
4.5.7.1 Capacity and Demand 4-114
4.5.7.2 Travel Flexibility and Opportunity 4-115
4.5.7.3 Travel Time 4-115

TABLE OF CONTENTS (continued)

Section | **Title** | **Page**

4.5.7.4 State and User Costs 4-116
4.5.7.5 Other Transportation Impacts..4-118
4.5.8 Geology 4-118
4.5.9 Hydrology and Water Quality 4-119
4.5.9.1 Hydrology...4-119
4.5.9.2 Water Quality 4-119
4.5.10 Air Quality 4-119
4.5.11 Hazardous Materials 4-119
4.5.12 Wetlands...4-119
4.5.13 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)..4-119
4.5.14 Terrestrial Habitat 4-120
4.5.15 Wildlife 4-120
4.5.15.1 Marine Mammals 4-120
4.5.15.2 Marine Birds...4-120
4.5.15.3 Terrestrial Mammals 4-121
4.5.15.4 Terrestrial Birds..4-121
4.5.15.5 Amphibians 4-121
4.5.16 Bald Eagles 4-121
4.5.17 Threatened and Endangered Species...4-121
4.5.17.1 Steller Sea Lion..4-121
4.5.17.2 Humpback Whales..4-121
4.5.18 Permits and Approvals...4-122
4.6 Alternatives 4B and 4D – FVF and Conventional Monohull Shuttle Service from Berners Bay...4-122
4.6.1 Land Use 4-122
4.6.1.1 Land Ownership and Management 4-122
4.6.1.2 Consistency with Land Use Plans 4-122
4.6.1.3 Land and Resource Uses...4-123
4.6.1.4 Parks and Recreation Facilities...4-123
4.6.2 Coastal Zone Management...4-123
4.6.3 Visual Resources...4-124
4.6.3.1 Views from the Bay 4-124
4.6.3.2 Views from the Highway...4-124
4.6.3.3 Consistency with Visual Quality Objectives (VQOs) 4-124
4.6.4 Historical and Archeological Resources 4-125
4.6.5 Socioeconomic Resources 4-125
4.6.5.1 Juneau..4-125
4.6.5.2 Haines 4-127
4.6.5.3 Skagway 4-129
4.6.6 Subsistence 4-130
4.6.7 Transportation...4-130
4.6.7.1 Capacity and Demand...4-131
4.6.7.2 Travel Flexibility and Opportunity 4-132
4.6.7.3 Travel Time..4-132
4.6.7.4 State and User Costs...4-132
4.6.7.5 Other Transportation Impacts...4-134
4.6.8 Geology 4-135
4.6.9 Hydrology and Water Quality 4-135

TABLE OF CONTENTS (continued)

Section	**Title**	**Page**

4.6.9.1 Floodplains 4-135
4.6.9.2 Hydrology....4-136
4.6.9.3 Water Quality 4-136
4.6.10 Air Quality 4-137
4.6.11 Hazardous Materials 4-138
4.6.12 Wetlands....4-138
4.6.13 Marine and Freshwater Habitat and Fish (Including Essential Fish Habitat).....4-139
4.6.14 Terrestrial Habitat 4-140
4.6.15 Wildlife....4-141
4.6.15.1 Marine Mammals 4-141
4.6.15.2 Marine Birds....4-141
4.6.15.3 Terrestrial Mammals 4-142
4.6.15.4 Terrestrial Birds....4-143
4.6.15.5 Amphibians 4-144
4.6.16 Bald Eagles 4-144
4.6.17 Threatened and Endangered Species....4-144
4.6.17.1 Steller Sea Lion....4-144
4.6.17.2 Humpback Whales....4-144
4.6.18 Permits and Approvals....4-145
4.7 Other Environmental Issues....4-145
4.7.1 Wild and Scenic Rivers 4-145
4.7.2 Environmental Justice....4-145
4.7.3 Farmlands....4-147
4.7.4 Relocation Impacts 4-147
4.7.5 Coastal Barriers....4-147
4.7.6 Energy 4-147
4.7.7 Noise 4-148
4.7.7.1 No Action Alternative....4-148
4.7.7.2 Direct Impacts of Build Alternatives....4-148
4.7.7.3 Noise Abatement Evaluation 4-150
4.7.7.4 Indirect Impacts....4-153
4.8 Construction Impacts....4-157
4.8.1 Land Use 4-157
4.8.2 Visual Resources....4-158
4.8.3 Historical and Archeological Resources 4-158
4.8.4 Socioeconomic Resources 4-158
4.8.4.1 Alternatives 2 through 2C....4-158
4.8.4.2 Alternative 3....4-161
4.8.4.3 Alternatives 4A through 4D 4-161
4.8.5 Transportation....4-161
4.8.6 Hydrology and Water Quality 4-162
4.8.7 Air Quality 4-163
4.8.8 Noise 4-163
4.8.9 Wetlands....4-164
4.8.10 Terrestrial Habitat 4-164
4.8.11 Marine and Freshwater Habitat and Species (Including Essential Fish Habitat)....4-165
4.8.12 Wildlife....4-165
4.8.12.1 Marine Mammals 4-165

TABLE OF CONTENTS (continued)

Section	Title	Page

4.8.12.2 Marine Birds....4-166
4.8.12.3 Terrestrial Mammals....4-166
4.8.12.4 Terrestrial Birds....4-167
4.8.12.5 Amphibians....4-167
4.8.12.6 Bald Eagles....4-167
4.8.12.7 Threatened And Endangered Species....4-168
4.9 Cumulative Impacts....4-169
4.9.1 Past, Present, and Foreseeable Future Projects....4-169
4.9.1.1 Mining....4-169
4.9.1.2 Timber Harvests....4-170
4.9.1.3 Development....4-170
4.9.1.4 Recreation....4-171
4.9.1.5 Private Industry....4-171
4.9.1.6 Utilities....4-172
4.9.1.7 Other....4-172
4.9.1.8 Actions Not Considered....4-173
4.9.2 Cumulative Impact Analysis....4-173
4.9.2.1 Land Use....4-173
4.9.2.2 Visual Resources....4-174
4.9.2.3 Historical and Archeological Resources....4-174
4.9.2.4 Economics....4-175
4.9.2.5 Social Effects....4-176
4.9.2.6 Water Quality....4-176
4.9.2.7 Air Quality....4-176
4.9.2.8 Noise....4-177
4.9.2.9 Wetlands....4-178
4.9.2.10 Marine Fish Habitat (Including Essential Fish Habitat)....4-178
4.9.2.11 Terrestrial Habitat....4-180
4.9.2.12 Wildlife....4-180
4.9.2.13 Bald Eagles....4-181
4.9.2.14 Threatened and Endangered Species....4-181
4.10 The Relationship Between Local, Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity....4-182
4.11 Irreversible and Irretrievable Commitments of Resources....4-183

5.0 PROPOSED MITIGATION AND COMMITMENTS....5-1
5.1 Water Quality....5-1
5.2 Wetlands....5-1
5.3 Terrestrial Habitat....5-2
5.4 Intertidal and subtidal areas....5-2
5.5 Anadromous and Resident Fish Streams....5-3
5.6 Bald Eagles....5-3
5.7 Migratory Birds....5-3
5.8 Wildlife....5-3
5.9 Threatened and Endangered Species....5-4
5.10 Cultural Resources....5-4
5.11 Recreation and Visitor Facilities....5-5

6.0 SECTION 4F....6-1
6.1 Introduction....6-1

TABLE OF CONTENTS (continued)

Section	Title	Page
6.2	Parks and Recreation Areas	6-1
6.2.1	Parks	6-1
6.2.2	Recreation Areas	6-1
6.2.2.1	Municipal Land	6-1
6.2.2.2	State Land	6-2
6.2.2.3	Federal Land	6-3
6.3	Refuges	6-5
6.4	Significant Historic Sites	6-5
6.4.1	Berners Bay Historic Mining Districts	6-5
6.4.2	Skagway Hydroelectric Complex District and Lower Dewey Lake Trail	6-6
6.4.3	Skagway and White Pass District National Historic Landmark	6-6
6.4.4	Dalton Trail	6-7
7.0	PUBLIC AND AGENCY COORDINATION	7-1
7.1	1997 Draft EIS Public and Agency Scoping	7-1
7.2	2003 Notice of Intent and Scoping	7-1
7.3	2003 Public Coordination	7-2
7.3.1	Presentations	7-2
7.3.2	Newspapers and Newsletters	7-2
7.3.3	Meetings	7-2
7.3.4	Local Government	7-2
7.4	2003 and 2004 Agency Coordination	7-3
7.5	1997 and 2003 Government-to-Government Coordination	7-3
7.6	Summary of 1997 Draft EIS Comments and Response to Comments	7-3
7.7	Summary of 2003 Scoping Comments	7-4
7.7.1	Purpose and Need Issues	7-4
7.7.2	Traffic Forecast Issues	7-4
7.7.3	Household Survey	7-4
7.7.4	User Benefit Analysis	7-4
7.7.5	Range of Alternatives	7-5
7.7.6	Highway Alignment	7-5
7.7.7	Cost Estimates	7-5
7.7.8	Marine Segments	7-6
7.7.9	Wetlands	7-6
7.7.10	Geology	7-6
7.7.11	Avalanche	7-6
7.7.12	Noise	7-7
7.7.13	Wildlife	7-7
7.7.14	Essential Fish Habitat	7-7
7.7.15	Steller Sea Lions	7-8
7.7.16	Bald Eagles	7-8
7.7.17	Other Biological Environment Issues	7-8
7.7.18	Socioeconomic and Land Use	7-8
7.7.19	Visual	7-10
7.7.20	Cultural and Historical Resources	7-10
7.7.21	Secondary and Cumulative Impacts	7-11
7.8	Cooperating Agency Review	7-11
7.9	Relevant Correspondence Involving Local Government, Federal And State Agencies, And Organizations	7-11

TABLE OF CONTENTS (continued)

Section	Title	Page
8.0	LIST OF PREPARERS	8-1
9.0	SDEIS DISTRIBUTION LIST	9-1
9.1	Federal Agencies	9-1
9.2	State Agencies	9-1
9.3	Local Governments	9-2
9.4	Native Organizations	9-2
10.0	REFERENCES	10-1
11.0	INDEX	11-1

LIST OF TABLES

Table	Title	Page
Table S-1	Summary of Estimated Beneficial and Adverse Impacts of Proposed Project Alternatives	S-14
Table 1-1	Lynn Canal Annual ADT 1988 to 2002 Juneau to Haines Traffic Volumes	1-6
Table 1-2	Population and Transportation Growth	1-8
Table 1-3	Corridor Annual Traffic Volumes and Annual ADT	1-9
Table 1-4	AMHS Travel Time	1-11
Table 1-5	AMHS Statewide Expenditures and Revenues	1-12
Table 1-6	AMHS Lynn Canal Corridor Expenditures and Revenues	1-12
Table 1-7	Family of Four Cost per Mile by Mode in Lynn Canal	1-13
Table 2-1	Reasonable Alternatives Evaluated in the Supplemental Draft EIS	2-6
Table 2-2	Daily Traffic Capacity for Alternative 1	2-8
Table 2-3	Travel Time for Alternative 1	2-8
Table 2-4	Travel Frequency for Alternative 1	2-8
Table 2-5	Daily Traffic Capacity for Alternative 2	2-9
Table 2-6	Travel Time for Alternative 2	2-10
Table 2-7	Travel Frequency to Haines of Alternative 2	2-10
Table 2-8	Daily Traffic Capacity for Alternative 2A	2-14
Table 2-9	Travel Time for Alternative 2A	2-14
Table 2-10	Travel Frequency for Alternative 2A	2-15
Table 2-11	Daily Traffic Capacity for Alternative 2B	2-16
Table 2-12	Travel Time for Alternative 2B	2-16
Table 2-13	Travel Frequency for Alternative 2B	2-17
Table 2-14	Daily Traffic Capacity for Alternative 2C	2-18
Table 2-15	Travel Time for Alternative 2C	2-18
Table 2-16	Travel Frequency to Haines for Alternative 2C	2-18
Table 2-17	Daily Traffic Capacity for Alternative 3	2-20
Table 2-18	Travel Time for Alternative 3	2-20
Table 2-19	Travel Frequency for Alternative 3	2-20
Table 2-20	Daily Traffic Capacity for Alternative 4A	2-23
Table 2-21	Travel Time for Alternative 4A	2-23
Table 2-22	Travel Frequency for Alternative 4A	2-24
Table 2-23	Daily Traffic Capacity for Alternative 4B	2-25
Table 2-24	Travel Time for Alternative 4B	2-25
Table 2-25	Travel Frequency for Alternative 4B	2-25
Table 2-26	Daily Traffic Capacity for Alternative 4C	2-26
Table 2-27	Travel Time for Alternative 4C	2-27
Table 2-28	Travel Frequency for Alternative 4C	2-27
Table 2-29	Daily Traffic Capacity for Alternative 4D	2-28
Table 2-30	Travel Time for Alternative 4D	2-28
Table 2-31	Travel Frequency for Alternative 4D	2-29
Table 2-32	Alternatives Data Summary	2-30
Table 3-1	2000 Health and Human Services Poverty Guidelines	3-21
Table 3-2	Key Demographic and Economic Data	3-23
Table 3-3	National Ambient Air Quality Standards	3-35
Table 3-4	Project Area Wetlands by Type	3-45
Table 4-1	Land Ownership of Required Right-of-Way for Alternatives 2 through 2C	4-15
Table 4-2	2008 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Juneau	4-28
Table 4-3	2038 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Juneau	4-28

LIST OF TABLES (continued)

Table	Title	Page
Table 4-4	2008 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Haines	4-33
Table 4-5	2038 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Haines	4-33
Table 4-6	2008 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Skagway	4-36
Table 4-7	2038 East Lynn Canal Highway Alternatives Visitor Spending and Related Impacts in Skagway	4-36
Table 4-8	2008 Forecast Demand and Capacity to Haines and Skagway for the No Action Alternative and Alternatives 2 Through 2C	4-40
Table 4-9	2038 Forecast Demand and Capacity to Haines and Skagway for the No Action Alternative and Alternatives 2 Through 2C	4-41
Table 4-10	Travel Times for the No Action Alternative and Alternatives 2 Through 2C	4-43
Table 4-11	Thirty-Year Life Cycle Costs for the No Action Alternative and Alternatives 2 Through 2C ($millions)	4-43
Table 4-12	Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 2 through 2C	4-44
Table 4-13	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 2 through 2C	4-45
Table 4-14	User Benefits and Net Present Value of Alternatives 2 through 2C Versus the No Action Alternative	4-45
Table 4-15	Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternatives 2 Through 2C	4-47
Table 4-16	Costs, Closures, and Mitigated Avalanche Hazard Index for Alternatives 2 through 2C	4-49
Table 4-17	Alternatives 2, 2A, 2B, and 2C Total Fill in Wetlands and Other Waters of the U.S. (Acres)	4-57
Table 4-18	Acreage of Terrestrial Habitat Impacted by Alternatives 2, 2A, 2B, and 2C	4-62
Table 4-19	Known Eagle Nest Trees within the Vicinity of Alternatives 2 through 2C	4-67
Table 4-20	Land Ownership of Required Right-of-Way for Alternative 3	4-71
Table 4-21	2008 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Juneau	4-76
Table 4-22	2038 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Juneau	4-77
Table 4-23	2008 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Haines	4-80
Table 4-24	2038 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Haines	4-81
Table 4-25	2008 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Skagway	4-83
Table 4-26	2038 West Lynn Canal Highway Alternative Visitor Spending and Related Impacts in Skagway	4-83
Table 4-27	2008 Forecast Demand and Capacity for the No Action Alternative and Alternative 3	4-85
Table 4-28	2038 Forecast Demand and Capacity for the No Action Alternative and Alternative 3	4-85
Table 4-29	Travel Times for the No Action Alternative and Alternative 3	4-87

LIST OF TABLES (continued)

Table	Title	Page
Table 4-30	Thirty-Year Life Cycle Costs for the No Action Alternative and Alternative 3 ($millions)	4-87
Table 4-31	Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternative 3	4-87
Table 4-32	Juneau to Haines and Skagway Total and Out-of-Pocket User Costs for Family of Four in 19-Foot Vehicle for the No Action Alternative and Alternative 3	4-88
Table 4-33	Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternative 3	4-89
Table 4-34	Costs, Closures, and Mitigated Avalanche Hazard Index for Alternative 3	4-91
Table 4-35	Wetlands and Other Waters of the U.S. Filled by Alternative 3 (Acres)	4-97
Table 4-36	2008 Alternatives 4A and 4C Visitor Spending and Related Impacts in Juneau	4-109
Table 4-37	2038 Alternatives 4A and 4C Visitor Spending and Related Impacts in Juneau	4-109
Table 4-38	2008 Alternatives 4A and 4C Visitor Spending and Related Impacts in Haines	4-110
Table 4-39	2038 Alternatives 4A and 4C Visitor Spending and Related Impacts in Haines	4-111
Table 4-40	2008 Alternatives 4A and 4C Visitor Spending and Related Impacts in Skagway	4-112
Table 4-41	2038 Alternatives 4A and 4C Visitor Spending and Related Impacts in Skagway	4-113
Table 4-42	2008 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4A and 4C	4-114
Table 4-43	2038 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4A and 4C	4-115
Table 4-44	Travel Times for the No Action Alternative and Alternatives 4A and 4C	4-116
Table 4-45	Thirty-Year Life Cycle Costs for the No Action Alternative and Alternatives 4A and 4C ($millions)	4-116
Table 4-46	Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 4A and 4C	4-117
Table 4-47	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	4-117
Table 4-48	User Benefits and Net Present Value of Alternatives 4A and 4C Versus the No Action Alternative	4-118
Table 4-49	Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternatives 4A and 4C	4-118
Table 4-50	2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Juneau	4-125
Table 4-51	2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Juneau	4-126
Table 4-52	2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Haines	4-127
Table 4-53	2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Haines	4-128
Table 4-54	2008 Alternatives 4B and 4D Visitor Spending and Related Impacts in Skagway	4-129
Table 4-55	2038 Alternatives 4B and 4D Visitor Spending and Related Impacts in Skagway	4-130
Table 4-56	2008 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4B and 4D	4-131
Table 4-57	2038 Forecast Demand and Capacity for the No Action Alternative and Alternatives 4B and 4D	4-131
Table 4-58	Travel Times for the No Action Alternative and Alternatives 4B and 4D	4-132
Table 4-59	Thirty-Year Life Cycle Costs for the No Action Alternative and Alternatives 4B and 4D ($millions)	4-133

LIST OF TABLES (continued)

Table	Title	Page
Table 4-60	Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 4B and 4D	4-133
Table 4-61	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	4-134
Table 4-62	User Benefits and Net Present Values for Alternatives 4B and 4D Versus the No Action Alternative[1]	4-134
Table 4-63	Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternatives 4B and 4D	4-135
Table 4-64	Wetlands and Other Waters of the U.S. Filled by Alternatives 4B and 4D (Acres)	4-138
Table 4-65	Estimated Annual Operational Energy Usage	4-148
Table 4-66	Modeling Results for Noise-Sensitive Receptors Along Road Segments in Skagway by Project Alternatives	4-151
Table 4-67	Housing Units Along Egan Drive and Glacier Highway in the Juneau Area Impacted by Summer Traffic Noise	4-154
Table 4-68	Modeled Indirect Noise Impacts on Selected Noise-Sensitive Receptors, Skagway	4-157
Table 4-69	Project Construction Phase Employment Impacts	4-159
Table 4-70	East Lynn Canal Highway Alternatives Construction Phase Direct and Total Employment and Payroll Effects	4-160
Table 4-71	East Lynn Canal Highway Alternatives Construction Phase Maximum Potential Population-Related Effects	4-160

LIST OF FIGURES

Figure	Title
Figure 1-1	Project Area
Figure 2-1	Taku River Valley Highway Alternative
Figure 2-2	Alternative 1: No Action Alternative
Figure 2-3	Alternative 2 (Preferred): East Lynn Canal Highway with Katzehin Ferry Terminal
Figure 2-4	Typical Roadway Section
Figure 2-5	Alternative 2A: East Lynn Canal Highway with Berners Bay and Katzehin Ferry Shuttles
Figure 2-6	Alternative 2B: East Lynn Canal Highway to Katzehin Ferry Terminal with Shuttles to Haines & Skagway
Figure 2-7	Alternative 2C: East Lynn Canal Highway with Haines/Skagway Shuttle
Figure 2-8	Alternative 3: West Lynn Canal Highway
Figure 2-9	Alternative 4A: Fast Vehicle Ferry (FVF) and Alternative 4C: Conventional Monohull Shuttle Service from Auke Bay
Figure 2-10	Alternative 4B: Fast Vehicle Ferry (FVF) and Alternative 4D: Conventional Monohull Shuttle Service from Berners Bay (Summer)
Figure 2-11	Alternative 4B: Fast Vehicle Ferry (FVF) and Alternative 4D: Conventional Monohull Shuttle Service from Auke Bay (Winter)
Figure 3-1	Land Ownership and Coastal Management Districts at Northern End of Lynn Canal
Figure 3-2	Land Ownership and Coastal Management Districts at Southern End of Lynn Canal
Figure 3-3	Tongass Land Management Plan Land Use Designations
Figure 3-4	Areas Meriting Special Attention
Figure 3-5	Parks, Trails, and Historic Districts in the Skagway Area
Figure 3-6	Historic Mining Districts in East Lynn Canal Area
Figure 3-7	Skagway Subsistence
Figure 3-8	Haines Subsistence
Figure 3-9	Klukwan Subsistence
Figure 3-10	Karst Vulnerability for West Lynn Canal Area
Figure 3-11	Avalanche Paths and Rock Slides
Figure 3-12	Potential Hazardous Waste Sites in Project Area
Figure 3-13	Wetlands Classifications Figure Index
Figure 3-14	Wetlands Classifications for Berners Bay Area
Figure 3-15	Wetlands Classifications for William Henry Bay Area and Comet Area
Figure 3-16	Wetlands Classifications for Sullivan River Area
Figure 3-17	Wetlands Classifications for Haines Area
Figure 3-18	Essential Fish Habitat Including Anadromous Fish Streams
Figure 3-19	Marine Mammal Concentrations in Lynn Canal
Figure 3-20	Wolf and Black Bear Habitat in Lynn Canal
Figure 3-21	Mountain Goat, Brown Bear, and Marten Habitat in Lynn Canal
Figure 3-22	Moose and Deer Habitat in Lynn Canal
Figure 3-23	Bald Eagle Nest Locations at Northern End of Lynn Canal
Figure 3-24	Bald Eagle Nest Locations at Southern End of Lynn Canal
Figure 4-1	Proposed Pullouts and Scenic Overlooks in East Lynn Canal
Figure 4-2	Visual Simulation Locations in Lynn Canal
Figure 4-3	Visual Simulation of Alternatives 2 through 2C from Point Bridget Looking East
Figure 4-4	Visual Simulation of Alternatives 2A, 3, 4B, and 4D from Berners Bay at Sawmill Cove Looking East

LIST OF FIGURES (continued)

Figure	Title
Figure 4-5	Visual Simulation of Alternatives 2, 2B, and 2C from Berners Bay South of Antler River Looking East
Figure 4-6	Visual Simulation of Alternatives 2, 2B, and 2C from Berners Bay at Antler, Lace, and Berners River Delta Looking North
Figure 4-7	Visual Simulation of Alternative 2A from Berners Bay at Slate Cove Looking North
Figure 4-8	Visual Simulation of Alternatives 2 through 2C from Lynn Canal at Sherman Point Looking East
Figure 4-9	Visual Simulation of Alternatives 2 through 2C from Lynn Canal North of Comet Looking East
Figure 4-10	Visual Simulation of Alternatives 2 through 2C from Lynn Canal at Eldred Rock Looking East
Figure 4-11	Visual Simulation of Alternatives 2 through 2C from Lynn Canal South of Katzehin River Looking East
Figure 4-12	Visual Simulation of Alternatives 2 through 2C and Katzehin Ferry Terminal from Lynn Canal at Katzehin Delta Looking East
Figure 4-13	Visual Simulation of Alternatives 2, 2A, and 2C from Chilkoot Inlet Near Port Chilkoot Looking East
Figure 4-14	Visual Simulation of Alternatives 2, 2A, and 2C from Taiya Inlet Near Mount Harding Looking East
Figure 4-15	Visual Simulation of Alternatives 2, 2A, and 2C from Taiya Inlet South of Skagway Looking North
Figure 4-16	Visual Simulation of Alternatives 2, 2A, and 2C from Skagway Airport Looking East
Figure 4-17	Visual Simulation of Alternatives 2, 2A, and 2C from Dyea Road Looking East
Figure 4-18	Visual Simulation of Alternatives 2, 2A, and 2C from Dyea Inlet Looking Southeast
Figure 4-19	Proposed Pullouts and Scenic Overlooks in West Lynn Canal
Figure 4-20	Visual Simulation of Alternative 3 from Point Bridget Looking East
Figure 4-21	Visual Simulation of Alternative 3 from Berners Bay at Sawmill Cove Looking East
Figure 4-22	Visual Simulation of Alternative 3 William Henry Bay Ferry Terminal from William Henry Bay Looking West
Figure 4-23	Visual Simulation of Alternative 3 from Lynn Canal at William Henry Mountain Looking West
Figure 4-24	Visual Simulation of Alternative 3 from Lynn Canal at Endicott River Delta Looking West
Figure 4-25	Visual Simulation of Alternative 3 from Lynn Canal at Davidson Glacier Looking West
Figure 4-26	Visual Simulation of Alternative 3 from Chilkat Inlet South of Pyramid Island Looking North
Figure 4-27	Visual Simulation of Alternatives 4B and 4D from Point Bridget Looking East
Figure 4-28	Visual Simulation of Alternatives 4B and 4D from Berners Bay at Sawmill Cove Looking East

APPENDICES LIST

Appendix A: Alternative Screening Report
Appendix B: Marine Segments Technical Report
Appendix C: Traffic Forecast Report
Appendix D: Technical Alignment Report
Appendix E: User Benefit Analysis
Appendix F: Land Use and Coastal Management Technical Report
Appendix G: Visual Resources Technical Report
Appendix H: Socioeconomic Effects Technical Report
Appendix I: Household Survey Report
Appendix J: Snow Avalanche Report
Appendix K: Hydrology and Water Quality Technical Report
Appendix L: Noise Analysis Technical Report
Appendix M: Initial Site Assessment Technical Report
Appendix N: Essential Fish Habitat (EFH) Assessment
Appendix O: Wetlands Technical Report
Appendix P: Anadromous and Resident Fish Streams Technical Report
Appendix Q: Wildlife Technical Report
Appendix R: Bald Eagle Technical Report
Appendix S: Steller Sea Lion Technical Report
Appendix T: Air Quality Modeling Memorandum
Appendix U: Indirect and Cumulative Impact Technical Report
Appendix V: Responses to Comments

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
A	
AAC	Alaska Administrative Code
ADT	Average daily traffic
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
AIDEA	Alaska Industrial Development and Export Authority
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
AWQS	Alaska Water Quality Standards
B	
B.C.	British Columbia
BMP	Best Management Practices
C	
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
CO	Carbon monoxide
D	
dBA	Average Weighted Decibels
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
F	
°F	degrees Fahrenheit
FC	fecal coliform
FCRPA	Federal Cave Resources Protection Act
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FVF	Fast Vehicle Ferry

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
G	
GPS	Global Positioning System
GIS	Geographic Information System
Goldbelt	Goldbelt, Inc.
H	
HCMP	(City of) Haines Coastal Management Plan
HCI	Habitat Capability Index
I	
IFA	Inter-Island Ferry Authority
ISA	Initial Site Assessment
L	
L_{eq}	Equivalent Sound Level
LUD	Land Use Designation
M	
M&O	Maintenance and Operations
mph	miles per hour
M/V	Motor Vessel
μ/m^2	micrograms per cubic meter
N	
NAC	Noise Abatement Criteria
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHP	National Historic Park
NHS	National Highway System
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
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 Wetland Inventory
O	
O_3	ozone
OHMP	(Alaska Department of Natural Resources) Office of Habitat Management and Permitting
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

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
PSI	Preliminary Site Investigation
ppm	parts per million
R	
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 Improvement Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
STIP	Statewide Transportation Improvement Program
T	
TLMP	Tongass Land and Resource Management Plan
TNM	Traffic Noise Model
TSS	total suspended solids
U	
$\mu g/m^3$	microgram(s) per cubic meter
U.S.	United States
URS	URS Corporation
USACE	United States Army Corps of Engineers
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
V	
VQO	Visual Quality Objective
W	
WET	Wetland Evaluation Technique
WP&YR	White Pass and Yukon Route

This page left intentionally blank.

1.0 PURPOSE AND NEED

1.1 Introduction

This document is a Supplemental Draft Environmental Impact Statement (Supplemental Draft EIS) for the Juneau Access Improvements Project. Currently, access to Juneau, the Alaskan 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.

DOT&PF and the Federal Highway Administration (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 EIS. This Supplemental Draft EIS has been prepared in accordance with the Council on Environmental Quality regulations for implementation of the National Environmental Policy Act (NEPA) of 1969 (Title 40, Code of Federal Regulations [CFR], Part 1502.9) and FHWA regulations (23 CFR 771.130). The purpose and need for the Juneau Access Improvements Project, described in Section 1.4, have not changed from the purpose and need described in the 1997 Draft EIS.

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

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 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 United States Code (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 six-hours on, six hours off, for one or two 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 multiple daily trips between the three Lynn Canal communities.

The *M/V Fairweather* operates on a 12-hour schedule, travelling 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 U.S. Army constructed the Alaska Highway between Dawson Creek, British Columbia, 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 United States Department of the Interior, National Park Service (NPS), and the governments of Yukon Territory and British Columbia. 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 Southeast Transportation Plan (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 Environmental Impact Statement (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, 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 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.

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, a local corporation organized under the Alaska Native Claims Settlement Act, 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 is investigating the possibility of constructing 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 would be to assist Goldbelt and its partner Coeur Alaska, the mining company developing the Kensington Gold Project, with their plans to develop a marine facility at Cascade Point (USFS, 1997a). 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 (five miles north of Auke Bay) to Bessie Creek (seven miles south of Echo Cove) are needed based on the condition of the highway and current traffic. DOT&PF plans to begin rehabilitating and widening the seven miles from Tee Harbor to Amalga Harbor Road in the spring of 2005. The remaining eight miles to Bessie Creek would be rehabilitated and widened as funding becomes available. Resealing or asphalt overlaying of the section from Bessie Creek to Echo Cove is not currently in the STIP but is anticipated in the next 5 to 10 years.

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 over 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, British Columbia, and in Bellingham, Washington.

Six of the seven state ferries in Southeast Alaska serve Lynn Canal. Four are mainline vessels with full accommodations that can carry between 80 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, 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 will be based in Juneau and will make 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.

Another private company plans to begin providing daily passenger service from Juneau to Haines and Skagway beginning in 2006. This company would operate two wing-in-ground-effect vessels that typically carry up to eight passengers and 440 pounds of luggage.

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 2002, AHMS transported approximately 29,000 vehicles and 105,000 passengers through Lynn Canal. Annual Average Daily Traffic (annual 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 average annual ADT in Lynn Canal between Juneau and Haines 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 from 1988 to 2002.

Table 1-1
Lynn Canal Annual ADT 1988 to 2002 Juneau to Haines Traffic Volumes

Year	Round-trips	Traffic Volumes for Year (Vehicles)	Annual Average Daily Traffic
1988	266	29,513	81
1989	240	28,871	79
1990	256	30,734	84
1991	290	32,605	89
1992	283	31,044	85
1993	245	30,098	82
1994	262	29,322	80
1995	270	30,349	83
1996	270	30,998	85
1997	287	29,158	80
1998	285	28,083	77
1999	298	30,131	83
2000	308	28,889	79
2001	285	26,662	73
2002	324	29,202	80
Average (15 years)	278	29,711	81

Source: *Annual Traffic Volume Reports,* 1998-2002, AMHS.

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* will provide this service in 2004 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* will not operate between Haines and Skagway. 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 fast vehicle ferry (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 two-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.

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 two percent annually. Traffic on adjacent corridors increased at a rate of one to two percent annually. Over the same period, there has been no increase in vehicular volumes in Lynn Canal.

In addition to no growth, a 15-year average 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 1-2
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	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 and Yukon Highways and Public Works 2002 Yukon Traffic Count Summary (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. The AMHS is the National Highway System (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.

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.

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 2003, and Yukon Highways and Public Works, 2003.

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 average 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 ten round-trip voyages per week during the summer peak season and four round-trip voyages per week 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 season periods can require making reservations within days of the summer ferry schedule release in the preceeding December.
- Changing reservations can be problematic and can include financial penalties.
- 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 two hours before sailing for standby vehicle space; however, there is no guarantee of boarding.

The above 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. This is often cited by capital move proponents 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).
- Fifty-five 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.
- Forty-seven 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]Planned check-in time for the FVF is one hour. During initial startup of this service in summer 2004, check-in time for the FVF was 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 would take about 1.5 to 2 hours. Traveling by highway from Auke Bay to Skagway at a speed of 40 to 50 miles per hour 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 (fares, restaurant income, staterooms, etc.) and state funds appropriated annually by the legislature. Statewide, the system requires about $80 million to operate and generates about $40 million in revenues, as shown in Table 1-5.

Table 1-5
AMHS Statewide Expenditures and Revenues

Fiscal Year (FY)	Expenditures in $Millions	Revenues in $Millions (Percent of Total)	State Subsidy in $Millions (Percent of Total)
FY01	$81.7	$37.6 (46%)	$44.1 (54%)
FY02	$79.6	$39.5 (50%)	$40.1 (50%)

Source: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038, DOT&PF 2004g.

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 the system is not used by a large portion of the state's population, 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. In fiscal year 2002, the cost to operate AMHS in Lynn Canal was $11.5 million (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 in fiscal year 2002 from passenger and vehicle tickets and on-ship services totaled $6.4 million. As a result, the state subsidy was $5.1 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 Subsidy in $Millions (Percent of Total)
FY01	$10.4	$5.5 (53%)	$4.9 (47%)
FY02	$11.5	$6.4 (56%)	$5.1 (44%)

Source: Lynn Canal Revenue and Expenditures 2001 and 2002 and Projected Capital Costs 2001-2038, DOT&PF 2004g.

In comparison to statewide operations, AMHS provides about 2.5 million vehicle miles of travel in Lynn Canal at a state cost of $5.1 million, or $2.04 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 subsidy 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[4] traveling one way from Juneau to Skagway pays $237 on a mainline vessel and $261 on an FVF in 2004. The fare between Juneau and Haines for the same family is $180 on a mainline ferry and $198 on an FVF. In comparison, if direct highway links existed the total cost to a vehicle owner would be about $40 from Juneau to Skagway and $35 from Juneau to Haines. The out-of-pocket cost to a vehicle owner would be about $9 from Juneau to Skagway and $8 from Juneau to Haines[5].

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

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

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, registeration, 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.

[4]Nineteen feet is the average vehicle size transported on the AMHS. The cost of any vehicle over 15 feet up to 19 feet is the same. 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.

[5] Assumes fuel cost at $2 per gallon and 19.7 miles per gallon (United States Environmental Protection Agency fleet mix average).

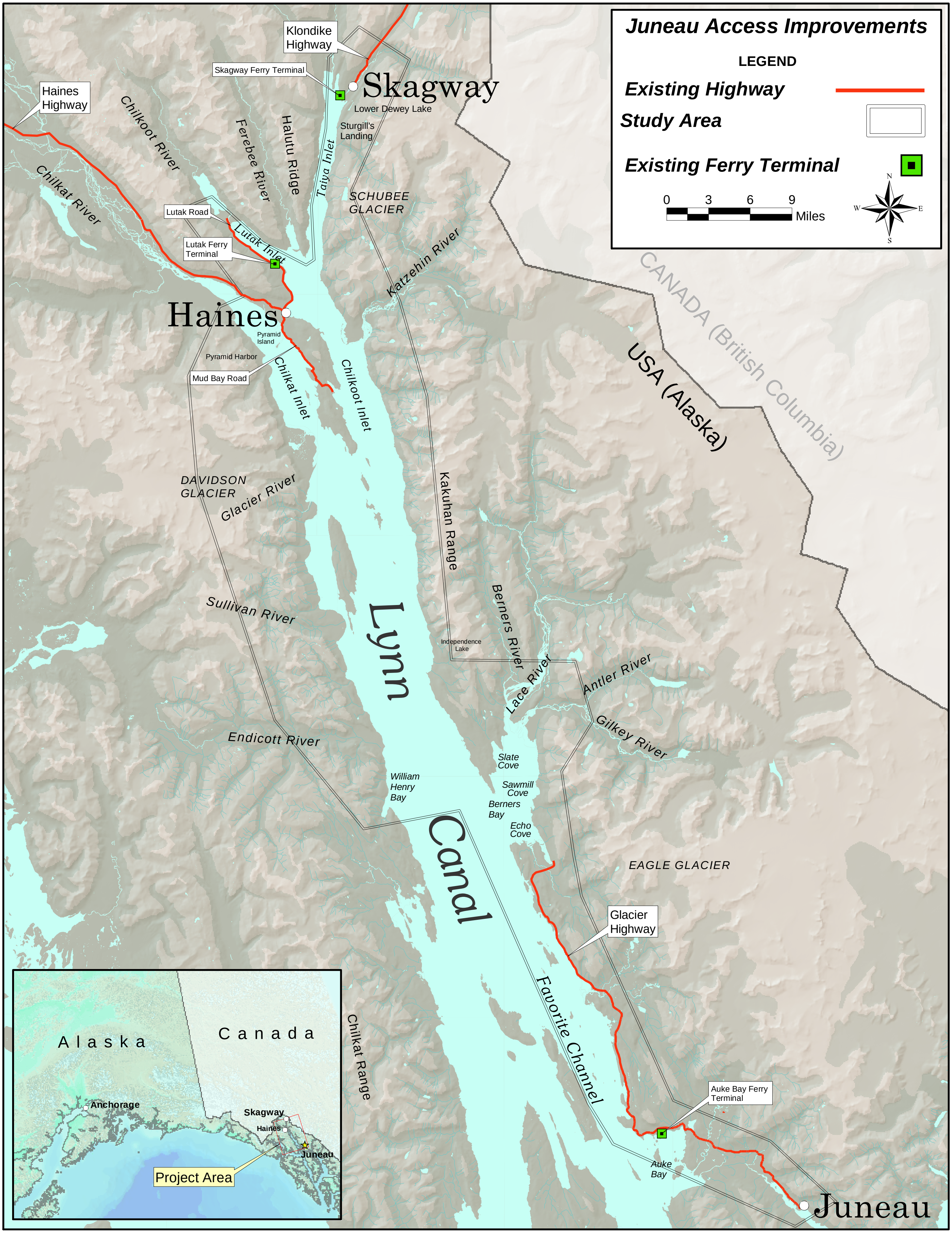


Figure 1-1
Project Area

2.0 PROJECT ALTERNATIVES

This chapter describes the reasonable alternatives evaluated in this Supplemental Draft 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 (Shannon and Wilson, 1994)
- The 1997 Draft EIS (DOT&PF, 1997)
- The 1999 DOT&PF Preferred Alternative Report (PAR)

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 Alaska Marine Highway System [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.

A detailed discussion of the screening process and figures depicting the screened alternatives can be found in the *Alternatives 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 foreign country that does not have the support of the government of that country 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. Goldbelt, Inc. (Goldbelt) is no longer pursuing the development of a private vehicle ferry to Haines and Skagway. Potential development of private ferry service cannot be compelled by the state and is therefore 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 *Haines/Skagway Access Reconnaissance Report* (2004), DOT&PF has determined that a shuttle ferry is the appropriate Haines/Skagway connection for the near future. The 2004 Southeast Alaska Transportation Plan (SATP) identifies the *M/V Aurora* as available for Haines/Skagway service as early as 2005. 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. In any analysis of surface transportation modes there are many possible combinations of ferry and road links. The full spectrum of alternatives is covered without Proposal 5B. Also, an alternative that requires all traffic to travel two or more ferry links (while not significantly reducing the distance between ferry terminals) does not pass the common sense test. All impacts associated with this alternative (other than the combined delay and sequencing problems) will be evaluated in the analysis of the two basic alternatives. Therefore, this alternative was dropped from further consideration.

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 Motor Vessel (*M/V) Malaspina* would operate as a dayboat between the two ferry terminals. A second shuttle ferry would operate between the Katzehin and the 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 fast vehicle ferry (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 now a part of the Marine Alternatives (4C and 4D) in the Supplemental Draft EIS. This alternative is an additional combination of ferry and highway links; therefore, it 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 National Environmental Policy Act (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 is captured in two marine options in the Supplemental 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 is constructing 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 in the 1997 Draft EIS. The original marine options are variations that are no longer relevant, and therefore have been dropped from further consideration.

2.3 Reasonable Alternatives

All the remaining alternatives that were screened at least partially meet the Purpose and Need elements, 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 meet the purpose and need elements, 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 Supplemental Draft EIS designations.

Table 2-1
Reasonable Alternatives Evaluated in the Supplemental Draft EIS

Alternative Title	Supplemental Draft EIS Alternative Designation
No Action Alternative	Alternative 1
East Lynn Canal Highway with Katzehin Terminal (Preferred)	Alternative 2
East Lynn Canal Highway with Berners Bay Shuttles	Alternative 2A
East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway	Alternative 2B
East Lynn Canal Highway with Haines/Skagway Shuttle	Alternative 2C
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[6]). 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.

[6] Life-cycle costs are the total construction, refurbishment, and maintenance costs for a 5-year construction period (2004 to 2008) and a 30-year operation period (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[7] 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 2-2). The *M/V Aurora* would provide shuttle service between Haines and Skagway, beginning as early as 2005. The *M/V Fairweather* would travel at approximately 32 knots (37 miles per hour [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 which 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 National Highway System (NHS) route from Juneau to Haines and Skagway. The No Action Alternative would not involve any of the actions described in the build alternatives (Alternatives 2 through 4D) evaluated in this Supplemental Draft EIS.

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.

[7] 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.

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 maintenance and operation (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 2 (Preferred) – East Lynn Canal Highway with Katzehin Ferry Terminal

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 2-3). The highway would have a 30-foot pavement width, with two 11-foot-wide vehicle lanes and 4-foot shoulders for cyclists and pedestrians, meeting NHS design standards (Figure 2-4). The minimum design speed would be 40 miles per hour.

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 (Figure 2-3). 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.

Capacity – A two-lane highway from Auke Bay to Skagway would provide for high volumes of traffic to Skagway. The traffic capacity to Haines would depend on the frequency and capacity of the shuttle ferry service between Katzehin and Haines. The *M/V Aurora* has a 34-vehicle capacity. Table 2-5 lists the Alternative daily traffic volumes that could be accommodated by Alternative 2.

Table 2-5
Daily Traffic Capacity for Alternative 2

Alternative 2 – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	612
Winter	408
To/From Skagway	
Summer	30,000[1]
Winter	30,000[1]

Note: [1]Based on an estimate of 2,000 cars/hour for a 2-lane highway (Transportation Research Board, 2000).

The 30-year summer traffic projections to Haines under Alternatives 2, 2A, and 2B exceed the vehicle capacity of the *M/V Aurora* on a two-shift operating schedule. The *Marine Segments Technical Report* (Appendix B) includes the optimum vessel for the long-term projected traffic. As traffic demand approaches capacity, AMHS may choose to operate the *M/V Aurora*, replace it with the optimum vessel, or add a second smaller vessel. The alternative is analyzed in the Supplemental Draft EIS based on replacement with the optimum vessel in the year that the projected demand exceeds the capacity of the *M/V Aurora*. For more detail see the *Marine Segments Technical Report* (Appendix B).

Travel Time – The one-way trip times for Alternative 2 are provided in Table 2-6. These times include ferry loading, transit time, and unloading, but no delay time is included. The travel time for the shuttle ferry between Katzehin and Haines does not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis. Travel times were calculated on an average speed of 45 mph for the highway segments of all alternatives. The current posted speed limit on Glacier Highway north of Auke Bay is 50 mph. The minimum design speed of the proposed highway segments of all alternatives is 40 mph. Many sections of the proposed highway would have a higher design speed and would be posted with a higher speed limit. For this reason, the average travel speed would be 45 mph.

Table 2-6
Travel Time for Alternative 2

Alternative 2 – Travel Time	
Route	**Travel Time (hours)**
Auke Bay – Haines	2.5
Auke Bay – Skagway	2.1

Travel Frequency – Under Alternative 2, flexibility and opportunity for travel to Skagway would be limited only by winter weather conditions, when road closures would be necessary for avalanche control. Travel to Haines would be constrained by the Katzehin/Haines shuttle ferry, which is anticipated to operate on a 15-hour daily schedule in summer, and a 10-hour daily schedule in winter (Table 2-7).

Table 2-7
Travel Frequency to Haines of Alternative 2

Alternative 2 – Travel Frequency		
Auke Bay – Haines	**Round-Trips per Day**	**Round-Trips per Week**
Summer	9	63
Winter	6	42

Cost – The estimated initial construction cost for this alternative is $281 million, including design. Highway construction costs would be $265 million, and the Katzehin Ferry Terminal would cost $16 million. The estimated annual M&O cost is $4.4 million, including $1.5 million for highway M&O and $2.9 million for the Katzehin to Haines shuttle M&O. The estimated 30-year life cycle cost is $323 million.

Alignment – Alternative 2 would begin at the end of Glacier Highway at north Echo Cove (Mile 40.5). The highway would generally follow the shoreline all the way to Skagway. Wherever possible, the highway would be positioned inland from the high tide line to avoid marine impacts and to reduce visual effects. At some locations, avoiding trees with eagle nests and/or avalanche hazards would force the highway below the high-tide line. At a few locations, the terrain allows the road to be located well inland from the shore.

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 Point the highway location would be similar to the Goldbelt alignment permitted by the United States Forest Service (USFS) and the United States Army Corps of Engineers (USACE). If a road were built on the Goldbelt alignment before the start of construction for the Juneau Access

Improvements Project, construction to Cascade Point would be limited to widening, grade improvements, and paving. The highway would avoid the 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 2,150 feet in length, and the bridge over the Lace River would be 2,500 feet in length. Both bridges would be constructed with enough clearance to permit air boats, 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 interspersed with muskegs. 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 imported fill, as few rock cuts would be required. A combination maintenance station and rest stop would be located at Comet Landing near the existing Kensington mine facilities.

> 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 may be upgraded as part of Coeur Alaska's proposal to build a deep water floating dock at Slate Cove with funds from the Alaska Industrial Development and Export Authority (AIDEA). Use of these funds would insure state access to the dock. If Coeur Alaska develops the Slate Cove dock with AIDEA funds, 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 area. 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 2,300 feet long and set high enough to allow air boats 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 offer upland area for construction. 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.

2.3.2.6 Katzehin to Sturgill's Landing

From Katzehin to Sturgill's Landing, steep rock slopes project into deep water. The highway would be benched into these slopes for its entire length. The highway would move uphill and downhill as it proceeds north to take advantage of natural benches, avoid trees with eagle nests, and mitigate avalanche hazards. Many of the rock cuts would generate excess material, which would be sidecast into Taiya Inlet.

Rockfall ditches to catch slide material and flattened downhill cuts to facilitate snow removal would help mitigate the avalanche zones on this segment. The highway would move uphill near the large talus slope south of Sturgill's Creek to provide a stable roadway and reduce slide hazard. The highway would also be located uphill of the proposed Otter Creek Hydroelectric Plant at Kasidaya Creek to avoid impacts to that project.

2.3.2.7 Dewey Lake Bench

Across from Sturgill's Landing the highway would turn northeast along the east side of Sturgill's Creek. About 3,000 feet up from the mouth of the creek, the highway would cross over the creek to the ridge between Dewey Lake and Skagway. The highway would be located to the west of the lake to minimize impacts to both the lake and the adjacent trail system. To maintain the continuity of the trail system, a pedestrian tunnel would be constructed for the trail to Sturgill's Landing, and a pedestrian bridge would be built for the trail to a lookout above the Skagway harbor.

2.3.2.8 Skagway Area

Opposite the north end of Dewey Lake, the highway would cross a 300-foot bridge over the power flume, tramline, and Dewey Lake trail, and descend toward the north end of Skagway. The highway would be benched into the slope above the town. At the base of the hill, the highway would cross a 400-foot bridge spanning the Whitepass & Yukon Route Railroad tracks and tie into a retaining-wall-supported roadway sloped to match 23rd Avenue at Main Street. Access to State Street would be via Main Street. Southbound traffic would use Main Street to 21st Avenue. Northbound traffic on State Street would use 22nd Avenue to Main Street. The intersection of Main Street and 23rd Avenue would be reconstructed with Main Street raised a few feet to match the grade of the new intersection.

> Note: The 1997 Draft EIS alignment into Skagway crossed Sturgill's Creek, traversed the shore above the high-tide line, and then crossed the White Pass dock. The exact connection with the Skagway street system was not established.

> The owners of the White Pass dock have expanded operations, including extending train tracks onto the dock and are not interested in joint use. During 2003 fieldwork, additional historic resources in the area were documented. The estimated $30 million cost of replacing the dock and reconfiguring the railroad tracks, combined with potential impacts to historic resources, downtown Skagway traffic, planned City of Skagway harbor improvements, and contaminated sites, led to a new alignment through the Lower Dewey Lake area.

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

2.3.3 Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles

This alternative would construct a 5.2-mile highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay. A ferry terminal would be constructed at both Sawmill Cove and Slate Cove, and shuttle ferries would operate between the two terminals. A 52.9-mile highway would be constructed between Slate Cove and Skagway. The design features of the highway segments of this alternative would be the same as those described for Alternative 2.

A ferry terminal would be constructed at Katzehin, and the *M/V Aurora* would operate between the Katzehin and the Lutak Ferry Terminals (Figure 2-5). 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.

> Note: This alternative was considered in the 1997 Draft EIS but not advanced as reasonable due to the high capital and M&O costs of the additional shuttle ferries and terminals. However, this alternative was ranked high in the PAR, partially meets four of the five 2003 Purpose and Need screening elements, and addresses a 2003 scoping concern regarding impacts to Berners Bay. Therefore, it has been added to the range of reasonable alternatives in the Supplemental Draft EIS.

Capacity – The capacity of Alternative 2A is determined by the capacity of the shuttle ferries at Berners Bay and the shuttle between Katzehin and Lutak Ferry Terminal in Haines. Two shuttles would operate across Berners Bay in the summer and one in the winter; the shuttles would each have an estimated capacity of 33 vehicles. The *M/V Aurora*, with a 34-vehicle capacity, would operate year-round to and from Haines, between the Katzehin and the Lutak Ferry Terminals. The daily traffic volumes that would be accommodated under Alternative 2A are listed in Table 2-8.

Table 2-8
Daily Traffic Capacity for Alternative 2A

Alternative 2A – Daily Traffic Capacity (vehicles)	
Route	**Number of Vehicles**
To/From Haines	
Summer	544
Winter	408
Across Berners Bay	
Summer Total	1,320[1]
Winter Total	528

Note: [1]The Skagway capacity is approximately 776 vehicles, assuming 544 of the 1,320 crossing Berners Bay travel to or from Haines.

Travel Time – The one-way trip times for Alternative 2A is provided in Table 2-9. These times include ferry loading, transit time, and unloading, but no delay time is included. The travel times for the shuttle ferries across Berners Bay and between Katzehin and Haines 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 2A

Alternative 2A – Travel Time	
Route	**Travel Time (hours)**
Auke Bay – Haines	3.0
Auke Bay – Skagway	2.6

Travel Frequency – Under Alternative 2A, flexibility and opportunity for travel would be determined by the frequency of the shuttle ferries operating in Berners Bay and from Katzehin to Haines. Travel to Skagway would be limited by the Berners Bay shuttles, and travel to Haines would primarily be limited by the Katzehin/Haines shuttle. The Berners Bay shuttles would operate 17 hours a day in summer and 10 hours a day in winter. The Katzehin/Haines shuttle would operate 15 hours a day in summer and 10 hours a day in winter. Winter travel would also be limited by road closures for avalanche control. Table 2-10 provides travel frequencies for Alternative 2A.

Table 2-10
Travel Frequency for Alternative 2A

Alternative 2A – Travel Frequency		
Auke Bay – Haines	**Round-Trips per Day**	**Round-Trips per Week**
Summer	8	56
Winter	6	42
Auke Bay – Skagway	-	-
Summer	20	140
Winter	8	56

Cost – The initial design and construction costs for Alternative 2A would be $294 million, including $205 million for highway segments, $43 million for ferry terminals, and $46 million for vessel acquisition. The annual M&O cost is estimated at $8.4 million: $1.5 million for the highway and $6.9 million for the two shuttle ferry segments. The estimated 30-year life cycle cost is $380 million.

Alignment – Alternative 2A would begin at the end of Glacier Highway just north of the Echo Cove boat launch. The new highway would continue for 4.3 miles along the alignment described for Alternative 2 before traveling on a lower alignment for almost a mile to a ferry terminal at Sawmill Cove on Berners Bay. Sawmill Cove would provide protection from northerly wind and waves and would be relatively well protected from southeast winds. Ferries would be overnighted at Sawmill Cove. A double-berth ferry terminal would be built, consisting of two bridge support floats and a shared dolphin system with all-tide floating fenders. Access to the ferries would be via twin 143-foot steel transfer bridges founded on offshore fill. The area under the bridge floats would need to be dredged. Some intertidal fill would be required. Dredged material would be incorporated into upland fill.

Under Alternative 2A, no highway or bridge would be constructed across the rivers and floodplain at the head of Berners Bay. Instead, shuttle ferries would cross Berners Bay to a ferry terminal on the west side of Slate Cove. The Slate Cove Ferry Terminal would be a single-berth terminal consisting of a steel transfer bridge abutting offshore fill and supported at the seaward end by a steel bridge float. Fixed dolphin structures with all-tide floating fenders or fixed mooring faces would be used, depending on vessel needs. No dredging would be required at this site, but some intertidal fill would be required.

From the Slate Cove Ferry Terminal, the alignment would proceed north uphill for approximately 0.5 miles and would then turn east for 600 feet. Beyond this point, the alignment for Alternative 2A is the same as that for Alternative 2, including the layout of the Katzehin Ferry Terminal.

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

2.3.4 Alternative 2B – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

This alternative would construct a 50.5-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 design features for the highway would be the same as those described for Alternative 2.

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 meets four of the five 2003 Purpose and Need screening elements and is therefore included in the range of reasonable alternatives in the Supplemental Draft 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 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 2-11.

Table 2-11
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

Travel Time – The one-way trip times for Alternative 2B are provided in Table 2-12. 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 2-12
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 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. Trip frequency for Alternative 2B is provided in Table 2-13.

Table 2-13
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 initial design and construction costs for Alternative 2B would be $246 million. Highway construction costs would be $182 million, vessel acquisition costs would be $48 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 launch and would follow the same alignment described for Alternative 2 to the Katzehin Ferry Terminal, but the highway would not continue from this point. Instead, shuttle ferries would provide service to both Haines and Skagway from Katzehin.

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).

2.3.5 Alternative 2C – East Lynn Canal Highway with Haines/Skagway Shuttle

This alternative would construct a 68.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway. The design features would be the same as those described for Alternative 2. The Haines/Skagway shuttle described in the No Action Alternative would continue to provide service to Haines (Figure 2-7). Mainline ferry service would end at Auke Bay, and no terminal would be constructed at Katzehin. 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.

Capacity – A two-lane highway from Auke Bay to Skagway would provide for high volumes of traffic between Juneau and Skagway. Capacity between Juneau and Haines would be determined by the shuttle ferry service from Skagway. The *M/V Aurora* has a capacity of 34 vehicles. The traffic volumes that would be accommodated by Alternative 2C are provided in Table 2-14.

Table 2-14
Daily Traffic Capacity for Alternative 2C

Alternative 2C – Daily Traffic Capacity	
Route	**Number of Vehicles**
To/From Haines	
Summer	408
Winter	272
To/From Skagway	30,000[1]

Note: [1]Based on estimate of 2,000 cars/hour for a 2-lane highway.

Travel Time – The one-way trip times for Alternative 2C are provided in Table 2-15. These times include ferry loading, transit time, and unloading, but no delay is included. The travel times for the shuttle ferries from Auke Bay to Haines and Haines do not include check-in time because reservations would not be taken. Vehicles would be accommodated on a first-come, first-serve basis.

Table 2-15
Travel Time for Alternative 2C

Alternative 2C – Travel Time	
Route	**Travel Time (hours)**
Auke Bay – Haines	3.4
Auke Bay – Skagway	2.1

Travel Frequency – Under Alternative 2C, flexibility and opportunity for travel from Auke Bay to Skagway would be unconstrained in the summer. During winter, travel would be limited by road closures for avalanche control. Frequency of travel to and from Haines would be determined by the frequency of the shuttle ferry system, which would operate approximately 15 hours a day in summer and 10 hours a day in winter. The trip frequency to Haines for Alternative 2C is provided in Table 2-16.

Table 2-16
Travel Frequency to Haines for Alternative 2C

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

Cost – The initial design and construction costs for Alternative 2C are $265 million. Annual M&O costs are estimated to be $4.4 million: $1.5 million for the highway and $2.9 million for the Haines/Skagway shuttle. The estimated 30-year life cycle cost is $304 million, including initial capital costs, M&O costs, highway and vessel refurbishment costs, and vessel replacement costs.

Alignment – Alternative 2C would begin at the end of Glacier Highway just north of the Echo Cove boat launch access and follow the same alignment described for Alternative 2 north to Skagway, except that the Katzehin Ferry Terminal would not be constructed.

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

2.3.6 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 2.

The *M/V Aurora* would continue to 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 is therefore included in the range of reasonable alternatives in the Supplemental Draft 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 2-17.

Table 2-17
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

Travel Time – The one-way trip times for Alternative 3 are provided in Table 2-18. 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 2-18
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 estimate trip frequency for Alternative 3 is provided in Table 2-19.

Table 2-19
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 initial design and construction cost for Alternative 3 is $269 million. Highway costs would be $179 million, vessel acquisition costs would be $59 million, and terminal costs would be $31 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 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.

2.3.6.1 Echo Cove to Sawmill Cove

Alternative 3 would begin at the end of Glacier Highway at Echo Cove and follow the same alignment described in Alternative 2A to the north for 5.2 miles to 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.

2.3.6.2 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.

2.3.6.3 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.

2.3.6.4 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.

2.3.6.5 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.

2.3.6.6 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.

2.3.6.7 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 5,800- and 3,000-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).

2.3.7 Alternatives 4A through 4D – Marine Options

The four marine alternatives would all include continued mainline ferry service in Lynn Canal, and the AMHS would continue to be the National Highway System (NHS) route from Juneau to Haines and Skagway. These alternatives are based on a minimum of two mainline vessel trips per week, year-round, 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 a new double-stern berth 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. Because these marine alternatives would partially meet three or more of the five Purpose and Need elements, all four modified marine options are reasonable with regard to the Purpose and Need Statement and therefore are included in the range of reasonable alternatives in the Supplemental Draft 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 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.

2.3.8 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* (Appendix C). The daily traffic volumes that would be accommodated by Alternative 4A are provided in Table 2-20.

Table 2-20
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 2-21. These times include check-in, transit time, and ferry loading and unloading, but no delay time is included.

Table 2-21
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 2-22.

Table 2-22
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 initial design and construction costs for Alternative 4A are $124 million. Vessel acquisition cost would be $111 million, and terminal construction cost at Auke Bay would be $13 million. Estimated annual M&O costs would be $16.6 million: $3.5 million for mainline service, $11.2 million for Juneau 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 a double-stern berth. Terminal layout details for the Auke Bay modifications can be found in the *Technical Alignment Report* (Appendix D).

2.3.9 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 2 (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 2-23, with mainliner capacity split 55 percent and 45 percent between Haines and Skagway, respectively.

Table 2-23
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 2-24 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 2-24
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 boat 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 2-25.

Table 2-25
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 initial design and construction costs of Alternative 4B would be $137 million: $5 million for highway design and construction, $30 million for terminal design and construction at Auke Bay and Sawmill Cove, and $102 million for vessel acquisition. Annual M&O costs would be $15.5 million: $3.5 million for mainline service, $10.1 for Juneau 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 Alternatives 2A and 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).

2.3.10 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 2-26, including mainline capacity split of 55 percent to Haines and 45 percent to Skagway.

Table 2-26
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 2-27. These times include check-in, ferry loading and unloading, and transit time, but no delay time is included.

Table 2-27
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. Trip frequency for Alternative 4C is provided in Table 2-28.

Table 2-28
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 initial design and construction costs for this alternative are $102 million. Vessel acquisition would cost $89 million, and terminal construction cost at Auke Bay would be $13 million. Annual M&O costs would be $11.6 million: $3.5 million for mainline service, $6.2 million for Juneau 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 a double-stern berth. The terminal layout details for the Auke Bay modifications can be found in the *Technical Alignment Report* (Appendix D).

2.3.11 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 2 (Figures 2-10 and 2-11). 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 Sawmill Cove Ferry Terminal in summer: one to Haines and one to Skagway. In winter, only one of these shuttle ferries would operate, departing from Auke Bay Ferry Terminal. Mainline service would continue at an average of two roundtrips 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 2-29.

Table 2-29
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 2-30. 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 2-30
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 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. Trip frequency is provided in Table 2-31.

Table 2-31
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 initial design and construction costs of Alternative 4D are $98 million. Road construction would cost $5 million, vessel acquisition would cost $63 million, and terminal construction at Auke Bay and Sawmill Cove would cost $30 million. Annual M&O costs would be $11.3 million: $3.5 million for mainline service, $5.9 million for Juneau 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 Alternative 2 alignment for 4.3 miles before descending 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 2-32 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 2-32
Alternatives Data Summary

	Alt 1	Alt 2	Alt 2A	Alt 2B	Alt 2C	Alt 3	Alt 4A	Alt 4B	Alt 4C	Alt 4D
PROJECTED SUMMER CAPACITY (vehicles per day)										
To Skagway	71	30,000	776	636	30,000	408	223	227	149	203
To Haines	96	612	544	544	408	1,008	229	284	154	208
SUMMER TRAVEL TIME (check-in/loading/unloading)										
Auke Bay to Skagway [2]	3.8 / 9.1	2.1	2.6	3.0	2.1	4.2	4.1 / 9.1	3.8 / 9.1	6.3 / 9.1	5.3 / 9.1
Auke Bay to Haines [2]	3.5 / 7.1	2.5	3.0	2.5	3.4	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	NA	140	42	NA	42	16	16	9	16
Auke Bay to Haines - Summer	8	63	56	56	42	84	16	30	9	16
INITIAL CAPITAL COSTS ($Millions)										
Highway [3]	$0	$265	$205	$182	$265	$179	$0	$5	$0	$5
Total Marine Vessel Acquisition [3]	$0	$0	$46	$48	$0	$59	$111	$102	$89	$63
Ferry Terminal [3]	$0	$16	$43	$16	$0	$31	$13	$30	$13	$30
Total	**$0**	**$281**	**$294**	**$246**	**$265**	**$269**	**$124**	**$137**	**$102**	**$98**
ANNUAL MAINTENANCE AND OPERATIONS COSTS										
Highway M&O [3] ($Thousands)	$0	$1,526	$1,517	$1,296	$1,526	$1,244	$0	$19	$0	$19
Marine M&O [4] ($Thousands)	$10,185	$2,880	$6,886	$7,710	$2,938	$7,992	$16,655	$15,535	$11,658	$11,291
Total ($Thousands)	**$10,185**	**$4,406**	**$8,403**	**$9,006**	**$4,464**	**$9,236**	**$16,655**	**$15,554**	**$11,658**	**$11,310**
30 Year Life Cycle Costs[5] ($Millions)	**$267**	**$323**	**$380**	**$352**	**$304**	**$375**	**$495**	**$482**	**$326**	**$313**

Notes: [1]Based on estimate of 2,000 cars/hour for a 2-lane highway.
[2]Travel Time - Shuttle / Mainliner
[3]Technical Alignment Report (Appendix D)
[4]Marine Segments Report (Appendix B), Lynn Canal Revenues and Expenditures 2001-2002, and Projected Capital Cost 2001-2038 (DOT&PF, 2004)
[5]From User Benefit Analysis (Appendix E). See Supplemental Draft EIS Section 4.1.5 for further information.

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 (see Section 6.8).

After careful scrutiny of all the studies prepared for the Supplemental Draft EIS, DOT&PF continues to prefer Alternative 2. This preference is based on ability to meet traffic demand, provide the greatest flexibility and opportunity to travel, provide the shortest travel times and the greatest reduction in user costs, while reducing state operating expense.

All reasonable alternatives evaluated in the Supplemental Draft EIS are under consideration and have been developed to a comparable level of detail. Final identification of a preferred alternative will not occur until the alternatives impacts, written comments on the Supplemental Draft EIS, and comments received at the public hearings have been fully evaluated and considered. The selected alternative will be provided in the Record of Decision.

2.5 Funding Considerations

The 1997 Draft EIS identified several potential funding sources for construction and operation of build alternatives, as this 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 State Transportation Improvement Plan [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 are under consideration now as potential funding sources for a build alternative, if selected, with the exception of highway tolls. No tolls are proposed for the highway segments included in the Supplemental Draft EIS build alternatives. M&O for new highway segments would be funded out of the state general fund, as with all existing highways in Alaska. 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 alternative; 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 the construction of any build alternative in the Supplemental Draft EIS assumes a project-specific congressional earmark. If a special congressional appropriation does not become available, initial funding would come from the state's Federal Aid Highway Program. This would require a revision to the STIP by delaying or eliminating projects in the current 2004 to 2006 STIP to make room for the Juneau Access Improvements Project.

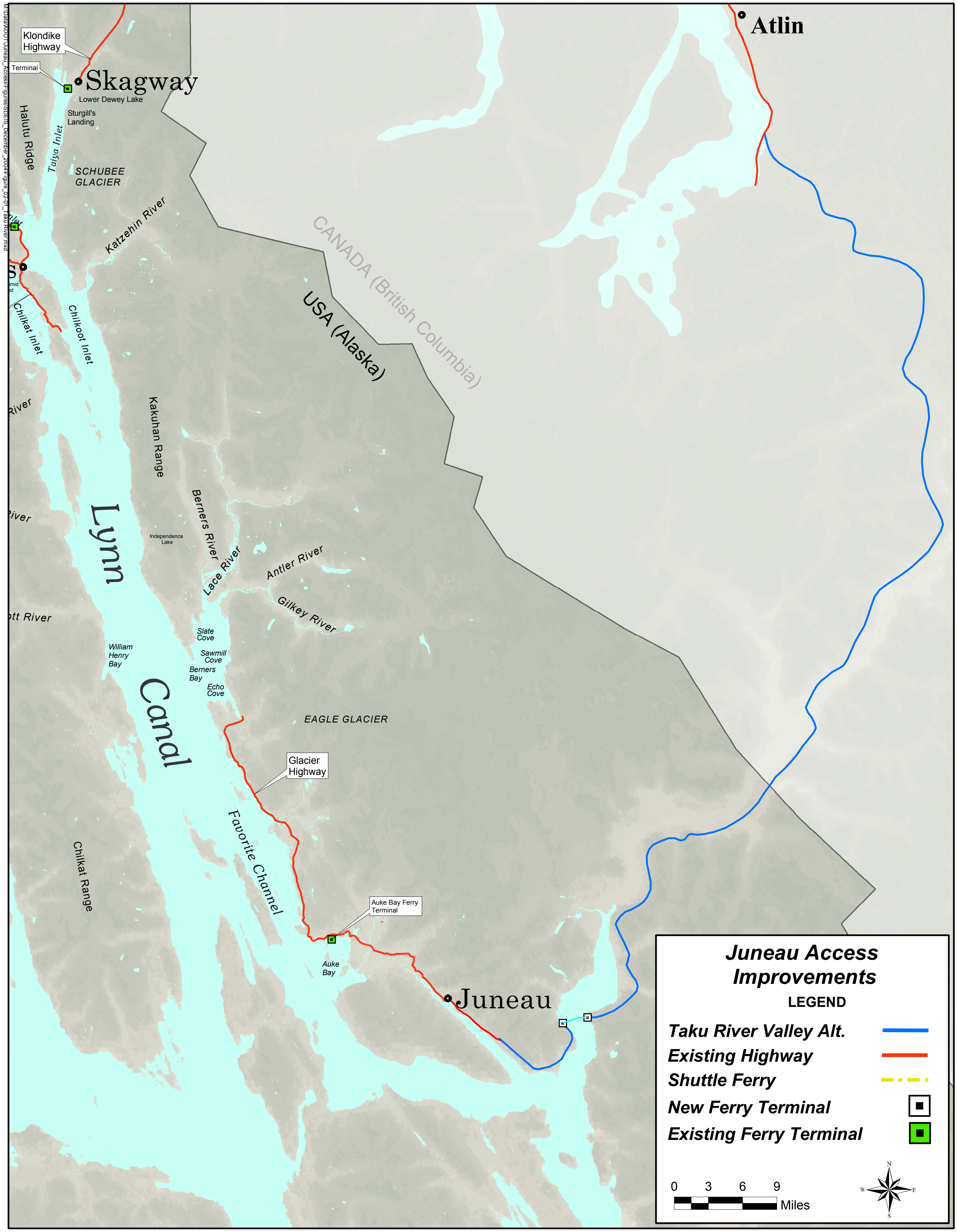


Figure 2-1
Taku River Valley Highway Alternative

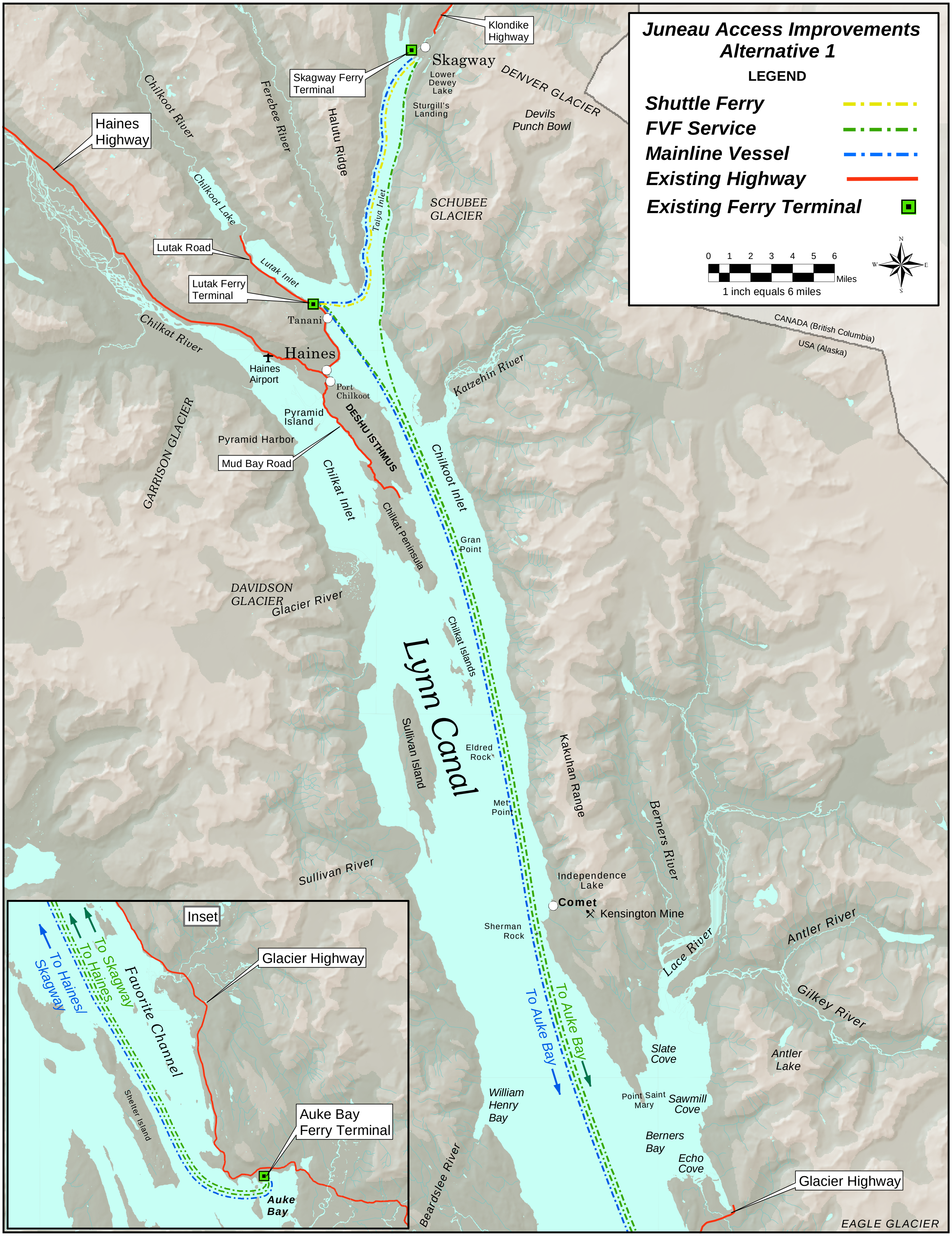


Figure 2-2
Alternative 1: No Action Alternative

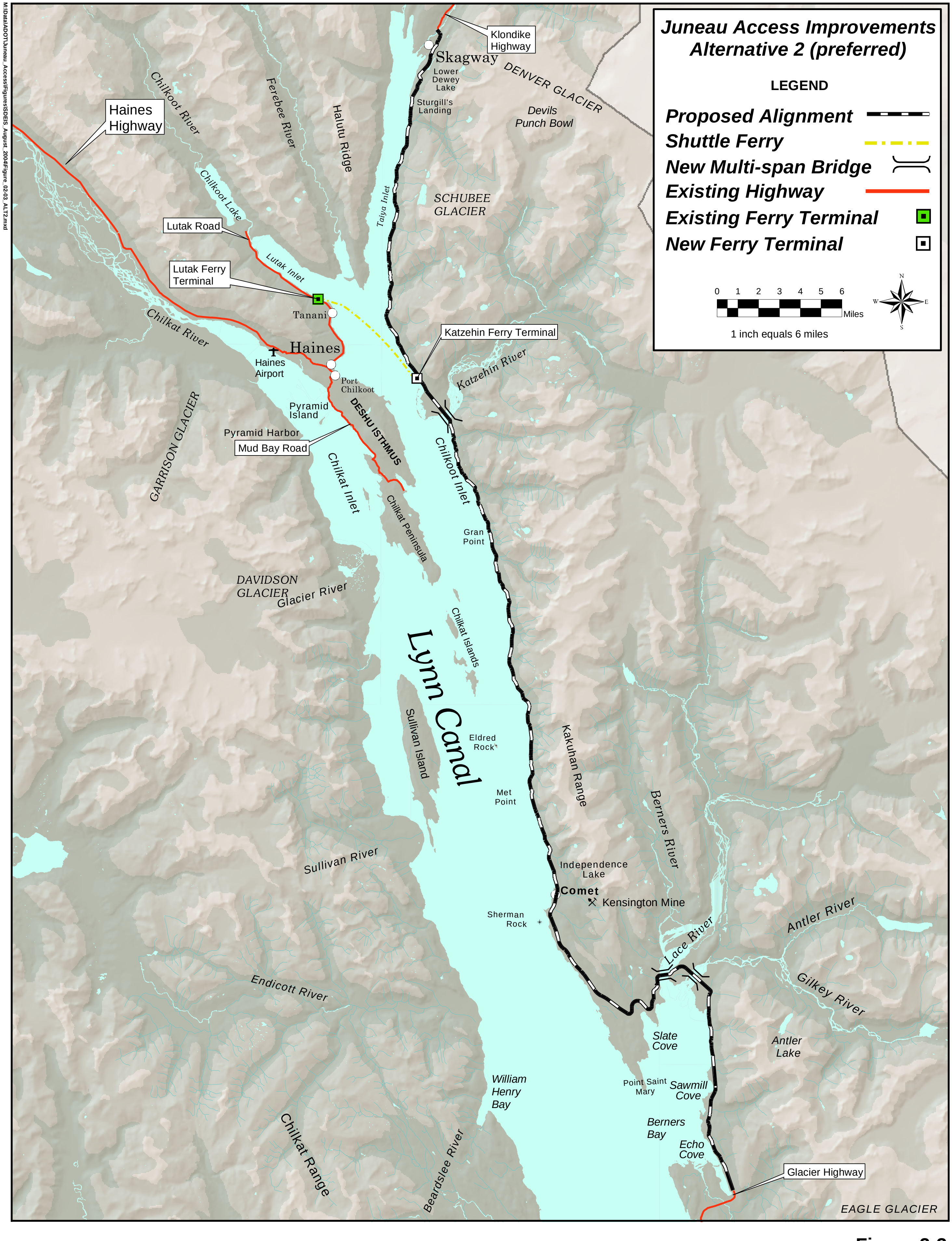


Figure 2-3
Alternative 2 (preferred): East Lynn Canal Highway with Katzehin Ferry Terminal

Juneau Access Improvements
Typical Roadway Section

Cut and Fill Typical
Both Sides of Roadway

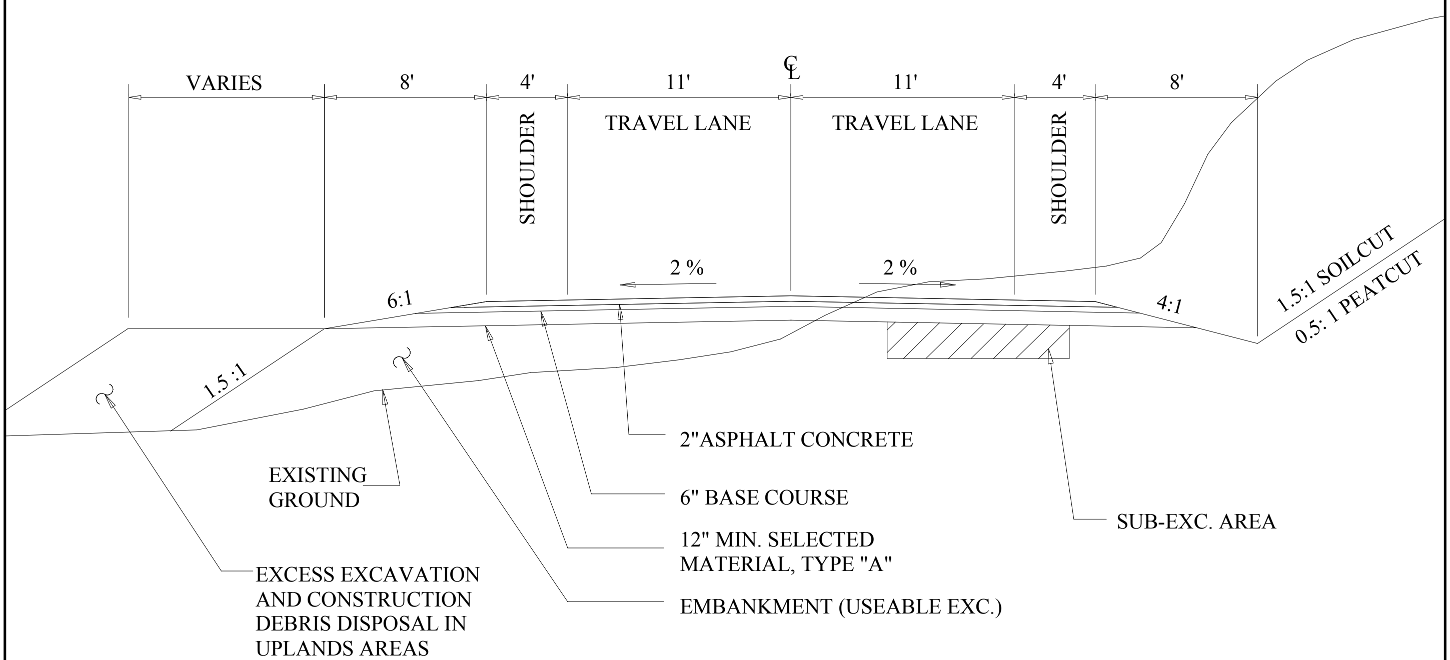


Figure 2-4
Typical Roadway Section

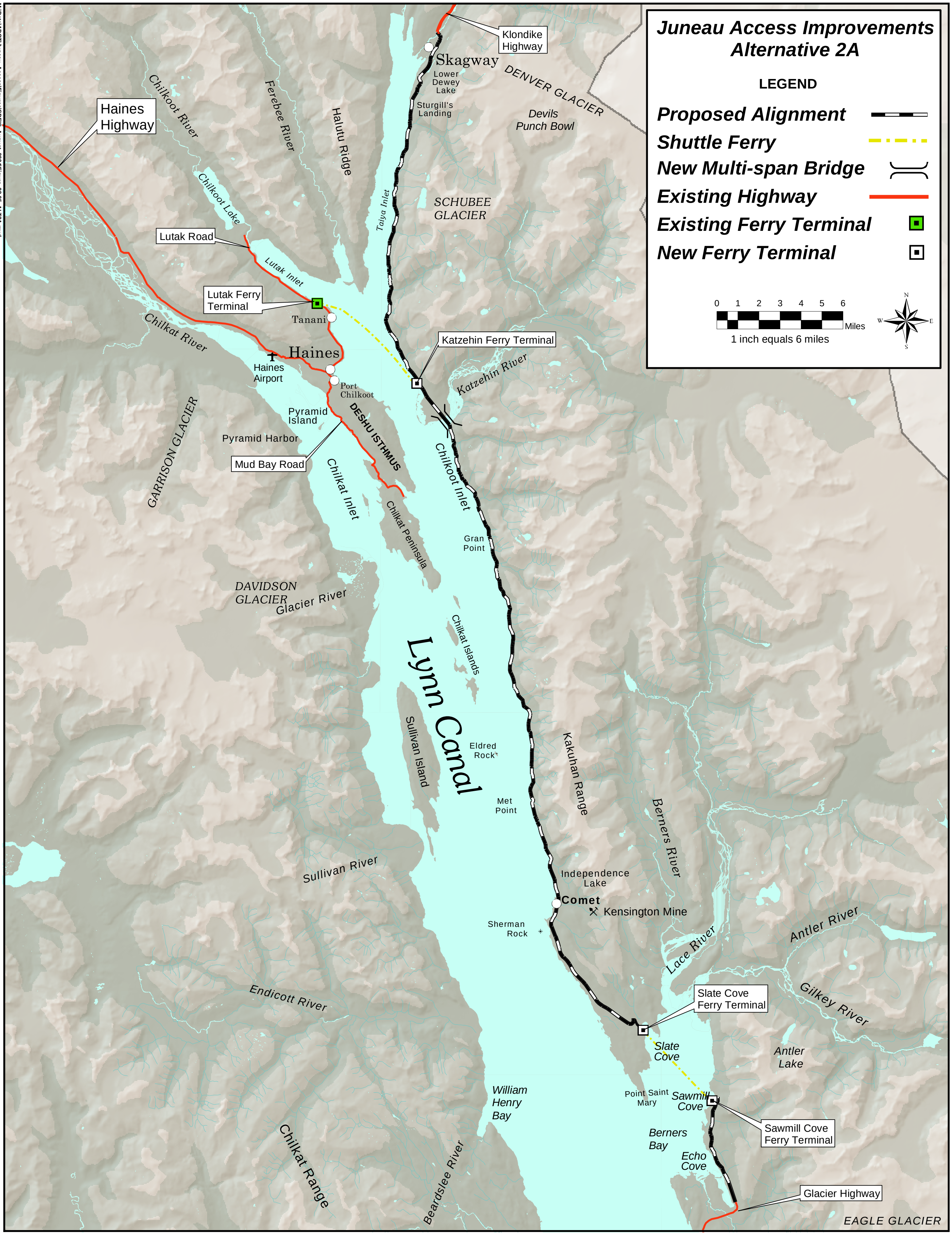


Figure 2-5
Alternative 2A: East Lynn Canal Highway with Berners Bay and Katzehin Ferry Shuttles

3.0 AFFECTED ENVIRONMENT

3.1 Social and Economic Environment

3.1.1 Land Use

The Alaska Department of Transportation and Public Facilities (DOT&PF) prepared a *Land Use and Coastal Zone Technical Report* in 1995 (revised in 1997) in support of the 1997 Draft EIS. The report has been 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) (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 United States Department of Agriculture Forest Service (USFS). The Klondike Gold Rush National Historic Park (NHP) in Skagway is administered by the United States Department of the Interior National Park Service (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 City and Borough of Juneau (CBJ), Haines Borough, and City of Skagway, respectively. 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 below.

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 of 1990. Information for the Supplemental Draft EIS has been taken from the 1997 revision of the plan.

Most of the lands in the study area are in the Tongass National Forest and are therefore managed by the U.S. Forest Service (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 as vital linkages.
  - **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 archeological, 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. 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.

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 category area. 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.

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 the City and Borough of Juneau (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. This plan expresses a concern about a Lynn Canal road link to Juneau. The *City of 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 Alaska Marine Highway System (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) [8], which means that the city will manage land uses in this area to prioritize transportation and waterfront industrial and commercial development. The extreme southeast corner of the Skagway River AMSA (shown in Figure 3-4) could also be affected by the Juneau Access Improvements Project.

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. As explained above, 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 study area surrounding Echo Cove. In 1996, Goldbelt prepared the Echo Cove Master Plan and the USFS circulated an EIS for a proposed access highway from Echo Cove to Cascade Point in Berners Bay. The USFS completed a Record of Decision in 1998. Goldbelt has received USFS special-use permits and a U.S. Army Corps of Engineers (USACE) 404 permit for construction of the proposed highway.

One Native allotment application lies along the proposed alignment of Alternatives 2, 2B, and 2C; seven certified allotments and allotment applications lie near the proposed alignment of the West Lynn Canal Highway. The Central Council Tlingit and Haida Tribes of Alaska administers 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.

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

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 five- 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 2 through 2C 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 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 completed its Supplemental EIS, developed agreements with state and federal agencies, and expects to receive all necessary permits for mine operation in 2005. Construction could begin in 2005, and mine operation could begin in 2006. 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, Inc., 2004).

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 flight seeing, 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 3-5). 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 Island State Marine Park (Figures 3-1 and 3-2). The United States Park Service manages the Klondike Gold Rush National Historical Park in the Skagway area (Figure 3-5). 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 3-4).

The Lower Dewey Lake area is a popular hiking/picnicking destination and trail hub and is owned by the City of Skagway (Figure 3-5). The area has many trails connecting to Sturgill's Landing, Icy Lake, Upper Reid Falls, Upper Dewey Lake, and Devil's Punchbowl.

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 is in the design stage of 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 permits that could potentially affect the coastal zone are consistent with the federal Coastal Zone Management Act of 1972 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 Alaska Department of Natural Resources (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 Alaska Coastal Management Plan (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 City of Skagway coastal management plan includes four approved AMSAs; however, only the Skagway River AMSA would potentially be affected (Figure 3-4). 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 briefly summarized below. The full text of the ACMP statewide coastal standards is presented in the *Land Use and Coastal Management Technical Report* (Table A-2, Appendix F).

- 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 Archeological Resources

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.

The majority 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 visual quality objectives 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 listed below.

3.1.2.1 East Lynn Canal

Berners Bay – This bay is almost three 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 five to eight 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 one-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 one 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 one to two 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 three 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 Archeological 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 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. Archeological 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 archeological 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 archeological 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. No potential traditional cultural properties were identified within the Juneau Access Improvements Project APE.

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 3-6). 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 Alternatives 2, 2B, and 2C.

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 Alternatives 2 through 2C.

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 is located in the APE for Alternatives 2, 2A, and 2C. This 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 archeological 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 and Bittner 1995). This site is in the project’s APE.

The Skagway Hydroelectric Complex District located at Lower Dewey Lake is another NRHP-eligible historic district crossed by the APE 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. The pipelines, tramway, and hoist building are in the APE for Alternatives 2, 2A, and 2C.

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 3-5) 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 in the APE of Alternatives 2, 2A, and 2C. The trail is visible in a 1903 photograph of Skagway, and older rockwork supports some of the switchbacks.

The Skagway and White Pass District National Historic Landmark (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 White Pass and Yukon Route 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 only listed NHL-contributing element in the APE for Alternatives 2, 2A, and 2C is the railroad alignment near State Street and 23rd Avenue.

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. No elements of the Klondike Gold Rush NHP are 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 British Columbia 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 28, 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).

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 six percent Asian, one percent African American, and two 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 six 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.

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 (nine percent) and earnings (12 percent) (DOL&WD, 2002).

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 four 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 three and four percent, is forecast for the cruise market over the next decade. Cruise growth is expected to slow to an average of about one to two 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 Southeast Alaska Regional Health Consortium 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, 2001). 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 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 one percent Asian and one percent of a variety of other races (U.S. Census Bureau, 2000).

The 2000 Census counted 985 households in Haines, with an averaqe 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 two 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 above, 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. 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 Southeast Alaska Regional Health Consortium (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 five percent Alaska Native or American Indian, two percent Asian, and two percent of a variety of other races (U.S. Census Bureau, 2000).

The 2000 Census counted 398 households in Skagway, with an averaqe 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 three to four 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 White Pass and Yukon Route Railroad. The railroad was originally built to supply goods to interior gold mining camps. Today, the railroad connects Skagway with Fraser, British Columbia, 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 Skagway Medical Service, 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 United States 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).

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, 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 3-2 summarizes race and income for Juneau, Haines, Skagway, and Klukwan by Census Tract[9] and Block Group[10] from the 2000 Census (U.S. Census 2000).

3.1.5.1 Poverty Guidelines

The U.S. Department of Health and Human Services (DHHS) poverty guidelines are illustrated in Table 3-1. 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

[9] A **census tract** is a small, relatively permanent statistical subdivision of the MOA 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.

[10] 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.

2.66, 2.4, and 2.2, 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 3-1 to provide a comparison to Alaska guidelines. The DHHS proverty 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.

Table 3-1
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 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 (Subsistence Management Information, 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, 29). 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 3-7 through 3-9). 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 3-7 through 3-9).

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 only 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).

Table 3-2
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: Highlighted block groups include portions of the existing Glacier and Haines highways.

Source: U.S. Census Bureau, Census 2000

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, Klukwan, 28).

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. 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 (Betts et al., 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 motor vessel (*M/V) Fairweather*, Alaska's first fast vehicle ferry, five days per week to Haines and four days per week to Skagway. This vessel will be based in Juneau and will make 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 2002 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 2002.

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.

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 2004 Supplemental Draft 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; 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 (Shannon & Wilson, 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 archeological 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 karstlands encountered along the West Lynn Canal project area based on the vulnerability criteria category. Figure 3-10 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 karstlands 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 3-11 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 in the vicinity of Alternatives 2 through 2C. 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) 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. While little historic seismicity is associated directly with the Chatham Strait segments of this fault system, there is sufficient geologic evidence of activity to consider this fault capable of seismic activity.

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 3-11 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 would 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 five 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 five 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 (Shannon & Wilson, 1994).

3.2.3 Floodplains

Executive Order 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.

3.2.5 Air Quality

According to the 1994 air quality report prepared for the 1997 Draft EIS, ambient air quality is good and carbon monoxide 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 U.S. Environmental Protection Agency (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: carbon monoxide (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 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 Alaska Ambient Air Quality Standards promulgated in Title 18, Chapter 50, of the AAC.

In addition to the National Ambient Air Quality Standards (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.

Table 3-3
National Ambient Air Quality Standards

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

Notes: µg/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 ozone (Register 168, 18 AAC 50.010).

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. 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.

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. 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 (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).

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 has been conducted for the 2004 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. Alternatives 2, 2B, and 2C 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 air boats, 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.

The local topography confines the town of Skagway almost entirely to the Skagway River valley. The town is bounded by a railroad corridor to the east, an airport to the west, and boat docks to the south. Alternatives 2B, 3, and 4A through 4D would use the existing Skagway ferry terminal, with traffic traveling to and from the terminal via State Street. However, Alternatives 2, 2A, and 2C would intersect with 23rd Avenue and Main Street. Adjacent residences and other sensitive noise receptors would have a sound path to the highway as it descends the valley wall into town.

For assessing the potential of direct traffic noise impacts, 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). This is in close proximity to the intersection of the alignment for Alternatives 2, 2A, and 2C with 23rd Avenue. 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). The location was chosen because it was representative of sensitive receptors that were not on a main throughway but would have a view of the proposed highway. 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 noise abatement criteria 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 the American Association of State Highway and Transportation Officials (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 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 East Lynn Canal alternatives and three were identified in the vicinity of the West Lynn Canal alternative (Figure 3-12). 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 and are within 0.5 mile of the project corridor. However, both sites are outside of the proposed highway right-of-way for Alternatives 2, 2A, and 2C. 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 Skagway/Nahku Ore Terminal and Port area is downgradient and approximately 2,500 feet from the nearest point of the right-of-way for Alternatives 2, 2A, and 2C. The WP&YR Railroad Yard is located adjacent to the terminus of Alternatives 2, 2A, and 2C in Skagway.

One site with a high hazard rating is located within 150 feet of the alignment for Alternatives 2, 2A, and 2C in Skagway. That is the White Pass and Yukon Route Railroad Coach Cleaning Shop on 21st Avenue and State Street. The site is used by the railroad as a staging and storage area for cleaning supplies used to clean passenger cars on tourist trains. The site is listed as an ADEC contaminated site based on diesel fuel contamination to soil and groundwater. Some soil remediation for diesel fuel took place on the site in 2001; however, all of the contamination was not removed to ADEC cleanup levels and the site remains as an active cleanup site (ADEC, 2003a).

The Kensington beach facility, which has a medium hazard rating, is located about 150 feet from the alignment for Alternatives 2 through 2C 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).

Two sites with a medium hazard rating are located adjacent to the alignment for Alternatives 2, 2A, and 2C in the Skagway area. The alignment for these alternatives would cross the former Skagway to Whitehorse fuel pipeline just before the alignment reaches 23rd Avenue. This 110-mile, 8-inch diameter diesel and gasoline pipeline operated from 1948 to 1996. Multiple historic spills have been recorded along the pipeline when it was in operation. All of the spills documented by ADEC have occurred outside the 300-foot study corridor for the Juneau Access Improvements Project. The other site with a medium hazard rating is the Skagway Alaska Power and Telephone, Inc. maintenance building and equipment yard located within 250 feet of the terminus of the alignment for Alternatives 2, 2A, and 2C immediately adjacent to 23rd Avenue. This site was assigned a medium risk because of possible PCB contamination from electrical transformers in the equipment yard. A review of the EPA PCB Activity Database indicates that the site was found to be out of compliance with PCB-record keeping requirements in 1991, but no other violations have been issued (EPA, 2003).

The AT&T Alascom Sullivan River Microwave Repeater Station is located one 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 3-13 through 3-17). At the north end of Berners Bay, the Antler and Berners rivers and their tributaries support an extensive area of palustrine scrub-shrub/emergent, 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 3-15 through 3-17). 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, National Oceanic and Atmospheric Administration National Marine Fisheries Service (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 3-14 through 3-17 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" (American Society of Testing and Materials 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).

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 essential fish habitat (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 essential fish habitat. 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 excepting 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 essential fish habitat 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 Supplemental Draft 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 Supplemental Draft 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 3-18 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 3-18. 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 *Essential Fish Habitat (EFH) Assessment* (Appendix N).

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 12 on the west side of the canal) are known to support anadromous fish species (ADF&G, 2003b). 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 Sweeny creeks; and the Katzehin River (Figure 3-18). 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) 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 (DOT&PF 1997). 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.

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 Supplemental Draft 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, etc.), 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 (two percent), disease (two percent), and habitat modification (two 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 and Chilkat 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 Supplemental Draft EIS has evaluated 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 3-19 through 3-21 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 categories applicable to species found in the study area, and the species selected for analysis, are listed below.

3.3.5.1 Species Selected for Analysis

During 2003 agency scoping, resource agencies indentified species to be analyzed. The species selected for anlysis were drawn from USFS management indicator species, 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 – 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, 1997). 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 Supplemental Draft 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. The USFWS designated this species as a candidate species in 2004[11]. 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 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. 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

[11] 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 are not subject to regulatory protection and human activities that may effect them are not restricted.

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 watershed 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) 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; Horwood, 1990). Gestation time is estimated to be 10 months (Best 1982), 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 British Columbia 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 40 to 50 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 2003 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 locations of bald eagle nests relative to the highway alignments are shown in Figures 3-23 and 3-24 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) 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 affect 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 (threatened). Figure 3-19 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. Calins 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 and 2004 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 and 2004 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) 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 has been carried forward in this Supplemental Draft EIS, as appropriate.

The environmental impact assessment presented in this chapter is based on the following technical reports that are either new reports or updated versions of the 1997 Draft EIS technical reports:

- *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*
- *Essential Fish Habitat (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 Impact Technical Report*
- *Karst Technical Report*
- *Cultural Resources Technical Report*

The technical reports contain detailed analyses that are summarized in this chapter. Except for the *Karst Technical Report* and the *Cultural Resources Technical Report*, all of the technical reports are appendices to the Supplemental Draft EIS. These two technical reports are not being distributed to the public to protect sensitive 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 Supplemental Draft EIS only address direct impacts. Indirect and cumulative impacts are addressed in a separate technical report (Appendix U). The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (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. The USFS anticipates authorizing 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.

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 Archeological Resources

The Area of Potential Effect (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 National Regiser of Historic Places 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 National Register of Historic Places 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. For further information on the socioeconomic assumptions and analysis, see the *Socioeconomic Effects Technical Report* (Appendix H).

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, 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.

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** – Current baseline traffic (2002) in Lynn Canal was updated from the 1997 Draft EIS, including current ferry (Alaska Marine Highway System [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 current (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 is the rate recommended by the Federal Office of Management and Budget for evaluating Federal programs whose benefits and costs are distributed over time. Different discount rates are used for the life cycle cost analysis (which addresses only costs and not user benefits). For capital costs, a rate of 2.65 percent is used. This represents the State of Alaska's real borrowing cost for capital improvement projects. A 5 percent discount rate is used for operating costs. This represents the opportunity cost to the State of spending its own money (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.

For further discussion of the assumptions used in developing these analyses, see the *User Benefit Analysis* (Appendix E).

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, 1994). Further geotechnical engineering investigations would be done during engineering design of the alternative selected for the project. This Supplemental Draft 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. The Alaska Department of Environmental Conservation (ADEC) Water Quality Standards (18 Alaska Administrative Code [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 National Ambient Air Quality Standards (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 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 Federal Highway Administration (FHWA) in *Appropriate Level of Highway Air Quality Analysis for CE, 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).

For the 2004 Supplemental Draft EIS, the CO emission model has been rerun using updated Supplemental Draft EIS traffic data for the project area. 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 Supplemental Draft EIS 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 traffic 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). Model assumptions included a 40-mph average vehicle speed for rural segments and 20 mph for urban segments. 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 Draft EIS and 2004 Supplemental Draft EIS analyses were compared to the Alaska Ambient Air Quality Standards (18 AAC 50.010), which adopt the federal NAAQS promulgated in 40 CFR 50.8.

Further information on the CO modeling conducted for the Supplemental Draft EIS is provided in *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 noise abatement criteria.

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. 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) contains 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 *Essential Fish Habitat (EFH) Assessment* (Appendix N).

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 4.3.14, 4.4.14, 4.5.14, 4.6.14, 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 was addressed in the *Wildlife Technical Report* (Appendix Q).

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 Alaska Department of Fish and Game (ADF&G), and the U.S. Fish and Wildlife Service (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 this document does not rely on any new HCI modeling. However, the Supplemental Draft EIS summarizes statistics from the previous HCI model analyses where appropriate.

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 ADFG 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 address wildlife and development issues, including the Endangered Species Act, the Fish and Wildlife Coordination Act, the Migratory Bird Treaty Act, and the Marine Mammal Protection Act. 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, 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.

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) 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:

- 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 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.

Alternatives 2 through 2C would include no DOT&PF-constructed boat launches or structures that enhance boat access. As described in Section 3.3.7, DOT&PF monitored Steller sea lions at Gran and Met points in 1998 and 2002 to 2004. DOT&PF adjusted alternative highway alignments because of this monitoring to minimize potential impacts to sea lions.

Potential project impacts on Steller sea lions were reassessed for the Supplemental Draft EIS because of these alignment adjustments and the additional baseline data. The 2003 *Steller Sea Lion Technical Report* (Appendix S) updated and built on the information presented in the 1997 Draft EIS. The impact assessment in the report uses the same disturbance factors considered in the 1997 Draft EIS (i.e., construction noise and vibration, human presence, and traffic noise) but includes new traffic predictions and noise analysis data.

As indicated in this chapter, the FHWA has made the preliminary determination that Alternatives 2 through 2C would not be likely to adversely affect Steller sea lions. FHWA will provide 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.

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 has been modified in 2004 with the addition of the motor vessel (*M/V) Fairweather*. For purposes of this document, it is assumed that the 2004 service will be similar in the future, with the addition of the Haines/Skagway shuttle, which could be operational as early as 2005. This section describes the environmental consequences to resources discussed in Chapter 3 during the analysis period from 2008 and 2038. The section only discusses 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 archeological 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 system under the No Action Alternative. The demand[12] 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

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/VAurora*, 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 is provided 4.5 days per week by the fast ferry *M/V Fairweather*, with a vehicle capacity of 35. As discussed in Supplemental Draft EIS Chapter 2, the projected combined daily summer traffic capacity under the No Action Alternative is 167 vehicles.

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.

Maximum surface transportation demand in the Lynn Canal corridor is expected to reach at least 900 annual 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.

[12] Demand projected for a particular mode of transportation, in this case ferry service, assuming no capacity limitations on that transportation mode.

The Haines-Skagway shuttle ferry would take approximately 1.3 hours for a one-way trip. The *M/V Aurora* would make to three roundtrips per day in the summer and two roundtrips 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 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 would be about $61 million discounted to present dollars (January 2004). AMHS expenditures in Lynn Canal for 2001 and 2002 exceeded $10 million a year, $5 million per year of which was subsidized by the state. The average annual operating cost of the No Action Alternative is estimated to be about $10.2 million. 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 subsidy 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 subsidy 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.

4.3 Alternatives 2, 2A, 2B, and 2C – East Lynn Canal Highways

As discussed in Section 2.3, four alternatives contain a highway on the east side of Lynn Canal. The highway alignment for all four alternatives is the same, and under each alternative mainline ferry service from Auke Bay to Haines and Skagway would end. The alternatives differ on either the location of a shuttle ferry service to Haines or the length of the highway within the alignment. Alternatives 2 and 2C (Figures 2-3 and 2-7, respectively) call for a highway from Echo Cove to Skagway with the shuttle ferry to Haines either from a new terminal at the Katzehin River delta (Alternative 2) or the existing terminal at Skagway (Alternative 2C). Alternative 2A is the same as Alternative 2 except that the highway would not be constructed around Berners Bay and vehicles would be shuttled across the Bay on ferries from Sawmill Cove to Slate Cove (Figure 2-5). In Alternative 2B, the highway would extend 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).

Based on the environmental studies conducted for the Juneau Access Improvements Project, many of the potential impacts associated with these four alternatives would be the same; therefore, they are discussed together in this assessment. Where the potential impacts of Alternatives 2 through 2C are substantially different, those differences are noted in the text.

Several pullouts, scenic overlooks, and trailheads were identified in the 1997 Draft EIS. Many of those sites are no longer applicable because the highway alignments for Alternatives 2 through 2C have been revised to avoid or minimize potential impacts to resources such as wetlands and trees with bald eagle nests. DOT&PF and the USFS reconsidered appropriate sites for the different alternatives in 2003. The following sites are likely to be constructed in the event that Alternative 2, 2A, 2B, or 2C is the selected alternative. These sites are shown on Figure 4-1.

- 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 (Alternatives 2, 2B, and 2C).
- A Lace and Berners River pullout would be located just after the bridge over the Lace River (Alternatives 2, 2B, and 2C).
- A Slate Cove pullout would be located west of Slate Cove (Alternatives 2, 2A, 2B, and 2C).
- 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 (Alternatives 2, 2A, 2B, and 2C).
- 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 (Alternatives 2, 2A, 2B, and 2C).
- A pullout and scenic overlook would be located near Eldred Rock (Alternatives 2, 2A, 2B, and 2C).
- 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 (Alternatives 2, 2A, 2B, and 2C).
- A pullout and scenic overlook would be located in a valley south of the Katzehin River (Alternatives 2, 2A, 2B, and 2C).
- A pullout and scenic overlook would be located north of the Katzehin River (Alternatives 2, 2A, 2B, and 2C).
- 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 Dayebas Creek (Alternatives 2, 2A, and 2C).
- A pullout and scenic overlook would be located near Long Falls (Alternatives 2, 2A, and 2C) below Schubee Glacier.
- Sturgill's Landing currently is a day use area at the end of a 3-mile trail. A highway pullout with toilet facilities would be located to intersect with the existing trail (Alternatives 2, 2A, and 2C).

The environmental impact assessment provided in Section 4.3 includes consideration of the potential impacts of the proposed pullouts and scenic overlooks. The USFS may develop trails at some of the pullouts in the future. (See USFS letter dated March 25, 2004 in Chapter 7 for information regarding trails envisioned by USFS if one of these alternatives is constructed.) A separate environmental assessment would be completed by the USFS for these trails.

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 any new ferry terminal facilities for Alternatives 2, 2A, 2B, and 2C is presented in Table 4-1. As indicated in that table, over 90 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. Approximately one percent of the land that would be required by Alternatives 2, 2A, and 2C is already owned by the state. About two to three percent of the land required by Alternatives 2 through 2C is owned by Goldbelt, and the remaining land is owned by the City of Skagway or other parties including the Alaska Mental Health Trust. For Alternative 2B the highway would end at the Katzehin River delta, and no land owned by Skagway or the Mental Health Trust would be required for the project. Goldbelt, Skagway, the Mental Health Trust, 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 Alternatives 2 through 2C

Alternative[1]	Ownership (acres)							Total (acres)
	USFS	U.S. Coast Guard	State of Alaska	Mental Health Trust	Goldbelt	Skagway	Private	
2	2,223	37	32	3	55	37	5	2,392
2A	1,820	37	32	3	55	37	5	1,989
2B	1,719	29	0	0	55	0	5	1,808
2C	2,223	37	32	3	55	37	5	2,392

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 Alternatives 2 through 2C; therefore, these alternatives are consistent with the TLMP. A portion of the USFS land crossed by the alignments for Alternatives 2, 2B, and 2C 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 for Alternatives 2 through 2C 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 2, 2A, 2B, or 2C 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 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 2 through 2C are 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). Alternatives 2 through 2C cross 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.

The Skagway Comprehensive Plan (City of Skagway, 1999) is also silent on a highway link to Juneau.

4.3.1.3 Land and Resource Uses

Alternatives 2 through 2C 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 Alternatives 2 through 2C to provide use of Tongass National Forest lands (Figure 4-1).

Alternatives 2 through 2C 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. 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 Alternatives 2 through 2C 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. For instance, current users of the Berners Bay cabin who travel there by kayak, canoe, small boat, or float plane would find the experience there different if the cabin were accessible by road. Alternatives 2 and 2C would provide access to recreation along the full corridor on the east side of Lynn Canal, as each alternative would include a highway from Echo Cove to Skagway. Alternative 2A would not provide direct road access between Sawmill Cove and Slate Cove, leaving that area unchanged. Under Alternative 2B, the highway would end north of the Katzehin River delta, and remote and semi-remote recreational opportunities would continue to be available along the east Lynn Canal coast between there and Skagway.

Many of the rivers and streams that would be crossed by Alternatives 2 through 2C 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 Alternatives 2 through 2C. As in other readily accessible regions of the state, the Alaska Department of Fish and Game would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect those resources from overutilization.

The commercial activities of Goldbelt could be expanded with improved access to its Echo Cove lands. Better access and through-traffic resulting from Alternatives 2 through 2C would facilitate development opportunities, including transportation-related activities, recreation, tourism, and residential development.

Alternatives 2, 2B, and 2C 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.

4.3.1.4 Parks and Recreation Facilities

No land from a municipal, state, or federal park or recreation area would be required by Alternatives 2 through 2C. Based on a USFS request, the Berners Bay cabin would be provided with handicapped access from the highway under Alternatives 2, 2B, and 2C. See Chapter 6 for further discussion of potential impacts to public recreation facilities.

4.3.2 Coastal Zone Management

Alternatives 2 through 2C are 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 by non-federal entities that affect the coastal zone, such as the highway and ferry terminal uplands for Alternatives 2 through 2C, must be consistent with the ACMP and the consistency provisions of Section 307 of the Coastal Zone Management Act for all land impacted.

The topics addressed by the enforceable policies of the ACMP and the district coastal management plans that are relevant to Alternatives 2 through 2C 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 or affecting the coastal zone, including transportation projects.

Alternatives 2 through 2C have 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 and Skagway coastal management plans following the ACOE and ADNR public notice period as part of the process to obtain the necessary state and federal permits for the project.

4.3.3 Visual Resources

Visual simulations were made of Alternatives 2 through 2C 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 alternatives 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 2 through 2C 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. At closer distances, the ferry terminal at Sawmill Cove and associated highway proposed for Alternative 2A 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 4-4 is a visual simulation of the highway in the foreground at the Sawmill Cove Ferry Terminal, which is proposed for Alternative 2A. 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 ½ 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.

Figure 4-5 is a visual simulation of the highway under Alternatives 2, 2B, and 2C 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 4-6 provides a visual simulation of Alternatives 2, 2B, and 2C 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.

Figure 4-7 is a visual simulation near the Slate Creek Ferry Terminal, which is proposed for Alternative 2A. The highway would traverse very gentle terrain in a continuous closed-canopied forest. Although the visibility of cut-and-fill areas would be reduced as a factor of terrain characteristics, the removal of vegetation would create a distinct line across this small peninsula. Changes to the natural rounded form characteristics would be noticeable from views of the highway at a perpendicular angle, as the roadway would create a distinct notch as it crests over the peninsula. The proposed ferry terminal would contrast strongly with the natural landscape because of the closeness of the viewer (i.e., foreground) and the increased visibility of changes to form, line, color, and texture from natural characteristics.

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 Alternatives 2 through 2C include:

- Views from mining roads in the vicinity of Comet
- Views from cruise ships and small boats

Figure 4-8 is a visual simulation of Alternatives 2 through 2C 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 4-9 provides a visual simulation of Alternatives 2 through 2C 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 Alternatives 2 through 2C 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 4-10 provides a visual simulation of Alternatives 2 through 2C 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 – Alternatives 2 through 2C 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 4-11 and 4-12 show visual simulations of Alternatives 2 through 2C within the middleground viewing threshold in this area. From the location assumed in Figure 4-11, 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 rivermouth. 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 4-12, 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 Alternatives 2, 2A, and 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 of Alternatives 2, 2A, and 2C around the base of Mount Villard most susceptible to potential impacts include:

- Views from Portage Cove Campground
- Views from Chilkat State Park
- Views from Haines
- Views from ferries, cruise ships, and small boats

Figure 4-13 provides a visual simulation of these project alternatives in the background viewing threshold from Haines. From this viewpoint, the highway would create a linear band across an unmodified setting. The highway would be sited 60 to 80 feet above the water surface in a closed-canopied forest. The existing natural setting with Mount Villard in the background dominates the viewshed. It is anticipated that the light linear band created by exposing subsurface soil and rock along the proposed highway may be noticeable at this distance but not compete substantially with the existing 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 Mount Villard to Skagway

Views from Lynn Canal – Alternatives 2, 2A, and 2C would affect views in this area. Alternative 2B ends south of Mount Villard and would not be visible from this landscape unit.

In Taiya Inlet south of Skagway between Mount Villard and Mount Harding, views most susceptible to potential impacts include:

- Views from Taiya Inlet
- Views from Sturgill's Landing Day Use Area
- Views from cruise ships, ferries, and small boats
- Views from hiking trails

Figure 4-14 provides a visual simulation of Alternatives 2, 2A, and 2C along Taiya Inlet in this area. This viewpoint represents a characteristic viewpoint of a traveler in a boat in Taiya Inlet. From this viewpoint, the highway would be sited approximately 60 to 80 feet above the water surface. Travelers within Taiya Inlet have foreground, middleground, and background views of the highway. Because of its contrasting line and color, the highway would be visible even in background views of this area.

Views most susceptible to potential impacts at the northern end of Taiya Inlet in the vicinity of Skagway include the following:

- Views from the Skagway Historic District
- Views from the White Pass & Yukon Route Railroad
- Views from residences within the valley bottom and on hillsides
- Views from Sturgill's Landing Day Use Area
- Views from ferries, cruise ships, and small boats
- Views from hiking trails
- Views from Dyea Road and the Klondike Highway
- Views from near the NPS campground at the head of Taiya Inlet

The viewpoint for Figure 4-15 is approximately one-half mile from Skagway looking northeast from the approach to the port in -Taiya Inlet. From this location, the highway would be hidden within the immediate foreground viewing threshold. Middleground views would be intermittent at the northern portions of Skagway. Background views, even from within Taiya Inlet approaching Skagway, would be screened by topography from both the northern portions of Skagway and south of Mount Harding. From superior viewing locations at Upper Dewey Lake and other surrounding higher hills and mountains, the highway would be highly noticeable. The lighter color contrast would be noticeable within this moderately developed area given the close proximity of the highway to viewers and the linear nature of the highway ascending into this confined valley. Cruise ships and other man-made features (e.g., the Skagway Airport) detract from the overall existing natural setting in this area, which would lessen the visual contrast of the proposed highway from many viewing locations.

The viewpoint at Figure 4-16 occurs within the foreground viewing threshold of the highway within the vicinity of the Skagway Airport. The topography within this area is very steep and is covered by a continuous forested canopy. Large and continuous cuts are anticipated, which would create a distinct linear feature within the existing setting. It is likely that this portion of the highway would create a visual contrast in the line, color, and texture of the natural landscape.

Figure 4-17 is a view from a scenic pullout along Dyea Road above Skagway. As with the visual simulation shown in Figure 4-14, the highway would create a clear linear feature in the existing viewshed. This feature would contrast in line, color, and texture with the existing natural landscape.

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. However, there would be only intermittent views of the road and the bridge over the railroad tracks at 23rd Avenue from the core of the Klondike Gold Rush NHP, where vistas are screened or blocked by buildings and other features of the natural and developed environment. The bridge at 23rd Avenue is at the northern end of town, where both foreground and middleground views are predominately of modern development.

Figure 4-18 is a visual simulation of Alternatives 2, 2A, and 2C from a viewpoint near the NPS Dyea campground at the head of Taiya Inlet. The highway would be located approximately three to five miles from this viewpoint. The highway would be noticeable as a line along Taiya Inlet in the background of views from the inlet looking south. Form and texture changes are not as noticeable as line and color contrast created by exposing sub-soil and rock and through physical landform modifications. These changes could create a noticeable linear feature for several miles along the inlet.

Views from the Highway – From Mount Villard to Mount Harding, the highway is high above the water (60 to 80 feet), providing panoramic views of the narrow Taiya Inlet. Because of the steep forested slopes on both sides of the narrow inlet, views would tend to be drawn to the north toward Skagway, which would become visible about one-half mile south of the town. At the northern end of Taiya Inlet, the topography would more strongly focus views toward Skagway, and as the highway approaches the town, it would provide panoramic views of the Skagway and White Pass District NHL and Klondike Gold Rush NHP.

4.3.3.5 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. Alternatives 2 through 2C would be consistent with this VQO. Where ever 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. In many locations, the alternatives would exceed the VQO of Modification. In order to demonstrate the overall visual effect of the alternatives, DOT&PF also evaluated the alternatives' consistency with the VQOs of the adjacent LUDs.

Berners Bay – USFS LUD II land at the north end of Berners Bay has a VQO of Retention. From Echo Cove to south of the Antler River delta, the VQO is Partial Retention. Alternatives 2 through 2C would be visible from many of the views of the coastline from the bay; therefore, the alternatives would not conform to the VQOs of adjacent land in most of the area.

Point St. Mary to Eldred Rock – USFS land is this area has a VQO of Retention. Because of the gentle terrain and homogeneous vegetative cover in this area, Alternatives 2 through 2C would not be visible from most Lynn Canal views; therefore, the alternatives would meet the VQO of the adjacent land.

Eldred Rock to Mount Villard – Most of the USFS land from Eldred Rock to Mount Villard has a VQO of Partial Retention. The Katzehin River delta and the coastline east of Anyaka Island have a VQO of Retention. The area east of Shikosi Island has a VQO of Maximum Modification. From Mount Villard to the Katzehin River delta, Alternatives 2, 2A, and 2C would be consistent with the VQO of adjacent lands because the highway would be largely masked from views from the Lynn Canal by topography and vegetation. The VQO of adjacent land would not be met at the Katzehin River delta because the proposed bridge crossing for Alternatives 2 through 2C would be visible in foreground and middleground views from Lynn Canal. South of the Katzehin River delta, Alternatives 2 through 2C would be visible from many views from Lynn Canal; therefore, they would not be consistent with the VQO of adjacent land except in the vicinity of Shikosi Island.

Mount Villard to Skagway – USFS land in this area has a VQO of Retention. Because the proposed alignment for Alternatives 2, 2A, and 2C would be sited approximately 60 to 80 feet above the water, a highway would be visible along most of the alignment from Skagway to Mount Villard. Therefore, it would not meet the VQO of adjacent land in this area.

4.3.4 Historical and Archeological Resources

Based on record searches and surveys of the study area, Alternatives 2 through 2C would not affect any known prehistoric resources. Consultations with Native Tribes and organizations have not indicated that these alternatives would impact any traditional cultural properties. Historic resources potentially affected by Alternatives 2 through 2C are discussed below.

Alternatives 2, 2B, and 2C 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 3-6). At this location, the rails on the tram are visible on the ground between the shore and a rock bluff to the west. The alternatives would bridge over the tram to the top of the rock bluff, leaving the tram intact. These alternatives would impact no other structures or features that contribute to the Jualin Historic Mining District. For these reasons, FHWA has determined that Alternatives 2, 2B, and 2C would not have an adverse effect on the Jualin Historic Mining District.

Alternatives 2 through 2C would cross the Comet/Bear/Kensington Railroad (Figure 3-6), 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 alternatives 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 Alternatives 2 through 2C would not have an adverse effect on the Comet/Bear/Kensington Historic Mining District.

Alternatives 2 through 2C would pass between two discontinuous units of the Ivanhoe/Horrible Historic Mining District (Figure 3-6). Therefore, FHWA has determined that Alternatives 2 through 2C would have no effect on the Ivanhoe/Horrible Historic Mining District.

Alternatives 2 through 2C 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 Alternatives 2 through 2C would not have an adverse effect on the Berners Bay Historic Mining District.

The APE for Alternatives 2, 2A, and 2C includes the Dayebas Creek Mill Site. Due to the fact that this site is eligible because of its potential for historic information and highway construction would not occur at the site itself, these alternatives would not affect the site. Therefore, FHWA has determined that Alternatives 2, 2A, and 2C would have no effect on the Dayebas Creek Mill Site.

Alternatives 2, 2A, and 2C would pass through the Skagway Hydroelectric Complex District, which is eligible for the National Register of Historic Places (NRHP), and cross above the pipelines and tramway west of and below the dam and reservoir. The alternatives would affect the District, but this effect would not be adverse because the proposed highway would bridge over the pipelines and tramway. The bridge design would be based on a form (i.e., steel arch) that would minimize visual contrast to the historic resources. For this reason, FHWA has determined that Alternatives 2, 2A, and 2C would not have an adverse effect on the Skagway Hydroelectric Complex District.

Alternatives 2, 2A, and 2C would cross the Lower Dewey Lake Trail near the northern end of Lower Dewey Lake. The same bridge that crosses the pipeline and tramway of the Skagway Hydroelectric Complex District would go over the trail. Because the highway would span the trail, FHWA has determined that Alternatives 2, 2A, and 2C would not have an adverse effect on the Lower Dewey Lake Trail.

The proposed highway alignment for Alternatives 2, 2A, and 2C would end in the Skagway and White Pass District NHL. Northeast of Lower Dewey Lake, the proposed alignment into Skagway would run diagonally down the intermittently vegetated, irregular rock bluff east of town and cross a bridge over the railroad tracks to connect with the Klondike Highway at 23rd Avenue. The proposed alignment runs east and north of the Skagway unit of the Klondike Gold Rush NHP, but enters the Skagway and White Pass District NHL as it starts down the bluff.

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.

Setting refers to the character of the place in which Skagway played its historical role and the town's relationship to surrounding features and open space. Physical features that constitute the setting of the Klondike Gold Rush NHP and Skagway and White Pass District NHL are both natural and man-made, and include such elements as topography and vegetation. For such historic districts, setting includes not only the relationships between buildings and other features within the exact boundaries of the property, but also the relationships between the properties and their surroundings (NPS, 1991). Because landscapes change over time as vegetation grows, land use practices change, and structures deteriorate, what is important is the general character and feeling of the historic period[13].

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. The nearest contributing structures to the alignment are at the corner of Main Street and 22nd Avenue. These structures are the Shearer cabin, a "dilapidated, one story log cabin converted to a garage," and the Ed Hestness House, a two-story framed structure. These buildings are listed as contributing resources 249 and 250 in the Skagway and White Pass District nomination (Norris, Cole, and Houston, 1999). The Gold Rush Cemetery, another contributing element of the Skagway and White Pass District, is located approximately one-half mile northeast of 23rd Avenue just below Reid Falls.

The proposed highway would have a visual effect on the setting of the Klondike Gold Rush NHP and Skagway and White Pass District NHL under the evaluation criteria set forth in the implementing regulations for Section 106 of the National Historic Preservation Act found at 36 CFR 800.4(d)(2). The degree of visual effect on the Skagway and White Pass District NHL depends on many factors, including the sensitivity of the viewer and existing visual elements. Distance is also a large factor, so that the proposed road cut and the bridges would not be major features of the landscape unless the viewer had an open view from at least one-quarter of a mile away. 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. For example, the vista toward town from the southern-most bridge over the Skagway River, the first clear view of Skagway along the Klondike Highway, is currently of a modern highway bridge, a new pedestrian bridge, the railroad yard, the airport runway, and modern houses.

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. Furthermore, the final appearance of the road cut and bridges over Dewey Creek and the railroad tracks would be developed during design with input from the City of Skagway and the NPS to minimize the effect on the historic physical setting and cultural landscape of the community. For these reasons, FHWA has determined that Alternatives 2, 2A, and 2C would not have an adverse effect on the Skagway and White Pass District NHL and the Klondike Gold Rush NHP.

Alternatives 2 through 2C 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, 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.

[13] During the historic period, the hillside to the east of Skagway where the proposed highway would be constructed was logged for building materials and firewood. The area has since been revegetated.

4.3.5 Socioeconomic Resources

4.3.5.1 Overview

The improved access in the Lynn Canal that would result from Alternatives 2 through 2C 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 Alternatives 2 through 2C. However, it is possible that improved access would 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 above, 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 highway access would 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 Alternatives 2 through 2C. 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 2 through 2C is estimated to range from 125 annual ADT (Alternatives 2A and 2B) to 185 annual ADT Alternative 2) in 2008[14]. Assuming all traffic is round-trip, two annual ADT equals one additional visiting vehicle carrying an average of 2.3 people[15]. Therefore, Juneau is projected to receive a total of 52,000 (Alternatives 2A and 2B) to 78,000 (Alternative 2) new non-Juneau resident visitors in 2008. From the 2003 Alaska Travelers Survey (see Appendix H) and the 1994 household survey (McDowell, 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 to \$8.6 million in 2008 as a result of Alternatives 2 through 2C (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 between \$3.2 million and \$4.7 million in new payroll and between 110 and 160 additional annual average jobs (Table 4-2).

[14] These estimates are less than half of total traffic associated with each alternative because Juneau residents would account for the majority of traffic on a highway. The estimates of new traffic also do not include baseline traffic because that traffic is already affecting the economy.

[15] Based on the Skagway and Haines border crossings average vehicle occupany (USDOT, 2001).

Table 4-2
2008 East Lynn Canal Highway Alternatives
Visitor Spending and Related Impacts in Juneau

Description	East Lynn Canal Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	510	390	380	410
Vehicle Traffic Less Residents and Baseline Traffic	185	125	125	140
Total New Visitors[1] per year	78,000	52,000	52,000	58,000
Total New Visitor Spending per year	$8,600,000	$5,800,000	$5,700,000	$6,400,000
New Local Payroll per year	$4,700,000	$3,200,000	$3,200,000	$3,500,000
New Local Employment	160	110	110	120

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not Juneau residents.

Traffic on Alternatives 2 through 2C is predicted to increase at an annual rate of approximately 2 percent for the 30-year forecast period considered in this Supplemental Draft 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).

Table 4-3
2038 East Lynn Canal Highway Alternatives
Visitor Spending and Related Impacts in Juneau

Description	East Lynn Canal Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	930	670	670	730
Vehicle Traffic Less Residents and Baseline Traffic	335	225	225	250
Total New Visitors[1] per year	140,400	93,600	93,600	104,400
Total New Visitor Spending per year	$15,480,000	$10,440,000	$10,440,000	$11,520,000
New Local Payroll per year	$8,460,000	$5,760,000	$5,760,000	$6,300,000
New Local Employment	290	200	200	220

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[16]. Therefore, the 110 to 160 new jobs in Juneau resulting from Alternatives 2 through 2C in 2008 would be expected to result in a population increase of between 170 and 250 residents. By 2038, the population increase would reach between about 300 and 430 residents. A population increase in Juneau of up to 430 residents would represent an overall increase of about 1 percent of Juneau's current population (approximately 31,000).

Assuming 2.6 persons per household, a population increase of 250 residents would result in additional demand for about 100 housing units in 2008, and a population increase of 430 residents in 2038 would result in a demand for about 165 housing units. Juneau had approximately 320 vacant housing units in 2001. Although the housing demand associated with

[16] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

Alternatives 2 through 2C in 2008 and 2038 is less than the existing vacancy rate, some additional housing development would probably occur in anticipation of increased demand.

Alternatives 2 through 2C 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 swap in Berners Bay between the USFS and the Cape Fox Corporation would put additional land in private-sector ownership. 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 between \$5.7 and \$8.6 million in 2008 would generate (assuming all of the spending is taxable) \$290,000 to \$430,000 in additional sales tax revenues (based on a five percent tax rate). In 2038, additional visitor spending of between about \$10.4 and \$15.5 million would generate \$520,000 to \$775,000 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 – Alternatives 2 through 2C 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. Alternatives 2 through 2C would not impact any of these factors.

As indicated above, the independent visitor industry in Juneau would benefit from Alternatives 2 through 2C. With completion of a highway, 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 Alternatives 2 through 2C. 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 account for 10,000 household trips a year to Juneau, or about 20,000 total visitors. Also, Juneau would capture a somewhat larger share of the Alaska Highway market. The traffic forecast estimates that trips from this market would average 10 annual ADT, which translates into about 4,000 additional independent visitors per year to Juneau. The increase in non-resident traffic to Juneau would be lower for Alternatives 2A and 2B, which include ferry links, than for Alternatives 2 and 2C, which provide uninterrupted highway connection to the Alaska/Canada highway system.

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 of highway access is estimated to be approximately 10,000 to 12,000, 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 Alternatives 2 through 2C 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.

Construction of Alternatives 2 through 2C 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 90 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 five to 10 years.

Development of Alternatives 2 through 2C could affect operation of the Kensington Gold Project. The decision to develop the mine and its productive life is not contingent on a highway. In fact, the mine would likely be fully operational before Alternatives 2 through 2C could be constructed. Couer 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 deep-water port. This method of moving supplies and product would continue even if Alternatives 2 through 2C 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 on Alternatives 2 through 2C could reduce the cost of transporting workers to the site. It could also help to ensure prompt medical responses to injuries of mine personnel.

Juneau's seafood processing industry would benefit from Alternatives 2 through 2C as a result of 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. Alternatives 2 and 2C would have the greatest effect on this industry with no ferry links to restrict travel times.

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 Alaska Marine Lines (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 – Alternatives 2 through 2C are not expected to impact Juneau utilities. All of the utilities are adequate to accommodate any population increases attributable to the improved access afforded by Alternatives 2 through 2C through 2038.

Much of the information provided below on the effects of Alternatives 2 through 2C 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 Alternatives 2 through 2C would be an increase of less than one percent by 2038. This increase would mean an additional 20 to 30 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 Alternatives 2 through 2C. 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 City and Borough of Juneau. Local officials do not anticipate that additional staff would be required to patrol the area.

In response to concerns voiced in the 2003 public scoping meetings for this 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 five percent of arrests in the City and Borough of Juneau involve non-residents and less than two 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 Alternatives 2 through 2C is estimated to range from 30 annual ADT (Alternative 2C) to 115 AADT (Alternative 2) 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 in non-Haines resident visitors of between 12,000 (Alternative 2C) and 48,000 (Alternative 2) in 2008. Assuming that visitors would spend an average of $50 to $60 per trip in Haines (Southeast Strategies, 2000 and McDowell, 2002), visitor spending in the community would increase by $700,000 to $2.8 million in 2008 as a result of Alternatives 2 through 2C.

In terms of economic impact, increased spending in Juneau by Haines residents would offset some of the new visitor spending in Haines. Approximately 10 percent of new spending that would occur in Juneau with Alternatives 2 through 2C would be by Haines residents, and this spending would range between $600,000 and $900,000 in 2008. Based on these estimates, total visitor spending in Haines would result in an increase of approximately $100,000 (Alternative 2C) to $1.9 million (Alternative 2) in 2008 (Table 4-4). A net increase in visitor spending in Haines of $1.9 million would generate $800,000 in new payroll and an annual average of 40 additional jobs.

Traffic on Alternatives 2 through 2C is predicted to increase at an annual rate of approximately two percent for the 30-year forecast period considered in this Supplemental Draft 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 4-4
2008 East Lynn Canal Highway Alternatives
Visitor Spending and Related Impacts in Haines

Description	East Lynn Canal Highway Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	225	170	190	120
Vehicle Traffic Less Residents and Baseline Traffic	115	80	100	30
Total New Visitors[1] per Year	48,000	33,000	42,000	12,000
Total New Visitor Spending per Year	$2,800,000	$1,900,000	$2,500,000	$700,000
Less New Haines Resident Spending in Juneau	$900,000	$600,000	$700,000	$600,000
Net Annual Change In Spending In Haines	$1,900,000	$1,300,000	$1,800,000	$100,000
New Local Payroll per Year	$800,000	$500,000	$700,000	-
New Local Employment	40	25	35	-

Note: Annual ADT = annual average daily traffic
[1]New visitors would be all visitors who are not residents of Haines.

Table 4-5
2038 East Lynn Canal Highway Alternatives
Visitor Spending and Related Impacts in Haines

Description	East Lynn Canal Highway Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	405	305	340	215
Vehicle Traffic Less Residents and Baseline Traffic	207	144	180	54
Total New Visitors[1] per Year	86,400	59,400	75,600	21,600
Total New Visitor Spending per Year	$5,040,000	$3,420,000	$4,500,000	$1,260,000
Less New Haines Resident Spending in Juneau	$1,620,000	$1,080,000	$1,260,000	$1,080,000
Net Annual Change In Spending In Haines	$3,420,000	$2,340,000	$3,240,000	$180,000
New Local Payroll per Year	$1,440,000	$900,000	$1,260,000	-
New Local Employment	70	45	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[17]. Therefore, for the maximum of 40 new jobs in Haines in 2008, the population would increase by about 60 residents or about three percent of the existing Haines population (2,360). In 2038, the population would increase by a maximum of about 100 residents, which represents about four percent of the existing Haines population. As indicated in Tables 4-4 and 4-5, Alternative 2C is projected to have no population effect on Haines, and Alternatives 2A and 2B would have population effects somewhat lower than Alternative 2.

A population increase of 60 residents would result in additional demand for about 25 housing units in 2008, assuming 2.4 persons per household. In 2038, housing demand would reach a maximum of 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

[17] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Haines population participates in the local labor force.

residents may seek seasonal or year-round homes in Haines with Alternatives 2 through 2C. 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 Alternatives 2 through 2C 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 between $100,000 (Alternative 2C) and $1.9 million (Alternative 2) in 2008 would generate $5,500 to $100,000 in additional sales tax revenues (based on a 5.5 percent tax rate). In 2038, additional sales tax revenues would range from about $10,000 (Alternative 2C) to $188,000 (Alternative 2). 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. Alternatives 2 through 2C would affect Haines' non-Alaskan independent market but would not affect the cruise market.

As indicated above, visitor traffic to Haines is expected to increase with Alternatives 2 through 2C. 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 Alternatives 2 through 2C would be the degree to which Haines develops and promotes local assets and attractions.

Alternatives 2 through 2C 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 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 Alternatives 2 through 2C 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 increase in students resulting from Alternatives 2 through 2C 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 Alternatives 2 through 2C based on the potential population growth associated with these alternatives through 2038. Haines' water supply and wastewater treatment system is adequate to accommodate 10 percent population growth. Alternatives 2, 2A, and 2B would generate a maximum of about four 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 Southeast Alaska Regional Health Consortium (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.

Quality of Life – Haines' quality of life would change in a number of ways as a result of Alternatives 2 through 2C. 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 indicated above and in Section 4.3.7, traffic would increase in Haines with Alternatives 2 through 2C. It is also projected that residents of Haines would increase their spending in Juneau. For Alternatives 2 through 2C, increased spending in Juneau may be off-set 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 Alternatives 2 through 2C 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, 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, Alternatives 2 through 2C are expected to economically benefit the community. The total increase in non-Skagway resident traffic to Skagway associated with Alternatives 2 through 2C is estimated to range from 100 annual ADT (Alternative 2B) to 320 annual ADT (Alternative 2C) 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 between 43,000 (Alternative 2B) and 134,000 (Alternative 2C) in 2008. Independent visitors would spend an average of $50 per trip in Skagway (Southeast Strategies, 2000). This expenditure would result in an annual increase in visitor spending of $2.1 million (Alternative 2B) to $5.0 million (Alternative 2C) in 2008 (Table 4-6). This net increase in visitor spending in Skagway would generate from $900,000 (Alternative 2B) to $2 million (Alternative 2C) in new payroll and an annual average increase in jobs of 30 (Alternative 2B) to 70 (Alternative 2C) (Table 4-6).

Table 4-6
2008 East Lynn Canal Highway Alternatives
Visitor Spending and Related Impacts in Skagway

Description	East Lynn Canal Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	285	220	190	410
Vehicle Traffic Less Residents and Baseline Traffic	180	125	100	320
Total New Visitors[1] per year	75,000	53,000	43,000	134,000
Total New Visitor Spending per year	$3,700,000	$2,600,000	$2,100,000	$5,000,000
New Local Payroll per year	$1,500,000	$1,100,000	$900,000	$2,000,000
New Local Employment	50	40	30	70

Note: Annual ADT = annual average daily traffic
[1]New visitors are all visitors who are not Skagway residents.

Traffic on Alternatives 2 through 2C is predicted to increase at an annual rate of approximately two 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 Alternatives
Visitor Spending and Related Impacts in Skagway

Description	East Lynn Canal Alternative			
	2	2A	2B	2C
Highway Traffic (Annual ADT)	515	395	340	740
Vehicle Traffic Less Residents and Baseline Traffic	325	225	180	575
Total New Visitors[1] per year	134,000	95,000	78,000	241,000
Total New Visitor Spending per year	$6,660,000	$4,680,000	$3,780,000	$9,000,000
New Local Payroll per year	$2,700,000	$1,980,000	$1,620,000	$3,600,000
New Local Employment	60	70	55	125

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[18]. Therefore, the population of Skagway would increase by 40 to 90 new residents in 2008 and by about 70 to 160 new residents in 2038. This would represent an increase of five to 11 percent over the year-round population of the community (840) and approximately two to five percent over the summer population in 2008, and about double that in 2038.

A population increase of 90 residents would result in additional demand for about 40 housing units in 2008. The demand for housing would increase to a maximum of about 70 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 from $80,000 to $200,000 in additional sales tax revenues in 2008. In 2038, sales tax revenues would increase by about $140,000 to $360,000.

Industry/Commercial Sectors – Construction of a highway between Juneau and Skagway 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) recently discussed the proposed highway alternatives during the 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 their member lines carry 97 percent of Alaska cruise passengers.

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.

---

[18] Based on an estimated participation rate of 77 percent, meaning that 77 percent of the Skagway population participates in the local labor force.

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 Alternatives 2 through 2C 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, 2003). 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 Alternatives 2 through 2C 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 Alternatives 2 through 2C, particularly for those alternatives that include a ferry link. The cost of off-loading vans or fuel in Juneau and then trucking to Skagway or the Yukon is more than the cost associated with barge transportation.

Public Utilities and Services – Much of the information provided below on the effects of Alternatives 2 through 2C 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 maximum increase in students resulting from Alternatives 2 through 2C would be about 16 in 2038 spread across all grades.

Alternatives 2 through 2C 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 Alternatives 2 through 2C are 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 highway traffic and a new roadway south of Skagway would impact the Skagway fire department. The department's small size and reliance on volunteers would make responding to multiple emergencies difficult. 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 Alternatives 2 through 2C. 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 Alternatives 2 through 2C.

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 above 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. As indicated in Section 4.3.7, traffic would increase in Skagway with Alternatives 2 through 2C. It is also projected that residents of Skagway would increase their spending in Juneau. For Alternatives 2 through 2C, this increased spending may be off-set 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 Alternatives 2 through 2C on Juneau, Haines, and Skagway, see the *Socioeconomic Effects Technical Report* (Appendix H).

4.3.6 Subsistence

Haines and Skagway residents use the Katzehin River area for subsistence harvest of marine invertebrates and marine mammals. Alternatives 2 through 2C, 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.

4.3.7 Transportation

The 2004 Southeast Alaska Transportation Plan calls for construction of a highway from Juneau to Skagway with a shuttle from Katzehin to Haines. Alternative 2 is consistent with this plan. Alternatives 2A, 2B, and 2C contain elements of the plan regarding Lynn Canal but are not completely consistent.

4.3.7.1 Capacity and Demand

Traffic demand for Alternatives 2 through 2C 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 Alternatives 2 through 2C is provided in Table 4-8. A comparison between the No Action Alternative and Alternatives 2 through 2C indicates that these build alternatives would generate and accommodate substantially more travel demand in the Lynn Canal corridor than the No Action Alternative. From four to almost six times as much traffic would travel under Alternatives 2 through 2C 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 Alternatives 2 Through 2C

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	96/71[1]
2	510	910	240	1,800	612/30,000[2]
2A	390	680	180	1,350	544/776[2]
2B	380	680	180	1,340	544/636[2]
2C	410	730	190	1,450	408/30,000[3]

Notes: [1]The first number is vehicle capacity between Juneau and Haines and the second number is vehicle capacity between Juneau and Skagway.
[2]The first number is vehicle capacity between Katzehin and Haines and the second number is vehicle capacity between Juneau and Skagway.
[3]The first number is vehicle capacity between Haines and Skagway and the second number is vehicle capacity between Juneau and Skagway.

As shown in Table 4-8, traffic demand is projected to vary among Alternatives 2 through 2C. This variation is a function of unit travel cost and travel time. Alternative 2 with a highway from Echo Cove to Skagway and a short ferry link to Haines would have the lowest unit travel cost and the shortest travel time of any of the alternatives and therefore would generate the greatest travel demand. As travel times and costs increase with ferry links, projected travel demand decreases.

As traffic demand grows with time, the ability of Alternatives 2 through 2C to accommodate that 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 Alternatives 2 through 2C. These projections assume an increase in travel demand of 1.9 to two percent annually. As indicated in Table 4-9, five to seven times as much traffic would travel on Alternatives 2 through 2C than on the AMHS system under the No Action Alternative in 2038.

By providing a highway on the east side of Lynn Canal, Alternatives 2 through 2C 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 Alternatives 2 through 2C, travel demand between Haines and Skagway is projected to increase to 89 ADT in 2008 and 138 ADT in 2038.

Table 4-9
2038 Forecast Demand and Capacity to Haines and Skagway for the No Action Alternative and Alternatives 2 Through 2C

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1—No Action	130	230	60	460	96/71[1]
2	930	1,640	430	3,250	912/30,000[2]
2A	670	1,190	310	2,360	720/600[2]
2B	670	1,190	310	2,350	640/636[2]
2C	730	1,290	340	2,560	576/30,000[3]

Note: [1]The first number is vehicle capacity between Juneau and Haines and the second number is vehicle capacity between Juneau and Skagway.
[2]The first number is vehicle capacity between Katzehin and Haines and the second number is vehicle capacity between Juneau and Skagway.
[3]The first number is vehicle capacity between Haines and Skagway and the second number is vehicle capacity between Juneau and Skagway.

The summer ADT between Juneau and Haines with Alternatives 2 through 2C is projected to range from 220 (Alternative 2C) to 399 (Alternative 2) vehicles in 2008 and 388 (Alternative 2C) to 723 (Alternative 2) vehicles in 2038. The summer ADT between Juneau and Skagway is projected to range from 339 (Alternative 2B) to 733 (Alternative 2C) vehicles in 2008 and 594 (Alternative 2B) to 1,294 vehicles (Alternative 2C) in 2038. The number of ferry trips and ferry capacity between Haines and Katzehin (Alternatives 2 through 2B) or Skagway (Alternative 2C) has been sized to accommodate the combined projected summer ADT including the demand for travel just between Haines and Skagway.

4.3.7.2 Travel Flexibility and Opportunity

Alternative 2 would provide the greatest increase in flexibility and opportunity for travel relative to the No Action Alternative. In summer, travelers to Skagway could use the highway at any time without regard for ferry schedules or reservations. In winter, the road would be closed at times because of weather conditions or avalanches. As indicated in Table 4-16, Alternatives 2 through 2C would be closed an average of 16.5 times per year with a total projected closure time of about 34 days per year. The shuttle ferry(s) associated with Alternatives 2 through 2C could carry northbound and southbound traffic between Haines, Skagway, and Juneau when the highway is closed. Generally, a shuttle ferry would only be used for this purpose if the road were closed for two or more consecutive days. *The M/V Aurora* would provide passage for 34 vehicles per day in each direction for Alternatives 2, 2B, and 2C and 68 vehicles per day for Alternative 2A using the Sawmill Cove terminal. Other AMHS ferries could be used to supplement the *M/V Aurora* if necessary. See Section 4.3.8.2 for more detail.

Under Alternative 2, travelers to Haines would take a ferry from Katzehin to Haines. It is projected that there would be nine ferry trips per day to Haines in the summer and six per day during the winter. This would be a substantial increase in travel flexibility and opportunity compared to the No Action Alternative.

Alternative 2C would provide the same flexibility and opportunity for travel between Juneau and Skagway as Alternative 2. However, because of the longer ferry travel time from Skagway versus Katzehin, there would be fewer trip opportunities between Juneau and Haines. Under Alternative 2C, there would be six ferry trips per day to Haines in the summer and four per day during the winter. Nevertheless, this is still a fivefold increase in travel flexibility and opportunity compared to the No Action Alternative.

Alternatives 2 and 2C would also provide a direct surface transportation link to Whitehorse. This would provide Juneau residents the option of using air service to and from Whitehorse as an alternative to Juneau air service.

Travel flexibility under Alternatives 2A and 2B would be less than for Alternatives 2 and 2C because they would involve a ferry link for all travel between Juneau, Skagway, and Haines. Under Alternative 2A, travel flexibility and opportunity to Skagway would be limited by the Berners Bay shuttles and travel to Haines would require two ferry links (across Berners Bay and from Katzehin to Haines). Two shuttle ferries would operate in Berners Bay in the summer and one in the winter, with 20 round-trips per day between Sawmill and Slate Coves in the summer and 8 round-trips per day in the winter. Alternative 2A would provide eight round-trips per day from Katzehin to Haines. This alternative would still represent a substantial increase in travel flexibility and opportunity compared 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. This alternative also represents a substantial increase in travel flexibility and opportunity relative to the No Action Alternative.

An indirect impact of the forecast demand for Alternatives 2 through 2C would be increased opportunities for travelers to take 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 Katzehin in the summer would operate nine times per day under Alternative 2 and eight times per day under Alternatives 2A and 2B. For Alternative 2C, a Haines/Skagway shuttle would operate six times per day during the summer.

4.3.7.3 Travel Time

Table 4-10 provides a comparison of travel times between the No Action Alternative and Alternatives 2 through 2C. Travel between Juneau and Skagway under Alternatives 2 and 2C would take approximately 2.1 hours, assuming an average travel speed of 45 mph.

As travelers are required to take ferries to reach their destinations, the length of their travel time increases. Alternatives 2 and 2B have the shortest travel time to Haines of the build alternatives on the east side of Lynn Canal (2.5 hours) because of the short shuttle ferry link between Haines and Katzehin. Travel to Haines under Alternative 2C would take 3.4 hours, virtually the same amount of time as the FVF trip under the No Action Alternative, because of the longer shuttle ferry ride from Skagway to Haines in a conventional monohull vessel.

Travel time between Juneau and Skagway with Alternative 2A would be lengthened to 2.6 hours because of the necessary shuttle ferry ride across Berners Bay. Travel between Juneau and Haines under Alternative 2A would take at least 3.0 hours because of the shuttle ferry to Haines from Katzehin as well as the ferry link across Berners Bay. All travel times involving ferries include load and unload time but no additional wait time. For alternatives with two ferry links it is unlikely that no wait time would occur.

Alternative 2B would have the longest travel time between Juneau and Skagway of the build alternatives on the east side of Lynn Canal because of the ferry trip from Katzehin to Skagway; this alternative's travel time would still be shorter than the travel time under the No Action Alternative. Travel time between Juneau and Haines for Alternative 2B would be the same as travel time under Alternative 2, which is an hour less than the travel time for the No Action Alternative on the FVF.

Table 4-10
Travel Times for the No Action Alternative and Alternatives 2 Through 2C

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 2	
Auke Bay – Haines	2.5
Auke Bay – Skagway	2.1
Haines - Skagway	1.2
Alternative 2A	
Auke Bay – Haines	3.0
Auke Bay – Skagway	2.6
Haines - Skagway	1.2
Alternative 2B	
Auke Bay – Haines	2.5
Auke Bay – Skagway	3.0
Haines - Skagway	1.3
Alternative 2C	
Auke Bay – Haines	3.4
Auke Bay – Skagway	2.1
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.

4.3.7.4 State and User Costs

The 30-year life cycle costs for the No Action Alternative and Alternatives 2 through 2C discounted to present (January 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 Alternatives 2 Through 2C ($millions)

Alternative	Capital Cost	Operating Cost	Total Life Cycle Cost
No Action	$87	$179	$267
2	$219	$104	$323
2A	$227	$152	$380
2B	$194	$158	$352
2C	$202	$103	$304

Table 4-12 provides an estimate of the state's portion of these costs. As indicated in the table, the capital cost of Alternatives 2 through 2C 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 Alternatives 2 through 2C, the total state cost, before considering estimated revenues, would be less for any of these build alternatives than for the No Action Alternative. As explained in Chapter 2, Alternatives 2 and 2C would have an annual operating cost of approximately $4.4 million versus $10.2 for the No Action Alternative. The annual operating cost for Alternatives 2A and 2B would be $8.4 million and $9.0 million, respectively.

Table 4-12
Present Value of Capital and Operating Costs to State of Alaska for the No Action Alternative and Alternatives 2 through 2C

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	$51
2	$20	$104	$124	$56	$68	$9
2A	$21	$152	$173	$87	$86	$15
2B	$18	$158	$176	$88	$88	$15
2C	$18	$103	$121	$53	$68	$11

Note: [1]Current 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 2 would be about $7 million more than the No Action Alternative. This is because revenues from fares and onboard ferry services generated by Alternative 2 would be less than half those generated by the No Action Alternative. Alternatives 2A through 2C would have a net cost to the state of about $25 to $27 million more than the No Action Alternative. These build alternatives would also generate less revenues than the No Action Alternative. Alternatives 2 through 2C would carry more vehicles than the No Action Alternative. Therefore, they all would cost the state less than the No Action Alternative on a per vehicle basis.

The total cost[19] 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 Alternatives 2 through 2C. This table also lists the out-of-pocket cost of travel between Juneau and Skagway or Haines for the same family. As indicated in the table, Alternatives 2 through 2C would cost the traveler from 17 to 43 percent of the cost of the same 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.

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 each alternative in present dollars is provided in Table 4-14. As indicated in that table, Alternatives 2 through 2C would provide benefits to travelers of as much as $288 million (Alternative 2) relative to the No Action Alternative over 35 years.

---

[19] Total user costs areout-of-pocket costs, vehicle maintenance and ownership costs, and accident costs.

Table 4-13
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 2 through 2C

Alternative	Haines User Cost[1]	Skagway User Cost[1]
No Action	$180/$180[2]	$237/$237[2]
2	$60/$34	$41/$10
2A	$77/$55	$60/$31
2B	$60/$34	$77/$51
2C	$82/$50	$41/$10

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.

Table 4-14
User Benefits and Net Present Value of Alternatives 2 through 2C Versus the No Action Alternative[1]

Alternative	User Benefits ($million)	Net Incremental Project Costs ($million)[2]	Net Present Value ($million)
2	$288	$173	$115
2A	$240	$193	$46
2B	$226	$156	$70
2C	$271	$157	$114

Note: [1]For the period 2004 to 2038 discounted to current (January 2004) dollars.

[2]Overall project costs minus revenues.

The cost of taking the shuttle ferry between Haines and Skagway would remain the same regardless of the alternative. The fare for a family of four is estimated to be about $40. Under Alternatives 2 and 2A, a traveler could drive between Skagway and Katzehin and take the ferry from Katzehin to Haines. Because of the shorter ferry trip, this would cost less than the Haines/Skagway shuttle. It is estimated that the Katzehin/Haines shuttle fare plus the cost of driving from Skagway to Katzehin would be about $28 for a family of four.

One of the best economic measures 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 Alternatives 2 through 2C are provided in Table 4-14. The net present values of Alternatives 2 and 2C are similar at approximately $115 and $114 million, respectively. Alternatives 2A and 2B have substantially lower net present values for this period of about $46 and $70 million, respectively.

4.3.7.5 Other Transportation Impacts

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.

Alternatives 2 through 2C 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.

Alternatives 2 through 2C 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.

Alternatives 2 through 2C are 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. Alternative 2 would provide a direct highway link between Juneau and Skagway with a short ferry link to Haines, and could divert up to 52 percent of the current air travel between these two communities. For Alternatives 2A and 2B, an estimated 40 percent of air traffic would be diverted. For Alternative 2C, an estimated 42 percent of air traffice would be diverted. As travel time increases with more ferry links, the amount of air travel diverted would decrease. Travelers between Juneau and Haines with substantial time constraints are likely to continue to rely on air transportation, whereas they may choose to use the highway instead of air transportation to travel between Juneau and Skagway.

With Juneau serving as the northern terminus for mainline AMHS service under Alternatives 2 through 2C, the AMHS would only need to operate short shuttles in Lynn Canal. The projected annual AMHS operating costs and estimated AMHS state subsidy for Alternatives 2 through 2C in 2008 is provided in Table 4-15. As indicated in the table, the No Action Alternative is estimated to require a state subsidy of about $3.3 million in 2008. Alternatives 2, 2A, and 2C would require less of a state subsidy for AMHS operations in Lynn Canal in 2008 than the No Action Alternative. Alternative 2 would require the smallest state subsidy at $700,000. As ferry links increase in length or number, the state subsidy required for AMHS service in Lynn Canal increases, with Alternative 2B requiring the largest state subsidy in 2008 at $3.2 million, approximately $100,000 less than the subsidy 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 Subsidy in 2008 for the No Action Alternative and Alternatives 2 Through 2C

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Subsidy ($million)
No Action	$10.2	$3.3
2	$2.9	$0.7
2A	$6.9	$2.6
2B	$7.7	$3.2
2C	$2.9	$0.8

Note: Source DOT&PF, 2004g.

Residents of Haines have expressed concern that an East Lynn Canal Highway could result in the state closing the Haines Highway in winter to reduce maintenance costs. This concern is based on the premise that a direct highway connection to the Klondike Highway via Skagway would reduce the traffic on the Haines Highway. Closing the Haines Highway is unlikely to occur for several reasons. As the traffic forecast indicates, traffic to and through Haines would increase, not decrease, in comparison to the No Action Alternative. Also, the Haines Highway is Canada's official access to tidewater in northern Southeast Alaska, established by international agreement. Furthermore, the Haines Highway is important as a local road as well as a connection to Canada. Haines Borough residents live along the highway throughout its length, all the way to the border.

Rather than jeopardizing winter operation of the Haines Highway, an alternative that substantially increases traffic to both the Haines and Klondike Highways decreases the likelihood of future winter closures of either, but particularly the Klondike. The Klondike Highway is more expensive to the state to maintain, because the snowiest part (the pass) is close to the border. Currently winter traffic counts on the Klondike Highway are lower than on the Haines Highway, in part because there are few residents beyond the downtown Skagway area, and the winter population is smaller than in Haines. Although there are no current plans to close the Klondike under any alternative, it would be more likely under alternatives that result in lower levels of traffic.

Lack of highway access is often cited by capital move proponents as one of the reasons to move the state capital. Alternatives 2 through 2C would provide highway access to Juneau, which would reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the state capital.

The highway proposed for Alternatives 2 through 2C 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. 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.

See the *Traffic Forecast Report* (Appendix C) for additional information on the transportation demand forecast for the proposed project alternatives.

4.3.8 Geology

Alternatives 2 through 2C would not impact any unique geologic resources in the study area. These alternatives 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. 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 g[20] in the project region. 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 Alternatives 2 and 2C crosses 61 avalanche paths (including subpaths). Alternative 2A crosses 60 avalanche paths. Alternative 2B crosses 36 avalanche paths (the proposed highway would end immediately north of the Katzehin River). 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 Alternatives 2 and 2C is 205.2, the unmitigated AHI for Alternative 2A is 204.7, and the 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 Alternatives 2 through 2C would be reduced to an AHI value of 30 or less. 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 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

[20] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

the proposed project (Appendix J) calculated closure periods using weather logs and avalanche observations from the same six years of field studies that were used in the AHI calculations. Estimates 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 Alternatives 2 through 2C 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 Alternatives 2 Through 2C

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
2, 2A, and 2C	$2,790,170	$749,556	34.5	16.5	0.8 to 8.0	29.4
2B	$2,668,070	$719,446	33.9	16.5	0.8 to 7.8	26.5

The avalanche season in the project area runs from November 1 to April 30 with the highest activity from December to March. As indicated in Table 4-16, in an average year the highway would be closed between 34 (Alternative 2B) and 35 days (Alternatives 2, 2A, 2C). Road closures would vary in length from one to eight days, with the average closure lasting two days.

A northern Lynn Canal shuttle ferry is included in Alternatives 2 through 2C. This shuttle ferry would carry northbound and southbound traffic between Haines, Skagway, and Juneau when the highway is closed for more than one or two days. Having an alternative means of moving essential traffic provides not only convenience but reduces the pressure to open the highway in marginal conditions.

The *M/V Aurora* would be diverted from the Haines to Katzehin (or Skagway for Alternative 2C) run to transport vehicles to and from Auke Bay (Alternatives 2, 2B, 2C) or Sawmill Cove (Alternative 2A). Given the *M/V Aurora*'s capacity, on a 12-hour operating schedule 68 vehicles could be moved to and from Auke Bay, and 136 could be moved to and from Sawmill Cove. (If the Coeur Alaska dock at Slate Cove is constructed, the *M/V Aurora* could transport 136 vehicles per 12-hour day around a road closure for any East Lynn Canal Highway alternative.) Based on the SATP, at least one fast ferry will be homeported in Juneau, providing service to Petersburg. During the winter this vessel would also be available to provide additional temporary service in Lynn Canal during road closures.

4.3.8.3 Landslides

Six slide areas have been identified near Alternatives 2, 2A, and 2C, and four in the vicinity of Alternative 2B (Figure 3-11). All of these slides are rockfall slides, with little soil movement, although the initial slides removed large amounts of vegetation. Two of these slides stop above the alignment of Alternatives 2, 2A, and 2C (one above Alternative 2B) and would not pose a problem in terms of safety or maintenance. Of the four slides that have the potential to reach the alignment of Alternatives 2, 2A, and 2C, three are also avalanche paths. These three rock slides on avalanche paths are the only rock slides with potential to reach the alignment of Alternative 2B. 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. The remaining rockslide near Dayebas Creek (Alternatives 2, 2A, and 2C) would be mitigated by constructing a rock catchment ditch along the uphill side of the road. 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 alternatives 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 Alternatives 2 through 2C 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.

4.3.9 Hydrology and Water Quality

4.3.9.1 Floodplains

Planning and preliminary design of Alternatives 2 through 2C have 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 Juneau and Skagway 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. The alternatives 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 Alternatives 2 through 2C would not create significant flood risks.

Impacts on Natural and Beneficial Floodplain Values - Alternatives 2 and 2C would cross the floodplains of 58 streams. Most of these streams are less than 50 feet wide. Bridges would be used to cross 27 streams, including all anadromous fish streams. Fourteen 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. 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 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 remaining streams would be crossed with culverts. The culverts would be sized to pass the 100-year flood.

The Katzehin, Lace, and Antler rivers are navigable in accordance with U.S. Coast Guard guidelines. The bridges over these rivers would require a Rivers and Harbors Act Section 9 permit from the U.S. Coast Guard. These bridges would be constructed to maintain navigation at all tide stages.

Alternative 2A would not include highway construction around Berners Bay; therefore, this alternative would not affect the Lace and Antler rivers or Slate Creek.

Under Alternative 2B, the highway would end at the proposed Katzehin River Ferry Terminal. This alternative would cross 46 streams, including the Katzehin, Lace, and Antler rivers.

Potential for Incompatible Floodplain Development - There are no community floodplain development plans for the project area. The streams crossed by Alternatives 2 through 2C 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.

Alternatives 2 through 2C 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, for Juneau, and in the case of Alternatives 2, 2A, and 2C, for Skagway.

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 no more than 24 inches in diameter with groups of in-line piles spaced approximately 130 feet apart.

4.3.9.2 Hydrology

Alternatives 2 through 2C 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 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.

Ferry terminals at Sawmill Cove and Slate Cove for Alternative 2A and at Katzehin River for Alternatives 2, 2A, and 2B would require the placement of fill (shot-rock generated during highway construction) at each proposed terminal site. The proposed terminals at Sawmill Cove and Katzehin would also require 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 water courses whose drainages include Alternatives 2 through 2C, 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, 2000b). These studies showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below the Alaska Water Quality Standards (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, 2000e). Polynuclear aromatic hydrocarbons were at concentrations below the EPA water quality criteria.

Because of the rural setting of Alternatives 2 through 2C 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 2, which provides the greatest capacity of the alternatives considered for the east side of Lynn Canal, would have a maximum peak week ADT in 2008 and 2038 of 1,800 and 3,250 vehicles, respectively. During all but that week, ADT would be on the order of less than 1,000 vehicles per day.

Highway runoff and melt water from Alternatives 2 through 2C 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 five 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 low due to the rural setting of the highway and the low predicted highway traffic volume.

The following Best Management Practices (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 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 not constructed of shot rock. 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 through fill slopes in appropriate locations to maintain natural flow patterns for surface water.

Ferry operations under Alternatives 2 through 2C 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 Alternatives 2 through 2C would have sanitary waste holding tanks,[21]or would discharge treated wastewater meeting applicable standards. Sewage treatment facilities with a permitted outfall would be installed at the Katzehin (Alternatives 2, 2A, and 2B) and Sawmill Cove and Slate Cove Ferry Terminals (Alternative 2A). Discharges from the sewage treatment facilities 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

[21] Holding tanks would be pumped out and the waste treated onshore for disposal.

minimal and temporary impacts to water quality. This low level of impact would likely continue under Alternatives 2 through 2C.

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.

4.3.10 Air Quality

The increase in traffic on Egan Expressway and Glacier Highway predicted for Alternatives 2 through 2C 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 peak traffic volumes for the construction year (2008) and design year (2038) for Alternatives 2 through 2C. 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 assumed background value of 1 ppm and 2 ppm for rural and urban (e.g., Haines, Skagway, and Auke Bay) segments of Alternatives 2 through 2C indicates that CO concentrations would not approach the 9 ppm CO NAAQS with any of the alternatives.

Marine vessel CO emissions were not modeled for Alternatives 2 through 2C. Marine vessel traffic in the Lynn Canal would decrease with these alternatives, as mainline ferry service north of Juneau would be discontinued. However, ferry operations under all alternatives 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 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 Alternatives 2 through 2C. 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 2, which would have the highest traffic volumes of all the alternatives considered on the east side of Lynn Canal, was estimated at nine percent of the summer average daily traffic (summer ADT). Summer ADT for Alternative 2 is projected to be 910 and 1,640 vehicles in 2008 and 2038, respectively. Therefore, the peak hour traffic for this alternative would be about 80 and 150 vehicles in 2008 and 2038, respectively. These traffic volumes are 15 (2008) and 8 (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 2:

- Year 2008 – 24-hour average: 2.0 $\mu g/m^3$ annual average: 0.6 $\mu g/m^3$
- Year 2038 – 24-hour average: 3.4 $\mu g/m^3$ annual average: 1.0 $\mu g/m^3$

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 Alternatives 2 through 2C.

Alternatives 2 through 2C would burn approximately the same amount of fuel as the No Action Alternative (Table 4-65); however, the No Action Alternative would burn twice as much diesel fuel in ferries than Alternatives 2 through 2C. 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, 29 sites along the alignment of Alternatives 2 through 2C were identified as having the potential for hazardous materials involvement (Figure 3-12). As explained in Section 4.1.10, an impact rating was assigned to those sites within a 300-foot 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 clearup costs.

Based on the ISA screening process, no preliminary site investigations were recommended for any of the sites associated with Alternatives 2 through 2C because no sites were determined to have a high or moderate impact rating.

The Skagway White Pass & Yukon Route Railroad Coach Cleaning Shop is upgradient of the proposed alignment for Alternatives 2, 2A, and 2C on the edge of the 300-foot screening corridor used for this evaluation. The right-of-way required for these alternatives in Skagway would be 150 feet or less. Therefore, the probability that soil or groundwater contaminated with diesel fuel would occur within the right-of-way at this location is low.

The proposed alignment for Alternatives 2, 2A, and 2C would cross perpendicular to the former Skagway to Whitehorse fuel pipeline. There is no documentation that any spills related to the pipeline occurred in the immediate area of the alignment crossing. The highway would be elevated above grade in this area; therefore, no substantial excavations would take place here as part of the proposed project. For these reasons, the probability for hazardous materials involvement at this location is low.

The alignment for Alternatives 2 through 2C 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. 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

Alternatives 2 through 2C would result in filling approximately 100.4 to 118.6 acres of wetlands and other waters of the U.S. The specific aquatic habitats that would be filled for Alternatives 2 through 2C, including habitats impacted by the proposed ferry terminals, are provided in Table 4-17. The preliminary alignment for highway segments of Alternatives 2 through 2C 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.

Approximately 70 to 80 percent of the wetlands impacted by Alternatives 2 through 2C 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.

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 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. Alternatives 2, 2B, and 2C would require the fill of 3.4 acres of palustrine emergent, 19.1 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 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 Alternatives 2, 2B, and 2C was adjusted in 2003 to avoid this wetland.

Adjacent to the Antler and Berners Rivers and on the west shore of Berners Bay, the proposed alignment for Alternatives 2, 2B, and 2C would fill 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 Slate Creek to Sherman Point, Alternatives 2, 2B, and 2C would impact 62.4 acres of wetlands and Alternative 2A would impact 53.4 acres of wetlands, approximately 95 percent of which are palustrine forested wetlands. Approximately 3.2 acres of emergent wetlands would be filled. These wetlands are open fens and muskegs. No salt marsh would be affected. The functions affected by Alternatives 2 through 2C 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 27 acres of the wetlands that would be impacted in this subregion are the result of an 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. The alignment was shifted up hill into forested wetlands in this area in order to avoid the numerous eagle nest trees along the shore.

From Sherman Point to the Katzehin River, Alternatives 2 through 2C 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 94 percent of all of the rocky shoreline impacts of Alternatives 2 through 2C would occur in this portion of the proposed alignment. A total of 19.2 acres of marine habitat would be filled in this area. Potential impacts of this fill are discussed in Section 4.3.14.

Alternatives 2, 2A, and 2B would result in fill of approximately 4.7 acres and Alternative 2C would result in fill of 2.2 acres of estuarine emergent wetlands at the Katzehin River crossing and along the upper levels of the large flats on the north side of the delta. This fill would modify the surface hydrologic control functions and reduce riparian support and wildlife habitat functions in the area. Salt marsh habitat on the Katzehin River outwash plain is quite extensive, and the portion of the marsh potentially affected by Alternatives 2 through 2C is a narrow band located at the highest levels of the marsh. Impacts to the wildlife habitat functions would consist of direct loss of habitat and potential disruption of wildlife corridors between the estuary and the adjacent forested uplands. This potential fragmentation of habitat is discussed further in Section 4.3.16.

Sand would be used on the highway in the winter. A small quantity of salt (up to five 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 indirect effects of Alternatives 2 through 2C on wetlands include the potential introduction of contaminants from 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.

DOT&PF has avoided wetlands to the extent practicable during development of the preliminary alignment for Alternatives 2 through 2C. 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 coordinate with resource agencies to further minimize encroachment on wetlands. Compensatory mitigation would be provided for wetland losses associated with the selected alternative (see Section 5.2 for further information on mitigation).

Table 4-17
Alternatives 2, 2A, 2B, and 2C Total Fill
in Wetlands and Other Waters of the U.S. (Acres)

Subregion	Classification	Alternatives and Areas of Fill (acres)			
		2	2A	2B	2C
Echo Cove to Slate Creek	**Wetlands**				
	Palustrine Emergent	3.4	0.01	3.4	3.4
	Palustrine Forested	19.1	10.3	19.1	19.1
	Palustrine Scrub-Shrub	0.7	0.7	0.7	0.7
	Subtotal	**23.2**	**11.0**	**23.2**	**23.2**
	Marine Areas				
	Rocky Shores	0.0	1.9	0.0	0.0
	Subtotal	**0.0**	**1.9**	**0.0**	**0.0**
Slate Creek to Sherman Point	**Wetlands**				
	Palustrine Emergent	3.2	3.2	3.2	3.2
	Palustrine Forested	59.2	50.2	59.2	59.2
	Subtotal	**62.4**	**53.4**	**62.4**	**62.4**
	Marine Areas				
	Beach Bars	0.0	1.1	0.0	0.0
	Subtotal	**0.0**	**1.1**	**0.0**	**0.0**
Sherman Point to Katzehin River	**Wetlands**				
	Palustrine Forested	1.3	1.3	1.3	1.3
	Estuarine Emergent	0.8	0.8	0.8	0.8
	Subtotal	**2.1**	**2.1**	**2.1**	**2.1**
	Marine Areas				
	Rocky Shores	19.2	19.2	19.2	19.2
	Subtotal	**19.2**	**19.2**	**19.2**	**19.2**
Katzehin River to Skagway	**Wetlands**				
	Estuarine Emergent	4.7	4.7	4.7	2.2
	Subtotal	**4.7**	**4.7**	**4.7**	**2.2**
	Marine Areas				
	Beach Bar	1.3	1.3	1.3	1.3
	Rocky Shores	5.7	5.7	5.7	1.4
	Subtotal	**7.0**	**7.0**	**7.0**	**2.7**
All East Lynn Canal Subregions	**Wetlands**				
	Palustrine Emergent	6.6	3.2	6.6	6.6
	Palustrine Forested	79.6	61.8	79.6	79.6
	Palustrine Scrub-Shrub	0.7	0.7	0.7	0.7
	Estuarine Emergent	5.5	5.5	5.5	3.0
	Subtotal	**92.4**	**71.2**	**92.4**	**89.9**
	Marine Areas				
	Beach Bars	1.3	2.4	1.3	1.3
	Rocky Shores	24.9	26.8	24.9	20.6
	Subtotal	**26.2**	**29.2**	**26.2**	**21.9**
	Subregion Totals				
	Total Wetlands	92.5	71.2	92.5	90.0
	Total Unvegetated Marine Areas	26.2	29.2	26.2	21.9
	Total Acres	**118.6**	**100.4**	**118.6**	**111.8**

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.

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 essential fish habitat 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 *Essential Fish Habitat (EFH) Assessment* (Appendix N).

Construction of Alternatives 2 through 2C 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 2 and 2C would generate approximately 8.7 million cubic yards of excess excavation material, mostly rock. Alternative 2A would generate approximately 7.9 million cubic yards, and Alternative 2B would generate approximately 3.3 million cubic yards. Under these alternatives, up to 2.3 million cubic yards of shot rock would be stockpiled at the ends of the project for future use. For Alternatives 2, 2A, and 2C, 6.4 million cubic yards of rock would be sidecast: 4.4 million cubic yards in Taiya Inlet and 2 million cubic yards in Lynn Canal between Comet and the Katzehin River. For Alternative 2B, only the Comet to Katzehin sidecasting would occur. 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 gowth 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 essential fish habitat due to sidecasting of materials in subtidal areas would be below measurable levels.

The approximate losses of essential fish habitat (intertidal and subtidal habitat) due to highway and ferry terminal construction are:

- Alternative 2: 30.7 acres (21.9 acres filled for highway, 4.3 acres filled for Katzehin Ferry Terminal, and 4.5 acres dredged for ferry mooring basin).
- Alternative 2A: 35 acres (21.9 acres filled for highway, 4.3 acres filled for Katzehin Ferry Terminal, 4.5 acres dredged for Katzehin mooring basin, 1.1 acres filled for Slate Cove

Ferry Terminal, 1.9 acres filled for Sawmill Cove Ferry Terminal, and 1.3 acres dredged for Sawmill Cove mooring basin).

- Alternative 2B: 30.7 acres (21.9 acres filled for highway, 4.3 acres filled for Katzehin Ferry Terminal, and 4.5 acres dredged for ferry mooring basin).
- Alternative 2C: 21.9 acres filled for highway.

Placement of in-water fill in 21.9 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 Alternatives 2 through 2C 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 Alternatives 2, 2A, and 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 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 up to 8.8 acres of intertidal and subtidal habitat from construction of a new ferry terminal[22] would not measurably alter fish populations in the Katzehin River delta area or 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.

Alternative 2A includes new ferry terminals at Sawmill and Slate coves. The Sawmill Ferry Cove Terminal site is over a mile north of the mouth of Sawmill Creek, and the Slate Cove Ferry Terminal site is about 3,000 feet south of Slate Creek. Because of the distance of the terminal sites from the creeks, terminal activities would not impact anadromous fish use of the creek.

The Slate Cove Ferry Terminal site has a highly uniform muddy substrate. A few boulders and cobbles were observed at the southern portion of the site within the intertidal zone during a 2003 survey. No kelp or eelgrass was observed in the subtidal zone. Because of its lack of intertidal and subtidal vegetation, the terminal site is not high value fish habitat or spawning habitat for Pacific herring. No crabs were observed in the subtidal underwater camera survey of Slate Cove. The loss of 1.1 acre of this substrate from terminal construction would not measurably alter fish populations in the Berners Bay area or Lynn Canal.

[22] The fill area for the proposed terminal would be 4.3 acres. Another 4.5 acres would be dredged for a ferry mooring basin.

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 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. 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, the replacement of natural substrates due to terminal construction, and the dredging of approximately 16,000 cubic yards 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 two 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.

The shuttle ferries that would be used in Alternative 2A would increase turbidity in the terminal areas at Slate Cove and Sawmill Cove due to vessel maneuvering. At Slate Cove, where the mud substrate is easily resuspended by natural processes, ambient turbidity is already high and turbidity caused by ferry operations would be within the existing natural range. At Sawmill Cove, turbidity could be increased over ambient conditions for short periods. 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. Because the ferry terminal would impact less than two percent of the spawning area for Pacific herring, the loss of eggs and larvae would not likely affect the population of this 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 Alternatives 2 through 2C would have sanitary waste holding tanks[23]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 Alasaka-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.

Alternatives 2, 2B, and 2C would bridge nine streams that support anadromous fish populations, including the Lace, Antler, and Katzehin Rivers. Alternative 2A would bridge five of these streams, including the Katzehin River. 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 approximately 130 feet apart and would not impede fish movement in these rivers.

---

[23] Holding tanks would be pumped out and the waste treated onshore for disposal.

Most 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" (August 3, 2001).

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 Alternatives 2 through 2C 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 Alternatives 2 through 2C would result in the direct loss of 21.9 (Alternative 2C) to 35 (Alternative 2A) acres of essential fish habitat as a result of filling for highway and ferry terminal construction and dredging, as well as the modification of subtidal habitat resulting from sidecasting shot rock. With Alternative 2A, the habitat loss would include 3.2 acres of historically documented spawning habitat for Lynn Canal Pacific herring stock in Sawmill Cove (Battelle, 2004). 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 2 through 2C 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 Alternatives 2, 2B, and 2C would be placed approximately 130 feet apart and would not impede fish movement in these rivers.

The incremental effect of Alternative 2A on Pacific herring stock is relatively small; therefore, this loss alone is not expected to adversely affect the stock's ability to recover to previous population levels. For other commercial fish species, the direct loss of between 21.9 to 35 acres of foraging habitat through highway fill and ferry terminal construction with Alternatives 2 through 2C, as well as the modification of some subtidal habitat as a result of sidecasting, would not substantially affect any fish and invertebrate populations in Lynn Canal. FHWA has determined that Alternatives 2 through 2C would not have a substantial adverse affect on essential fish habitat.

The alignment for Alternatives 2 through 2C and ferry terminals 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. Compensatory mitigation would be provided for the loss of intertidal and subtidal habitat (see Section 5.4 for further information on mitigation).

4.3.14 Terrestrial Habitat

Alternatives 2, 2A, 2B, and 2C 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 acreage of vegetation types that would be removed for each alternative is provided in Table 4-18. As indicated in that table, virtually all of the vegetation that would be removed by each of the alternatives is forest. Between 55 (Alternative 2A) and 71 (Alternative 2B) percent of this forest is classified as old-growth. 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 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 remaining vegetation that would be removed for Alternatives 2 through 2C consists of shrub (non-forest brush) and open meadow or muskeg vegetation communities.

Table 4-18
Acreage of Terrestrial Habitat Impacted by Alternatives 2, 2A, 2B, and 2C

Habitat Type	Alternative (acres)			
	2	2A	2B	2C
Old-Growth Forest	382[1]	294[1]	314[1]	382[1]
Other Forest	233	230	128	233
Open Meadow/Muskeg and Shrub	13[2]	9[2]	13[2]	13[2]
Rock	1	1	1	1
Total Acres	**629**	**534**	**456**	**629**

Note: [1]Includes 80 acres of forested wetlands for Alternatives 2, 2B, and 2C and 62 acres of forested wetlands for Alternative 2A.

[2]Includes 7.3 acres of palustrine emergent and scrub-shrub wetlands for Alternatives 2, 2B, and 2C and 3.9 acres of palustrine emergent and scrub-shrub wetlands for Alternative 2A.

As discussed in Section 4.3.14, Alternatives 2, 2A, and 2C would involve sidecasting 6.4 million cubic yards of rock in Taiya Inlet and Lynn Canal. Alternative 2B would involve sidecasting 2 million cubic yards 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 one 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 known rare or sensitive plant species.

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. These effects would likely occur more frequently in the steeper terrain along the alignment north of Point Sherman.

Alternatives 2 through 2C 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 a level that often occurs in the natural environment. The alignment of Alternatives 2, 2B, and 2C are several hundred yards away from beaches and sand bars in Berners Bay. The proposed highway alignment for Alternatives 2 through 2C 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 ferry terminals at Sawmill and Slate coves and Katzehin are not expected to cause disturbance to harbor seals because of the distance between these terminals and seal haulouts. The alignment of Alternatives 2, 2A, and 2C is adjacent to the shoreline along Taiya Inlet; however, this shoreline is very steep and there are few places where seals could haul out even at low tide. Therefore, these alternatives are unlikely to affect the population of this species in the project study area.

Minke whales tend to be attracted to motor vessels and would likely not be displaced by increased vessel traffic in Chilkoot and Taiya inlets associated with Alternatives 2 through 2C. 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, Alternatives 2 through 2C 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 and would not be impacted by the ferry traffic associated with Alternatives 2 through 2C.

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 Alternatives 2 through 2C. Alternatives 2 through 2C are 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. Alternatives 2 through 2C 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 on Alternatives 2 through 2C. For these reasons, Alternatives 2 through 2C 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. Alternatives 2 through 2C would impact a small percent of the available nesting habitat preferred by marbled murrelets. Therefore, Alternatives 2 through 2C 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. This species is not expected to be affected by highway traffic.

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 Alternatives 2, 2B, and 2C. 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. Alternatives 2, 2B, and 2C pass primarily through forested areas as they approach 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 loss of wetland and terrestrial habitat described in Sections 4.3.12 and 4.3.14 would have a minor effect on terrestrial mammals because this loss 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 affect wildlife populations in the study area.

Behavioral avoidance of a highway on the alignment for Alternatives 2 through 2C 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. Alternatives 2 through 2C 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, and even when they venture down to low elevations to escape deep snow, they seldom venture far from steep escape terrain. Therefore, little of the winter range for mountain goats would be affected by Alternatives 2 through 2C. The HCI model prepared for the 1997 Draft EIS predicted that an East Lynn Canal Highway would decrease mountain goat habitat capability on the east side of Lynn Canal by only one percent compared to present conditions.

Sitka black-tailed deer use a variety of habitat types, so it is unclear how habitat fragmentation might affect their survival (USFS, 1997). 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. 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 Alternatives 2 through 2C and traffic disturbance could block some bears from portions of their existing home ranges. 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 seven 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 Alternatives 2 through 2C 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 29 percent compared to present conditions. To reduce this habitation fragmentation, bridges over streams would be designed to provide underpasses for wildlife migration. In addition, if Alternative 2, 2B, or 2C is the selected alternative, a wildlife underpass would be constructed for the brown bear migration corridor identified in the inland area between the Lace and Antler rivers.

A highway on the alignment for Alternatives 2 through 2C is not likely to fragment the range of marten, as they would readily cross the road to access favorable habitat. The largest impact of these alternatives on marten would be the indirect impact of trapping. Marten are highly desirable as a furbearing species and are relatively easy to trap. Alternatives 2 through 2C 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 38 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.

Wolves travel widely in pursuit of prey and strongly avoid areas of human activity (USFS, 2000; Person, 2001). The proposed highway would provide more access for people to beaches and riparian areas, potentially inhibiting the use of these areas by wolves.

Alternatives 2 through 2C 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 Alternatives 2 through 2C 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 Alternatives 2 through 2C 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.

Alternatives 2 through 2C 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 Alternatives 2 through 2C. To limit this pressure, DOT&PF would not provide additional pullouts other than those identified in Section 4.3 unless requested by USFS[24]. The effects of this increased hunting and trapping 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 undesirable population-level effects in addition to those due to habitat loss and fragmentation.

See Section 5.8 for a discussion of 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

[24] The USFS is the agency responsible for management of most land adjacent to the alignment for Alternatives 2 through 2C.

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. Alternatives 2 through 2C would affect up to approximately 382 acres, or 0.5 percent, of the old-growth forest. Therefore, the proposed project is not expected to result in population-level impacts to these species.

Alternatives 2 through 2C 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. 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. These impacts are not expected to affect amphibian populations on an area-wide basis.

4.3.16 Bald Eagles

The principal concerns for maintenance and operation of Alternatives 2 through 2C with regard to bald eagles is disturbance of nesting birds and abandonment of nesting sites. The alignment for Alternatives 2 through 2C 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 4.1.15, 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 4-19 lists the known trees with eagle nests within specified distances from the proposed highway alignment for Alternatives 2 through 2C. Based on a USFWS survey, 37 of the 100 nests within 0.5 mile of Alternatives 2 and 2C were actively being used by bald eagles in 2003.

Table 4-19
Known Eagle Nest Trees within the Vicinity of Alternatives 2 through 2C

Distance from Highway	Alternative (No. of Eagle Nests)			
	2	2A	2B	2C
0 to 0.5 mile	100	97	88	100
0 to 330 feet	57	54	45	57

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 Alternatives 2 through 2C 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, Alternatives 2 through 2C are 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

Consultation on Steller sea lions and humpback whales with NMFS under Section 7 of the Endangered Species Act will be concluded after the comment period for the Supplemental Draft EIS. Following consideration of comments received on the Supplemental Draft EIS, a final preferred alternative will be identified for the proposed project. Section 7 consultation will be concluded based on that alternative.

4.3.17.1 Steller Sea Lions

There are two principal haulouts along the proposed alignment for Alternatives 2 through 2C 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.

Modeling was done to estimate traffic noise from Alternatives 2 through 2C at the Gran Point haulout (see the *Steller Sea Lion Technical Report* [Appendix S]). The modeling results indicated that peak hour traffic noise levels in the haulout area would range from approximately 35 to 41 dBA. Background noise levels in the area were measured in the mid-30 to upper-40 dBA range. Therefore, traffic noise from Alternatives 2 through 2C 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 and ferry terminal.

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). Alternatives 2 through 2C would not include any new boat launch sites for private or commercial vessels. Because the ferry traffic associated with Alternative 2A would be relatively slow and consistent in both direction and speed, it is expected that sea lions at Point St. Mary would habituate to these vessels in the same way they have habituated to marine vessels including ferries that currently pass the Gran Point and Met Point haulouts.

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 Alternatives 2 through 2C that are intended to prevent motorists from leaving the highway corridor and approaching these haulouts. The measures include steep embankments and eight- to 10-foot-high concrete 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. The proposed ferry terminal at Slate Cove is approximately three miles from the sea lion haulout at Point St. Mary. Although this haulout is potentially accessible to pedestrians along the beach at low tide, the difficulty of traversing the rocky shoreline and adjacent forested area would deter most people from walking out to the area.

During highway construction, work within 1,000 feet of the Gran and Met points haulouts would only be done when the haulouts are vacant. 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 made a preliminary determination that Alternatives 2 through 2C are not likely to adversely affect Steller sea lions or adversely modify the Gran Point Critical Habitat Area.

4.3.17.2 Humpback Whales

Alternative 2 would increase marine traffic in Chilkoot Inlet. Alternative 2A would result in a substantial increase in marine traffic in Berners Bay as well as increased traffic in Chilkoot Inlet. Alternatives 2B and 2C would increase marine traffic in Chilkoot and Taiya inlets. The increase in ferry traffic associated with Alternatives 2, 2B, and 2C would not be high enough to substantially increase the risk of collisions with humpback whales. The number of trips across Berners Bay with Alternative 2A (20 per day during the summer and eight per day during the winter) may be high enough to discourage the use of the bay by some 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 made the preliminary determination that Alternatives 2, 2B, and 2C are not likely to adversely affect humpback whales. FHWA has made the preliminary determination that Alternative 2A may affect humpback whales.

4.3.18 Permits and Approvals

Alternatives 2 through 2C 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 Section 9 permits (Rivers and Harbors Act) for bridges over navigable waters
- 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 Sawmill Cove (Alternative 2A), Slate Cove (Alternative 2A), and Katzehin (Alternatives 2, 2A, and 2B) Ferry Terminals, and easements for highway segments built below mean high water
- Authorization from EPA and/or ADEC for treated wastewater discharge from the Sawmill Cove (Alternative 2A), Slate Cove (Alternative 2A), and Katzehin (Alternatives 2, 2A, and 2B) Ferry Terminals

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 2A (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 locations of these sites are provided in Figure 4-19.

- A pullout at William Henry Bay Ferry Terminal.
- A scenic overlook would be located on the shoreline near Lance Point.
- A pullout would be located near the Endicott River.
- A pullout and scenic overlook would be located north of the Cant geodetic marker.
- A pullout would be located near the Sullivan River.
- A pullout and scenic overlook would be located near the Gen geodetic marker.
- A pullout would be located 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 may develop trails at some of the pullouts in the future. (See March 25, 2004 letter from USFS in Chapter 7.) A separate environmental assessment would be completed by the USFS for these trails.

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 4-20. 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, including Goldbelt and 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 4-20
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 Alternative 3 is selected as the final preferred alternative for the proposed project and a highway is 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.

The majority of the land on the west side of Lynn Canal from north of the Tongass National Forest to the Pyramid Harbor area (Figure 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 15 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 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 Highway 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.

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 Alaska Department of Fish and Game (ADF&G) would monitor the resources along Lynn Canal and adjust fish and game regulations, as necessary, to protect these resources from overutilization.

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.

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.

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 4-20 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 4-21 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 include:

- 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 4-22 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 4-23 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 4-24 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 include:

- 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 4-25 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 4-26 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. Alternative 3 would be consistent with this VQO. Where ever 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. 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 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 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.

4.4.4 Historical and Archeological Resources

The Dalton Trail would be crossed by Alternative 3 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 archeological 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, 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 4-21). 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 4-21
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 Supplemental Draft 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 4-22).

Table 4-22
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.

Each new job in the Juneau economy results in an increase in population of about 1.5 people[25]. 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).

Assuming 2.6 persons per household, 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. The latest available data indicate that Juneau had approximately 320 vacant housing units in 2001. The demand generated by Alternative 3 is well within the existing vacant housing capacity of Juneau.

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 above discussion on population, economics, housing, and municipal revenues, the independent visitor industry in Juneau would benefit under Alternative 3. With

[25] Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Juneau population participates in the local labor force.

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.

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 one 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 this 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 City and Borough of Juneau 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 4-23). 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 4-23
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 Supplemental Draft 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 4-24).

Table 4-24
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[26]. Therefore, for the maximum of 90 new jobs in Haines in 2008, the population would increase by about 135 residents, or about six 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.

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

26 Based on an estimated participation rate of 65 percent, meaning that 65 percent of the Haines population participates in the local labor force.

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.

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.

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 off-set 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 4-25). Therefore, the alternative would not stimulate population growth in the community.

Table 4-25
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 Supplemental Draft 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 4-26). 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 4-26
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 recently discussed the proposed highway alternatives during the 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.

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.

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 one 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

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.

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. The plan would need to be amended if Alternative 3 is selected.

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 4-27 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 4-27
2008 Forecast Demand and Capacity for the No Action Alternative and Alternative 3

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1 – No Action	90	170	40	330	96/71[1]
3	310	550	140	1,100	1,008/408[2]

Note: [1]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Juneau and 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 4-28. As indicated in Tables 4-27 and 4-28, 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 4-28, 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 4-28
2038 Forecast Demand and Capacity for the No Action Alternative and Alternative 3

Alternative	Annual ADT	Summer ADT	Winter ADT	Peak Week ADT	Summer Capacity (vehicles per day)
1—No Action	130	230	60	460	96/71[1]
3	530	940	250	1,860	1,008/408[2]

Note: [1]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Juneau and 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 total projected demand.

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 4-34). No closure is expected to exceed a day.

4.4.7.3 Travel Time

Table 4-29 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.

Alternative 3 would have no impact on travel times between Haines and Skagway. The travel time would be the same for the Haines/Skagway shuttle under the No Action Alternative and Alternative 3, 1.3 hours.

Table 4-29
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.

4.4.7.4 State and User Costs

The 30-year life cycle costs for the No Action Alternative and Alternative 3 discounted to present (January 2004) dollars are provided in Table 4-30. 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 4-30
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 4-31 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.

Table 4-31
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	$51
3	$19	$161	$180	$94	$86	$19

Note: [1]Present value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

Table 4-31 indicates that the West Lynn Canal Highway would have a larger net cost to the state 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[27] and out-of-pocket cost 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 4-32. As indicated in the table, Alternative 3 would cost the traveler to Haines 39 percent of the cost of the same travel on a mainline vessel under the No Action Alternative. For a traveler 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 the traveler 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 over a 35-year period.

Table 4-32
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]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 mainline ferry. Cost for FVF is 10 percent higher.

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 of the best economic measures 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 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

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

[27]Total user costs are out-of-pocket cost, vehicle maintenance and ownership costs, and accident costs.

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.

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.

With Juneau serving as the northern terminus for mainline AMHS service under Alternative 3, the AMHS would only need to operate short shuttles in Lynn Canal. The projected annual AMHS operating costs and estimated AMHS state subsidy for Alternative 3 in 2008 is provided in Table 4-33. As indicated in the table, the No Action Alternative is estimated to require a state subsidy of about $3.3 million in 2008. Ferry operations for Alternative 3 are estimated to require a similar state subsidy 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 4-33
Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternative 3

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Subsidy ($million)
No Action	$10.2	$3.3
3	$8	$3.1

Note: source DOT&PF, 2004h.

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.

Lack of highway access is often cited by capital move proponents as one of the reasons to move the state capital. Alternative 3 would provide highway access to Juneau, which would reduce the perception that it is difficult and expensive for the majority of Alaska residents to visit the state capital.

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. 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.

See the *Traffic Forecast Report* (Appendix C) for additional information on the transportation demand forecast for the proposed project alternatives and the *Socioeconomic Effects Technical Report* (Appendix H) for additional information on the transportation industry in Lynn Canal.

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. 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 g[28] in the project region. 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, Colo., 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 30 or less. 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.

---

[28] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

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. 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 4-34. 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 4-34
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.

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.

4.4.9 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 a Rivers and Harbor Act Section 9 permit 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 no more than 24 inches in diameter with groups of in-line piles spaced approximately 130 feet apart.

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, 2000b). 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, 2000e). 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 peak week ADT of 1,008 vehicles. During all but that week, the ADT would be on the order of 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 five 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 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 not constructed of shot rock. 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 through fill slopes 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 2 would have sanitary waste holding tanks,[29] 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 1994 Draft EIS. Traffic forecasts conducted for the Supplemental Draft EIS indicate that future traffic volumes would be less than those developed for the 1994 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 peak 2008 and 2038 traffic volumes projected for Alternatives 2 through 2C. Peak traffic volumes for Alternative 3 in those years would be approximately 60 percent of the peak volumes projected for Alternative 2. The modeling predicted that maximum one-hour average CO concentrations associated with Alternative 2 traffic combined with background CO concentrations would total 2 to 3 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 associated with Alternative 2; 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

[29] Holding tanks would be pumped out and waste treated onshore for disposal.

that year. Projected peak hour traffic for Alternative 3 was estimated at nine 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 $\mu g/m^3$
- 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 clearup 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 35.5 acres of wetlands and 11.8 acres of other aquatic habitat would be filled 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 4-35, approximately 88 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 require the fill of 0.01 acre of palustrine emergent, 0.7 acre of palustrine scrub-shrub, and 10.3 acres of palustrine forested wetlands between Echo Cove and Sawmill Cove. 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 11.8 acres of marine habitat discussed in Section 4.4.14.

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 effects of filling 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 fill 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 three 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.

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 affect 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.

Table 4-35
Wetlands and Other Waters of the U.S. Filled by Alternative 3 (Acres)

Sub-Region	Classification	Area of Fill (acres)
Echo Cove to Sawmill Cove	**Wetlands**	
	Palustrine Forested	10.3
	Palustrine Emergent	0.01
	Palustrine Scrub-Shrub	0.7
	Sub Total	11.0
	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
	Sub Total	**0.2**
Davidson Glacier Outwash Plain to Haines	**Wetlands**	
	Palustrine Forested	0.9
	Estuarine Emergent	1.1
	Sub Total	**2.0**
	Marine Areas	
	Beach Bars	4.8
	Sub Total	**4.8**
Total Wetland Fill for Alternative 3	**Wetlands**	
	Palustrine Forested	31.0
	Palustrine Emergent	2.3
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	1.5
	Total	**35.5**
Total Other Waters of the U.S. Filled for 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.	**47.3**

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 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 (Stormwater, 2001). Due to the small quantity of salt (up to five percent per total weight of sand) used to keep the sand friable for winter maintenance, no detectable impacts on adjacent vegetation are likely.

The indirect effects of Alternative 3 on wetlands include the potential introduction of contaminants from 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.

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 coordinate with resource agencies to further minimize encroachment on wetlands. Compensatory mitigation would be provided for wetland losses associated with the selected alternative.

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 essential fish habitat 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 *Essential Fish Habitat (EFH) Assessment* (Appendix N).

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 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 cubic yards 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 two 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[30] 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 11 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,

[30] Holding tanks would be pumped out and the waste would be treated onshore for disposal.

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.

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" (August 3, 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 12.9 acres of essential fish habitat as a result of filling for highway and ferry terminal construction at Sawmill Cove and William Henry Bay. The habitat loss would include 3.2 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 is relatively small; therefore, this loss is not expected to adversely affect the stock's ability to recover to previous population levels. For other commercial fish species, the direct loss of 13.1 acres of habitat through highway fill and ferry terminal construction would not adversely affect any fish and invertebrate populations in Lynn Canal. The FHWA has determined that Alternative 3 would not have a substantial adverse effect on essential fish habitat.

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 to be:

- 314 acres of old-growth forest
- 95 acres of other forest
- 14 acres of shrub and open meadow/muskeg

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 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 one 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). The loss of this vegetation would not adversely affect any rare or unique community types or any known rare or sensitive plant species. 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 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.

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 4.4.18.

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. Depending on the location and weather conditions, at a distance of 100 to 300 yards traffic noise would be at a level that often occurs 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 and would likely not be displaced by increased vessel traffic associated with Alternative 3. 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 loss of wetland and terrestrial habitat described in Sections 4.4.13 and 4.4.15 would have a minor effect on terrestrial mammals because this loss would amount to less than one 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 affect wildlife populations in the study area.

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 Alternative 2 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 one 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. 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 two 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 these alternatives 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). Because the proposed highway alignment is mostly at lower elevations, its presence may limit access to beaches and riparian areas along the alignment for wolves.

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. 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, and even when they venture down to low elevations to escape deep snow, 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 above, 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 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 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 314 acres of old-growth forest, or 0.4 percent of the total. Therefore, the proposed project is not expected to result in 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. 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. These impacts are not expected to affect amphibian populations on an area-wide basis.

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 4.1.15, 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 45 trees with bald eagle nests within 0.5 mile of the Alternative 3 alignment, seven of which are on the east side of Lynn Canal between Echo Cove and Sawmill Cove. Twenty-five of these nest trees are within 330 feet of the alignment. Of the total nests surveyed in 2003, 19 (42 percent) were found to be active.

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

Consultation on Steller sea lions and humpback whales with NMFS under Section 7 of the Endangered Species Act will be concluded after the comment period for the Supplemental Draft EIS. Following consideration of comments received on the SDEIS, a final preferred alternative will be identified for the proposed project. Section 7 consultation will be concluded based on that alternative.

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 while they are feeding on spring forage fish aggregations; however, this is not likely to 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. For these reasons, the FHWA has made the preliminary determination that Alternative 3 is not likely to adversely affect Steller sea lions.

4.4.17.2 Humpback Whales

Highway traffic and maintenance activities associated with Alternative 3 would not cause disturbance of 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.

Based on the above, the FHWA has made the preliminary determination that Alternative 3 is 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).

4.4.18 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 Section 9 permits for bridges over navigable waters

- 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

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 roundtrips 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, 1999; City of Skagway, 1999). Therefore, Alternatives 4A and 4C are consistent with these plans.

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.

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 Archeological 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 4-36). 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, 2003c), 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, 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 4-36
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 1.4 percent for the 30-year forecast period considered in this Supplemental Draft 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 4-37).

Table 4-37
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[31]. 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

[31] 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.

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 five 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 4-38). 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.

Table 4-38
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 1.4 percent for the 30-year forecast period considered in this Supplemental Draft 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 4-39).

Table 4-39
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[32]. 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 one 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).

[32] 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.

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 4-40). 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.

Table 4-40
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. Assuming 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 1.4 percent for the 30-year forecast period considered in this Supplemental Draft 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 4-41).

Table 4-41
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	10	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[33]. 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 one 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 two percent of Skagway's current population.

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 five 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

[33] 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.

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) 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. The plan would need to be amended if Alternative 4A or 4C is the selected alternative.

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 4-42. 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 4-42
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)[1]
No Action	90	170	40	330	96/71
4A	140	250	70	490	229/223
4C	100	180	50	360	154/149

Note: [1]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Juneau and Skagway.

Table 4-43 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 4-43
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)[1]
No Action	130	230	60	460	96/71
4A	220	390	100	780	229/223
4C	150	260	70	520	154/149

Note: [1]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Juneau and Skagway.

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 eight round-trips per week between Juneau and Haines and seven round-trips per week between Juneau 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 4-44 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 4-44
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.

4.5.7.4 State and User Costs

The 30-year life cycle costs for the No Action Alternative and Alternatives 4A and 4C discounted to present (January 2004) dollars are provided in Table 4-45. 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.

Table 4-45
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 4-46 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 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 be slightly lower with Alternatives 4A and 4C than the No Action Alternative because of the higher volume of traffic transported with these alternatives than the No Action Alternative.

Table 4-46
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	$51
4A	$21	$263	$284	$186	$98	$50
4C	$11	$198	$209	$131	$78	$57

Note: [1]Current value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

The total cost[34] 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 4-47 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.

Table 4-47
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[1]

Alternative	Haines User Cost	Skagway User Cost
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.

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.

Table 4-48 shows user benefits and net present values for Alternative 4A and 4C. User benefits can include reduced out-of-pocket costs, 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[35]. Alternative 4C would offer little user benefit.

[34]Total user costs are out-of-pocket cost, vehicle maintenance and ownership costs, and accident costs.

[35] 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).

Table 4-48
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 current (January 2004) dollars.
[2]Overall project costs minus revenues.

One of the best economic measures 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

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.

AMHS service in Lynn Canal under the No Action Alternative is estimated to require a state subsidy 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 a larger state subsidy than the No Action Alternative (Table 4-49). These alternatives would place an additional funding burden on AMHS which could have negative impacts on other AMHS service.

Table 4-49
Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternatives 4A and 4C

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Subsidy ($million)
No Action	$10.2	$3.3
4A	$16.7	$5.7
4C	$11.7	$4.2

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,[36] 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 4-65, ferry and motor vehicle operations under Alternative 4A would consume about 2.5 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 2.5 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 uses conventional monohull ferries, fuel consumption would be essentially the same as 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

---

[36] Holding tanks would be pumped out and the waste treated onshore for disposal.

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 essential fish habitat.

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 and would likely not be displaced by increased vessel traffic associated with Alternatives 4A and 4C. 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

Consultation on Steller sea lions and humpback whales with NMFS under Section 7 of the Endangered Species Act will be concluded after the comment period for the Supplemental Draft EIS. Following consideration of comments received on the SDEIS, a final preferred alternative will be identified for the proposed project.

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
- 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

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 roundtrips per week year round.

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 is selected as the final preferred alternative for the proposed project and a highway is 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 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, 1999). 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, 1999). Therefore, these alternatives are consistent with the plans and policies of Haines and Skagway.

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 overutilization.

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.

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 management 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.

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 4-27 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 4-28 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 ½ 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. Where ever possible, the alignment has been located to maintain a buffer between the highway and the shore to reduce the visibility of the highway. In most locations, these alternatives would exceed the VQO of Modification. In order to demonstrate the overall visual effect of the alternatives, DOT&PF also evaluated the consistency of Alternatives 4B and 4D with the VQOs of the adjacent LUDs.

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 terminal and the new ferry terminal would be visible from Berners Bay; therefore, the alternatives would not conform to the VQO of adjacent land in this area.

4.6.4 Historical and Archeological 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 increased disturbance of historic and prehistoric cultural sites 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, 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 4-50).

Table 4-50
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 this alternative is predicted to increase at an annual rate of approximately 1.4 percent for the 30-year forecast period considered in this Supplemental Draft 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 4-51).

Table 4-51
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[37]. 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.

Assuming 2.6 persons per household, 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 five 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.

[37] 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.

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 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 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 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 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 4-52).

Table 4-52
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 this alternative is predicted to increase at an annual rate of approximately 1.4 percent for the 30-year forecast period considered in this Supplemental Draft 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 4-53).

Table 4-53
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[38]. 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 two percent of Haines current population

Assuming 2.6 persons per household, 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

[38] 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.

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.

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 4-54).

Table 4-54
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 this alternative is predicted to increase at an annual rate of approximately 1.4 percent for the 30-year forecast period considered in this Supplemental Draft EIS. At that rate of growth, annual spending, employment, and payroll related to Alternatives 4B in 2038 would be approximately 50 percent higher than in 2008 (Table 4-55).

Each new job in the Skagway economy results in an increase in population of about 1.3 people[39]. 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.

[39] 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 4-55
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 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

Because Alternatives 4B and 4D would not substantially change transportation facilities and visitor trips in Lynn Canal, they would not result in direct or indirect impacts to subsistence uses.

4.6.7 Transportation

The 2004 Southeast Alaska Transportation Plan calls for the construction of a highway from Juneau to Skagway with a shuttle ferry from Katzehin to Haines. The plan would need to be amended if Alternative 4B or 4D is selected as the final preferred alternative.

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 4-56 along with travel demand for the No Action Alternative. These projections are based on an increase in annual travel demand of 0.5 percent. 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 4-56
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[1]
No Action	90	170	40	330	96/71
4B	170	290	80	580	284/227
4D	130	230	60	460	208/203

Note: [1]The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle capacity between Juneau and Skagway.

Table 4-57 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 4-57
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)[1]
No Action	130	230	60	460	96/71
4B	270	470	120	940	284/227
4D	200	350	90	690	208/203

Note: 1The first number is vehicle capacity between Juneau and Haines, and the second number is vehicle 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 4A and 4C. 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.

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 4-58 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[40]. 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.

Table 4-58
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.

Travel time between Haines and Skagway would be the same with Alternatives 4B and 4D as the No Action Alternative, approximately 1.3 hours.

4.6.7.4 State and User Costs

The 30-year life cycle costs for the No Action Alternative and Alternatives 4B and 4D discounted to present (January 2004) dollars are provided in Table 4-59. 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.

---

[40] 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 4-59
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 4-60 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 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 4-61). 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.

Table 4-60
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	$51
4B	$21	$249	$269	$175	$94	$39
4D	$11	$193	$204	$134	$70	$39

Note: [1]Current value of 2004 to 2038 costs as of January 1, 2004, at private-sector rate of return.

The total[41] and out-of-pocket cost of summer travel between Juneau and Skagway or Haines for a family of four in a 19-foot vehicle is listed in Table 4-61 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.

[41]Total user costs are out-of-pocket cost, vehicle maintenance and ownership costs, and accident costs.

Table 4-61
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 4-62 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.

Table 4-62
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 current (January 2004) dollars.
[2]Overall project costs minus revenues.

One of the best economic measures 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

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.

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.

AMHS service in Lynn Canal under the No Action Alternative is estimated to require a state subsidy 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 4-63). These alternatives would place an additional funding burden on AMHS, which could have negative impacts on other AMHS service.

Table 4-63
Annual AMHS Operating Costs and Estimated AMHS State Subsidy in 2008 for the No Action Alternative and Alternatives 4B and 4D

Alternative	AMHS Operating Cost ($million)	Estimated AMHS State Subsidy ($million)
No Action	$10.2	$3.3
4B	$15.5	$6.8
4D	$11.3	$4.9

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. 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 g[42] in the project region. 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.

Alternatives 4B and 4D would provide a highway where there are currently no roads. The highway would serve as a new evacuation route for emergencies for land adjoining the road.

[42] Seismic ground acceleration is measured in units of gravity or *g*. The acceleration of *g* is 32 feet/second/second.

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.

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, 2000b). 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, 2000e). 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 in 2008 of about 460 to 580 vehicles, and the peak week ADT in 2038 is projected to range from 690 to 940 vehicles. During most times but that week, the ADT would be fewer than 500 vehicles.

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 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 not constructed of shot rock. 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 through fill slopes 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[43] 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 4-65, 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.

[43] Holding tanks would be pumped out and the waste treated onshore for disposal.

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.

4.6.12 Wetlands

A total of 11.0 acres of wetlands and 1.9 acres of other waters of the U.S. would be filled between Echo Cove and Sawmill Cove under Alternatives 4B and 4D. All of the wetland fill would result from construction of the proposed highway. The preliminary alignment for highway segments of Alternatives 4B and 4D 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 4-64, 94 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 4-64
Wetlands and Other Waters of the U.S. Filled by Alternatives 4B and 4D (Acres)

Wetlands and Other Waters of the U.S.	Alternatives 4B and 4D (acres)
Wetlands	
Palustrine Emergent	0.01
Palustrine Forested	10.3
Palustrine Scrub-Shrub	0.7
Subtotal	**11.0**
Marine Areas	
Rocky Shore Beaches	1.9
Subtotal	**1.9**
Total Acres	**12.9**

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 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 (Stormwater, 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 indirect effects of the proposed highway for Alternatives 4B and 4D on wetlands include the potential introduction of contaminants from 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.

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 continue to coordinate with resource agencies 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 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 cubic yards 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[44],or would discharge treated wastewater meeting applicable standards. Sanitary waste generated at the ferry terminals 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 essential fish habitat.

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" (August 3, 2001).

In summary, the construction of Alternatives 4B and 4D would result in the direct loss of 3.2 acres of essential fish habitat 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. 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. FHWA has determined that Alternatives 4B and 4D would not have a substantial adverse effect on essential fish habitat.

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:

[44] Holding tanks would be pumped out and the waste treated onshore for disposal.

- Fifty-three acres of old-growth forest
- Two acres of open meadow/muskeg

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 region (NPS, 2003). The loss of this vegetation would not adversely affect any rare or unique community types or any known rare or sensitive plant species. 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 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 and would likely not be displaced by increased vessel traffic associated with Alternatives 4B and 4D. 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 loss of wetland and terrestrial habitat described in Sections 4.6.12 and 4.6.14 would have a minor effect on terrestrial mammals because this loss would amount to less than one 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 affect wildlife populations in the study area.

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. 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). 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, and even when they venture down to low elevations to escape deep snow, they never venture far from steep escape terrain. Therefore, the home range of mountain goats would not be substantially affected by the highway for Alternatives 4B and 4D.

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 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. 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 seven 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

Consultation on Steller sea lions and humpback whales with NMFS under Section 7 of the Endangered Species Act will be concluded after the comment period for the Supplemental Draft EIS. Following consideration of comments received on the SDEIS, a final preferred alternative will be identified for the proposed project. Section 7 consultation will be completed on that alternative.

4.6.17.1 Steller Sea Lion

Alternatives 4B and 4D would not affect Steller sea lions at any traditional haulouts and would not change the nature of potential sea lion/AMHS ferry interactions, which are considered minimal. 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. For these reasons, the FHWA has made a preliminary determination that Alternatives 4B and 4D are not likely to adversely affect Steller sea lions.

4.6.17.2 Humpback Whales

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.

Based on the above, the FHWA has made a preliminary determination that Alternatives 4B and 4D are not likely to adversely affect humpback whales.

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
- 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

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 Alternatives 2, 2B, and 2C. Therefore, the proposed project would not affect the status of the Gilkey River. The Katzehin River is crossed by the proposed alignment for Alternatives 2 through 2C 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.

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 (Executive Order 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 2 through 2C, 3, 4B, and 4C 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 Alternatives 2 through 2C).

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 a 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 Native Alaskans. 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 home town. Alternatives 2 through 2C, 3, 4B, and 4D would reduce the cost of travel in this area benefiting all travelers. Alternatives 2 and 2C are the only alternatives that would reduce travel cost in this area to a level typical of the rest of the United States, particularly for travel between Juneau and Skagway.

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 United States. 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, standard passenger vehicles, standard vans, standard ½- to ¾-ton pickups, recreational vehicles, and commercial tractor-trailer freight haulers. Ferry consumption rates were based on the optimum vessel identified for each marine segment. (Substitution of the *M/V Aurora* on the Haines/Skagway or Haines/Katzehin segment would have a minor effect on the analysis.)

Table 4-65 presents the estimated annual operational energy usage for all project alternatives. In 2008, Alternatives 2 through 2C would have lower fuel consumption while providing greater transportation capacity than the No Action Alternative. All other project alternatives would have greater fuel consumption than the No Action Alternative, but would also provide greater transportation capacity than the No Action Alternative. In 2038, Alternatives 2 through 2C would have similar fuel usage as the No Action Alternative. All other project alternatives would have greater fuel consumption than the No Action Alternative.

Fuel usage per vehicle would be substantially lower for Alternatives 2 through 2C and 3 than for the No Action Alternative in 2008 and 2038 (Table 4-65). For the number of people transported, motor vehicles provide a more energy-efficient mode of transportation than ferries.

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 4-65
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	2,607	0	2,607	2,607	0	2,607	79	55
2	775	1,013	1,788	775	1,835	2,610	10	8
2A	1,222	665	1,887	1,222	1,165	2,387	13	10
2B	1,284	700	1,984	1,284	1,226	2,510	14	10
2C	1,054	1,114	2,168	1,054	1,969	3,023	15	11
3	2,036	617	2,653	2,036	1,045	3,081	23	16
4A	6,601	0	6,601	6,601	0	6,601	129	82
4B	5,545	81	5,626	5,545	132	5,677	91	58
4C	3,072	0	3,072	3,072	0	3,072	84	56
4D	2,848	63	2,911	2,848	97	2,945	61	40

Notes: [1]All calculations are based on travel from Auke Bay to Haines and Skagway Ferry Terminals.
[2]DOT&PF, 2004g and Appendix B
[3]Passenger and recreational vehicles and commercial trucks. Based on 19.7 mpg USEPA 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 almost 200 vehicles in 2038 on Alternative 2, which would have the highest traffic volumes of all the alternatives considered on the east side of Lynn Canal. Peak hour traffic volumes are projected to reach approximately 100 vehicles on the West Lynn Canal Highway in 2038. The traffic on Alternatives 2 and 3 would average approximately one vehicle every 20 to 35 seconds, respectively. At these volumes, 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 2 through 2C, 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 traffic noise at the USFS cabin on Berners Bay was estimated for Alternative 2 using basic noise attenuation theory. Peak-hour traffic noise at the cabin was estimated to be approximately 48 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 Alternatives 2, 2B, and 2C 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 Alternatives 2 through 2C, 3, 4B, and 4D. Of these alternatives, Alternative 2 would have the largest volume of traffic and would therefore create the greatest traffic noise. The peak-hour traffic noise is estimated to be approximately 45 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 2 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 Alternatives 2 through 2C 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. Traffic associated with Alternatives 2, 2A, and 2C would enter and leave Skagway on a new highway. Alternative 2C would generate the maximum traffic volume entering and departing Skagway of any of these alternatives because in addition to the Skagway/Juneau traffic, all traffic between Juneau and Haines would have to pass through Skagway under this alternative. Peak-hour noise in 2038 from summer traffic on the proposed new highway descending into Skagway under Alternatives 2, 2A, and 2C was modeled at sensitive receptors on State Street north of 21st Avenue and 23rd Avenue from State to Alaska Street. Modeled peak-hour noise from the highway for these alternatives at these receptors ranged from 49 to 55 dBA. Traffic noise from the highway under Alternatives 2, 2A, and 2C would not be perceptible because of masking from local traffic noise as well as noise from trains and aircraft.

With Alternatives 2, 2A, and 2C, State Street would no longer connect to 23rd Avenue. Main Street at 23rd Avenue would become the main point for traffic entering and leaving Skagway. From State Street, traffic leaving Skagway would turn on 22nd Avenue and proceed to Main Street. Traffic from the Klondike Highway or East Lynn Canal Highway would access State Street from Main Street and 21st Avenue. Therefore, traffic on State Street would decrease substantially north of 21st Avenue and particularly north of 22nd Avenue. Conversely, more traffic would be on Main Street, 21st Avenue, and 22nd Avenue than under current conditions or the No Action Alternative. New construction for Alternatives 2, 2A, and 2C would terminate on Main Street north of the alley between 22nd Avenue and 23rd Avenue. Impacts at the intersection of 23rd Avenue and Main Street and on Main north of 22nd Avenue are partially the result of traffic on this new construction; therefore, direct impacts were evaluated as far south as the intersection of Main Street and 22nd Avenue.

Peak-hour noise from summer traffic on the proposed new highway for Alternatives 2, 2A, and 2C was modeled in combination with other projected peak-hour summer traffic at sensitive receptors on Main Street north of 22nd Avenue and on 23rd Avenue. Traffic noise at these receptors was also modeled based on 2002 traffic data for Skagway to represent current conditions, and for the No Action Alternative in 2038. For analyses purposes, the worst-case scenario for the No Action and Build Alternatives was modeled. Based on past trends in population growth, it was estimated that traffic would increase at the rate of one percent a year into the future. This would increase traffic volumes in Skagway by approximately 35 percent by 2038. For the Build Alternatives, all traffic from the Klondike Highway and East Lynn Canal Highway was assumed to enter and leave Skagway. For both the No Action and Build Alternatives, all traffic was assumed to use State Street.

Table 4-66 provides the results of this noise modeling. As indicated in the table, current interior peak-hour traffic noise is estimated to be 50 dBA at the daycare center on the corner of 23rd Avenue and Main Street. No sensitive receptors in this area currently have an exterior traffic noise of 65 dBA. Under the No Action Alternative, peak-hour traffic noise is estimated to increase relative to existing conditions by 1 to 2 dBA by 2038. With Alternatives 2, 2A, and 2C, interior peak-hour traffic noise in 2038 is projected to increase by 3 to 15 dBA relative to existing traffic conditions at the five sensitive receptors on Main Street north of 22nd Avenue, and all these receptors would have interior peak-hour traffic noise greater than 50 dBA. Exterior peak-hour noise is projected to increase by 3 to 16 dBA in 2038 relative to existing traffic conditions at these sensitive receptors on Main Street north of 22nd Avenue, and three of them would have exterior peak-hour noise of at least 65 dBA with these alternatives. These five receptors are the only sensitive receptors that would have direct traffic noise impacts from any of the build alternatives. Therefore, noise abatement was evaluated for these receptors.

Table 4-66
Modeling Results for Noise-Sensitive Receptors Along Road Segments in Skagway by Project Alternatives[1]

Location	Modeled Peak- Hour Traffic Noise Level (dBA L_{eq})																	
	Existing (2002)		No Action Alternative (2038)				Alternative 2 (2038)				Alternative 2A (2038)				Alternative 2C (2038)			
	In	Ex	In	In Δ	Ex	Ex Δ	In	In Δ	Ex	Ex Δ	In	In Δ	Ex	Ex Δ	In	In Δ	Ex	Ex Δ
Residence southeast corner 23rd and Main	47	60	48	1	62	2	52	5	63	3	52	5	62	2	53	6	63	3
Daycare southwest corner 23rd and Main	50	60	51	1	62	2	54	4	63	3	53	3	63	3	54	4	64	4
Residence on Main between 22nd and 23rd	41	51	42	1	52	1	54	13	66	15	53	12	65	14	54	13	66	15
Residence northwest corner Main and 22nd	39	50	41	2	51	1	53	14	66	16	53	14	66	16	53	14	66	16
Residence northeast corner Main and 22nd	40	50	41	1	51	1	55	15	65	15	55	15	65	15	55	15	65	15

Notes: [1]In = interior, Ex = exterior, InΔ = Difference between alternative and existing interior, ExΔ = Difference between alternative and existing exterior

4.7.7.3 Noise Abatement Evaluation

In accordance with 23 CFR 772.13(c), the following noise abatement measures must be considered for direct noise impacts:

- Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations)
- Alteration of horizontal and vertical alignments
- Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers
- Construction of noise barriers (including landscaping for aesthetic purposes) whether within or outside the highway right-of-way
- Acquisition of real property or interests therein (predominately unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise
- Noise insulation of public use or nonprofit institutional structures

The two relevant criteria considered in identifying and evaluating noise abatement measures to be incorporated into a project are feasibility and reasonableness. Feasibility deals primarily with engineering considerations on whether or not a substantial noise reduction can be achieved given the conditions of the specific project location. A proposed sound barrier that will not achieve a minimum of five decibels of attenuation under the specific conditions of the project site is generally not considered to be feasible. In addition, feasibility also takes into account the safety and maintenance of noise abatement facilities.

Reasonableness is a more subjective criterion that takes into account an array of factors. According to DOT&PF Noise Abatement Policy (March 1996), a determination of reasonableness for noise abatement shall be based on the following:

- Amount of noise reduction provided
- Number of people protected
- Cost of abatement
- Views of impacted residents
- Future absolute traffic noise levels
- Difference between future traffic noise levels and existing noise levels
- Difference between future traffic noise levels for the build and no-build alternatives
- Amount of development that occurred before and after the initial construction of the highway
- Extent to which zoning or land use is changing
- Effectiveness of land use controls implemented by local officials to prevent incompatible development

In order to be considered reasonable pursuant to DOT&PF policy, noise abatement measures must have a cost of $25,000 or less per benefited receptor unless a severe[45] noise impact is demonstrated. Reasonableness criteria also include a requirement that unmitigated future build noise levels would be at least five dBA greater than existing noise levels.

If Alternative 2, 2A, or 2C were the selected alternative for the project, the only routes into and out of Skagway would be via Main Street or Alaska Street. Therefore, traffic management measures to abate noise on Main Street such as traffic control devices and signing for prohibition of certain vehicle types or time-use restrictions for certain vehicle types would not be feasible because they would only move this traffic onto another residential street. In addition, it is projected that most of the traffic associated with an East Lynn Canal highway would be personal vehicles such as automobiles, light duty trucks, and recreation vehicles. Only a small percentage of the traffic is expected to be large trucks.

The speed limit for Main Street and 21st and 22nd avenues is anticipated to be 25 mph. Traffic noise was modeled using that speed. A traffic noise reduction of 3 dBA requires halving the speed. Reducing the speed limit to 20 mph would reduce traffic noise by less than one dBA. Speed limits below 20 mph are not realistic.

45 A severe noise impact is defined as a predicted (design year) sound level that would create an increase of at least 15 dBA over existing sound levels or that the predicted "build" sound levels would exceed the predicted "no action" sound levels by at least 5 dBA.

The northeastern portion of Skagway that would be impacted by project traffic noise is developed. Therefore, it would not be possible to abate traffic noise through restrictions to development in this area.

Minor horizontal and vertical adjustments that could be made to the proposed highway alignment in the area of Skagway potentially impacted by traffic noise would not reduce noise on Main Street north of 22nd Avenue. Major changes to the alignment would result in relocation of residences, introduction of traffic noise impacts to other areas of Skagway, or additional project costs greater than $25,000 per benefited receptor. Therefore, alignment alteration is not a feasible means of noise abatement in Skagway.

Alternatives 2, 2A, and 2C would impact residences and a for-profit daycare center. Therefore, noise insulation of public use or nonprofit institutional structures is not a feasible noise abatement measure.

Noise barriers were considered for sensitive receptors along Main Street north of 22nd Avenue as well as along 23rd Avenue east of Main Street where modeled peak-hour traffic noise with Alternatives 2, 2A, and 2C would be at or above the NAC. The following sound barriers were determined to reduce traffic noise below these criteria at the daycare center on the corner of 23rd Avenue and Main, the residence on Main between 22nd and 23rd, and the three residences on Main Street north of 22nd and south of the mid-block alley:

- Six-foot high barrier approximately 400 feet long on the east side of Main Street from the alley at mid-block to 23rd Avenue wrapping around the south side of 23rd Avenue in front of the residence on the corner of 23rd Avenue and Main Street.
- Six- (Alternative 2A) to eight-foot (Alternatives 2 and 2C) high barrier approximately 700 feet long in front of the daycare center on 23rd Avenue wrapping around the west side of Main Street to the alley at mid-block.
- Eight- (Alternatives 2 and 2A) to ten-foot (Alternative 2C) high barrier approximately 300 feet long on the west side of Main Street from the alley at mid-block south to 22nd Avenue.
- Ten-foot high barrier approximately 400 feet long on the east side of Main Street from the alley at mid-block south to 22nd Avenue wrapping around the north side of 22nd Avenue to the first driveway.

A sound barrier on the east side of Main Street from 23rd Avenue to the mid-block alley would reduce estimated interior traffic noise levels at the residence on this corner from 53 dBA to 49 dBA; however, this barrier would not achieve a five decibel reduction in noise. Therefore, it was not considered feasible. As indicated above, sound barriers must have a cost of $25,000 or less per benefited receptor based on DOT&PF guidelines. Based on typical sound barrier cost of $45 per square foot, this barrier would cost $108,000. Therefore, this sound barrier is not feasible or reasonable.

The other three potential sound barriers evaluated for the project would reduce traffic noise by at least five decibels. As indicated above, sound barriers must have a cost of $25,000 or less per benefited receptor, although where the sound impact is considered severe this amount can be exceeded. A barrier on 23rd Avenue and Main Street would cost from approximately $190,000 (6 feet high) to $250,000 (8 feet high) and would only benefit the daycare center. The barrier on the west side of Main Street between the alley and 22nd Avenue would only benefit two residences that would have a severe noise impact (traffic noise projected to be 66 dBA, up to 14 dBA above no action) at an estimated cost of $108,000 (8 feet high) to $135,000 (10 feet high). A barrier on the east side of Main Street between the alley and 22nd Avenue would only benefit two residences that would have a severe noise impact (traffic noise projected to be 66 dBA, up to 14 dBA above no action) at an estimated cost of $180,000. Therefore, on the basis of cost, the sound barriers at these three locations are not reasonable.

Traffic noise is not the only noise source in the area of these five receptors. Based on long-term noise measures taken on State Street and 22nd Avenue, non-traffic noise (trains and aircraft) is the predominant noise source and is currently at levels equal to predicted 30-year peak-hour traffic noise. The noise barriers considered in this analysis would not appreciably reduce noise from these sources. Based on this and the feasibility and reasonableness determinations presented above, no noise barriers are proposed.

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 one 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 4-67). 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 evaluated 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).

Table 4-67
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)		Alternatives 2–2C (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 - 28[2]	4	26	4	26	4
Glacier Highway from Auke Nu Drive to Terminus	5	0	6	2	13 - 14[2]	4	11	3	7 - 11[3]	2 – 3[4]
Total	103	25	121	36	128-131	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]28 for Alternative 2 and 26 for Alternatives 2B, 2A, and 2C.
[2]13 for Alternatives 2A and 2B and 14 for Alternatives 2 and 2C.
[3]11 for Alternatives 4A, 4B, and 4D and 7 for Alternative 4C.
[4]3 for Alternatives 4A, 4B, and 4D and 2 for Alternative 4C.

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 4-67 lists sensitive receptors in the Juneau area that are currently at or above the Noise Abatement Criteria (NAC) and sensitive receptors that would be affected by traffic noise with the No Action Alternative in 2038.

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 Yukon and White Pass Route 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 2 through 2C, 3, and 4A through 4D would be the same as estimated for the No Action Alternative (Table 4-67). As Table 4-67 shows, two additional sensitive receptors would receive exterior peak-hour traffic noise at or above 65 dBA with Alternatives 2 through 2C relative to the No Action Alternative. Interior peak-hour noise levels would be at or above 50 dBA at 10 additional sensitive receptors with Alternative 2 and 7 additional receptors with Alternatives 2A, 2B, and 2C (Table 4-67) 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 4-67). 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 4-66) 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 4-67).

Alternative 2 would increase peak hour noise at the Adlersheim Wilderness Lodge near Yankee Cove by 10 dBA. Current (2002) peak hour noise at the lodge is estimated to be 51 dBA. Peak hour noise in 2038 with Alternative 2 would be 61 dBA. Peak hour noise in 2038 at the lodge is estimated to range from 59 to 60 dBA with Alternatives 2A through 2C, 58 dBA with Alternative 3, and 55 to 56 dBA with Alternatives 4A through 4D.

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 2 through 2C, 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.

Revision of the traffic pattern into and out of Skagway with Alternatives 2, 2A, and 2C would result in indirect noise impacts to receptors in the northeast part of the community. The new traffic pattern would result in a reduction in noise at most receptors on State Street north of 21st Avenue since fewer vehicles would use this segment of the street than under existing conditions or the No Action Alternative. Exterior peak-hour traffic noise would increase by 10 to 11 dBA at residences near mid-block on 21st and 22nd avenues between State and Main streets (Table 4-68). Residences closer to State Street on 21st and 22nd avenues would have less of a traffic noise impact. Residences closer to Main Street on 21st and 22nd avenues would have a greater traffic noise impact. As explained in Section 4.7.7.3, long-term noise measures in this part of Skagway indicated that non-traffic noise is the predominant noise source, and is currently at levels above the predicted 30-year peak-hour traffic noise.

Table 4-68
Modeled Indirect Noise Impacts on Selected Noise-Sensitive Receptors, Skagway[1]

Location	Modeled Exterior Peak-Noise-Hour Traffic Noise Level (dBA L_{eq})									
	Modeled Existing Noise Level (2002)		No Action Alternative (2038)		Alternative 2 (2038)		Alternative 2A (2038)		Alternative 2C (2038)	
	In	Ex	In	Ex	In	Ex	In	Ex	In	Ex
Residence on State and 22nd	48	61	50	62	46	56	46	55	47	56
Residence on State and 23rd	51	62	53	64	46	56	46	56	47	57
Residence on southwest corner State and 22nd	50		52		52		51		52	
Apartment northwest corner State and 21st	48		50		49		48		49	
Residence on 22nd mid-block between State and Main		52		53		62		62		63

Notes: [1]In = interior, Ex = exterior

Alternatives 2, 2A, and 2C would result in increased summer traffic in downtown Skagway (e.g., Broadway between 1st and 6th avenues) in 2038. Modeling indicates that this increased traffic would increase peak-hour noise over the No Action Alternative in downtown Skagway by 1 to 3 dBA. These noise increases in downtown Skagway would result in peak exterior traffic noise levels of less than 65 dBA, based on current measured noise levels of less than 60 dBA.

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 Alternatives 2 through 2C, it is likely that a construction camp would be set up at Comet Landing, outside of the required right-of-way for the project. For Alternative 2B, a camp is likely at the Katzehin Ferry Terminal site. The camp could be 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, construction staging areas would be likely at the Sawmill Cove Ferry Terminal site. The number and location of these 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 Archeological Resources

Known historical and archeological 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. Cultural resources within the project limits 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 National Register of Historic Places, and, if the site is determined to be eligible, DOT&PF, FHWA, and the State Historic Preservation Officer have agreed to a plan to avoid or mitigate adverse impacts.

4.8.4 Socioeconomic Resources

4.8.4.1 Alternatives 2 through 2C

Table 4-69 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 4-69, Alternatives 2, 2A, and 2C would more than double this employment and Alternative 2B would increase it 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 alternatives.

As the region’s commercial and population center, Juneau would receive the largest construction-related impacts under Alternatives 2 through 2C. Haines would not experience appreciable socioeconomic impacts from Alternatives 2 through 2C because it is not located on the alignment for these alternatives. However, Haines-area construction contractors and labor could participate in the project. Skagway could be most affected by a construction-related, temporary population influx because it is the smallest community in the project region and because it is located on the alignment for Alternatives 2, 2A, and 2C.

Table 4-69
Project Construction Phase Employment Impacts

Alternative	Construction Cost ($Million)	Estimated Annual Employment (people)
2	281	370
2A	248	320
2B	198	255
2C	265	350
3	210	275
4A	13	25
4B	21	40
4C	13	25
4D	21	40

Note: Construction costs include only highway and ferry terminal costs; vessel construction is not included. Estimates are based on a four-year construction period.

The highway construction effort for Alternatives 2 through 2C would be initially staged out of Juneau and/or Skagway. Camp-supported facilities near the Katzehin River would likely be used for Alternative 2B and could potentially be a part of Alternatives 2, 2A, or 2C, depending on the contractor's work plan and schedule.

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 4-70 provides an estimate of total annual employment and payroll associated with Alternatives 2 through 2C. The estimates provided in Table 4-70 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 any of the alternatives.

Table 4-70
East Lynn Canal Highway Alternatives Construction Phase
Direct and Total Employment and Payroll Effects

Alternative	Estimated Annual Direct Employment (people)	Estimated Annual Direct Payroll ($Million)	Estimated Annual Total Employment (people)	Estimated Annual Total Payroll ($Million)
2	370	25	520	30
2A	320	22	450	26
2B	255	17	360	21
2C	350	24	490	29

Note: Estimates are based on a four-year construction period.

Table 4-71 provides an estimate of construction-related population increases, total new housing demand, and additional school-age population projections for Alternatives 2 through 2C. These estimates are based on the following assumptions:

- Half of the total construction-related labor force would seek some form of housing in Juneau, including construction workers relocating to Juneau.
- For construction workers relocating to Juneau, 75 percent would 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 would seek shared housing with other construction workers (two people per housing unit).

Table 4-71
East Lynn Canal Highway Alternatives Construction Phase
Maximum Potential Population-Related Effects

Alternative	Total Construction Related Population Increase (people)	Total New Housing Demand (No. of Units)	Additional School Age Population (children)
2	670	240	130
2A	580	200	115
2B	460	160	90
2C	630	220	125

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 Alternatives 2 through 2C 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 $210 million. This alternative would create approximately 275 construction jobs, which is similar to 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 would be similar to Alternative 2B.

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 the same as those listed for Alternative 2B.

Assuming that about 75 percent of the construction jobs for Alternative 3 would be filled by non-residents, and about half of those non-residents would bring dependents with them to Haines, 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.

This population increase would increase public school enrollment by approximately 50 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 40 construction workers, which is equal to 13 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 four-year period would be negligible.

4.8.5 Transportation

DOT&PF may set up interim ferry service during construction of Alternatives 2 through 2C or 3. For Alternatives 2A or 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 Alternatives 2, 2B or 2C, 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 (Alternative B in USFS Supplemental EIS for the Kensington Gold Project). In both cases this service could be provided by a combination of the *M/V Aurora* and the *M/V Fairweather*. The *M/V Aurora* 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 Alternatives 2, 2A, and 2B) and Sawmill Cove (under Alternatives 2A, 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. Alternatives 2 through 2C 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 Stormwater Pollution Prevention Plans

(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 not constructed of shot rock. 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 checks would be used to reduce erosion during construction.
- Sedimentation basins would be used, as necessary, during construction.

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 (carbon monoxide, nitrogen oxides, 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 segment 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 Stormwater Pollution Prevention Plan (see Section 4.8.5) 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. 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 Supplemental Draft EIS Section 5.3 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 2A, 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 Alternatives 2, 2A, and 2C would require sidecasting of up to 6.4 million cubic yards of rock from road cuts into Taiya Inlet and Lynn Canal. Alternative 2B would require two million cubic yards of rock sidecasting because the Taiya Inlet highway segment would be eliminated. 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 (Alternatives 2, 2B, and 2C), Lace (Alternatives 2, 2B, and 2C), Katzehin (Alternatives 2 through 2C), 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. Clearing for Alternatives 2 through 2C, 3, 4B, and 4D during the spring and summer seasons would be limited to reduce the potential for disturbing nesting birds. 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.

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 Alternatives 2, 2B, and 2C; however, at least one known nest site is approximately 3,200 feet from the alignment on the delta between the Antler and Lace rivers (USFS, 2001). As indicated in Section 4.8.7, this is far enough away from construction activities that noise from construction equipment would be at background levels typical for the area. 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.

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 one-quarter to one-half 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. 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.

4.8.12.5 Amphibians

Project construction would result in the loss of individual frogs and toads in the wetlands crossed by the highways for Alternatives 2 through 2C, 3, 4B, and 4D. Few amphibians inhabiting areas to be cleared, graded, or filled would be able to avoid construction equipment. However, this 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. Alternatives 2 through 2C have from 45 (Alternative 2B) to 57 (Alternatives 2 and 2C) known trees with bald eagle nests within 330 feet of the alignment and from 88 (Alternative 2B) to 100 (Alternatives 2 and 2C) known nest trees within 0.5 mile of the alignment. There are 25 bald eagle nest trees within 330 feet of the proposed alignment for Alternative 3, and 45 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 seven nest trees occur within 0.5 mile of the alignment.

Construction along the alignments of Alternatives 2 through 2C 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 Alternatives 2 through 2C 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 Alternatives 2 through 2C 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 317 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.

Calculations of ground velocity at the Gran Point haulout were developed using standard blasting formulas and delayed charge weights of 20, 50, and 100 pounds. For the haulout site, corresponding ground vibration was calculated to be 0.048 ips for 20-pound charges, 0.096 ips for 50-pound charges, and 0.16 ips for 100-pound charges. It is estimated that 20-pound delayed charges would be used during highway construction. These charges would produce ground vibration of less than half of the inferred disturbance threshold for sea lions.

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, to watch for the presence and/or disturbance of whales. 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. The time frame for past actions ranged from the nineteenth century, when the earliest mining operations began, to 2003. The time frame for reasonably foreseeable future 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 foreseeable future 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.

4.9.1 Past, Present, and Foreseeable Future Projects

Past, present, and reasonably foreseeable future actions in the project area were identified using the Juneau Access Improvements Project comment database (to find foreseeable future actions referred to in 1997 Draft EIS comment letters from agencies and the public), 1997 public testimony, and 2003 scoping letters. In addition, future projects were identified through planning documents, personal communications with resource agency representatives, NEPA documentation, current events reported in the local and regional news, and best professional judgment.

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 Alternatives 2 through 2C 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 Record of Decision. Construction of the new mine has not started. In an effort to increase efficiency and reduce disturbance in the area Coeur submitted an amended Plan of Operations, which became the basis of the current *2004 Kensington Gold*

Project Draft Supplemental Environmental Impact Statement. For the purpose of this cumulative impact assessment, it is assumed that mine development will take place before 2010. The 2004 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, Goldbelt conducted a timber harvest in the Cascade Point/Echo Cove area, and that land is now being used as a rock quarry. There are no plans for timber harvests in the project area. It is possible that some timber harvest would occur on Mental Health and University Trust lands; however, it is not possible to quantitatively predict a reasonably foreseeable amount. Therefore, the only logging included as reasonably foreseeable in the detailed cumulative impact analysis is the logging within the right-of-way for construction of one of the alternatives for the Juneau Access Improvements Project.

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 obtained a permit to construct 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 a permit modification to construct a timber dock and a saltwater intake system for the processing facility.

Goldbelt – Goldbelt has prepared a management 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. Their access easement allows for the construction, maintenance, and operation of a three-mile-long gravel-surfaced road from the end of the existing Glacier Highway to the company's lands at Cascade Point. The Cascade Point Road project was the only Goldbelt project included in this analysis because it has a NEPA analysis that provides details of potential impacts and is permitted. The other projects are conceptual and are not dealt with in this analysis because they are not reasonably foreseeable.

The State of Alaska is funding the 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.

West of the Lace River, the highway for Alternatives 2, 2B, and 2C 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 may be upgraded as part of Coeur Alaska's proposal to build a deepwater floating dock at Slate Cove with funds from the Alaska Industrial Development and Export Authority (AIDEA). Use of these funds would ensure state access to the dock. If Coeur Alaska develops the Slate Cove dock with AIDEA funds, 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.

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.

4.9.1.4 Recreation

Personal Recreation – Recreation in Lynn Canal includes pleasure boating, sailboating, kayaking, canoeing, camping, hiking, sport fishing, hunting, and shellfish harvesting. In 2001, the U.S. Coast Guard reported 4,472 boat registrations in Juneau, 436 in Haines, and 101 in Skagway. Developed tent and RV campgrounds are found near the communities of Juneau, Skagway, and Haines. Hiking primarily occurs on trails maintained by the state, local governments, or private non-profit organizations.

Commercial Recreation – Several companies provide scenic tours in the Lynn Canal area using small aircraft and helicopters for optimal viewing opportunities. Primary flight-seeing destinations include the Juneau Icefield, Chilkat Glacier system, Mendenhall Glacier, Glacier Bay National Park, and Wrangell-St. Elias National Park. Wilderness guiding is a growing industry in Southeast Alaska, and guided tours in Berners Bay, the Katzehin River Valley, the Endicott River Wilderness, and the Chilkat Bald Eagle Preserve are popular. Guides operate Glacier River float trips and marine animal viewing tour boats in the Davidson Glacier area. Sport fishing is one of the most popular recreational activities in Lynn Canal. In 2003, the ADF&G Charter Vessel Registration List reported 1,127 charter boats registered in Juneau, 81 in Haines, and 13 in Skagway (ADF&G, 2003a).

4.9.1.5 Private Industry

Non-AMHS Vessel Operations – The Chilkat Express Ferry includes two 150-passenger high-speed jet catamarans operated seasonally in northern Lynn Canal between Haines and Skagway. Fjord Express operates a 48-passenger vessel between Haines and Juneau. Large cruise ships (overnight capacity ≥ 250 passengers), small cruise ships (overnight capacity of < 250 passengers), fishing boats, and other commercial boats also operate within Lynn Canal between Skagway, Haines, and Juneau.

Commercial Fishery – The Lynn Canal commercial fisheries (District 15) are segmented into three regulatory areas: 15A – Upper Lynn Canal; 15B – Berners Bay; and 15C – Lower Lynn Canal. The drift gillnet fishery targets sockeye, summer chum, coho, and fall chum salmon, with some king and pink salmon taken incidentally. A limited power and hand troll fishery for king and coho salmon exists in Lynn Canal, as well as a limited crab and shrimp pot fishery in Haines and Juneau.

There were 286 commercial fishing permit holders active in Juneau in 2002, with a combined harvest of 18.4 million pounds for a gross value of $14.35 million. In Haines, 81 commercial fishing permit holders harvested 5.3 million pounds with a gross value of $2 million. Skagway had three active permit holders, but only two fished commercially in 2002 (values unavailable).

Pacific Seaflight Ferry – Pacific Seaflight is planning to begin operating wing-in-ground-effect ships between Juneau and Haines and Juneau and Hoonah. The vessels operate much like a hydrofoil but instead of using noisy fans to lift the vessel the air cushion is created by the forward motion of the ship. The ships are quiet and do not exchange fluids with the marine environment. The ferry service will be based in downtown Juneau.

4.9.1.6 Utilities

Alaska Power and Telephone Company has a Federal Energy Regulatory Commission 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. Construction is scheduled to begin in 2005.

Both the Haines and Skagway sewage treatment facilities are primary treatment plants that operate under EPA 301(h) waivers from secondary treatment for ocean discharges. Primary treatment includes screening, settling, grit removal, and skimming. The Haines outfall extends 1,800 feet into Lynn Canal and discharges effluent at 70 feet below mean lower low water. Skagway's outfall extends 85 feet into Taiya Inlet and discharges effluent at 60 feet below mean lower low water.

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 other outfalls are not near the project area. The Auke Bay Ferry Terminal also discharges effluent to Auke Bay after treatment at 20 feet below mean lower low water.

4.9.1.7 Other

Subsistence and Personal Use – Subsistence harvests are conducted by residents of Klukwan, Haines, and Skagway. These residents fish for salmon and non-salmon finfish and hunt black bear, brown bear, moose, Sitka black-tailed deer, and mountain goat. The Native Alaskans residing in Haines and Skagway also harvest marine invertebrates, including crabs, shrimp, clams, and cockles. Harbor seals have also been harvested by Skagway residents in the past, and continue to be harvested by Native Alaskans residing in Haines.

Juneau is not recognized as a subsistence community under the Alaska National Interest Lands Conservation Act. Some residents of Juneau use Berners Bay and Lynn Canal for personal use harvests of fish and shellfish.

4.9.1.8 Actions Not Considered

The following actions were determined not to be reasonably foreseeable future 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.

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 [FR] 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 exchange is not completed and there is no management plan in place; therefore, no details of potential impacts are reasonably foreseeable.

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 future 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 future actions, were not evaluated for cumulative impacts. Potential cumulative effects were identified for the following resource areas: land use, visual resources, historical and archeological 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 2 through 2C and 3 – Alternatives 2 through 2C 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 but there are no specific plans to do so. Outdoor recreation is a principal leisure time activity for Juneau, Haines, and Skagway residents. The improved access provided by Alternatives 2 through 2C and 3, 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.

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 2 through 2C and 3. The proposed Goldbelt developments from Echo Cove to Cascade Point 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 tour operations 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 2 through 2C, 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. 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 foreseeable future 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 or Taiya Inlet.

4.9.2.3 Historical and Archeological Resources

The increased population and visitors associated with either Alternatives 2 through 2C or 3, together with the improved access associated with these project alternatives and USFS joint 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.

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 2 through 2C 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

Alternatives 2 through 2C – Alternatives 2 through 2C are projected to create about 200 to 290 new jobs in Juneau by 2038. The Kensington Gold Project (225 permanent jobs), the Alaska Glacier Seafoods Auke Bay facility (10 to 15 seasonal and two permanent jobs), and the Pacific Seaflight ferry (five to seven seasonal and 9 permanent jobs) are also projected to increase employment in Juneau. As a rule of thumb, each new job results in a population increase of about 1.5 people. Alternatives 2 through 2C are projected to add 300 to 430 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 five percent of the community's existing population (Juneau's 2003 population estimate is 31,000 people).

Sales tax revenues for Juneau would increase due to a predicted increase in visitor spending. It is estimated that Alternatives 2 through 2C would generate approximately $520,000 to $775,000 additional sales tax dollars in 2038. CBJ would receive approximately $1.4 million dollars from the Kensington Gold Project property taxes.

The Otter Creek Hydroelectric Project at Kasidaya Creek would reduce electrical costs to Skagway and possibly Haines. Alternatives 2 through 2C 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, Alaska Glacier Seafoods Auke Bay facility, and Pacific Seaflight 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 four percent would be expected in Juneau.

Increased visitor spending associated with Alternative 3 would generate approximately $170,000 additional sales tax dollars in Juneau in 2038. CBJ would receive approximately $1.4 million dollars from the Kensington Gold Project property taxes.

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 70 to 96 new jobs in Juneau by 2038. The Kensington Gold Project, Alaska Glacier Seafoods Auke Bay facility, and Pacific Seaflight are also projected to increase employment in Juneau. Alternatives 4A, 4B, and 4D are projected to result in an increase of about 70 to 150 people in Juneau by 2038. Together with the Kensington Gold Project projected population increase (1,164 people), a maximum overall population increase of approximately four percent would be expected in Juneau.

Increased visitor spending associated with these three alternatives would generate approximately $80,000 to $240,000 in additional sales tax dollars in Juneau by 2038. CBJ would receive approximately $1.4 million dollars from the Kensington Gold Project property taxes.

Economic Cumulative Effects – To varying degrees, the cumulative effect of the new jobs and corresponding increase in Juneau's population associated with the proposed project alternatives and foreseeable future projects would cause an increase in housing demand greater than the existing housing supply and a corresponding increase in property values in Juneau. This population growth is projected to place an increased demand on public utilities, the CBJ school system, and health care services. 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.

4.9.2.5 Social Effects

The increased population and visitors associated with improved access, particularly with Alternatives 2 through 2C and 3, and the Kensington Gold Project 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 foreseeable future projects would introduce some pollutants to stormwater runoff, which would eventually flow to marine and freshwater bodies. Treated wastewater would also be discharged from these projects to marine waters. All treated effluent would meet NPDES wastewater discharge limits, and pollutant loads in stormwater runoff are expected to be below AWQS, as discussed in Section 4.3.9 and the Supplemental EIS for the Kensington Gold Project (USFS, 2004); therefore, there would be no substantial cumulative water quality impacts.

4.9.2.7 Air Quality

Alternatives 2 through 2C 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 fires is carried south from the Yukon under northerly winds.

Foreseeable future actions, including the Kensington Gold Project, Goldbelt developments, 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 foreseeable future 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 Alternatives 2 through 2C 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 nitrogen oxides and reactive organic gases from the proposed project and foreseeable future projects would be too small in combination with background concentrations to result in the formation of substantial concentrations of ozone.

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 the Supplemental Draft EIS and presented in the *Noise Analysis Technical Report* (Appendix L).

Alternatives 2, 2A, 2B, or 2C – These alternatives 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 the Supplemental Draft EIS discussions on noise), traffic noise is estimated to be at background levels at approximately 200 to 250 feet from centerline along the coastline. Alternative 2A would introduce the same noise source in Lynn Canal but not around the shoreline of Berners Bay.

The Kensington Gold Project Slate Cove access road and the Goldbelt Cascade Point Road 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 Alternative 2, 2A, 2B or 2C highway alignments. No residences would be impacted and vehicular noise levels are anticipated to have negligible effects on wildlife due to the predicted volume of traffic.

Alternatives 3, 4B, and 4D – The traffic noise under Alternative 3, 4B, and 4D would be the same as discussed above for Alternatives 2 through 2C 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

Alternatives 2 through 2C would result in filling approximately 100.4 to 118.6 acres of wetlands and other waters of the U.S. Alternative 3 would result in filling 47.3 acres of wetlands and other waters of the U.S. Alternatives 4B and 4D would fill 12.9 acres of wetlands and other waters of the U.S. 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 4.3.13, 4.4.13, and 4.6.13. The maximum wetland loss associated with these alternatives is approximately 92.5 acres for Alternatives 2 and 2B. Indirect effects could occur due to introduction of invasive plant species from increased access and accidental spills from vehicles.

Past projects have resulted in the loss of 3.9 acres of palustrine emergent wetland in the east side of Lynn Canal and an unknown acreage of wetland forest (USFS, 2003, USFS, 1988a, and USFS, 1988b). The Kensington Gold Project would result in the loss of 92 acres of wetlands, primarily forest wetland. Development of the Cascade Point Road by Goldbelt would result in the loss of 2.5 acres of forest wetland and 0.2 acre of palustrine emergent wetland.

The loss of wetlands associated with the Cascade Point Road and Alternatives 2 through 2C, 3, 4B, and 4D would not be cumulative. The alignment of the road and the highway segment for these alternatives between Echo Cove and Sawmill Cove would be the same. If the Cascade Point Road is built first, DOT&PF would use that alignment and widen the road to meet the state's highway standards. This small additional impact in wetland areas would not result in a greater wetland impact than quantified for Alternatives 2 through 2C, 3, 4B, and 4D. If one of these alternatives is built first, Goldbelt could use the highway after constructing a short access road to Cascade Point through nonwetland areas.

Wetland Cumulative Effects – The maximum cumulative loss of approximately 188 acres of wetlands from the Kensington Gold Project, Alternatives 2, 2B, or 2C, and past activities would constitute approximately 1.7 percent of the total wetlands on the east side of Lynn Canal (approximately 11,259 acres) and 1.4 percent of the wetlands in the entire Lynn Canal region (approximately 13,710 acres). The affected wetlands are relatively abundant within the Lynn Canal region, 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 2A, 3, 4B, and 4D – Alternatives 2A, 3, 4B, and 4D would fill approximately 1.9 acres of intertidal and subtidal habitat in Sawmill Cove. Alternative 2A would also fill 1.1 acres of intertidal and subtidal habitat in Slate Cove. Dredging would occur in 1.3 acres of subtidal habitat for the Sawmill Cove mooring basin. A potential for cumulative effects would only occur in Berners Bay because this is the only area where foreseeable future actions would also place fill in the marine environment. The Goldbelt Cascade Point marine facility would fill about 1.3 acres of beach/intertidal habitat and dredge approximately 1.4 to 1.6 acres of subtidal habitat. The Kensington Gold Project marine facility in Slate Cove would fill approximately 3.6 acres of upland/beach/intertidal habitat. If Alternative 2A, 3, 4B, or 4D was chosen as the project action and the Goldbelt Cascade Point terminal was constructed, there would be approximately 9.7 to 10.8 acres of marine habitat lost due to 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 (two percent), disease (two percent), and habitat modification (two 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 two 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 2A, 3, 4B, or 4D, the cumulative loss of herring spawning habitat in Berners Bay would be 4.4 percent.

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 essential fish habitat.

Alternatives 4A through 4D – 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 foreseeable future 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. 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 630 acres under Alternatives 2 and 2C. Past impacts to terrestrial habitat have occurred due to timber harvests and mine developments. The Goldbelt Cascade Point Road would remove approximately 33 acres of terrestrial habitat, the Kensington Gold Project would impact an additional 95 acres, and the Otter Creek Hydroelectric Project on Kasidaya Creek would impact about six acres of terrestrial habitat. Together, these losses result in a maximum potential cumulative loss of approximately 764 acres of terrestrial habitat[46]. This cumulative loss represents about 0.6 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.

4.9.2.12 Wildlife

Marine Mammals – Alternatives 2A, 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 2 through 2C, 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 have the potential to cause similar impacts. Nesting, resting, and foraging habitat is not scarce 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 above, the maximum terrestrial habitat loss associated with the proposed project is approximately 630 acres under Alternatives 2 and 2C. This loss represents about 0.6 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.

---

[46] The loss of terrestrial habitat associated with the Cascade Point Road and any of the East Lynn Canal Highway alternatives would not be cumulative. The alignment of the road and an East Lynn Canal Highway would be similar.

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 Alternatives 2 through 2C, the highway could reduce the habitat capability of the east side of Lynn Canal for the brown bear by 29 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 (5.5 miles), habitat fragmentation for brown bears would be minor.

Of the foreseeable future projects in the region, only the Kensington Gold Project would contribute to cumulative impacts to brown bears. Depending on the alternative selected for this project, the Kensington Gold Project, including upgrading the Slate Cove to Jualin road, would result in the loss of 118 to 268 acres of habitat, half of which is upland 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 Alternatives 2 through 2C and would not cause substantial habitat fragmentation. The contribution of the Kensington Gold Project on cumulative effects to the brown bear population would be small in comparison to Alternatives 2 through 2C.

Terrestrial Birds – Terrestrial birds nest in wetlands and old-growth forest in Berners Bay. Alternative 2 through 2C, 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. Nesting, resting, and foraging habitat is not limited in the Berners Bay area. The cumulative loss of habitat would represent less than 1 percent of the amount available. Therefore, this cumulative effect would not have population-level effects on any terrestrial bird species.

Amphibians – As discussed in Section 4.9.2.9, past, present, and foreseeable future projects in combination with the proposed project would result in the loss of less than 1 percent of the wetland habitat in the Lynn Canal region. This cumulative loss of habitat would not have population-level effects on amphibian species.

4.9.2.13 Bald Eagles

Past, present, and reasonably foreseeable future 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 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.

4.9.2.14 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 pollution from runoff and waste disposal.

Alternatives 2A, 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. This increased traffic would increase the risk of collisions between marine vessels and humpback whales. Alternative 2A would add about 20 trips per day in the summer across Berners Bay. Alternative 4B would involve a high-speed ferry, which would further increase the risk of collisions with humpback whales (Laist et al., 2001). Considering the existing level of construction, commercial, and recreational activity in Southeast Alaska and the increasing population trend for this species, it appears that the cumulative activities in Lynn Canal would not be likely to hinder the overall recovery of the humpback whale population.

As indicated above in this chapter of the Supplemental Draft EIS, 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 foreseeable future projects would be required to meet NPDES discharge limitations. The proposed project in combination with foreseeable future projects would not measurably decrease water quality in Lynn Canal; therefore, no water quality impacts to marine mammals would likely occur.

Alternatives 2A, 3, 4B, and 4D, in combination with foreseeable future projects, including commercial fishing, recreational, and commercial marine traffic and development projects in the Berners Bay area, is likely to cause some short-term disturbance of foraging Steller sea lions. These activities may also contribute to periodic disturbance of Steller sea lions at haulouts in Berners Bay, but are not likely to cause long-term, chronic disturbance at the Gran Point or Met Point haulouts. Therefore, the cumulative effects of these projects are not likely to result in population-level effects to Steller sea lions in Lynn Canal.

See the *Indirect and Cumulative Impact Technical Report* (Appendix U) for further information on potential cumulative impacts of the proposed project.

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 660 acres of natural habitat, principally old-growth forest, to transportation facilities. This overall loss of habitat represents less than one 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 660 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 $98 million to $294 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.

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 (such as steepened slopes and reduced embankment heights). Other specific commitments and mitigation measures for the project are described below by resource area.

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 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. The roadway would be constructed using the minimum-width fill footprint necessary to provide a stable road base.
5. 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 not constructed of shot rock. 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, but have indicated a desire for greater baseline data for many resources in the Berners Bay area. DOT&PF would work with resource agencies to develop a combination of funding for research in or near the affected watersheds and fee-in-lieu payments for restoration or protection of off-site wetlands.

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.

5.4 Intertidal and subtidal areas

1. The original 2003 alignment for the East Lynn Canal Highway alternatives included 45 intertidal sites where highway construction would be below the high tide line, nine subtidal locations for potential sidecasting of excess rock, and three ferry terminal sites. Based on detailed aerial survey data, DOT&PF adjusted the alignment to limit intertidal fill to 17 sites. During design, DOT&PF would investigate ways to further reduce intertidal fills, including alignment shifts and steepened slopes.
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 combination of funding for research in or near the affected intertidal and subtidal habitat and 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 with120-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. In-water work areas would be isolated and dewatered to avoid direct impacts to fish as well as downstream water quality impacts.

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. Clearing in areas where migratory birds are likely to nest would be done before or after the nesting season (late spring to early summer, to be determined in consultation with the USFWS) to avoid impacts to nesting birds.

2. Nesting surveys for trumpeter swan and Queen Charlotte goshawk would be conducted prior to construction in appropriate habitats to avoid disturbing nesting activities during this period.

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 2, 2B, or 2C is the selected alternative, a wildlife underpass would be located at the brown bear migration corridor in the isthmus between the Antler and Lace rivers.
3. Mitigation for impacts to wetlands would include funding for bear 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, monitors would be used during pile driving to ensure that this activity does not occur when humpback whales and other marine mammals are within 660 feet of the construction site.
2. 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.
3. Any construction within 3,000 feet of Gran Point or Met Point would include through-cuts and walls to avoid lines of sight between the haulouts and the highway and to discourage human disturbance of sea lions.
4. Monitoring would be done during any construction within 3,000 feet of the Gran Point and Met Point haulouts.
5. Video monitoring at the Gran Point haulout and aerial and ground monitoring at the Met Point haulout would continue for three years after any construction in these areas to determine the extent of human disturbance of sea lions.
6. 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 archeological 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. If bridges are to be placed over the Lower Dewy Lake Trail or the White Pass & Yukon Railroad tracks, the City of Skagway and the National Park Service would be consulted regarding bridge design to minimize visual impacts to these resources.
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 State Historic Preservation Officer 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, and a handicap-accessible trail would be constructed from the highway parking area to the cabin.
3. 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. Composting toilets at Katzehin and/or Sturgill's Landing access trail would be maintained by the USFS.
4. If the East Lynn Canal Highway alternative without the Katzehin Ferry Terminal is selected (Alternative 2C), a toilet would be provided at a pullout in the Katzehin River vicinity.
5. Any highway constructed in the vicinity of the USFS Sturgill's Landing Day Use Area would be at least 660 feet from the mouth of the creek. A connection would be made to the Landing trail, and a toilet would be provided at the new trailhead.
6. If a highway is constructed through the City of Skagway-owned Lower Dewey Lake parcel, the City would be consulted on the design and placement of any trailheads, parking areas, day-use areas, and pedestrian/bicycle facilities. Furthermore, DOT&PF would provide funding to the City for improvements to the Upper Dewey Lake Trail, the Icy Lake to Upper Reid Falls Trail, and the East Lower Dewy Lake Trail on City land. DOT&PF would also investigate the feasibility of trail enhancements on state and federal land adjoining these trails.

This page left intentionally blank.

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 Federal Highway Administration (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 SDEIS 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 Mollie Walsh Park, and Pullen Creek Shoreline Park, all in Skagway (Figure 3-5). 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 3-5).

No park land would be required for any of the alternatives under consideration, nor would proximity impacts create a constructive use. The only parks close to potential new highway construction are those in the City of Skagway. Alternatives 2, 2A, and 2C would be over 1,000 feet from Pullen Creek Shoreline and Mollie Walsh parks and approximately 500 feet from the closest corner of the KLGO.

6.2.2 Recreation Areas

Several alternatives would require land from municipal, 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 Municipal Land

Alternatives 2, 2A, and 2C would pass through City of Skagway land known as the Dewey Lake Parcel (Figure 3-1). This land is zoned Residential Conservation and is designated as Recreation/Open Space in the City of Skagway Comprehensive Plan (1999). Based on the information in the Comprehensive Plan, FHWA determined that this land is managed for uses in addition to recreation and therefore Section 4(f) does not apply to the entire parcel (Haugh, 2003). 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, 1989].

DOT&PF consulted with City of Skagway officials to determine what recreational facilities in the parcel function for significant recreation purposes. The City of Skagway has indicated that the Lower Dewey Lake Trail and the Harbor Overlook Trail are significant recreation facilities (Yost, 2004), therefore FHWA has determined they are subject to Section 4(f) regulations. One other trail shown on the Skagway way trail system would be crossed by some project alternatives. This trail, the Icy Lake/Upper Reid Falls Trail, uses a power company access road for part of its length, including the segment that would be crossed. FHWA has determined that where this trail is on the power company access road, it is not a significant recreation facility, because its major purpose is not recreation.

Alternatives 2, 2A and 2C would avoid use of land from the two Section 4(f) protected trails by passing over or under the trails, maintaining trail continuity. Only air or subsurface rights would be acquired at the crossing locations. The trails would continue to function as recreational hiking facilities. FHWA has determined that no constructive use would occur. The trail experience would be altered in the vicinity of the crossings, but these proximity impacts would not be so severe as to substantially diminish the qualifying activities, features, or attributes of the trails. DOT&PF has also committed to trail enhancements and mitigation for non-4(f) impacts (see Chapter 5, Proposed Mitigation and Commitments).

On March 4, 2002 the Skagway City Council passed Resolution 04-04R recommending the Dewey Lakes Trail System be designated a Special Management Area and considered for establishment as a park. One of the reasons cited for this action was the development pressure that could be created by road access to this area. In response DOT&PF proposed a Joint Planning Agreement designating a road corridor through the area that could be incorporated into the City's Special Management Area plan (Paxton, 2004). On October 7, 2004 the Skagway City Council adopted an ordinance creating the Dewey Lake Recreation Area Management Plan. The City has yet to act on a Joint Planning Agreement.

The FHWA has reviewed the ordinance creating the Dewey Lake Recreation Area Management Plan and has determined that nothing in the ordinance changes the original determination that the parcel is managed for multiple use. The only Section 4(f) protected facilities are the two trails mentioned above.

FHWA has determined that Alternative 2, 2A and 2C would pass through City of Skagway land but would not require the use of any City of Skagway land protected by Section 4(f).

6.2.2.2 State Land

Alternatives 2, 2A, and 2C would pass through State of Alaska land, Parcel S-23, south of the Dewey Lake parcel (Figure 3-1). The Alaska Department of Natural Resources administers this land under the Northern Southeast Area Plan (ADNR, 2002a). This parcel is designated General Use, and the management plan allows for potential development while maintaining habitat, scenic and recreation values. The land designation, management guidelines and intent all indicate this land is managed and functions for multiple use. The only portion of the parcel designated and/or functioning for recreation (excluding dispersed activities) is the Sturgill's Landing Trail (Figure 3-4). Alternatives 2, 2A, and 2C would avoid use of land from this trail by bridging over the trail, maintaining trail continuity. The trail would still provide access to the USFS Sturgill's Landing Day Use Area. Although the trail experience would be altered in the vicinity of the crossing, no constructive use would occur. The qualifying activities, features and attributes would not be substantially diminished. Roadside parking and a connection to the trail would be provided as a trail enhancement.

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.

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, 2002b) states that this land "will primarily be managed …for public recreational uses". However, the Plan also states that "the Haines State Forest will be managed for multiple use, consistent with the establishment of the State Forest (AS41.15.300)". 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 Alaska Department of Natural Resources has concurred that the only specific recreational facilities on land that would be crossed by Juneau Access Improvements alternatives are the Sturgill's Landing and the Davidson Glacier Lake trails (Irwin, 2004).

FHWA has determined that Alternatives 2, 2A, 2C and 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).

6.2.2.3 Federal Land

All build alternatives with highway segments would pass through federal land under management of the United States Forest Service (USFS). As explained in Section 3.1.1.1, the 1997 Tongass Land and Resource Management Plan (TLMP) assigned Land Use Designations (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. Alternatives 2, 2B, and 2C would pass through the following LUDs: Scenic Viewshed, Semi-Remote Recreation, Old Growth-Habitat, Modified Landscape, and LUD II. Alternative 2A would pass through all of the preceding LUDs except for LUD II. Alternative 2A would not entail highway construction from Sawmill Cove to Slate Cove, bypassing the Berners Bay 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 which 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 (Ken 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 (Ouderkirk, 2004a).

None of the alternatives would cross the Sturgill's Landing trail on USFS land. (Alternatives 2, 2A, and 2C would cross this trail on state land; see Section 5.2.2.) Alternatives 2, 2A, and 2C would pass approximately 680 feet east of the day use area. Alternatives 2, 2B, and 2C would pass approximately 400 feet east of the Berners Bay cabin. No established property boundary exists for either facility. The USFS often considers a 1/8 mile (660 feet) "zone of influence" around cabins and similar facilities and has indicated that this should be applied to the day use area (Ouderkirk, 2004b).

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, 2004c). 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 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 2-2C, 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

Alternatives 2, 2A, 2B, and 2C would pass through the Berners Bay Historic Mining District (BBHMD). These alternatives 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 3-6). No land would be required from any contributing property within these historic districts. Alternatives 2, 2B, and 2C would bridge over the Jualin Mine Tram. Alternatives 2, 2A, 2B, and 2C would 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, an integral part of the historic district, or contributes to the factors which make the district historic [Section 4(f) Policy Paper, Question 3, FHWA, 1989]. 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 Hydroelectric Complex District and Lower Dewey Lake Trail

Alternatives 2, 2A, and 2C would pass through one area of the Skagway Hydroelectric Complex District and over the Lower Dewey Lake Trail (Figure 3-5). These alternatives would bridge over this historic trail; the same bridge would cross the hydroelectric complex pipelines and tramway. No land from an identified contributing property would be required from the trail or district. All of these alternatives would bridge over the contributing elements affected. The land easement from the City of Skagway would be limited to air rights where the highway crosses over the trail. Only air rights would be acquired from the power utility for the bridge crossing the pipelines and tramway. Other than the crossings of the trail, railroad and hydroelectric elements, the only lands impacted in the hydroelectric complex district are previously disturbed (logged) undeveloped areas. These lands 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 within and near these Skagway historic sites would not result in a constructive use. Although the highway for Alternatives 2, 2A, and 2C would have an effect on the trail and hydroelectric district, it would not be so severe as to substantially impair their qualifying activities, features or attributes.

6.4.3 Skagway and White Pass District National Historic Landmark

Alternatives 2, 2A, and 2C would pass through a portion of the Skagway and White Pass District National Historic Landmark (NHL) (Figure 3-5). The highway would traverse the hillside above the north end of Skagway and cross over the White Pass & Yukon Route tracks before connecting to 23rd Avenue. 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. (Parts of the Lower Dewey Trail and the Hydroelectric Complex are within the NHL but are not listed as contributing resources.) The bridge over the railroad tracks would only require the purchase of air rights.

As discussed in Section 4.3.4, the boundaries of the NHL include natural areas to provide an understanding of Skagway's historic setting. Consultation with the National Park Service (NPS), the federal agency responsible for NHLs, regarding potential impacts to the landmark is ongoing (see August 11, 2004 letter in Section 7). During consultation regarding NPS concerns with potential visual and auditory impacts of these alternatives, 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 above, applicability of Section 4(f) to land within a historic district is based on whether or not the land is individually historic, an integral part of the historic district, or contributes to the factors which make the district historic. Consultation with the NPS has been expanded to include this issue (see October 21, 2004 and December 3, 2004 letters in Section 7). A determination of the applicability of Section 4(f) to the natural land that would be crossed by these alternatives will be made at the conclusion of consultation with the NPS and the State Historic Preservation Officer.

6.4.4 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.

This page left intentionally blank.

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 Council on Environmental Quality 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* (Lochner, 1994) in April 1993 to May 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 Public Coordination

Public coordination has 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 – Chamber Lunch Presentation – Gary Paxton with an introduction overview of the EIS
- August 1, 2003 – KINY Radio AM 8:00, Juneau – Capital City Chat with Chris Burns
- October 23, 2003 – Yakoosge Daakahidi Alternative High School Presentation
- September 5, 2003 – Project update presentation 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 – Southeast Transportation Plan (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 City and Borough of Juneau (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 essential fish habitat 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 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. 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 Area of Potential Effect (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* (DOT&PF, 2003d) 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 V).

This report allows the public, agencies, and other organizations to see how their substantive comments were addressed in the Supplemental Draft EIS by using the "track response" tables in the report.

7.7 Summary of 2003 Scoping Comments

The following information briefly summarizes the 2003 scoping comments from Juneau, Skagway, and Haines residents and agencies. The *2003 Scoping Summary Report* (DOT&PF, 2003b) contains copies of all of the scoping comments. The *Comment Analysis Report* analyzes the substantive comments made during 2003 scoping.

7.7.1 Purpose and Need Issues

Public Comments – Several commentors indicated that they thought the statement of purpose in the Supplemental Draft EIS is biased toward road construction. A number of comments also requested broader and more detailed analysis of project need. These comments focused on fully addressing the benefits of improved access, including improved access to health care services for residents of Haines and Skagway, the benefits to freight movement to and from the region (especially seafood), the cost-of-living benefits (especially those accruing to low-income households), and overall economic benefits associated with improved transportation infrastructure. In addition, a comment was submitted requesting that the Purpose and Need section be expanded to include "enhanced economic benefits to the communities of Juneau, Skagway, and Haines, including benefits from enhanced cruise ship tourism, independent travelers and commercial recreation."

7.7.2 Traffic Forecast Issues

Public Comments – Comments received regarding traffic forecasts generally asked for clearer identification of who would use the East Lynn Canal Highway, including vehicle types (RVs, trucks, etc.) and trip purpose. Commentors also asked for additional information about the assumptions made in the traffic forecasts.

7.7.3 Household Survey

Public Comments – Comments received on the household survey focused on the need for sufficiently large sample sizes in Skagway and Haines to ensure statistically valid data. Comments also indicated an interest in more information to address the transportation needs and the quality-of-life impacts of the alternatives.

7.7.4 User Benefit Analysis

Public Comments – Detailed comments were received on the user benefit methodology. Concerns included the opinion that the user benefit analysis should be completely redone because the America Association of State Highway and Transportation Officials (AASHTO) methodology is an inappropriate tool for assessing the economic implications of project alternatives. Comments also suggested that inaccurate cost data were incorporated into the analysis, the analysis was based on unrealistic traffic analysis, and the analysis contains material errors.

Regarding the marine alternatives, it was suggested that traveler costs were understated in the original draft, and that the user benefit must include the full cost of traveler time on all ferry options and evaluate the "cost or value of the freedom to travel at will, which is lost on ferry options."

Another comment suggested that a "level of confidence" be associated with each key assumption made in the user benefit analysis. Presumably, based on this level of confidence, a sensitivity analysis could be conducted.

Other comments focused on the need to expand the economic analysis to include all costs and benefits associated with each alternative. This includes the systemwide economic impacts on the AMHS and the communities served by AMHS and the economic value of Tongass land along the proposed route left in its “pristine” condition.

7.7.5 Range of Alternatives

Public Comments – Most of the comments concerning alternatives focused on revisiting the West Lynn Canal Highway alternative. A number of Haines residents, in particular, wanted to see the West Lynn Canal Highway alternative carried forward as a reasonable alternative. Numerous comments indicated that the West Lynn Canal Highway alternative was the only road alternative that would not result in major adverse economic impacts on Haines.

In addition, some residents view Taku River as an alternative that can meet Juneau’s hard-link access needs without affecting Lynn Canal economies or the environment.

Based on comments received, some uncertainty exists about access to Haines and Skagway under Alternative 2 when the road is closed due to avalanches.

Comments on the alternatives also focused on modifying the assessment of the road alternatives to include a road link between Haines and Skagway. Comments from Haines and Skagway residents expressed interest in adding a road link rather than a shuttle ferry.

One commentor suggested that a train alternative should be considered in the Supplemental Draft EIS.

It was suggested that the reliability of each alternative needed to be better assessed, including the number of days per year the East Lynn Canal Highway would be closed to avalanche risks or snow removal, as well as the number of days per year ferries would be unable to operate due to adverse weather.

7.7.6 Highway Alignment

Public Comments – Most of comments received regarding highway alignment focused on the Skagway tie-in for the East Lynn Canal Highway. Under the current concept, the road would pass through the Lower Dewey Lake area, a popular recreation area accessible only by trail. One comment requested computer simulations of routes into Skagway.

A Juneau resident asked that if the Taku River alternative is added, a Thane Road bypass be considered, due to potential impacts on the neighborhood.

Commentors also suggested that a 30-foot total roadway width would be inadequate, and in particular, shoulder widths of four feet would not be wide enough for emergency pull-off. It was also expressed that many of the curves in the 1997 alignment were under the 50 mph design standard.

7.7.7 Cost Estimates

Public Comments – The most frequently expressed concern in the Supplemental Draft EIS scoping process was the validity of East Lynn Canal Highway construction and maintenance cost estimates. Generally, commentors expressed concern that the cost estimates were too low and requested detailed, clearly understandable cost estimates with sensitivity analyses (and confidence levels) for key assumptions. Detailed cost estimates for a Skagway–Haines highway were also requested.

7.7.8 Marine Segments

Public Comments – A number of scoping comments expressed concern about the impact of project alternatives on the AMHS overall. Commentors stated that the Lynn Canal market contributes an important share of systemwide revenues and the impact of revenue losses associated with road construction must be addressed.

It was also requested that the Supplemental Draft EIS incorporate the ferry service recommendations presented in the McDowell Group's study of Lynn Canal ferry service. That study recommended operating an FVF between Juneau and Haines/Skagway (a vessel similar to the 35-vehicle ferry then under construction, now in service), a shuttle ferry between Haines and Skagway, continued mainline service as warranted and an additional FVF as demand dictates. In addition, it was suggested that cost data now available on FVF construction be included in the analysis of marine alternatives.

Other commentors suggested that, for the West Lynn Canal Highway alternative, only one ferry would be required on the Berners Bay to William Henry Bay link rather than the two ferries indicated in the Draft EIS.

7.7.9 Wetlands

Public Comments – Specific comments concerning wetlands indicated that the Supplemental Draft EIS must include a functional assessment of potentially impacted areas, not just a delineation of location and type of wetlands. Further, it was suggested that the wetlands study should incorporate an overview of both the entire wetlands area and the subsections of the wetlands that are the most productive and the most likely to be impacted. Particular concern was expressed regarding the Berners Bay area and the effect of highway construction on water flow. One commentor asked for clarification of the acreage affected by road construction.

Agency Comments – The Alaska Office of Habitat Management and Permitting (OHMP) expressed the opinion that the Draft EIS assessed wetlands function at too large a scale. Use of the hydrogeomorphic methodology or an alternate function analysis methodology was recommended to assess wetland impacts. OHMP also recommended that the wetlands mitigation options be revisited, since the number of potential mitigation opportunities has expanded since the 1997 Draft EIS. OHMP also recommended that the CBJ Wetlands Review Board be included in the development and review of wetland aspects of the Supplemental Draft EIS, particularly mitigation.

7.7.10 Geology

Public Comments – Comments regarding geology focused on the need for an extensive study and greater detail in the Supplemental Draft EIS on the geology of both the East Lynn and West Lynn highway routes. For example, it was suggested that the Supplemental Draft EIS include a thorough search for and study of karst features on the west side of Lynn Canal. Similarly, another commentor questioned how road construction would affect water drainage and hydrology on the west side. Other issues raised included the likelihood and effects of landslide/mudslide/mass wasting triggered by blasting.

7.7.11 Avalanche

Public Comments – Numerous comments were received regarding the potential avalanche hazard associated with Alternatives 2 through 2C. In general, a detailed report of the avalanche risks and mitigation was requested. Commentors asked for details such as what percentage of time the road would be closed due to avalanche control, what would be done to prevent strandings, where would callboxes be located, and how avalanche control would be conducted. It was also suggested that the Supplemental Draft EIS assess the safety risks for drivers compared to ferry riders. It was also requested that the Supplemental Draft EIS include comparative data from other avalanche-prone areas, including Seward Highway and Klondike Highway, to lend perspective to the risks associated with the East Lynn Canal avalanche areas.

7.7.12 Noise

Public Comments – The only comments received concerning noise focused on the potential noise impacts in Haines from vehicle traffic on Alternatives 2 through 2C. It was reported that on quiet days sound carries well from the east side of the canal to Haines, and that noise tests should be conducted as part of the Supplemental Draft EIS.

7.7.13 Wildlife

Public Comments – Scoping comments concerning wildlife generally focused on the need to broaden the analysis to include studies of impacts on other species such as deer, wolf, harbor seal, moose, trumpeter swan, and wolverines. One commentor recommended increasing the number of indicator species to include at least one small mammal and one migratory nesting songbird. One person expressed the need for a comprehensive study of the population of goshawks in the East Lynn area. Another commentor asked for an assessment of the impact downhill of road cuts, including impacts on communities of lichens, plants, invertebrates, fungi, small animals, and intertidal communities.

Another commentor recommended that the Supplemental Draft EIS consider new reports released since 1997 concerning habitats and wildlife of Northern Lynn Canal and Berners Bay. Of specific interest is work that relates to the importance of eulachon runs to wildlife that inhabit Lynn Canal. Eulachon was characterized as a “cornerstone species” for Steller sea lions, humpback whales, bald eagles, migratory shorebirds, and waterfowl. Also it was suggested that the Supplemental Draft EIS consider the effects of oil-polluted stormwater runoff on herring eggs, which is thought to be linked to the decline of Juneau’s herring runs.

Some public comments noted that the Supplemental Draft EIS should incorporate research conducted by the USFS Juneau Field Office including surveys of waterbirds, marine mammals, and human use of the Berners Bay shoreline and nearshore waters.

Comments also indicated that the Supplemental Draft EIS should consider the impact of all-terrain vehicle (ATV) traffic on flatlands as related to poaching, wildlife harassment, and cost of increased wildlife protection and enforcement.

Agency Comments –NMFS asked that the preliminary 2003 USFWS report on wildlife and human use of Berners Bay be used to update the Supplemental Draft EIS. NMFS also recommended that DOT&PF coordinate with the USFS to utilize information collected in the Berners Bay area for the Kensington Gold Project’s current NEPA process.

7.7.14 Essential Fish Habitat

Public Comments – The only comment somewhat related to essential fish habitat asked for a study of impacts of heavy metals in the roadside environment on salmon and crab.

Agency Comments – NMFS recommended that an essential fish habitat assessment be prepared for the Supplemental Draft EIS.

7.7.15 Steller Sea Lions

Public Comments – Only very general scoping comments were received concerning sea lions. One commentor asked that the Supplemental Draft EIS incorporate all of the latest studies of human impacts on sea lions. It was also suggested that the Supplemental Draft EIS consider effects of auto-related pollution on herring and eulachon and subsequent indirect effects on sea lions.

Agency Comments – NMFS recommended that the Supplemental Draft EIS be updated with aerial survey and remote camera data collected for Steller sea lion haulouts along the proposed alignment for Alternatives 2 through 2C.

7.7.16 Bald Eagles

Public Comments – Comments regarding eagles focused on ensuring that the proposed highway alignments will maintain the 100-meter avoidance zone required for nests.

7.7.17 Other Biological Environment Issues

Public Comments – One organization asked that the Supplemental Draft EIS detail the pests and plants that could potentially spread to Southeast Alaska as a result of building a road along Lynn Canal and identify precautions that will be taken (and monitoring conducted) to prevent spread of invasive species.

Concern was also voiced about what debris might enter Lynn Canal because of highway construction. The opinion was offered that if debris is allowed to enter the canal, an ocean discharge evaluation is required, which will require underwater camera surveys along the route and dive surveys at “hot spots” such as eelgrass beds or important crab habitat.

Agency Comments – NMFS asked that information published in the updated Marine Mammal Viewing Guideline brochure on humpback whale approach regulations be considered for the marine alternatives in the Supplemental Draft EIS.

7.7.18 Socioeconomic and Land Use

Public Comments – Residents of Haines and Skagway asked for more detailed analysis of the economic impact of Alternatives 2 through 2C. Specifically, commentors asked that the Supplemental Draft EIS provide clearer analysis of the types of businesses in those communities that could be harmed by road construction and the types of businesses that could benefit.

Haines residents expressed particular concern about the economic impact of Alternatives 2 through 2C on their community. Some residents commented that these alternatives would result in most Lynn Canal traffic bypassing Haines, harming local businesses that depend on the traffic.

Some of specific concerns included the loss of port traffic in Skagway, with the possible replacement of Skagway as a transshipment link into the Interior. The question was asked, Will Goldbelt’s plans for Cascade Point replace Skagway as a deepwater port link to the Interior, resulting in the loss of Skagway’s role as “Gateway to the Yukon”? One commentor suggested that Alternatives 2, 2A, and 2C would eliminate Skagway’s “ocean-only monopoly” on access to the very popular White Pass Railroad. Related to this, concern was expressed that cruise ship traffic could be reduced if a road is built, because cruise lines may choose to bus passengers from Juneau to Skagway rather than to call on Skagway directly (potential fuel savings being a reason to drop Skagway as a port of call). The concern was expressed that a reduction in traffic could have significant impacts on Skagway's economy.

A number of specific economic development impacts were identified for further analysis in the Supplemental Draft EIS. One such issue is how construction of Alternatives 2 through 2C could facilitate construction of a gas line to Juneau. Commentors also requested that the Supplemental Draft EIS consider benefits to Juneau contractors as they compete in the Interior construction markets (related to Alternatives 2 through 2C). It was requested that the Supplemental Draft EIS examine the effect of road construction on fish shipments out of Juneau. Commentors suggested that Alternatives 2 through 2C could add 1,200 miles to Juneau's market radius, and additional benefits could result from the FVF links to Sitka and Petersburg.

Numerous comments were submitted concerning the effect of Alternatives 2, 2A, and 2C on recreational values in the Lower Dewey Lake area, a popular recreation spot for local residents.

One specific scoping request asked that the Supplemental Draft EIS study impacts of increased sport fishing in Northern Lynn Canal (resulting from improved access from Juneau) on commercial and subsistence fishermen.

Concerns were expressed about the adequacy of the assessment of infrastructure impacts in Juneau associated with Alternatives 2 through 2C. It was suggested that the Supplemental Draft EIS consider downtown traffic and parking, especially related to RVs. It was suggested that the Supplemental Draft EIS identify the sources of funding if infrastructure improvements are required in Juneau.

Questions about health care–related costs and benefits were raised in the scoping comments. A cost issue concerned who would pay for basic services along a new highway, including public safety and emergency medical services. If emergency medical service will be provided from Juneau with only two on-duty ambulances, a call-out on Alternatives 2 through 2C could take one out of service for several hours, potentially impacting response time in Juneau. It was noted that the Supplemental Draft EIS should address potential benefits, such as urgent and emergency air travel via Whitehorse, when the weather is adverse in Juneau. Commentors said the Supplemental Draft EIS should also consider the health care benefits to Skagway residents, with better access to Juneau's medical care infrastructure. It was also suggested that the Supplemental Draft EIS examine in detail the potential for increased crime in Juneau because of better access, especially drug-related crime.

One scoping request asked for an Environmental Justice evaluation. The concern was expressed that lower-income people in Juneau, Haines, and Skagway are more likely to need and use a road because they cannot afford the airfare.

Concern was also expressed about the potential impact of Alternatives 2, 2A, and 2C on the reservoir for the Dewey Lake Hydro system, potentially increasing the risk of vandalism, pollution, and hiker safety. The alignment for these three alternatives would also cut through the middle of the planned Otter Creek Hydroelectric Project, potentially exposing this project to increased construction cost, risk of vandalism, and public safety issues.

It was requested that the Supplemental Draft EIS consider in detail the impacts of road construction on existing uses of Berners Bay that depend on its wilderness setting, such as commercial and noncommercial recreation. Further, scoping comments suggested that the Supplemental Draft EIS address impacts to existing and potential future use of the area by charter boats, skiff rental businesses, guided kayak operations, fly fishing outfitters, sightseeing boats, and other enterprises in Berners Bay.

Agency Comment – National Park Service (NPS) is concerned about the local economic impact of the change in Skagway's status as "end-of-the-road" to a roadside stop (associated with Alternatives 2, 2A, and 2C). Additional socioeconomic studies were requested. NPS is also concerned about impacts on recreational values in the Lower Dewey Lakes area, a popular recreation area near Skagway. The area is a trail hub with several trails running from it to Sturgill's Landing, Icy Lake, Upper Reid Falls, Upper Dewey Lake, and Devil's Punchbowl. Some of these trails may date back to the gold rush (1897 to 1898). NPS commented that a study of the area's past and present recreational use should be included in the Supplemental Draft EIS.

7.7.19 Visual

Public Comments – Most comments concerning visual impacts focused on the need for visual aids to help people picture what Alternatives 2 through 2C would look like from Skagway, from Haines, from the water in small boats and cruise ships, and from airplanes. It was also requested that visual aids should include developments such as gas stations, rest stops, and boat haulouts, as well as accurate depictions of highway backslopes and marine dumps. Related to this, it was requested that the Supplemental Draft EIS consider the visual impact of the road on cruise ship passengers' experience, small-scale commercial tourism, and recreational experiences in Berners Bay and Lynn Canal. It was also requested that the Supplemental Draft EIS visual analysis include the visual experience for drivers on Alternatives 2 through 2C.

Agency Comment – NPS is concerned about the visual impact of the proposed road on the historic town of Skagway, the Klondike Gold Rush NHP, and the Skagway and White Pass District NHL. NPS commented that Skagway's pristine scenic vistas are an important part of a visitor's experience and an asset to the community. NPS recommends that additional visual impact studies be conducted, including computer simulations showing visual impacts of the road at various locations throughout the Skagway area.

7.7.20 Cultural and Historical Resources

Public Comments – Comments suggested that the survey of a 100-meter-wide strip of National Forest land along the proposed route of Alternatives 2 through 2C does not allow for a full evaluation of direct, indirect, and cumulative effects of a road on cultural historic sites in the area, as required by Section 106 of the National Historic Preservation Act. It was suggested that DOT&PF must re-evaluate the NRHP eligibility of all Auk Kwaan historic sites that may be impacted by the project.

The question was also raised about how access to former village sites, burial grounds, and other culturally significant sites will be controlled. In addition, it was noted that if the West Lynn Canal Highway alternative is to be considered as a viable alternative, a complete archeological study of these features should be included.

One comment recommended that a survey for submarine archeological sites 200 feet below sea level be conducted before dumping excess road material into the canal.

Agency Comments – The proposed project is within the boundaries of the Skagway and White Pass District NHL. The historic landmark's boundary extends up to and includes a portion of Lower Dewey Lake Bench. A number of cultural resources could be affected, including Sturgill's

Landing Wood Camp and Sawmill Site; the Lower Dewey Lake Dam and associated water diversion features; the remains of Kastle Kern, an early tourist area (1908 to 1910); and historical advertisements painted on the rocks in addition to the historic Ship's Registry. NPS suggests that additional cultural resource studies be conducted to determine the location, extent, and importance of all the cultural resources located in the area.

NPS also commented that if the proposed road from Skagway to Haines is fully developed as an alternative, a full range of cultural and natural resource studies should be undertaken along the proposed road corridor.

7.7.21 Secondary and Cumulative Impacts

Public Comments – Addressing the potential secondary and cumulative impacts associated with Alternatives 2 through 2C was recommended in several comments. It was expressed that Juneau Access Improvements Project, the Cascade Point and Kensington/Jualin projects, and the Cape Fox/USFS land exchange are "functionally interdependent" and therefore the Supplemental Draft EIS must look at all direct, indirect, and cumulative impacts of all these projects.

Agency Comments – The OHMP requested "rigorous" analysis of secondary and cumulative impacts to fish and wildlife resources and habitats associated with Alternatives 2 through 2C. OHMP is particularly concerned about the Berners Bay area and cumulative impacts associated with highway construction and potential development at Kensington and Cascade Point. OHMP also asked that the Supplemental Draft EIS include an analysis of effects on Pacific herring, which spawn in the Berners Bay area. Declines in herring populations in the Auke Bay area may be related to sedimentation, chronic oil pollution from vessels, and polluted runoff. Therefore, potential effects of development in Berners bay on herring spawning and survival should be investigated.

7.8 Cooperating Agency Review

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 are included at the end of this chapter.

7.9 Relevant Correspondence Involving Local Government, Federal And State Agencies, And Organizations

Relevant correspondence related to issues other than scoping is provided at the end of this chapter.

This page left intentionally blank.

2.24.03 cc: Rov
Jan
Chu
RT

MEMORANDUM

State of Alaska

Department of Transportation & Public Facilities
Office of the Commissioner

ALASKA DOT & PF
SOUTHEAST REGION
FEB 20 2003
PRECONSTRUCTION & DESIGN

TO: Distribution

DATE: February 19, 2003

TELEPHONE NO: 465-3900
FAX NUMBER: 586-8365
TEXT TELEPHONE: 465-3652

FROM: Mike Barton
Commissioner

SUBJECT: Juneau Access Project
Preferred Alternative

On February 22, 2000 the Department stated by letter to the Federal Highway Administration (FHWA) that we had selected Alternative #2: East Lynn Canal Highway as our preferred alternative for the Juneau Access Project. Our work on the project since has been limited to the ongoing monitoring of habitat in the corridor. On December 17, 2002, Governor Murkowski established the project as a Department priority and directed the Department to recommence work on the project and complete the Environmental Impact Statement (EIS).

Pursuant to the FHWA letter of December 18, 2002 and 23 CFR 771.129, we have completed a reevaluation of the 1997 Draft EIS. The FHWA has since approved the reevaluation determining that a Supplemental Draft Environmental Impact Statement (SDEIS) is needed for the project. After reviewing the reevaluation and the comprehensive information contained in the Draft EIS, I see no reason for a change in the Department's position, Alternative #2: East Lynn Canal Highway continues to be the preferred alternative for the SDEIS.

Further studies as well as public and agency comments during the course of the NEPA process will help guide us in the selection of the preferred alternative for the Final EIS and the Record of Decision.

Distribution:

John Mackinnon, Deputy Commissioner
Michael Downing, P.E., Chief Engineer
Robert Doll, Southeast Region Director
Pat Kemp, P.E., Southeast Preconstruction Engineer

8.11.03 Rovbon

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

OFFICE OF THE COMMISSIONER

FRANK H. MURKOWSKI, GOVERNOR

3132 CHANNEL DRIVE
JUNEAU, ALASKA 99801-7898

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

August 4, 2003

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

Dear Minister Reid:

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

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

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

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

Sincerely,

Mike Barton

Mike Barton
Commissioner

Enclosures

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

A-T34LH

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION - DESIGN

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

September 9, 2003

Re: Juneau Access Improvements
Project No. 71100

Rosita Worl, Executive Director
Sealaska Heritage Institute
One Sealaska Plaza, Suite 201
Juneau, AK 99801

Dear Ms. Worl:

The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing a supplement to the 1997 Draft Environmental Impact Statement (DEIS) for the Juneau Access project. A supplemental DEIS is needed primarily due to the passage of time, during which some field conditions have changed, new regulations were passed, new land use plans were approved, and new analytical methods were developed. DOT&PF and the Federal Highway Administration determined there are no fundamental changes in the project scope that would require a new DEIS. The current Juneau Access alternatives are attached to this letter for your convenience.

In compliance with the federal laws and regulations regarding cultural resources, most notably the National Historic Preservation Act of 1966 and 2000 revision of 36 CFR Part 800, DOT&PF is considering the effects this undertaking might have on prehistoric and historic properties. We invite your organization to participate in this process.

DOT&PF has contracted with URS Corporation and Cultural Resource Consultants to identify cultural resource concerns. They are making every effort to determine whether there are any previously undocumented cultural properties in the project's study area. These properties could be physical sites such as former villages, clan houses, or fishing camps, or special areas with intangible associations such as sacred sites, places of legend, or areas of traditional cultural activity.

25A-T34LH

If your organization is interested in participating in this process, or if you know persons within your organization who might be interested or have specific knowledge, please contact me at the address above or the email, or telephone number below. I will arrange a meeting with your organization and a representative from Cultural Resource Consultants. A member of our project team will call you in a few days to follow up on this letter. If you will be submitting written comments, please send them by October 10, 2003.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager
Reuben_yost@dot.alaska.ak.us
(907) 465-1774

Attachment

Distribution:

Lee Clayton, President, Chilkoot Indian Association of Haines
Thomas Crandall, President, Klukwan, Inc.
Gary Droubay, President, Goldbelt, Inc.
Jones Hotch, Jr., President, Chilkat Village of Klukwan
Chris McNeil, President, Sealaska Corporation
Norman Sarabia, President, Douglas Indian Association
Edward Thomas, President, Tlingit & Haida Central Council
Lance Twitchell, President, Skagway Traditional Council
Albert Wallace, Aukquan Traditional Council
Rosita Worl, Executive Director, Sealaska Heritage Institute
Frank Wright, Jr., President, Hoonah Indian Association

cc:

Pat Kemp, P.E., Preconstruction Engineer, DOT&PF
Joyce Payne, Project Coordinator,URS
Mike Yarborough, Archaeologist, CRC

Juneau Access Alternatives.

Alternative 1:	No Build. (Includes a Haines-Skagway shuttle developed independent of Juneau Access. All Build alternatives assume this shuttle is in place.)
Alternative 2:	A road from Echo Cove around Berners Bay to Skagway, shuttle ferry between Skagway and Haines would homeport in Haines.
Alternative 2A:	A road from Echo Cove to Sawmill Cove, ferry terminals at Sawmill Cove and Slate Creek, shuttle ferry across Berners Bay from Sawmill Cove to Slate Creek, road from Slate Creek to Skagway. Haines-Skagway shuttle homeport in Haines.
Alternative 2B:	A road from Echo Cove around Berners Bay to Katzehin, Katzehin ferry terminal, and shuttle ferry between Katzehin/Haines/Skagway.
Alternative 3:	A road from Echo Cove to Sawmill Cove, ferry terminals at Sawmill Cove and William Henry Bay, shuttle ferry between Sawmill Cove and William Henry Bay, road from William Henry Bay to Haines via Pyramid Island. Haines-Skagway shuttle ferry homeport in Skagway.
Alternative 4A:	Continue mainline ferry service in Lynn Canal from Auke Bay to Haines/Skagway with a new fast ferry(s) from Auke Bay to Haines/Skagway.
Alternative 4B:	Continue mainline ferry service in Lynn Canal from Auke Bay to Haines/Skagway; a road from Echo Cove to Sawmill Cove, new ferry terminal at Sawmill Cove, and shuttle ferry(s) from Sawmill Cove to Haines/Skagway.
Alternative C:	Only Bellingham mainline ferry service continues; two (or more) new shuttle ferries operating Auke Bay-Haines and Auke Bay-Skagway.
Alternative 4D:	Only Bellingham mainline ferry service continues; a road from Echo Cove to Sawmill Cove, new ferry terminal at Sawmill Cove, and two (or more) new shuttle ferries operating Sawmill Cove-Haines and Sawmill Cove-Skagway.

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION - DESIGN

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

September 16, 2003

Re: Juneau Access Improvements
Project No. 71100

Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Ave., Suite 1310
Anchorage, AK 99501-3565

Subject: Area of Potential Effect and Cultural Resources Inventory

Dear Ms. Bittner:

The Department of Transportation and Public Facilities (DOT&PF), with funding from the Federal Highway Administration (FHWA), has restarted a project to improve surface transportation in the Lynn Canal corridor. A draft Environmental Impact Statement (DEIS) was released in December of 1997. We are currently working on a supplemental to that draft. The supplemental DEIS will evaluate road alternatives on both sides of Lynn Canal as well as ferry improvements.

In 1994, an inventory was undertaken for all areas with high probability for cultural resources that could be affected by the Juneau Access alternatives. These areas included: (1) river and stream mouths; (2) shoreline benches below 100 feet in elevations; (3) areas of less than 25 percent slope; and (4) other terrain types that have shown a high potential for past human occupancy. Areas of low potential received a reconnaissance level survey utilizing shoreline survey from a boat and review of aerial photographs. Areas of high potential identified during the course of such reconnaissance were investigated in more detail, utilizing methods prescribed for high probability zones. An Area of Potential Effect (APE) corridor of 100 meters (approximately 164 feet from centerline or a 328 foot corridor) was used to assess effects to cultural resources in the 1994 inventory. This inventory identified seven eligible sites on the east and two on the west.

25A-T34LH

DOT&PF, on behalf of FHWA, defined the 1994 APE for the Juneau Access project on the basis of informal consultations with SHPO staff and a review of commonly used impact zones for road projects. The current alternative road alignments are not significantly different than those used for the cultural resources fieldwork, with a notable exception. We are investigating alternate routes in to Skagway, which will require further cultural resource analysis. Mike Yarborough (Cultural Resource consultants), through URS, Inc., is under contract to lead the cultural resource efforts for the supplemental DEIS.

We believe that the 1994 APE (100-meter corridor) and basis for determining level of survey are still applicable. On behalf of FHWA, we request your concurrence that the 1994 APE used in the 1997 Juneau Access DEIS is applicable for the current analysis.

Should you need additional information please contact me at (907) 465-1774. Thank you for your consideration of this matter.

Sincerely,

Reuben Yost
Project Manager

Cc:

Tim Haugh, FHWA
Joyce Payne, URS
Mike Yarborough, CRC

10/24/03 CC JAUG
CHUS
[illegible]

ORIG : [illegible]

BRITISH
COLUMBIA

ALASKA DOT & PF
OCT 24 2003
SPECIAL PROJECTS

OCT 0 2 2003

Reference: 116278

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

Dear Mr. Barton:

Re: Access to Juneau

Mike

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

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

I hope this information proves useful for your study.

Sincerely,

Judith Reid

Judith Reid
Minister

RECEIVED
OCT 1 5 2003
DOT & PF Commissioner

Ministry of Transportation

Office of the Minister

Mailing Address:
Parliament Buildings
Victoria BC V8V 1X4

100 - 1111 W. Hastings Street
Vancouver, BC V6E 2J3
Main: 604-681-9515
Fax: 604-681-4364
Email: nwca@nwcruiseship.com

NORTH WEST
CRUISESHIP
ASSOCIATION

October 31st, 2003

Governor Frank Murkowski
State of Alaska
P.O. Box 110001
Juneau, Alaska 99811-0001

Dear Governor Murkowski:

Thank you for your letter of September 30 and your congratulations for another successful year of cruise tourism in Alaska. Although the start of the 2003 season was slow it did firm up during the summer. We ended up with at slight increase overall in total cruise visitors to Alaska year over year.

I had a chance to meet with Gary Paxton at the Alaska Travel Industry Association meetings in Vancouver last week. Gary gave an excellent overview of the highway projects in SE Alaska, including the planned highway connecting Juneau to Skagway.

We have discussed this project with our member lines with a view to determine if the project would have any impact on cruise itineraries or ports calls. There is no evidence that the project would cause any structural changes in port calls in Juneau and Skagway, or in any way reduce traffic in one port at the expense of the other. We will continue o keep in touch with Gary, and provide feedback as the project plans unfold.

Sincerely

John Hansen
President

Cc: Mike Barton, Commissioner, DOT/PF
Becky Hultberg, Special Staff Assistant to the Governor
Gary Paxton, Director, Southeast Region, DOT/PF
Dale Anderson

NWCA Member Lines:
Carnival Cruise Lines • Celebrity Cruises • Crystal Cruises • Holland America Line-Westours • Norwegian Cruise Line
Princess Cruises • Radisson Seven Seas Cruises • Royal Caribbean International • World Explorer Cruises

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE: (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-3506

STATEWIDE DESIGN & ENGINEERING SERVICES DIVISION

October 31, 2003

Re: Juneau Access Improvements
Project 71100

Tim Haugh
Federal Highway Administration
P.O. Box 21648
Juneau, AK 99802

Subject: 4(f) status of City of Skagway Dewey Lake parcel

Dear Mr. Haugh:

The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing a supplement to the 1997 Draft Environmental Impact Statement (DEIS) for Juneau Access Improvements, a project to improve surface transportation in Lynn Canal between Juneau and Haines/Skagway. At present, a State operated ferry system provides the only surface transportation service for the public in this corridor.

DOT&PF is currently evaluating the potential Section 4(f) impacts associated with all alternatives. One alternative under consideration would construct a road passing through, or near, Skagway. Alternative 2, the East Lynn Canal Highway, would connect to the current road system in Skagway via one of two routes. The route described in the1997 DEIS approached Skagway along the coast, passing across the White Pass and Yukon dock. The dock has been reconstructed and expanded since the 1997 document, and historic resources have been discovered near it; consequently DOT&PF is currently investigating an approach on the perimeter of the city (Dewey Lake Route) that avoids the dock. Both potential routes would pass through a parcel of land owned by the City of Skagway, although the Lower Dewey Lake Route would appear to have more impact on this parcel due to its proximity to accessible features.

The City of Skagway (City) acquired the parcel in question from the State of Alaska in the mid-1990's. The City addressed the future use of this land in the most recent update of its Comprehensive Plan. DOT&PF has reviewed the current City of Skagway Comprehensive Plan (Plan), completed in 1999, a complete copy of which is attached as Exhibit 1. Two maps have been attached to this letter, both taken from the Plan. Exhibit 2 is Plan Figure 7-6, showing existing zoning. Exhibit 3 is Plan Figure 7-8 depicting guidance for future land use. DOT&PF has slightly modified both figures by adding the potential routes and land ownership boundaries.

25A-T34LH

Figure 7-6 also shows part of the Lower Dewey Lake trail, a well used trail on City and State land. Exhibit 4 from the Skagway Trail Map shows the complete trail system.

In order to evaluate the status of this parcel, DOT&PF examined the current zoning designation, the future land use designation in the Plan, and the current uses of the land. Currently the City has eight zoning districts. The area in question is in the Residential-Conservation Zone. As described in the Plan:

> This zoning district is intended to provide an area for low-density residential development on adequate lot sizes not served by city water and sewer, to allow natural resource development and conservation, and to allow dispersed recreational activities including recreational cabins, lodges, and small seasonal recreational facilities.
>
> Criteria for lands that are included in this zoning district are those that are relatively isolated from city development due to natural features and the lay-of-the-land, and that are presently without any or all of the following: city water, sewer, roads up to standards. (Ex. 1 at 7-14)

This zoning designation allows residential development, natural resource development, and dispersed recreational activities. This combination of allowed uses supports a determination of the land as a multiple use property.

The Plan acknowledges that the zoning districts are not particularly specific, stating that "[i]n the past, virtually all land outside the City townsite was designated for Residential Conservation uses" (Ex. 1 at 7-18). To better plan for the future, the Plan designates "nine general types of future land use." (Ex. 1 at 7-18). Exhibit 3 depicts a large area to the east of downtown Skagway as being "Recreation/Open Space". This includes non-City land owned by the State of Alaska as well as land owned by the United States Forest Service. Recreation/Open Space is described as follows:

> This is for land with high recreation values. Some land will be left as undeveloped open space while other land will be actively managed to promote dispersed and more intensive recreation use, including visitor-related activities. Recognizing that the Highway and railroad are major transportation corridors, contained areas of commercial or industrial use along either facility that are sensitively designed and operated are also appropriate. (*the railroad tracks, Dewey Lakes area, Warm Pass Valley area, Dyea Flats and Taiya River Valley/Chilkoot Trail, and Nourse River Valley*). (Ex. 1 at 7-19.) (italics in original.)

Although this future land use designation is more specific in terms of the recommended uses and areas to which it applies, it still allows multiple uses. It identifies undeveloped open space, dispersed and intensive recreation, and sensitively designed commercial and industrial use in certain areas.

Currently this land is used for a combination of industrial and recreation activities. Alaska Power & Telephone Company, the electrical utility in Skagway, has dams, access roads and large water pipes as part of a Federal Energy Regulatory Commission licensed Power Project. Lower Dewey Lake is dammed at the southern end, creating a large reservoir to supply water to a smaller reservoir at its northern end. The smaller reservoir has a dam at its western end, which feeds penstock pipes supplying water to a hydroelectric plant in town. The power company access roads, as well as other trails in the area, are used as hiking trails to access the lake and other locations within and beyond the parcel. The lake is used for skating in the winter and for swimming/nature viewing in the summer.

With regard to Section 4(f) of the Department of Transportation Act [codified at 49 U.S.C. § 303] the applicable federal regulations explain that in multiple use properties, only certain areas qualify for 4(f) protection:

> Where Federal lands or other public land holdings (e.g., State forests) are administered under statutes permitting management for multiple uses, and, in fact, are managed for multiple uses, section 4(f) applies <u>only to those portions of such lands which function for, or are designated in the plans of the administering agency</u> as being for, significant park, recreation, or wildlife and waterfowl purposes. The determination as to which lands so function or are so designated, and the significance of those lands, shall be made by the officials having jurisdiction over the lands. The Administration will review this determination to assure its reasonableness. The determination of significance shall apply to the entire area of such park, recreation, or wildlife and waterfowl refuge sites.[1]

(Underline added.)

As stated above, the Dewey Lake parcel is currently used for multiple purposes. While some of the facilities within the parcel may be significant for recreation or wildlife purposes, the surrounding land owned by the City has not been "designated or administered, formally or informally" as a park, recreation, wildlife or refuge site.[2] DOT&PF respectfully submits that the parcel depicted in Exhibits 2 and 3 is a multiple use property, and requests FHWA concurrence. Following FHWA concurrence, DOT&PF will consult with the City and the Alaska Department of Natural Resources (the land manager responsible for State of Alaska trail and wildlife easements within the parcel) and request their determination as to the function, designation and significance of potentially 4(f) protected facilities.

If you have any questions regarding this request, please call me at 465-1774.

---

[1] <u>See. e.g.</u>, 23 C.F.R. § 771.135(d).
[2] <u>Mullin v. Skinner</u>, 756 F.Supp. 904, 924 (E.D. N.C. 1990).

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

cc: Pat Kemp, SE Region Preconstruction Engineer
Peter Putzier, Alaska Department of Law

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION
OFFICE OF HISTORY AND ARCHAEOLOGY

550 W. 7th Ave., SUITE 1310
ANCHORAGE, ALASKA 99501-3565
PHONE: (907) 269-8721
FAX: (907) 269-8908

November 19, 2003

File No.: 3130-2R DOT

SUBJECT: Juneau Access Improvements
Project No. 71100

ALASKA DOT & PF SPECIAL PROJECTS NOV 24 2003

ALASKA DOT & PF
SOUTHEAST REGION
NOV 24 2003
PRELIMINARY DESIGN & ENVIRONMENTAL

Reuben Yost
Project Manager
Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, AK 99801-7999

Dear Mr. Yost,

We have reviewed your correspondence (9/16/2003) and additional documents *Juneau Access Technical Appendix E (1994)*, *Archaeological Survey on the West Coast of Lynn Canal (1994)* and *Cultural Resources Within the APE of Both East & West Lynn Canal Highways* (received 10/21/2003). We have also received a set of maps from your contractor, Michael Yarborough (11/10/2003), showing the proposed highway alignments as defined in the 1996 EIS compared with the 2003 revised alignment. We agree that there is overall correspondence between the 1996 and 2003 routes. In many sections however, the 2003 route is slightly uphill of the 1996 version. Higher elevation and greater distance from the shore generally decreases the potential for prehistoric sites or historic cabins so additional survey may not be needed in these sections. The exception is, as you are aware, near Skagway where the 2003 alignment is uphill of the 1996 route but crosses a terrace with a high potential for historic sites. Also, alignment revisions in the Berner's Bay area (Sheet 2 of 9) and near the Brown USGS marker (Sheet 3 of 9) shift the 2003 route closer to shore and in high potential areas. We recommend therefore, that the alignment revisions in the Berner's Bay and Brown areas be archaeologically surveyed.

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: Ed DeCleva, FHWA

Printed on Recycled Paper

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

November 25, 2003

REFER TO
HDA-AK
File #: MGS-STP 000S(131)/71100

Mr. Rueben Yost, Project Manager
Alaska Department of Transportation
and Public Facilities
6860 Glacier Hwy.
Juneau, AK 99801

SUBJECT: Applicability of Section 4(f) to Dewey Lake Parcel, Juneau Access Study

Dear Mr. Yost:

In response to your letter of October 31, 2003, we have reviewed the correspondence and documentation provided by your office concerning the City of Skagway Dewey Lake Parcel. The current City of Skagway Comprehensive Plan, adopted May 1999, (Plan) designates the zoning classification for the parcel in question as Residential-Conservation. As described in the Plan:

> This zoning district is intended to provide an area for low-density residential development on adequate lot sizes not served by city water and sewer, to allow natural resource development and conservation, and to allow dispersed recreational activities including recreational cabins, lodges, and small seasonal recreational facilities.

Clearly, the current zoning designation provides for uses other than recreation including residential development and natural resource development. The Plan specifies that the area is to allow "dispersed recreational activities". In addition to some trails, the current uses of the parcel include transportation and hydroelectric facilities. The Plan identifies the future land use of the area as Recreation/Open Space. Recreation/Open Space is described as follows:

> This is for land with high recreation values. Some land will be left as undeveloped open space while other land will be actively managed to promote dispersed and more intensive recreation use, including visitor-related activities. Recognizing that the Highway and railroad are major transportation corridors, contained areas of

commercial or industrial use along either facility that are
sensitively designed and operated are also appropriate.

The future designation shows a consistent intent to allow for uses in addition to recreation. In consideration of the factors identified above, the Federal Highway Administration finds that, for the purposes of Section 4(f) [codified at 49 U.S.C. § 303], the Dewey Lake Parcel is considered a Multiple-Use property and that Section 4(f) would not apply to the entire parcel, but may apply to portions of the parcel which function as or are designated in the plans of the administering agency as being for, significant park, recreation, or wildlife and waterfowl purposes.

If you have any questions or need to discuss this further, please contact me at (907) 586-7430.

Sincerely,

Tim A. Haugh
Environment and Right-of-Way Programs Manager

cc: David Ortez, FHWA
Pat Kemp, ADOT&PF SE Region Preconstruction Engineer
Peter Putzier, Alaska Department of Law

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

January 5, 2004

Re: Juneau Access Improvements
Project No: 71100

Subject: Significant Recreation Facilities

Honorable Tim Bourcy, Mayor
City of Skagway
P. O. Box 415
Skagway, AK 99840

Dear Mayor Bourcy,

As you know, the Alaska Department of Transportation and Public Facilities (DOT&PF) is evaluating alternatives for this project. As part of this evaluation we are identifying potential impacts to significant park, recreation, and wildlife/waterfowl refuge land. Under Section 4(f) (codified at 49 U.S.C. 303) regulations, a federal transportation project may not use land from these properties unless there is no feasible and prudent alternative.

Three of the alternatives being evaluated would pass through the City of Skagway (City) owned Lower Dewey Lake parcel. The Federal Highway Administration has determined this parcel is a Multiple Use property and as such Section 4(f) does not apply to the entire parcel, but may apply to portions (see attached letters dated 10/31/03 and 11/25/03). We are aware from previous discussions with you that the City considers the trails in this area to be significant for recreation. It is DOT&PF's intent to avoid Section 4(f) land use on all alternatives and furthermore, to minimize impacts to this area and enhance recreation opportunities where practicable. We would like to discuss this with you on January 21, 2004 before the information workshop to be held at City Hall.

We will also be in discussion with the Department of Natural Resources regarding trails on State land adjoining the Lower Dewey Lake parcel as well as trail easements the State retained when the Lower Dewey Lake parcel was conveyed to the City. Some trails in the parcel are subject to a reservation for Power Project 1051; they were established for power company access and therefore Section 4(f) does not apply. We would like to include them in the discussion, however, so we can put together a comprehensive plan for dealing with trails in this area. We are also investigating the historic aspects of these trails, and if any trails are determined to be eligible for

25A-T34LH

the National Register of Historic Places, mitigation and enhancement would need to be consistent with their historic character.

I look forward to discussing this with you further at our meeting.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

Enclosure

cc: Pat Kemp Preconstruction Engineer
Tim Haugh, FHWA Environment & Right-of-Way

Jack
Pat
Reuben

ALASKA D.O.T. & PF SOUTHEAST REGION
FEB 25 2004
PRECONSTRUCTION & DESIGN

ALASKA DOT & PF
FEB 25 2004
SPECIAL PROJECTS

CITY OF SKAGWAY

GATEWAY TO THE GOLD RUSH OF "98"
P.O. BOX 415, SKAGWAY, ALASKA 99840
(PHONE) (907) 983-2297
(FAX) (907) 983-2151

February 19, 2004

Reuben Yost, Special Projects Manager
Alaska Department of Transportation and Public Facilities
Southeast Region
6860 Glacier Highway
Juneau, Alaska 99801-7999

Re: Juneau Access Improvements: Project No. 71100

Dear Mr. Yost:

This is our written position on mitigation projects to be included in the overall project documents for the potential road construction between Skagway and Juneau, through the Lower Dewey Lake bench. By forwarding these mitigation projects, we are in no way moving from our stated preference for Juneau Access, that being improved Alaska Marine Highway System service.

The projects would need to be implemented as part of this plan are:

- Improvements of trail from Icy Lake to Upper Reid Falls
- Trail connection from Upper Reid Falls to Gold Rush Cemetery
- Any overpass or underpass necessary for crossing the highway
- Trail from Devil's Punchbowl to the south end of Lower Dewey Lakes
- Improvements to the trail along the back, or east side of Lower Dewey Lake
- Recreational trail access up Paradise Valley (This is Tongass land, so may not be viable)
- Improvements to the Upper Dewey Lakes Trail
- Adequate vehicle pull outs and parking along with day use facilities, trash receptacles, etc.
- A bike/pedestrian lane from 23rd Avenue to the Lower Dewey Lake parking area

Thanks for your consideration of these projects. We look forward to their inclusion in the project documents.

Additionally, we will need for the State to consider the long term impacts to our emergency response functions. While most of this road would be within other jurisdictions, we would be compelled to respond to any emergency north of the point that is half way between the Glacier Valley Fire Department and Skagway. We may also be faced with the delivery of accident victims to Bartlett Regional Hospital rather than return to the Skagway Clinic. All of these considerations must be deliberated during the analysis of the impacts of this project on the various affected municipalities.

Sincerely,

Tim Bourcy,
Mayor

Cc: Council
Recreation Advisory Board
Skagway Fire Department

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

February 27, 2004

Re: Juneau Access Improvements
Project No. 71100

Subject: Mitigation Projects & Draft
Resolution 04-04R

Honorable Tim Bourcy, Mayor
City of Skagway
P. O. Box 415
Skagway, AK 99840

Dear Mayor Bourcy,

Thank you for your February 19, 2004 letter detailing trail mitigation the City of Skagway would like to see added to the Juneau Access Improvements Project alternatives that would pass through the Lower Dewey Lake area. The identified trail improvements on City land will be added to the document as Alaska Department of Transportation and Public Facilities (DOT&PF) commitments to fund the trail improvements if a Skagway highway alternative is selected. We will talk to the appropriate land managers about the potential trails on State land. With regard to a Paradise Valley trail, we will discuss the possibility with the Forest Service, but be advised it is not on their list of potential trails at this time. Pullouts, parking and over/underpasses would be designed and built as part of the project. If an east Lynn Canal alternative is ultimately selected, DOT&PF would coordinate with the City during design as to specific location and layout.

Your letter did not specifically address the existing trail from the lake up to a cliff overlooking the boat harbor. We will include a commitment to make safety improvements at the end of the trail, as we believe the trail would receive increased use with improved access. With regard to a bike/pedestrian lane from 23rd Avenue to a Lower Dewey Lake parking area, the current design includes four-foot wide shoulders on both sides of the road. The topography is not conducive to a separate path, but during design we would investigate the feasibility of widened shoulders.

Thank you for a copy of draft Resolution 04-04R. You stated at our January 26, 2004 meeting that the purpose of a resolution to make the Dewey Lake area a park is not to block alternatives that would enter Skagway via this alignment. Rather the purpose is to insure that adequate mitigation would be provided if the area was impacted. As written the resolution does not reflect this purpose. The only mention of a potential road is with regard to the pressure for development that access could create. We recommend you add language establishing a transportation corridor

25A-T34LH

centered on the alignment provide to the City on January 27, 2004 and specifying that if a highway is constructed it must include the mitigation identified by the City on February 19, 2004. This would make clear that although the City opposes a highway into Skagway, the resolution is to insure adequate mitigation if such a highway alternative is selected.

You have mentioned that pro-road advocates as well as pro-ferry supporters support a resolution protecting and promoting the area's resources. The change suggested would also capture this common concern. Thank you for your letter and the opportunity to comment on the draft resolution.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Tim Haugh, FHWA Environment & Right-of-Way Programs manager
Pat Kemp, DOT&PF Preconstruction Engineer
Gary Paxton, DOT&PF Southeast Region Director

United States Department of Agriculture | Forest Service | Alaska Region | P.O. Box 21628
Juneau, AK 99802-1628

File Code: 1950-4
Date: MAR 25 2004

Mr. Reuben Yost
Southeast Region
Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, AK 99801

Dear Mr. Yost:

Thank you for the opportunity to address potential enhancement opportunities as well as an early preliminary list of locations where the Forest Service expects to reserve rights to access to the highway in the future.

East Side of Lynn Canal Alternative

The 1997 plan indicated a day use area with picnic facilities at the Sawmill Creek area. Land exchanges have resolved the ownership in the vicinity of this stream. The current intent would be to provide a trailhead and scenic overlook. Future access and development opportunities are possible.

The relocation of the Berners Bay cabin is not desired if there is a final alignment that can preserve it and the experience of the cabin with reasonable separation. A small trail and parking are needed to access and service the cabin if it remains. If the cabin is practical in the final alignment, and is relocated to an alternate location, a scenic overlook should be created. The alternative relocation of the cabin is a site located at Young Bay on Admiralty Island. We look forward for further discussions concerning the cabin. The Forest Service does not consider the cabin a "4(f) property".

There is seeking the opportunity for a trailhead at the location of the Antler Bluff overlook. The proposal is for a new trail along the west side of the Berners River. The overlook would include interpretive signage. This would be in addition to the overlook on the shoreline side that provides wildlife viewing opportunities.

A multi-purpose interpretive trail (interpreting the areas rich mining history) from Slate Creek Cove to Comet Cove (where the State is considering a maintenance facility with restrooms) and then continuing to a point along the proposed alignment approximately two miles north of Comet Cove is proposed. The route is northwest through the Sweeney Creek drainage and then north parallel to the proposed road alignment towards Independence Lake. At each point identified above there would be a small trailhead or parking (accommodating 5-10 vehicles) and scenic overlooks should be developed in the vicinity. The route proposed has not been checked for land ownership encumbrances and there are potential mining claims, native allotments and the potential for the Cape Fox Land Exchange that may alter the feasibility of the proposed route.

Eldred Rock would consist of a scenic overlook as proposed in 1997.

The Yeldagalga Creek site would consist of an overlook and trailhead; there would not be a day use area at this time unless the State agrees to provide maintenance for the site. The valley located approximately 4 miles south of Katzehin River would have a trailhead, with day use as a future opportunity. A trail could be constructed to the east, up the valley.

The Katzehin River flats area is suitable for a future recreation site. The logistics and cost of operations presently suggest it is not practical to construct at this time.

There is an existing cabin included in the Forest Service database at the Katzehin River that was not earlier identified to you. The database indicates that it is not currently maintained and is to be abandoned. Part of the reason for the lack of maintenance is because of limited access. With the construction of the road this access issue would be resolved. The demand for a cabin is anticipated to increase. A replacement cabin to the east up the Katzehin river drainage is an alternative.

The Katzehin River Development proposal includes a trailhead, a scenic overlook and a shoreline access trail. The trail between the road and the cabin would be hand construction and not be included as a recreational enhancement for this project.

The Dayebas Creek day use site would only consist of a trailhead and scenic overlook at this time.

A scenic overlook at Long Falls should be considered.

Sturgills Landing appears not to be impacted with the current alignment; however, a trailhead with sanitary facilities and extension of the existing spur trail should be considered where the existing trail from Skagway past Dewey Lakes is in close proximity to the road and the main trail.

West Side of Lynn Canal Alternative

The terminal located in William Henry Bay should include day use facilities for travelers arriving early for the ferry. A trailhead would be constructed with parking to provide for access south to Saint James Bay.

A scenic overlook would be constructed on the shoreline side of the road in the vicinity of Lance Point.

A trailhead would be constructed at the Endicott River on the mainland side of the road, but no trail at this time.

A scenic overlook would be constructed north of the Endicott River at approximately Cant.

The Sullivan River would include a trailhead and trail to both the east to saltwater and to the west to an arm of Davidson Glacier. There would also be a scenic overlook constructed in this area.

Approximately, five miles north of the Sullivan River another scenic overlook would be developed. This site is at Gen Station across the channel from northern Sullivan Island.

The last enhancement on the west side would be located just south of the National Forest boundary, approximately three miles south of Glacier River. This site would consist of trailhead and a trail to the east and one to the west. The trail to the east would end at saltwater and the one to the west would end at an arm of the Davidson Glacier. The glacier access provided here and at Sullivan River would provide an opportunity for dispersing visitors and an enhanced opportunity for hiking.

While some developments originally included in the DEIS have not been carried forward, those ideas have not been excluded, but are being deferred for the reasonable foreseeable future.

Reserved Right of Access (Road Junctions)

The Forest Service intends to stipulate the reservation of rights of access, subject to reasonable safety considerations, in our stipulations to the highway easement. Because the rights of way are a perpetual grant, these reservations are an effort to provide a future outlook beyond the foreseeable future of the current environmental analysis. The following is a list of locations that have been identified to date. We anticipate that the locations can be identified during the road design and identified in the drawings to assist in providing safe and effective access to and from the highway.

Juneau Access Right of Access to the Highway Reservation Locations Proposed	
East Side Alternative	**West Side Alternative**
Sawmill Creek	William Henry Bay Headlands – mainland
Berners Bay Cabin - shoreline	River at William Henry Bay Ferry Terminal - mainland
Antler Bluff Overlook	Lance Point – shoreline
Gilkey River	Endicott River
Lace/Antler River	Endicott River flats and upriver
Berners River & Deltas	Cant Station River
Slate Creek Cove	Sullivan River
Comet Cove	Sullivan River flats and upriver
Independence Lake	Gen Station River
Pt. St. Marys	River 1 mile south of Forest Boundary
Sweeny Creek	River valley and flats of river approximately 6 miles north of the Sullivan River. (Not mentioned above but possible area of future development).
Brown Station	River valley and flats 5 miles south of Glacier River
Eldred Rock - shoreline	
Yeldagalya Creek	
River 4 miles S. of Katzehin	
River 1 mile S. of Katzehin	
Katzehin River	
Dayehas Creek	
Long Falls - mainland	
Sturgills Landing	

The team working on this task was led by Eric Ouderkirk (907) 228-6301; please contact Eric or me if you have questions.

Sincerely,

KENNETH D. VAUGHAN, P.E.
Forest Service Representative

cc: Peter M Griffin, Susan Marthaller, Eric Ouderkirk, Matt M Phillips, Ron Marvin

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHEAST REGION

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, AK 99801-7999
PHONE: 907-465-1763
FAX: 907-465-2016
TTY/TDD: 907-465-4647

April 16, 2004

Honorable Tim Bourcy, Mayor
City of Skagway
P.O. Box 415
Skagway, AK 99840

~~Dear Mayor Bourcy~~ Tim:

I am writing regarding two issues, the mitigation the City of Skagway would like for the Juneau Access Improvements alternatives that would traverse the Lower Dewey Lake area and the City's Resolution 04-04R that recommends the Dewey Lakes Trail System be designated as a special management area.

After reading in the minutes of a recent Skagway City Council meeting and in the Skagway News your comments that a right-of-way corridor has been established for a highway in this area, I want to clarify that a right-of-way has not been established. Acquisition of right-of-way required for the selected alternative will take place after the Record of Decision (ROD) for the project (anticipated in January of '05) is issued. Nevertheless, the preliminary alignment for East Lynn Canal Highway alternatives (2, 2A, 2C) provided to the City on January 27, 2004 is based on a detailed aerial survey and is suitable for establishing a corridor for planning purposes. I am enclosing a proposed Joint Planning Agreement that establishes the corridor through which the highway would be built if the ROD contains an East Lynn Canal Highway alternative. The document also formalizes our agreement to provide the City's requested mitigation. The agreement in no way alters the City's stated opposition to a road, and retains the City's right to compensation for any right-of-way eventually conveyed to the State.

25A-T34LH

I have signed two copies of the agreement on behalf of the State. If the agreement is acceptable to the City, please sign both and return one original to my office. Thank you for your consideration of this agreement.

Sincerely,

Gary L. Paxton
Southeast Region Director

Enclosure

cc: Mike Barton, Commissioner DOT&PF
Bob Ward, Skagway City Manager
Skagway City Council
Rob Murphy, ROW Chief
Reuben Yost, Project Manager
Tim Haugh, FHWA Environment & Right-of-Way Programs Manager

JOINT PLANNING AGREEMENT
FOR
LOWER DEWEY LAKE AREA
BETWEEN
THE CITY OF SKAGWAY
AND
THE STATE OF ALASKA

WHEREAS, the Department of Transportation and Public Facilities (DOT&PF) is currently preparing a supplement to the 1997 Draft Environmental Impact Statement (DEIS) for the Juneau Access improvements Project.

WHEREAS, the supplemental DEIS contains East Lynn Canal Highway alternatives that would pass through City of Skagway (City) owned lands west of Lower Dewey Lake.

WHEREAS, the City has passed a resolution recommending the Dewey Lakes Trail System be designated a special management area.

WHEREAS, the City has indicated the need for trail enhancements and new remote recreational trails to mitigate impacts to the Dewey Lake area if an alternative passing through it is selected for construction.

WHEREAS, DOT&PF has agreed to incorporate improvements to the Upper Dewey Lake, Icy Lake to Upper Reid Falls and East Lower Dewey Lake Trails and creation of new trails on City land into the appropriate supplemental DEIS alternative discussions.

WHEREAS, DOT&PF has agreed to investigate the feasibility of other trail enhancements on State and Federal land, and to work with the City on final design elements if an alternative through the Lower Dewey Lake area is selected.

THEREFORE, DOT&PF and the City do hereby agree to Joint Planning as follows:

1. If DOT&PF selects an alternative that passes through the City-owned Dewey Lakes parcel, the highway will be constructed within the 300-foot wide corridor reservation depicted in exhibit A.
2. Only the actual right-of-way required for construction and maintenance of the highway would be transferred to the State of Alaska. Remaining land within the corridor would be retained by the City and would be managed as part of the special management area if created.
3. If an alternative through the Dewey Lakes parcel is selected, DOT&PF will provide funding for the trail improvements identified above. Furthermore, DOT&PF will consult with the City during final design regarding trail overpasses and/or underpasses, vehicle pullouts, parking areas, day use areas and pedestrian/bicycle facilities.

4. Nothing in this agreement removes the City's right to compensation at fair market value for the land required for right-of-way.
5. This agreement shall not be construed as changing the City's stated position of preferring improved ferry service rather than highway access.
6. This agreement is effective upon approval by both parties.

State of Alaska Department of Transportation & Public Facilities	City of Skagway
By: Gary L. Paxton	By: ______
Title: Director SE Region	Title: ______
Date: 16 April 2004	Date: ______

JUN-08-04 TUE 07:53 AM ALASKA DOT&PF COMM. FAX NO. 9075868365 6/8/04 P. 01

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
OFFICE OF THE COMMISSIONER

3132 CHANNEL DRIVE
JUNEAU, ALASKA 99801-7898

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

STATE OF ALASKA DOT & PF JUN - 8 2004 SOUTHEAST REGION DIRECTOR'S OFFICE

June 4, 2004

Friends of the Earth
1717 Massachusetts Ave NW 600
Washington DC 20036-2002

Dear Friends of the Earth:

I read with interest your June 2nd news release regarding the 27 most wasteful road projects in America. I had particular interest in your discussions of the Juneau Access Project. I am sure that had you had all of the facts in hand you would have seen the benefits of this project to Alaska and the nation. Instead, the news release implies Friends of the Earth support for:

1. Using more fossil fuel in one year to transport 30,000 vehicles by ferry than 200,000 vehicles would consume annually on the proposed highway.
2. Stifling the seven-fold demand to travel between Juneau and the continental highway system. (Juneau is the largest community on the North American continent not connected by a highway.)
3. Requiring the public to plan trips months in advance to travel a distance of less than 100 miles.
4. Retain an annual state cost of over $5 million dollars to transport 81 vehicles per day 100 miles.
5. Forcing users to spend $250 one-way to travel between Juneau and the continental highway system.
6. Denying access to public lands to anyone not physically capable of strenuous hiking, kayaking or other physically-demanding activities.

I doubt that Friends of the Earth actually does support such things but the News Release certainly leads one to conclude that they do.

I hope that you were better informed about the other 26 projects that you have maligned. The millions of people that will benefit from these projects deserve better treatment.

Sincerely,

Mike Barton

Mike Barton
Commissioner

cc: The Honorable Donald E. Young, United State Congress
The Honorable Lisa Murkowski, United State Senate
The Honorable Ted Stevens, United State Senate
John W. Katz, State/Federal Relations, Office of the Governor
John Horsley, Executive Director, American Association of State Highway & Transportation Officials

25A-T34LH "Providing for the movement of people and goods and the delivery of state services."

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 SOUTHEAST REGION AUG 12 2004 PRECONSTRUCTION & DESIGN

ALASKA DOT & PF AUG 12 2004 SPECIAL PROJECTS

August 9, 2004

REFER TO
HDA-AK
File #: MGS-STP-000S(131)/71100

Ms. Rosita Worl, Executive Director
Sealaska Heritage Institute
One Sealaska Plaza, Suite 201
Juneau, Alaska 99801

SUBJECT: Juneau Access Improvements Project. Determinations of eligibility and finding of No Adverse Effect pursuant to 36 CFR 800.4(c) and 800.5(b)

Dear Ms. Worl:

The Alaska Department of Transportation and Public Facilities (AKDOT&PF), in cooperation with the Alaska Division of the Federal Highway Administration (FHWA), is proposing to improve surface transportation to and from Juneau within the Lynn Canal corridor. The AKDOT&PF, with consultant assistance, is preparing an environmental impact statement (EIS) for FHWA.

There are ten project alternatives under consideration. Alternative 1 is the No Action Alternative. Alternative 2 (East Lynn Canal Highway with Katzehin Terminal) would construct the East Lynn Canal Highway from Echo Cove to Skagway, with a shuttle ferry from the Katzehin delta to Haines. Alternative 2A (East Lynn Canal Highway with Berners Bay Shuttle) is the same as Alternative 2, with the exception that shuttle ferries would cross Berners Bay from Sawmill Cove to Slate Cove. Alternative 2B (East Lynn Canal Highway to Katzehin, shuttles to Haines and Skagway) would construct the East Lynn Canal Highway from Echo Cove to the Katzehin delta, with shuttle ferries providing service to both Haines and Skagway. Alternative 2C (East Lynn Canal Highway with shuttle to Haines from Skagway) would construct the East Lynn Canal Highway from Echo Cove to Skagway, with shuttle ferry service from Haines to Skagway. (See enclosed map.)

Alternative 3 (West Lynn Canal Highway) would extend Glacier Highway to Sawmill Cove, which would be connected by shuttle ferry service to William Henry Bay. A highway would be constructed from William Henry Bay to Haines via Pyramid Island. Alternatives 4A through 4D would provide additional ferry service in Lynn Canal. Two of these alternatives, 4B and 4D, would include a five-mile long extension of Glacier Highway and a ferry terminal at Sawmill Cove in Berners Bay.

The area of potential effect (APE) for this project is a 100-meter (m) wide corridor that includes the actual road footprint of each highway alternative and approximately 35 m wide buffer zones to either side of the roads. The APE also includes potential ferry terminals. The likely presence of historic properties within the APE for each alternative has been established through background research, consultations, and field investigations. The level of effort has been commensurate with the likely effects of the undertaking and the views of the State Historic Preservation Officer, the U.S. Forest Service (USFS), and National Park Service (NPS).

In September 2003, the AKDOT&PF sent formal tribal consultation letters to you and the other native organizations on the distribution list below. 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. From the information available to us, it appears that the only potential traditional cultural property in the general project area is near Point Sherman. Identified during ethnographic research for the Kensington Gold Project SEIS, this site is outside the project's APE.

Seven historic properties in the APE have previously been determined eligible for the National Register: the Berners Bay Historic Mining District (JUN-928), Jualin Historic Mining District (JUN-022), Comet/Bear/Kensington Historic Mining District (JUN-945), Jualin Mine Tram (JUN-932), Comet/Bear/Kensington Railroad (JUN-946), Dayebas Creek Sawmill (SKG-139), and Skagway & White Pass District (SKG-013).

Six additional sites and one historic district within the APE were identified in 2003 and 2004: a cabin near Lower Dewey Lake Creek (SKG-196), Sturgill's Landing Trail (SKG-207), Skagway Hydroelectric Complex District (SKG-189), Lower Dewey Lake Trail (SKG 203), Icy Lake/Reid Falls Trail (SKG-208), Dalton Trail (SKG-052), and culturally modified trees (CMTs) comprising JUN-993. The attached summary table lists these sites and FHWA's determination of eligibility.

The cabin near Lower Dewey Lake Creek probably dates to the early twentieth century and was possibly built by Garland Sturgill as part of his wood cutting business. Although the early woodcutting industry in Skagway is historically significant, this cabin is badly deteriorated and lacks associated artifacts. For these reasons, it is not considered eligible for the National Register.

Local citizens constructed the Sturgill's Landing Trail from the southern end of Lower Dewey Lake to Sturgill's Landing fairly recently. Although this hiking trail does follow older logging trails in places, it is by and large a modern route. It is not considered eligible for the National Register.

Contributing elements of the Skagway Hydroelectric Complex District (SKG-189) include the Lower Dewey Lake Dam (SKG-190) at the southern end of the lake, the Reservoir and Dam (SKG-191), Pipelines (SKG-192), Power Plant (SKG-193), a Tramway (SKG-194) northwest of the northern end of the lake, and a Hoist Building (SKG-198). The district is eligible for the National Register under criterion (a) because of its early date of construction and long-term service to residents of Skagway.

The Lower Dewey Lake Trail, from the trailhead to the junction where it splits into three other trails, is a historic route. The trail is visible in a 1903 photo of Skagway and older rockwork supports some of the switchbacks. The portion of the trail from the trailhead to the junction is eligible for the National Register under criterion (a).

The exact date that the Icy Lake/Reid Falls Trail was constructed is unknown. However, it is a relatively recent route that allows larger vehicles access to the Lower Dewey Lake bench. This trail is not considered eligible for the National Register.

The Dalton Trail is eligible for the National Register under criteria (a) and (b) because of its association with a number of historical events and its association with its namesake, builder, and chief promoter, Jack Dalton.

JUN-993 is a cluster of 259 culturally modified trees (CMTs) in the hemlock forest above the western shore of the Lace River. These trees are distinguished only by the fact that they are along a surveyed half-mile section of the alignment. With an average density of approximately 14.5 per acre in the surveyed area, CMTs are abundant along this shore. All of these CMTs are hemlock with predominantly oval or irregular scars, probably reflecting use of the inner bark for food. Although their presence demonstrates early use of the project area, these CMTs along the bank of the Lace River are not eligible for listing in the National Register.

The project could affect historic properties in the APE, but these effects would not be adverse. The project would not result in the physical destruction of any of the historic properties in the APE.

Construction would introduce visual elements that over the short term would diminish the integrity of some of the properties' setting, but these would be primarily temporary.

Alternatives 1 and 4A-D would have no effect on cultural resources. Alternatives 2, 2A, 2B, and 2C would pass through portions of the Berners Bay, Jualin, and/or Comet/Bear/Kensington Historic Mining Districts. These alternatives would affect the districts, but the effects would not be adverse. Alternatives 2, 2A, 2B, and 2C would cross the Comet/Bear/Kensington Railroad in a forested area where both the rail sections and supporting pilings are missing. These alternatives would cross the original alignment of the railroad. This affect would not be adverse because the route bridges over the railroad, and because there is no physical integrity of the railroad in this crossing location. Alternatives 2, 2B, and 2C would cross the Jualin Mine Tram just inshore from Berners Bay, in Section 25. This affect would not be adverse because the route bridges over the tram at the crossing point.

The Dayebas Creek Sawmill is in the APE for Alternatives 2, 2A, 2B, and 2C, but would not be affected by the road.

Alternatives 2, 2A, and 2C would pass through the Skagway Hydroelectric Complex District, crossing the pipelines and tramway west of the dam and reservoir. These alternatives would affect the district, but this effect would not be adverse. The route would bridge over the pipelines and tramway as it crosses Dewey Creek. The Hoist building, on the bench north of Lower Dewey Lake, is in the APE, but would not be impacted by the road.

Alternatives 2, 2A, and 2C would cross the Lower Dewey Lake Trail near the northern end of Lower Dewey Lake. However, only the lower portion of the trail, from the trailhead at Pullen Creek to the junction with the Upper Dewey Lake Trail, is historic. These alternatives would have an effect on the trail, but because the route would bridge over the trail and visual effects would be minimized, the effect would not be adverse.

The proposed highway alignment for Alternatives 2, 2A and 2C would end in the Skagway and White Pass Historic District National Historic Landmark (NHL). Northeast of Lower Dewey Lake, the road route into Skagway would run diagonally down the intermittently vegetated, irregular rock bluff east of town and cross over the railroad tracks to connect with 23rd Avenue (the Klondike Highway). The alignment runs east and north of the Skagway unit of the Klondike Gold Rush National Historic Park (Park), but enters the NHL as it starts down the bluff.

The proposed alignment would not result in the physical destruction of any Park or NHL contributing buildings, structures, or sites. The alignment would bridge over the White Pass & Yukon railroad tracks, a contributing element of the NHL. The nearest other NHL contributing structures are at the corner of Main Street and 22nd Avenue.

The proposed alignment would have visual impacts on the Park and NHL, but many of these would be temporary. Construction would introduce visual elements that over the short term would diminish the integrity of the property's setting, but these would last only until natural or designed mitigation measures took effect (e.g., weathering of the rock and revegetation). Cumulatively, the effect would not be adverse. The AKDOT&PF and FHWA propose that the final appearance of the road cut and bridges over Lower Dewey Lake Trail and the railroad tracks would be developed during design with input from the City of Skagway and National Park Service (NPS) to fit into the historic physical setting and cultural landscape of Skagway.

The Dalton Trail is the only site within the APE of Alternative 3 that would be affected.
The route would cross the Dalton Trail just north of Pyramid Harbor. This alternative would have an effect on the trail, but because the route would bridge over the trail and visual impacts would not be an issue, the effect would not be adverse.

The FHWA has determined that the Skagway Hydroelectric Complex District (SKG-189), Lower Dewey Lake Trail (SKG 203), and Dalton Trail (SKG-052) are eligible for the National Register. Conversely, the cabin near Lower Dewey Lake Creek (SKG-196), Sturgill's Landing Trail (SKG-207), Icy Lake/Reid Falls Trail (SKG-208), and the CMTs comprising JUN-993 are not eligible for the National Register. The FHWA has also determined that no project alternative would have an adverse effect on historic properties.

If you wish to comment on these determinations, I can be reached at the above contact information. In addition, Mr. Tim Haugh, Environmental & Right of Way Programs Manager, is available at the same address above, by telephone at 907-586-7430, or by e-mail at Tim.Haugh@fhwa.dot.gov. However, please note that to receive consideration, your comments must be received within thirty days of your receipt of this correspondence.

Sincerely,

David C. Miller
Division Administrator

Enclosure: Alternatives map
Distribution List

cc w/o enclosures:
Reuben Yost, AKDOT&PF Southeast Region, Project Manager
Laurie Mulcahy, AKDOT&PF HQ, Environmental Program Manager

AHRS No.	AHRS Site Name	Agency Determination of Eligibility
JUN-993	Lace River CMTs	Not Eligible
SKG-196	Cabin near Lower Dewey Lake Creek	Not Eligible
SKG-207	Sturgill's Landing Trail	Not Eligible
SKG-199	Cabin on Sturgill's Landing Trail	Not Eligible
SKG-200	Cabin on Sturgill's Landing Trail	Not Eligible
SKG-189	Skagway Hydroelectric Complex District	Eligible under criterion (a)
SKG-190	Lower Dewey Lake Dam	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-191	Reservoir and Dam	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-192	Pipelines	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-193	Power Plant	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-194	Tramway	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-198	Hoist Building	Eligible under criterion (a) as part of the Hydroelectric Complex District
SKG-203	Lower Dewey Lake Trail	Eligible under criterion (a)
SKG-208	Icy Lake/Reid Falls Trail	Not Eligible
SKG-052	Dalton Trail	Eligible under criteria (a) and (b)

Juneau Access

Native Organization Contacts

Contact Name	Title	Group	Address	City	State	Zip	Phone
Lee Clayton	President	Chilkoot Indian Association of Haines	P.O. Box 490	Haines	AK	99827	766-2323
Thomas Crandall	President or CEO	Klukwan, Inc.	P.O. Box 209	Haines	AK	99827	766-2211
Gary Droubay	President or CEO	Goldbelt, Inc.	9097 Glacier Hwy., Suite 200	Juneau	AK	99801	790-4990
Jones Hotch, Jr.	President	Chilkat Village of Klukwan	P.O. Box 201	Haines	AK	99827	767-5505
Chris McNeil	President or CEO	Sealaska Corporation	One Sealaska Plaza, Suite 400	Juneau	AK	99801	586-1512
Norman Sarabia	President	Douglas Indian Association	P.O. Box 240541	Hoonah	AK	99829	945-3545
Edward Thomas	President	Tlingit & Haida Central Council	320 W. Willoughby Ave., Suite 300	Juneau	AK	99801	586-1432
Lance Twitchell	President	Skagway Traditional Council	P.O. Box 1157	Skagway	AK	99840	983-4068
Albert Wallace	Chief	Aukquan Traditional Council	9296 Stephen Richards Memorial Drive	Juneau	AK	99801	789-0632
Rosita Worl	Executive Director	Sealaska Heritage Institute	One Sealaska Plaza, Suite 201	Juneau	AK	99801	463-4844
Frank Wright, Jr.	President	Hoonah Indian Association	P.O. Box 602	Hoonah	AK	99829	983-4068

9/25/2003

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

August 11, 2004

Re: Juneau Access Improvements
Project No. 71100

Myra Gilliam
Archaeologist
U. S. Department of Agriculture, Forest Service
Tongass National Forest
Juneau Ranger District
8465 Old Dairy Road
Juneau, AK 99801

Subject: Section 106 Consultation

Dear Ms. Gilliam,

The Alaska Department of Transportation and Public Facilities (DOT&PF) has completed the cultural resources studies initiated as part of preparation of a supplemental draft environmental impact statement (EIS) for the Juneau Access Improvements project. Enclosed are three documents for your review. The first is the Cultural Resources Summary and Compilation of Data. This report summarizes the research, fieldwork, and determinations for the 1997 Draft EIS as well as the additional fieldwork completed in 2003 and 2004. The second document is a memo (including a map) proposing boundaries for the four historic mining districts in Berners Bay. Boundaries were not delineated as part of the Forest Service eligibility determinations for the Kensington Gold Project, but are required by the Federal Highway Administration (FHWA) for the purpose of determining potential impacts under Section 106 of the National Historic Preservation Act and Section 4(f) of the Transportation Act. The third document enclosed is a draft letter to the State Historic Preservation Officer (SHPO) with FHWA's proposed determinations of eligibility for additional properties identified in 2003 and 2004, and FHWA's proposed determination of effect for the project's build alternatives.

The enclosed documents are being sent for your review as part of the Section 106 consultation process prior to submittal to the SHPO. The proposed boundaries for the historic mining districts and the proposed determinations of eligibility and effect for historic properties on Forest Service land are based on existing Forest Service determinations and additional fieldwork by Cultural Resource Consultants.

25A-T34LH

I will be contacting you soon to see if you would like to meet to discuss any of these documents, or if you have any questions. FHWA anticipates sending a determination letter to the SHPO at the end of August. Thank you for your ongoing cooperation on this project.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

Enclosures:

cc: Tim Haugh, FHWA
Ken Vaughan, USFS

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

August 11, 2004

Re: Juneau Access Improvements
Project No. 71100

Marcia Blaszak
Regional Director, Alaska
National Park Service
240 West 5th Avenue, Room 114
Anchorage, AK 99501

Subject: Section 106 Consultation

Dear Ms. Blaszak,

The Alaska Department of Transportation and Public Facilities (DOT&PF) has completed the cultural resources studies initiated as part of preparation of a supplemental draft environmental impact statement (EIS) for the Juneau Access Improvements project. Enclosed are three documents for your review. The first is the Cultural Resources Summary and Compilation of Data, prepared by Cultural Resource Consultants (CRC). This report summarizes the research, fieldwork, and determinations for the 1997 Draft EIS as well as the additional fieldwork completed in 2003 and 2004. The second document, Juneau Access Road 2003 Cultural Resource Studies, prepared by Northern Land Use Research (NLUR), is a report on the additional fieldwork completed in 2003, including the field work in Skagway. The third document is a draft letter to the State Historic Preservation Officer (SHPO) with FHWA's proposed determinations of eligibility for additional properties identified in 2003 and 2004, and FHWA's proposed determination of effect for the project's build alternatives.

The NLUR report includes information on additional historic properties identified in Skagway. This includes two properties within the Skagway & White Pass District National Historic Landmark: the Lower Dewey Lake Trail and the Skagway Hydroelectric Complex. The CRC summary report and FHWA's draft letter explain that highway for three of the alternatives under consideration would have an effect on the landmark and the Klondike Gold Rush National Historic Park. The highway would pass above the park and through a portion of the landmark. No contributing buildings, structures or sites would be impacted, and no land would be required from a contributing element. The effect would be limited to visual impacts, primarily to the landmark at the north end of Skagway. Views from the park would be limited by topography and buildings.

25A-T34LH

An aerial photograph and several simulations are enclosed. These materials were prepared to help evaluate the potential visual impact. As explained in the report and draft letter to SHPO, FHWA does not believe the effect on the park and landmark would be adverse, based in part on the commitment to coordinate with the National Park Service during design in order to incorporate measures to reduce the visual impact.

The enclosed documents are being sent for your review as part of the Section 106 consultation process prior to submittal to the SHPO. I will be contacting you soon to see if you would like to meet to discuss these documents, or if you have any questions. FHWA anticipates sending a determination letter to the SHPO at the end of August. Thank you for your ongoing cooperation on this project.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

Enclosures:

cc: Tim Haugh, FHWA
Nancy Swanton, NPS, KLGO

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

August 11, 2004

Re: Juneau Access Improvements
Project No. 71100

Richard Enriquez
U.S. Fish and Wildlife Service
300 Vintage Blvd., Suite 201
Juneau, AK 99801-7100

Dear Mr. Enriquez,

Enclosed is the Preliminary Supplemental Draft Environmental Impact Statement for the Juneau Access Improvements project. The Alaska Department of Transportation and Public Facilities is circulating the preliminary draft to Cooperating Agencies for review and comment at this time. Our intention is to evaluate comments from Cooperating Agencies, make changes to the document if necessary, and include comments and a response in the draft document released to the public no later than October 4, 2004.

Please submit your comments by September 11. Contact me at 465-1774 if you have any questions. Thank you.

Sincerely,

Reuben Yost
Special Projects Manager

Enclosure

Distribution:
- Jim Helfinstine, USCG
- John Leeds, ACOE
- Chris Meade, USEPA
- Ken Vaughan, USDA-FS
- Susan Walker, NMFS

cc: Tim Haugh, FHWA
Pat Kemp, DOT&PF

25A-T34LH

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

August 13, 2004

Re: Significant Recreation Facilities
Juneau Access Improvements
Project No. 71100

Pete Griffin, District Ranger
Juneau Ranger District
United States Forest Service
U. S. Department of Agriculture
8465 Old Dairy Road
Juneau AK 99801

Dear Mr Griffin,

As you know, the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA) are preparing a Supplemental Draft Environmental Impact Statement for this project. As part of the evaluation of reasonable alternatives we are identifying potential impacts to significant park, recreation, and wildlife/waterfowl refuge land. Under Section 4(f) (codified at 49 U.S.C. 303) regulations, a federal transportation project may not use land from these properties unless there is no feasible and prudent alternative and the project includes all possible planning to minimize harm to the property resulting from such use.

Much of the land traversed by the alternatives under consideration is federally owned land managed by your agency. As indicated in the 1997 Tongass Land and Resource Management Plan (TLMP), alternatives on the east side of Lynn Canal would pass through the following land use designations: Semi-Remote Recreation, Congressionally Designated LUD II, Old-Growth Habitat, and Modified Landscape. The alternative on the west side of Lynn Canal would pass through Semi-Remote Recreation, Scenic Viewshed, and Modified Landscape designations. Based on a review of the applicable management prescriptions for these land use designations in the latest Forest Service management plan, as well as past discussions with Forest Service personnel, this land is managed for multiple uses. In the case of multiple use public land, FHWA regulations [23CFR 771.135(d)] state that "section 4(f) applies only to those portions of such lands which function for, or are designated in the plans of the administering agency as being for, significant park, recreation, or wildlife and waterfowl purposes". FHWA guidance stresses that Section 4(f) does not apply to areas of incidental, secondary, occasional or dispersed recreational activities.

Discussions with Eric Ouderkirk and Ken Vaughan have indicated that the only specific significant recreational facilities on Forest Service land in the project vicinity are the Berners Bay Cabin, the Sturgill's Landing Day Use Area, and the Sturgill's Landing Trail. They have

5A-T34LH

indicated that all other areas, including the areas on the TLMP Recreation Places Inventory, are used for dispersed recreational activities.

As indicated in the March 25, 2004 letter from Ken Vaughan, the Forest Service would like to make the Berners Bay Cabin handicap accessible if an alternative is selected that would pass behind the cabin. DOT&PF has agreed to include a parking area and handicap accessible trail in the applicable alternatives (2, 2B, 2C). DOT&PF has surveyed the area and identified the use areas in relation to the cabin and the proposed alignment. We have determined that the highway centerline would be approximately 400 feet from the cabin, and the nearest point of disturbance would be approximately 200 feet from the closest use area (a short trail past the outhouse). For purposes of defining the recreational property, we have established a boundary 100 feet from the closest use area. This boundary therefore includes a buffer of vegetation. Our intention is to maintain an additional 100-foot wide buffer. A greater separation would force the alignment onto steep terrain, which would make construction more difficult and lengthen the handicap access trail.

The alternatives that include a highway to Skagway (2, 2A, 2C) would pass approximately 680 feet east of the Sturgill's Landing Day Use Area. The trail to the day use area would not be crossed or affected on Forest Service land. As requested by the Forest Service, a parking area would be provided in the vicinity of a spur trail that connects to the main trail.

No designated wildlife or waterfowl refuges have been identified on Forest Service land in the project vicinity.

By this letter we are requesting your concurrence on the following points:

1. The only specific (non-dispersed) significant recreation areas in the project vicinity are the Berners Bay Cabin, the Sturgill's Landing Day Use Area, and the Sturgill's Landing Trail. All other recreational activity is dispersed, with no defined facilities.
2. The alternatives, as described in reference to the Berners Bay Cabin and the Sturgill's Landing Day Use Area, would not take land from a significant recreation area.
3. There are no significant wildlife or waterfowl refuges on Forest Service land in the project vicinity.

Please concur on the line provided, or respond by separate letter. Thank you for your assistance in this matter.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

Enclosures: Map of Berners Bay Cabin Area
Map of Sturgill's Landing Day Use Area and Trail

cc: Tim Haugh, FHWA Environment & Right-of-Way
Eric Ouderkirk, Forest Service
Ken Vaughan, Forest Service

Concurrence:

Concur:____________________________________ ________________(date)
Pete Griffin, District Ranger
Juneau Ranger District
United States Forest Service

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

August 13, 2004

Re: Significant Recreation Facilities
Juneau Access Improvements
Project No. 71100

Tom Irwin, Commissioner
Alaska Department of Natural Resources
400 Willoughby Avenue
Juneau, AK 99801

Dear Commissioner Irwin,

As you know, the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA) are preparing a Supplemental Draft Environmental Impact Statement for this project. As part of the evaluation of reasonable alternatives we are identifying potential impacts to significant park, recreation, and wildlife/waterfowl refuge land. Under Section 4(f) (codified at 49 U.S.C. 303) regulations, a federal transportation project may not use land from these properties unless there is no feasible and prudent alternative and the project includes all possible planning to minimize harm to the property resulting from such use.

Some of the land traversed by the alternatives under consideration is state owned land managed by the Department of Natural Resources (DNR). Alternatives 2, 2A, and 2C would pass through State of Alaska land near Skagway, Parcel S-23, south of the Dewey Lake. DNR administers this land under the Northern Southeast Area Plan. ParcelS-23 is designated General Use; the management plan allows for potential development while maintaining habitat, scenic and recreation values. Based on the land designation and management guidelines, this land is managed and functions for multiple use. In the case of multiple use public land, FHWA regulations state that Section 4(f) applies only to those portions of such lands which function for, or are designated in the plans of the administering agency as being for, significant park, recreation, or wildlife and waterfowl purposes. FHWA guidance also explains that Section 4(f) does not apply to areas of incidental, secondary, occasional, or dispersed recreational activities.

Based on our studies and discussion with the previous Regional Manager, the only portion of the parcel designated and/or functioning for recreation (excluding dispersed activities) is the Sturgill's Landing Trail. Alternatives 2, 2A, and 2C would avoid use of land from this trail by bridging over the trail, maintaining trail continuity. Roadside parking and a connection to the trail would be provided as a trail enhancement.

iA-T34LH

Alternative 3 would pass through a land management unit of the Haines State Forest, Unit 6. Unit 6 is classified as Public Recreation Land. The Haines State Forest Plan states that this land will primarily be managed for public recreational uses. However, the plan also states that the Haines State Forest will be managed for multiple use, and specifically allows personal timber harvest in sub-unit 6a and salvage timber harvest in both sub-units a and b. Also, mineral extraction is allowed under certain circumstances. Based on the language in the plan, this land functions and is managed for multiple use. Our studies and discussion with the Area Forester indicate 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. A parking area and trail connection would be provided. The management plan recommends a cabin or shelter be constructed along the trail, but our understanding is that no site has been designated.

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. To our knowledge none of these lands are designated for or function for recreation other than dispersed activities.

No designated wildlife or waterfowl refuges have been identified on state land in the project vicinity.

By this letter we are requesting your concurrence on the following points:

1. The only specific (non-dispersed) significant recreation areas on state land in the project vicinity are the Sturgill's Landing Trail, and the Davidson Glacier Lake Trail. All other recreational activity is dispersed, with no defined facilities.
2. The alternatives, as described in reference to the Sturgill's Landing Trail and the Davidson Glacier Trail, would not take land from a significant recreation area.
3. There are no significant waterfowl or wildlife refuges on state land in the project vicinity.

Please concur on the line provided, or respond by separate letter. Thank you for your assistance in this matter.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

Enclosures: Map of Davidson Glacier Area
Map of Sturgill's Landing Trail

cc: Tim Haugh, FHWA Environment & Right-of-Way
Ed Cohazzi, Regional Manager, SERO
Roy Josephson, Haines Area Forester

Concurrence:

Concur:_________________________ _____________(date)
Tom Irwin, Commissioner
Alaska Department of Resources

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

ALASKA DOT & PF
AUG 25 2004
SPECIAL PROJECTS

August 13, 2004

Re: Significant Recreation Facilities
Juneau Access Improvements
Project No. 71100

Tom Irwin, Commissioner
Alaska Department of Natural Resources
400 Willoughby Avenue
Juneau, AK 99801

Commissioner's Office
Juneau
AUG 18 2004
Department of
Natural Resources

Dear Commissioner Irwin,

As you know, the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA) are preparing a Supplemental Draft Environmental Impact Statement for this project. As part of the evaluation of reasonable alternatives we are identifying potential impacts to significant park, recreation, and wildlife/waterfowl refuge land. Under Section 4(f) (codified at 49 U.S.C. 303) regulations, a federal transportation project may not use land from these properties unless there is no feasible and prudent alternative and the project includes all possible planning to minimize harm to the property resulting from such use.

Some of the land traversed by the alternatives under consideration is state owned land managed by the Department of Natural Resources (DNR). Alternatives 2, 2A, and 2C would pass through State of Alaska land near Skagway, Parcel S-23, south of the Dewey Lake. DNR administers this land under the Northern Southeast Area Plan. ParcelS-23 is designated General Use; the management plan allows for potential development while maintaining habitat, scenic and recreation values. Based on the land designation and management guidelines, this land is managed and functions for multiple use. In the case of multiple use public land, FHWA regulations state that Section 4(f) applies only to those portions of such lands which function for, or are designated in the plans of the administering agency as being for, significant park, recreation, or wildlife and waterfowl purposes. FHWA guidance also explains that Section 4(f) does not apply to areas of incidental, secondary, occasional, or dispersed recreational activities.

Based on our studies and discussion with the previous Regional Manager, the only portion of the parcel designated and/or functioning for recreation (excluding dispersed activities) is the Sturgill's Landing Trail. Alternatives 2, 2A, and 2C would avoid use of land from this trail by bridging over the trail, maintaining trail continuity. Roadside parking and a connection to the trail would be provided as a trail enhancement.

25A-T34LH
orig - Anch S.P.

Alternative 3 would pass through a land management unit of the Haines State Forest, Unit 6. Unit 6 is classified as Public Recreation Land. The Haines State Forest Plan states that this land will primarily be managed for public recreational uses. However, the plan also states that the Haines State Forest will be managed for multiple use, and specifically allows personal timber harvest in sub-unit 6a and salvage timber harvest in both sub-units a and b. Also, mineral extraction is allowed under certain circumstances. Based on the language in the plan, this land functions and is managed for multiple use. Our studies and discussion with the Area Forester indicate 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. A parking area and trail connection would be provided. The management plan recommends a cabin or shelter be constructed along the trail, but our understanding is that no site has been designated.

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. To our knowledge none of these lands are designated for or function for recreation other than dispersed activities.

No designated wildlife or waterfowl refuges have been identified on state land in the project vicinity.

By this letter we are requesting your concurrence on the following points:

1. The only specific (non-dispersed) significant recreation areas on state land in the project vicinity are the Sturgill's Landing Trail, and the Davidson Glacier Lake Trail. All other recreational activity is dispersed, with no defined facilities.
2. The alternatives, as described in reference to the Sturgill's Landing Trail and the Davidson Glacier Trail, would not take land from a significant recreation area.
3. There are no significant waterfowl or wildlife refuges on state land in the project vicinity.

Please concur on the line provided, or respond by separate letter. Thank you for your assistance in this matter.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

Enclosures: Map of Davidson Glacier Area
Map of Sturgill's Landing Trail

The Department of Natural Resources generally concurs to the three points identified on page 2 of this letter subject to the following:

Under point #2, while we concur that a road would not physically occupy a large portion of Unit 6 in the Haines State Forest Plan; a road developed using the alignment depicted as Alternative #3 could have a potential impact on the heavily used summer recreation area at Davidson Lake. DOT/PF should consult with the Division of Mining, Land and Water Southeast Regional Office when considering any decision on preferred alignments in order to mitigate impacts to the recreation activities.

Under point #3, while there are no significant wildlife refuges on state land in the immediate vicinity, the area of the Chilkat River, situated to the east of this road alignment, contains a significant seasonal waterfowl concentration, which should also be taken into consideration in a decision on preferred routes. DOT/PF should consult with the Office of Habitat Management and Permitting to mitigate any potential impacts.

Concurrence:

Concur: ______________________ Aug. 23, 2004
Thomas E. Irwin
Commissioner
Date

ALASKA DOT & PF
AUG 25 2004
SPECIAL PROJECTS

Cc: Tim Haugh, FHWA Environment & Right-of-Way
Ed Cohazzi, Regional Manager, SERO
Roy Josephson, Haines Area Forester

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

STATEWIDE DESIGN & ENGINEERING SERVICES
SOUTHEAST REGION PRECONSTRUCTION – SPECIAL PROJECTS

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999
PHONE (907) 465-1774
TEXT: (907) 465-4647
FAX: (907) 465-2016

August 13, 2004

Re: Significant Recreation Facilities
Juneau Access Improvements
Project No. 71100

ALASKA DOT & PF
AUG 30 2004
SPECIAL PROJECTS

Pete Griffin, District Ranger
Juneau Ranger District
United States Forest Service
U. S. Department of Agriculture
8465 Old Dairy Road
Juneau AK 99801

Dear Mr Griffin,

As you know, the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA) are preparing a Supplemental Draft Environmental Impact Statement for this project. As part of the evaluation of reasonable alternatives we are identifying potential impacts to significant park, recreation, and wildlife/waterfowl refuge land. Under Section 4(f) (codified at 49 U.S.C. 303) regulations, a federal transportation project may not use land from these properties unless there is no feasible and prudent alternative and the project includes all possible planning to minimize harm to the property resulting from such use.

Much of the land traversed by the alternatives under consideration is federally owned land managed by your agency. As indicated in the 1997 Tongass Land and Resource Management Plan (TLMP), alternatives on the east side of Lynn Canal would pass through the following land use designations: Semi-Remote Recreation, Congressionally Designated LUD II, Old-Growth Habitat, and Modified Landscape. The alternative on the west side of Lynn Canal would pass through Semi-Remote Recreation, Scenic Viewshed, and Modified Landscape designations. Based on a review of the applicable management prescriptions for these land use designations in the latest Forest Service management plan, as well as past discussions with Forest Service personnel, this land is managed for multiple uses. In the case of multiple use public land, FHWA regulations [23CFR 771.135(d)] state that "section 4(f) applies only to those portions of such lands which function for, or are designated in the plans of the administering agency as being for, significant park, recreation, or wildlife and waterfowl purposes". FHWA guidance stresses that Section 4(f) does not apply to areas of incidental, secondary, occasional or dispersed recreational activities.

Discussions with Eric Ouderkirk and Ken Vaughan have indicated that the only specific significant recreational facilities on Forest Service land in the project vicinity are the Berners Bay Cabin, the Sturgill's Landing Day Use Area, and the Sturgill's Landing Trail. They have

25A-T34LH

indicated that all other areas, including the areas on the TLMP Recreation Places Inventory, are used for dispersed recreational activities.

As indicated in the March 25, 2004 letter from Ken Vaughan, the Forest Service would like to make the Berners Bay Cabin handicap accessible if an alternative is selected that would pass behind the cabin. DOT&PF has agreed to include a parking area and handicap accessible trail in the applicable alternatives (2, 2B, 2C). DOT&PF has surveyed the area and identified the use areas in relation to the cabin and the proposed alignment. We have determined that the highway centerline would be approximately 400 feet from the cabin, and the nearest point of disturbance would be approximately 200 feet from the closest use area (a short trail past the outhouse). For purposes of defining the recreational property, we have established a boundary 100 feet from the closest use area. This boundary therefore includes a buffer of vegetation. Our intention is to maintain an additional 100-foot wide buffer. A greater separation would force the alignment onto steep terrain, which would make construction more difficult and lengthen the handicap access trail.

The alternatives that include a highway to Skagway (2, 2A, 2C) would pass approximately 680 feet east of the Sturgill's Landing Day Use Area. The trail to the day use area would not be crossed or affected on Forest Service land. As requested by the Forest Service, a parking area would be provided in the vicinity of a spur trail that connects to the main trail.

No designated wildlife or waterfowl refuges have been identified on Forest Service land in the project vicinity.

By this letter we are requesting your concurrence on the following points:

1. The only specific (non-dispersed) significant recreation areas in the project vicinity are the Berners Bay Cabin, the Sturgill's Landing Day Use Area, and the Sturgill's Landing Trail. All other recreational activity is dispersed, with no defined facilities.
2. The alternatives, as described in reference to the Berners Bay Cabin and the Sturgill's Landing Day Use Area, would not take land from a significant recreation area.
3. There are no significant wildlife or waterfowl refuges on Forest Service land in the project vicinity.

Please concur on the line provided, or respond by separate letter. Thank you for your assistance in this matter.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

Enclosures: Map of Berners Bay Cabin Area
Map of Sturgill's Landing Day Use Area and Trail

cc: Tim Haugh, FHWA Environment & Right-of-Way
Eric Ouderkirk, Forest Service
Ken Vaughan, Forest Service

Concurrence:

Concur: Pete Griffin 8-27-04 (date)
Pete Griffin, District Ranger
Juneau Ranger District
United States Forest Service

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) 586-7240

August 27, 2004

Reuben Yost
Special Projects Manager
Department of Transportation and Public Facilities
Southeast Region
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Juneau Access Preliminary Supplemental Draft 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 Supplemental Draft Environmental Impact Statement (PSDEIS). The JFWFO, as a cooperating agency in the development of this National Environmental Policy Act (NEPA) document, submits the following general comments, as well as comments specific to the PSDEIS referenced by section and page number.

Of greatest concern are the cumulative and secondary impacts associated with providing a road access to Skagway and its transportation infrastructure. In addition to mortality, there are other impacts from highways such as disruption of natural movements and habitat fragmentation (Mansergh and Scotts 1989, Beier 1993), habitat loss (Adams and Geis 1983, Mader 1984), a sensory disturbance (Edge and Marcum 1987, Mattson et al. 1992, Paquet 1993). Alternatives 2, 2B, and 2C 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 River). These areas support diverse and very high quality fish and wildlife habitats. The influence of the proposed transportation system on fish and wildlife ecology and the remedial actions to offset negative influences should be fully disclosed in the Supplemental Draft Environmental Impact Statement (SDEIS). This will assist in promoting a safe and sustainable transport infrastructure through recommending measures and planning procedures to conserve biodiversity.

Other Species

Page 3-56, paragraph 3. This paragraph includes a narrative stating that the Kittlitz's murrelet was petitioned for Endangered Species Act (ESA) listing in 2001. **Note:** The U.S. Fish and

Wildlife Service (Service), in its 2004 Candidate Notice of Review, published in the Federal Register on May 4, 2004 (attached), designated the Kittlitz's murrelet as a candidate species. The Service placed this species on the candidate list because it has sufficient information on the biological vulnerability and threats to the species to warrant listing as threatened or endangered under the ESA of 1973, as amended. Candidate species are not subject to the regulatory protections of the ESA, and human activities that may affect candidate species are not restricted. Candidate status signals that there are conservation concerns about a species. The Service encourages agencies, organizations, and individuals to participate in research and conservation activities that may preclude the need to list the species. We recommend that this note be included in the SDEIS for species recognition and potential future analysis.

3.3.3 Terrestrial Habitat

Page 3-51, paragraph 6 describes the landscape in Lynn Canal as "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." Page 3-57, paragraph 3, fourth sentence states that "Kittlitz's murrelets nest at scattered sites located high on recently deglaciated rocky slopes." We recommend that the following statement be added: ***Kittlitz's murrelets forage in glacially-fed waters during the breeding season.*** Identification of habitats used by this species can assist in environmental planning efforts to alleviate threats and thereby possibly remove the need to list the species as threatened or endangered.

Page 3-57, fourth paragraph. This paragraph includes statements that describe the beach and estuary fringe as important wildlife habitat for black and brown bear, river otters, bald eagles, and Sitka black-tailed deer. Figure 3 (SEAWEAD, 2004), depicts the importance of this habitat as related to the primary bear travel corridors in the Antler and Lace River estuaries and nearby lowlands. We recommend that the travel corridor route information provided in the SEAWEAD report be included in the discussion of the terrestrial habitat use section in Section 3 of the SDEIS. This will add scientific evidence to support the important bear use areas found in the project area, and provide the basis for recommending mitigation/compensation measures to offset the negative influences resulting from conflicts between nature and the transportation infrastructure associated with the build alternatives (2, 2B, and 2C).

The impacts of invasive species on the environment are casually mentioned under the **Terrestrial Habitat** sections found on pages 4-66, 4-106, and 4-150 of the PSDEIS. The first paragraph found in **6.7.17, Other Biological Environmental Issues, Public Comments** states that an organization requested that the SDEIS detail the pests and plants that could potentially spread to Southeast Alaska as a result of building a road along Lynn Canal. We are concerned that the construction and maintenance of roads can facilitate the invasion of non-native species that flourish in disturbed environments. Roads enable invasive species to hitchhike on vehicles and livestock into otherwise remote landscapes (Bjurlin and Cypher 2003). We recommend that the Affected Environment section of the SDEIS describe in more detail the impacts of invasive species on the environment.

5.7 Wildlife

Figure 3 (SEAWEAD, 2004) identifies brown bear travel corridors in the Berners Bay area. The proposed road alignment in Alternatives 2, 2B, and 2C (PSDEIS, Figures 2-3, 2-6, and 2-7) will bisect four of the primary travel corridors (1, 2, 4, and 5) shown in Figure 3 of the SEAWEAD Report. Page 5-3 of the **PROPOSED MITIGATION AND COMMITMENTS** section, does not include mitigation measures for disrupting natural movements of wildlife at known crossings. Mitigation for wildlife disruptions should be included in SDEIS. A bridge construction design that provides for connectivity for the broadest spectrum of species from invertebrates to ungulates should be included as a mitigation measure. Bridges with an open span design (similar to the one shown on attachment 1) would minimize the disruption of wildlife movements while providing connectivity across the road. Species having wide ranging territories (brown bear) would be hindered less by wider gaps in the corridor than species with more limited territories. Acknowledging the spatial needs of wildlife and incorporating them into a planning document can minimize the impacts to a healthy and sustainable ecosystem by including positive physical structures, ecological functions, and change.

We appreciate the opportunity to review and provide comments on the PSDEIS. Please keep this office informed if additional information relevant to this project becomes available. If you have any questions, please contact me at (907) 586-7240.

Sincerely,

Bruce G. Halstead
Field Supervisor

Attachments - 2

cc: DNR, OHMP, Juneau, AK
DNR, OPMP, Juneau, AK
NMFS, Juneau, AK
COE, Juneau, AK
ADF&G, Douglas, AK

3

Literature Cited

Adams, L.W. and Geis, A.D. 1989. Effects of roads on small mammals. Journal of Applied Ecology 20: 403-415.

Beier, P. 1993. Determining minimum habitat areas and corridors for cougars. Conservation Biology 7: 94-108.

Bjurlin, C.D. and Cypher, B.L. 2003. Effects of roads on San Joaquin kit foxes: A review and synthesis of existing data. ICOET 2003 Proceedings.

Edge, W.D. and Marcum, C.L. 1989. Determining elk distribution with pellet-group and telemetry techniques. Journal of Wildlife Management 53: 621-624.

Mader, H.-J. 1984. Animal habitat isolation by roads and agricultural fields. Biological Conservation 29: 81-96.

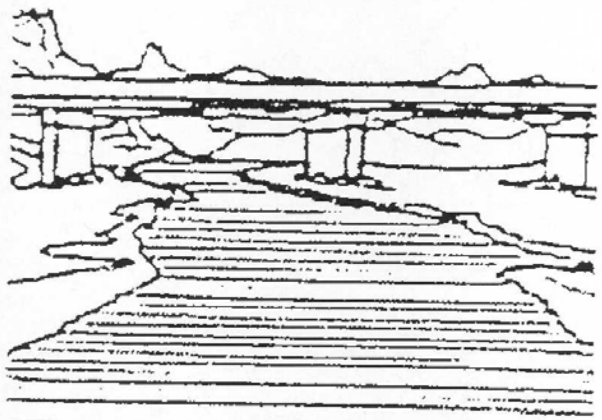
Mansergh, I.M. and Scotts, D.J. 1989. Habitat continuity and social organization of the mountain pygmy-possum restored by tunnel. Journal of Wildlife Management 53: 701-707.

Mattson, D.J., Blanchard, B.M. and Knight, R.R. 1992. Yellowstone grizzly bear mortality, human habituation, and whitebark pine seed crops. Journal of Wildlife Management 56: 432-442.

Paquet, P.C. 1993. Summary reference document – ecological studies of recolonizing wolves in the Central Canadian Rocky Mountains. Unpubl. Rept. by John/Paul and Assoc. Canadian Parks Service, Banff National Park, Canada. 176 pp.

SEAWEAD, 2004. Brown bear (*Ursus arctos*) habitat and signs of use: Berners Bay, Alaska Site Survey – June 15-19, 2003.

ATTACHMENT 1: BRIDGE DESIGN FOR WILDLIFE – NOTE THAT ONE BAY OF THE BRIDGE ALLOWS FOR A CONTINUOUS TERRESTRIAL OR AQUATIC CORRIDOR.



(Dramstead)

5

United States Department of Agriculture | Forest Service | Alaska Region | P.O. Box 21628 Juneau, AK 99802-1628

File Code: 1950-4
Date: September 13, 2004

Mr. Ruben Yost
Project Manager, Juneau Access Project
Alaska Department of Transportation and Public Facilities
Southeast Region
6860 Glacier Highway
Juneau, AK 99801-7999

Dear Mr. Yost:

Thank you for the opportunity to comment on the Agency Review Draft of the Supplemental Draft Environmental Impact Statement (RD-SDEIS) for the proposed Juneau Access highway construction. The Forest Service understands that extensive review and revision are likely and that the SDEIS produced for public review may be substantially different in part. The Forest Service is expecting to comment on the public review SDEIS also.

During the review period for the Agency Review Draft, there has been ongoing work in several resource areas including plants, visual quality, and heritage resources. Because of the ongoing work, the Forest Service will not comment on these sections of the draft document, expecting extensive revisions.

The Forest Service is expecting that the rights-of-way (ROW) authorized across National Forest System lands will be closely approximated by the extent of the highway construction. The ROW will be essentially for the construction limits (clearing limit to clearing limit) of the constructed highway. The Forest Service will work with the Alaska Department of Transportation and Public Facilities (ADOT&PF) to develop special use permits for any additional occupancy such as that needed for road maintenance facilities, The Forest Service expect to work cooperatively to manage any temporary access needs during construction along with mitigation and decommissioning of any temporary facilities.

The RD-SDEIS includes discussion on page 4-10 that the National Marine Fisheries Service sought a commitment from ADOT&PF that no boat launches would be constructed anywhere along East Lynn Canal Highway. The Forest Service has no objection to ADOT&PF agreeing to that stipulation, during construction of for the future, for the land within the construction limits of any ROW issued for the proposed East Side Lynn Canal alternative. It would not be appropriate for such a commitment for future activity to be made outside of the construction limits on the unencumbered Forest Service lands managed as part of the Tongass National Forest.

The RD-SDEIS discloses that approximately 6 million cubic yards of rock in excess of construction needs will produced during the construction. The RD-SDEIS is not clear on how this excess rock will be treated. Similarly, the Forest Service is concerned that construction administration could be permissive to severe effects to National Forest resources outside the construction limits. Such actions as excessive blasting charges overshooting rock and having

Caring for the Land and Serving People

Printed on Recycled Paper

significant damage to vegetation need to be avoided and curtailed when encountered. Proactive measure to protect vegetation along any highway corridor is expected.

The RD-SDEIS presents an expected effect of implementation of a highway alternative to be a substantial increase in the number of recreation vehicles (RVs) visiting Juneau. The numbers projected exceed the current capacity for RV parking available in Juneau under current policies. The Forest Service encourages ADOT&PF to facilitate proactive solutions for increased capacity in advance of the arrival of the increased RV traffics forecast. The effects of a shortage of RV parking space with the implementation of a highway alternative is likely to be heaviest on the City and Borough of Juneau, the Department of Natural Resources, and the Forest Service.

A Forest Service SDEIS would normally include a significant focus on significant issues developed during scoping. Not finding any significant discussion of scoping and the outcome from scoping was different. You may want to consider the development of a summary of the "significant issues" that were derived from scoping.

Recreation Access and Use

The Forest Service expects a change in access with the construction of any of the highway alternatives. This construction will generate traffics that result in increased land use, especially where pullouts and/or trailheads are constructed. These people effects are an inevitable effect of the action.

The Forest Service would appreciate increased discussion of the people effects, and the costs responsibility associated with the increased access. Litter containers and maintenance at pullouts and viewpoints, maintenance and operations of rest areas are implied, but should be specific commitments in Section 8.

Mapping showing Recreation Opportunity Spectrum classes and definitions should be available at the website if not included in the SDEIS.

The description of proposed recreation enhancements (page 4-15 and page 4-73) does not include the trailheads that were identified in the March 25th letter from Ken Vaughan to Ruben Yost, ADOT&PF (included as pages 6-34 to 6-37). These actions would seem to be necessary to include if for no other reason than as foreseeable future actions as part of the cumulative effects analysis rather than as a one liner at the end of the 1st paragraph at the top of page 4-16.

Particularly with the East Side Lynn Canal alternative, there are likely to be sites along this route that develop incidental recreational use for technical rock climbing, ice climbing, kayak launching, etc. Provision to provide safe parking for these uses will be important if the alternative is constructed.

Recreation Enhancements

The description of the scenic pullouts and overlooks (page 4-15 and 4-73) does not fully represent the proposed transportation enhancements that were provided by the Forest Service in March 2004. These items should be specifically identified in the document.

The Forest Service has found that vague descriptions and lack of specificity leads to future difficulties during project implementation. The Forest Service may propose some of the identified developments as recreation enhancements during project implementation or at a later date when the Juneau Ranger District is prepared to pursue those developments and incur the associated operations and maintenance costs.

Wildlife Connectivity

While the RD-SDEIS makes reference to wildlife connectivity as creating likely problems, Section 8 does not propose any mitigation or avoidance measures. The techniques for assessing connectivity issues is not fully mature, but there are enough indicators to include constructed measure for wildlife crossings, especially for moose and brown bear. The RD-SDEIS does predict changes in brown bear populations, but effective measures are available during design to minimize the effects. While vehicle-moose interactions are almost always fatal to the moose, they normally result in high property damage and some human fatalities also. Avoidance is a prudent design philosophy.

Sincerely,

/s/ Kenneth D. Vaughan
KENNETH D. VAUGHAN, P.E.
Forest Service Representative

Pete Griffin, District Ranger, Juneau Ranger District
Ron Marvin, Juneau Ranger District
Eric Ouderkirk, Tongass National Forest, Ketchikan
Larry Lunde, Tongass National Forest, Ketchikan
Larry Dunham, Tongass National Forest, Petersburg
Scott Fitzwilliams, Tongass National Forest, Sitka

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
JUNEAU REGULATORY FIELD OFFICE
JORDAN CREEK CENTER
8800 GLACIER HIGHWAY, SUITE 106
JUNEAU, ALASKA 99801-8079

REPLY TO
ATTENTION OF:

September 15, 2004

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 August 10, 2004, letter requesting our comments on the Preliminary Supplemental Draft Environmental Impact Statement (PSDEIS) on the Juneau Access Improvement project prepared by the Alaska Department of Transportation and Public Facilities (ADOT/PF). We reviewed the PSDEIS pursuant to the U.S. Army Corps of Engineers (Corps) authority under Section 404 of the Federal Clean Water Act and Section 10 of the Rivers and Harbors Act. Please note, work such as dredging and placement of pilings and other structural components associated with bridges or pile-supported causeways in or over navigable (tidal) waters are not under the Corps jurisdiction. The Department of Transportation Act of 1966 placed such work under the jurisdiction of the U.S. Coast Guard (USCG). Any discharge of fill or dredged fill material into waters and navigable waters of the United States in association with USCG regulated bridges or causeways would still be subject to Section 404 and Corps permit requirements.

The Corps previously provided substantial comments on the DEIS on November 20, 1997, and March 18, 1997. The following comments are provided for your review and incorporation into any future EIS and your Department of the Army (DA) permit application.

Terrestrial Habitat: Total wetland impacts shall be accurately described and accounted for. The "Terrestrial Habitat" sections in the preface and each of the alternatives includes impact acreages to "muskeg" areas and other wetland impacts. Muskeg is a type of wetland, as section 3.3.1.1 correctly describes, so muskeg impacts belong in the "Wetlands" section and not this section. There appears to be a lack of definitions as to what these land class terms mean so this needs to be clarified and the different habitat types found in the project area should be listed for each land class. The Corps defines terrestrial habitat as upland areas only, such as upland forest, alpine meadow, etc. All areas meeting the wetland criteria in the Corps 1987 Wetland Delineation Manual need to be placed in the "Wetlands" section and all impacts to upland areas only need to be placed in the "Terrestrial" section so that an accurate impact analysis can be completed. For example, table 4-21 (page 4-65) on terrestrial impacts includes muskeg and forested wetlands so it is unclear as to whether these impacts are being accounted for on table 4-20 (page 4-61) with wetland impacts. This is also the case for the terrestrial habitat sections for alternative 3 (section 4.4.15) and table 4-39 and alternative 4 (section 4.6.15) and table 4-70.

Essential Fish Habitat: The summary table on page S-16 shows this term being used for submerged lands. However, it is unclear as to whether this term includes all submerged lands or areas that are intermittently exposed, such as non-anadromous streambeds and mudflats. Therefore, we suggest an alternate land class term be used, such as "Other Waters of the U.S." or a similar term. Please note that our Section 404 jurisdiction extends to all waters of the U.S., including mudflats, and extends to the ordinary high water (OHW) mark of freshwaters. The Corps regulations at 33 CFR 328.3e defines the OHW as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." The Corps will need to know what method ADOT/PF used to establish the OHW line in freshwater areas.

In tidal waters, the Corps Section 404 jurisdiction extends to the high tide line (HTL), which is defined in the Corps regulations as "the line of intersection of the land with the water's surface at the maximum height reached by a rising tide." The Corps Section 10 jurisdiction extends to the mean high water (MHW) line in coastal areas. The Alaska District has defined the HTL and MHW for the following areas in the project area (the MHW and HTL are in feet above sea level of 0.0 feet):

LOCATION	MHW	HTL
Berners Bay	15.25	19.7
Lynn Canal	14.79	19.7
Chilkat Inlet (Haines)	15.48	20.8
Taiya Inlet (Skagway)	15.74	21.2

The DA application will require that all work in the above areas and other coastal areas have elevations taken to determine if the work would be within the Corps jurisdiction. The elevations at the nearest locations listed above would be used to establish the Corps jurisdictional boundaries. The baseline elevation of the term "mean lower low water" as referenced in Section 3.2.2.4 (page 3-34) needs to be further defined (in feet) and compare those tidal ranges with those above.

Alternatives Analysis: It is incumbent upon an applicant to provide a thorough and detailed alternatives analysis to clearly show that their preferred build alternative would have the least environmentally damaging impact. A Corps/EPA memo (Attachment A) on this issue states, "the applicant is required in every case (irrespective of whether the discharge site is a special aquatic site or whether the activity associated with the discharge is water dependent) to evaluate opportunities for use of non-aquatic areas and other aquatic sites that would result in less adverse impact on the aquatic environment." Such analysis needs to include cost comparisons and a detailed cost analysis breakdown, impact analysis, feasibility determination, and other relevant issues. This 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 Corps has determined that the following areas require a more detailed analysis:

1) Echo Cove to Slate Creek: address the feasibility of constructing portions of the highway on an open-pile causeway to further minimize impacts in the "ecologically diverse" Berners Bay region; address whether an open-pile causeway would be feasible in lieu of tidal fill areas on other portions of the project;
2) Slate Creek to Sherman Point: address the feasibility of moving the alignment to the upland area east of wetland complex B-3 to further minimize or avoid the largest wetland impact area on the project;

this would require further coordination with the U.S. Forest Service (USFS) if the road is placed on USFS upland areas and with private parties and the State Historic Preservation Office to determine the feasibility of routing the highway on existing and proposed transportation corridors through the Berners Bay Historic Mining District;

3) Taiya Inlet: address the feasibility of hauling the excess rock waste to upland disposal areas; EPA-approved ocean disposal areas should also be considered.

Navigable Waters: The Corps has not determined federal navigability status for the entire reach of the waterways listed in Section 3.1.7 (page 3-26). These waters are the Antler, Gilkey, Lace, Berners, Katzehin, Endicott, Sullivan, 'Unnamed' (north of Sullivan Island), North Glacier, and Chilkat rivers. However, the Corps considers all tidal waters to be navigable and subject to Section 10 jurisdiction up to the mean high water elevations stated above. It appears the downstream portions of all or most of these waters and other smaller coastal streams would be considered navigable up to the mean high water elevations stated above.

Water Quality: Please substantiate your findings in Section 3.2.2 (page 3-32) that "water quality in the project area is high." Typically, such statements are substantiated by taking water quality readings of Total Suspended Solids (TSS), Dissolved Oxygen (DO), and other relevant parameters and comparing it to other readings in other areas and/or used in a water quality index. An additional water quality mitigative measure of directing all water off bridge ends into sedimentation ponds should also be addressed.

Wild and Scenic Rivers (WSR): Please clarify how much of the Katzehin River is being considered for WSR status. Section 3.2.4 (page 3-34) states the lower two miles of the Katzehin River is not within the WSR recommended area, but Section 3.1.1.1 (page 3-3) states the lower three miles are not a WSR.

Noise: Section 3.2.6 should explain why the Stellar sea lion critical habitat at Gran Point is not within the activity category A for "lands on which serenity and quiet are of extraordinary significance and serve an important public need." This section also states, "the Glacier Highway from downtown to Auke Bay is densely developed" which would appear to be highly questionable given the large amount of undeveloped land that is along this highway.

Bald Eagles: Please explain in Section 3.3.6 whether other impacts to wetlands or other sensitive resources would result from changing the alignment to avoid eagle nests. It is also unclear as to whether any eagle nest trees would be removed and if so, how many such trees would be removed.

Wetlands: Section 3.3.1 needs to address, in more detail, the criteria used to determine when field work was deemed needed to determine wetland boundaries, and how much (percentage) of the total wetland impacts were field verified. Also describe, in detail, any areas that are a "checkerboard" of upland and wetlands and how much of these areas contain upland islands (e.g. palustrine forested wetland with 3% upland inclusions).

After reviewing the September 2004 Wetland Technical Report (WTR), the Corps still requires all original field data sheets with any field-drawn maps. It is unclear whether the legend on the wetland maps in the WTR (figures 3 through 34) are intended to show the actual field "plot ID" points. If this is not the case, the Corps requires such maps that clearly show the plot ID locations. We also still need to review the original functional assessment data sheets. High quality photocopies, copied to actual size, may be substituted for original data sheets.

Wetland Functions: Section 3.3.1.3 of the PSDEIS should explain why forested wetlands have only moderate to low wildlife habitat function. This is despite the section stating that these wetlands "provide forage and cover for several species"; please identify which species.

Wetland Classification Maps: A wetland map showing the Skagway area from the north end of figure 3-18 north to the end of the project needs to be included. Close-up conceptual drawings of the proposed ferry terminals should also be included in this section of the PSDEIS.

Marine Habitat: Section 4.3.14 states that the project would involve rock sidecasting of "4.4 million cubic yards in Taiya Inlet and 2 million cubic yards in Lynn Canal." The Corps needs additional detailed description regarding the expected coverage area and depth of rock in these marine areas and the area of marine habitat that would be converted to fast land and expected elevations. This section (page 4-62) also states, "Shallow subtidal areas may have sparse to dense (=25 percent) vegetative cover…" The Corps requires an accurate description of all vegetation at disposal sites so an accurate impact analysis can be completed. Please determine whether 4.3 or 4.5 acres of tidal habitat would be filled for the Katzehin terminal, as both are stated on page 4-62. The Corps also needs accurate figures on the amount of intertidal habitat (between mean high water and high tide line elevations) and subtidal habitat (below mean high water level) that would be impacted by the project and ferry terminals. Finally, please describe the methods considered for compensatory mitigation of the marine habitat impacts, as you reference at the end of this section on page 4-65.

Cumulative Impacts: A more thorough detailed description needs to be provided on the past environmental impacts (wetland and marine impacts) from the existing infrastructure (i.e. ferry terminals) for the three cities involved in the project.

Wetland Mitigation: We have attached a list of typical conditions that we typically require to avoid and minimize wetland impacts (Attachment B). The Corps needs to know if fill slopes in wetland areas could be constructed to a 3:1 (horizontal: vertical) or steeper slope to further minimize wetland impacts. If safety is a limiting factor in such design, then could the use of guardrails satisfy this concern. The Corps strongly recommends against constructing drainage ditches in wetlands, as sections 4.3.13 and 4.6.13 describe. Such ditches would likely result in greater wetland impacts by draining them and result in greater impacts to water quality of downstream receiving waters by diverting sediments and pollutants into them. If such ditches are proposed in the DA application then we require a thorough explanation of why such ditches are needed and an explanation on why other alternatives, such as providing an adequate number of culverts to provide adequate cross drainage, is not feasible. We also require an accurate accounting of any wetland drainage impacts from ditches, including surface drainage and subsurface drainage using an acceptable drainage equation.

Section 5.7 of the PSDEIS states, "Mitigation for impacts to wetlands would include funding for bear and moose population monitoring studies…" We believe more appropriate wetland compensatory mitigation measures are described in the attached (Attachment C) Regulatory Guidance Letter (RGL 02-2). Please note, "the Corps requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities." Preference is given towards the restoration of previously impacted aquatic resources. Hence, the feasibility of restoring the existing ferry terminal in Skagway needs to be examined, as that terminal would appear to be no longer needed if the Katzehin terminal is constructed. Wetlands could also be created by incorporating wetland design criteria (e.g. 8:1 or flatter sideslopes, meandered shoreline, topdressing with organic material, etc.) in the construction of any borrow pits, which must be located in upland areas only. Please note that preservation is also listed as an acceptable form of compensation when restoration or creation is not feasible or does not provide sufficient compensation. However, the Corps typically requires a higher ratio of compensation for preservation, such as 8:1 (8 acres of mitigation for each acre of impact) and only for wetlands that could be severely degraded without Corps permits (i.e. forested wetlands that could be clearcut). The Corps also has covenants that would be required for such sites to ensure they stay in a wetland condition in perpetuity.

Project Plans: Finally, the Corps permit application will also require accurate project plans for any build alternative. The plans shall show the accurate wetland boundary and the impact area and state whether it was field verified. Also, all borrow pits and other sources of fill material shall be identified on the plans (if in the project area). The plans shall be on 8.5 by 11 inch paper and in a format so they can be readily copied for our required public notice. The plans must be accompanied with a summary impact table that identifies each wetland basin or water area to be impacted and states the precise length (in feet) of the crossing and the impact area (in square feet) and other relevant information.

We appreciate the opportunity to comment on the PSDEIS, 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

United States Department of the Interior

NATIONAL PARK SERVICE
Alaska Region
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

IN REPLY REFER TO:

H4217 (KLGO)

SEP 2 0 2004

Mr. Rueben Yost
Special Projects Manager
Alaska Department of Transportation and Public Facilities
Southeast Region Preconstruction - Special Projects
6860 Glacier Highway
Juneau, Alaska 99801-7999

ALASKA DOT & PF
SEP 23 2004
SPECIAL PROJECTS

Dear Mr. Yost:

Thank you for the opportunity to comment on the draft Alaska Department of Transportation and Public Facilities (DOT&PF) letter and associated materials prepared for the State Historic Preservation Officer (SHPO) with regards to the Juneau Access Improvements Project #71100.

Per our meeting of September 9, 2004, this letter will provide our comments regarding eligibility of sites which were located during the 2003 archaeological investigations. Our comments regarding potential effects will be addressed in a separate letter.

We commend you for your concern for the proper identification of significant cultural resources located in the proposed routes of the highway project. We are pleased to note that the information provided by Northern Land Use Research, Inc. and Cultural Resources Consultants is of high professional quality.

As you can see in more detail in the enclosed comments, the NPS agrees with the DOT&PF determinations of eligibility for sites in the area of potential effects within and surrounding the Skagway Historic District and White Pass National Historic Landmark and Klondike Gold Rush National Historical Park.

Please do not hesitate to contact me to discuss this project or our comments in more detail. We look forward to continuing to work with you on this important project.

Sincerely,

for Marcia Blaszak
Regional Director

cc: Ted Birkedal, Team Manager, Cultural Resources Team\
Theresa Thibault, KLGO Acting Superintendent
Judith Bittner, SHPO

CULTURAL RESOURCE DOCUMENTATION AND FINDINGS ATTENDANT TO THE PROPOSED ALASKA DEPARTMENT OF TRANSPORTATION'S JUNEAU ACCESS IMPROVEMENTS (PROJECT NO. 71100)

Reviewers Include:
Susan Bender, National Register Programs Archeologist
Janet Clemens, National Register Programs Historian
Grant Crosby, Historical Architect
Bonnie Houston, Architectural Historian
Frank Norris, Research Historian
Ted Birkedal, Team Manager, Cultural Resources Team, Alaska Support Office
Theresa Thibault, Chief of Resource, Klondike Gold Rush National Historical Park
Karl Gurcke, Historian, Klondike Gold Rush National Historical Park

Items Submitted for Review:
The Alaska Department of Transportation (ADOT) included the following items for review and comment:

1. Letter on Section 106 Consultation for the Juneau Access Improvements (Project No. 71100) to the Regional Director, Alaska Region, National Park Service.

2. Draft letter to the State Historic Preservation Officer that identifies cultural resources located in the Area of Effect (APE) of the Juneau Access Improvements (Project No. 71100), evaluates the significance of these cultural resources, and assesses the potential effects that the project alternatives may have on important cultural resources (Appended to this draft letter are an color aerial photograph of the project route in to Skagway, Alaska and nine color photographs showing computer projections of potential project effects on the and streetscape of Skagway and its surrounding landscape).

3. "Juneau Access Road 2003 Cultural Resource Studies: West Lynn Canal Alternative Update and Skagway Approach Survey Results" (March 2004) by Northern Land Use Research, Inc.

4. "Cultural Resources and the Juneau Access Project: Summary and Compilation of Data" (June 2004) by Cultural Resources Consultants.

Comments
Because we understand that the US Forest Service also has been asked to comment on the draft letter to the SHPO's office, our comments will address only areas within, and immediately adjacent to, the Skagway Historic District and White Pass Historic National Historic Landmark (hereafter referred to as the NHL), and the Skagway Unit of the Klondike Gold Rush National Historical Park (hereafter referred to as KLGO).

Two issues are identified in the letter which we have been asked to comment on. The first is whether the identified properties in the potential area of potential effects (APE) are eligible for the National Register of Historic Places (NRHP), and the second is whether the project will adversely affect those historic properties within the project area that are considered eligible or are already listed on the NRHP. This comment will only address the issue of eligibility. A separate comment will be prepared for determination of effects.

Eligibility

The following properties have been identified and determined as ineligible by FWHA (Alaska Division of Federal Highways Administration) for the NRHP during the scope of this work: SKG-196 Lower Dewey Lake Cabin, SKG-207 Sturgill's Landing Trail, SKG-208 Icy Lake/Reid Falls Trail (recent).

The National Park Service agrees, based on the material provided, that these properties are *not eligible* for the NRHP.

The following properties have been identified and determined as eligible by FWHA for the NRHP during the scope of this work, and lie within the APE: 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.

We believe, based on the materials provided, that the subject properties identified as *eligible* for inclusion in the NRHP are well documented and meet the eligibility requirements. The National Park Service has no objection to the eligibility determinations as stated.

The following properties already have been determined eligible and been placed on the National Register of Historic places (NRHP) and are within the potential APE: SKG-013 Skagway Historic District and White Pass National Historic Landmark, SKG-106 Skagway and White Pass Railroad, SKG-086 Klondike Gold Rush National Historical Park.

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

September 29, 2004

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. Determinations of Eligibility, pursuant to 6 CFR 800.4(c) and 800.5(d)(1)

Dear Ms. Bittner:

The Alaska Department of Transportation and Public Facilities (AKDOT&PF), in cooperation with the Alaska Division of the Federal Highway Administration (FHWA), is proposing to improve surface transportation to and from Juneau within the Lynn Canal corridor. The AKDOT&PF, with consultant assistance, is preparing an Environmental Impact Statement (EIS) for FHWA.

Project Alternatives

There are ten project alternatives. Alternative 1 is No Action. Alternative 2 (East Lynn Canal Highway with Katzehin Terminal) would construct the East Lynn Canal Highway from Echo Cove to Skagway, with a shuttle ferry from the Katzehin Delta to Haines. Alternative 2A (East Lynn Canal Highway with Berners Bay Shuttle) is the same as Alternative 2, with the exception that shuttle ferries would cross Berners Bay from Sawmill Cove to Slate Cove. Alternative 2B (East Lynn Canal Highway to Katzehin with shuttles to Haines and Skagway) would construct the East Lynn Canal Highway from Echo Cove to the Katzehin delta, with shuttle ferries providing service to both Haines and Skagway. Alternative 2C (East Lynn Canal Highway with shuttle to Haines from Skagway) would construct the East Lynn Canal Highway from Echo Cove to Skagway, with shuttle ferry service from Haines to Skagway.

Alternative 3 (West Lynn Canal Highway) would extend Glacier Highway to Sawmill Cove, which would be connected by shuttle ferry service to William Henry Bay. A highway would be constructed from William Henry Bay to Haines via Pyramid Island. Alternatives 4A through 4D would provide additional ferry service in Lynn Canal. Two of these alternatives, 4B and 4D, would include a five-mile long extension of Glacier Highway and a ferry terminal at Sawmill Cove in Berners Bay.

Methods

The Area of Potential Effect (APE) for this project is a 100-meter wide corridor that includes the actual footprint of each highway alternative and approximately 35 meter-wide buffer zones to either side. The APE also includes potential ferry terminals. The likely presence of historic properties within the APE for each alternative has been 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, the U.S. Forest Service (USFS), and National Park Service (NPS). A report, *Cultural Resources and the Juneau Access Project, Summary and Compilation of Data,* that summarizes the archeological literature review and all of the field investigations within the APE is enclosed with this letter.

A literature review completed in 1994 as part of the initial scoping process for the EIS 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 the proposed project. Therefore, archeological inventories were undertaken in 1994 to confirm the existence of reported sites, locate previously undiscovered sites, and evaluate the significance of these properties. Subsequent consultations between your office and the AKDOT&PF led to determinations that thirteen historic properties within the general project area were eligible for the National Register of Historic Places (National Register).

The current alternative highway alignments are much the same as surveyed in 1994, although there are some differences in the routes. Additional archeological fieldwork was done during the fall of 2003 to more accurately locate previously discovered sites in relation to the new alignments. Also in 2003, archeologists examined a ferry terminal location in William Henry Bay and a new route into Skagway. In 2004, at the request of your office, a field crew surveyed two short realigned segments of the East Lynn Canal route in the vicinity of Berners Bay.

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.

Historic Properties Outside the Area of Potential Affect

Of the thirteen historic properties identified in the 1994, eleven have been totally avoided and are now outside the APE. These eleven historic properties are:

JNU-673 Sawmill Creek Shell Midden
JUN-674 Sawmill Creek Cabin

JUN-675 Sawmill Creek Sawmill
JUN-676 Sawmill Creek Shipway
JUN-062 Berners Bay Village & Petroglyph Site
SKG-138 Dayebas Creek Cache Pit
SKG-141 Lower Dewy Lake Creek Sawmill
JUN-670 William Henry Bay Petroglyph
JUN-671 Charles Ward Cabin
SKG-136 Pyramid Island Shell Midden
SKG-1378 Pyramid Island Shell Midden

The two eligible properties identified in 1994 that remain in the APE, SKG-139 and SKG 013, are discussed below.

Previous Determinations of Eligibility

There are seven historic properties in the current APE that have previously been determined eligible for the National Register:

JUN-928 Berners Bay Historic Mining District was found 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 the following 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.

Note: The USFS determinations for these districts did not delineate boundaries, in part because additional contributing elements may be identified in areas outside the APEs of current projects. The FHWA has drawn preliminary boundaries based on known contributing elements. These boundaries may change in the future, but any changes would be outside the Juneau Access project APE. See enclosed 2004 letter from Cultural Resource Consultants.

SKG-139 Dayebas Creek Sawmill is the site of a turn-of-the century sawmill. Material remains include a pelton wheel, riveted metal water pipe, numerous 12x12 milled wooden beams, and a penstock stretching upstream, presumably the source of hydropower for the mill. A shipway of cleared rock and vertical pilings are on the beach. The site was found eligible under criterion (d) for its potential to yield information on the character and development of the area's sawmills.

SKG-013 Skagway & White Pass District is a National Historic Landmark (NHL) listed in 1962.

FHWA Determination of Eligibility

One historic district and two additional historic properties within the APE identified in 2003 and 2004 are determined eligible for the National Register by the FHWA. These historic properties are:

SKG-189 Contributing elements of the Skagway Hydroelectric Complex District include the Lower Dewey Lake Dam (SKG-190) at the southern end of the lake, the Reservoir and Dam (SKG-191), Pipelines (SKG-192), Power Plant (SKG-193), a Tramway (SKG-194) northwest of the northern end of the lake, and a Hoist Building (SKG-198). The district is eligible for the National Register under criterion (a) because of the significant public service it provided to the residents and town of Skagway from its early beginnings through the historic period.

SKG-203 The Lower Dewey Lake Trail, from the trailhead to the junction where it splits into three other trails, is a historic route. The trail is visible in a 1903 photo of Skagway and historic rockwork supports some of the switchbacks. The portion of the trail from the trailhead to the junction is eligible for the National Register under criterion (a) as an important part of the non-motorized transportation routes used in the early settlement.

SKG-052 The late nineteenth-early twentieth century Dalton Trail is eligible for the National Register under criteria (a) and (b) because of its association with a number of historical events and its association with its namesake, builder, and chief promoter, Jack Dalton. Dalton used an old Chilkat route to reach the Interior of the Yukon to serve the gold rush communities. The consultant proposed that the trail was 100 feet wide and 4 miles long, about 50 acres in size, wider than a modern two-lane roadway with shoulders and clear zone. The FHWA finds that visible evidence of the trail is ¼ mile long across Green Point, with 20 feet width adequately covering the trail and providing a considerable buffer (.6 acres). The active tidelands and mud flats have lost any cultural evidence of a trail and therefore have no integrity. To include them in a determination is neither prudent nor justified. Only the visible portion within the APE is included by FHWA.

There are now a total of 10 historic properties (7 previously determined eligible, and 3 determined eligible in this letter) in the APE. Formal evaluations of eligibility for the Skagway Hydroelectric District Complex, the Dalton Trail, and the Lower Dewey Lake Trail, including locations and boundary descriptions, are attached.

Recent Consultation

In August 2004, the FHWA sent formal consultation letters to the USFS, the NPS and the tribal entities listed above. These letters explained FHWA's determinations of eligibility and effect. Copies of our letters and responses from the USFS and NPS are enclosed. No responses were received from tribal entities. Consultation is continuing with the NPS regarding potential effect to the Skagway and White Pass District NHL.

Conclusions

Based on the foregoing, the FHWA has determined that SKG-189 Skagway Hydroelectric Complex District, SKG-203 Lower Dewey Lake Trail, and SKG-052 Dalton Trail are eligible for the National Register. Conversely, SKG-196 cabin near Lower Dewey Lake Creek, SKG-207 Sturgill's Landing Trail, SKG-208 Icy Lake/Reid Falls Trail, and JUN-993 CMTs are not eligible for the National Register. Attached is a summary table of the information above, including historic properties and eligibility determination. Your concurrence is requested. Please direct your response or comments to Tim Haugh at the address above, by telephone at 907-586-7430, or by e-mail at tim.haugh@fhwa.dot.gov.

Sincerely,

Tim A. Haugh
Environmental and Right of Way Programs
Manager

Enclosures:

Cultural Resources and the Juneau Access Project, Summary and Compilation of Data. Cultural Resource Consultants. June 2004.

Juneau Access Road 2003 Cultural Resource Studies: West Lynn Canal Alternative Update and Skagway Approach Survey Results, including Evaluation of Eligibility for Dalton Trail (SKG-052), Skagway Hydroelectric Complex District (SKG-189), Lower Dewey Lake Trail (SKG-203). Catherine M. Williams, Peter M. Bowers, and Lisa J. Slayton. Northern Land Use Research, Inc., Fairbanks. 2004.

June 28, 2004 letter to Reuben Yost regarding boundaries of the Berners Bay Historic Mining District, from Mike Yarborough, Cultural Resource Consultants

August 9, 2004 letters to Tribal Entities, from David Miller, FHWA

August 11, 2004 letter to Myra Gilliam, USFS, from Reuben Yost, AKDOT&PF

August 11, 2004 letter to Marcia Blaszek, NPS, from Reuben Yost, AKDOT&PF

September 9, 2004 email to Reuben Yost, AKDOT&PF from Myra Gilliam, USFS (includes September 15, 2004 response from Rueben Yost to Myra Gilliam)

September 20, 2004 letter to Reuben Yost, AKDOT&PF, from Marcia Blaszek, NPS

cc w/o enclosures:
Reuben Yost, AKDOT&PF Southeast Region, Project Manager

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION
OFFICE OF HISTORY AND ARCHAEOLOGY

550 W. 7th Ave., SUITE 1310
ANCHORAGE, ALASKA 99501-3565
PHONE: (907) 269-8721
FAX: (907) 269-8908

ALASKA DOT & PF
OCT 27 2004
SPECIAL PROJECTS

October 19, 2004

File No.: 3130-1R FHWA
3130-2R DOT
3330-6 SKG-52, SKG-189 to SKG-194, SKG-198, SKG-203,
3330-6N JUN-993, SKG-196, SKG-207, SKG-208

SUBJECT: Juneau Access Improvements Project, Southeast Alaska
Project No. 71100

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 10/1/2004) regarding the referenced project for conflicts with cultural resources under Section 106 of the National Historic Preservation Act. Your correspondence included the following documents:

- *Cultural Resources and the Juneau Access Project: Summary and Compilation of Data* (June 2004) by Cultural Resources Consultants.
- *Preliminary Boundaries for the Berners Basy Historic Mining District (JUN-22)* (June 2004) by Cultural Resources Consultants.
- *Juneau Access Road 2003 Cultural Resource Studies: West Lynn Canal Alternative Update and Skagway Approach Survey Results* (March 2004) by Northern Land Use Research, Inc.
- Email and letter correspondence between FHWA, DOT & PF, National Park Service, US Forest Service and Tribal Entities

We concur with FHWA's finding that the following sites **are eligible** for the National Register of Historic Places:

- SKG-52 (Dalton Trail)
- SKG-189 (Skagway Hydroelectric Complex District)
- SKG-190 (Lower Dewey Lake Dam; part of SKG-189)

(continued on next page)

- SKG-191 (Reservoir and Dam; part of SKG-189)
- SKG-192 (Pipelines; part of SKG-189)
- SKG-193 (Power Plant; part of SKG-189)
- SKG-194 (Tramway; part of SKG-189)
- SKG-198 (Hoist Building; part of SKG-189)
- SKG-203 (Lower Dewey Lake Trail)

We concur with FHWA's finding that the following sites **are not eligible** for the National Register of Historic Places:

- JUN-993 (Lace River CMTs)
- SKG-196 (Cabin near Lower Dewey Lake Creek)
- SKG-207 (Sturgill's Landing Trail)
- SKG-208 (Icy Lake/Reid Falls Trail)

Although we concur with all of FHWA's findings regarding eligibility, we do not concur that the boundaries of the Dalton Trail (SKG-52) should be reduced to 20 feet in width. It is the nature of trails to become "braided", especially across level terrain as travelers attempt to avoid eroded or muddy patches. In order to encompass the variations in trail alignment over time, we recommend a 100 foot width as suggested by your consultant.

We look 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: Van Sundberg, Environmental Coordinator, AKDOT, Southeast Region, 6860 Glacier Highway, Juneau, AK 99801-7999

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
OCT 21 2004
SPECIAL PROJECTS

October 21, 2004

REFER TO
HDA-AK
File #: MGS-STP 000S(131)/71100

Ms. Marcia Blaszak
Regional Director, Alaska
National Park Service
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

SUBJECT: Juneau Access Improvements Project

Dear Ms. Blaszak:

I would like to thank you for your quick response to our request for a meeting to discuss the Skagway & White Pass District National Historic Landmark (NHL) in regard to the Juneau Access Improvements Project Supplemental Draft Environmental Impact Statement (SDEIS). Also, thank you for your staff's time on October 20th.

At the October 20th meeting between Federal Highway Administration (FHWA), the National Park Service (NPS), and the Alaska Department of Transportation and Public Facilities (AKDOT&PF), we discussed the relationship of Section 4(f) of the Department of Transportation Act [Section 4(f)] and Section 106 of the National Historic Preservation Act (Section 106) in regard to the NHL. The consensus of the participants was that the FHWA should prepare a separate letter posing the specific point FHWA would like the NPS to address relative to Section 4(f).

As you are aware Section 4(f) applies to U. S. Department of Transportation (USDOT) agencies and provides protection to significant publicly owned park, recreation, and waterfowl and wildlife refuge lands, as well as land from a significant historic site. 49 USC 303 states:

> (c) The Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if –
>
> (1) there is no prudent and feasible alternative to using that land; and
>
> (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

As a separate action from Section 106, the FHWA must determine the applicability of Section 4(f) to potential 4(f) resources. Based on case law, the FHWA has developed policy to address the complex application of the statute. With regard to the development of transportation projects within the boundaries of historic districts, the policy states that "Normally, Section 4(f) does not apply where a property is not individually historic, is not an integral part of the historic district in which it is located, and does not contribute to the factors which make the district historic." [1]

Based on the results of historic surveys and informal coordination between AKDOT&PF and NPS staff, the FHWA made the preliminary determination that Alternatives 2, 2A, and 2C would not take land within the NHL that was individually historic, not take land from an integral part of the NHL, or take land that contributes to the factors that make the NHL historic. We noted that while a portion of each of these alternatives traverse land with the NHL boundary, all identified contributing sites would be avoided and only undeveloped land would be taken.

However, at a meeting and teleconference of NPS, AKDOT&PF, and FHWA on September 9, 2004 to discuss potential adverse effects to the NHL, NPS regional staff asked how the FHWA planned to address Section 4(f) with regard to the NHL. The FHWA staff replied that based on the studies to date, FHWA Section 4(f) policy, and the understanding that no land from a contributing element would be taken, that FHWA did not believe that Section 4(f) applied. The NPS questioned this statement, based on the 1999 NHL nomination which includes a boundary justification that states "The boundaries were chosen so as to incorporate the area's major gold rush-era historic resources; in addition, *sufficient natural areas have been included so as to provide an understanding of the physical setting and cultural landscape that defined the historic corridor through the Skagway River Valley*." (emphasis added). Some of the NPS staff indicated that this statement makes all of natural areas within the boundary contributing property.

This raised a new concept and concern. No previous coordination with the NPS regarding this project during review of the 1997 DEIS or during the 2003 SDEIS scoping period raised this issue. In addition, this position was not taken during the review of other recent USDOT projects within the NHL boundary such as the airport expansion and the Skagway River pedestrian bridge projects. In all previous coordination, contributing property has been defined based upon the contributing sites listed in the nomination or potential undiscovered historic sites. During the development of a recent FHWA project on Unalaska Island, the DOT&PF proposed three alternatives to the replacement of the South Channel Bridge. All of the alternatives would have required the acquisition of land from within the boundary of the Dutch Harbor Naval Operating/Ft. Mears National Historic Landmark. The FHWA determined that the project would not take any land that contributed to the landmark – and thus, not result in a Section 4(f) use. After review of the project documentation, the NPS specifically found that the proposal did "not affect any contributing resources" to the landmark, despite the taking of land from a undeveloped natural area.

As indicated in the October 20th meeting, the FHWA is about to release the SDEIS for the project. While we recognize that the issue of potential adverse effect under Section 106 can be addressed after release of the SDEIS, the FHWA needs to resolve the question of the applicability of Section 4(f) prior to that release. If Section 4(f) applies to the natural areas

---

[1] Section 4(f) Policy Paper. September 24, 1987, revised June 7, 1989.
http://environment.fhwa.dot.gov/projdev/4fpolicy.htm

within the NHL boundary, there is no way for Alternatives 2, 2A, or 2C to connect to the Klondike Highway without taking Section 4(f) protected land. As noted above, Section 4(f) lands cannot be used if a prudent and feasible avoidance alternative exists. This decision has the potential to remove from consideration any alternative that includes road access into Skagway.

Traditionally, the FHWA weighs heavily the opinions of the agency with jurisdiction over a Section 4(f) resource that may be potentially impacted by our proposals. As such, we request your formal opinion on whether the land within the NHL boundary required for Alternatives 2, 2A, and 2C as shown in the figure (enclosed) attached to the August 11, 2004 letter is individually historic, is an integral part of the historic district in which it is located, or contributes to the factors which make the district historic. Please note that this request for an opinion relates solely to the status of *land*. A determination that Section 4(f) does not apply to the natural areas within the NHL in no way precludes an Adverse Effect determination under Section 106 for indirect effects such as visual or auditory impacts. Section 106 effects would be determined in consultation with the NPS after we provide additional analysis and information.

Thank you for your timely consideration of this request. I would appreciate a reply as soon as possible, since the release of the SDEIS is anticipated shortly.

Sincerely,

David C. Miller

David C. Miller
Division Administrator

Enclosure: Juneau Access: Sturgill's Landing to Skagway, Alternatives 2, 2A & 2C

cc: Mike Barton, Commissioner, AKDOT&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

November 29, 2004

RE: Juneau Access Improvements
Project Number 71100

Mr. Kenneth Vaughan, P. E.
Forest Service Representative
Alaska Region
United States Department of Agriculture
P.O. Box 21628
Juneau AK 99802-1628

Subject: Cooperating Agency preliminary SDEIS review comments

Dear Mr. Vaughan:

Thank you for your review comments on the preliminary Supplemental Draft Environmental Impact Statement (SDEIS) for this project. We appreciate your efforts as a Cooperating Agency. We have made the following changes to the document based upon you comments.

<u>SDEIS Changes</u>:

With regard to potential rights-of-way (ROW) across National Forest System lands, Section 4.1.1, Land Use, has a note that makes clear that the easement acreage shown for ROW on the National Forest is the <u>maximum</u> potentially affected. The note indicates the Alaska Department of Transportation and Public facilities (DOT&PF) desires 300 foot wide ROW on public lands, but the Forest Service (USFS) at this point anticipates ROW based on clearing limits. The note under Tables 4-2 and 4-23 has been revised as well. The issue of ROW width would need to be resolved prior to the Special Use Permit application if the selected alternative requires ROW across USFS lands.

The discussion in Section 4.1.16 (originally on page 4-10) has been amended to make clear that Alternatives 2 through 2C would include no <u>DOT&PF constructed</u> boat launches or structures that enhance boat access. In discussions with the National Marine Fisheries Service (NMFS) we have made clear that this commitment is not made on behalf of the USFS. If Alternative 2, 2A, 2B, or 2C is selected, the revised biological assessment sent to NMFS will make clear that the commitment only applies DOT&PF and the Federal Highway Administration (FHWA).

"Providing for the movement of people and goods and the delivery of state services."

25A-T34LH

Section 4.23.15, Terrestrial Habitat has been amended to address the potential effect of side casting on vegetation. The SDEIS now makes clear that, to minimize impacts to vegetation, side casting would only be allowed in areas where the road slope is adjacent to the shoreline, on steep, minimally vegetated cliffs above water, or at existing rock slide areas.

Currently the "people effects" of the alternatives are addressed in each relevant impact category section, e.g. recreation under Land Use, Noise, Wildlife, Steller Sea Lions, etc. With regard to making maintenance commitments, Section 5.11 of the SDEIS has been amended to clarify DOT&PF's commitment to maintain restrooms in ferry terminals and at a joint visitor rest stop/maintenance facility. DOT&PF also commits to maintaining DOT&PF constructed pullouts, including collection of refuse from containers provided. DOT&PF has agreed to provide composting toilets (termed SSTs by the USFS) at Katzehin under Alternative 2C, and at the Sturgills Landing trailhead for Alternatives 2, 2A, and 2C. DOT&PF has not committed to maintaining these USFS requested toilets.

Wildlife sections of Chapter 4 (Sections 4.3.16.3, 4.4.16.3, and 4.6.16.3) have been amended to include statements regarding the intent to design bridges such that they function as underpasses for wildlife movement. Also, Section 4.3.16.3 now states that if Alternative 2, 2B, or 2C is selected, a wildlife underpass would be constructed over the brown bear migration corridor identified inland between the Lace and Antler rivers. These changes have also been incorporated into Section 5.8, the Wildlife portion of the Proposed Mitigation and Commitments chapter.

Figures 3-6 and 3-7 have been changed to address concern raised by the Juneau Ranger District regarding the confidentiality of historic resource locations. The figures now only show the locations of properties either currently identified on quad maps or visible from public trails.

Other Issues:

I have discussed with FHWA the proposed recreation enhancements in the referenced March 25th letter, in regards to the best way to address your concern. Please note that DOT&PF has committed to providing pullouts at these locations, but has no intention of constructing any trails other than the two short connection trails identified in Section 5.11 the SDEIS. There is no money currently available for Transportation Enhancements, due to the backlog of these projects. DOT&PF does not anticipate funding being available for these trails as part of the project. We have changed Sections 4.3 and 4.4 to include a reference to the March 25th letter and an indication that it appears at the end of Chapter 7. Based on FHWA guidance, these potential trails would only be analyzed in the cumulative impact analysis if they were reasonably foreseeable, i.e. the USFS indicated in a plan or letter that it intended to construct these trails with its own funding.

Incidental recreational use areas would develop on any new highway constructed, however, the location and extent of the use of these areas cannot be accurately predicted. The typical section shown on Figure 2-4 shows that any highway segment would have four foot wide paved shoulders and at least eight feet of traversable unpaved shoulders. This would provide safe parking areas for incidental recreation users in addition to the planned pullouts. Also, as the typical section indicates, in some upland areas the downhill side of roadbed would have wider areas where excess material is placed. DOT&PF maintenance crews would monitor use of the shoulders for incidental recreation use, and DOT&PF would propose construction of additional pullouts on a case by case basis if a safety problem developed over time.

We have obtained an electronic version of the applicable Recreation Opportunity Spectrum mapping from USFS staff and are adapting it for website posting and printing as a figure in the Land Use and Coastal Management Technical Report. This report will be an appendix to the SDEIS.

Regarding facilities for recreation vehicles (RVs), you are correct that effects of a shortage of spaces for RVs will affect the City and Borough of Juneau (CBJ), the Alaska Department of Natural Resources, and the USFS. If a highway alternative is selected, DOT&PF will bring the potential problem to the attention of the CBJ planning staff. The first step in that process is identifying the potential impact in the SDEIS and Final EIS. One favorable aspect of the potential problem is that construction of a highway would take several years, allowing time for planning and implementation of a solution.

In response to your comments on not finding a significant discussion of scoping and the outcome, I point out that DOT&PF prepared a Scoping Summary Report that detailed the issues raised during the April, 2003 scoping period. This document was published in June 2003 and posted on the project website after review by Cooperating Agencies and interested state agencies. In December of 2003 DOT&PF published a Comment Analysis Report (after agency review) that analyzed the substantive comments on the 1997 Draft EIS and the 2003 scoping comments. Both of these reports are referenced in Chapter 7 of the SDEIS, Public and Agency Coordination. A brief summary of 2003 scoping issues is provided in this chapter; for more detailed information the reader can go to the two referenced reports. The SDEIS includes an appendix titled Response to Comments Report, which has a response to each substantive comment received in 1997 on the Draft EIS.

Thanks again for your review.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Tim Haugh, FHWA Realty & Environmental Programs Manager

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

November 29, 2004

RE: Juneau Access Improvements
Project Number 71100

Mr. Bruce Halstead
Field Supervisor
Juneau Fish & Wildlife Field Office
U.S. Department of the Interior
3000 Vintage Blvd., Suite 210
Juneau Alaska 99801-7240

Subject: Cooperating Agency preliminary SDEIS review comments

Dear Mr. Halstead:

Thanks you for your review comments on the preliminary Supplemental Draft Environmental Impact Statement (SDEIS) for this project. The Alaska Department of Transportation and Public Facilites and the Federal Highway Administration appreciate you efforts as a Cooperating Agency. We have made the following changes to the document based on your comments.

Section 3.3.5.1 Species Selected for Analysis, Other Species: This paragraph now contains the following information on Kittlitz's murrelet: "The Kittlitz's murrelet was petitioned for Endangered Species Act (ESA) listing in 2001. The USF&WS designated this species as a candidate species in 2004. (Candidate species are plants and animals for which the USF&WS has sufficient information to propose them as endangered or threatened under the ESA, 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 affect them are not restricted.)" Section 3.2.6 of the Wildlife Technical Report, an appendix of the SDEIS, has also been amended to include this information.

Section 3.3.5.2 Terrestrial Habitat: Following the sentence about Killitz's murrelets nesting at scattered sites located high on recently deglaciated rocky slopes, we have added the sentence "This species forages in glacially-fed waters during the breeding season".

The paragraph on brown and black bears has been amended to include information regarding bear migration to estuarine areas along established corridors and cites the SEWWEAD article (Christensen and Van Dyke, 2004). Also, information has been added to Chapter 4

"Providing for the movement of people and goods and the delivery of state services."

25A-T34LH

regarding brown bear seasonal movement between higher elevation dens and lower foraging habitat, and includes as an example the corridor in Berners Bay in the isthmus between the Lace and Antler rivers. The SEAWEAD article (Christensen and Van Dyke, 2004) is again cited.

The Affected Environment chapter describes the status of the existing environment that could potentially be impacted by project alternatives. As your letter points out, invasive non-native species flourish in disturbed environments. There has been little disturbance of the potentially affected environment to date, and plant surveys indicate that there has been little impact from invasive species.

With regard to the potential impact of invasive species introduction associated with road alternatives, the greatest potential would exist during construction. Much of the invasive plant introduction associated with past road projects stemmed from intentional and/or inadvertent use of seed mixes containing non-native species. Section 4.8.10 (the Construction Impacts section of the Environmental Consequences chapter) has been amended to include specific mention of potential pathways for introduction of invasive plant species.

A listing of potential species that could spread as a result of road construction and/or operation is included in the Overall Habitat Loss section of the Wildlife Technical Report (Section 4.2.1.1). Also, the Mitigation and Commitments chapter of the SDEIS now includes a new section (5.3) that identifies measures to minimize the introduction of invasive plants. Another important measure to reduce the likelihood of non-natives becoming established is to immediately stabilize disturbed areas. SDEIS Section 5.1 includes a commitment to vegetate all exposed soil slopes with indigenous species, with the exception of the use of annual grasses to protect the soil until permanent cover is established.

Section 5.8 Wildlife: The Mitigation and Commitments chapter has been amended to include the following commitment for wildlife. "Bridges across streams would be designed to also function as wildlife underpasses. In addition, if Alternative 2, 2B, or 2C is the selected alternative, a wildlife underpass would be located at the brown bear migration corridor in the isthmus between the Antler and Lace rivers." The bridge design attached to your letter is similar to the bridge design envisioned for combined wildlife corridor/stream and river crossings. For large rivers such as the Lace, Antler and Katzehin on the east or Endicott, Sullivan and Chilkat on the west, piers would be placed every 130 feet. On all bridges abutments would be set back from the banks to provide terrestrial corridors. This would accommodate the streamside corridors identified in the SEAWEAD study.

Thank you again for your review.

Sincerely,

Reuben Yost

Reuben Yost
Special Projects Manager

cc: Tim Haugh, FHWA Realty & Environmental Programs Manager

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

FRANK H. MURKOWSKI, GOVERNOR

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

November 30, 2004

RE: Juneau Access Improvements
Project Number 71100

Jeff Koschak, Project Manager
U.S. Army Engineer District, Alaska
Juneau Regulatory Field Office
8800 Glacier Highway, Suite 106
Juneau, AK 99801-8079

Subject: Cooperating Agency preliminary SDEIS review comments

Dear Mr. Koschak:

Thank you for your review comments on the preliminary Supplemental Draft Environmental Impact Statement (SDEIS). We appreciate your efforts as a Cooperating Agency on this project. The following is our response to your comments.

Terrestrial Habitat: Total wetland impacts are accounted for and described in the SDEIS. The wetland sections of Chapter 4 contain tables (Total Fill in Wetlands and Other Waters of the U.S.) and text which account for the total fill. Muskeg acreage is listed in the wetland tables by its Cowardin classifications of palustrine emergent and palustrine scrub-shrub wetlands.

There is overlap between the Wetlands sections, which deal with Section 10 and Section 404 jurisdictional areas, and the Terrestrial Habitat sections, as well as the Marine and Freshwater Habitat and Species sections. The sections on Terrestrial Habitat use the term "terrestrial" in the lay person sense, that is, pertaining to land as opposed to water. While wetlands are "aquatic sites" according to jurisdiction, they are generally used by terrestrial, not aquatic species. Because most terrestrial species do not use exclusively wetlands or uplands but move freely between the two, it makes sense to discuss all habitat used by terrestrial species in the same section. To further clarify this point, the Acreage of Terrestrial Habitat Impacted tables now have notes that indicate the amount of wetlands included in each Terrestrial Habitat Type. Furthermore, if a build alternative is selected, the Department of the Army (DA) application and draft 404(b)(1) analysis submitted will specifically address only impacts to wetlands and other waters of the U.S.

"Providing for the movement of people and goods and the delivery of state services."

25A-T34LH

Essential Fish Habitat (EFH): As mentioned above, there is overlap between the jurisdictional areas accounted for in the Wetlands sections and other sections. Addressing impacts to EFH is a requirement of the Magnuson-Stevens Fishery Conservation and Management Act. Therefore the SDEIS has sections titled "Marine and Freshwater Habitat Species (Including Essential Fish Habitat)". The bulk of the discussion is in regard to EFH species, but potential impacts to other species (e.g. freshwater resident fish) are included. All of the areas defined as Marine and Freshwater Habitat are also "other waters of the U.S." and would be addressed as such in a DA application. The areas of EFH identified as potentially filled by each alternative match the Marine Areas acreage in the Wetland and Other Waters of the U.S. tables.

If a build alternative is selected, the DA application will include the information you specified, including the high tide line (HTL), mean high water (MHW), and ordinary high water (OHW). HTL and MHW will be established from official benchmarks. For streams, OHW will be established by surveyors using the identification method described in DA regulations. The SDEIS includes a note that the amount of fill below culverts to be placed in non-anadromous streams would be determined during design. This information would be provided in the DA application. No fill would occur in anadromous streams, as all would be bridged. The baseline elevation of "mean lower low water" is 0.0 feet. The 22.5 feet mentioned in Section 3.2.2.4 is extreme high water, and is based on the same datum you referenced.

Alternatives Analysis: The SDEIS identifies the State's preferred alternative, but no final decision has been made. All of the reasonable alternatives are under consideration and all of these alternatives have been developed to a comparable level of detail. The Final EIS will identify the final preferred alternative, and will include a draft 404(b)(1) analysis. The analysis will provide more detail for the areas and issues you identified.

Navigable Waters: With the exception of the Antler, Katzehin, and Chilkat, all of the rivers and streams along the alternative alignments would be crossed above MHW. Bridges at any of these three rivers, as well bridges across rivers considered navigable by the U.S. Coast Guard (e.g. Lace, Sullivan and Endicott) would require Section 9 permits. All of the bridges would be pile supported for their entire length, with abutments above MHT or OHW. Any fill below MHW for highway segments or ferry terminals would be specified in a DA application.

Water Quality: The statement in Section 3.2.2 that in the freshwater environment "water quality in the project area is high" is a quote from the 1997 Draft EIS. It is based on the fact that as stated, streams in the area "originate in undeveloped alpine areas and are clear and low in dissolved solids". Because of the absence of development in the majority of the project area this statement is reasonable, has not been questioned in comments on the 1997 draft, and in fact is stated as a reason for concern about potential impacts to currently pristine water quality. While water quality measurements are often requested on projects where existing water quality has been subject to development impacts, they are not necessary in this case. The potential impacts to water quality are addressed more specifically in Appendix K of the SDEIS, Hydrology and Water Quality Technical Report. The report explains that based on projected traffic volumes and data from other studies, special measures such as sediment ponds would not be necessary.

Wild and Scenic Rivers: The lower two miles of the Katzehin is not within the area recommended by the USFS for Wild and Scenic designation. Section 3.1.1.1 has been corrected to be consistent with Section 3.2.6.

Noise: The Federal Highway Administration Noise Abatement Criteria (NAC) categories are specifically for evaluating areas of human use. Potential noise impacts at the Gran Point haulout and other haulouts are addressed separately in the Steller Sea Lion section under Threatened and Endangered Species. Section 3.2.6 has been modified and now makes clear that the NAC is specific to human use areas.

Bald Eagles: Section 3.3.6 is in the Affected Environment chapter; it does not address impacts. The Bald Eagle sections of the Environmental Consequences chapter all state that the alignments have been located to avoid the direct loss of any known eagle nest tree. No nest tree would be removed under any alternative considered. Section 4.3.12, Wetlands, has been amended to explain that approximately 27 acres of the primarily forested wetlands that would be filled in the Slate Creek to Sherman Point area are the result of an alignment change to avoid the eagle nests in a band of uplands along the shoreline.

Wetlands: Section 3.3.1 explains that the scope of the wetland assessment, including field work locations, was determined by resource agencies, including your agency. It lists the seven areas where individual wetlands that could be impacted were field surveyed. Section 2.3.1 of the Wetlands Technical Report (WTR), explains that these areas were identified at an agency meeting held on May 29, 2003. No criteria were formally established by the agency representatives at this meeting. Any area of concern to an agency was included on the list. The general discussion was about the potential for riparian, wildlife or waterfowl habitat at these locations. WTR Section 2.3.1, as well as SDEIS Section 3.3.1, also explains that we conducted field investigations at wetlands within 300 feet of the alignment that appeared to be part of extensive wetland areas, were potentially high value (habitat), or where aerial photography indicated the NWI mapping could be inaccurate. This was in addition to the site specific fieldwork requested by agencies.

With regard to Figures 3 through 34 in the WTR, the primary function of the red dot in each wetland polygon is to make clear the ID number and Cowardin Classification for the polygon. In some cases this corresponds to the field survey locations, but this is not always the case, as approximately half of the individual wetlands were assessed by NWI and aerial photography. Attachment B-1 and B-2 in the WTR indicates if a wetland was assessed by field survey; the transcribed field data and photos are in Attachment C. Photocopies of all field notes, including data sheets, and maps with actual field assessment locations identified, are being provided to you with this letter.

Section 3.3.1 of the SDEIS has been amended to indicate the number of individual wetlands that were field verified, and the percent acreage this represents. No "checkerboard" upland/wetland complexes were identified during field investigations.

Wetland Functions: The methodology for assessing wildlife habitat function of wetlands, including forested wetlands, is provided in the WTR, which is an appendix of the SDEIS. The criteria for rating wildlife habitat above moderate-low is very specific, and is more detailed than is appropriate to the general reader of the SDEIS. Per your request, this section has been amended to identify the species that use these areas for cover and forage.

Wetland Classification Maps: With the exception of two small wetlands on the Lower Dewey Lake bench, there are no wetlands in the project area north of the Katzehin River. These wetlands are shown on Figure 22 of the WTR. The following note has been added to SDEIS Figure 3-14 (Wetlands Classifications Figure Index): *The only wetlands in the vicinity of the project alternatives north of Figure 3-18 are two small wetlands on the Dewey Lake bench. Project alternatives would not encroach on these wetlands.*

Chapter 3 of the SDEIS is the Affected Environment. Proposed highway alignments and ferry terminals are only shown for reference. The impacts of the alternatives, including ferry terminals, are in the Environmental Consequences chapter. The actual alignment of highway segments and conceptual layout of proposed ferries are included in SDEIS Appendix D, the Technical Alignment Report (TAR).

Marine Habitat: The specific information you have requested will be included in the DA application for the selected alternative. Section 4.3.13 has been revised to correct the error (4.5 acres) in the fill for the Katzehin ferry terminal under Alternative 2A. The correct amount is 4.3 acres. Section 4.3.13 has also been amended to include more information on the vegetation at potential side casting locations. Please note that no fast land would be created by side casting. Side casting would only be proposed at locations with steep slopes; many are essentially underwater cliffs. Locations where intertidal or subtidal fill would be used for highway or ferry terminal construction are included in the appropriate fill tables. Also note that in the document "intertidal" refers to the area between the high tide line and the lowest tide (approximately elevation -4). "Subtidal" refers to the continually submerged surface below the intertidal area. The amount of fill or dredge below mean high water (Section 10) and below the high tide line (Section 404) will be identified as such in the DA application.

Chapter 5 of the SDEIS provides further information on compensatory mitigation for impacts to marine habitat. Because investigations to date have not identified marine habitat restoration or creation opportunities in the project area, DOT&PF has preliminarily proposed the use of fee in lieu compensation. Resource agencies have indicated that they are interested in having some funding go to studies that would facilitate their management of resources. Based on this, Chapter 5 contains the commitment to providing funding for a combination of research and fee in lieu payments.

Cumulative Impacts: Cumulative impacts evaluation in the SDEIS involves analysis of the impacts of the proposed alternatives together with impacts from past, present, and reasonably foreseeable future actions. In areas where the proposed alternatives would have no impact, no cumulative analysis is warranted. None of the project alternatives would fill or dredge in the marine environment in the vicinity of the Haines or Skagway ferry terminals, therefore no cumulative impact analysis has been prepared for those areas. Alternatives 4A through 4D would have impacts in the vicinity of the Auke Bay terminal. Section 4.9.2.10 of the SDEIS has been amended to include cumulative impacts to Auke Bay.

Wetland Mitigation: Chapter 5 contains a list of DOT&PF commitments and mitigation measures with regards to wetlands. Embankment heights and side slopes would be minimized; the typical section is based on 1.5:1 fill slopes in wetland areas (SDEIS Figure 2-4). Please note drainage ditches would not be excavated in wetland fill areas. In relatively flat areas, as is the case in many wetlands, both side slopes are fill slopes and no ditches are necessary (see Figure 3-3 in Appendix D, TAR). A drainage ditch would only be used in wetland areas where there would be a cut slope; this ditch would be created by the combination of the cut back slope and the placed road embankment. This is necessary to prevent water from running on to the road. Please note that SDEIS Figure 2-4 indicates the steepest possible back slope would be used (0.5:1 in peat) to minimize wetland disturbance. The Wetland sections of Chapter 4 of the SDEIS have been amended to remove the reference to roadside ditches.

Thank you for your reference to the Regulatory Guidance Letter. We are aware that restoration of previously impacted aquatic resources would be the most appropriate compensatory mitigation. However, with the exception of Auke Bay for Alternatives 4A-D, potential impacts would be in areas with little or no previous impacts, and abundant wetlands. Based on the absence of identified on-site mitigation opportunities and input from resource agencies, we have proposed a combination of population monitoring studies and fee in lieu payments. If feasible restoration opportunities are identified, we will investigate them.

Restoring the Skagway ferry terminal is not a feasible restoration option. All alternatives under consideration would utilize this terminal. Alternatives 1, 2B, 2C, 3, and 4A-D all would have scheduled service to this terminal. Under Alternatives 2 and 2A, DOT&PF would retain access to the terminal for use by the Haines/Katzehin shuttle during periods of bad weather at the Katzehin terminal, or periods of highway closure for avalanche control. (The TAR explains in greater detail the situation regarding the weather exposure at Katzehin and the expense and impacts of providing an all-weather moorage.) Also, it is important to note that the in-water elements of the Skagway terminal are jointly owned by DOT&PF and the City of Skagway. Given the limited dock space in Skagway harbor, it reasonable to assume that the City would continue to need this facility in the future regardless of DOT&PF use.

Project Plans: After review of comments submitted during the SDEIS comment period, a final preferred alternative will be determined. If a build alternative is selected, standard DA application drawings will be prepared for all jurisdictional areas. A draft DA application would be included in the final EIS.

Thank you for your comments. We are finalizing changes to the SDEIS and anticipate FHWA will release the document to the public in December.

Sincerely,

Reuben Yost

Reuben Yost
Project Manager

United States Department of the Interior

NATIONAL PARK SERVICE
Alaska Regional Office
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

ALASKA DOT&PF
DEC - 9 2004
SPECIAL PROJECTS

IN REPLY REFER TO:

H30(AKRO-RD)

DEC 3 2004

Mr. David C. Miller
Division Administrator
U.S. Department of Transportation
Federal Highways Administration
Alaska Division
709 West Ninth Street, Room 851
P.O. Box 21648
Juneau, Alaska 99802

Dear Mr. Miller:

With regard to your October 21, 2004, letter and our subsequent conversations, the National Park Service (NPS) reiterates that the 1999 Skagway and White Pass District National Historic Landmark nomination language is the basis for its eligibility for the National Register of Historic Places and is specifically important for determinations of effect under Section 106 of the National Historic Preservation Act. The determination of the applicability of Section 4(f) of the U.S. Department of Transportation Act is not the responsibility of the NPS.

Sincerely,

Marcia Blaszak

Marcia Blaszak
Regional Director

cc:
Commissioner, State of Alaska, DOT&PF
Regional Director, State of Alaska, DOT&PF, Southeast Region
✓ Rueben Yost, Special Projects Manager, State of Alaska, DOT&PF

United States Department of the Interior

NATIONAL PARK SERVICE
Alaska Regional Office
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501

ALASKA DOT & PF
DEC 10 2004
SPECIAL PROJECTS

IN REPLY REFER TO:
H34(AKRO-RCR)

DEC 6 2004

Mr. Rueben Yost
Special Projects Manager
Alaska Dept. of Transportation and Public Facilities
Southeast Region Preconstruction - Special Projects
6860 Glacier Highway
Juneau, Alaska 99801-7999

Dear Mr. Yost:

Thank you for the opportunity to comment on the draft Alaska Department of Transportation and Public Facilities (DOT&PF) letter and associated materials prepared for the State Historic Preservation Officer (SHPO) with regards to the Juneau Access Improvements Project #71100. Per our meeting of September 9, 2004, we have provided our opinions on your determinations of eligibility for the National Register of Historic Places (NRHP) in a separate letter.

As presently proposed, the Juneau Access Improvements Project would enter the boundaries of the Skagway & White Pass District National Historic 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 regulations that guide this special compliance process that is reserved for NHLs, 36 CFR 800.10 (c), require that Federal agencies "notify the Secretary [of the Interior] of any consultation involving a National Historic Landmark and invite the Secretary to participate in the consultation where there may be an adverse effect." The NPS, as the Secretary's staff, serves as a consulting party throughout the Section 106 process to ensure that the values associated with the NHL are given appropriate weight and consideration. Section 110(f) of the National Historic Preservation Act "requires that the agency official, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking [36 CFR 800.10(a)]." Moreover, the lead agency official should also afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking [as per 36 CFR 800.10 (a) thru 36 CFR 800.10 (d)].

This letter specifically focuses on the potential impacts of the proposed project on National Register properties associated with the Skagway & White Pass District NHL and the Klondike Gold Rush National Historical Park (KLGO). Because the Skagway Unit of KLGO is completely subsumed within the NHL, most of our attention is centered on the NHL, except where we raise specific points relating to indirect impacts to KLGO. This letter also takes into account and addresses additional concerns that have been raised in subsequent meetings with DOT and FHWA on the subject of the project (Please see the attached pages for our specific and detailed comments on the Juneau Access Improvements Project).

Your letter of August 11, 2004, states that " FHWA does not believe the effect on the park and landmark would be adverse. With the information that has been presented to us to date, we find it difficult to concur with that initial finding by FHWA. In order to appropriately review the proposed project plans in accordance with Section 106 of the National Historic Preservation Act of 1966 and 36 CFR 800(c), we will need the following additional information before we can fully assess potential project impacts:

- A map illustrating proposed routes in relation to the historic sites, both in and out of the Area of Potential Effect (APE) associated with the landmark. The map (Figure 1. Location Map) in the NLUR March 2004 report does not show all the components of SKG-189, the Skagway Hydroelectric Complex Historic District. Either update Figure 1 to show the other components of SKG-189, or update Figure 2 of the same report to show the proposed route of the road. It would also be helpful if both maps showed the NHL boundary.

- Updated digitally enhanced photographs depicting visual impacts using the correct vegetation (deciduous trees vs. evergreen), that demonstrate visual impacts for both summer and winter vegetation. Also provide more views from various locations within the NHL to give a better sense of the visual impacts. The graphics showing the road at its entry into the townsite on 23rd Avenue need to be more explicit. Currently it is difficult to understand what is being depicted.

- More specific information regarding the designs for the various bridges in a way that minimizes the visual impact on the landscape. Although a double arched steel bridge was specifically mentioned for crossing over the Lower Dewey Lake Trail (SKG-203), more detailed specific designs should be provided. No reference was made to the other proposed bridges, nor was any reference made to modifying the design of the road as it enters the townsite at 23rd Avenue. In addition, we would need to see the design options for the road. A copy of the DOT/FHWA analysis of the audible effects of the road within or adjacent to the NHL and KLGO. This information will give the reviewers a better sense of how much more noise is expected to be generated within the APE. This information is necessary for an adequate evaluation of the potential auditory effects.

- Information describing the expected increases in vehicular traffic to Skagway throughout the year and through time. A rise in vehicular traffic is expected to result in increased visitors to the NHL as well as the Skagway and Dyea park units. Additional visitation may have impacts to the park's resources, depending on the level of increase and the park's ability to absorb those increases within its existing carrying capacity.

- Information regarding anticipated future developments along the road corridor. For example, there is no mention made of any potential waysides or other recreational development along the road corridor—are additional features of this type planned as part of the proposed road project? This information is needed to properly evaluate indirect impacts to the historic resources within the NHL.

- Information regarding alternative blasting methods that would mimic the natural slopes and enhance natural revegetation of the area.

We look forward to continued Section 106 consultations with you and your staff to better understand and minimize potential impacts to the NHL and the park.

We welcome this opportunity for ongoing collaboration. Please do not hesitate to contact me to discuss this important project.

Sincerely,

Marcia Blaszak

Marcia Blaszak
Regional Director

Enclosure

cc:
Mr. David C. Miller, Division Administrator, Federal Highways Administration
Mr. Mike Barton, Commssioner, AKDOT&PF
Mr. Pat Tiller, Deputy Associate Director, Cultural Resources, NPS, Washington, DC

NATIONAL PARK SERVICE REVIEW OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES' JUNEAU ACCESS IMPROVEMENTS (PROJECT NO. 71100)

October 29, 2004

Reviewers:

Susan Bender, National Register Programs Archeologist, Alaska Regional Office
Ted Birkedal, Team Manager, Cultural Resources Team, Alaska Regional Office
Janet Clemens, National Register Programs Historian, Alaska Regional Office
Grant Crosby, Historical Architect, Alaska Regional Office
Karl Gurcke, Historian, Klondike Gold Rush National Historical Park
Bonnie Houston, Architectural Historian, Alaska Regional Office
Frank Norris, Research Historian, Alaska Regional Office
Theresa Thibault, Chief of Resources, Klondike Gold Rush National Historical Park

Items Submitted for Review:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) included the following items for review and comment:

1. ADOT&PF letter, dated August 11, 2004, on Section 106 Consultation for the Juneau Access Improvements (Project No. 71100) to the Regional Director, Alaska Region, National Park Service.

2. Draft letter to the State Historic Preservation Officer that identifies cultural resources located in the Area of Potential Effect (APE) of the Juneau Access Improvements (Project No. 71100), evaluates the significance of these cultural resources, and assesses the potential effects that the project alternatives may have on important cultural resources (Appended to this draft letter are a color aerial photograph of the project route in to Skagway, Alaska and nine color photographs showing computer projections of potential project effects on the streetscape of Skagway and its surrounding landscape).

3. "Juneau Access Road 2003 Cultural Resource Studies: West Lynn Canal Alternative Update and Skagway Approach Survey Results" (March 2004) by Northern Land Use Research, Inc.

4. "Cultural Resources and the Juneau Access Project: Summary and Compilation of Data" (June 2004) by Cultural Resources Consultants.

Comments:

Our comments will address only areas within the Skagway & White Pass District National Historic Landmark (hereafter referred to as the NHL) and the Skagway Unit of the Klondike Gold Rush National Historical Park (hereafter referred to as KLGO), as well as Areas of Potential Effects adjacent to the NHL and KLGO.

The proposed road would enter the NHL (SKG-013) at its southern end, would cross between or over (through bridging) several elements of the Skagway Hydroelectric Complex (SKG-189, et al.), cross over (bridging) the Lower Dewey Lake Trail (SKG-203), and would begin its descent into the viewscape of the Skagway townsite along the hillside at approximately 8th Avenue and enter the Skagway townsite at its northeastern end near 23rd Avenue and State Street, adjacent to the White Pass and Yukon Route rail yard.

1

Significance of Natural Areas within the NHL

The improved NHL nomination documentation in 1999 provided several clarifications, including a more accurate definition of its physical boundary and identification of its key elements. While they may appear to be abstract concepts, the National Register criteria of setting, feeling, and association are well-established and well-understood characteristics that contribute to the integrity of historic places. The 1999 nomination specifically includes an explicit boundary justification for the Skagway & White Pass District NHL. This justification clearly states that "sufficient natural areas have been included so as to provide an understanding of the physical setting and cultural landscape that defined the historic corridor through the Skagway River Valley (p. 43)." The creation of the boundary at the top of the slope so that it includes "natural areas" highlights the intent to provide the viewer the physical context of the historic settlement within the natural setting as it was experienced during the gold rush. This visual setting is integral to the significance and integrity of the Landmark.

Today's Skagway & White Pass District NHL retains its historic integrity. This area was listed as an NHL in 1962 because, in a strong visual sense, the town still reflected much of its gold rush-era appearance. In the last 40-plus years, the Skagway community and the NPS have done an excellent job of retaining that appearance. Inasmuch as downtown Skagway is part of the Klondike Gold Rush NHP, and a National Park Service unit is the highest form of protection that Congress can bestow on a historical property, no actions should be proposed that will significantly diminish this area's historic integrity.

The NHL program regulations require that the NPS Regional Office monitor the condition of, and threats to, NHLs.[1] But both the National Park Service and the FHWA have additional responsibilities with regard to NHLs in the context of the Section 106 process. Section 110(f) of the National Historic Preservation Act requires that "Prior to the approval of any Federal undertaking which may directly and adversely affect any National Historic Landmark, the . . . responsible agency shall, to the maximum extent possible undertake such planning and actions as may be necessary to minimize harm to such landmark . . . ." In addition, it is apparent that Federal Highways Administration recognizes the National Park Service's role as the Secretary of the Interior's staff in the fulfillment of the specific segment of the Section 106 consultation process that comes into play when an undertaking may have a potential adverse impact to an NHL. As the regulations that guide this portion of the Section 106 process require, the lead Federal agency "shall notify the Secretary [i.e. National Park Service] of any consultation involving a National Historic Landmark and invite the Secretary [i.e. National Park Service] to participate in any consultation where there may be an adverse effect [36 CFR 800.10(c)]." Furthermore, Section 110(f) of the National Historic Preservation Act "requires that the agency official, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to any National Historic Landmark that may be directly and adversely affected by an undertaking [36 CFR 800.10(a)]." Finally, the lead agency official should also afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking [as per 36 CFR 800.10 (a) thru 36 CFR 800.10 (d)].

The benchmark for judging threats to a NHL is its condition *when it was designated*. The Skagway & White Pass District NHL was designated June 13, 1962. When the National Register of Historic Places (NRHP) was established in 1966, the Landmark was automatically placed on this list. Improved documentation for the NHL was accepted by the Chief of the NHL Survey Program and Keeper of the National Register of Historic Places on April 7, 1999. Therefore, the benchmark date by which we judge the Landmark condition is based on how the Landmark (which retains its integrity from the time period of 1897-1910) looked in 1999.

[1] 36 CFR 65.2 (6) Section 8 of the National Park System General Authorities Act of 1970, as amended (90 Stat. 1940, 16 U.S.C. 1-5), directs the Secretary to prepare an annual report to Congress which identifies all National Historic Landmarks that exhibit known or anticipated damage or threats to the integrity of their resources. ; 36 CFR 65.7 Monitoring National Historic Landmarks, (b) Reports of monitoring activities form the basis for the annual report submitted to Congress by the Secretary of the Interior, as mandated by Section 8, National Park System General Authorities Act of 1970, as amended (90 Stat. 1940, 16 U.S.C. 1a-5). The Secretary's annual report will identify those National Historic Landmarks which exhibit known or anticipated damage or threats to their integrity. In evaluating National Historic Landmarks for listing in the report, the seriousness and imminence of the damage or threat are considered, as well as the integrity of the landmark at the time of designation taking into account the criteria in Section 65.4.; NPS NHL Survey "Guidance on the Collection and Reporting of Data on the Condition of National Historic Landmarks," February 4, 2004.

2

Potential Visual Impacts

In application of 36 CFR Part 800.5(a)(1) Criteria of adverse effects, "An adverse effect is found when an undertaking may alter, directly or indirectly, *any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association*" (emphasis added.). *As noted in Section (2),* this would include: "(iv) change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance" and "(v) introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features."

DOT/FHWA point out that the hillside location of the proposed road was historically logged, and that any trees growing there now are "visual amenities." This position implies that removing the trees would restore the hillside back to its historic setting. While some portions of the adjacent slopes were logged during the late 1890s, the bench area east of the Skagway townsite contained *only* a limited number of logged trees and undeveloped footpaths. It needs to be recognized that during the period of significance (1897-1910)[2], various parts of the NHL included fully vegetated, logged off, or partially vegetated lands. Because the NHL boundaries run from Skagway to the Canadian border, the vast majority of the land within the NHL was never logged during the gold rush period. What tree cutting did take place was performed with hand tools. Some slopes adjacent to Skagway were selectively logged for specific wood products—cabin logs, firewood, and other subsistence uses. It was not subject to commercial clear cutting. Photographs from both early 1897 and the 1908-1910 period, to all appearances, show a full vegetation regime in the area immediately surrounding the Skagway townsite. The historic photograph that is presented noting the "bare appearance of the hillside" (Williams, et al, 2004:18) is a winter scene, and does not show any areas of logged trees. The "bareness" is simply due to leaf-off conditions of winter. Thus, during the period of significance, 1897 to 1910, the Skagway & White Pass District NHL valley landscape ran the gamut from full vegetation to various degrees of tree cutting. Consequently, all stages of the natural setting, along with small scale logging, are part of the historic landscape. Any of those vegetation stages should be considered as contributing to the NHL.

The report "Cultural Resources and the Juneau Access Project: Summary and Compilation of Data" states that *"The integrity of setting for the NHL has already been compromised . . . by cruise ships that in essence become a permanent fixture on the skyline during peak tourists months. The proposed highway under Alternatives 2, 2A, and 2C would be but one of several elements already impacting the setting of the NHL (p.52)."* This statement fails to take into account that tourist traffic to Skagway via ship is a historic activity that continues in modern times. Ships carrying tourists have graced the skyline since the gold rush. The modernization of the town's historically placed infrastructure (ships, trains, electric utilities, and buildings) does not detract from the historic setting in the same way that a completely new highway and bridges would, in an area where they did not previously exist. There were no roads nor any substantial trails in the area of the proposed road during the time of significance for the NHL. Thus, no large-scale built features of a permanent nature, such as roads or bridges, were part of the historic setting in this sector of the Landmark.

A new highway and bridges, in a new location, would be instantly recognizable as modern intrusions by both local residents and visitors. Unlike ships, highways and bridges are permanent, fixed features on the landscape. This is why we recommend that any proposed projects in this area of the NHL remain as minimally intrusive as possible. It is important to continue to preserve as much of the historic natural setting as possible in view of the fact that this setting is a key element of the Landmark.

The computer generated simulations that have been provided show tree cover along the bluff overlooking Skagway. However, the model uses evergreen trees instead of the existing deciduous trees. An appropriate model, using the correct vegetation pattern, would demonstrate a more accurate visual representation within the NHL and from Skagway. This would show that the proposed road, and the proposed bridges, would be more readily apparent in the fall, winter, and early spring, with leaf-off conditions. The DOT/FHWA implication

[2] DOT/FHWA's assertion that the official time of significance for the NHL is between 1897 and 1910 is correct. An 1887 to 1912 period of significance, which was quoted by park staff during our September 9th meeting, was given in an early draft of the NHL revision, but those dates were later revised.

seems to be that the visual impacts are to be evaluated only in terms of visitors, and not the existing year-round residents. The argument would seem to be that there is less of a visual impact if there are fewer people to see it. Obviously a visual impact is a visual impact, no matter how many people are there to see it. We need to see an accurate representation of the proposed visual intrusions, in order to adequately evaluate their potential impact.

The NHL boundaries encompass the entire breadth of the river valley, and slopes immediately adjacent to the valley, from the ocean to the Canadian border. The visual impacts that can be seen from any point within the NHL should be considered; examples of these impacts may include highway lighting, picnic areas, waysides, and other associated highway features. We recommend that DOT/FHWA reproduce the computer simulations using the appropriate vegetation, and provide more, and varied, views for better evaluation of the visual impacts, with particular emphasis being given to the road as it drops onto the hillside from approximately 8th Avenue to the area where the road enters the townsite proper at 23rd Avenue.

Contrary to statements made in the DOT/FHWA letter, the physical impacts of right-of-way blasting, plus the "intermittently vegetated" bluff face, suggest that no amount of re-vegetation (naturally or with planted species) can fully mitigate impacts to the historic viewscape. The physical nature of the rocks, and the steepness of the cuts, potentially preclude natural revegetation. DOT/FHWA should provide information regarding alternative blasting methods that would mimic the natural slopes and enhance natural re-vegetation of the area.

Moreover, two of the computer-generated simulations ("22nd and Main Composite" and "23rd and Main Composite") show permanent, major, visual impacts at the northeastern end of town. The proposed entry of the highway into the townsite at 23rd Avenue, just south of the White Pass and Yukon Route (WP&YR) railroad yards (SKG-106), will visually sever the rail yards from the historic townsite. The WP&YR is a historically important component, not only of Skagway during the gold rush, but of Skagway's continued prosperity as a community. The history of the WP&YR is of paramount importance to the community and the NHL. The railroad yards themselves also are 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. The introduction of a modern highway into this historic setting constitutes a dramatic change in the historic landscape and will forever change the historic character and the context of the rail yards.

The area at the north end of Skagway is historically more important than has been stated in the various documents submitted for our review. The Shearer Cabin and the Hestness House (Cultural Resources Consultants report, p. 51), both contributing elements to the NHL, are the sole remnants of a gold rush-era neighborhood that was inhabited by White Pass and Yukon Route employees who worked in the railroad yards. Moreover, this neighborhood is zoned for residential purposes, not just for "industrial and general business uses," as cited in both the CRC report and the DOT/FHWA letter.

The north end of Skagway 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. Smith's grave is located a few yards away. The cemetery, which is a popular tourist attraction, is just north of the rail yards and is a contributing element to the NHL.

Very little information is given regarding the design of the proposed road at the north end of Skagway. The existing graphics are confusing and need to be clearer. It should be clarified exactly where the road is to go and how traffic will access the road as it comes onto 23rd Avenue. (For example—will there be on/off ramps? a stop light?) It would be helpful if DOT/FHWA provided designs that would minimize this modern intrusion within the historic fabric of the Landmark. More accurate information is also necessary for the proposed bridges on the bench that would elevate the road over the Skagway Hydroelectric Complex.

Potential Auditory Impacts

Although the DOT/FHWA letter states that an "analysis of potential traffic noise indicates no long-term impact," no specific documentation is provided regarding the scope of this analysis, including pre- and post-construction noise impacts within the APE. The Skagway townsite sits in a narrow river valley, with high valley walls. Sound carries long distances within the valley and resonates from the steep rock faces that line either side. Construction activities will generate short-term adverse impacts. In addition, increased post-construction vehicular traffic above town will contribute to long-term auditory impacts, both to the NHL and to the Lower Dewey Lake area wherein sit SKG-189 and SKG-203. These impacts will 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.

Potential Indirect Impacts

In consideration of 36 CFR Part 800.5(a)(1) Criteria of adverse effects, "Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed or be cumulative."

While not considered in the DOT/FHWA proposal, enhanced access for vehicular traffic has the potential to increase visitor traffic to the NHL, KLGO's Skagway Unit, and KLGO's other park units of White Pass and the Dyea and Chilkoot Trail. (Dyea and the Chilkoot Trail represent a separate NHL.) The information provided is insufficient to adequately evaluate the potential indirect impacts to the historic resources within the rest of the park units based on this potential increase. A change to year-round vehicular access resulting in presumed visitor increases may require commensurate increases in basic visitor services including road maintenance, development of infrastructure relating to parking and other vehicular needs, and access to trails for a greater amount of time throughout the year. All of these factors may have direct impacts on the historic resources.

Summary

- Natural areas within the established NHL boundaries are contributing features of the Landmark as defined by the 1999 NHL nomination.
- Based on the information provided to date, we believe that the proposed road and bridge(s) have the potential to cause visual, auditory, and indirect impacts to the Skagway & White Pass District NHL.
- We believe that any development of modern infrastructure should be designed so that it is minimally intrusive to the character of the sites and setting of the landmark.
- We disagree that long-term cumulative impacts will not be incurred on the already identified historic properties, or any other potential sites that might be located in the highway construction corridor.
- We believe insufficient information has been provided to evaluate construction or post-construction visual or auditory impacts on any of the historic properties already identified.
- We believe insufficient information has been provided to evaluate long-term indirect impacts to any of the historic properties already identified, or for any indirect impacts to other park units that would result from increased vehicular traffic.

Additional Information Requested

In order to more adequately evaluate the potential effects, and to better understand the DOT/FHWA determination of no adverse effect, the National Park Service needs to request the following information:

- A map illustrating proposed routes in relation to the historic sites, both in and out of the Area of Potential Effect (APE) associated with the landmark. The map (Figure 1. Location Map) in the Northern Land Use Research, Inc., March 2004 report does not show all the components of SKG-189, the Skagway Hydroelectric Complex Historic District. Either update Figure 1 to show the other components of SKG-189, or update Figure 2 of the same report to show the proposed route of the road. It would also be helpful if both maps showed the NHL boundary.
- Updated digitally enhanced photographs depicting visual impacts using the correct vegetation (deciduous trees vs. evergreen), that demonstrate visual impacts for both summer and winter vegetation. Also provide more views from various locations to give a better sense of the visual impacts. The graphics showing the

road at its entry into the townsite on 23rd Avenue need to be more explicit. Currently it is difficult to understand what is being depicted.

- More specific information regarding the potential for designing the various bridges in a way that minimizes the visual impact on the landscape. Although a double arched steel bridge was specifically mentioned for crossing over the Lower Dewey Lake Trail (SKG-203), more specific designs should be provided. No reference was made to the other proposed bridges, nor was any reference made to modifying the design of the road as it enters the townsite at 23rd Avenue. In addition, we would need to see the design options for the road which would include associated highway features such as lighting.

- A copy of the DOT/FHWA analysis of the audible effects of the road within or adjacent to the NHL and KLGO. This information will give the reviewers a better sense of how much more noise is expected to be generated within the APE. This information is necessary for an adequate evaluation of the potential auditory effects.

- Information describing the expected increases in vehicular traffic to Skagway throughout the year and through time. A rise in vehicular traffic is expected to result in increased visitors to the NHL as well as to the Skagway and Dyea park units. Additional visitation may have impacts to the park's resources, depending on the level of increase and the park's ability to absorb those increases within its existing carrying capacity.

- Information regarding anticipated future developments along the road corridor. For example, there is no mention made of any potential waysides or other recreational development along the road corridor—are additional features of this type planned as part of the proposed road project? We need to evaluate indirect impacts to the historic resources within the NHL.

- Information regarding alternative blasting methods that would mimic the natural slopes and enhance natural revegetation of the area.

6

This page left intentionally blank.

8.0 LIST OF PREPARERS

Name and Education	Supplemental Draft EIS Responsibility	Professional Experience
Reuben Yost MS Zoology BS Education	Alternative Screening Report, Purpose and Need, Technical Appendix and Supplemental Draft 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	Draft EIS and Technical Appendix Review	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	Supplemental Draft 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	Supplemental Draft 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	Manager, EIS preparation and	URS, Principal-in-Charge, 30

Name and Education	Supplemental Draft EIS Responsibility	Professional Experience
MS Plant Ecology BS Plant Ecology	Technical Appendix Review	years 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 Project Manager	URS, Senior Engineer, 40 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	Supplemental Draft 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

Name and Education	Supplemental Draft EIS Responsibility	Professional 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
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 Supplemental Draft 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
Ann Maki 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

Name and Education	Supplemental Draft EIS Responsibility	Professional Experience
Joyce Payne MS Agricultural Biology BS Agricultural Biology	Technical Reports and Document Review	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
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 archeological surveys and Cultural Resources Report and cumulative effects analysis	Cultural Resources Consultants, Inc, Principal Archaeologist, 25 years experience
Pete Bowers	Archeological surveys	NLUR, Principal Archaeologist, 29 years
Catherine Williams	Archeological 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 SDEIS DISTRIBUTION LIST

The Supplemental Draft EIS has been distributed to all 2003 scoping commentors and the following entities.

9.1 Federal Agencies

Advisory Council on Historic Preservation

Army Corps of Engineers, Alaska District

Federal Highway Administration (FHWA)

United States Forest Service, Alaska Region Office

United States Forest Service, Juneau Ranger District

United States Coast Guard

- Management and Navigation Safety Branch
- Maintenance and Logistics Command, Pacific, Realty Section

National Marine Fisheries Service

United States Environmental Protection Agency

- Office of Federal Activities, EIS Filing Section
- Alaska Operations Office

United States Department of the Interior (DOI)

- Office of Environmental Policy and Compliance
- United States 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 (ADNR)

- 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 (ADOT&PF)

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

Aukquan Traditional Council

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 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. 2003. *Alaska Community Database Community Information Summaries (CIS).* Accessed from website: http://www.dced.state.ak.us/dca/commdb/CF_CIS.htm.

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). 2001. Alaska Regional Haze Strategy. Alaska Department of Environmental Conservation Air Non-point and Mobile Sources. November 7.

ADEC. 2003a. State of Alaska Contaminated Sites Database. (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. (http://www.state.ak.us/dec/dspar/stp/search.htm)

ADEC. 2004. 1999 Air Toxics Emission Inventory Information as retrieved January 20, 2004. (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. Division of Subsistence. Reports on Klukwan, Haines, and Skagway. June.

ADF&G. 2003a. Charter Vessel Registration List. http://www.sf.adfg.state.ak.us/statewide/SFGuides/html/index.cfm.

ADF&G. 2003b. 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. http://www.habitat.adfg.state.ak.us/geninfo/anadcat.cfm.

ADF&G. 2004. Wildlife Notebook Series. Shellfish. Available on-line from website: http://www.adfg.state.ak.us/pubs/notebook/notehome.php. Accessed in April.

Alaska Department of Labor and Workforce Development (DOL&WD). 2000. Alaska Population Overview 1999 Estimates.

DOL&WD. 2002. Research and Analysis Section, Employment and Earnings Summary Report for the years 1980 through 2002.

DOL&WD. 2004. Alaska Population Overview 2001-2002 Estimates and Census 2000.

Alaska Department of Transportation and Public Facilities (DOT&PF). 1994. *Juneau Access Improvements Reconnaissance Engineering Report*. May 4.

DOT&PF. 1975. Lynn Canal Transportation Corridor Economic Analysis.

DOT&PF. 1980. Southeastern Alaska Transportation Plan.

DOT&PF. 1986. Southeast Alaska Transportation Plan.

DOT&PF. 1997. *Technical Memorandum User Benefit Analysis Juneau Access Improvements*. Prepared by Lochner. December 20.

DOT&PF. 1997. *Juneau Access Draft Environmental Impact Statement (Draft EIS)*. Prepared for Federal Highway Administration, Alaska Division, by ADOT&PF, Southeast Region.

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. Available on-line: http://www.dot.state.ak.us/stwddes/dcsenviron/assets/pdf/procedures/dot_adfg_fishpass080301.pdf

DOT&PF. 2002. *Alaska Marine Highway System.* 1998-2002. *Annual Traffic Volume Report*.

DOT&PF. 2003a. 2002 Traffic Maps. GIS/Mapping Section.

DOT&PF. 2003b. Juneau Access Improvements Project *Comment Analysis Report*.

DOT&PF. 2003c. Annual Traffic Volume Report, 2002. Alaska Marine Highway System

DOT&PF. 2003d. Juneau Access Improvements Project *Comment Analysis Report*.

DOT&PF, 2004a. Vessel Information, Alaska Marine Highway System (AMHS). Available on-line: http://www.dot.state.ak.us/amhs/services/details/vsslinfo.html#MAL. Accessed March 3, 2004.

DOT&PF, 2004b. New Waves Fast Vehicle Ferry MV Fairweather. Available on-line: http://www.dot.state.ak.us/stwdplng/projectinfo/ser/newwave/index.htm. Accessed March 3, 2004.

DOT&PF, 2004c. Travel Details Alaska Marine Highway System. Available on-line: http://www.dot.state.ak.us/amhs/services/details/limits.html#wait. Accessed March 4, 2004.

DOT&PF, 2004d. Port Information Alaska Marine Highway System. Available on-line: http://www.dot.state.ak.us/amhs/services/portinfo/index.html#bel. Accessed March 4, 2004.

DOT&PF, 2004e. Juneau Access Highway Maintenance Cost Estimates, DOT&PF, January 6, 2004.

DOT&PF, 2004f. Port Information Alaska Marine Highway System. Available on-line: http://www.dot.state.ak.us/amhs/schedres/tariffs/tariffs0304/tariffs_S04.htm. Accessed March 4, 2004.

DOT&PF. 2004g. Lynn Canal Revenues and Expenditures 2001-2002 and Projected Capital Costs 2001-2038.

DOT&PF. 2004h. The 2008 Estimated Revenue, State Cost and State Subsidy, Juneau Access Alternatives. March 2004.

Allred, K. and S. Allred. 1995. Broken Motor Cave. The Alaskan Caver, Glacier Grotto, Vol. 15, 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.

AASHTO. 2001. Policy on Geometric Design of Highways and Streets.

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. 2002. Alaska Marine Mammal Stock Assessment, 2002. NOAA Technical Memorandum NMFS-AFSC-133.

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. Available on-line: http://www.nmfs.noaa.gov/prot_res/PR2/Stock_Assessment_Program/sars.html

Ballard, W.F., DOT&PF Southeast Region Environmental Coordinator. 1994. Letter 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. Available on-line: www.state.ak.us/adfg/wildlife/geninfo/pub/division_reports/fur01mt_se.pdf Accessed on October 26, 2003.

Betts, M. F., R.F. Schroeder, T. Thornton, and A.V. Forthcoming. 1994. *Subsistence Resource Use Patterns in Southeast Alaska: Summaries of 30 Communities,* Technical Paper Number 216, Alaska Department of Fish and Game, Division of Subsistence June 1994. Reports on Klukwan, Haines and Skagway.

Bittner, J.E., State Historic Preservation Officer. 1995. Letter 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. Available on-line: http://www.absc.usgs.gov/research/bpif/conservation.html Accessed 26 October 2003.

Broderson, K. 1994. Frogs and Toads. Alaska Department of Fish and Game Wildlife Notebook Series. Available on-line: http://www.state.ak.us/local/akpages/FISH.GAME/notebook/amphibia/amphib.htm. Accessed October 2, 2003.

Brown, B.T.; Mills, G.S.; Powels, C.; Russell, W.A.; Therres, G.D.; Pottie, J.J. 1999. *The Influence of Weapons-Testing Noise on Bald Eagle Behavior*. Journal of Raptor Research 33(3): 227-232

Brown, B.T.; Stevens, L.E. 1997. *Winter Bald Eagle Distribution is Inversely Correlated with Human Activity Along the Colorado River, Arizona.* Journal of Raptor Research 31(1): 7-10Chilkat Cruises and Tours, 2004. Schedule and Rates, Haines/Skagway Daily Service. Available on-line: http://www.chilkatcruises.com/schedule.html#skagway. Accessed March 4, 2004.

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. Available on-line: http://www.biologicaldiversity.org/swcbd/species/murrelet/Petition.pdf. Accessed on 24 July, 2002.

City of Haines. 2000. City of Haines, Alaska District Coastal Management Plan. Update with 2000 Minor Amendment. November 15, 1993 and November 20, 2000.

City and Borough of Juneau. (CBJ). 1992. Enforceable Policies of the Juneau Coastal Management Plan Including the Juneau Wetlands Management Plan. April 2002. Chapter 49.70 of CBJ Land Use Code.

CBJ. 1996. *The Comprehensive Plan 1995 Update.* November.

CBJ. 2001. Housing Assessment data for 2001 obtained in 2003 from CBJ Community Development Department.

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 for the City of Skagway, by Southeast Strategies and Dean Runyon Associates.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. http://www.seawead.org.

Coeur Alaska, Inc. 2004. Properties, Kensington. Accessed from website: http://www.coeur.com in February 2004.

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.

Environmental Protection Agency (EPA). 1995. Alaska Power and Telephone Company; Notice of Availability. Available on-line at http://www.epa.gov/fedrgstr/EPA-IMPACT/1995/August/Day-08/pr-1184.html. Accessed February 22, 2004.

EPA. 2003. Enforcement and Compliance History Online (ECHO) Database. http://oaspub.epa.gov/enviro/ef home2.compliance.

Federal Aviation Administration. 2003. Hydrodynamics, Sediment Transport, Water Quality, and Aquatic Biotic Communities Associated with SFO Runway Reconfiguration Project.

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. 1997. Supplemental Hazardous Waste Guidance. Memorandum to Division Administrators. January 16.

FPE/Roen-Lochner Joint Venture (FPE/Roen). 1994. *Juneau Access Draft EIS, Draft Technical Memorandum, Initial Site Evaluation*. Report prepared for Alaska Department of Transportation and Public Facilities. 20 pp. October 6.

Ford, D.C., and Williams, P.W. 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 Berg, H.C., 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 Bodkin, J.E. (2001). Stock structure of sea otters (*Enhydra lutris kenyoni*) in Alaska. *Marine Mammal Science* 17(3): 632-647.

Haines Borough. 2004. *Haines Borough Comprehensive Plan*. 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. Available on-line: http://www.wildlife.alaska.gov/pubs/techpubs/mgt.cfm Accessed on November 17, 2003.

Hickel, W., Governor of State of Alaska. 1994. Letter 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.

Holmes, T.; Knight, R.L.; Craig, G.R. 1993. *Responses of Wintering Grassland Raptors to Human Disturbance.* Wildlife Society Bulletin 21: 461-468

Horwood, J.1990. Biology and Exploitation of the Minke Whale. Boca Raton, FL: CRC Press, Inc.

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.

Juneau Empire, 2002. *Land Swap Could Help Open Mine Exchange of USFS Acreage Would Consolidate Land Near Kensington.* As published on April 26, 2002 by Timothy Inklebarger.

Klein, David R., 2003. Personal communications regarding wildlife use of Lynn Canal. Cooperative Wildlife Research Unit Leader (Emeritus), University of Alaska, Fairbanks. October.

Laist, David W., A.R. Knowlton, J.G. Mead, A.S. Collet, and M. Podesta. 2001. *Collisions 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. 1994. *Juneau Access Household Survey Results*. Prepared for the Alaska Department of Transportation and Public Facilities, Southeast Region, Alaska, August.

McDowell. 2002. *Haines Tourism Study*. Prepared for the City of Haines.

McDowell. 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.

McDowell. 2004a. *The Socioeconomic Effects of Juneau Access Improvements Supplemental Draft EIS Update, Draft*. Prepared for Alaska Department of Transportation and Public Facilities, Juneau, AK by McDowell Group, Inc., Juneau and Anchorage, AK. February 2004.

McDowell. 2004b. *Juneau Access Traffic Forecast. Draft Report.* Prepared for Alaska Department of Transportation and Public Facilities, Juneau, AK by McDowell Group, Inc., Juneau and Anchorage, AK. February.

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, M.M.1963. Taku Glacier Evaluation Study. State of Alaska Department of Highways *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.

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.

Municipality of Anchorage (MOA) Watershed Management Program. 1999a. Street Sediment Buildup Rates in Anchorage, Alaska. Prepared by Scott R. Wheaton (MOA), Chris Brown (Montgomery Watson), and Eric Gropp (Montgomery Watson).

MOA Watershed Management Program. 1999b. Meltwater Runoff from Anchorage Streets and Snow Disposal: 1999 Data Report. Prepared by Montgomery Watson, Anchorage, Alaska.

MOA Watershed Management Program. 2000a. Street Sediments and Adsorbed Pollutants: *Data Report.* Prepared by Montgomery Watson, Anchorage, Alaska.

MOA Watershed Management Program. 2000b. Receiving Water Chemistry at Select Streams in Anchorage, Alaska: 2000 Data Report. Prepared by CH2M Hill, Inc., Anchorage, Alaska.

MOA Watershed Management Program. 2000c. Fecal Coliform at Anchorage Swimming Beaches. Prepared by HDR Alaska, Inc., Anchorage, Alaska.

MOA Watershed Management Program. 2000d. Anchorage Street Deicer and Snow Disposal Investigation: 2000 Data Report. Prepared by Montgomery Watson, Anchorage, Alaska.

MOA Watershed Management Program. 2000e. 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.

National Park Service (NPS), 2003. Glacier Bay National Park and Preserve, Alaska, Vessel Quotas and Operating Requirements, Final Environmental Impact Statement. Available on-line: http://www.glba.ene.com/. Accessed on October 25, 2003.

NatureServe. 2003. NatureServe Explorer: An online encyclopedia of life. Version 1.8. Arlington, Virginia. Available on-line: http://www.natureserve.org/explorer. Accessed October 2, 2003.

Norris, F., T. Cole, and B. Houston. 1999. Skagway and White Pass District. National Historic Landmarks Survey, National Park Service, Washington, D.C.

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.

Pacific Seaflight, 2004. Wing In Ground Effect, Marine Transportation, About Us. Available on-line: http://www.pacificseaflight.com/about.shtml. Accessed March 4, 2004.

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, 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.

Raymond-Yakoubian, B. 2004. *Inventory and Evaluation of Historic Properties For Lands Within the Area of Potential Effect from Addendum No. 1 to the Plan of Operation for the Kensington Gold Project Submitted by Coeur Alaska, Inc. in April 2002*. Report to the USDA Agriculture Forest Service, Tongass National Forest, Juneau Ranger District. Contract # 43-0109-3-0277. Integrated Concepts and Research Corporation, Anchorage.

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.

Rosenberg, D., S. Patten, and T. Rothe. 1994. Harlequin Ducks. Alaska Department of Fish and Game, Wildlife Notebook Series. Available on-line: http://www.state.ak.us/adfg/notebook/bird/harlequn.htm. Accessed September 30, 2003.

Rosenberg, D. and T. Rothe. 1994. Swans. Alaska Department of Fish and Game, Wildlife Notebook Series. Available on-line: http://www.state.ak.us/adfg/notebook/bird/swans.htm. Accessed September 26, 2003.

Schmid, C. 2003. Juneau Empire. *Corps of Engineers Public Notice M-1999-1426, December 31, 2003*. September.

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.

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.

Southeast Strategies and Dean Runyan Associates. 2000. *Skagway Economic Impact Study*. Prepared for the City of Skagway.

Stalmaster, M.V.; J.L. Kaiser. 1997. *Flushing Responses of Wintering Bald Eagles to Military Activity*. Journal of Wildlife Management 61(4):1307-1313.

Steidl, R.J.; R.G. Anthony. 1996. *Responses of Bald Eagles to Human Activity During the Summer in Interior Alaska*. Ecological Applications 6(2): 482-491.

Stormwater. 2001. *Environmental Impacts of Road Salt and Alternative in the New York City Watershed*. The Journal for Surface Water Quality Professionals. May/June 2001. Available on-line at http://www.forester.net/sw_0107_environmental.html. Accessed January 15, 2004.

Subsistence Management Information. 2004. Personal Use. Accessed from website: http://www.subsistmgtinfo.org/qa.htm on February 16.

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.

Transportation Research Board. 2000. Highway Capacity Manual 2000.

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 Department of Transportation, 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. 1997. Available on-line: http://www.fs.fed.us/r10/tlmp/. Accessed September 24, 2003.

USFS. 1998. Cascade Point Access Road Final Environmental Impact Statement. R10-MB-36B. USDA Forest Service, Tongass National Forest, Sitka, AK.

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 Draft Supplemental Environmental Impact Statement. Prepared by Tetra Tech, Inc., 143 Union Boulevard, Suite 1010, Lakewood, CO 80228.

United States Fish and Wildlife Service (USFWS). 2001. American Peregrine Falcon Proposed Monitoring Plan. Available on-line: http://www.dnr.state.wi.us/org/land/er/factsheets/birds/falcon.htm. Accessed September 26,2003.

USFWS. 2003. Wildlife and Human Use of the Shoreline and Near-shore Waters of Berner's Bay, Southeast Alaska. Preliminary report. February. 25 pp.

Wood, P.B. 1999. Bald Eagle Responses to Boating Activity in Northcentral Florida. Journal of Raptor Research 33(2): 97-101 pp.

Yukon Highways and Public Works. 2003. 2002 *Yukon Traffic Count Summary*.

Copies of DOT&PF references are available on request.

11.0 INDEX

A

Acquisition Costs · 2-17, 2-21
Adverse Impacts · S-1, S-4, 3-33, 4-52, 4-94, 4-137, 4-158
Affected Environment · 1-1, 3-1, 10-9
Air Quality · 3-34, 3-35, 3-36, 4-1, 4-6, 4-7, 4-11, 4-53, 4-54, 4-94, 4-95, 4-119, 4-137, 4-163, 4-173, 4-176, 4-177, 10-5
Alternative 1 · 2-6, 2-7, 2-8, 4-11
Alternative 2 · S-1, S-2, S-3, S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-13, 1-1, 1-3, 2-4, 2-6, 2-7, 2-9, 2-10, 2-13, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-21, 2-24, 2-26, 2-27, 2-29, 2-30, 2-31, 3-5, 3-6, 3-13, 3-14, 3-29, 3-38, 3-40, 3-41, 4-4, 4-11, 4-13, 4-14, 4-15, 4-16, 4-17, 4-18, 4-19, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, 4-34, 4-35, 4-36, 4-38, 4-39, 4-40, 4-41, 4-42, 4-43, 4-44, 4-45, 4-46, 4-47, 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, 4-54, 4-55, 4-56, 4-57, 4-58, 4-59, 4-60, 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, 4-69, 4-70, 4-94, 4-102, 4-145, 4-146, 4-147, 4-148, 4-149, 4-150, 4-151, 4-152, 4-153, 4-154, 4-156, 4-157, 4-158, 4-159, 4-160, 4-161, 4-162, 4-165, 4-166, 4-167, 4-168, 4-169, 4-171, 4-173, 4-174, 4-175, 4-176, 4-177, 4-178, 4-179, 4-180, 4-181, 4-182, 5-4, 5-5, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11
Alternative 2A · S-3, S-5, S-7, S-8, S-9, S-10, 2-4, 2-6, 2-13, 2-14, 2-15, 2-21, 4-13, 4-16, 4-18, 4-19, 4-41, 4-42, 4-43, 4-48, 4-49, 4-50, 4-51, 4-52, 4-55, 4-58, 4-59, 4-60, 4-61, 4-62, 4-69, 4-70, 4-151, 4-153, 4-157, 4-177, 4-178, 4-182, 6-3
Alternative 2B · S-3, S-5, S-7, S-8, S-9, 2-4, 2-6, 2-15, 2-16, 2-17, 4-13, 4-15, 4-16, 4-21, 4-35, 4-36, 4-41, 4-42, 4-43, 4-46, 4-48, 4-49, 4-50, 4-58, 4-59, 4-61, 4-62, 4-156, 4-157, 4-158, 4-159, 4-161, 4-165, 4-167
Alternative 2C · S-3, S-5, S-7, S-8, 2-6, 2-17, 2-18, 2-19, 4-13, 4-32, 4-33, 4-34, 4-35, 4-36, 4-41, 4-42, 4-43, 4-46, 4-49, 4-56, 4-59, 4-61, 4-149, 4-151, 4-153, 4-157, 5-5
Alternative 3 · S-3, S-5, S-7, S-8, S-9, 2-6, 2-19, 2-20, 2-21, 3-3, 3-5, 3-6, 3-14, 3-25, 3-27, 3-28, 3-29, 3-38, 3-39, 3-41, 4-4, 4-5, 4-70, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-79, 4-80, 4-81, 4-82, 4-84, 4-85, 4-86, 4-87, 4-88, 4-89, 4-90, 4-91, 4-92, 4-93, 4-94, 4-95, 4-96, 4-97, 4-98, 4-99, 4-100, 4-101, 4-102, 4-103, 4-104, 4-105, 4-106, 4-146, 4-154, 4-156, 4-157, 4-161, 4-162, 4-165, 4-167, 4-170, 4-175, 4-177, 4-178, 4-181, 6-3, 6-7
Alternative 4 · S-5, S-6, S-7, S-8, S-9, 2-5, 2-22, 4-107, 4-108, 4-109, 4-110, 4-111, 4-112, 4-113, 4-114, 4-115, 4-116, 4-117, 4-118, 4-119, 4-120, 4-121, 4-122, 4-123, 4-124, 4-125, 4-126, 4-127, 4-128, 4-129, 4-130, 4-131, 4-132, 4-133, 4-134, 4-135, 4-136, 4-137, 4-138, 4-139, 4-140, 4-141, 4-142, 4-143, 4-144, 4-145, 4-146, 4-147, 4-154, 4-156, 4-157, 4-161, 4-164, 4-166, 4-167, 4-174, 4-175, 4-176, 4-178, 4-179, 4-181, 6-3
Alternative 4A · S-3, S-5, 2-6, 2-23, 2-24, 2-25, 4-107, 4-108, 4-109, 4-110, 4-111, 4-112, 4-113, 4-114, 4-115, 4-116, 4-117, 4-118, 4-119, 4-120, 4-121
Alternative 4B · S-4, S-5, 2-6, 2-24, 2-25, 2-26, 2-29, 4-122, 4-125, 4-126, 4-127, 4-128, 4-129, 4-130, 4-132, 4-133, 4-134, 4-137, 4-140, 4-141, 4-144, 4-182
Alternative 4C · S-4, S-5, S-7, 2-6, 2-26, 2-27, 2-28, 4-107, 4-108, 4-110, 4-112, 4-113, 4-115, 4-116, 4-117, 4-118, 4-119, 4-154, 4-156
Alternative 4D · S-4, 2-4, 2-6, 2-27, 2-28, 2-29, 4-122, 4-125, 4-126, 4-127, 4-128, 4-129, 4-132, 4-133, 4-134, 4-138, 4-147
Alternative Screening · 2-1
AMHS · S-1, S-2, S-3, S-11, S-15, 1-1, 1-2, 1-5, 1-6, 1-7, 1-8, 1-9, 1-11, 1-12, 1-13, 2-1, 2-4, 2-5, 2-7, 2-8, 2-9, 2-13, 2-16, 2-17, 2-19, 2-22, 2-23, 3-5, 3-15, 3-17, 3-25, 4-4, 4-11, 4-12, 4-13, 4-16, 4-29, 4-34, 4-38, 4-40, 4-41, 4-45, 4-46, 4-47, 4-52, 4-60, 4-71, 4-78, 4-85, 4-88, 4-89, 4-94, 4-99, 4-107, 4-108, 4-109, 4-111, 4-112, 4-118, 4-119, 4-121, 4-122, 4-125, 4-127, 4-129, 4-134, 4-135, 4-137, 4-139, 4-144, 4-147, 4-171, 4-176, 4-182, 7-5, 7-6, 9-2, 10-2
Amphibians · 3-51, 3-55, 3-56, 4-9, 4-67, 4-105, 4-121, 4-144, 4-167, 4-181
Anadromous Fish · S-8, 3-48, 3-51, 3-53, 3-55, 4-8, 4-17, 4-50, 4-59, 4-60, 4-61, 4-72, 4-99, 4-100, 4-140, 4-162, 4-165, 5-3, 10-1
Archeological · 3-2, 3-9, 3-12, 3-13, 3-27, 4-3, 4-11, 4-23, 4-75, 4-108, 4-125, 4-158, 4-173, 4-174, 5-4, 7-10, 8-4, 10-8
Attainment Status · 3-34
Auke Bay Ferry Terminal · 1-2, 1-7, 2-24, 2-27, 3-7, 4-52, 4-94, 4-122, 4-137, 4-161, 4-169, 4-170, 4-172
Avalanche · S-5, S-7, S-12, 2-10, 2-11, 2-12, 2-14, 2-17, 2-18, 2-20, 2-21, 2-22, 3-10, 3-28, 3-29, 3-30, 3-52, 4-5, 4-41, 4-48, 4-49, 4-50, 4-66, 4-86, 4-90, 4-91, 4-104, 4-171, 7-5, 7-6

B

Bald Eagle · S-9, S-10, 3-7, 3-55, 3-56, 3-58, 3-59, 3-60, 4-1, 4-9, 4-10, 4-14, 4-55, 4-56, 4-67, 4-68, 4-105, 4-106, 4-121, 4-144, 4-167, 4-171, 4-173, 4-181, 5-3, 7-7, 7-8, 8-2, 8-3, 10-3, 10-4, 10-5, 10-6, 10-9, 10-10
Benefit · S-6, S-7, 1-2, 2-19, 2-30, 3-8, 3-37, 3-39, 4-1, 4-4, 4-5, 4-17, 4-27, 4-29, 4-30, 4-35, 4-77, 4-78, 4-81, 4-88, 4-110, 4-112, 4-117, 4-123, 4-127, 4-129, 4-153, 4-175, 4-183, 7-4, 7-8, 8-1, 10-1, 10-2
Biological Environment · 2-2, 4-1
Birds · 3-38, 3-39, 3-46, 3-47, 3-48, 3-55, 3-56, 3-57, 3-58, 4-9, 4-55, 4-63, 4-64, 4-66, 4-67, 4-101, 4-102, 4-105, 4-120, 4-121, 4-141, 4-142, 4-143, 4-166, 4-167, 4-180, 4-181, 5-3, 10-8, 10-10
Boating · 3-6, 3-7, 4-72, 4-171, 4-173, 5-4
Breakwaters · 2-12
Bridges · S-3, S-4, 1-9, 2-3, 2-11, 2-12, 2-15, 2-19, 2-21, 2-22, 3-8, 3-13, 4-14, 4-18, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-50, 4-51, 4-53, 4-60, 4-61, 4-63, 4-74, 4-75, 4-92, 4-94, 4-100, 4-135, 4-137, 4-140, 4-142, 4-158, 4-162, 4-165, 5-4, 6-5, 6-6, 6-7
Buffer Zone · 4-150, 4-167

C

Cape Fox · 4-29, 4-173, 7-11
Carbon Monoxide · 3-34, 4-163
Cascade Point · S-12, 1-4, 2-2, 2-10, 3-5, 4-170, 4-171, 4-174, 4-177, 4-178, 4-179, 4-180, 5-2, 7-8, 7-11, 10-9
Chilkat Inlet · S-7, 2-3, 2-21, 3-12, 3-26, 3-30, 3-33, 6-3, 6-7
Chilkat River · S-3, S-7, 2-19, 2-22, 3-6, 3-23, 3-24, 3-33, 3-39, 3-55, 3-60, 3-61, 4-72, 4-74, 4-75, 4-92, 4-98, 4-99, 4-100, 4-101, 4-104
Clean Air Act · 3-34, 4-6
Clean Water Act · S-13, 3-41, 3-44, 4-69, 4-70
Climate · 3-29, 3-31, 4-6, 4-33, 4-48, 4-81, 4-90
Coastal Zone Management · 3-8, 4-17, 4-72, 4-73, 4-107, 4-108, 4-123, 4-124
Coeur Alaska · S-12, 1-4, 2-11, 3-1, 3-6, 4-49, 4-161, 4-169, 4-171, 10-4, 10-8
Collisions · S-9, S-10, 4-64, 4-65, 4-66, 4-69, 4-102, 4-103, 4-104, 4-106, 4-121, 4-142, 4-143, 4-144, 4-180, 4-181, 4-182
Comments · S-1, S-10, S-11, 1-1, 2-5, 2-19, 2-29, 2-31, 3-38, 3-42, 3-55, 4-3, 4-7, 4-9, 4-55, 4-68, 4-106, 4-121, 4-144, 7-1, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11
Commitments · 4-2, 5-1
Conformity · 3-34, 4-6, 4-54, 4-95
Construction · S-3, S-6, S-8, S-9, S-10, S-11, S-12, S-15, 1-3, 1-4, 2-2, 2-3, 2-6, 2-7, 2-8, 2-10, 2-11, 2-12, 2-15, 2-16, 2-17, 2-18, 2-21, 2-22, 2-24, 2-26, 2-27, 2-29, 2-31, 3-5, 3-8, 3-9, 3-17, 3-25, 3-35, 3-37, 3-40, 3-47, 3-48, 3-55, 4-2, 4-4, 4-7, 4-8, 4-9, 4-10, 4-11, 4-24, 4-34, 4-37, 4-39, 4-43, 4-49, 4-50, 4-51, 4-52, 4-53, 4-58, 4-59, 4-60, 4-61, 4-67, 4-68, 4-69, 4-84, 4-85, 4-87, 4-91, 4-92, 4-93, 4-98, 4-99, 4-100, 4-105, 4-106, 4-108, 4-114, 4-116, 4-130, 4-132, 4-136, 4-137, 4-138, 4-139, 4-140, 4-144, 4-149, 4-150, 4-152, 4-157, 4-158, 4-159, 4-160, 4-161, 4-162, 4-163, 4-164, 4-165, 4-166, 4-167, 4-168, 4-169, 4-170, 4-171, 4-177, 4-179, 4-181, 4-182, 4-183, 5-1, 5-2, 5-3, 5-4, 6-1, 6-3, 6-4, 6-5, 6-6, 6-7, 7-4, 7-5, 7-6, 7-8, 7-9, 7-11
Consultation · S-13, 3-12, 3-47, 3-48, 3-60, 4-3, 4-15, 4-68, 4-106, 4-144, 4-167, 5-3, 5-4, 6-4, 6-6, 7-1
Contamination · 3-40, 3-41, 4-8, 4-52, 4-93, 4-137
Controversy · S-11, 2-19
Cooperating Agencies · 7-11
Coordination · S-7, 3-27, 3-59, 4-9, 7-1, 7-2, 7-3
Critical Habitat · 4-10, 4-68, 4-69, 4-106
Cruise Ships · 2-3, 4-19, 4-20, 4-21, 4-22, 4-25, 4-38, 4-74, 4-171, 7-10
Cultural Resources · S-7, 3-12, 4-1, 4-3, 4-158, 4-174, 5-1, 5-4, 7-3, 7-10, 8-3, 8-4
Cumulative Effect · 4-1, 4-2, 4-169, 4-173, 4-174, 4-176, 4-177, 4-178, 4-180, 4-181, 4-182, 7-10, 7-11, 8-2, 8-3, 8-4

D

Davidson Glacier · S-7, 2-22, 3-9, 3-10, 3-31, 3-42, 3-45, 3-46, 4-75, 4-96, 4-97, 4-98, 4-101, 4-165, 4-171, 6-3
Dewy Lake · 5-4, 5-5, 6-2, 6-6
Direct Effects · S-1, S-7, S-8, S-9, S-13, 1-5, 2-6, 3-12, 3-37, 3-47, 3-56, 4-2, 4-8, 4-23, 4-24, 4-25, 4-30, 4-31, 4-33, 4-37, 4-38, 4-40, 4-52, 4-53, 4-55, 4-56, 4-58, 4-61, 4-62, 4-64, 4-65, 4-66, 4-72, 4-75, 4-78, 4-79, 4-84, 4-86, 4-94, 4-96, 4-98, 4-100, 4-101, 4-102, 4-103, 4-104, 4-108, 4-119, 4-120, 4-121, 4-124, 4-125, 4-137, 4-138, 4-140, 4-142, 4-144, 4-146, 4-147, 4-156, 4-160, 4-161, 4-172, 4-174, 4-175, 4-176, 4-177, 4-180, 4-181, 6-5, 6-6, 6-7, 7-6, 7-9, 8-2
Direct Impacts · 4-2, 4-8, 4-9, 4-107, 4-149, 4-150, 5-3
Disposal Sites · 3-40
Draft EIS · S-1, S-2, S-4, S-9, S-10, S-11, S-13, S-14, 1-1, 1-3, 1-4, 1-8, 2-1, 2-3, 2-4, 2-5, 2-6, 2-7, 2-9, 2-11, 2-12, 2-13, 2-16, 2-19, 2-23, 2-29, 2-30, 2-31, 3-1, 3-6, 3-9, 3-10, 3-22, 3-23,

3-24, 3-25, 3-26, 3-29, 3-30, 3-31, 3-33, 3-34, 3-37, 3-38, 3-42, 3-47, 3-53, 3-55, 3-56, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-9, 4-10, 4-11, 4-12, 4-14, 4-28, 4-31, 4-32, 4-37, 4-46, 4-48, 4-53, 4-55, 4-58, 4-64, 4-65, 4-68, 4-76, 4-79, 4-80, 4-83, 4-89, 4-94, 4-98, 4-103, 4-106, 4-109, 4-111, 4-112, 4-121, 4-125, 4-127, 4-129, 4-144, 4-165, 4-168, 4-169, 4-177, 4-182, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11, 8-1, 8-2, 8-3, 9-1, 10-1, 10-5, 10-7

E

Earthquakes · 3-26, 3-28, 3-30, 3-31, 4-48, 4-90, 4-135, 10-5
Economic · S-6, 1-3, 2-31, 3-1, 3-4, 3-6, 3-20, 3-21, 4-1, 4-3, 4-5, 4-12, 4-26, 4-27, 4-32, 4-34, 4-35, 4-39, 4-45, 4-72, 4-80, 4-82, 4-84, 4-88, 4-108, 4-110, 4-112, 4-113, 4-118, 4-126, 4-128, 4-130, 4-134, 4-146, 4-161, 4-176, 4-183, 7-4, 7-5, 7-8, 7-9, 7-10, 9-1, 10-1, 10-4, 10-9
Eelgrass · 3-47, 3-49, 4-59, 4-60, 4-99, 7-8
EIS · S-1, S-2, S-4, S-9, S-10, S-11, S-12, S-13, S-14, 1-1, 1-3, 1-4, 1-8, 2-1, 2-3, 2-4, 2-5, 2-6, 2-7, 2-9, 2-11, 2-12, 2-13, 2-16, 2-19, 2-23, 2-29, 2-30, 2-31, 3-1, 3-5, 3-6, 3-9, 3-10, 3-22, 3-23, 3-24, 3-25, 3-26, 3-29, 3-30, 3-31, 3-33, 3-34, 3-36, 3-37, 3-38, 3-42, 3-43, 3-45, 3-47, 3-53, 3-55, 3-56, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-9, 4-10, 4-11, 4-12, 4-14, 4-28, 4-31, 4-32, 4-37, 4-46, 4-48, 4-53, 4-55, 4-58, 4-64, 4-65, 4-68, 4-76, 4-79, 4-80, 4-83, 4-89, 4-94, 4-98, 4-103, 4-106, 4-109, 4-111, 4-112, 4-121, 4-125, 4-127, 4-129, 4-144, 4-161, 4-165, 4-168, 4-169, 4-176, 4-177, 4-179, 4-181, 4-182, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11, 8-1, 8-2, 8-3, 9-1, 10-1, 10-5, 10-7
Employment · 3-6, 3-14, 3-15, 3-16, 3-17, 3-18, 3-19, 4-27, 4-28, 4-32, 4-34, 4-36, 4-77, 4-80, 4-83, 4-109, 4-111, 4-112, 4-125, 4-127, 4-129, 4-146, 4-158, 4-159, 4-161, 4-175
Endangered · S-10, 3-53, 3-55, 3-56, 3-58, 3-60, 4-9, 4-10, 4-11, 4-62, 4-68, 4-106, 4-121, 4-144, 4-168, 4-173, 4-178, 4-181, 5-4, 10-3
Endangered Species Act · 3-56
Energy · 3-36, 4-147, 4-148, 4-165, 4-166, 4-172, 4-183, 10-5
Environmental Assessment · 1-3, 4-7, 4-15, 4-70, 10-3, 10-5
Environmental Justice · 3-20, 4-11, 4-145, 4-146, 4-147, 7-9
Erosion · 2-12, 2-21, 3-26, 3-28, 3-46, 4-51, 4-92, 4-93, 4-136, 4-162, 4-163, 4-164, 5-1
Essential Fish Habitat · S-8, S-13, S-15, 3-44, 3-47, 3-48, 3-51, 4-1, 4-8, 4-58, 4-61, 4-98, 4-100, 4-119, 4-120, 4-139, 4-140, 4-165, 4-178, 4-179, 7-3, 7-7, 8-2
Explosives · S-8, 4-48, 4-90

F

Federal · S-1, S-2, S-13, 1-1, 2-5, 2-31, 3-1, 3-4, 3-6, 3-7, 3-8, 3-11, 3-12, 3-22, 3-25, 3-27, 3-33, 3-34, 3-40, 3-41, 3-47, 3-55, 3-60, 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-13, 4-15, 4-17, 4-18, 4-43, 4-70, 4-71, 4-72, 4-73, 4-78, 4-87, 4-108, 4-116, 4-119, 4-122, 4-123, 4-124, 4-132, 4-137, 4-145, 4-146, 4-147, 4-172, 4-173, 4-177, 5-5, 6-1, 6-3, 6-5, 6-6, 7-1, 7-3, 7-11, 9-1, 10-1, 10-4, 10-5, 10-7, 10-9
Federal Highway Administration · S-1, 1-1, 4-7, 6-1, 9-1, 10-5
Ferry Terminals · S-2, S-3, S-4, S-5, S-7, S-8, S-10, 1-3, 1-4, 2-2, 2-3, 2-4, 2-9, 2-13, 2-15, 2-17, 2-21, 2-22, 2-24, 2-26, 2-27, 2-29, 3-8, 3-12, 3-38, 3-39, 3-42, 3-47, 3-48, 4-2, 4-6, 4-15, 4-17, 4-18, 4-19, 4-20, 4-44, 4-52, 4-55, 4-58, 4-59, 4-60, 4-61, 4-63, 4-68, 4-69, 4-70, 4-72, 4-73, 4-74, 4-75, 4-87, 4-92, 4-93, 4-98, 4-99, 4-100, 4-106, 4-107, 4-118, 4-119, 4-120, 4-121, 4-122, 4-124, 4-125, 4-135, 4-136, 4-137, 4-139, 4-140, 4-141, 4-144, 4-157, 4-159, 4-161, 4-162, 4-165, 4-168, 4-179, 5-1, 5-2, 5-4, 5-5
Final EIS · S-1, S-13, 7-3
Fish · S-8, S-9, S-13, S-15, 3-1, 3-2, 3-6, 3-15, 3-16, 3-17, 3-23, 3-24, 3-25, 3-44, 3-45, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-53, 3-54, 3-55, 3-58, 3-59, 3-60, 3-61, 4-1, 4-8, 4-9, 4-17, 4-30, 4-34, 4-39, 4-46, 4-50, 4-55, 4-58, 4-59, 4-60, 4-61, 4-70, 4-72, 4-89, 4-98, 4-99, 4-100, 4-106, 4-107, 4-119, 4-120, 4-123, 4-139, 4-140, 4-141, 4-145, 4-162, 4-165, 4-172, 4-173, 4-178, 4-179, 4-180, 4-182, 5-2, 5-3, 7-3, 7-7, 7-9, 7-11, 9-1, 10-1, 10-2, 10-3, 10-4, 10-5, 10-8, 10-10
Fish and Wildlife Coordination Act · 3-59, 4-9
Fish Habitat Permit · 4-145
Floodplain · S-8, S-9, 2-15, 2-21, 3-1, 3-2, 3-4, 3-9, 3-11, 3-33, 3-46, 3-51, 3-52, 3-56, 3-57, 3-58, 4-6, 4-19, 4-20, 4-21, 4-50, 4-51, 4-55, 4-61, 4-62, 4-64, 4-67, 4-71, 4-73, 4-74, 4-75, 4-78, 4-91, 4-92, 4-96, 4-100, 4-101, 4-103, 4-105, 4-124, 4-135, 4-138, 4-141, 4-143, 4-166, 4-178, 4-180, 4-181, 4-182
Freshwater Habitat · S-8, 3-47, 3-51, 4-8, 4-58, 4-98, 4-119, 4-120, 4-121, 4-139, 4-165
Funding · S-1, S-12, 1-4, 1-12, 2-1, 2-31, 3-59, 4-89, 4-118, 4-135, 4-160, 4-171, 5-2, 5-4, 5-5, 7-9

G

Geology · S-7, 3-25, 3-26, 4-5, 4-11, 4-48, 4-90, 4-118, 4-135, 7-6, 8-1, 8-2, 8-3, 8-4, 10-5, 10-6, 10-7, 10-9
Karst · 3-25, 3-26, 3-27, 3-28, 4-5, 4-91, 7-3, 7-6, 8-2, 8-3, 8-4
Soil · 3-26, 3-28, 3-30, 3-31, 3-32, 3-40, 3-41, 3-42, 3-52, 4-18, 4-20, 4-21, 4-22, 4-49, 4-51, 4-52, 4-54, 4-91, 4-92, 4-93, 4-94, 4-136, 4-137, 4-148, 4-162, 4-163, 4-164, 5-1, 5-2
Topography · S-7, 3-11, 3-12, 3-30, 3-32, 3-35, 3-38, 3-52, 3-53, 4-18, 4-19, 4-20, 4-22, 4-23, 4-24, 4-74, 4-75, 4-174, 5-5
Goldbelt · S-12, 1-4, 2-2, 2-10, 3-1, 3-5, 3-8, 4-15, 4-17, 4-29, 4-71, 4-72, 4-77, 4-122, 4-123, 4-170, 4-171, 4-174, 4-176, 4-177, 4-178, 4-179, 4-180, 7-8, 9-2, 10-5
Ground Water · 3-32, 3-40, 3-41, 3-42, 3-43, 3-45, 3-46, 4-6, 4-51, 4-54, 4-55, 4-92, 4-95, 4-96, 4-136, 4-138

H

Habitat · S-8, S-9, S-10, S-13, S-15, 2-11, 3-2, 3-3, 3-42, 3-44, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-52, 3-53, 3-54, 3-55, 3-56, 3-57, 3-58, 3-60, 3-61, 4-1, 4-8, 4-9, 4-10, 4-11, 4-15, 4-55, 4-56, 4-58, 4-59, 4-60, 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, 4-69, 4-70, 4-95, 4-96, 4-98, 4-99, 4-100, 4-101, 4-102, 4-103, 4-104, 4-105, 4-106, 4-107, 4-119, 4-120, 4-138, 4-139, 4-140, 4-141, 4-142, 4-143, 4-145, 4-162, 4-163, 4-164, 4-165, 4-166, 4-167, 4-168, 4-173, 4-178, 4-179, 4-180, 4-181, 4-182, 4-183, 5-2, 5-4, 6-2, 6-3, 6-5, 7-3, 7-6, 7-7, 7-8, 9-1, 10-1, 10-4, 10-7, 10-8
Haines · S-2, S-3, S-4, S-5, S-6, S-7, S-11, S-14, S-15, 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-13, 2-1, 2-2, 2-3, 2-4, 2-6, 2-7, 2-8, 2-9, 2-10, 2-13, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-20, 2-22, 2-23, 2-24, 2-25, 2-26, 2-27, 2-28, 2-29, 2-30, 3-1, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-16, 3-17, 3-18, 3-20, 3-21, 3-22, 3-23, 3-24, 3-25, 3-31, 3-36, 3-37, 3-38, 3-39, 3-45, 4-3, 4-4, 4-8, 4-11, 4-12, 4-13, 4-16, 4-17, 4-20, 4-21, 4-26, 4-27, 4-29, 4-31, 4-32, 4-33, 4-34, 4-35, 4-39, 4-40, 4-41, 4-42, 4-43, 4-44, 4-45, 4-46, 4-47, 4-49, 4-53, 4-70, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-78, 4-79, 4-80, 4-81, 4-82, 4-84, 4-85, 4-86, 4-87, 4-88, 4-89, 4-92, 4-97, 4-107, 4-108, 4-110, 4-111, 4-112, 4-114, 4-115, 4-116, 4-117, 4-119, 4-122, 4-123, 4-125, 4-127, 4-128, 4-130, 4-131, 4-132, 4-133, 4-134, 4-146, 4-147, 4-148, 4-149, 4-153, 4-155, 4-156, 4-158, 4-161, 4-169, 4-170, 4-171, 4-172, 4-173, 4-174, 4-175, 4-176, 4-182, 6-3, 7-1, 7-2, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11, 9-2, 10-1, 10-3, 10-5, 10-6
Hazardous Materials · 3-40, 3-41, 4-8, 4-11, 4-34, 4-52, 4-54, 4-93, 4-95, 4-119, 4-137, 4-138
Health · 3-4, 3-16, 3-18, 3-22, 4-15, 4-31, 4-35, 4-78, 4-79, 4-81, 4-170, 4-171, 9-2
Helicopters · 3-38, 3-60, 4-66, 4-104, 4-148, 4-171, 4-177
Historic Preservation · S-13, 3-12, 4-3, 4-25, 4-158, 5-4, 6-6, 7-10, 9-1, 9-2, 10-3
Historic Resources · 2-13, 4-11, 4-17, 4-24, 4-73, 4-75, 4-124, 4-158, 4-173
Humpback Whale · S-10, 3-55, 3-58, 3-60, 4-10, 4-68, 4-69, 4-106, 4-121, 4-144, 4-145, 4-168, 4-181, 4-182, 5-4, 7-7, 7-8, 10-7
Hydrology · 3-30, 3-33, 3-42, 4-1, 4-6, 4-13, 4-50, 4-51, 4-55, 4-91, 4-92, 4-96, 4-119, 4-135, 4-136, 4-138, 4-162, 4-163, 7-6, 8-3, 10-5

I

Impact · S-1, S-2, S-7, S-8, S-9, S-12, 1-1, 1-3, 2-2, 3-10, 3-11, 3-36, 3-37, 3-42, 3-47, 4-1, 4-2, 4-3, 4-5, 4-6, 4-7, 4-8, 4-9, 4-11, 4-13, 4-14, 4-16, 4-20, 4-23, 4-27, 4-29, 4-31, 4-32, 4-34, 4-35, 4-38, 4-39, 4-42, 4-48, 4-51, 4-52, 4-53, 4-54, 4-55, 4-59, 4-60, 4-61, 4-63, 4-65, 4-66, 4-67, 4-70, 4-76, 4-77, 4-78, 4-79, 4-80, 4-81, 4-82, 4-83, 4-84, 4-86, 4-89, 4-90, 4-93, 4-94, 4-95, 4-96, 4-99, 4-100, 4-101, 4-102, 4-103, 4-105, 4-107, 4-119, 4-120, 4-123, 4-135, 4-136, 4-137, 4-139, 4-140, 4-141, 4-146, 4-147, 4-149, 4-152, 4-153, 4-157, 4-164, 4-165, 4-166, 4-168, 4-169, 4-170, 4-173, 4-174, 4-176, 4-177, 4-178, 4-179, 4-180, 4-181, 4-182, 5-3, 7-6, 7-7, 7-8, 7-9, 7-10, 10-1, 10-4, 10-6, 10-7, 10-9, 10-10
Income · 1-11, 3-14, 3-15, 3-17, 3-19, 3-20, 3-21, 3-22, 4-78, 4-145, 4-146, 4-147, 7-4, 7-9
Indirect Impacts · 3-37, 4-2, 4-25, 4-40, 4-56, 4-62, 4-64, 4-75, 4-86, 4-98, 4-101, 4-102, 4-107, 4-114, 4-118, 4-119, 4-120, 4-121, 4-122, 4-130, 4-139, 4-141, 4-142, 4-156, 4-159, 4-173, 4-178, 7-8
Industrial Roads Program · S-12, 1-4, 4-171
Infrastructure · 1-3, 4-160, 4-172, 7-4, 7-9
Irretrievable · 4-183
Irreversible · 4-183

J

Juneau · S-1, S-2, S-5, S-6, S-10, S-11, S-12, S-13, S-14, 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-13, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-9, 2-10, 2-16, 2-17, 2-19, 2-22, 2-24, 2-26, 2-27, 2-29, 2-31, 3-1, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 3-12, 3-13, 3-14, 3-15, 3-16, 3-18, 3-20, 3-21, 3-22, 3-24, 3-25, 3-30, 3-31, 3-32, 3-33, 3-35, 3-36, 3-37, 3-38, 3-39, 3-41, 3-42, 3-43, 3-44, 3-45, 3-53, 3-55, 3-60, 3-61, 4-3, 4-4, 4-6, 4-12, 4-13, 4-14, 4-16, 4-17, 4-18, 4-26, 4-27, 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, 4-34, 4-35, 4-37, 4-38, 4-39, 4-40, 4-41, 4-42, 4-44, 4-45, 4-46, 4-47, 4-49, 4-50, 4-51, 4-53, 4-63, 4-71, 4-72, 4-73, 4-76, 4-77, 4-78, 4-79, 4-80, 4-81, 4-82, 4-84, 4-85, 4-86, 4-88, 4-89, 4-94, 4-102, 4-107, 4-108, 4-109, 4-110, 4-111, 4-112, 4-113, 4-114, 4-115, 4-117, 4-122, 4-123, 4-125, 4-126, 4-127, 4-128, 4-130, 4-131, 4-132, 4-133, 4-134, 4-136, 4-146, 4-149, 4-153, 4-154, 4-156, 4-158, 4-159, 4-160, 4-161, 4-164, 4-169, 4-170, 4-171, 4-172, 4-173, 4-175, 4-176, 4-182, 4-183, 5-1, 6-3, 6-4, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-11, 9-1, 9-2, 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7, 10-8, 10-9, 10-10

K

Katzehin Ferry Terminal · S-10, 2-9, 2-10, 2-12, 2-15, 2-16, 2-17, 2-19, 2-29, 2-31, 3-29, 3-46, 3-49, 3-50, 4-58, 4-59, 4-157, 5-5
Kelp · 3-47, 3-49, 3-50, 4-59, 4-60, 4-99, 4-139

L

Land Use · 3-1, 3-3, 3-5, 3-7, 3-8, 3-9, 3-23, 3-27, 3-36, 3-37, 3-39, 4-1, 4-2, 4-5, 4-11, 4-15, 4-16, 4-25, 4-70, 4-71, 4-72, 4-107, 4-122, 4-146, 4-152, 4-157, 4-173, 6-3, 7-8, 8-2, 8-3, 8-4, 10-3, 10-8
Landslides · 3-28, 3-30, 4-48, 4-49, 4-91
Lease · 4-157
Life Cycle Costs · 4-43, 4-87, 4-116, 4-132
Long-Term Productivity · 4-2, 4-182
Lutak Ferry Terminal · S-2, S-3, 2-2, 2-3, 2-4, 2-9, 2-13, 3-39

M

Maintenance and Operations · 2-1
Mammals · S-9, 3-7, 3-23, 3-24, 3-47, 3-51, 3-55, 3-56, 3-57, 3-58, 3-60, 4-9, 4-39, 4-55, 4-62, 4-64, 4-66, 4-101, 4-102, 4-104, 4-120, 4-121, 4-141, 4-142, 4-143, 4-165, 4-166, 4-180, 4-182, 5-4, 7-7, 7-8, 10-2, 10-4, 10-5, 10-6, 10-8
Marine Alternatives · S-3, S-5, S-6, 2-5, 2-22, 7-4, 7-6, 7-8
Marine and Freshwater Habitat · S-8, 3-47, 3-58, 4-8, 4-56, 4-58, 4-96, 4-98, 4-119, 4-139, 4-165, 4-178, 5-2
Marine Segments · 2-6
Mining · S-12, 1-3, 1-4, 3-1, 3-5, 3-6, 3-9, 3-13, 3-19, 4-17, 4-19, 4-23, 4-24, 4-73, 4-169, 4-170, 4-174, 4-176, 6-5, 9-1, 10-9
Minority Population · 3-20, 4-145
Mitigate · S-7, 2-11, 2-12, 2-21, 2-22, 4-6, 4-48, 4-49, 4-90, 4-158
Mitigation · S-1, S-13, 3-29, 3-36, 3-37, 4-6, 4-10, 4-11, 4-56, 4-61, 4-66, 4-68, 4-98, 4-100, 4-106, 4-139, 4-140, 4-167, 5-1, 5-2, 5-4, 6-2, 7-6
Monitoring · 1-3, 3-6, 3-38, 3-56, 3-61, 4-7, 4-10, 4-11, 4-53, 4-94, 4-148, 4-168, 5-4, 7-8

N

National Ambient Air Quality Standards · 3-34, 4-6
National Highway System · 1-2, 1-8, 2-7, 2-22
Need · S-2, S-4, S-10, S-11, 1-1, 1-3, 1-7, 2-2, 2-3, 2-6, 2-15, 3-3, 3-37, 4-7, 4-30, 4-38, 4-46, 4-73, 4-78, 4-82, 4-85, 4-89, 4-107, 4-114, 4-123, 4-130, 4-134, 4-156, 4-158, 4-162, 4-164, 5-1, 5-3, 5-4, 7-1, 7-4, 7-5, 7-6, 7-7, 7-9, 7-10
NEPA · S-1, 1-1, 1-3, 2-5, 4-2, 4-9, 4-169, 4-170, 7-1, 7-3, 7-7
NMFS · S-10, 3-42, 3-47, 3-48, 3-58, 3-60, 3-61, 4-10, 4-11, 4-68, 4-69, 4-106, 4-121, 4-144, 4-181, 5-4, 7-7, 7-8, 9-1, 10-2, 10-6, 10-7
No Build Alternative · 2-1, 2-4, 2-7
Noise · S-10, 3-36, 3-37, 3-38, 3-39, 4-1, 4-7, 4-10, 4-11, 4-63, 4-64, 4-68, 4-101, 4-102, 4-105, 4-120, 4-141, 4-146, 4-148, 4-149, 4-150, 4-151, 4-152, 4-153, 4-154, 4-155, 4-156, 4-157, 4-163, 4-164, 4-165, 4-166, 4-167, 4-168, 4-169, 4-173, 4-177, 6-5, 7-7, 8-2, 8-3, 10-3, 10-6, 10-8
NPDES · 4-60, 4-99, 4-140, 4-172, 4-176, 4-182

O

Oil Pollution · 7-11

P

Particulates · 4-53, 4-54, 4-94, 4-119, 4-137, 4-176, 4-177
Pedestrians · 2-9, 4-69
Permits · S-1, S-12, S-13, 1-4, 2-11, 3-2, 3-3, 3-5, 3-6, 3-8, 3-15, 3-17, 4-18, 4-50, 4-52, 4-60,

4-66, 4-69, 4-70, 4-73, 4-92, 4-94, 4-99, 4-106, 4-107, 4-108, 4-122, 4-124, 4-137, 4-140, 4-143, 4-145, 4-157, 4-169, 4-170, 4-172, 4-173
Physical Environment · 2-2
Piles · 4-51, 4-92
Preferred Alternative · S-1, S-10, S-11, S-13, 1-1, 1-3, 1-4, 2-1, 2-29, 2-30, 2-31, 4-10, 4-11, 4-15, 4-68, 4-71, 4-106, 4-121, 4-122, 4-130, 4-144
Preservation · S-13, 3-12, 3-37, 4-3, 4-25, 4-158, 5-4, 6-6, 7-10, 9-1, 9-2, 10-3
Pullouts · 4-14, 4-66, 4-70, 4-173, 5-5
Purpose · S-2, S-14, 1-7, 1-9, 1-11, 1-12, 2-1, 2-2, 2-3, 2-5, 2-13, 2-16, 2-19, 2-23, 2-29, 7-4, 8-1
Purpose of and Need for the Action · S-2, S-10, S-14, 1-1, 1-7, 1-9, 1-11, 1-12, 2-1, 2-2, 2-3, 2-5, 2-6, 2-13, 2-16, 2-19, 2-23, 2-29, 7-4, 8-1

R

Recreation · 3-2, 3-3, 3-6, 3-7, 3-8, 3-9, 3-36, 3-37, 3-39, 4-15, 4-16, 4-17, 4-35, 4-51, 4-71, 4-72, 4-73, 4-82, 4-122, 4-123, 4-135, 4-152, 4-170, 4-171, 4-173, 4-174, 4-183, 5-5, 6-1, 6-2, 6-3, 6-4, 6-5, 7-4, 7-5, 7-9, 7-10, 8-3, 9-2
Relocation · S-10, 4-15, 4-68, 4-71, 4-105, 4-122, 4-146, 4-147, 4-152
Resident Fish · 3-47, 3-51, 4-61, 4-70, 4-100, 4-107, 4-140, 4-145, 5-3
Resources · S-7, S-12, S-15, 1-4, 2-13, 3-1, 3-2, 3-3, 3-8, 3-9, 3-11, 3-12, 3-14, 3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-31, 3-33, 3-56, 3-59, 4-1, 4-2, 4-3, 4-5, 4-9, 4-11, 4-14, 4-17, 4-18, 4-23, 4-24, 4-25, 4-26, 4-34, 4-39, 4-48, 4-54, 4-65, 4-71, 4-72, 4-73, 4-75, 4-76, 4-84, 4-91, 4-103, 4-108, 4-118, 4-119, 4-123, 4-124, 4-125, 4-135, 4-142, 4-147, 4-158, 4-163, 4-169, 4-171, 4-173, 4-174, 4-183, 5-1, 5-2, 5-4, 6-2, 6-3, 6-6, 7-3, 7-10, 7-11, 8-2, 8-3, 8-4, 9-1, 10-3, 10-5, 10-9
Response · 2-2, 2-4, 3-16, 3-18, 3-20, 3-56, 4-3, 4-31, 4-35, 4-38, 4-69, 4-79, 4-82, 6-2, 7-3, 7-9
Rivers and Harbors Act · S-13, 4-50, 4-70
Runoff · 3-27, 3-31, 4-6, 4-51, 4-52, 4-53, 4-61, 4-67, 4-93, 4-94, 4-100, 4-105, 4-136, 4-137, 4-140, 4-144, 4-162, 4-176, 4-181, 4-182, 7-7, 7-11

S

Safety · 3-15, 3-16, 3-18, 3-20, 3-34, 4-26, 4-29, 4-37, 4-48, 4-49, 4-77, 4-83, 4-90, 4-151, 5-1, 7-7, 7-9
Sanitary Waste · 4-6, 4-52, 4-60, 4-94, 4-99, 4-119, 4-140
Sawmill Cove Ferry Terminal · 2-21, 2-25, 2-26, 2-27, 2-28, 2-29, 4-18, 4-59, 4-60, 4-72, 4-73, 4-99, 4-100, 4-106, 4-123, 4-124, 4-136, 4-137, 4-139, 4-140, 4-145, 4-157, 4-161, 4-165, 4-179
Scoping · 2-1, 2-5, 2-13, 2-19, 3-12, 3-42, 3-45, 3-55, 4-3, 4-9, 4-31, 4-37, 4-38, 4-79, 4-169, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8, 7-9, 7-11, 9-1
Scoping meeting · 4-31, 4-79, 7-1, 7-2, 7-11
Screening · 2-1, 2-2, 2-11, 2-13, 2-16, 2-19, 3-40, 4-54, 4-66, 4-74, 4-75, 4-95, 4-172, 5-3
Sealaska · 3-5, 4-173, 9-2
Section 10 · S-13, 3-12, 4-25, 4-70, 4-106, 4-122, 4-145, 7-10
Section 4(f) · S-13, 2-3, 6-1, 6-2, 6-3, 6-5, 6-6
Section 401 · 4-70, 4-107, 4-122, 4-145
Section 404 · S-13, 4-69, 4-70, 4-106, 4-107, 4-122, 4-145
Sensitive Receptors · 3-36, 3-37, 3-38, 3-39, 4-149, 4-150, 4-152, 4-154, 4-155, 4-156
Shellfish · 3-6, 3-7, 3-23, 3-47, 3-53, 3-54, 4-39, 4-171, 4-172, 10-1
Short-Term Uses · 4-182
Skagway · S-2, S-3, S-4, S-5, S-6, S-7, S-11, S-13, S-14, S-15, 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-13, 2-1, 2-2, 2-3, 2-4, 2-6, 2-7, 2-8, 2-9, 2-10, 2-12, 2-13, 2-14, 2-15, 2-16, 2-17, 2-18, 2-19, 2-20, 2-22, 2-23, 2-24, 2-25, 2-26, 2-27, 2-28, 2-29, 2-30, 3-1, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-11, 3-13, 3-14, 3-18, 3-19, 3-20, 3-21, 3-22, 3-23, 3-24, 3-25, 3-29, 3-31, 3-36, 3-37, 3-38, 3-39, 3-40, 3-41, 3-44, 3-53, 4-3, 4-4, 4-8, 4-11, 4-12, 4-13, 4-15, 4-16, 4-17, 4-18, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-29, 4-30, 4-31, 4-34, 4-35, 4-36, 4-37, 4-38, 4-39, 4-40, 4-41, 4-42, 4-43, 4-44, 4-45, 4-46, 4-47, 4-49, 4-50, 4-51, 4-53, 4-54, 4-57, 4-72, 4-76, 4-79, 4-80, 4-82, 4-83, 4-84, 4-85, 4-86, 4-87, 4-88, 4-89, 4-107, 4-108, 4-110, 4-112, 4-113, 4-114, 4-115, 4-116, 4-117, 4-119, 4-122, 4-123, 4-125, 4-127, 4-129, 4-130, 4-131, 4-132, 4-133, 4-134, 4-146, 4-147, 4-148, 4-149, 4-150, 4-151, 4-152, 4-153, 4-155, 4-156, 4-157, 4-158, 4-159, 4-161, 4-169, 4-170, 4-171, 4-172, 4-173, 4-174, 4-175, 4-176, 4-182, 5-4, 5-5, 6-1, 6-2, 6-6, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-8, 7-9, 7-10, 7-11, 9-2, 10-1, 10-3, 10-4, 10-6, 10-8, 10-9
Skagway Ferry Terminal · 2-4, 4-148, 4-170
Slate Cove Ferry Terminal · 2-15, 4-52, 4-59
Social Environment · 2-2, 4-3
Socioeconomic · 3-1, 3-14, 3-20, 4-1, 4-3, 4-11, 4-26, 4-27, 4-31, 4-32, 4-34, 4-38, 4-39, 4-76, 4-78, 4-79, 4-82, 4-84, 4-90, 4-108, 4-114, 4-

125, 4-145, 4-158, 4-159, 4-161, 7-8, 7-10, 8-1, 8-2, 8-3, 10-7
Solid Waste · 4-38
Southeast Alaska Transportation Plan · S-2, 1-1, 2-3
State · S-1, S-2, S-6, S-10, S-11, S-12, S-13, S-14, 1-1, 1-2, 1-3, 1-4, 1-5, 1-7, 1-8, 1-10, 1-11, 1-12, 2-1, 2-2, 2-3, 2-6, 2-11, 2-12, 2-29, 2-30, 2-31, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-12, 3-14, 3-15, 3-16, 3-18, 3-20, 3-22, 3-33, 3-34, 3-38, 3-39, 3-40, 3-55, 3-56, 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-13, 4-15, 4-17, 4-18, 4-19, 4-20, 4-26, 4-27, 4-30, 4-43, 4-44, 4-46, 4-47, 4-59, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-78, 4-87, 4-88, 4-89, 4-92, 4-108, 4-116, 4-117, 4-118, 4-119, 4-122, 4-123, 4-124, 4-125, 4-132, 4-133, 4-134, 4-135, 4-137, 4-146, 4-147, 4-149, 4-150, 4-153, 4-155, 4-156, 4-157, 4-158, 4-160, 4-161, 4-170, 4-171, 4-177, 4-178, 4-183, 5-4, 5-5, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 7-1, 7-4, 7-11, 9-1, 9-2, 10-1, 10-2, 10-3, 10-5, 10-7, 10-8, 10-9, 10-10
State Costs · S-2, S-6, S-14, 1-7, 1-11, 1-12, 4-44, 4-87, 4-117, 4-133, 10-2
State Historic Preservation · S-13, 3-12, 4-158, 5-4, 6-6, 9-2, 10-3
State Historic Preservation Officer · S-13, 3-12
Steller Sea Lion · S-10, 3-7, 3-9, 3-48, 3-55, 3-58, 3-60, 3-61, 4-1, 4-10, 4-11, 4-62, 4-65, 4-68, 4-69, 4-101, 4-106, 4-120, 4-121, 4-141, 4-144, 4-168, 4-182, 7-7, 7-8, 8-2, 8-3, 10-3, 10-6, 10-8
Stormwater · 4-6, 4-51, 4-61, 4-93, 4-98, 4-100, 4-136, 4-138, 4-140, 4-144, 4-162, 4-164, 4-176, 4-182, 7-7, 10-9
Streams · S-8, 3-9, 3-10, 3-11, 3-26, 3-28, 3-31, 3-32, 3-33, 3-43, 3-51, 3-53, 3-55, 4-8, 4-17, 4-50, 4-51, 4-57, 4-60, 4-61, 4-64, 4-65, 4-70, 4-72, 4-92, 4-93, 4-97, 4-99, 4-100, 4-102, 4-103, 4-107, 4-136, 4-138, 4-140, 4-145, 4-162, 4-177, 5-3, 5-4
Subsistence · S-7, 3-9, 3-22, 3-23, 3-24, 3-25, 3-36, 4-11, 4-17, 4-39, 4-73, 4-84, 4-114, 4-123, 4-130, 4-172, 7-9, 10-1, 10-3, 10-9
Sullivan River · S-7, 2-21, 3-3, 3-29, 3-41, 3-42, 3-45, 4-70, 4-84, 4-92, 4-95, 4-96, 4-99, 4-101, 4-102, 4-165

T

Taxes · 3-16, 3-18, 3-19, 4-29, 4-34, 4-77, 4-81, 4-110, 4-126, 4-175, 4-176
Telephone Surveys · S-11, 1-4, 1-7, 1-8
Terrestrial Habitat · S-8, S-9, S-15, 3-52, 3-56, 4-8, 4-61, 4-62, 4-64, 4-100, 4-101, 4-102, 4-120, 4-140, 4-141, 4-142, 4-164, 4-173, 4-180, 5-2
Threatened · S-10, 3-53, 3-55, 3-56, 3-58, 3-60, 3-61, 4-10, 4-62, 4-68, 4-106, 4-121, 4-144, 4-168, 4-173, 4-178, 4-181, 5-4
Threatened and Endangered Species · S-10, 3-60, 4-10, 4-62, 4-68, 4-106, 4-121, 4-144, 4-181, 5-4
Timber · 2-21, 2-22, 3-1, 3-2, 3-3, 3-5, 3-6, 3-9, 3-29, 4-17, 4-30, 4-61, 4-73, 4-78, 4-100, 4-170, 4-173, 4-176, 4-180, 6-3
Toll · 4-146
Transportation · 3-25, 4-9, 4-72, 4-107
Trapping · 3-22, 4-65, 4-66, 4-103, 4-104, 4-143
Travel Demand · S-5, 1-8, 1-9, 4-3, 4-4, 4-12, 4-39, 4-40, 4-85, 4-86, 4-114, 4-131, 4-182
Travel Time · S-2, S-5, S-10, S-15, 1-3, 1-5, 1-7, 1-10, 1-11, 2-1, 2-6, 2-9, 2-14, 2-16, 2-18, 2-20, 2-22, 2-25, 2-28, 2-29, 2-30, 2-31, 4-3, 4-4, 4-12, 4-30, 4-37, 4-40, 4-41, 4-42, 4-44, 4-46, 4-86, 4-88, 4-115, 4-117, 4-132, 4-134, 4-183
Tribes · 3-12, 7-3

U

USACE · S-12, S-13, 2-10, 3-5, 3-41, 3-42, 3-44, 3-48, 4-38, 4-69, 4-70, 4-84, 4-106, 4-122, 4-145, 4-162
USDA Forest Service · 10-8, 10-9, 10-10
USEPA · 1-13, 3-34, 9-1
User Benefit Analysis · 2-19, 4-4, 7-4
User Costs · S-2, S-14, S-15, 1-7, 1-12, 2-29, 2-31, 4-4, 4-43, 4-44, 4-87, 4-88, 4-116, 4-117, 4-127, 4-128, 4-130, 4-132, 4-133
USFWS · S-9, 3-22, 3-41, 3-42, 3-48, 3-56, 3-59, 3-60, 4-9, 4-10, 4-62, 4-63, 4-64, 4-67, 4-102, 4-105, 4-148, 4-167, 5-3, 5-4, 7-7, 10-3, 10-4, 10-5, 10-6, 10-10

V

Vegetation · S-7, S-8, S-9, 3-30, 3-34, 3-41, 3-42, 3-43, 3-44, 3-46, 3-47, 3-48, 3-49, 3-50, 3-51, 3-52, 3-57, 4-10, 4-18, 4-19, 4-20, 4-23, 4-24, 4-49, 4-51, 4-55, 4-56, 4-59, 4-61, 4-62, 4-91, 4-92, 4-96, 4-98, 4-100, 4-101, 4-136, 4-138, 4-140, 4-141, 4-148, 4-158, 4-162, 4-180, 4-181
Vibration · 4-11, 4-168
Visual · S-7, S-13, 2-10, 2-21, 3-9, 3-10, 3-11, 4-1, 4-2, 4-3, 4-11, 4-18, 4-19, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-64, 4-73, 4-74, 4-75, 4-108, 4-124, 4-158, 4-173, 4-174, 5-4, 6-6, 7-3, 7-10, 8-2, 8-3, 8-4
Visual Resources · 3-9, 3-11, 4-2, 4-11, 4-173

W

Wastewater Discharge · 4-13, 4-52, 4-70, 4-94, 4-107, 4-119, 4-137, 4-145, 4-176, 4-179, 4-182
Water Quality · 3-2, 3-9, 3-30, 3-31, 3-33, 3-45, 4-1, 4-6, 4-13, 4-17, 4-50, 4-51, 4-52, 4-53, 4-60, 4-61, 4-70, 4-73, 4-91, 4-93, 4-94, 4-99, 4-100, 4-107, 4-119, 4-122, 4-124, 4-135, 4-136, 4-137, 4-140, 4-145, 4-162, 4-163, 4-164, 4-173, 4-176, 4-182, 5-1, 5-2, 5-3, 8-3, 10-4, 10-9
Weather · S-5, 1-10, 2-10, 3-11, 4-37, 4-41, 4-48, 4-66, 4-101, 4-149, 4-163, 4-177, 7-5, 7-9
Wetlands · S-8, S-9, S-13, S-15, 2-11, 2-22, 3-9, 3-11, 3-27, 3-41, 3-42, 3-43, 3-44, 3-45, 3-46, 3-47, 3-48, 3-52, 3-57, 3-58, 4-1, 4-8, 4-14, 4-55, 4-56, 4-57, 4-62, 4-64, 4-67, 4-69, 4-74, 4-95, 4-96, 4-97, 4-98, 4-102, 4-105, 4-106, 4-119, 4-138, 4-139, 4-142, 4-144, 4-145, 4-164, 4-166, 4-167, 4-173, 4-178, 4-180, 4-181, 5-1, 5-2, 5-4, 7-3, 7-6, 8-2, 8-3, 10-1, 10-2, 10-3, 10-4
  Mitigation · 7-6
Whales · S-10, 3-7, 3-55, 3-58, 3-59, 3-60, 4-62, 4-63, 4-68, 4-69, 4-101, 4-106, 4-120, 4-121, 4-141, 4-144, 4-145, 4-168, 4-180, 4-181, 4-182, 5-4, 7-7
Whitehorse · S-6, 1-3, 1-4, 1-5, 1-8, 1-9, 1-10, 1-11, 3-41, 4-3, 4-12, 4-26, 4-27, 4-29, 4-42, 4-54, 4-76, 7-9, 10-6
Wild and Scenic Rivers · 3-3
Wildlife · S-8, S-9, 3-1, 3-2, 3-6, 3-7, 3-16, 3-23, 3-24, 3-45, 3-46, 3-55, 3-57, 3-58, 3-59, 3-60, 4-1, 4-8, 4-9, 4-55, 4-56, 4-62, 4-64, 4-65, 4-66, 4-96, 4-98, 4-101, 4-102, 4-103, 4-104, 4-106, 4-120, 4-121, 4-138, 4-139, 4-141, 4-142, 4-143, 4-164, 4-165, 4-173, 4-177, 4-180, 4-182, 5-1, 5-3, 5-4, 6-1, 6-2, 6-5, 7-7, 7-11, 8-1, 8-2, 8-3, 9-1, 10-1, 10-3, 10-4, 10-5, 10-6, 10-8, 10-9, 10-10
William Henry Bay Ferry Terminal · 2-21, 4-70, 4-94, 4-107, 4-161, 4-162